



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • www.asmfc.org

Joseph Cimino (NJ), Chair

Dan McKiernan (MA), Vice-Chair


Robert E. Beal, Executive Director

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEMORANDUM

April 17, 2024

TO: Commissioners; Proxies; American Eel Management Board; American Lobster Management Board; ACCSP Coordinating Council; Atlantic Menhaden Management Board; Atlantic Striped Bass Management Board; Coastal Pelagics Management Board; Coastal Sharks Management Board; Executive Committee; Horseshoe Crab Management Board; ISFMP Policy Board; Law Enforcement Committee; Sciaenids Management Board; and Spiny Dogfish Management Board

FROM: Robert E. Beal 
Executive Director

RE: ASMFC Spring Meeting: April 29 – May 2, 2024 (TA 24-037)

The Atlantic States Marine Fisheries Commission's Spring Meeting will be April 29 – May 2, 2024 at **The Westin Crystal City**. This will be a hybrid meeting (both in-person and remote) to allow for participation by Commissioners and interested stakeholders. The room block is now closed; if you need assistance reserving a room, please contact Lisa Carty at lcarty@asmfc.org. The Spring Meeting final agenda and meeting materials are available at <http://www.asmfc.org/home/2024-spring-meeting>.

Please note the meeting times on Monday have shifted slightly with 30 minutes added to the American Lobster Management Board and 15 minutes removed from the Horseshoe Crab Management Board; the start times for all other meetings that day reflect the shift in time. 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.

Additionally, due to an email outage, any comments sent to us prior to April 6 have not been included in the meeting materials. Please forward comments to comments@asmfc.org and they will be included in the supplemental materials to be posted to the meeting webpage on April 24; receipt of incoming comments will be confirmed.

Webinar Information

Meeting proceedings will be broadcast daily via webinar beginning Monday, April 29 at 1:30 PM and continuing daily until the conclusion of the meeting (expected to be noon) May 2. To register for the webinar, please go to: <https://attendee.gotowebinar.com/register/6595956399847660630> (Webinar ID 385-329-571).

If you are joining the webinar but will not be using voice over internet protocol (VoIP), you can may also call in at 415.655.0060, access code 439-781-011. A PIN will be provided to you after joining the webinar; see webinar instructions for details on how to receive the PIN. For those who will not be joining the webinar but would like to listen to the audio portion only, press the # key when asked for a PIN.

Each day, the webinar will begin 15 minutes prior to the start of the first meeting so that people can troubleshoot any connectivity or audio issues they may encounter. If you are having issues with the webinar (connecting to or audio related issues), please contact Chris Jacobs at 703.842.0790.

Meeting Process

Board chairs will ask both in-person and virtual board members if they wish to speak. In-person members can simply raise their hands at the meeting without logging on to the webinar, while virtual members will raise their hands on the webinar. The chair will work with staff to compile the list of speakers, balancing the flow of questions/comments between in-person and virtual attendees. The same process will be used for public comment. Depending upon the number of commenters, the board chair will decide how to allocate the available time on the agenda (typically 10 minutes) to the number of people who want to speak.

We look forward to seeing you at the Spring Meeting. If the staff or I can provide any further assistance to you, please call us at 703.842.0740.



Atlantic States Marine Fisheries Commission

Spring Meeting

April 29 – May 2, 2024

The Westin Crystal City

Arlington, Virginia

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 opportunities to the public to bring matters of concern to the board's attention at the start of each board meeting. Board chairs will ask members of the public to raise their hands to let the chair know they would like to speak. Depending upon the number of commenters, the board chair will decide 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 comments 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 comments 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 (April 8) will be included in the briefing materials.
2. Comments received by 5 PM on Tuesday, April 23 will be included in supplemental materials (to be released April 24).
3. Comments received by 10 AM on Friday, April 26 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.

Monday, April 29

1:30 – 4 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: McNamee

Staff: White

1. Welcome/Call to Order (*J. McNamee*)
2. Council Consent
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment
4. Consider Funding Decision Document and FY2025 Request for Proposals (*J. Simpson*) **Action**
5. Update on Program and Committee Activities (*G. White, J. Simpson*)
6. Other Business/Adjourn

Tuesday, April 30

9 – 11:30 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, NEFMC

Chair: Keliher

Other Participants: Pugh, Beal

Staff: Starks

1. Welcome/Call to Order (*P. Keliher*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January and March 2024
3. Public Comment
4. Progress Update on Benchmark Stock Assessment for American Lobster (*T. Pugh*)

5. American Lobster Technical Committee Report on Northern Edge Lobster Population and Fishery (*T. Pugh*)
 - Consider Sending Comments to New England Fishery Management Council on Scallop Action **Possible Action**
6. Plan Development Team Report on Conservation Measures for Lobster Conservation Management Areas 2 and 3 (*C. Starks*)
7. Reports from Lobster Conservation Management Teams 2 and 3
8. Elect Vice-Chair **Action**
9. Other Business/Adjourn

11:45 a.m. – 12:15 p.m.

Sciaenids Management Board

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

Other Members: NMFS, PRFC

Chair: Haymans

Staff: Bauer

1. Welcome/Call to Order (*D. Haymans*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment
4. Consider Spot Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year (*T. Bauer*) **Action**
5. Progress Update on Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments (*J. Kipp*)
6. Elect Vice-Chair **Action**
7. Other Business/Adjourn

12:15 – 1:15 p.m.

Lunch

1:15 – 2:45 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: McManus

Other Participants: Craig, Corbin, Nesslage

Staff: Boyle

1. Welcome/Call to Order (*C. McManus*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment

4. Review Report on Acoustic Survey of Overwintering Atlantic Menhaden Offshore of New Jersey (*G. Nessler*)
5. Updates from State Management Programs
 - Maryland (*L. Fegley*)
 - Virginia (*P. Geer*)
6. Progress Update on 2025 Stock Assessments (*K. Drew*)
 - Ecological Reference Point Benchmark Assessment
 - Atlantic Menhaden Single-Species Assessment Update
7. Elect Vice-Chair **Action**
8. Other Business/Adjourn

1 – 5 p.m.

Law Enforcement Committee

(A portion of this meeting will be closed session for Committee members and the LEC Coordinator only)

Members: Baker, Beal, Brown, Cassins, Corbin, Couch, Day, Gadowski, Hettenbach, Hodge, Hogan, LaCourte, Mercer, Pearce, Rogers, Sabo, Scott, Snellbaker, Thomas, Walker, Williams

Chair: Snellbaker

Staff: Blanchard

Webinar: <https://meet.goto.com/192713685>

Phone: 408.650.3123; Access Code: 192-713-685

1. Welcome/Call to Order (*J. Snellbaker*)
2. Committee Consent (*J. Snellbaker*)
 - Approval of Agenda
1. Public Comment
2. Introductions
3. Update on Changes to Enforceability Guidelines (*J. Snellbaker*)
4. North American Wildlife Law Enforcement Accreditation NAWLEA (*J. Cobb*)
5. American Eel/Elver Fishery (*R. Beal*)
6. Break
7. Review and Discuss Commission Species
 - Atlantic Striped Bass Draft Addendum II (*E. Franke*)
 - Atlantic Cobia FMP Update (*E. Franke*)
 - Other Species
8. Meeting Recess/Reconvene May 1 at 8 a.m.

3:00 – 5:15 p.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: Davis

Other Participants: Walsh, Couch, Rodrigue, Sweka

Staff: Starks

1. Welcome/Call to Order (*J. Davis*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment
4. Consider 2024 Horseshoe Crab Stock Assessment Update (*K. Rodrigue*) **Action**
5. Discuss Horseshoe Crab Bait Demand (*C. Starks*)
 - Possible Impact of State Harvest Regulations on Bait Demand
6. Adaptive Resource Management Subcommittee (ARM) Report (*J. Sweka*)
 - Technical Response to External Review of ARM Framework Revision
7. Update on Horseshoe Crab Management Objectives Workshop (*C. Starks*)
8. Elect Vice-Chair Action
9. Other Business/Adjourn

6 – 7 p.m.

Annual Awards of Excellence Reception

Wednesday, May 1

8 – 10 a.m.

Executive Committee

Breakfast will be available at 7:30 a.m.

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

Members: Abbott, Burgess, Cimino, Clark, Davis, Dyer, Fegley, Gary, Geer, Haymans, Keliher, Kuhn, McKiernan, McNamee, Miller, Patterson, Rawls

Chair: Cimino

Staff: Leach

1. Welcome/Call to Order (*J. Cimino*)
2. Board Consent
 - Approval of Agenda
 - Approval of Meeting Summary from January 2024
3. Public Comment
4. Review FY25 Budget
5. Legislative Update
6. Future Annual Meetings Update
7. Executive Director Performance Review (Closed Session)
8. Other Business/Adjourn

8 – 11:15 a.m.

Law Enforcement Committee (continued)

(A portion of this meeting may be a closed session for LEC Coordinator and Committee members only)

Webinar: <https://meet.goto.com/192713685>

Phone: 408.650.3123; Access Code: 192-713-685

1. Reconvene
2. Review and Discuss Ongoing Enforcement Activities (Closed Session)
3. Review and Discuss Commission Species (continued)
 - American Lobster FMP/Mitchel Provision (*C. Starks*)
 - Horseshoe Crab FMP (*C. Starks*)
4. State Agency Reports
5. Elect Vice Chair
6. Other Business/Adjourn

10:15 – 11:45 a.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

Chair: Woodward

Other Participants: Giuliano, Pearce

Staff: Franke, Tuohy

1. Welcome/Call to Order (*S. Woodward*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment
4. Consider Approval of Atlantic Cobia Draft Addendum II on Recreational Allocation, Harvest Target Evaluation, and Measures Setting for Public Comment (*E. Franke*) **Action**
5. Presentation of Spanish Mackerel White Paper (*E. Franke*)
6. Update from South Atlantic Fishery Management Council on Mackerel Port Meetings (*J. Carmichael*)
7. Other Business/Adjourn

11:45 am. – 1:15 p.m.

Lunch Provided for Commissioners, Proxies and Board Members

11:45 a.m. – 1:15 p.m.

Legislative and Governor Appointees Luncheon

1:15 – 2:45 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: Ware

Other Participants: Grabowski, Mercer

Staff: Franke

1. Welcome/Call to Order (*M. Ware*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from March 2024
3. Public Comment
4. Consider Revised Addendum II State Implementation Plans **Final Action**
 - Overview of Pennsylvania, Maryland, and Potomac River Fisheries Commission Plan Revisions (*K. Kuhn, M. Luisi, I. Braun-Ricks*)
 - Consider Approval of State Implementation Plans
5. Presentation of Massachusetts Division of Marine Fisheries Release Mortality Study (*M. Armstrong*)
6. Discuss Recreational Release Mortality Workgroup Task **Potential Action**
 - Overview of Past Board Discussion (*E. Franke*)
 - Consider Tasking for Recreational Release Mortality Workgroup
7. Review and Populate Advisory Panel Membership (*T. Berger*) **Action**
8. Elect Vice-Chair **Action**
9. Other Business/Adjourn

3 – 5 p.m.

American Eel 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

Chair: Kuhn

Other Participants: Carty, Feigenbaum, Beal

Staff: Starks

1. Welcome/Call to Order (*K. Kuhn*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment
4. Consider Addendum VI on Maine Glass Eel Quota for Final Approval **Final Action**
 - Review Options and Public Comment Summary (*C. Starks*)
 - Advisory Panel Report (*M. Feigenbaum*)
 - Consider Approval of Addendum VI

5. Consider Addendum VII on Yellow Eel Yellow Eel Coastwide Cap and Monitoring for Final Approval
Final Action
 - Review Options and Public Comment Summary (*C. Starks*)
 - Advisory Panel Report (*M. Feigenbaum*)
 - Consider Approval of Addendum VII
6. Elect Vice-Chair **Action**
7. Other Business/Adjourn

Thursday, May 2

8 – 8:45 a.m.

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

Vice-Chair: Luisi

Other Participants: Willey, Thomas

Staff: Starks

1. Welcome/Call to Order (*M. Luisi*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment
4. Progress Update on Ongoing Highly Migratory Species Fishery Management Plan Actions
 (*K. Brewster-Geisz*)
5. Consider Implementing Complementary State Waters Measures to Prohibit Retention of Oceanic Whitetip Sharks (*C. Starks*) **Action**
6. Other Business/Adjourn

9 – 9:45 a.m.

Spiny Dogfish Management Board

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

Other Members: NMFS

Chair: Geer

Other Participants: Baker, Newlin, Cisneros

Staff: Boyle

1. Welcome/Call to Order (*P. Geer*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment

4. Review Action by the Mid-Atlantic and New England Fishery Management Councils (MAFMC and NEFMC) to Reduce Sturgeon Bycatch and Consider Complementary Action **Possible Action**
 - Review MAFMC and NEFMC Final Action (*K. Cisneros*)
 - Review Consistency of Federal and State Management of Spiny Dogfish (*J. Boyle*)
5. Other Business/Adjourn

10 – 11:45 a.m.

Interstate Fisheries Management Program Policy 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: Gaichas, Salerno

Chair: Cimino

Staff: Kerns

1. Welcome/Call to Order (*J. Cimino*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment
4. Executive Committee Report (*J. Cimino*)
5. 2024 State of the Ecosystem Report (*S. Gaichas*)
6. Northeast Trawl Advisory Panel Progress Report for Industry- Base Survey Pilot Program (*D. Salerno*)
7. Consider Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (*K. Blanchard*) **Final Action**
8. Stock Assessment Updates (*K. Drew*)
9. Review Noncompliance Findings, if necessary **Action**
10. Other Business/Adjourn

11:45 a.m. – 12 p.m.

Commission 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: Cimino

Staff: Beal

1. Welcome/Call to Order (*J. Cimino*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Consider Noncompliance Recommendations, if necessary **Final Action**
4. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

Atlantic Coastal Cooperative Statistics Program Coordinating Council

*April 29, 2024
1:30 p.m. – 4:00 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 (*G. White / J. McNamee*)
2. Council Consent
 - Approval of Agenda
 - Approval of Minutes from October 2023
3. Public Comment
4. Consider Funding Decision Document and FY2025 Request for Proposals (*J. Simpson*) **Action**
5. Update on Program and Committee Activities (*G. White, J. Simpson*)
6. Other Business
7. Adjourn

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details.

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ATLANTIC COASTAL COOPERATIVE STATISTICS PROGRAM
COORDINATING COUNCIL**

**Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting**

October 17, 2024

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Coordinating Council. The Council will review the minutes during its next meeting.

TABLE OF CONTENTS

Call to Order, Chair Jason McNamee1

Approval of Agenda.....1

Approval of Proceedings from August 31, 20231

Public Comment1

Consider Approval of FY2024 ACCSP Project and Administrative Proposals for Funding.....1

Consider Approval of SciFish Policies for ACCSP’s Citizen Science Mobile Application 10

Program and Committee Updates 15

Adjournment 18

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of August 31, 2023** by consent (Page 1).
3. **Move to approve Move to approve the FY2024 ACCSP Administrative grant as the base budget inclusive of Option 2 (\$50K) for a total of \$2,310,327** (Page 4). Motion by John Carmichael; second by Erica Burgess. Motion passes (19 in favor) (Page 4).
4. **Move to approve the top six (6) FY2024 ACCSP Maintenance projects as recommended by the Operations Committee and Advisors, including \$65,819 of the \$250K carry-over funds** (Page 5). Motion by Brandi Salmon; second by Ingrid Braun. Motion passes (20 in favor) (Page 5).
5. **Main Motion**
Move to accept the recommendations of the operations committee with the modification of funding both the MAFMC proposal “Improving Catch and Effort Data Collection from Recreational Tilefish Anglers” and the RIDEM proposal “The Economic Impact of Rhode Island’s Fishing Industry” per the agreement these two entities reached to alter their funding request to not exceed the new proposal allocation (Page 5). Motion by Dan McKiernan; second by Renee Zobel. Motion amended.

Motion to Amend
Motion to amend to add “if Rhode Island Department of Environmental Management (RIDEM) and the Mid-Atlantic Fishery Management Council (MAFMC) are unable to reach an agreement on how to split the funds the final arbitrator would be the ACCSP Leadership Committee (Page 8). Motion by Erika Burgess; second by Megan Ware. Motion passes (20 in favor) (Page 8).

Main Motion as Amended
Move to accept the recommendations of the operations committee with the modification of funding both the MAFMC proposal “Improving Catch and Effort Data Collection from Recreational Tilefish Anglers” and the RIDEM proposal “The Economic Impact of Rhode Island’s Fishing Industry” per the agreement these two entities reached to alter their funding request to not exceed the new proposal allocation. If RIDEM and MAFMC are unable to reach an agreement on how to split the funds the final arbitrator would be the ACCSP Leadership Committee. Motion passes by unanimous consent (Page 8).
6. **Move to approve early funding option (November 2023) be used for Option 2 of the Administrative Grant (\$50,000) and for the new SC DNR project to add HMS fields to VESL (\$112,900)** (Page 8). Motion by Erika Burgess; second by John Carmichael. Motion passes by unanimous consent (Page 9).
7. **Motion to approve the SciFish Policies and launching of the SciFish Project Builder and application** (Page 15). Motion by John Carmichael; second by John Clark. Motion passes by unanimous consent (Page 15).
8. **Move to adjourn** by consent (Page 18).

ATTENDANCE TO BE FILLED ON A LATER DATE

The Atlantic Coastal Cooperative Statistics Program Coordinating Council of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Tuesday, October 17, 2023, and was called to order at 8:30 a.m. by Chair Jason McNamee.

CALL TO ORDER

CHAIR JASON McNAMEE: Welcome everyone to the Atlantic Coastal Cooperatives Statistics Program Coordinating Council Meeting.

We've got a couple important things on the agenda today, so we'll call this meeting to order and take care of the first couple of items on the agenda here.

APPROVAL OF AGENDA

CHAIR McNAMEE: The first being the agenda. Are there any modifications, edits, deletions to the agenda that anyone would like to make: If you do, please raise your hand. Not seeing any hands around the table, any hands online? Geoff, can I look to you for that?

MR. GEOFF WHITE: You may, and no hands online.

CHAIR McNAMEE: No hands online either, so with that, I will look around the table to see if anybody has any objections to approving the agenda as submitted. Please, raise your hand if you have an objection. Seeing no hands around the table, and assuming no hands online as well. We will consider the agenda approved as submitted by consent.

APPROVAL OF PROCEEDINGS

CHAIR McNAMEE: Next up are the proceedings from the August, 2023 meeting. Are there any edits, deletions, corrections to those proceedings from anyone on the Coordinating Council? Seeing non hands around the table, any hands online? No hands online. I will ask the question again, are there any objections to approving the proceedings as submitted?

Please, raise your hand if you have an objection. No hands around the table, no hands online, we will

consider the proceedings approved by consent as submitted.

PUBLIC COMMENT

CHAIR McNAMEE: Next up we've got public comment. There are a few folks in the room back there, is there anybody that wishes to make a public comment on anything that is not on the agenda?

No seeing any hands in the audience here, anyone online with their hand up? No hands online, either, so we will consider that our public comment period, with that we move on.

CONSIDER APPROVAL OF FY2024 ACCSP PROJECT AND ADMINISTRATIVE PROPOSALS FOR FUNDING

CHAIR McNAMEE: I was just going to move us to our next agenda items, which is Consideration for Approval of the FY2024 ACCSP Project and Administrative Proposals for funding. We've got a presentation that we'll work our way through. Just to give you something to think about. When we start to think about motions and things like that, it might be best to split the motions up, so we've got a couple of buckets here, right? We've got the administrative proposals; we've got maintenance proposals and new proposals. It might be most succinct to tackle those one by one with individual motion. Just be thinking about that as we're going through the presentation here. I think that will keep things orderly when we start to take action on these. With that I will go ahead and turn it over to Geoff first, so Geoff, whenever you're ready.

MR. WHITE: Good morning on this beautiful day in Beaufort. Before I hand it over to Julie for the presentation on the funding, I did want to note there are a few extra dimensions to the funding this year and the options. I wanted to take a moment to frame those, just to make sure that we've covered that.

First, the annual kind of expected funding of 3.5 million is normally split between 75 percent maintenance and 25 percent new. That is really the base funding and approach that was presented to the Operations and Advisors, as they ranked through

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

the proposals and that information went through. Another dimension is the unallocated \$250,000 from last year's budget that is currently in the ACCSP Administration budget, ready to be allocated.

The decision on that in a prior Coordinating Council meeting was to maintain flexibility and have the Coordinating Council choose where and how to use those funds. Those were not automatically split to the 75 percent and 25 percent maintenance and new. Those are up for discussion; those other funds are up for discussion.

The Advisors and the Operations Committee were given advice to provide recommendations on how to use those funds, that would be useful to the Coordinating Council, but ultimately the decision on what projects get funded with the unallocated funds is of course up to your discretion and action today. I just wanted to make sure that it was clear. The rankings exist in the order and recommendations that they are.

The unallocated funds, as they come up under the motions, we try to be clear about what comes under base funding, and how the discussion and Coordinating Council wants to decide how to use the unallocated funds. That is a little bit of background on why those recommendations from the Ops and Advisors were framed that way. That was ultimately to maintain the decision making and choice at this body. Julie.

MS. JULIE DEFILIPPI SIMPSON: Good morning, everybody. I am going to be presenting today on behalf of the Operations and Advisory Committees, their recommendations and their rankings. What we wanted to do is start out by showing sort of a comparison between the Operations and the Advisors rankings. This is because we use to present them individually, and then in some recent years we've actually been just presenting the combined rankings. As you know, each person's ranking has an equal weight.

However, as we will talk about later, we have a dearth of advisors right now. Their collective opinion is not as powerful as it used to be. We wanted to

separate it to show you the difference between the two groups in the ranking. We'll start with the maintenance projects here. They are color coated, so the left column is the Operations and the right is the Advisors. The colors will show you the projects that are different. In this case there are only two projects that ranked differently for the maintenance proposals. There was a lot of agreement in the maintenance proposals. For the comparison for the ranking on the new projects there was a lot more difference. I used as many colors as I could find that tried to be different, and hopefully you're not colorblind. This again just shows the difference. One of the things that you can see, however, is that in the partner columns we've colored those green, as the ones that when we combined the rankings are the ones that get funded.

One of the things that you can see is that while there are differences in the rankings, for the most part the majority of the projects that are recommended for ranking do fall into the top, for both groups. Despite their being differences between the groups, and some of the projects falling a little bit lower than other projects. For the most part there is agreement between the two groups.

But we did want to give you the visual of this, so that you could see the difference between the Operations and Advisors. As Geoff mentioned, we usually start with a 3.5 million. There has been a "FINcrease" which is a little bump up, and that has become fairly standard, so we've gone ahead and put that in there now.

That makes it 3.53 million. Then we also have, as Geoff mentioned, the \$250,000 from the 2023 unallocated. That leaves us 3.78 million as the funding available. With the Administrative Grant, seven maintenance proposals and nine new proposals, the total proposed funding was 4.76 million, so obviously we don't have enough money to fund everything.

There are going to have to be some hard decisions made today, and I know that the Operations and Advisors also spent a considerable amount of time and thought in putting together their

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

recommendations, because they know that not funding things is always a struggle. We're looking here, and it's called average ranking, but it really isn't an average of the Operations and Advisors. Again, it's a combined ranking of the maintenance projects.

What you can see is that the top six projects are ranked in green and are proposed for funding. Then the Rhode Island project on the Whelk Research Fleet would not be funded, based on the amount of funds available, and also the recommendation of the Operations and Advisory Committees.

Using the 3.53 million, we are going to look at the new projects. The top three projects would be funded or the South Carolina Vessel Project for the Southeast Fisheries Science Center Dockside Biosampling, and then also the Massachusetts Oracle Forms Redesign. Then other proposals that were considered to be very strong, and considered that the Operations and Advisors would like to find funding for, are the Improving Catch in Effort from the Mid-Atlantic Council, and then also the Economic Impact of Rhode Island Fishing Industry.

It was asked to specifically point out that the majority of Operations and Advisory Panel member ranked the economic proposal as high as they possibly could. However, that form has a range for a module that doesn't allow a score above six, whereas biological and catch and effort can have up to a ten. Even being ranked as high as possible, it doesn't come up as high in the rankings. That is one of the reasons they are recommending going out of order. Because there is a lot of pots of money this year, and not enough money to fund everything, we tried to put together a little infographic that tries to explain how the money is being distributed. The yellow boxes represent the recommendations of the Operations and Advisory Committees. At the top you have the 3.53 million, and that gets split into the \$881,000 and the \$293,000 and those go into the maintenance and new proposals respectively. Then there is 2.3 million for the Administrative Grant, and that does include Option 2, which is a Xamarin option, and then there is \$44,000 that does go into the GARFO Overhead.

From the \$250,000 unallocated, \$65,000 of that is recommended to go into the maintenance projects to fully fund that sixth project, and then the remaining would go towards the top three new proposals. Based on what the new proposals get from the 3.53 and the 250, they can fund the top three new proposals.

But then in order to fund those last two that were highlighted in orange, there is only \$130,000 remaining funds, and the recommendation is to try to fund the Mid-Atlantic Council Tilefish and Rhode Island Economic with those remaining funds. I'm just going to walk through the recommendations as they were outlined by the Operations and Advisory Committee.

For the Administrative Grant, they want to fully fund the base budget, and include Option 2. They felt that Option 1, while it was important, that those funds could be used this year elsewhere, and that that Option 1 could be presented again, potentially next year. For the maintenance projects.

Their recommendations are to use a portion of the 250K which you saw in the infographic from the last slide, to fully fund the top six maintenance proposals, but should not fund the seventh project, the Rhode Island Whelk. Their reasoning for that is that that species is not in the top quartile of a biological matrix.

For the new projects, they want to use the new project banks, and the remaining portion of the 250 carry over to fund the top three new proposals. I had listed those earlier. Again, they felt the two projects that were below, which were the Mid-Atlantic Council Tilefish and the Economic Impact in Rhode Island, are both seen and valued, and the Committees recommend that they both be considered for funding.

The Tilefish Project is the next highest ranked project, and the Economic Project was again ranked as highly as possible, given the range for the program priorities. There is that early funding that Geoff mentioned earlier, as well, and the Committee's recommend that the early funding be used for

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

Option 2 in the Administrative Grant, and for the South Carolina DNR Project, to add HMS fields to the VESL. Both projects are able to start work on that timeline, and because of the nature of implementing those projects, no funds would need to be moved.

Activity would be able to begin fairly quickly. Finally, their recommendation is, the Committee's request that the Funding Subcommittee be convened by this group, to review and potentially update the available point ranges of program priorities in the ranking process, with the consideration of the increased importance of socioeconomic data in recent years. A number of the factors that the group cited were things like windfarms, whales, so many other projects, where socioeconomic data is becoming much more important. They feel that those projects should be able to receive a higher ranking. The Funding Subcommittee is made up of members of this group, as well as members of the Operations group. In order to convene, this group would have to charge that group to convene. As was mentioned earlier, it is probably potentially easiest on everyone's brains if we try to break this up a little bit, as we make our recommendations, so I will pass it back to the Chair for next steps.

CHAIR McNAMEE: Great, thank you so much, Julie. Okay, let's start off with any questions for Julie, before we get to work here. Any questions anybody has for Julie on the proposals or the rankings or any of that stuff? We'll let it get just a little more uncomfortably silent, just to make sure. It seems like everybody is okay. I appreciate having this slide up before us here.

You know we've got a couple of buckets, and it will probably be easiest to kind of tackle them one by one, to keep everything nice and clear. You can start off with any one of those that you would like, but looking for somebody to offer some sort of a motion on what to do with the different proposals and the funding available. Yes, so we're trying to be as helpful as possible here. We have some draft motions prepared already. No obligation, just in case it helps.

Let's start with Number 1, if we can pop that one up. This will be consideration of the Administrative Grant. Here is a proposed motion we've got up here, if somebody would like to make that. It would be to move to approve the FY2024 ACCSP Administrative Grant as the base budget inclusive of Option 2 (\$50K) for a total of \$2,310,327. Anybody wishing to make that? I see John Carmichael in the back.

MR. JOHN CARMICHAEL: Yes, to get the ball rolling here, I'll **move to approve the FY2024 ACCSP Administrative Grant as the base budget inclusive of Option 2 (\$50K) for a total of \$2,310,327.**

CHAIR McNAMEE: Excellent, thank you, John, and I have Erika Burgess with a second. We've got a motion made; it's been seconded. The seconder was Erika Burgess. Any discussion. Geoff, did you have something? Oh yes, sorry, make sure you have your microphone. Just remember to turn your microphones on.

We've got a motion, motion made by John Carmichael, seconded by Erika Burgess. John, do you wish to say anything more on that? No, Erika, anything to add? No, anyone wishing to have any discussion on the motion? Okay, not seeing any hands around the table. Anyone flagging us down online? Okay, why don't we go ahead and move this along, and I'll call the question. **All those in favor of the motion, please, raise your hand.**

MR. WHITE: Three online, got you.

CHAIR McNAMEE: Okay, so that count is 19 in favor. **Actually, folks online, put your hand down. Anyone opposed to the motion, please raise your hand. Any abstentions to the motion, please raise your hand, and any null votes. Actually, can we have null votes in the Coordinating Council? Okay, great, all right, that motion passes 19 to 0 to 0.** Thank you very much for that. Why don't we go ahead and move on to the next draft motion. We'll go right down the list here, so Number 2, which is the maintenance proposals. Okay, so we've got a draft motion up on the board and I've got a hand raised. I think it's Brandi. Go ahead.

MS. BRANDI SALMON: **I move to approve the top six (6) FY2024 ACCSP Maintenance projects as recommended by the Operation Committee and Advisors, including \$65,819 of the \$250K carryover funds.**

CHAIR McNAMEE: Thank you for that, Brandi, second by Ingrid. We have the motion made by Brandi, seconded by Ingrid. I don't know your last names yet, I'm sorry.

MS. SALMON: Salmon, pretty easy.

CHAIR McNAMEE: All right, so we've got a motion, it's been seconded. Would either of you wish to speak further to the motion? Okay, anyone else wishing to have discussion on the motion? Any hands online, Geoff?

MR. WHITE: No hands online.

CHAIR McNAMEE: All right, well why don't we keep it moving along and I will go ahead and call the question. **All those in favor of the motion, please raise your hand. Okay, thank you for that. Folks online, please put your hands down. All those opposed to the motion, please, raise your hand. No hands in the room.**

MR. WHITE: No hands online.

CHAIR McNAMEE: **Okay that's zero, any abstentions? None in the room, okay, so that motion passes 20 to 0 to 0.** Thank you for that everybody. We'll keep moving along here. Okay, so we've got a draft motion up here, also could have an alternate motion if anybody wanted. Dan McKiernan.

MR. DANIEL McKIERNAN: **Move to accept the recommendations of the Operations Committee with the modification of funding both the MAFMC proposal "Improving Catch and Effort Data Collection from Recreational Tilefish Anglers" and the RIDEM proposal "The Economic Impact of Rhode Island's Fishing Industry" per the agreement that these two entities reached to alter their**

funding request to not exceed the new proposal allocation. I'll speak to that if I have a chance.

CHAIR McNAMEE: It didn't make its way this way, Dan, so we'll get that so we can put that up on the board. Hang on a second, folks. Okay, thanks for that everybody. All right, so we have the motion up on the board here for folks to take a look at. Motion made by Dan McKiernan, any seconds to the motion? Okay, seconded by Renee Zobel. We have a motion up on the board, it's been seconded, any discussion? Dan, I'll come back to you.

MR. McKIERNAN: Would you like me to speak to it?

CHAIR McNAMEE: Yes, please, Dan. Thank you.

MR. McKIERNAN: Following up on Julie's earlier comments of her description of the process. This proposal would have ranked higher, but not for the scoring system of the rankings, in terms of priorities. The Rhode Island DEM study particularly has broad applicability. I can't tell you how many conversations that I've been in over the last two years with the industry members arguing with the wind developers, talking about economic multipliers.

Too often, numbers are thrown around, 3.5 to 4, but we know that an economic multiplier can vary among species, depending on how the product is handled, et cetera. I'm also pleased that the Mid-Atlantic Council has kind of stepped up, and has offered to assist to maybe get these projects over the goal line. I would really appreciate support on this particular motion.

CHAIR McNAMEE: Renee, anything to add?

MS. RENEE ZOBEL: Sure, I mean I can echo Dan's sentiments about the economic multiplier. We have a study done in 2007 that I reference people to all the time for our commercial fisheries, so incredibly important after talking with our Ops member. I completely understand the rationale behind moving this up.

I had the question talking to Bob over here, sidebar about how these two projects were going to get

funded if we voted them forward. I am pleased to hear that there has been some work in the background to fully fund those projects in a way that is manageable for them.

CHAIR McNAMEE: We also have a hand online, Brandon Muffley. Brandon, unmute whenever you're ready.

MR. BRANDON MUFFLEY: Great, thank you, Mr. Chair and thanks to the maker and seconder of this motion. I certainly support it. Certainly, I support the Council's proposal. We've spent a lot of time working on this, and trying to increase engagement of our tilefish anglers in getting them to report.

I think it could provide a lot of good information as the Commission and the Councils are thinking about mandatory reporting in some of our other recreational fisheries. I think it could be really useful. I fully support the Rhode Island proposal as well. I think there has been some good economic proposals over the last few years that just haven't made it, because of the way we have things structured.

I fully support getting something onboard for Rhode Island, and supporting their project. We have already had conversations with Rhode Island about how we could modify each other's proposals, so that we could get the work done that we want to get done, or that we need to get done, at least the core components of it.

This is a little unclear. I guess you all are going to leave it to the Council and the state of Rhode Island to work those numbers out. Is that my take on what this motion means? Again, we've already been doing that, but I just want to be clear, in terms of how we're going to come to an agreement of what the funding number would be. But fully support the motion, and appreciate the opportunity to comment.

CHAIR McNAMEE: Brandon, thank you very much, and yes, just to answer your question. Roughly 130K that is available for the two, and so per the letters, they both offered that they would work to adjust the numbers in a way that allowed both of the projects

to work. You know originally there was a number of like \$30,000 kind of moving from one to the other that they thought they could both make work.

In any case, that is how that would work, they would just negotiate that knowing what the cap was. Both of them felt under a couple of different scenarios that they could make their projects as effective with less funding by drafting components that they could follow up with later, or other things like that. Thanks for that, Brandon. Okay, we've got two more hands online. I'll start with you, Richard Cody. Feel free to unmute whenever you're ready.

MR. RICHARD CODY: I just wanted to offer to Brandon and the Mid-Atlantic, if they require any technical support for the catch and effort data collection, please feel free to reach out to us at Office of Science and Technology. I just wanted to put that offer out there. We would be happy to collaborate on that.

CHAIR McNAMEE: Thank you, Richard. Next up I have Kathy Knowlton, go ahead, Kathy and unmute whenever you're ready.

MS. KATHY KNOWLTON: Good morning. I just wanted to add my support for these two options in particular. The Economic Impact Proposal, it's not only for the reasons that have been enumerated this morning, but also the ability for this project to be transferred to other ACCSP partners, in terms of coming up with the protocol for economic multipliers. That is one of the things that ACCSP does best, is having a partner start with one project, and it being able to be transferred to other partners, as we always refer to it as the bang for our buck. Additional reasons for this.

CHAIR McNAMEE: Next up we have Carrie Kennedy. Go ahead, Carrie.

MS. CARRIE KENNEDY: Thank you. I think I just want to express maybe a word of caution or concern, that it feels like we're maybe a little out of process. It's not so much that I disagree or don't understand the importance of these projects, but I do think that ACCSP has the ranking priorities. The Advisors and

the Operations Committee have the priorities that they have, and we are through some workshops in the future, going to be exploring the priorities and importance of things like accountability.

While I understand that there is some socioeconomic room in ranking for projects. I think that maybe what needs to happen is that we need to sort of evaluate some ranking criteria, that maybe it's appropriate at this point, because I certainly understand my state doesn't have a lot of economic information about our commercial fisheries, and I suspect that as we walk through offshore wind, and other ocean planning issues, those things are going to become more important. I think ACCSP needs to reflect that in their ranking criteria a little better.

CHAIR McNAMEE: Thank you, Carrie. You know however things work out here, I have flagged that recommendation as well, so I'll be sure to come back to that one way or the other. Thank you for that. We've got another hand online, David Gloeckner. David, go ahead and unmute whenever you're ready.

MR. DAVID GLOECKNER: Well, after what Carrie said, I can just say ditto. I think we have a process in place. Those priorities are there deliberately, right, for all of the modules. It seems like at this point we had not thought we were to the point where the economic module had risen to the degree that the other modules are prioritized. But it seems like now might be the time to move forward, and I think we will reevaluate those priorities.

I think that should take care of my issue I have with the economic survey, or the economic project. The other thing I wanted to say is, I wasn't really clear, but it sounds like she's like Rhode Island and the Council hadn't reached an agreement on how to split those funds yet, but it kind of reads like they have. We might want to just be clear that they are going to decide how to split those funds.

CHAIR McNAMEE: Any other discussion from folks? Bob, go ahead.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, just kind of commenting on, yes, the negotiation between the

Council and Rhode Island DEM. I have the utmost confidence they'll figure it out, but it is a pretty significant cut going from those two projects totaled \$225K and there is only \$130K available. It's a, I don't know 40 plus percent cut to those projects.

But I think we may want to have on the record some sort of backstop, if they are not able to come to a resolution and a negotiated spot that goes back to the Funding Subcommittee, sort of the what if. I don't think it's going to happen; I think they'll figure it out. It sounds like they made a lot of progress. But probably worthwhile to have some backstop process in place, just in case they need some help finishing their negotiation.

CHAIR McNAMEE: Yes, thanks, Bob. Geoff, go ahead.

MR. WHITE: Appreciate that, Bob, and I was just talking about it. We used the ACCSP Leadership Team as kind of a subset of the Coordinating Council to accomplish that task.

CHAIR McNAMEE: Thanks for that, sounds like a good resolution there. Erika, go ahead.

MS. BURGESS: Would you like a motion to amend the current motion that's on the board?

CHAIR McNAMEE: Thank you, Erika. The interpretation I just had of that discussion just a moment ago was that we didn't have to do an amendment. But I was wrong. If you would be willing to having an amendment that would add on something to the effect of, if an agreement can't be reached by the Mid-Atlantic and Rhode Island, that the decision will be remanded back to the Leadership Group, something to that effect. I wouldn't say it like that, but something better than that.

MS. BURGESS: I don't promise better, but I'll try. I would like to make a **motion to amend to add a sentence at the end of the current motion that states if Rhode Island DEM and the Mid-Atlantic Fishery Management Council are unable to reach an agreement on how to split the funds, that the final arbiter would be the ACCSP Leadership Team.**

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

CHAIR McNAMEE: All right, thank you, Erika, we'll get that up there and cleared up a little here, so just bear with us. Does this look okay, Erika? Pretty close to what you offered? Great. A motion to amend has been made by Erika Burgess, is there a second to the motion to amend? Made by Megan Ware, thank you, Megan. We have a motion to amend up on the board. It's been seconded. Any further discussion on this motion to amend? No hands in the room, anyone online? Dave Gloeckner, go ahead.

MR. GLOECKNER: I just want to point out that we are saying in this amendment that if they are unable to reach an agreement, yet in the first it says per the agreement, like they've already reached the agreement. We may want to modify that to make sure that we're clear that an agreement has not yet been made on how to split those funds.

CHAIR McNAMEE: Do you have a suggestion of where that should go, David? I'm just not clear on a part.

MR. GLOECKNER: I'm not sure how to reword it. It probably should say something like the Rhode Island and the Council will work to develop an agreement how to split the funds, I guess, or to alter their request. As long as it just doesn't say the agreement. Instead of per the agreement, I'm not sure where to go with it.

MR. WHITE: From a process standpoint, I'm thinking we may want to address the motion to amend, and then ask Dan McKiernan if he would be willing to just change the word "two entities reached." Change from reached to, to reach or will reach. That way we can handle the motion to amend first, and then we're back to the main motion, and I think at that point Dan would be agreeable to a friendly amendment.

MR. GLOECKNER: That's fine, Geoff, as long as we're just clear that they haven't reached an agreement yet that works fine.

CHAIR McNAMEE: Erika, go ahead.

MS. BURGESS: I suggest that there is no alteration that is needed, we're talking about two separate agreements here. They've already reached an agreement to foot the funds. The second agreement is how they split the funds. I think we're creating extra work. We can leave it as it is.

CHAIR McNAMEE: I can live with that. Geoff can live with that. Maybe I'll look back to you, David online, does that sound reasonable to you?

MR. GLOECKNER: Yes, that's fine. I think the motion to amend is clear that the agreement that I was assuming had been met has not been met yet, so I think that's fine.

CHAIR McNAMEE: Excellent, okay. We've got another hand online, Julie Evans. Go ahead, Julie, and unmute whenever you're ready.

MS. JULIE EVANS: Yes, my name is Captain Julie Evans, I represent East Hampton Town Fishing Industry, and I would like to add my support to the economic impact of Rhode Island's fishing industry effort, as we would benefit from that information here in East Hampton, as we have also had our fishing industry work around the offshore wind industry that has placed a lot of burden on our fishermen. I would add my support to that. Thank you very much for recognizing me.

CHAIR McNAMEE: Thank you, Julie, I appreciate the comments. Let's take care of this motion to amend. Does anybody need any more time on this, any more discussion? Not seeing hands around the table, any remaining hands online? Let's go ahead and call the question on the motion to amend. **All those in favor of the motion to amend please, raise your hand.**

Okay, 20 in favor. Hands online, please put them down and we'll do any one opposed to the motion, please raise your hand. No hands in the room. No hands online. Any abstentions? None in the room, none online. Great, so the motion to amend passes. We'll get the new main motion up on the board, just bear with us. Go ahead, John.

MR. JOHN CLARK: Just a process question. Is there any reason why these can't be done by consent, without us taking a vote each time, if there is no opposition?

CHAIR McNAMEE: I don't know, I'm going to look to my right. All right, thank you, John, for making us more efficient.

MR. CLARK: Yes, as a geezer, you know raising my hand all the time is getting tiring.

CHAIR McNAMEE: Getting worn out, sorry, John. We'll take it easy on you now then. Okay, so we're back to the main motion here. The amendment has been, well, it's the main motion now. Any further discussion on this before we call the question? None here in the room, no one online, so let's take John Clark's, sorry I was just checking.

We have the main motion here, **are there any objections to the main motion? If you object, please raise your hand. None in the room, none online, so the motion passes by consent.** Great, thanks everybody, appreciate that. With that, we can move on to the final motion here. Okay, this one had to do with the early funding. There it is.

Okay, so we have a draft motion for folks to consider. The draft motion here is to **move to approve early funding option (November 2023) be used for Option 2 of the Administrative Grant (\$50,000) and for the new SCR DNR project to add HMS fields to VESL, on the order of \$112,900.** There is a draft motion, anybody wish to make that motion? Motion made by Erika Burgess, is there a second? Seconded by John Carmichael. Any discussion on the motion from anyone?

No hands in the room, anyone online? Okay, why don't we try the John Clark method here again. **Are there any objections to approving this motion? If you object, please raise your hand. No hands in the room. Any hands online? Motion passes by unanimous consent.** Thanks everybody. All right, before we move on to the next item, I just wanted to get back to you. There was a recommendation for some tasking to the Funding Subcommittee. There

was some discussion about the economic data. I think it would hold for some of the social science stuff that may be needed moving forward. I was wondering if anybody wants to speak to potentially tasking the Funding Subcommittee.

I don't think we need to make a motion here, I think we can just make the request to take up that recommendation at the Ops Committee, if anybody wishes to. I just wanted to remind folks that that was kind of in the information that we received. Back to the Board, anybody want to make a comment on that? Yes, Carrie, go ahead.

MS. KENNEDY: Yes, I'm happy to make the recommendation that they need to reevaluate and consider boosting socioeconomic and accountability in ranking.

CHAIR McNAMEE: Great, thank you, Carrie. Not a motion here, just a request made. Anyone else wishing to speak to that? Erika, go ahead.

MS. BURGESS: I was very excited to see this brought up in the ACCSP briefing materials for this meeting. I am very passionate about the social sciences, and their value to our decision-making process. I would like to see them receive higher ranks as projects are considered in the future, and I encourage the Committee to reevaluate those rankings.

CHAIR McNAMEE: Excellent, so a couple of folks in favor of some tasking to the Funding Subcommittee. Anyone else wishing to comment? Any hands online? David, go ahead.

MR. GLOECKNER: I was just going to lend my support to revisiting the priorities. I think it's about time.

CHAIR McNAMEE: Great, thank you very much. I think that is all based off the recommendation that we received, so I think we've got enough guidance there, so I appreciate that everybody. Let's move along here.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

CONSIDER APPROVAL OF SCIFISH POLICIES FOR ACCSP'S CITIZEN SCIENCE MOBILE APPLICATION

CHAIR McNAMEE: The next agenda item that we need to tackle is Consider Approval of SciFish Policies for ACCSP's Citizen Science Mobile Application.

We had kind of a little preliminary meeting a month or so ago, where some of the information was introduced. You've had some time to think on it a little bit. Here we are to kind of make the final call here. With that I will turn it over to Julie, to take us through a quick presentation, so Julie, whenever you're ready.

MS. SIMPSON: What I want to do today is just talk about the SciFish Policies. We're going to do a little bit of a shorter version than we did in August. But if there are any questions, we can definitely go back and answer them. We do want to start out by thanking the SciFish Organizing Committee.

They've been working on this project for about three years now, and putting together the applications that exist, and in doing the beta testing, and a lot of writing for creating the policy's that you got in your materials. Thank you to everyone from all of these organizations that participated in this process. An introduction to SciFish is that Citizen Science is evolving, and it is a very potentially powerful tool for better understanding fish populations. Citizen Science is a tool that has even been mentioned in the Atlantic recreational priorities. There is a growing interest in Citizen Science to supplement data collection. The development of SciFish, which is not just a mobile application for collecting the data, but also the project builder, where folks can build their project, will help support capturing and sharing information on the Atlantic coast.

Our long-term goal is to develop the Citizen Science mobile application, the project builder, so that you can easily create a customizable application. This will remove the need to develop standalone applications, and will help to standardize the data. Some of the drivers of this are to reduce the cost needed for each of the individual projects, by removing the need to develop software for each

project, reduce the time to create applications from the ground up in getting a project going, and increase the consistency in the data fields and data structure.

One of the things that we did want to sort of reemphasize, is that this doesn't necessarily make projects free, there are other costs to standing up the projects that are part of your outreach and other aspects of the projects. Even though the software is potentially free, it just reduces the cost of projects, it doesn't eliminate them altogether.

Moving on to the SciFish vision and mission, these are stated in the policies. Again, this is about standardizing data fields, centralizing the collection of data, therefore those data are more available for science and management, and by giving a flexible project builder platform, we've minimized the cost and resources needed for more projects.

We wanted to note a few of the additions and changes that have been made since the August meeting, based on the recommendation from this group. We did add language that the SAP, which is the Advisory Panel recreational group, will bring in their consulting expertise as needed. We did specifically note statistical skills in MAT language.

We did also add language about account creation in the policies itself, and the privacy policy link, which previously was not an active link now does link to a website with privacy policies. SciFish administration and oversight, it will be administered through the ACCSP, and the primary oversight will be by the SciFish Advisory Panel or SAP.

This is a new group within the ACCSP. The role of the SAP will be to draft and recommend the SciFish policy updates as they are needed. Then to oversee and implement the SciFish application process, which I will talk briefly about in a minute. Then also, to coordinate and review SciFish project updates. We feel it's very important to make sure that we are checking in with the projects that we have, to make sure that they are maintaining the standards, and doing the things that they said they were going to do in the applications.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

The approach for project development is that we are focusing on data collection from marine and diadromous fisheries on the Atlantic coast, specifically filling data gaps or data deficiencies that have been addressed by research needs, oftentimes stock assessments recommend research or data collection, and this is a place to fill those gaps. We want to use intentional design, and clearly articulate how the data are collected, and also how those data are going to be used in management and/or stock assessments. This is something that needs to be identified prior to the beginning of a project, not after the data have been collected. Finally, this encourages the collaboration between scientists and fishermen. The application process is multi-step. There is going to be a preapplication. We will be accepting those in April, June, October and December. Then there will be full applications that are accepted in February and August.

These are designed to coincide with other funding opportunities, so that as you get funding from another source you can then step through the SciFish application process and use that project builder, rather than developing software on your own. For the application topics, there are boxes here that list all of the topics. We did go over these in August, so I'm not going to go over each one of them in detail.

But I do want to point out that the ones on the right, the last two columns are in the full location only. The preapplication is designed for us to get an idea of your project. Once you are approved through the preapplication, then you will be allowed to submit a full application. At that time the application is a little bit more intensive.

We will ask for things like the data management plan volunteer training plan and communication plan, which indicates to folks that they should have those, because if you can't upload one and/or write one for us, then that is a gap in your project planning. For the review criteria, in the preapplication we are essentially looking for, have you answered all of the questions fully.

If you have, are you addressing how the data will be used in assessment inner management, and also, is

this project a good fit for citizen science. Very important to recognize that not all projects are a good fit for citizen science. It's a very useful tool, but like any other tool, it can't be used for everything. In the full part application, we do have a more rigorous review. Those criteria are ranked by specific numbers, and they are ranked by the entire group.

An average of those rankings is taken, and then if the score is not high enough for any, if there are any criteria that falls below a three, then that application would not be approved. We would work with the applier, in order to fit them up to the point of being accepted. For account creation we have Option 1, which is currently in place.

This is a SAFIS account, which is a standard ACCSP account that is created by a PI. A second option would be an auto approval, essentially this is a non SAFIS account, and so someone could essentially just sign up, and then the user would be creating their own account in the SciFish project.

Option 3 is a combination, where a PI would choose whether they wanted to use Option 1 or 2. We previously mentioned that this was an important aspect that needed to be addressed, because there was interest by North Carolina to be using Option 2, and that due to the number of people that they were going to be having, creating those accounts was going to be burdensome for their staff.

That situation has become potentially more critical, and so I will allow Brandi to speak to that later. But that is definitely something that will need to be addressed, probably rather sooner rather than later. Some of the additional policy topics that are covered in the documentation that you'll receive, are hardware requirements, data access to resources, security, transparency, branding. All of these items are covered in the materials that you received. You also have the link that you received in August with a video on how the project builder works, and all of those were available in your materials. Some of the key takeaways is that, if you are a project PI, you do need to be either an ACCSP partner, or you need to be sponsored by an ACCSP partner.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

Sponsor's will essentially be not required to do the work, but making sure that the work that is being done is meeting the proper standards. We are focusing on supporting citizen science. In the beginning we are going to be limiting the current data fields, and not adding new data fields, just in the interest of simplifying the initial rollout of the project.

Then we wanted to again reemphasizes that project development doesn't require funding, but it does use ACCSP resources. We will have to create a SciFish Advisory Panel, and that will be done through applications from individuals, and then recommendations from this group or appointments from this group, rather.

Then we will definitely have to address account creation quickly. The process that we've gone through is that we presented to this group in August. We presented to the Operations and Advisory Committee at their meeting in September, and they did make a motion to approve, and recommend approval from this group, and that has been done. Today we are putting this in front of you as consideration for action.

Finally, we did want to talk about the rollout of the project. If it is approved today, then in December we will finalize the project builder and all of our outreach documentation, including a new page on the ACCSP website. In January of 2024, we would put out a call for the SciFish Advisory Panel members, and then in February, membership would be approved and we would hold our first SAP meeting, and then the first round of preapplications would begin to be accepted in April of 2024. I will turn it back to you, Mr. Chair.

CHAIR McNAMEE: Excellent, thank you so much, Julie, good info. We've got a couple of folks who can help out as the questions are coming along, so we might go to other folks, besides just Julie. Open it up to the Council for questions. Yes, Brandi, go ahead.

MS. SALMON: Yes, so I just first want to give some kudos to Julie and all the staff that are working on SciFish. They are awesome, and they've been

working so hard to consider all the different avenues and things to be able to finalize these things here. Good job to you folks, you guys are awesome. One thing that Julie kind of mentioned a little bit earlier was the Option 1, Option 2 and Option 3 for being able to create, Option 1 being to create the accounts and Option 2 is not creating accounts.

The direness that Julie was adhering to was that North Carolina just last week had legislation passed that requires mandatory reporting of five species in North Carolina, which is like, Oh my gosh! There is some expectation that that reporting would be through a smartphone application, which is right up this alley here. But we haven't made any decisions on how we're going to move forward with that, but it would be extremely important to put a lot of eggs in the basket of making sure that we can build in the flexibility in SciFish, to be able to have the option to not require every person to create an account. If every person in North Carolina that fishes, millions of anglers have to report to an Ap, it's just not possible for us to be able, it would create an account for every single person. The ability to have options when you come into SciFish to have a project in there, to be able to do something like that is really what we would love to have. I think that other states would be able to benefit from that as well.

CHAIR McNAMEE: Thank you, Brandi. Any response, Julie or Kathy or Julia?

MS. SIMPSON: I would just say that we are, I think in the SAP or in the SciFish Organizing Group. I think a lot of those folks may rollover to the SAP. But we are very aware of that, and so I think that moving to Option 3 is going to be the desired path forward, especially because there are projects, such as relief through the South Atlantic Council that do like the ability to be able to connect with each of their users, and do that outreach. By having that need to create the account through them, is actually an important aspect of their project. I think that because there are varying needs Option 3 is likely going to be the necessary technology moving forward.

CHAIR McNAMEE: Yes, John, go ahead.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

MR. CARMICHAEL: It's great to see this coming to fruition. You know it was an idea a long time ago to develop a tool like this, so it's really awesome the work that you guys have done, getting it this far. I think it's interesting hearing from Brandi, with the idea of using this for something that's mandatory reporting, because I think out of the gate that sort of puts us in a thought of, you know what really is the purpose of SciFish.

The vision says its citizen science, and you know we've always tried to separate the idea of citizen science, the people doing things voluntarily, from mandatory catch reporting, the kind of stuff that is covered by things like the vessels and eTrips and that sort of thing. I think it's great to have the tool.

But I do think it could be perhaps a challenge for fitting something like that into this framework, because once you make something mandatory, you are kind of changing the game of fishermen. One of the goals of citizen science is to keep it voluntary, and let people help us fill data gaps. You know it's going to be interesting to see where this goes. I think we do need to resolve the idea of creating the accounts, because one of the values of having, there has to be a count, obviously.

It's got to be efficient if you get thousands of people, I can imagine. Seeing what it takes to deal with a few people, that is going to be a challenge. We should try to work that out at the end of the day, we do still have that ability to have useful account information, and we can track the fish throughout the system.

Because that has been a hallmark of the ACCSP process, and I think it's really important to making sure the data you use are using and get in these programs, can be put in the context of all the other data collection programs that are out there, because that's always been a challenge of kind of one-off things and studies that people do. If you can't take a bunch of measured fish and know whether or not they are duplicates of an MRIP sample or a TIP sample. Then you get into assessment world and it's like, well, I can't necessarily use those fish. The beauty of what ACCSP has done, is to let you know you can use those fish, and I can put this fish that was

reported and released, in the context of a TIP sample or an MRIP sample, et cetera, and know where this fish fits into that greater pool of stock assessment data. As long as that part is preserved, I think it's fine to have some flexibility in how individual entities come up with creating accounts.

CHAIR McNAMEE: Appreciate the comments, John. Any response, Julie? Okay, just wanted to check. Brandi, go ahead.

MS. SALMON: I just wanted to respond to John's comments. Even if SciFish is not the vessel for mandatory reporting, it would still be nice to be able to have the technology built in to a system, to be able to go to something, even if it's something outside of SciFish. But having it in SciFish for other projects that would be voluntary, would be beneficial to other people as well.

CHAIR McNAMEE: Excellent. Okay, we've got one hand online, and then I'll come to you, Marty. Richard Cody, go ahead.

MR. CODY: Yes, just wondering if Julie could speak a little bit to data access. You know we've talked a lot about setting up an account and so on, but maybe you could elaborate a little bit on how that might work.

CHAIR McNAMEE: Go ahead, Julie.

MS. SIMPSON: Sure. Right now, the PIs automatically have the ability to look at their data and manage it in the Data Warehouse interface. As with any other data, ACCSP is acting as the stewards of these data, and the PIs are the owner of the data. If you are interested in access to the data's current new project, you would need to contact that PI.

If they give you that approval, then we would allow you to see those data through the Data Warehouse application. Part of the outreach will be a website that has a list of all of the projects, and a little bit about each of those projects, so that anyone who is potentially interested in data could at least see those projects listed on the website, and also the PI contact information, so that they could initiate that process.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

CHAIR McNAMEE: Richard, any follow up?

MR. CODY: No, that's great. Thank you, Julie.

CHAIR McNAMEE: Great, Marty, go ahead.

MR. MARTIN GARY: Thanks, Julie, for the presentation. Just a question about the Advisory Panel. The call is going to go out in January. Can you give some more insight on what you are looking for, the size and makeup, you know when we put that call out, what are we looking for?

MS. SIMPSON: Yes, we're looking for a group of approximately 8 to 12 people. We would like as much variation as possible, in terms of regional representation. In our previous presentation we did have a slide where we are looking for someone from each of the primary regions. We want state folks, we want federal representation, we would like to see an Ops Member and a Coordinating Council member on there, as well as an Advisor.

We are also looking for one staff member to be on that group. We are looking for a range, but we recognize that if you're an Ops Member and you also happen to be from the northeast, you can wear both of those hats, to check those boxes. What we will do is we will be putting out an announcement, at minimum through the ACCSPs monthly committee newsletter, and then potentially through some other avenues of soliciting applications, and then this group would make appointments to that SAP.

CHAIR McNAMEE: Other discussion, questions, anything? John.

MR. CLARK: This is more just curious about North Carolina's mandatory reporting. Besides the logistical nightmare, how was it going to be enforced?

MS. SALMON: Good question.

MR. CLARK: I figured as much, but I just wanted to ask.

MS. SALMON: Yes, there is specific legislation language that has sort of a phase in approach, so we have essentially a year to build whatever we deem appropriate to be able to collect the data. Then after that year, we start with verbal warnings, and then a year after that we start with, I think some kind of written warnings. Then after that, another year after that it would be like a \$35.00 ticket or something like that.

MR. CLARK: Did they give you much funding?

MS. SALMON: They gave us 5 million dollars to spend in a year.

CHAIR McNAMEE: There are no hands left around the table, anybody online? Okay, so this is an action item. What we are looking for is some sort of a motion, potentially to approve or whatever else you might wish, but we are looking for some action here. We have a proposed motion up on the Board, if anybody wishes to make it, or start there and modify it. John, go ahead.

MR. CARMICHAEL: Yes, I think this is good, so I'll **move to approve the SciFish Policies and the launching of the SciFish Project Builder and application.**

CHAIR McNAMEE: Thank you, John, so the motion has been made by John Carmichael. Anyone wishing to second that? John Clark seconds the motion. John Carmichael, anything you wish to add as the maker of the motion?

MR. CARMICHAEL: Yes, again, just to recognize the years of work that have gone into this, and seeing this as a flexible tool. Maybe this is just the start of the type of work that we can do here with these types of things, be more efficient. Years ago, we spent a lot of money building a lot of apps, so it's nice to see this get to this point.

CHAIR McNAMEE: John Clark, anything to add?

MR. CLARK: No, Mr. Chair, I'm exhausted from raising my hand so much.

CHAIR McNAMEE: You had two there without, adding that second, sorry. Okay, so any further discussion by the Board? Any hands online? All right, so let's try this approach again. **Are there any objections to approving the motion that is up on the board? If you object, please, raise your hand. No hands around the table, any hands online?**

All right, so the motion passes by unanimous consent. All right, thanks everybody, and really nice job to the team that has been working on this for so long. It's super cool.

PROGRAM AND COMMITTEE UPDATES

CHAIR McNAMEE: All right, moving on to the next agenda item, we have Program and Committee updates, and I'm going to turn that over to Geoff White, whenever you're ready.

MR. WHITE: Excellent, thank you, Mr. Chair. Just before we move forward, I also want to say thank you to Julie and the entire SciFish group that has brought that forward. It's an excellent amount of work and effort that they've brought to us, and it's a movement for ACCSP to start addressing more of the citizen science data collection and dissemination in a new zone, so very excited about that.

For our program updates there is usually a long list of ongoing activities. Today we've got a short list of focus items that we did want to share and highlight with you in this presentation. The first one is just a quick point that ACCSP is now fully staffed. We added Skye Thomas to the data team in July. She is a Virginia native, she completed her Masters at UNC Wilmington, and her shellfish and aquaculture and GIS information is going to be very useful.

She is currently working a lot on the biological module, and the data inputs into that from a couple of our partners. Welcome, Skye! Moving forward to the software. The software group has been quite busy with a long-term project, the validation project. Julie hosted a workshop in May of 2023. This is really focused on electronic trip reporting, the SAFIS eTrips application. We had a lot of different partners in person for a week-long meeting there, and they

really went through the process and data flow details of the diagram below.

You don't need to read at this point, but it was identifying all of the data flows of where work was occurring, where it was occurring on paper or is it manual, where it could be electronic, and where could those items be added in to that SAFIS electronic trip reporting, as data field validations, responses back to the end user to improve data quality and those types of items.

The red stars are listed as kind of the pain points. Here are items that took a lot of manual effort, or had a lot of difficulty in completing those tasks, and then the yellow stars are validations that needed to occur. Some of this was an in-person process, some could be electronic. One of the exciting things about this is we did have funds from FIS to move forward and begin the programming from that. That project has already begun. What you can see here. We have a contractor, we've got funds from FIS, and we've begun to program the validations into the background of how eTrips works. That includes an interface in SMS, the SAFIS Management System, testing of how that works. The partners are going to be required to enter some information about what are the boundaries that can be entered into those fields.

We're working now on some of the core fields of that, and between now and February, we'll be adding in additional validations, in terms of what are the range checks, is it numerical or is it character. Then what are the warning messages that should come back. In January, we'll be focused more on the attributes.

The attributes of some of our software naming of detailed items that are a lot more flexible, that might be individual partners. They might be fields that can be added or subtracted, depending on what permit you have and what type of report you're submitting. I just wanted to give you guys an update that this work that had been defined earlier in 2023, is now ongoing, and we're looking to implement that in early 2024.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

This is in line with some of the software long term project plans. The items in 2022 were completed, and the items for 2023 registration tracking is an additional way to manage the fishermen, the dealers, the entities, the business entities in between them, and who can see different records and have access to things.

That is a structural change we're doing internally at the moment, and that will be rolled out for partners that wish to submit the additional fields and tracking information into the data systems in 2024. Future steps will involve including those fields into electronic trip reporting and electronic dealer reporting. But right now, the structure needed to be created first, before we move forward with other designs.

Moving into next year, this is also part of the action plan is the electronic dealer reporting redesign. Being able to move the online form to be more flexible. There is a whole series of a switchboard for what questions can and can't be asked, and updating that to an API submission that are processing behind the scenes, and really getting a refresh of the electronic dealer reporting platform that has been in place for many, many, years, so it is ready for a refresh in that standpoint.

The goal of a 2025 rollout is really to align the different pieces of the online, the mobile, the API. Any file upload components to all be pushed out at the same time, so the regulations, depending on how data are submitted, would all be applied at the same point in time. These projects and other new ones will certainly be discussed during the upcoming spring committee meetings.

The Information Systems meeting will really be looking at how to implement registries and tracking, how to expand one stop reporting. If you recall, one stop reporting was the initiative to make sure that folks that had multiple permits could be able to submit one report through the SAFIS eTrips API, or data collection systems, and have that shared with multiple federal entities, so if they've got a southern and a northern permit, that they can see that one report and have it shared behind the scenes with

both of those entities. The next steps in that are to include more of the state requirements, and a state-specific questions, and partners questions that wanted to be added to the one stop reporting. There are a few more of these items coming up, but given that we're coming to the third year of a three-year software development plan.

Having a plan for staff and a priority by the partners, in terms of where to go next, including other developments supportive of your process, and also the data management needs. At this point we're at a pause, and just going to see if there are questions on some of the software development, or future planning that you wanted to ask at this point.

CHAIR McNAMEE: Okay, so looking to the Council, and questions for Geoff? Not seeing any around the table, none online? Okay.

MR. WHITE: Okay, so we'll keep moving.

CHAIR McNAMEE: Keep moving along, thanks, Geoff.

MR. WHITE: The next slide is really about the work that has been done by the Biological and Bycatch Committees. They had historically had some metadata inventory, what programs exist. Last year they had tried to move from an older Excel Spreadsheet format to actually having a database version that is searchable by end users.

That was developed and deployed in the spring of this year, and the Committees were able to go in, and over the summer, add partner specific programs and make those available via the CSP Data Warehouse and on the website. At this point there are 78 projects that have been populated, that cover 56 species. Going from an older, kind of static form, they can certainly add more information as it comes available.

But if people are interested in, oh, what biological data collection programs exist for my favorite species in my favorite area. You can go into this tool and have a quick reference of, what are the programs, who are the contact points. When did it

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

start? What are the types of data collection that are occurring? It doesn't have all the detailed information included here, in terms of the actual data rows, but it does have a reference point to what programs exist over time. We're rather excited to get that one out.

I covered this already, but it does include additional things, the sampling methodology, the primary contact information, but no new information. I think we've covered all this. But the exciting part is really the centralized catalogue that people can search online. This is just a quick screenshot of what it looks like, so when you're into the nonconfidential dataset over on the left-hand side, the menus of the ACCSP Data Warehouse, there is now a new item that says bio and bycatch.

It shows a search set of inventories and programs that exist, and when you highlight a particular row, as I've identified in yellow, it gives you more information about that down below. I think we're going to keep moving. Another item that had come up through Coordinating Council several years ago, was the development of the 2022 Accountability Report Best Practices Workshop, was identified to compare data collection programs, the audits and the trips versus dealer reports. This was mentioned by Carrie Kennedy, it's been a work that Julie has organized the workshops on, and given the ability to schedule things and the propensity for the federal government to stay open, and be included in the workshop. We have shifted this from late 2023 to February 12 through 16, 2024. This will be an in-person meeting down in Charleston.

We've got a lot of the folks identified that will be there already. Really excited to get the process flow laid out. What are the important activities that are going to occur, and really how to combine and improve data quality and accountability between systems. I think our next slide goes to a little bit more of an infographic on that.

By identifying the workload, the staffing and the skillsets, kind of the pros and cons of what can be done with the resource availability, and then evaluating a rubric for implementing new or updated

programs. It's going to be all things that will go into this idea of an accountability toolbox, which will help move partners forward, and ACCSP help to address what data collection is occurring.

How does it align between one data stream, fishermen reporting, and another data stream the dealer reporting, and even beyond that? Before we go further, Julie did you want to add anything at this point? Okay, and then we had planned to kind of be quick here, and so moving forward I wanted to highlight that at the Ops and Advisors Meeting, we did hold Advisors elections.

Dee Lupton, as a new Advisor this year, we're excited to have her on, was voted in as Chair and Fran Karp will be Vice—Chair. We want to also extend thanks to Ellen Goethel for her commitment, her energy and her always point on observations of the process, and being able to move things forward. Thanks to all for that.

The next slide is really a call to action for all of you. Our Advisors, as Julie pointed out earlier, as a group that has been shrinking. There are currently six listed here, but one member does, I believe, needs to drop out. We're down to five active Advisors, and really would love to have each of you consider new advisors to be participating here.

It could be recreational, commercial data associated, you know any of those zones, but to have greater partner participation on the Advisory Group would be fantastic. We would love to have you guys think about who you can appoint, and get them appointed so that they can be active in 2024. That is the end of the highlighted points for the program update.

We've got one more slide we're going to allow a point for questions, but also, I did want to note the two rather important things related to ACCSP would be the MRIP Fisheries Effort Survey Session, it begins at 10:45, and also a lot of the items we talked about as future planning in 2024, are part of Goal 3 in the Action Plan, which is being presented tomorrow during the Business Meeting. With that we'll stop and ask for questions.

These minutes are draft and subject to approval by the Atlantic Coastal Cooperative Statistics Program (ACCSP) Management Board. The Board will review the minutes during its next meeting.

CHAIR McNAMEE: All right, thank you so much, Geoff, way to cover a lot of material in a very succinct way. Questions from anybody for Geoff on what he covered? Anyone online? Okay, last call, no questions or comments for Geoff? It looks like none, Geoff. Thank you very much, appreciate that. Anything you want to add there?

MR. WHITIE: We're good, thank you, Mr. Chair.

CHAIR McNAMEE: That was our last main agenda item.

ADJOURNMENT

CHAIR McNAMEE: We're on to Other Business. Have not received any requests to add anything under Other Business. Just a quick scan around the table, to see if anybody has second thoughts about that. I know John Clark is not going to raise his hand, so I think we are ready to adjourn.

Can I have a motion to adjourn from somebody on the Council? John, I'm going to count that. John, with a motion to adjourn, can I have a second? Thank you, Marty. Any objections to the motion to adjourn? Seeing none; we are adjourned. Thanks, everybody.

(Whereupon the meeting adjourned at 10:00 a.m. on October 17, 2023)

ACCSP FY25 RFP Summary of Changes

1. RFP

1.1. General Changes

- 1.1.1. Updated dates appropriately

2. Funding Decision Document

2.1. General changes

- 2.1.1. All dates have been updated

2.2. Appendix A (**PAGE 15**)

- 2.2.1. Added Year 5 value (\$142,344) for PRFC electronic reporting project

3. Biological Priority Matrix – No Changes

4. Bycatch Priority Matrix – No Changes

5. Recreational Technical Committee Priorities – No Changes

6. Socioeconomic Priority Data Elements – No Changes

7. Timeline for Proposal Review

7.1. Dates are updated

- 7.2. Overall timeline remains relatively the same

8. Ranking Criteria Document – No Changes



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

TO: ACCSP Coordinating Council and All ACCSP Committees

FROM: Geoff White, ACCSP Director

SUBJECT: ACCSP Request for 2025 Proposals

The Atlantic Coastal Cooperative Statistics Program (Program or ACCSP) is issuing a Request for Proposals (RFP) to Program Partners and Committees for FY25 funding.

ACCSP's [Funding Decision Document](#) (FDD) provides an overview of the funding decision process, guidance for preparing and submitting proposals, and information on funding recipients' post-award responsibilities. Projects in areas not specifically addressed in the FDD may still be considered for funding if they help achieve Program goals. These goals, listed by priority, are improvements in:

- 1a. Catch, effort, and landings data (including licensing, permit and vessel registration data);
- 1b. Biological data (equal to 1a.);
2. Releases, discards and protected species data; and,
3. Economic and sociological data.

Project activities that will be considered according to priority may include:

- Partner implementation of data collection programs;
- Continuation of current Program-funded partner programs;
- Funding for personnel required to implement Program related projects/proposals; and
- Data management system upgrades or establishment of partner data feeds to the Data Warehouse and/or Standard Atlantic Fisheries Information System.

Proposals for biological sampling should target priority species in the top quartile (Attachment II) of the Biological Priority Matrix. Proposals for observer coverage should align with fisheries affecting the top quartile priority species (Attachment III) of the Bycatch Priority Matrix. Brief descriptions of the current levels of biological or bycatch sampling by any of the Partners would be helpful to the review process. Projects for recreational catch and effort data should target the priorities set by the Recreational Technical Committee (Attachment IV). Projects involving socioeconomic data should reference the Socioeconomic Priority Data Elements (Attachment V).

Proposals to continue Program-funded partner projects ("maintenance proposals") may not contain significant changes in scope (for example the addition of bycatch data collection to a dealer reporting project), and 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.

Additionally, 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

Our vision is to produce dependable and timely marine fishery statistics for Atlantic coast fisheries that are collected, processed, and disseminated according to common standards agreed upon by all program partners.

fourth year of maintenance funding. For maintenance projects entering year 6, a further 33 percent cut will be applied and funding will cease in year 7.

All project submissions must comply with the Program Standards found [here](#). Please consider using [this successful project proposal](#) as a template. Overhead rates may not exceed 25% of total costs unless mandated by law or policy. Items included within overhead should not also be listed as in-kind match.

Submissions will be reviewed in accordance with the FDD (Attachment I), ranking criteria (Attachment VII), and funding allocation. Current funding allocation guidelines are 75% for maintenance projects and 25% for new projects within the Program priorities. If either allocation is not fully utilized, remaining funds will be available to approved projects in the other category. For example, if maintenance projects only use 67% of the total available funds, the remaining balance would be added to the 25% new project allocation to fund new projects as approved by the Coordinating Council.

Attachment VI provides a timeline for the FY25 funding process. The final decision on proposals to be funded for FY25 will be made in October 2024. Project awards will be subject to funding availability and, if there is a funding shortfall, awards may be adjusted in accordance with the FDD. Successful applicants will be notified when funding becomes available.

Project Investigators will be required to report progress directly to the Program's Operations and Advisory Committees in addition to meeting the standard Federal reporting requirements.

Please submit initial proposals as Microsoft Word and Excel files no later than **June 17, 2024** by email to Julie DeFilippi Simpson, ACCSP Deputy Director julie.simpson@accsp.org. If you have any questions about the funding decision process, please contact your agency's Operations Committee member (<http://www.accsp.org/committees>) or ACCSP staff (703-842-0780).

RELEVANT ATTACHMENTS

ATTACHMENT I	FY2025 Funding Decision Document
ATTACHMENT II	FY2025 Biological Priority Matrix
ATTACHMENT III	FY2025 Bycatch Priority Matrix
ATTACHMENT IV	FY2025 Recreational Technical Committee Priorities
ATTACHMENT V	FY2025 Socioeconomic Priority Data Elements
ATTACHMENT VI	FY2025 Timeline for Proposal Review
ATTACHMENT VII	FY2025 Ranking Criteria Document

Funding Decision Process
Atlantic Coastal Cooperative Statistics Program
May 2024

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 FY25 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 FY25

Projects in Year 5 or 6 of Maintenance Funding	Calculated Base (4-year avg)	Maximum Funding Year 5	Maximum Funding Year 6 (Final Year)
Electronic Trip-Level Reporting for the Potomac River Fisheries Commission Commercial Fisheries Sector	\$213,516	\$142,344	\$71,172

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 Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 – 10 0 – 6 0 – 4	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.
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 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 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



Biological Sampling Priority Matrix

Created in February 2023
For FY2024

*Our vision is to be the principal source of fisheries-dependent information
on the Atlantic coast through the cooperation of all program partners.*

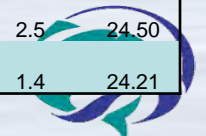
Biological Review Panel Recommends:

- Species in the upper 25% of the priority matrix should be considered for funding.
- Sampling projects which cover multiple species within the upper 25% are highly recommended.



Biological Review Panel Recommendations Based on Matrix:

Species	Overfished		Overfishing		Most Recent Stock Assessment	Current/Next Stock Assessment	Council Priority	ASMFC Priority	State Priority	NMFS Priority	Fishery Managed	Sig. change in landings w/in 24 mo	Sig. change in mgmt w/in 24 mo	Adequacy of level of sampling	Stock Resilience	Seasonality of Fishery	Average Priority	TOTAL
	N: MA	N:SA	N: MA	N:SA														
Black Sea Bass <i>Centropristis striata</i>	N: MA	N:SA	N: MA	N:SA	2021	2023	5	5	3.6	5	5	3	5	4	3	1	4.5	39.57
Red Grouper <i>Epinephelus morio</i>	Y		Y		2017	2023	5	0	1.1	5	3	3	4	3	4	3	2.8	31.07
Tilefish <i>Lopholatilus chamaeleonticeps</i>	N: MA	N:SA	N: MA	Y:SA	2021	2024	5	0	1.9	4	5	1	3	3	4	3	2.8	29.86
Snowy Grouper <i>Epinephelus niveatus</i>	Y		N		2020	2026	5	0	0.9	5	3	1	3	3	5	3	2.8	28.93
American Shad <i>Alosa sapidissima/mediocris</i>	D		U		2020		0	3	3.8	0	5	3	1	4	5	3	2.2	27.79
Atlantic Menhaden <i>Brevoortia tyrannus</i>	N		N		2022	2025	0	5	3.1	3	5	1	3	3	3	1	2.8	27.14
Cobia <i>Rachycentron canadum</i>	N		N		2020	2025	1	5	1.6	4	3	1	1	4	3	3	3.1	26.57
River Herring <i>Alosa</i>	D		U		2017	2023	0	4	3.4	0	5	3	0	4	4	3	2.3	26.36
Spanish Mackerel <i>Scomberomorus maculatus</i>	N		N		2020	2022	5	2	1.2	4	3	1	2	3	2	3	3.0	26.21
Atlantic halibut <i>Hippoglossus hippoglossus</i>	Y		N		2022	2024	4	0	1.2	1	3	3	1	4	5	3	2.0	25.21
Blueline Tilefish <i>Caulolatilus microps</i>	U		U		2017	2024	3	0	1.1	5	3	1	3	3	3	3	2.4	25.07
Finetooth Shark <i>Carcharhinus isodon</i>	N		N		2007		0	1	1.1	3	5	5	1	3	3	3	1.6	25.07
Gray Triggerfish <i>Balistes capriscus</i>	U		U		2023	2024	5	0	1.0	4	3	1	3	3	2	3	2.6	25.00
Bluefin Tuna <i>Thunnus thynnus</i>	E/M: U; W:U	E/M: N; W:N			E/M: 2017; W: 2021	E/M: 2022; W: TBD	0	0	1.9	5	5	1	5	3	3	1	2.0	24.86
Gag Grouper <i>Mycteroperca microlepis</i>	N		N		2021	2025	5	0	0.9	5	3	1	0	3	4	3	2.8	24.86
Vermilion Snapper <i>Rhomboplites aurorubens</i>	N		N		2018	2028	5	0	0.8	4	3	3	3	2	3	1	2.4	24.79
American Lobster <i>Homarus americanus</i>	N: GOM/GB SNE	D: N: GOM/GB SNE	N:		2020	2025	0	5	2.7	0	3	1	5	3	4	1	2.1	24.71
Spiny Dogfish <i>Squalus acanthias</i>	N		N		2022	2026	0	3	2.6	2	5	3	1	2	5	1	1.9	24.64
Red Snapper <i>Lutjanus campechanus</i>	Y		Y		2021	2026	5		0.6	5	3	1	1	1	5	3	2.9	24.57
American Eel <i>Anguilla rostrata</i>	D		U		2017	2022	0	5	3.5	0	5	1	0	4	5	1	2.5	24.50
Shortfin Mako Shark <i>Isurus oxyrinchus</i>	Y		Y		2019	2024	0	1	1.2	3	5	3	5	2	3	1	1.4	24.21



Biological Sampling Priority Matrix

- Grouping of species in upper 25% of total matrix score, based on sampling adequacy and average priority (average of ASMFC, Council, NMFS and State priorities).
- Projects that target multiple upper quartile species should be given a higher priority.

		Biological Sampling Adequacy	
		Adequate (0 - 2)	Inadequate (3 - 5)
Averaged Priority Columns	High (≥ 3.0)		Black Sea Bass - Cobia - Spanish Mackerel
	Low (< 3.0)	Red Snapper - Shortfin Mako Shark - Spiny Dogfish - Vermillion Snapper	American Eel - American Lobster - American Shad - Atlantic Halibut - Atlantic Menhaden - Bluefin Tuna - Blueline Tilefish - Finetooth Shark - Gag Grouper - Gray Triggerfish - Red Grouper - River Herring - Snowy Grouper - Tilefish





Bycatch Sampling Priority Matrix

Created in February 2023
For FY 2024

*Our vision is to be the principal source of fisheries-dependent information
on the Atlantic coast through the cooperation of all program partners.*

Top Quartile of Bycatch Matrix Suggestions

Combined Fleets	Sig. Change in mgmt w/in past 36 mo	Amt of reg discards	Amt of non reg discards	Prot Spp Interactions	Score
Mid-Atlantic Gillnet	3	4	2	5	14
American lobster Pots	3	4	1	5	13
American lobster Pots	3	4	1	5	13
South Atlantic shrimp Trawl	1	4	2	5	12
South Atlantic Deep Water shrimp Trawl	3	4	2	3	12
New England Otter Trawl	3	4	2	3	12
Mid-Atlantic Pound Net	1	4	2	5	12
Pelagic H&L Fleet (North)	3	4	1	3	11
Snapper grouper H&L Fleet	3	4	1	3	11
New England Gillnet	3	2	1	5	11
New England Extra-Large-Mesh Gillnet	0	4	2	5	11
Mid-Atlantic Small-Mesh Otter Trawl, Bottom	1	4	1	5	11
Mid-Atlantic Large-Mesh Otter Trawl, Bottom	3	2	1	5	11
Mid-Atlantic Fish Pots and Traps	3	4	1	3	11
South Atlantic Large Mesh Gillnet	0	4	2	5	11
Southeastern, Atlantic and Gulf of Mexico HMS Pelagic Longline	1	4	1	5	11
Mid-Atlantic Dredge, Other	1	4	1	5	11
New England Crab Pots	3	2	1	5	11
Southeastern, Atlantic and Gulf of Mexico HMS Shark Bottom Longline	0	4	1	5	10





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

ACCSP Funding Prioritization of the Recreational Technical Committee

April 2023

The Recreational Technical Committee determines that recreational data collection priorities for inclusion in ACCSP's annual request for proposals (RFP) and also guides the allocation of resources for NOAA Fisheries' NOAA Fisheries' Marine Recreational Information Program (MRIP). The prioritized list of data needs, which were reviewed and approved by the ACCSP Coordinating Council and approved by MRIP, is provided below:

- 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**

Our vision is to produce dependable and timely marine fishery statistics for Atlantic coast fisheries that are collected, processed, and disseminated according to common standards agreed upon by all program partners.

SOCIOLOGICAL AND ECONOMIC DATA

The Committee on Economics and Social Sciences (CESS) developed a list of priority socioeconomic data elements for coastwide collection. The list is not exhaustive; it represents key elements that can serve as a baseline of fundamental socioeconomic information to support management decisions. The list of priority data elements includes:

1. Trip-level information (to be collected through voluntary or mandatory reporting, for all or a subset of participants)
2. Data elements for an owner/operator survey (to be collected through an annual or semiannual survey)*

The CESS identified these priority data elements with the understanding that data would be collected in the aforementioned methods and would be linked to other ACCSP data through identifiers. Alternative collection methods or the inability to link data with identifiers may require changes to the priority data elements list in order to ensure the utility of the data.

Note: Priorities for standalone surveys will differ from the priorities identified below due to their distinct methodologies and inability to leverage other ACCSP data. The CESS should be consulted when identifying data elements for standalone socioeconomic surveys to ensure their utility and, where practical, consistency across studies.

*The ACCSP recognizes the analytic value of collecting the data elements below. We recommend that partners be aware of and take into account the reporting burden to industry, the sensitivity and at times confidentiality of socioeconomic information, and other relevant perspectives when determining which data elements to collect and set as optional or mandatory.

A. COMMERCIAL FISHERIES

**Table 1:
TRIP LEVEL INFORMATION**

DATA ELEMENT	DESCRIPTION / CRITERIA
Trip Information	
Vessel Identifier	-Unique vessel identifier (e.g., US Coast Guard, state registration number, etc.) -These identifiers must be trackable through time and space.
Trip Identifier	- Unique identifier assigned to the trip
Labor Cost Information	
Total Crew Cost	- Total monetary amount that was given to the crew for this trip

Total Captain Cost (If other than owner)	- Total monetary amount that was given to the captain for this trip
Owner Share	- Total monetary amount the vessel (or permit) owner received for this trip
Other Trip Cost Information	
Fuel & Oil Costs	- Cost for all fuel and oil used on this trip
Bait Costs	- Cost for all bait used on this trip
Ice Costs	- Cost for all ice used on this trip
Grocery Costs	- Cost for all groceries used on this trip
Miscellaneous Costs	- Cost of any other expenses specific to this trip (not including wages, overhead, or fixed costs) E.g., offloading/non-crew labor costs, packaging costs, etc.

**Table 2:
DATA ELEMENTS FOR OWNER/OPERATOR SURVEY**

DATA ELEMENT	DESCRIPTION / CRITERIA
Vessel Identification*	-Unique vessel identifier (e.g., US Coast Guard, state registration number, etc.) -These identifiers must be trackable through time and space.
Fishermen Identification	-Unique ACCSP Identifier for fishermen
Labor Cost Information	
Crew Payment System	- Code to identify crew & captain payment system (e.g. share system, per day, per trip)
Percentage Share Crew	- Percentage share to crew (if applicable)
Percentage Share Captain	- Percentage share to captain (if applicable)
Percentage Share Boat/Owner	- Percentage share to boat/owner (if applicable)
Crew Wages	- Average crew wages for the year (crew payment system indicates whether by hour, trip, day, etc.) (if applicable)
Captain Wages	- Average captain wages for the year (crew payment system indicates whether by hour, trip, day, etc.) (if applicable)
Annual Costs (Most Recent Year)	
Labor costs (captain and crew not in household)	- Total costs of labor for captain and crew outside the owner/operator's household
Labor costs (to people within owner/operator household)	- Total costs of labor for captain and crew within the owner/operator's household
Annual Insurance Costs	- Hull, health, protection and indemnity, mortgage, etc.
Dockage	- Total cost for vessel dockage, home port and transient dockage
Loan Payments	- Principal and interest
New Gear/ Equipment	- Total cost of new gear or equipment acquired
Repairs & Maintenance	- Total cost of repairs & maintenance of vessel and gear that were conducted in the previous year
Permits & Licenses	- Total cost of fishing permits / licenses for the previous year

Leased Quota Cost	- Total cost of leased quota for the previous year
Other Professional Expenses	- Professional expenses not otherwise itemized
Demographic Information	
Household Size	- # of individuals in the household (including respondent)
Employment Status	- Current employment status (e.g., employed fulltime, part-time, unemployed, retired, etc.)
Education	- Highest level of education completed
Marital/Cohabital Status	- Current marital or cohabital status of respondent
Age	- Age of the respondent
Gender	- Gender of the respondent
Ethnicity	- Ethnic background
Total Annual Household Income	- Total annual household income
Number of Household Individuals Involved in Commercial Fishing	- Total number of household individuals involved in commercial fishing (including respondent)
Percent of Annual Household Income from Commercial Fishing	- Percent of household income that is generated through commercial fishing or support activities
County of Residence	- County of residence
Years in Community	- Years in county of residence
Fishing Activity Information	
Fishermen status	- Fishermen status (e.g. full time, part time, not actively fishing)
Years in Commercial Fishing	- Number of years participating in commercial fishery
Permits held	- fishing permits held (by permit type)
Permit use	- Were all permits used within the last year
Reason for Latency	- Reason for not using permit within the last year
Primary Species Landed by Month	- Primary species landed by month
Primary Gears Used by Month	- Primary gears used by month

*Vessel Identifier is needed to link trip-level data to survey results



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

This list includes dates for fiscal year 2024, 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.


Jan 23- Jan 25:	ASMFC Meeting – Arlington, VA
Jan 30- Feb 1:	NEFMC Meeting – Portsmouth, NH
Jan 31:	2023 FHTS Training– Webinar
Feb 6:	Biological Review Panel Annual Meeting – Webinar
Feb 7:	Bycatch Prioritization Committee Annual Meeting –Webinar
Feb 6-7:	MAFMC Council Meeting- Arlington, VA
Feb 13-14:	APAIS North Atlantic Training- Providence, RI
Feb 27-28:	APAIS South Atlantic Training- Raleigh, NC
Mar 1:	Start of ACCSP FY24
Mar 4-8:	SAFMC Meeting – Jekyll Island, GA
Mar 6:	Commercial Technical Committee Annual Meeting – Webinar
Mar 7:	Information Systems Committee Annual Meeting – Webinar
Mar 20-21:	Recreational Technical Committee Meeting – Crystal City, VA
Apr 1:	Operations and Advisory Committees Spring Meeting – Webinar
Apr 9-10:	MAFMC Meeting – Atlantic City
Apr 16-18:	NEFMC Meeting – Mystic, CT
Apr 29-May2:	ASMFC/Coordinating Council Meeting – Arlington, VA
May 6:	ACCSP issues request for proposals
Jun 4-6:	MAFMC Meeting – Riverhead, NY
Jun 10-14:	SAFMC Meeting – Daytona Beach Shores, FL
Jun 17:	Initial proposals are due
Jun 24:	Initial proposals are distributed to Operations and Advisory Committees
Jun 25-27:	NEFMC Meeting – Freeport, ME
July 5:	Any initial written comments on proposals due
Week of Jul 8:	Review of initial proposals by Operations and Advisory Committees – Webinar
July 17:	If applicable, any revised written comments due
Week of Jul 22:	Feedback submitted to principal investigators
Aug 5 -Aug 8:	ASMFC Meeting – Arlington, VA
Aug 12-15:	MAFMC Meeting – Philadelphia, PA

Aug 19:	Revised proposals due
Aug 26:	Revised proposals distributed to Operations and Advisory Committees
Week of Sep 2:	Ranking exercise for Advisors and Operations Members – Webinar
Sep 16-20:	SAFMC Meeting – Charleston, SC
Sep 24-25:	Annual Advisors/Operations Committee Joint Meeting (in-person; location TBD)
Sep 24-26:	NEFMC Meeting – Plymouth, MA
Oct 8-10:	MAFMC Meeting – New York, NY
Oct 21-24:	ASMFC Annual Meeting/Coordinating Council Meeting – Annapolis, MD
Dec 2-6:	SAFMC Meeting – Wrightsville Beach, NC
Dec 3-6:	NEFMC Meeting – Newport, RI
Dec 9-12:	MAFMC Meeting – Annapolis, MD

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 Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 – 10 0 – 6 0 – 4	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.
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 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 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

[View this email in your browser](#)



March 2024 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.



**PUT THIS
ON YOUR
CALENDAR!**

- **April 2: Operations Committee and Advisory Committee Meeting**
- **April 29 - May 2: ASMFC Spring Meeting (ACCSP Coordinating Council)**
- **See [ACCSP Calendar Link](#) for more information**

Operations Committee and Advisory Panel

The Operations Committee and Advisory Panel have scheduled a meeting for April 2, 9am - noon, focusing on the FY2025 RFP and ACCSP operations. Key agenda items include:

- Review and approval of the FY 2025 Request for Proposals (RFP).
- Program Updates
 - Accountability Workshop
 - Software Project Status
 - Recreational Fisheries Project Status
 - Spring Data Load
 - Regional Data Coordination

- ACCSP presented annual software-team accomplishments as well as 2024/2025 project priorities. Additional partner feedback on the eDR ReDesign and Registration Tracking projects will be solicited in April and June, respectively.

Progress on ACCSP software items include:

- A minor update to eTRIPS Online and Mobile will be released next week. This release includes a change to SE Federal commercial-trip reporting requirements. When users select a SE Federal vessel on a commercial trip, the reporting agency will be based on the State or Federal operator permit and not the SE Federal vessel permit.
- ACCSP is working with GARFO to remove an exclusion for GARFO-permitted vessels holding only lobster permits. Starting April 1, selection of a lobster-only GARFO vessel will result in GARFO trip reporting requirements.
- The eDR API enhancements to collect and process GARFO and HMS dealer reports was moved into production on March 13. The initial rollout was a success and ACCSP is working with Federal and State partners to address any remaining issues associated with the new data pathway.
- ACCSP has been working with Harbor Light Software to add new account types and authentication processes to the SciFish Project Builder. The changes are currently in the testing phase.

Recreational Technical Committee

The Recreational Technical Committee (RTC) held an in-person (hybrid) meeting on March 20, 2024 which covered:

- RTC subcommittee members and ACCSP staff presented revamped project proposal to collected recreational discards via pre-trip catch cards, using existing MRIP APAIS design for assignment distribution. This meeting acted as the last chance for the full RTC to review RTC subcommittee efforts to finalize the proposal document for the ACCSP Request for Proposal (RFP), due in mid-June, 2024. The full RTC approved of the updated proposal with small requests for modification and clarification. Pending the outcome of the RFP, the Discards subcommittee will hopefully be limited to pilot project states to prepare for 2025 field sampling efforts. The discards proposal addresses the #3 priority (Improved recreational fishery discard and release data) of the 2023-2027 Atlantic recreational implementation plan by both checking on current data collection methodologies and in supplying additional recreational discard length data for potential use in stock assessments.
- ACCSP staff presented updates to the MRIP statistical consultant review of a proposed methodology for the creation of for-hire logbook estimates of both catch and effort. This methodology addresses the #2 priority (Comprehensive for-hire data collection and monitoring) of the 2023-2027 Atlantic recreational implementation

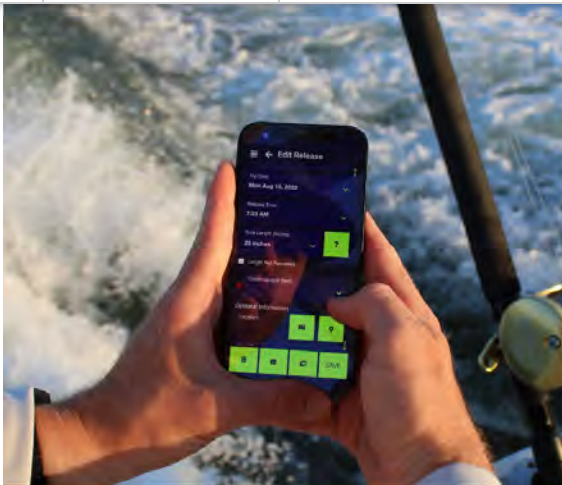
is inclusive of charter and headboats operating in both state and federal waters, while minimizing overlapping for-hire fishery reporting programs. This was the second round of feedback from the full RTC in an iterative process with ACCSP committees (i.e., RTC, Operations, and Advisors). The RTC will continue to work with MRIP to further the path towards certification. The full RTC made decisions related to the methodology (i.e., Did Not Fish reports, Hail-outs, etc.) and agreed on next steps towards certification, including the potential for analyses with existing data streams.

- ACCSP staff presented recent improvements to the ACCSP recreational pages to provide a better approach to website visitors and the ACCSP Data Warehouse (DW) MRIP effort and catch estimates pages. The DW page updates better reflected recent updates to the MRIP presentation standards and presentation of estimate information on the MRIP query tool.

Additionally, NOAA Fisheries' Office of Science and Technology presented to the RTC and State Lead Biologists on March 21. NOAA OST covered APAIS design and evaluations, discussed for-hire processes, OST updates, and MRIP estimate review processes with the goal of beginning Wave-based and annual review sessions of estimates to continually improve recreational estimates.

The full RTC will meet virtually in late November/December, 2024 to discuss the outcome of the Discard project proposal to the ACCSP RFP, next steps with the for-hire methodology, and the potential for future data/estimate review meetings in future calendar years. The RTC Discard Subcommittee will meet in August, November, and December of 2024 as well as January through April of 2025 to continue preparing for a 2025 implementation of the Discards project into the field, aiming for at least Wave 3 (May) through Wave 5 (October) of 2025 conduct

Highlight



SciFish
FISHERMEN DRIVEN DATA COLLECTION

CITIZEN SCIENCE POWERED BY ACCSP



PRE-APPLICATIONS OPEN UNTIL APRIL 1, 2024

ACCSP is excited to announce the first round of SciFish applications is now open! Pre-applications will be accepted during this first round until April 1, 2024. The next deadline for pre-applications will be June 1, 2024.



LEARN MORE

The SciFish application process has multiple steps, including pre- and full application submissions and reviews. The timeline for these steps is below. More information, including the full policy document that has templates for pre- and full applications can be found on the SciFish page of the ACCSP website.

Editor: Marisa Powell

Please contact us if you have any questions or feedback at info@accsp.org.



Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).



[View this email in your browser](#)



February 2024 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.



PUT THIS
ON YOUR
CALENDAR!

Upcoming Events

- **March 6: Commercial Technical Committee Meeting**
- **March 7: Information System Committee Meeting**
- **March 20-21: Recreational Technical Committee Meeting**
- **April 2: Operations Committee and Advisory Committee Meeting**
- **April 29 - May 2: ASMFC Spring Meeting (ACCSP Coordinating Council)**
- **See [ACCSP Calendar Link](#) for more information**

Commercial Technical Committee

The Commercial Technical Committee is scheduled to convene on March 6th, with a comprehensive agenda aimed at enhancing industry standards and regulatory compliance.

Key topics of discussion will include:

- Examination of attribute validation processes
- Introduction of a new disposition code to improve classification accuracy.
- Proposal for mandatory Sale Disposition reporting for all catches, aimed at enhancing harvester/trip-reporting transparency.
- Discussion on granting users, including captains and dealers, the ability to delete their records post-submission, balancing operational flexibility with data veracity.
- Progress report on vessel and registration tracking enhancements, aimed at boosting tracking efficiency and accuracy.
- Review of confidential access standards to safeguard sensitive information while ensuring necessary access.
- Update on the conversion factors project, aiming to standardize measurements and improve data comparability across the industry.

Information Systems Committee / Software Update

fishing area using the effort-page map, a new "this information is true" prompt forcing users to click YES before trip processing completes, and changes to allowed DNF date ranges.

- ACCSP has completed the development work and is now testing several major enhancements to the dealer-reporting API (eDR API). These changes allow GARFO dealers, including those reporting HMS landings, to submit reports via the eDR API.
- ACCSP made several improvements to AWS-cloud and backend database hosting systems to address capacity challenges (e.g. connection disruptions) associated with the recent (since May 2023) increase in VMS location "pings" submitted to SAFIS.
- ACCSP has been working with the Information Systems (IS) Committee chair and co-chair to prepare for the upcoming (March 7) IS meeting. A strategic session is on the agenda, focusing on the review and planning of key information systems initiatives. The meeting will cover the following critical topics:
 - 2023 Software Accomplishments, a comprehensive overview of the milestones and achievements in software development and implementation over the past year.
 - 2024-2025 Software Project Prioritization, discussion on the strategic prioritization of software projects for the next two years, aiming to align with organizational objectives and maximize resource efficiency.
 - eDR Redesign Update, progress update on the electronic Data Reporting (eDR) system's redesign, including milestones achieved, challenges faced, and anticipated next steps.
 - Registration Tracking Update and Discussion, examination and dialogue on the advancements and considerations in registration tracking systems, focusing on enhancing accuracy and efficiency.

Recreational Technical Committee

The Recreational Technical Committee has scheduled a meeting for March 20th-21st, focusing on a series of critical discussions and updates to enhance data collection, analysis, and reporting within the recreational fishing sector. Key agenda items include:

- Examination and progress update on the Recreational Discards Project, aimed at improving the accuracy and comprehensiveness of discard data.
- Technical review of the For-hire Methodology, focusing on refining data collection and analysis techniques for charter and party boats.
- Overview of the latest enhancements and developments in the ACCSP (Atlantic Coastal Cooperative Statistics Program) Data Warehouse and Website, highlighting improvements in data accessibility and user experience.
- Discussion on the APAIS (Access Point Angler Intercept Survey) Design and Implementation, aimed at optimizing survey methodologies for more accurate angler catch data.

- Update on MRIP (Marine Recreational Information Program) initiatives, including recent advancements and future directions in recreational fishing data collection.
- Review of estimation processes and the introduction of an Estimate Review Framework to ensure data reliability and validity across recreational fisheries statistics and reports.

Highlight

We Are **HIRING**

ACCSP FISHERIES DATA TEAM LEAD

Requirements :

- Provides supervision, daily oversight and management for the Data Team staff, ensuring that collection, processing, and dissemination of catch, landings, and biological sampling data are conducted efficiently and in accordance with the ACCSP standards
- Provides guidance on data structures and quality control and monitoring for partner data feeds and deployed ACCSP data collection systems;
- Works with ACCSP technical committees in guiding the evolution of ACCSP data collection standards;
- Works with the partners and ACCSP staff to provide data support for data-intensive activities, such as stock assessments;
- Provides support for custom data requests completed by Data Team staff;
- Ensures established quality control/quality assurance protocols are followed for all information systems during the entire system life cycle.



Send applications to
asmfc-jobs@asmfc.org



REVIEW FULL JOB POST HERE:

[HTTPS://WWW.LINKEDIN.COM/FEED/UPDATE/URN:LI:ACTIVITY:7165830176126287873](https://www.linkedin.com/feed/update/urn:li:activity:7165830176126287873)



Copyright © 2024 ACCSP, All rights reserved.

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).



[View this email in your browser](#)



January 2024 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.

A yellow sticky note is pinned to a white background with a red pushpin. The note contains the text 'PUT THIS ON YOUR CALENDAR!' in a bold, blue, sans-serif font. The word 'ON' is underlined. The entire note is enclosed within a blue rectangular border.

**PUT THIS
ON YOUR
CALENDAR!**

- **February 6: Biological Review Committee Meeting**
- **February 7: Bycatch Prioritization Committee Meeting**
- **February 12-16: Accountability Workshop**
- **February 13-14: North Atlantic APAIS Training**
- **February 27-28: South Atlantic APAIS Training**
- **March 6: Commerical Technical Committee Meeting**
- **March 7: Information System Committee Meeting**
- **March 20-21: Recreational Technical Committee Meeting**
- **See [ACCSP Calendar Link](#) for more information**

Advisory Committee

The Advisors are pleased to welcome two new members representing the state of Maryland. The MDNR Fishing and Boating services put out a call for volunteers in late 2023 and have selected the following two candidates.

- Gordon Ford - A commercial waterman with 50+ years of experience as an active harvester on the Chesapeake Bay and the Atlantic coast.
- Walt Vieser II - A recreational fisherman for most of his 70 years. He is the CEO of a tech company and has professional experience developing performance metrics and managing budgets.

All of the existing Advisory Committee members look forward to working with the newest members.

Recreational Technical Committee

ACCSP Public and Login Data Warehouse system has now been updated to reflect MRIP direction on the presentation of cumulative and wave level data.

The new ACCSP interface includes options to search the data as:

- Annual or partial year cumulative
- Calendar or fishing years to start at any of the 2-month Waves
- Continued ability to query by wave (see optional parameters)
- Visual stoplight (low, medium, warning) highlighting of data based on precision standards (PSE)
- Inclusion of upper and lower 95% confidence intervals
- Identification of final or preliminary status of estimates
- Selection of default and alternate detailed reports for viewing and download
- Expanded metadata / awareness text

ACCSP would like to thank staff and volunteer testers from the Recreational Technical

Bycatch Prioritization Committee

The Bycatch Prioritization Committee would like to welcome Lauren Staples from the New Hampshire Fish and Game Department to the committee and thank her for volunteering to become the newest committee vice-chair.

Highlight



SciFish
FISHERMEN DRIVEN DATA COLLECTION

CITIZEN SCIENCE POWERED BY ACCSP



SCIFISH ADVISORY PANEL MEMBERS NEEDED

The SciFish Advisory Panel (SAP) provides primary oversight for SciFish and is seeking individuals with citizen science expertise. SAP roles and responsibilities include drafting and recommending updates to SciFish policies and procedures, oversight and implementation of the SciFish application process, and coordination and review of annual SciFish project updates.



WE NEED MEMBERS FROM:

- ✓ each region (NE, MA, and SE)
- ✓ a federal agency
- ✓ a state agency
- ✓ a Council or Commission
- ✓ an ACCSP staff
- ✓ each of these ACCSP committees (Coordinating Council, Operations, and Advisors/Industry)

SAP APPLICATION

Applications will be
accepted until
February 16th.

[APPLY NOW](#)

Editor: Marisa Powell

Please contact us if you have any questions or feedback at info@accsp.org.



Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).



[View this email in your browser](#)



November/ December 2023 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.



**PUT THIS
ON YOUR
CALENDAR!**

Upcoming Events

- **January 18: Spring Data Coordination Calls**
- **February 12-16: Accountability Workshop**
- **February 13-14: North Atlantic APAIS Training**
- **February 27-28: South Atlantic APAIS Training**
- **March 20-21: Recreational Technical Committee**
- **See [ACCSP Calendar Link](#) for more information**

Recreational Technical Committee

The Recreational Technical Committee (RTC) held a call on November 1, 2024 and covered:

- MRIP statistical consultant review of a proposed methodology for the creation of for-hire logbook estimates of both catch and effort. This methodology represents a step towards the idea of comprehensive for-hire data collection to address a critical need along the Atlantic Coast to provide for data collection that is inclusive of charter and headboats operating in both state and federal waters, while minimizing overlapping for-hire fishery reporting programs. This was the first round in an iterative process and the RTC will continue to work with MRIP in late 2023 and into 2024 to further this path towards certification.
- Updates from the SciFish Citizen Science project's plan forward from individual projects in the South Atlantic to an eventual switchboard for use in other partner states.
- Updates from the RTC subcommittee about the progress of the proposal for a discards project. This proposal is intended to help address the #3 priority (Improved recreational fishery discard and release data) of the 2023-2027 Atlantic recreational implementation plan.
- Updates to the presentation of the impacts from Modern Fish Act (MFA) funding for the APAIS on the Atlantic within the annual report, starting in 2024. The report will continue to present summary totals and will also target to present more complex comparisons of pre- and post-MFA sample sizes to attempt to show usefulness of MFA implementation.
- ACCSP committee processes and roles to help assure involvement is productive for and from all partners.

The subcommittee has continued to create the project proposal to use pre-trip catch-cards, tied to a certified random sampling design (e.g., the APAIS). Project framework is almost complete with the help of stock assessment scientist perspectives and MRIP perspectives and the subcommittee plans to present the proposal to the full RTC early in 2024, then to the ACCSP Operations Committee and eventually for submission to the ACCSP Request for Proposal in mid-June, 2024.

- The full RTC will meet virtually in January/February, 2024 to discuss the for-hire methodology with MRIP and in-person in March, 2024 to focus on the discards project proposal, Data Warehouse updates, and next steps on for-hire methodology.

Software Team Update

- ACCSP modified the process for mobile trip updates. Trip updates submitted by mobile clients now include the ability to change trip start and end dates and times without changing the existing SAFIS trip ID.
- ACCSP has also been working on several enhancements to the dealer-reporting API (eDR API) including broader support for other vendors and partners not currently using this API. Other changes include the ability to collect and process additional information on Bluefin Tuna and other HMS species.
- Work was recently completed to improve the DEALERS lookup_list API feed. The status of inactive/active dealers is now included in the API feed. This improves the mobile-user experience by no longer allowing users to submit invalid dealers which are subsequently rejected by ACCSP.
- ACCSP also added a new warning targeting non-OSR mobile applications. This warning is sent when ACCSP receives a trip from a dual-permitted vessel that was submitted under a single permitting agency. In addition, a new report was created within SMS to provide a summary of warnings sent to users.
- Last month, ACCSP created a partner-managed footer in eTrips/online and mobile. This footer is currently disabled as requested by partners. When enabled, the feature allows partners to add additional questions to reports beyond standard switchboard-controlled attributes. Footer questions occur downstream from trip, effort, and catch pages allowing footer questions to be conditional on other upstream data entered by users.

Biological Review Panel and Bycatch Prioritization Committee

- ACCSP is planning for the Bycatch Prioritization Committee meeting and Biological Review Committee Annual Meetings. Please choose a 2 day span of availability from January 30 to February 8.

<https://doodle.com/meeting/participate/id/dwkz7AJd>

Commercial Technical Committee and Information Systems Committee

- Due to ASMFC moving up annual meeting dates this year, ACCSP is planning for early Commercial Technical Committee and the Information Systems Committee meeting dates. This will be a virtual-only meeting. Please fill out your availability for March 5 - 14.

<https://doodle.com/meeting/participate/id/enY2P1d>

Please fill out poll by COB Friday, December 22nd.

Highlight





Copyright © 2023 ACCSP, All rights reserved.

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).



Atlantic States Marine Fisheries Commission

American Lobster Management Board

April 30, 2024
9:00 – 11:30 a.m.

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 (*P. Keliher*) 9:00 a.m.
2. Board Consent 9:00 a.m.
 - Approval of Agenda
 - Approval of Proceedings from January and March 2024
3. Public Comment 9:05 a.m.
4. Progress Update on Benchmark Stock Assessment for American Lobster (*T. Pugh*) 9:15 a.m.
5. American Lobster Technical Committee Report on Northern Edge Lobster Population and Fishery (*T. Pugh*) 9:25 a.m.
 - Consider Sending Comments to New England Fishery Management Council on Scallop Action **Possible Action**
6. Plan Development Team Report on Conservation Measures for Lobster Conservation Management Areas 2 and 3 (*C. Starks*) 10:15 a.m.
 - Reports from Lobster Conservation Management Teams 2 and 3
7. Elect Vice-Chair **Action** 11:20 a.m.
8. Other Business/Adjourn 11:30 a.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details.

MEETING OVERVIEW

American Lobster Management Board

April 30, 2024

9:00 – 11:30 a.m.

Chair: Pat Keliher (ME) Assumed Chairmanship: 02/24	Technical Committee Chair: Tracy Pugh (MA)	Law Enforcement Committee Rep: Rob Beal (ME)
Vice Chair: Vacant	Lobster Advisory Panel Chair: Grant Moore (MA) Jonah Crab Advisory Panel Chair: Sonny Gwin	Previous Board Meeting: March 14, 2024
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NMFS, NEFMC (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from January and March 2024

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. Progress Update on Benchmark Stock Assessment for American Lobster (9:15-9:25 a.m.)

Background

- The benchmark stock assessment for American lobster is in progress with results expected in 2025.
- The Assessment Methods Workshop is scheduled for July 2024.

Presentations

- Progress Update on Benchmark Stock Assessment for American Lobster by T. Pugh

5. American Lobster Technical Committee Report on Northern Edge Lobster Population and Fishery (9:25-10:15 a.m.) Possible Action

Background

- In October the Board tasked the lobster Technical Committee (TC) with compiling information on the lobster resource and fishery in and around the Northern Edge of Georges Bank in relation to a potential action at the New England Fishery Management Council (NEFMC) considering scallop fishery access on the Northern Edge.
- The TC presented a preliminary report responding to the Board Task in January, and were directed to complete the recommended analyses.

- The TC has prepared a report including analyses of the available biological data and fishing effort data to describe the lobster population and fishery in the area being considered by the NEFMC (**Briefing Materials**).

Presentations

- Technical Committee Report by T. Pugh

Board guidance for consideration at this meeting

- Consider Sending Comments to New England Fishery Management Council on Scallop Action

6. Plan Development Team Report on Conservation Measures for Lobster Conservation Management Areas 2 and 3 (10:15-11:20 a.m.)

Background

- NOAA fisheries published an interim rule in October 2023 that responds to the Commission’s 2013 recommendations to NOAA to adopt the measures in Addenda XXI and XXII in federal waters. The Addenda aimed to scale the capacity of the Southern New England (SNE) fishery to the diminished size of the SNE resource. However, because over a decade passed since the date when the Commission intended for these federal measures to be implemented, there have been significant changes in the fishery.
- In January, the Board tasked the Plan Development Team (PDT) to explore alternative measures to those included in Addenda XXI and XXII (i.e., trap caps) that would achieve the same goal but better align with the needs of the current fishing fleet, with consideration of the recommendations of the Lobster Conservation Management Teams (LCMTs) for Areas 2 and 3.
- LCMTs 2 and 3 met in April 2024 to provide input to the Board on possible measures and impacts to the lobster fishery (**Supplemental Materials**).
- Given the limited time between the LCMT meetings and this Board meeting, the PDT has compiled information to help characterize the changes in the fishery, and preliminary recommendations for next steps (**Supplemental Materials**).

Presentations

- PDT and LCMT reports by C. Starks

7. Elect Vice Chair (11:20-11:30 a.m.) Action

Background

- The vice chair seat is empty since Pat Keliher assumed the role of chair.

Board actions for consideration at this meeting

- Elect Vice Chair

8. Other Business/Adjourn (11:30 a.m.)

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

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 23, 2024

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

TABLE OF CONTENTS

Call to Order, Chair Jason McNamee1

Approval of Agenda.....1

Approval of Proceedings from October 16, 20231

Public Comment1

American Lobster Technical Committee Report2
Information on Lobster Resource and Fishery Near the Northern Edge of Georges Bank2

Jonah Crab Technical Committee Report.....7
Jonah Crab Stock Indicators.....7
Discuss Future Management Tools..... 10

Discuss Implications of 2025 Size Limit Changes on Imports..... 12

Consider Pursuing a Management Strategy Evaluation for American Lobster (*Dismissed*) 17

Discuss Inconsistencies in Federal and Commission Rules for Lobster Conservation Management Areas 2 and 3
..... 18

Progress Update on State Implementation of Addendum XXIX on Federal Vessel Trackers..... 27

Progress Update on American Lobster Benchmark Stock Assessment (*Dismissed*) 28

Review and Populate Jonah Crab Advisory Panel Membership..... 28

Adjournment 29

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 16, 2023** by consent (Page 1).
3. **Main Motion**
Motion to initiate an addendum to clarify that Addendum XXVII shall include compliance with the Mitchell provision and signal to NMFS that the smallest implemented minimum size should apply to imports (Page 14). Motion by Dan McKiernan; second by Doug Grout. Motion amended.
4. **Motion to Amend**
Motion to amend to add consideration of a maximum size limit for imports (Page 17). Motion by Pat Keliher; second by Dan McKiernan. Motion passes by unanimous consent (Page 17).
5. **Main Motion as Amended**
Move to initiate an addendum to clarify that Addendum XXVII shall include compliance with the Mitchell provision, signal to NMFS that the smallest implemented minimum size should apply to imports, and also consideration of a maximum size limit for imports (Page 17). Motion passes by unanimous consent (Page 17).
6. **Approval of recommend to the ISFMP Policy Board that the Commission send a letter to NOAA Fisheries to withdraw the Commission’s recommendation to implement the measures of Sections 3 and 4, except Sections 3.1.1 and 3.2.1 – transfers of Multi-LCMA Trap Allocation of Addendum XXI and all of Addendum XXII** (Page 23). Motion by Dan McKiernan; second by David Borden. Motion passes with 1 null note (ME) and 1 abstention (NOAA Fisheries) (Page 27).
7. **Move to send states who have not implemented the electronic vessel tracking requirement for federal lobster permit holders a letter stating that the implementation deadline for this action was December 15, 2023 and states need to implement this requirement in a timely fashion to ensure compliance with the Lobster FMP** (Page 28). Motion by Pat Keliher; second by Doug Grout. Motion passes by unanimous consent (Page 28).
8. **Move to approve the nomination of Denny Colbert to the Jonah Crab Advisory Panel** (Page 29). Motion by Dan McKiernan; second by Dennis Abbott. Motion passes by unanimous consent (Page 29).
9. **Move to have the Plan Development Team review the conservation measures originally set in Addenda XXI and XXII and make recommendations for alternate measures to achieve those reductions inclusive of the Lobster Conservation Management Team recommendations by the ASMFC Spring Meeting** (Page 29). Motion by Cheri Patterson; second by Pat Keliher. Motion passes by unanimous consent (Page 29).
10. **Move to adjourn** by consent (Page 30).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

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, January 23, 2024, and was called to order at 12:30 p.m. by Chair Jason McNamee.

CALL TO ORDER

CHAIR JASON McNAMEE: Welcome, everybody. This is the January, 2024 edition of the Lobster Management Board. Welcome, everyone. A couple of things to get started here.

APPROVAL OF AGENDA

CHAIR McNAMEE: The first we will start with the agenda. Are there any additions, deletions, anything with the agenda that anybody wants to offer? Looking around the room here, not seeing anyone raising their hand, is there anyone online?

It does not seem like there is anyone online either. Great, are there any objections to approving the agenda as submitted, please raise your hand, either real hand or virtual. No hands at the table, no hands online. We will consider the agenda approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR McNAMEE: Okay, next up is the approval of the proceedings from the October, 2023 meeting. Are there any corrections? I see Alli Murphy in the back. Go ahead, Alli.

MS. ALLISON MURPHY: I have a quick correction on Page 30 of the minutes from the annual meeting in 2023. I misspoke and said the date, the line that we drew in the sand for the date for allocations that would be considered over the Area 2 and 3 ownership caps. I misspoke and said that was May 1st, 2023, and in its place, it should be May 1st, 2022. I believe staff have that correction.

CHAIR McNAMEE: Great, thank you, Alli. Just folks in the room, make sure, it's pretty loud. We have that correction. Anyone else with any corrections?

Thank you, Alli for that. Anyone else with any corrections to the proceedings? Please, raise your hand. No seeing any in the room, nobody online. I'll look around the room. Are there any objections to approving the October, 2023 proceedings as modified today, please raise your hand. No hands in the room, and looking online no hands online. We'll consider the proceedings approved with the modification offered by Alli Murphy.

PUBLIC COMMENT

CHAIR McNAMEE: Next, we'll go to public comment. This is an opportunity to make a public comment on anything that is not on the agenda, so important distinction there. If it is on the agenda today, please hold your comment until we get to that part of the agenda. But if there is anything that isn't on the agenda, anyone in the public wishes to address, now is your opportunity. Is there anyone here in the room, looking for hands. Not seeing anyone in the room, we do have one hand online, so it's Stephen Smith, so we'll make sure we've got you unmuted, and you can go ahead and make your comment. You should be good to go, Stephen.

MR. STEPHEN SMITH: My comment and a question are a general question. The commercial lobster Gulf of Maine area between Cape Cod Bay and the Canadian Border has no effort control, aside from an 800 trap per license holder limit. The average in Massachusetts alone, is approximately 360 traps per license holder, which allows a greater than a double increase in effort any time in the future.

This is more than enough to counter any trap control in the Outer Cape Cod area and the EEZ area combined. It will also keep the minimum size increases at a first-time molt into the legal size. There is much too much effort that is able to be applied to the fishery in this particular area. The question would be then, will the ASMFC address this problem? Thank you.

CHAIR McNAMEE: Thank you for the comment. There was a question there. I don't know that anyone is ready to speak to that question, but Toni looks like she's going for her microphone, maybe?

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

Hang on one second, Sir. Sorry, we just did a little sidebar here. We have your comment, just kind of on the fly here. If your question was about effort control, there is no action right now for additional effort control. But we have your comment. We will try and digest that a little more after the meeting, but that is our comment for the time being.

Thank you for that. Okay, let's keep moving along here.

AMERICAN LOBSTER TECHNICAL COMMITTEE REPORT

CHAIR McNAMEE: Next up is a report from the Lobster Technical Committee. This was the request that the Board made about giving a little bit of information on the lobster resource in the fishery near the northern edge of Georges Bank. We have Tracy Pugh on the line, and so Tracy, whenever you are ready to go, please feel free to take it away.

MS. TRACY PUGH: Hello, thank you, Mr. Chair. I am going to sort of briefly review the key points in the memo that we provided. This again was the task for looking for information on the northern edge of Georges Bank. If we could click the slide, please. This is in response to the New England Fisheries Management Council's potential action. They are considering opening scallop access to a portion of Closed Area II.

Specifically, the area they are talking about is within a currently closed Habitat Management Area, and if you can go to the next slide, they have a map here to give you a little bit of orientation.

INFORMATION ON LOBSTER RESOURCE AND FISHERY NEAR THE NORTHERN EDGE OF GEORGES BANK

MS. PUGH: This is the northern edge of Georges Bank, and the gold box here is highlighting the Habitat Management Area in which they are considering opening scallop access. Essentially the task was for the TC to provide some information to help characterize any potential impacts that allowing

scallop access to this area might have on the lobster resource and the lobster fishery.

Specifically, the Board gave us several topics to address with this. The topics were to provide information on the presence and abundance of lobsters, including ovigerous lobsters in and around the northern edge by month or season. To provide information on lobster fishery effort in and around the northern edge, again by month or season. To provide potential information on potential impacts of mobile gear on the lobster population in this area. To provide information on habitat type and depth preferences of lobsters, which could inform our understanding of the lobster resource in the northern edge if there are limitations in available data. To provide information on whether the current reporting by Area 3 vessels is representative, or if it is an underestimate of the effort in the northern edge area, and how future requirements might impact our data availability.

The TC met via webinar, and we discussed the data sources that we thought would be useful to address these points. But unfortunately, we did not have enough time, or in some cases we didn't actually have access to the data that we're going to need to conduct these analyses. What I'm going to do here is provide the review of the data sources that we identified, and cover a little bit of a couple preliminary results we were able to put together, and then what we think we can do in the future to provide you with additional information.

Data availability, specifically within the Habitat Management Area. We think we can look, there is going to be harvester reported data from the federal VTRs. There is going to be a little bit of tracker data. The Massachusetts fleet came online with tracker data about nine months ago, I think. We have a little bit of tracker data that might be informative.

There is a potential that there is federal observer data, although I think the most recent data is from 2015. There is the potential that the Commercial Fisheries Research Foundation, or CFRF, they have a study fleet, and we may be able to request data and

have a look at those data, to inform effort and catch characteristics.

There is a potential that we could look at tagging study data. There was a recent collaboration between Atlantic offshore lobster, New Hampshire Fish and Game, and Maine DMR. We can look at the tagging study data that came from that work, and of course we have the Science Center spring and fall trawl survey locations. They are going to be relatively limited, because only a couple of trawls will fall within the specific area.

For information that is not maybe exactly in the Habitat Management Area, but really nearby, everything that I previously mentioned. Then there is also a Coonamessett Farm Foundation seasonal scallop bycatch survey, and we think that this Coonamessett Farm survey data is going to be particularly useful for looking at seasonality of lobster in the scallop dredged gear, and understanding what that bycatch looks like, and then also, whether or not there is any damage induced by that particular gear type.

For some preliminary results, I mentioned that we took a brief look at the tracker data. A very preliminary analysis of the Massachusetts tracker data was available to us. Again, this is about nine months they activated in May of 2023. If you look at the map here, what we're looking at is the NMFS statistical areas in red. The gray boxes are the ten-minute squares, and in Area 561, the yellow box there is the Habitat Management Area that we're talking about.

Then those pink hatched boxes are the ten-minute squares in which we took a look at the tracker data. In that area, there is definitely some activity. We had at least five vessels with trips in that area, and it represented at least 34 trips. But we wanted to note here that Massachusetts boats represent only about 10 percent of the effort in Area 561, based on a preliminary look at our VTR data. Just to note, the memo said that we looked at eight ten-minute squares, it's actually 17 squares, as you can see in the map there. There is definitely activity in the area. We need to do a little bit more to understand a little

bit better what that activity is. We could also look at some previous work, and information indicates that lobsters in this region tend to be very large, and the sex ratio tends to be pretty female skewed.

We spent some time looking at this back in, I think 2012 and in 2015, and we're referencing a TC memo to the Board that was 2015, where we looked into impacts of opening Closed Area II to mobile gear. I think that memo was attached at the end of the memo we provided to you. The Coonamessett Farm data, there were a couple of final reports available, and we had a look at that. The lobsters that they are seeing retained in those scallop dredges are definitely vulnerable to significant damage.

They observed 783 lobsters, and 34 percent of those had lethal damage. Another 27 percent exhibited moderate but sublethal damage from that scallop gear. We do see damage to lobsters from scallop and other gear, it tends to be worse for recently molted lobsters. If they haven't fully hardened that shell yet, they are going to be more susceptible to damage from scallop or other mobile gear. Again, this is referencing our 2015 TC memo, along with an appendix that was provided in Addendum XX.

It's important to note here that any kind of seasonality of interactions with lobsters and mobile gear is going to be important to the level of impact on the resource itself. Finally, again from the Coonamessett Farm surveys. They did see higher bycatch in those scallop surveys that occurred near the Habitat Management Area during the summer and the fall season, and this was primarily driven by a large increase in the females in the catch.

The last topic question, I guess, was whether or not the data that we're getting, in terms of reporting data, is going to be representative of actual effort in the northern edge area. We wanted to point out that while nearly all of the vessels that are active in the area have been reporting VTRs since 2013, there are definite limitations to using VTR data, in terms of the spatial resolution.

For the most part, vessels are reporting a single latitude/longitude instead of coordinates for each

These minutes are draft and subject to approval by the American Lobster Management Board.

The Board will review the minutes during its next meeting

trawl that they fish. It does limit our ability to look at a trawl-by-trawl kind of effort and spatial footprint, and of course there are confidentiality challenges when it comes to presenting or displaying any of these data.

We think that the upcoming implementation of the federal EVTRs is going to improve the coverage, and possibly the data quality here. But we wanted to highlight that the implementation of the trackers on the federally permitted vessels is going to be a huge improvement in our ability to understand the spatial footprint and the timing of when and where effort is occurring.

Those confidentiality challenges will likely remain, in terms of how we can present or share the data. But the tracker data will be a big improvement once it gets all online. For next steps, the TC can examine the seasonal catch and effort in the vicinity of the area. We can do this by looking more in depth at the harvester reporting data for recent years at the ten-minute square level. This is going to require a data request to National Marine Fisheries Service, so that we can get the data to capture the seasonality and the spatial resolution. Again, there is likely going to be some confidentiality issues in what we can present, but we can certainly look at it in detail. We can also look at size composition and sex ratios for lobsters in the vicinity. We can use the CFRF Study Fleet data for this, the Federal Observer data, and we can also look at the Science Center's Trawl Survey information.

We think that some information is also likely going to be available from the Coonamessett Farm Foundation bycatch surveys. Both of these things are going to require additional data requests. We can do these things, but they clearly are going to take a little bit of time. We have to do data requests to National Marine Fisheries Service and the Coonamessett Farms, in order to get the data at the resolution we need. We are unclear what the turnaround time on that request would be, hopefully it would be relatively quick.

I did want to note that the TC members do have a fair amount of time and effort commitments in

preparation for the stock assessment coming up. We have data workshops for the assessment that are going to be taking place in February. We will have a little bit of time conflict there. It is our understanding that the New England Fisheries Management Council is going to be meeting in April.

Ideally, we would be able to provide some input in time for this meeting. Depending on the turnaround time on getting these data, we think that we should be able to have information provided to the Board by late March. With that, again, this was just a brief overview of what is in the memo. I am happy to take any questions.

CHAIR McNAMEE: Good report from the Technical Committee. You did some nice work, collecting the available information that is out there, a little bit of preliminary analysis. I think the job here for the Board is to kind of figure out the priority of this work amongst all of the other priorities that the Technical Committee has, you know if we want them to kind of move forward.

There is kind of a date critical here, April, for the New England Council meeting to have anything we ask for, have it relevant for their deliberations. I just wanted to kind of summarize that so folks could have a sense of where we're driving at with this agenda item. Let's start with some questions for Tracy. I'll look around the table first, questions for Tracy. None at the table, any online, Caitlin? Okay, David.

MR. DAVID V. BORDEN: I don't have a question, but I just want to make a point that, first off, thank you very much, Tracy, for an excellent report, and thank the members of the Committee that participated in it. The last time I was involved in this issue was a number of years ago, when I worked for AOLA, and it came up at the New England Council.

We were opposed to it. I'm just stating history here. We were opposed to it because of the damage rate on lobsters, and as you can see from Tracy's report, damage rates can be as high as 60 percent, both moderate and lethal damage to lobsters. Of equal, if not greater concern to us, was the fact that 80 percent of the lobsters at certain times of year are

These minutes are draft and subject to approval by the American Lobster Management Board.

The Board will review the minutes during its next meeting

ovigerous in this area. I think there are a lot of good reasons to be super cautious, and have the Commission go on record with a strong letter on the issue, when we eventually get to it. I guess a question to you, Mr. Chairman, or the staff, how will we formalize that recommendation? In other words, our meeting isn't until May, so what is going to be the process we're going to follow?

CHAIR McNAMEE: Good question, David. I don't think that one is for Tracy, maybe for Toni or Caitlin. Toni.

MS. TONI KERNS: I think what we can do is provide this preliminary report to the New England Council, and then have the TC work as quickly as possible, because I know that this is an agenda item that I believe is on their February meeting. Mr. Reid probably will correct me if I'm wrong. We want to make sure that we get our input at thorough fashion to the Council, so that they have all the information when they are considering their management document.

CHAIR McNAMEE: Thank you, Toni, what's that? Okay, got it, so a couple of hands around the table. Let's take care of the one online. Eric, go ahead, Eric Reid.

MR. ERIC REID: Thank you for your report. For our meeting next week, the northern edge is not on that agenda. But it will be for sure on our April agenda, that is the 16th through the 18th of April. But another milestone is the Habitat and Scallop Committee are meeting jointly on March 27th, and ideally it would be good to have as much information as possible for that meeting. That is March 27th. That is our schedule, so see what you can do. Thank you.

CHAIR McNAMEE: No, that is helpful to kind of understand the timeline a little bit more. I had a couple of hands, so Ray, I had you first, and I'll come to you, Pat.

MR. RAYMOND W. KANE: Maybe Tracy could answer this question, but a number of years ago we were sitting at this table, I believe Bill Adler was still a

Commissioner from Massachusetts, and we had an issue with the Otter Trawlers wanting to tow out there. If my recollection serves me well, 70 percent of those lobsters on the northern edge are egg bearing females. Another question I would have.

I believe Bob Glenn gave us a presentation about with the wind and tidal shifts and all and currents, that those egg bearing lobsters, when they drop their eggs. You know there is this biological, where they are up on the surface and they drop down through the different depths, and all those eggs end up in the Gulf of Maine. You know we're pressed right now in the Gulf of Maine; we know what the young of the year stock looks like. I was wondering if Tracy could bring me up to speed on that.

CHAIR McNAMEE: Yes, thanks, Ray. Tracy, that definitely sounds like it's in your wheelhouse, so please feel free to offer Ray a response.

MS. PUGH: Yes, certainly. It's in the wheelhouse, but maybe a little rusty. I think that in both 2012 and 2015, our old memos that I found that the TC put together in response to the Council considering opening some mobile gear in that Closed Area II, I think in portions a little further south than what we're talking about here, but still in that Closed Area II. Those memos did certainly talk about the concentrations of large mature females up on top of the bank in the shallow water in the summer and the fall. Timing wise, yes, a lot of those would probably be egg bearing. I don't have the percentages right off, but we can certainly do some additional digging, and see if we can find information that would be a little bit informative there. In terms of the larval distribution, that one I am going to have to say that it is not fresh in my head, and I would have to do a little bit of digging, with the TCs help, and see if we can get a better answer for that. It is certainly plausible, but I don't want to answer right off.

CHAIR McNAMEE: Anything else, Ray? All right, next up is Pat.

MR. PATRICK C. KELIHER: Tracy, thanks for that update from the TC. It is clear that there is a lot more conversations the TC must have. I think some of the

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

points that David and Ray Kane just brought up, with some of the resource issues, I think really highlights the fact that I think where your going is we need to prioritize what some of this work is going to look like. I appreciate the New England Council Chair giving us a little bit of clarity on that deadline, so March is coming up pretty quickly.

I think from my standpoint, I would like to highlight two areas that the TC needs to focus on for goals, and that is information on the presence and abundance of lobsters, including ovigerous lobsters in and around the northern edge by month and by season, and the lobster fishery efforts in and around the northern edge by month and by season. Those two things overlaid I think really give us a really good picture of potential impacts of allowing the scallop fleet in there, and the interaction with the lobster resource.

CHAIR McNAMEE: Excellent, thank you, Pat, and so yes, we've kind of transitioned into providing advice and recommendations here, so thanks for that, Pat. Let's see, Dan, I have you next.

MR. DANIEL McKIERNAN: I agree with Pat Keliher's request that the TC look at by month and by season the incidents of lobsters, and especially ovigerous lobsters in this area. But I have a process question as well. If the Council is going to make a decision before this Board meets again, would the comment period not be open, so that this Board could take a formal position on something at its next meeting, and submit that to the Regional Administrator for his consideration about whatever the Council would have approved?

CHAIR McNAMEE: Okay, the question is a good one. I'm not sure who to go to for an answer. Okay, let's start with the Chair of the New England Council, so Eric Reid, go ahead.

MR. REID: Thanks for the question, Mr. McKiernan. We're not taking final action in April; we're still developing alternatives at that point. But early and often is what I would suggest on comments, but final action isn't going to be until much later in 2024, if

that should actually happen then. That's the timeline.

CHAIR McNAMEE: Excellent, thank you, Eric. That sounds like there is some time there, great. Toni.

MS. KERNS: The rationale for putting this information together is so that the Council can weave some of this information into their document that they put out for public comment, so that everybody is informed of the full scope of the issue.

CHAIR McNAMEE: Okay, so we've provided some clear guidance to the Technical Committee on areas to focus. Oh, sorry, Tracy, go ahead.

MS. PUGH: I just wanted just to briefly expectation managing a little bit. For the VTR data. That is going to provide us with catch data, certainly, and effort with the ten-minute square resolution. Getting really good monthly or seasonal abundance estimates is a little bit more of a challenge, because we can certainly use the catch data to inform that.

But abundance is typically something we think of as being the fishery independent surveys, and the Science Centers trawl survey is just simply a spring and fall. We've used that in the past in addition to catch data, to sort of infer things, but that is kind of the best we can do with that. Additionally, in terms of getting really specific information, in terms of where and when the eggers are there. That will again be a little bit of a challenge.

That is obviously not going to be in the VTR data, because VTR data is catch. It doesn't take into account discards. For that we're going to be reliant on any kind of observer programs in the area, or if the CFRF or previous logbook program with, I think AOLA and New Hampshire Fish and Game. Those will be the data sources we will have to rely on for that. It might be a little bit sparse, but we will certainly do everything we can to get a good picture of what's going on out there.

CHAIR McNAMEE: That is excellent, Tracy, thank you for that clarification and yes, tempering the expectations on what the data can actually deliver,

so appreciate that. But we also appreciate you thinking on it and doing the best you can with what is available. Okay, let's look around the table one more shot here. Dan, go ahead.

MR. MCKIERNAN: Just a comment. If there was ever a reason for vessel trackers, and you needed an Exhibit A, this is it.

CHAIR McNAMEE: Good point, Dan, thank you for that. I think we are going to move on. Just one comment. I want to get through these two Technical Committee reports and then I will quickly go out to the public, but I want to keep things moving along. We're still close to being on time, and a lot to get through.

With that, next up we have a report, and Tracy, thank you very much, really appreciated the work the Technical Committee did, and excellent presentation there, thanks for that.

JONAH CRAB TECHNICAL COMMITTEE REPORT

CHAIR McNAMEE: Okay, so next we are going to turn to the Jonah Crab Technical Committee Report, and for that I'll look to Corinne Truesdale to walk us through that, so Corinne, whenever you're ready.

MS. CORINNE TRUESDALE: I am going to walk through; I'll try to keep this as brief as possible, a presentation just providing a little bit of stock assessment background that will contextualize the tasks that the Technical Committee was given by the Board in October. Then included in this review, I'll go over some feedback that we got from the Advisory Panel to assist us in this task. The first benchmark assessment for Jonah Crab was accepted by the Board in October of 2023. As part of that assessment, it established four stocks for Jonah crab. We have offshore and inshore Gulf of Maine, and offshore and inshore Southern New England.

The offshore Southern New England stock is one where over 75 percent of the landings on average come from every year, so that is the stock where Jonah crab is targeted, and the others are largely bycatch fisheries. From reviewing the indicators

available to the Stock Assessment Subcommittee, they found that the abundance for Jonah crab is above historical lows from the '80s and '90s for the Gulf of Maine and offshore Southern New England, but status was unknown for inshore Southern New England due to data limitations in that area in particular.

We don't have absolute estimates of abundance or biomass, and fishing mortality rates are unknown for the stock. Stock status does remain uncertain for all of the stocks for Jonah crab. The Peer Review Panel for the stock assessment had concerns over this decline in landings seen for offshore Southern New England in the more recent three years of the time series.

You can see that there is a time series high in landings in 2018, and after that a 51 percent decline in offshore Southern New England landings. The concern for the Peer Review Panel was that this mirrors, or it does resemble, a decline that occurred in the offshore Lobster Fishing Area 41 fishery in Canada.

There they had a fishery that was established in 1995 with pretty stable landings, and then experienced a rapid decline, starting in 2000 and leading to an almost complete diminishment of landings in 2008, 2009. Given that comparison, and the biological data that we have available of the data limitations that exist for Jonah crab, the Technical Committee was tasked with these five tasks.

The first was to gather current information on management and stock conditions for the Canadian stock. Specific to what has occurred since 2009, when the last assessment was conducted for that fishery, what is being done with regard to management, and what monitoring is occurring, and getting some context on fisheries characteristics there.

JONAH CRAB STOCK INDICATORS

MS. TRUESDALE: The second was to recommend additional indicators from existing data to monitor stocks for Jonah crab, so any additional indicators

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

that we can use to monitor the fishery, and the resource itself, in addition to those recommended by the Stock Assessment Subcommittee. The third was to recommend the frequency of those indicator updates.

Fourth, recommend potential management measures for the Jonah crab fishery, in response to any changes in biomass that might be indicated with those indicators. Then fifth, to provide recommendations to improve monitoring in the short term for Jonah crab. To that end, the TC had meetings on November 16 and January 2nd, and then also requested additional feedback from the Advisory Panel.

They met on December 14, to provide some context related to the fishery characteristics, and some input on indicators that could be used for Jonah crab. I'll launch right into a review of the tasks that we have, starting with the review of the Canadian fishery. As I mentioned, the last assessment for that LFA 41 offshore fishery occurred in 2009. There has been no ongoing monitoring or assessments in that fishery, and they haven't had any substantial targeting of Jonah crab in that area. When they did have a fishery occurring, so from 1995 to 2009, it was with one sole license holder that owned several boats, so it was one enterprise that had a monopoly on the fishery at that time.

The fishery has been largely inactive since 2009, and the management measures have been largely stable with a minimum size of 130 millimeters, 8 millimeters larger than what we have in the United States, and a catch limit that has had a TAC in place since the beginning of the fishery that was 720 tons.

It was reduced after the assessment found that there could be impact, that there was likely impact of the fishery on the resource that reduced the TAC in 2009, and then they reduced it again in 2017, because it was indicated that there might be interest in retaining Jonah crabs again in the fishery. Largely, the management measures have been stable. Monitoring has not continued.

I'm going to try to breeze through the indicators that we've had and reviewed as part of this task. First, we have Catch Per Unit Effort or Fishery Dependent Indicators, starting with the Rhode Island fishery. This was an indicator that was introduced during the peer review process with requests by the Peer Review Panel.

We have a subset of highliners or vessels that we know are landing and targeting Jonah crab in Rhode Island, looking at landings per trip over time. What was concerning here was that there was a decrease you can see at the end of the time series, in landings per trip among these five highliner vessels in Rhode Island.

We updated the time periods to go through 2022, and you can see when you zoom in on the plot that there really is a decrease in landings per trip that occurred in Rhode Island. From talking to industry, and we'll get into it later on in the presentation, there are market factors at play here. That has come out through the Advisory Panel meeting and discussions with industry members there.

For Massachusetts, we have not CPUE, but we have an effort time series. We're looking at number of trips that are actually landing Jonah crab from the offshore fishery statistical areas. We can see that there has been a decline since 2014, with time series lows in those most recent three years for the Massachusetts fishery.

We have a lower number of trips that are actually occurring and landing Jonah crab in Massachusetts; Rhode Island and Massachusetts comprising over 90 percent of the fishery, in terms of the landings. The Technical Committee recommends continuing to update these fishery dependent indicators for Rhode Island and Massachusetts.

In particular, for this offshore Southern New England stock in future years, to get an idea of whether things are continuing to change in the fishery, or the conditions remain stable there. We also looked at price indicators, so looking at Jonah crab and lobster price per pound, with Jonah crab in orange and lobster in blue here, from 2010 to 2023. You can see

the peak for the Jonah crab price per pound was in 2022, with a decrease thereafter, but is generally high compared to the rest of the time series. For lobster we had a peak in the price in 2021, and that coincides with when we saw this decline in Jonah crab landings per trip, and landings overall.

There is some interplay believed to be occurring, and we know that these two fisheries are linked, they occur in a crustacean fishery. With that the Technical Committee recommends including these price data in indicator updates in the future in looking at price data for lobster and Jonah crab.

We'll also note that we did look at a Canadian snow crab and Dungeness crab price per pound, and found that the relationship between those and Jonah crab wasn't readily apparent, and there needs to be more work to understand the linkages between those species and Jonah crab. Briefly we looked at sex-ratio data for just a few sampling data, and also for trawl survey data.

I won't get into this part, where it's less complicated than it looks. We're looking at sex ratios over time to report over a bunch of statistical areas. The takeaway being that there weren't any patterns or any intuitive patterns that you could see in the data here. We don't recommend looking at sex ratios for indicator updates in the future.

We also looked at a suite of length-based indicators as part of the stock assessment process, and then added examination of the 5 percent smallest crabs being landed in port samples, to look at whether there are changes driven by the market in the Jonah crabs that are selected to be landed. Data were too sparse to determine trends.

We don't have enough years of data available, so at this time we don't recommend using those in indicator updates in the future. A brief summary of the indicators that we are recommending for updates in the future. We would like to continue to look at Rhode Island and Massachusetts catch per unit effort as effort data for Jonah crab, and then price data for Jonah crab and lobster in that offshore Southern New England stock in particular.

We recommend that from the offshore Southern New England stock, fishery dependent indicators be updated annually, and then fishery independent, the trawl survey indicators be updated biannually, and knowing that there are constraints on how quickly those data can be processed and reported.

For the other stocks, inshore Southern New England and then inshore and offshore Gulf of Maine, we recommend that the indicators for those stocks we recommend updated every five years. Those are largely a bycatch fishery. We could update more frequently if there are changes, if no fisheries indicate over the next few years. But for now, recommend that those indicators are updated every five years.

We also recommend the Advisory Panel be included in the update process every year, to provide some context with regards to the market and fishery dynamics, to be able to interpret the fishery dependent indices in particular, and to include dealer representation as well in that, to get some context in terms of market and competition, or interplay between different species market. We recommend that these updates be provided during the annual meeting every year in October, giving us some time to process the data from the previous calendar year and report back. As I mentioned, the Advisory Panel met in December, on December 14, and four advisors attended. They were asked to provide some context, and assist with this task that the Technical Committee was given.

As far as this meeting, they were asked to discuss the stock assessment itself, and then economic factors that affect the Jonah crab fishery. The topics included indicators from existing data, so examining the indicators that we had, handle the indicators that might be informative of stock or market conditions for Jonah crab, which might be reliable, and what should be considered in interpreting them.

Any data that could be used to identify a trip target, so in the Jonah crab and lobster fishery, a big obstacle is being able to determine whether or not a vessel is targeting Jonah crab and to what extent, and using that to interpret catch per unit effort with

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

those data. The Advisory Panel was asked to weigh in on that in particular. They were also asked to provide information on why landings have been trending down since the late 2010s, despite there being high prices for Jonah crab in the most recent years, and also to weigh in on what drives CPUE for Jonah crab.

Overall, the Jonah Crab Advisory Panel indicated that the decline in landings was related to fleet dynamics, so vessels actually leaving the fleet, not targeting Jonah crab to the same extent that they used to, and that they did indicate, some of them indicated that wind energy development is when catch per unit effort of Jonah crab, with observations of a decrease in catch during acoustic surveys that were being conducted before offshore windfarm construction.

It was noted that prices for Jonah crab were driven by Canadian snow crab and by dynamics in the processing availability in the United States. Noting that there is competition between Canadian snow crab and Jonah crab, if there is more Canadian snow crab available, Jonah crab demand goes down.

There are now fewer processes in New England than there used to be, and processors have been placing catch limits on those or trip limits on both, due to a decreased amount of demand for Jonah crab. The Advisory Panel notably said that CPUE is mostly driven by market factors for Jonah crab. Price and availability of other crab species, as I mentioned, really drives how much Jonah crab can be bought in the United States.

Some of that leads to an intentional selectivity to catch larger crabs. The target species, they also noted might change on multiday trips. We knew this, but there is some spectrum, in terms of the target species that they have on a given trip. They might be switching back and forth between Jonah crab and lobster, which complicates straightforward interpretation of trip level information, in terms of what they were targeting.

That is a quick summary of the Advisory Panel comments that we got at that December 14 meeting, providing some context for those fishery dependent

indicators, and why the trends we're seeing might be occurring. Back to the fourth and fifth task for the Technical Committee.

DISCUSS FUTURE MANAGEMENT TOOLS

MS. TRUESDALE: The fourth was to recommend potential management measures for Jonah crab, in response to conditions for the stock. The Technical Committee considered several management measures, including seasonal closures, effort controls, which would be trap limits, circular vent size changes, and legal minimum size changes. We concluded that identifying the cause of a population change would be necessary to selecting any of those management measures for Jonah crab.

For example, sperm limitation might be one mechanism by which there would be a decline in Jonah crab if you're overharvesting males. There is less reproduction capacity in the stock, and we would recommend seasonal closures or effort controls be examined for their potential to improve stock condition.

Another mechanism might be increased mortality due to environmental conditions. In which case, they might be recommended to increase minimum size, or modify circular vents to release handling stress or to reduce handling stress on female crabs, and provide a reproductive buffer, in case environmental conditions were to improve in the future.

At this time, we note the Technical Committee does not believe management action is necessary. This is because of data limitations, and the biological condition of the stocks being uncertain at this time. We are not sure about the absolute abundance of Jonah crab and the impact of the fishery, and further would not be able to evaluate the effectiveness of management measure changes in the near future.

This is also complemented by the fact that the demand is going down for Jonah crab. We have reports that the price has continued to decrease, and there is reduced effort in the fishery, and a decrease in demand that is continuing, so we don't expect that

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

the fishery landings will be increasing rapidly anytime soon.

We recommend continued monitoring, so that would be observed if it were to occur. For monitoring recommendations moving forward, the Technical Committee emphasized the high priority research items that were in the stock assessment itself. Those included growth information for that offshore New England stock in particular.

Examining for exploration of video surveys, which may be a way forward to estimate abundance and fishery impact on the stock. Research of recruitment dynamics, including settlement dynamics, research of ecosystem and environmental drivers of population dynamics, including recruitment for Jonah crab.

Then finally, research in to the interpretation of fishery dependent data, to be able to interpret CPUE and effort data for Jonah crab. This includes interactions between fisheries response to abundance for Jonah crab and for lobster, economic drivers and then of course lobster fishery dynamics along with some crab fishery dynamics. With that I am happy to take any questions, and provide more information on indicators.

CHAIR McNAMEE: All right, Corinne, nice job. Thank you for that. Okay, why don't we start off with questions for Corinne. It just maybe another quick summary, so we offered a number of tasks to the Technical Committee. They went through those tasks, they indicated some indicators that they think would be good to supplement what we were already looking at, some that weren't that great. They've offered a couple of timelines, didn't recommend the need for management at this time, so some really good feedback from the Technical Committee, also some good integration of the Advisory Panel feedback into that as well. Hopefully I've yammered enough to give you some time to think about any questions.

I'm looking around the table for hands for questions for Corinne. No hands at the table. Any virtual hands? No virtual hands either. Okay, so no

questions, and that leaves us with we have a number of recommendations from the Technical Committee. We could accept those, we could adjust them, or we could not do anything at this time. What is the will of the Board? David.

MR. BORDEN: I agree with the recommendations, excellent report, Corinne. With the exception, when you get to a management recommendation, I'll be diplomatic and say there is a lot of paranoia in the industry about management recommendations. What I would hope is that the technical people are going to do, exploratory research on a different type of management recommendations, that they should keep it low key, it's not Board action that is generating it.

I know we could waste a lot of time, I think, dealing with this. There is no need in my view to get into management recommendations. I think this is primarily a marketing problem. I thought the recommendations that the Advisors gave us were well placed, and pointed out one of the things that I particularly noted was this issue of self-selectivity, which has been going on/

I personally know of boats that land 20 or 30,000 pounds of Jonah crabs on a trip, and now they are on a quota, and the dealers are basically telling him, land 2,500 pounds, or 3,000 pounds. They pick out the best and most beautiful crabs, all the rest go over the side alive. That has totally changed the behavior, and then there are also relationships between the lobster fishery and the crab fishery that are kind of playing out.

Scallopers aren't fishing in a particular area, and Georges Bank, as a result of that what is happening is there is more effort being placed in those areas for targeting lobsters, and there is less effort being placed on crab. I wouldn't spend a huge amount of time on the management. I think the Committee has a really good list of items that they can improve, without getting into the management issue.

CHAIR McNAMEE: That aligns with the recommendations of the Technical Committee as well, so that is great. We had comments supporting

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

the recommendations of the Technical Committee. Does anyone else wish to offer any? Just having that on the record is fine, we don't need a motion or anything for that. Anyone else on Jonah crabs? No hands in the room, any hands online? No hands online.

Great, I think I will take a quick check here with the public, and so we would be looking for any comments anyone in the public would like to make on either of the Technical Committee reports we just heard. I ask you to please keep your comments as concise as possible. We still have a way to go on our agenda here. Any public in the room wishing to comment or ask a question? No hands in the room, any hands online? All right, no hands online either, so with that, Tracy and Corinne, thank you both very much, great job with those reports, really informative, and hopefully we provided some good guidance back to the Technical Committees. Thank you both.

DISCUSS IMPLICATIONS OF 2025 SIZE LIMIT CHANGES ON IMPORTS

CHAIR McNAMEE: Moving on, on our agenda. The next item is to Discuss Implications of 2025 Sizes Limit Changes on Imports. For that I am going to turn to you, Caitlin, for that one.

MS. CAITLIN STARKS: For the background on this topic. Addendum XXVII, which was approved originally in May, 2023, established a trigger mechanism that would automatically implement the series of gauge and vent size changes when the trigger is reached, and the trigger is defined as a 35 percent decline in the recruit abundance indices from the reference level, which is equal to the three-year average from 2016 to 2018.

With the inclusion of the 2022 data in the timeseries last fall, the trigger index had declined by 39 percent, so passing that trigger point of 35 percent decline. Under Addendum XXVII, this would mean the changes to the gauge and escape vent sizes in the lobster population and management areas LCMAs 1, 3, and Outer Cape Cod would be initiated, starting in 2024.

However, because that trigger was tripped more quickly than anticipated, the Board decided to delay the implementation of the measures until January 1, 2025. This is a reminder of the implementation timeline for those measures since that trigger was reached. The first change is the LCMA 1 minimum size increase to 3-5/16 of an inch for January 1, 2025, and that would be followed by another increase to the Area 1 minimum size then its vent size, and finally a decrease to the maximum size for Outer Cape Cod and Area 3.

When the Commission implements management measures for state waters, it also makes recommendations to NOAA Fisheries to implement complementary measures in federal waters, and the issue we are specifically looking at today is the size limit of lobster imports. The Magnuson-Stevens Act includes some language, which is called the Mitchell Provision, which prohibits the import and sale of lobsters smaller than the minimum possession size in effect under the Commission's FMP.

This provision was intended to prevent smaller lobster than what the U.S. industry can catch from coming into the U.S. market. Staff has been hearing that there are two potential interpretations of this provision, and how it would impact the live-market size limits. We're looking for some clear guidance on this, so that we don't end up with different regulations for different jurisdictions or a patchwork.

Those two interpretations that we understand to be possible are first that when the lobster measures go into effect, because of Addendum XXVII, then the imports from other countries would be restricted to the smallest LCMA minimum size, which will be 3-5/16 of an inch, starting January 1, 2025.

This would be interpreting that the Mitchell Provision's intent is that the minimum size of live lobster coming into the U.S. could not be any smaller than the smallest effective size limit of any of the LCMAs. The second interpretation would mean that imports from other countries would be restricted to the coastwide minimum size in the Commission's FMP, which is 3-1/4 inches, and in this case the coastwide minimum size is the size limit that no

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

conservation management area may go below, but it's not an active size limit for any of the LCMAs. After January 1, 2025, no LCMA will have an active minimum size that matches that coastwide minimum. Previously we got feedback from the Law Enforcement Committee about this issue that generally if imports were allowed to be smaller than the minimum age size in effect in the U.S., it could create additional challenges for enforcement.

In particular it would open up opportunities for the illegal sale of U.S. caught lobster that are below the legal minimum size. The LEC said enforcing the size difference when lobsters are coming into the U.S. from Canada at the border wouldn't be as much of an issue, but that once lobsters go to a dealer in the U.S. from another foreign country, they are usually comingled for sale with the U.S. caught lobster, and so it would be hard to maintain separation of those lobster of different origins.

In some states that you currently have a larger minimum size than what is in place in Maine, they have dealt with the trade issue by requiring their dealers to have special exemption permits, in order to possess lobsters from Maine or Canada that are under their space minimum legal size, and they have requirements for those dealers to report on shipments of smaller lobster, and keep records of all their transactions, and they are not allowed to sell those lobsters within the state.

That could be something to consider if imports were allowed to be smaller than the LMA1 minimum size. For the Board's discussion today, staff is looking for clarification as to the Board's intent for the size limit that would apply to foreign imports of lobster after January 1, 2025. I can take any questions.

CHAIR McNAMEE: Toni, go ahead.

MS. KERNS: Jason, depending on the Board's intent, we may need to initiate an addendum, not in the typical addendum fashion where it would be management options, but more to clarify to the public of what our intent is, in terms of recommending to NOAA Fisheries what will happen, but it will depend on how the Board gives us feedback.

CHAIR McNAMEE: Great, thank you, Toni. We'll kind of keep our eye on that as the discussion happens here. Let's go out first for questions for Caitlin from the Board. Anyone online with questions? Okay, so Dan, go ahead.

MR. McKIERNAN: Thirty-five years ago, was the last time the Area 1 gauge was raised, and the Mitchell Provision in the Magnuson-Act was enacted specifically to address the challenges of having live comingled lobsters from within a jurisdiction of one of the lobster jurisdictions and from outside, and the potential to undermine the enforcement and compliance. It really makes no sense to me, to assume that a 3-1/4-inch minimum size would be acceptable around the country.

If the Mitchell bill was very clear saying, no, the minimum size should be the smallest minimum size in place among all of the lobstermen jurisdictions in the United States. I would be in favor of the Commission imitating a very brief addendum, because my understanding of the dilemma that we're in, it had to do with conversations on the record, that even though the motion to pass this addendum may not have sent a clear signal about the applicability of the Mitchell Provision. I think conversations on the record and conversations by staff that might fail to maybe hear. I just came from Monkton, New Brunswick, at the International Lobster Town Meeting last week, and kind of give folks a heads up that I expected the Commission to deliberate on this issue today, and take an action to clarify this.

I don't know if you need a motion to initiate an addendum to clarify that Addendum XXVII shall include compliance with the Mitchell Provision, or that we want to signal to the National Marine Fisheries Service that the Mitchell Provision should apply as written.

CHAIR McNAMEE: It looks like, so let me come back to you, Dan, on the need for a direct motion, but certainly a recommendation to initiate an addendum as suggested by Toni, as we started out here. Thanks for that. I'll look around the table, to see if anybody

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

has any supports or anything different than what Dan has suggested here. Pat.

MR. KELIHER: This is certainly a difficult issue, and it's one that has taken a lot of time to work through back home in Maine. I think some clarity on where we're going here is needed. The Lobster Advisory Council for DMR did take this issue up. They have actually formed a working group. I think that working group certainly, from a harvester perspective, has been very specific about live lobster trade, and not wanting to see that live product coming into the U.S. to compete with ours. We call it the Colorado example, right?

If the federal government does something different than the primary states do, going forward, you could have potentially lobster business showing up in another state, right, disadvantaging the primary states if there is not some clarity. I appreciate the intent of what Dan is thinking about, it's a complicated issue, and would support this going out for a broader public conversation in the future here.

CHAIR McNAMEE: Doug, I saw your hand.

MR. DOUGLAS E. GROUT: I was just going to second Dan's motion.

CHAIR McNAMEE: Okay, I think we do want a motion here, and I think they are working on something based on what you said, so bear with us. We have a motion up on the board. I think we want to make sure there has been a little addition here, Dan, so just make sure that this is okay. Yes, go ahead, Dan. Thank you.

MR. McKIERNAN: Yes, that looks good, Mr. Chairman, thank you. Just to clarify that consistent with NMFS interpretation of this, processed lobsters are not subject to this Mitchell bill, so a cooked lobster can enter the U.S. markets, you know something that is processed. It's really about the enforceability of the minimum size. I want that on the record.

CHAIR McNAMEE: How does this look?

MR. McKIERNAN: It looks fine, Mr. Chairman, thank you.

CHAIR McNAMEE: Okay, so we have a motion here made by Dan McKiernan, have the second. I would love it if you would read that, Dan.

MR. McKIERNAN: I would be happy to. **Motion to initiate an addendum to clarify that Addendum XXVII shall include compliance with the Mitchell Provision and signal to National Marine Fisheries Service that the smallest implemented minimum size should apply to imports.**

CHAIR McNAMEE: I have the motion made by Dan McKiernan, seconded by Doug Grout. Any further discussion on the motion from the Board? No hands around the table, any hands online? Okay, no further discussion. It looks like we have some public that would like to comment, so I will entertain that. I see one hand in the back. Sir, you can come up, there should be a public microphone over there.

MR. DUSTIN DELANO: Thank you, Dustin Delano, a commercial harvester for lobster from Maine. I also represent the New England Fishermen's Stewardship Association. We also would agree with this motion. There would be a major inequity here if we allowed the bare minimum to continue at 3-1/4 after the gauge is changed, and the enforcement issues would also be quite problematic. While many in the industry may not have agreed on the gauge increase itself, most of us wholeheartedly agree that this, the Mitchell bill needs to be made a part of Addendum XXVII. Thank you.

CHAIR McNAMEE: Thank you very much, appreciate the comment, so the Board can consider that. I'm going to go to Pat first, and then I've got a hand online as well.

MR. KELIHER: This may be for Toni. We continue to talk about the minimum size component here as it relates to the Mitchell Provision within Magnuson. In the near future we will have the maximum size on the Outer Cape. How do we deal with the provision of oversize going forward? I mean that is continually, that is another type of inequity, right, where

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

oversized product is currently allowed to come in, because we had no maximum size associated with a portion of the Outer Cape Cod fishery. Now that that is closing, how do we want to handle that?

MS. KERNS: Mr. Chairman, if Beth could give here comment and then I will consider Pat's question and then come back to the Board, but if Beth Casoni could provide comment, she has her hand raised, so I can think while she comments.

CHAIR McNAMEE: Yes, go ahead, Toni.

MS. KERNS: I want a moment to think about it, so if you can let Beth go first before I reply to Pat.

CHAIR McNAMEE: I got you now, yes, thank you. Pat, we will come back to your question. Beth Casoni, please go ahead whenever you're ready.

MS. BETH CASONI: Thank you, Mr. Chairman, thank you for the opportunity to comment. Beth Casoni, Executive Director of the Massachusetts Lobstermen's Association. I really appreciate Dan's motion, and we would support this wholeheartedly. Massachusetts is limited in the number of months that they can fish. To have the Canadian lobsters come into the market when our fishermen are just getting back would even cause further economic harm. We would support this wholeheartedly, and I would like to thank Mr. Keliher for his comment on the oversight, because that is yet another inequity. We look forward to seeing this come out to the public for more input. Thank you very much.

CHAIR McNAMEE: Toni, kind of looking towards you, okay whenever you're ready.

MS. KERNS: Thank you, Mr. Chairman, for that moment to think. The Mitchell Provision language is very specific to minimum sizes only. I think we would have to consider what we could do for maximum sizes. I think we'll have to confer with our NOAA counterparts to see if there is anything that we could do within the realm of our FMP, and NOAAs FMP.

But I'm not sure. I don't want to say this. I don't have anything off the top of my head right now. Chip

Lynch, the attorney for NOAA Fisheries is in the audience right now. If he has any ideas that would work immediately off the top of your head, Chip, you could come to the microphone. But if you don't have anything it's okay, you don't have to come to the microphone.

CHAIR McNAMEE: Chip, you are welcome to it if you don't mind being put on the spot.

MR. CHIP LYNCH: It's what I do, I guess. I'm going to expand your question, and say that as a lawyer I'm looking for some clarification on this particular motion. The Mitchell Provision is law, so we don't need a recommendation to comply with a law. The question, excuse me, you're free to recommend that by the way, I'm just saying that we're going to follow the law, period.

The question is, the Mitchell Act says that there is a prohibition on imports to below the minimum possession size in the Plan Historically, the lowest in the Plan has always been the same as the lowest in whatever LCMA, which would include Area 1. I think, potentially, if the facts supported it, if the enforcement fact supported it, that could always be decoupled. You could have 3-1/4 be the lowest size in the plan, and 3 and 5/16 be the lowest size in the LCMA. Again, you would have to nuance it, it depends on the facts how you want to word it.

That is, I guess, the potential. As a lawyer I'm looking at this, and the real question I had for Addendum XXVII was, what was the intent of the Board? Was the intent of the Board to restrict imports below the new lowest most restrictive 3-5/16, or was it to sort of bifurcate the two, and allow imports to continue as is, keeping 3-1/4 as the lowest size in the Plan, but increasing in Area 1? I think, Dan, that is what is intended by this Addendum to clear up.

But I just wanted to, this is what lawyers get paid to do is to parse language, and I know it's annoying, but just so you're aware of that. Now, the real reason you asked me to come up to the microphone was you were asking about a maximum size. Incidentally, the federal government does not have a separate fishery management plan.

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

The fishery management plan that we operate off of is the ISFMP that the Commission has. If the Commission chose to do something in a plan, and it was rationally related to the facts and to the best available science and all, and that could include restrictions, potentially, and hypothetically on a max. If the Commission went down that path, then made a recommendation to NOAA Fisheries, we would consider that recommendation, again, based upon the law and the facts as it existed at the time. It is hard for me to answer very specifically, because it is so hypothetical at this point. Hope that was helpful.

CHAIR McNAMEE: Appreciate that. Toni, did you still want me to come to you? Okay, so Dan had his hand up, so go ahead, Dan.

MR. McKIERNAN: To respond to Chip. That is my intent of the motion, and just for purpose of the conversation, I'm looking at the slide here of all the maximum sizes, and we have three different maximum sizes among all the management plans. I guess the least restrictive rule would be a 6-3/4-inch maximum size.

Of course, coming down, by virtue of Addendum XXVII to 6-1/2. Ultimately, it will be a 6-1/2-inch maximum size. I don't think it's quite the enforcement burden that a minimum size is, because those big lobsters aren't all that common. But it would be helpful if we could find a way to have a similar Mitchell Provision on the maximum size as well, but I think that is for another day. This particular motion is trying to zero in on that which would be consistent with the law as enacted in 1989.

CHAIR McNAMEE: Pat, just kind of looking back to you. Anything further you want to do on this for now, I guess?

MR. KELIHER: Honestly, I'm a little bit, I hadn't really thought about bringing this up associated with this, but as we started talking about this, looking at some of my comments that have been made to me, thinking about some of the comments that have been made to me over the last several months. This oversize issue continues to come up.

It usually comes up associated with the gray zone. The gray zone issue for us is very specific, and this even on the minimum size doesn't take care of it. If lobster fishermen in the gray zone catches a lobster and throws it over, right now a Canadian harvester right beside him could still keep that. The same is true on the oversize, so those larger lobsters that they are throwing back over, the maximum are being kept.

The inequity of the issue is highlighted really clearly in those two cases in the gray zone. But from an enforcement side, to Dan's point, and the reason I started thinking about this again. We started to really go through the process of what happens from an enforcement standpoint if that small live lobster is allowed into the U.S., and what we would have to do to segregate, to deal with the chain of custody, to be able to enforce that issue?

Well, we do that now for oversize, and it's a lot less product, and it's an incredible burden to patrol and to the dealers that are dealing with it. I'm just wondering if this document shouldn't at the very least, just have an option to consider it. We take comment on it, and then make a determination at the time of making final decision, whether to do something or not.

CHAIR McNAMEE: I think the idea here is to potentially add this into the current, at least the current idea of an addendum, not talking about the parliamentary way to get there yet. We think we have a plan here, so I am going to go to you, Pat.

MR. KELIHER: I would like to make a **motion to amend to add the consideration of a maximum size limit for imports.**

CHAIR McNAMEE: Thank you, Pat, is there a second? Dan McKiernan seconds the motion to amend. We've got a motion up on the board and it's been seconded. Pat, does this look okay, the language?

MR. KELIHER: Yes, I think it's fine, Mr. Chairman. I think this gives us the ability and the time to have some additional conversations with NOAA, in

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

regards to this issue, make sure that from a legality standpoint that we're not straying here. But it also adds that consistency to address the inequity component within the addendum going forward. At least we could take comments on it, make a determination later whether we need to do something or not.

CHAIR McNAMEE: Dan, did you want to add anything?

MR. McKIERNAN: No, Sir.

CHAIR McNAMEE: Now we have a motion to amend up on the board. Any discussion on this amended motion? Seeing no hands around the table, any hands online? No hands online. Why don't we take a minute here to caucus before we call the question, I don't know, maybe two minutes, one minute to caucus. Just in case people need to text or whatever with folks who aren't here. One minute, it's actually already running, so we'll be back in 48 seconds.

Okay, as the last seconds are ticking off the clock here. It looks like most folks here in the room are ready to go. I will look around the table and ask if there are **any objections to the amended motion. Seeing none in the room, any hands online? Okay, so there are no objections to the amended motion here.**

The amendment passes by consent, unanimous consent, so now we're going to go to what is now the main motion here, read it. The motion is now; the motion is to initiate an addendum to clarify that Addendum XXVII shall include compliance with the Mitchell Provision, signal to the National Marine Fisheries Service that the smallest implanted minimum size shall apply to imports, and to also consider a maximum size limit for imports.

We have now a main motion. I will look around the room. Can anyone let me know if they need a minute to caucus? Not seeing any, okay. I will ask the question again. **Are there any objections to this motion? Please, raise your hand if you're in the room, anyone online with objections? No hands**

online. This motion also passes by unanimous consent.

I think we've got it, thanks, everybody. Let's keep moving along here, and I think I'm up next.

CONSIDER PURSUING A MANAGEMENT STRATEGY EVALUATION FOR AMERICAN LOBSTER (DISMISSED)

CHAIR McNAMEE: The next item here is to Consider Pursuing a Management Strategy Evaluation. I'm going to go super, super fast, and I'll just give a high sign to flip the slides. We've talked about this a couple of times now; we've been sort of dragging this along with us through the process here. I've got a quick presentation to just kind of consider whether we want to implement the Management Strategy Evaluation for lobster. Pat, go ahead.

MR. KELIHER: I'm sorry, Mr. Chairman, I meant to catch your eye before this. Understanding our time constraints here, but also understanding the fact that we have a benchmark stock assessment coming up. I'm just wondering if we shouldn't bring this back up as soon as we have the finalized stock assessment for consideration. Just from a timing aspect, doing both of those things at the same time seemed highly problematic to me. I meant to catch your eye before you started down this road, but just wanted to bring that to your attention, to see if we wanted to delay this for a bit.

CHAIR McNAMEE: I have an opinion on that, but I'm going to keep it to myself as Chair. I'll look around the table to see if anyone else agrees with Pat, which would basically just skip over this agenda item for today. Dan.

MR. McKIERNAN: I agree with Pat.

CHAIR McNAMEE: Mike, did you want to make a comment? Just giving a thumbs up, okay. Okay, I guess that does that, if that is the will of the Board. Anyone with a different opinion? I guess I don't get to have that different opinion. Not seeing any. Okay, off we go then.

DISCUSS INCONSISTENCIES IN FEDERAL AND COMMISSION RULES FOR LOBSTER CONSERVATION MANAGEMENT AREAS 2 AND 3

CHAIR McNAMEE: Next on the agenda is to Discuss Inconsistencies in Federal and Commission Rules for Lobster Conservation Management Areas 2 and 3. I believe I go to you first, Caitlin.

MS. STARKS: I'm going to just provide some background on these two Addenda XXI and XXII, which are the basis for the recent NOAA rulemaking for Area 2 and 3 trap and ownership cap. Addendum XXI and XXII were a part of a series of addenda that the Board initiated after the 2009 stock assessment, which found that the Southern New England lobster stock was depleted. In response to that the Board initiated these addenda to scale back the size of the SNE fishery to match the size of the lobster resource.

Before these two addenda, Addenda XVIII and XIX had already initiated trap allocation reductions in Area 2 and Area 3, and the conservation transfer tax in Area 3. In that context, Addendum XXI and XXII were meant to address trap transferability and trap caps in Area 2 and 3. Addendum XXI changed the transferability program for LCMA 2 and 3 and Addendum XXII changes the single and aggregate ownership limits in Area 3.

These changes were designed to allow for some flexibility in the movement of traps, as the consolidation program for LMA 2 and 3 to address latent effort was implemented, and they were intended to provide a mechanism for the industry to maintain a profitable fishery during the period of trap reductions.

Specific to LCMA 2, Addendum XXI modified the transferability program such that when there was a transfer of a trap allocation with a history for multiple areas, the recipient of that transfer would be able to maintain that multi LCMA history, and at the start of each fishing year they would have to declare which area or areas were to be fished. It also established a single ownership trap cap for LCMA 2 of a maximum of 1,600 traps, 800 of which could be active and 800 banked. However, two years after the

final year of trap reductions on LCMA 2, which was in 2022, the cap would return to an 800 maximum traps per entity. Then lastly, Addendum XXI established an aggregate ownership cap for LMA 2 of two permits and 1,600 traps.

There were a group of permit holders that had more than two permits as of December, 2003, and they were allowed to maintain those additional permits and traps. For LMA 3, Addendum XXI made the same change to the transferability program about the multi LCMA trap allocation transfers.

It also established active trap cap reductions for Area 3 that were recommended for implementation by NOAA, starting with a cap of 2,000 traps. That would then be reduced by 5 percent per year for five years, in conjunction with the LMA 3 trap allocation reduction from Addendum XVIII.

Addendum XXII focused only on Area 3, and it established a single and aggregate ownership cap. The single ownership cap for Area 3 would allow for an entity to accumulate more traps than the active trap cap. This assumed the 2000 active trap cap from Addendum XXI would be implemented by NOAA, and that would decrease by 5 percent per year.

This table shows the accepted single ownership cap that would be implemented each year. Then the aggregate ownership cap for Area 3 that was recommended in Addendum XXII limited a single entity's trap to five times the single ownership trap. This was based on the maximum number of permits being five permits per entity.

In this table each year the aggregate ownership cap would be five times the number that was in the previous table. Entities that had already accumulated more traps than the aggregate cap before the control date published by NOAA were exempt, and allowed to maintain those excess traps.

For a summary of all of the measures in Addendum XXII for LMA3, this table shows the active trap cap, individual permit cap, and aggregate permit cap for the first year, and each year following the implementation of the measures by NOAA. I'm going to pause here and pass the presentation to Alli

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

Murphy, and then I'll come back for a few more slides.

CHAIR McNAMEE: Alli, whenever you're ready.

MS. MURPHY: We certainly recognize that over ten years have passed since these recommendations were made by the Lobster Board, and things could have changed in that timeframe. Following the publication of the proposed rule in the summer of 2022, we got some comments, including from the Commission, requesting additional time to consider these measures, and to understand them in the current context of the fishery.

We published an interim final rule this past October, implementing the measures in 2025 as a backstop, but also taking additional comments on these measures to be responsive to that request. While that comment period has closed, I think this is still a valuable discussion for the Board to have. These measures stem from your recommendations, and if they no longer make sense in the current context of the fishery, then the Board could alter their recommendations. I made a few terminology changes in the Rule, based on some public comments. I removed permit from the cap, because traps were really the currency that we saw, and having permit in the title of these things cause confusion. The word active also caused a lot of confusion in the comments we received.

Folks were wondering if we were trying to regulate actively fished traps differently than traps that are not actively fished. We clarified that to the maximum trap cap. I just wanted to highlight that for everyone here, as I walk through the next few slides. Just a quick note on banking. I think there was some confusion that came up during the public input session a week or so ago.

As I understood it, the Commission would have allowed banking by stacking additional or inactive traps on a single permit, above the areas maximum trap cap, which could be actively fished. That's what we are not allowing. That is what we did not propose and ultimately did not implement in this action.

If an owner had a second vessel that they are essentially using, or second vessel with a second permit that they are essentially using as a bank, that this action would not affect that vessel permit and trap. For the Area 2 measures we implemented an ownership cap of 800 traps per person. We also allowed those who were over that cap as of May 1st, 2022 to retain those traps, but would prevent them from acquiring additional traps in the future. We will implement this cap on May 1st 2025, unless recommendations change and we take additional action.

The big difference, as I said, is we didn't implement the banking provisions that the Commission had considered and recommended. With the trap reductions having been completed, we saw those as no longer necessary. I just wanted to give a quick example here of how we're looking at the ownership caps.

Forgive my use of the Beatles, but it's kind of the best example I could come up with here. Please assume that everybody is alive, I know there are some deceased people, some deceased names on this. But these are a few situations that were discussed during the input session that I felt might highlight how we're looking at ownership, and taking ownership back to the people behind all of the vessels and permits, and potentially corporations.

We have the three McCartney's; they are all part of a single corporation. They own three vessels. Those vessels each have Area 2 allocation that totals 1,550 traps. Each of those people would be capped at 1,550 traps going forward. The next example we have George Harrison, who has one vessel in ownership under his name.

The other vessel is in corporate ownership. Those two vessels combine for 1,800 traps. He has capped at 1,080 traps. He is capped at that level going forward. Finally, we have Ringo, who owns a single vessel under his name with 625 traps. He would be allowed to build up to 800 traps under this rule as it currently stands. My main objective here was just showing how we are taking trap allocations associated with the people behind the permits,

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

behind the vessels and the permits, and implementing the caps on the people. I hope that is helpful. In our environmental assessment we assessed this as having fairly minimal impacts, because it capped the fishery as it currently exists. It's not going to take traps away from anybody, but you know yes, it certainly would prevent folks building up their businesses in the future above these caps. Since that analysis we looked at ownership data. You know there are 24 people who are capped at allocations above 800.

There is some overlapping ownership interest there like husbands and wives and siblings, like the examples I showed previously. We also note since that time one person, or since May 1, 2022, one person completed trap transfers, and that person stands to lose those traps, because they were made after that May 1, 2022 line in the sand. Jumping into the Area 3 measures. We implemented or will implement a reduction in the maximum trap cap from 1,945 traps to 1,548 traps.

We're doing that over three years, and that's the big difference here. The Commission had recommended that over five years. We'll be jumping to Year 2, Year 4, and then Year 5 of the Commission's recommendations. This will be assessed against each permit. As you'll see in the next slide, some folks stand to lose some traps. Again, this will be implemented if nothing changes in 2025.

As I said moments ago, there are some impacts associated with this. We know in the first year, based on 2019 data there were 21 vessels who had allocations over 1,805 traps, and so those folks would stand to lose those traps. That totals a little over a thousand traps. By Year 3 we have 43 vessels who stand to lose some traps, and that total they are just under 10,000 traps.

Certainly, folks could take advantage of the trap transfer program, to either move allocations between their vessels if they own multiple, or sell them to try to recoup some of the costs. The specific impacts are a little bit unclear as we can't predict exactly what decisions will be made. Just in looking at more recent data, that looks pretty similar to this,

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

so it wasn't worth noting changes here.

With regard to the Area 3 ownership cap, we are implementing a cap that is 5 times the maximum trap cap in a given year. The final aggregate ownership cap would be 7,740 traps per person. Again, this is assessed to each person, the same as the example with Area 2. Those who are over the cap as of May 1, 2022, again, would be allowed to retain those traps but not build up.

The big difference here is again, eliminating that banking provision there. In Caitlin's slide there was an intermediate step between the trap cap and the aggregate ownership cap that we did not propose or implement. Again, with the ownership caps, because this caps the fishery as it currently exists, we didn't assess any serious impacts here.

Two folks are over the cap of 7,740 traps, so those folks would be capped at their current levels, and wouldn't be allowed to build up any more. Nobody made business decisions after May 1, 2022 that changes anything. I think this is my last slide, I have links to the proposed, the Interim Final Rule and then all of the comments we've received on this, and I'm happy to answer any questions on the Rule or anything else. Thank you.

CHAIR McNAMEE: Thank you, Alli, back to Caitlin.

MS. STARKS: As most of you know, we had a public meeting on January 10 to get some input on the NOAA Rules and how they would impact the fishery in its current context, since these Rules were intended to be implemented about ten years ago, and there have been lots of changes in the fishery since then.

We had about 58 people in attendance at this meeting, including LCMA 2 and 3 stakeholders as well as Commissioners, state and ASMFC staff. At this meeting the input received from Area 2 stakeholders included that they want to see a change to the sunset date of May 1, 2022 that is in the NOAA Rule to a future date, and they suggested different dates between now and 2030.

The argument there is that the date needs to be proactive, because they can't plan to respond to this if it's in the past. We also heard that they do not support the maximum ownership cap of 800 traps. Instead, they would like to maintain the two permits with 800 traps each, because this gives them more flexibility and allows families to keep their traps within the family if someone were to leave the fishery.

They also commented that the fishery is a lot different today than ten years ago. They noted increases in cost, new marine mammal and whale regulations, wind power development, and the development of the Jonah crab fishery. Regarding the Area 3 measures, the majority of the stakeholders that spoke on this in the meeting said they did not support the trap cap reductions and ownership cap.

Their reasoning behind this is that they said the ownership caps were really meant to prevent consolidation in the fishery. But they noted that consolidation has already occurred, and now that the offshore fishery has a different makeup, these measures would disadvantage the larger fleets that are now there. They also commented that they don't think the measures would really reduce traps, but just spread them out across more vessels and permits.

Another reason they no longer support these caps is that they believe there will not be a biological benefit from it, and they referenced the Impact Analysis in the NOAA Rules. Then as I mentioned, the fishery has changed in the last ten years or so, and they specifically commented that it is no longer majority owner/operator as it was. The fleet does not support measures that are intended to keep it owner/operator.

Additionally, they also mentioned that increased business costs, marine mammal protections, wind farms and the increase in the Jonah crab fishery were not part of the equation when these rules were developed. There was one former Area 3 fisherman during the meeting that disagreed with those sentiments.

They instead thought that the trap caps would increase the efficiency of the fleet by lowering bait and that cost, and that these rules would reduce the fishing pressure on the lobster stock. They commented that in Southern New England the accessible bottom areas decreasing, due to wind farms, closed areas and other reasons, but the number of traps is not, and that is problematic. It was noted that the trap reductions in the NOAA Rule were counted towards the large whale risk reductions. Finally, they noted that they think more closed areas will likely open to mobile gear, and more lobsters will be displaced in the future. With that, that is the summary of input from the public meeting, and I can take any questions and Alli can take questions.

CHIAR McNAMEE: Great, thanks Alli and Caitlin very much. You got a good slug of background there, and then you got some information about the feedback that we got when we went out to the industry. Before we kind of get into the discussion here, first any questions that anyone has for Caitlin or Alli? Not seeing any questions, we can get right into the discussion. Dan, go ahead.

MR. McKIERNAN: First, I want to thank NOAA for delaying the Final Rule, while we provide this input at the eleventh hour. Actually, I think it's ten past midnight. But I am grateful that they are considering this input. I also want to thank ASMFC staff for putting that great webinar together, and giving the industry, and also us managers, to kind of get refreshed and to hear first hand what their concerns were two weeks ago, and of course the public for their participation.

The goals of this addenda were good goals, but they were goals that were established 11 years ago, and since then so much has transpired, so many permits have been transferred, and many businesses have really altered their arrangements, as mentioned in one of the slides. It is no longer a predominantly owner/operator, single boat fishery.

We're seeing the proliferation of these fleets, which was one of the goals to avoid, but no, it's too late. That is one of the reasons that I think we should be

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

pumping the brakes. Many trap allocations have been transferred as a means to mitigate against those trap cuts, including traps that might have to be lost as a result of these final actions, should NOAA take those.

If we enact the rules as outlined in NOAA's Proposed Rule, or in the original language enacted 11 years ago, there could be serious unintended consequences, especially with the activation of traps that currently aren't even being fished. Also, we would be retorquing some of the scales of the Area 3 fleet, which is probably inappropriate and unnecessary for the reasons that were mentioned on the slide, such as offshore wind development, which is going to displace vessels all around the Gulf of Maine, as well as the Jonah crab situation and marine mammals.

I'm going to confess that we've been remiss, me personally and others, of keeping an active set of LCMTs. The current rosters are peppered with the names of permit holders who are no longer in the fishery. My request and my recommendation are to reconstitute those LCMTs, convene them, and then return back to this Board with some new goals and new objectives to manage effort in the two LCMAs, Area 2 and Area 3. I have a motion once you are done taking comments from the rest of the Board.

CHAIR McNAMEE: Before we go to Dan for the motion, anybody else want to jump in? Not seeing any. David, go ahead.

MR. BORDEN: Dan made a lot of the points that I intended to make. But I think we find ourselves in a position where we really need a do over, in spite of all the good intentions. They are over 10-years-old, and the factual situation has almost totally changed. Dan spoke quite eloquently about the Area 3 circumstances.

But in the case of the Area 2 circumstances, they used to be a really prominent lobster fishery similar to the Maine coast fishery, where everyone was dedicated to lobstering. They did it 100 percent of the time. The Rhode Island and Mass Fishery, and

about 98 percent of the permits are now contained in those two states.

That fishery only exists because it has transitioned into a multispecies fishery that now needs to have different vessel capacities and different crewing, and all sorts of different changes. What started out as kind of a desire to have a continuation of that owner/operator fishery in small boats is transitioning as we speak.

I think we've got to kind of reflect on that, and take a step back and reconsider what we put in there, look at the Proposed Rule. While I'm on the Proposed Rule, I would just like to take the time to comment on the Rule itself and not on the language in the Rule, but more the individuals that crafted it.

I really thought they did an excellent job of putting together a Rule that was almost 12 years late. I mean they were incredibly creative, in terms of how they handled some of the disconnects that were created by the time lapse. I realize that is a little bit of a backhanded compliment, but they really deserve praise, because I think they did an excellent job. I'm happy to second that motion, Mr. Chairman, when you get around to it.

CHAIR McNAMEE: Great, thank you, David. Okay, let's get to it then. Dan, I'll come to you for the motion that is also up on the board here.

MR. McKIERNAN: Okay, **move to recommend to the ISFMP Policy Board that the Commission send a letter to NOAA Fisheries to withdraw the Commission's recommendation to implement the measures of Sections 3 and 4, except Sections 3.1.1 and 3.2.1 – transfers of Multi-LCMA Trap Allocation of Addendum XXI and all of Addendum XXII.**

I'm not sure that the way that is worded is easy to follow, but essentially, we are asking to withdraw our endorsement of XXI and XXII, except those two sections in XXI, which is 3.1.1 and 3.2.1 that has to do with the transfers of multi LCMA trap allocations.

CHAIR McNAMEE: Motion made, seconded by David Borden. Any further discussion? Pat.

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

MR. KELIHER: I'm going to support the motion, but just for the record, I think there needs to be a little bit of due diligence done. If you all recall, a year ago December Congress passed a Consolidated Appropriations Act, which gave a six-year reprieve, or it put us in compliance for six years with both the Endangered Species Act and the Marine Mammal Protection Act, which is a critical step in helping us have the time we need to deal with the data deficiencies going forward, so we can have some better tools, better data to make some decisions going forward. I talked to Chip Lynch before this meeting, knowing this was coming up. This was not in place when Congress initiated or passed that law. However, I would just encourage us to make sure that the data associated with this was not something that was considered in the risk reductions, just to make sure that we are not inadvertently finding ourselves either slightly out of compliance, with the intent of the statute in Congress.

But we also have some decisions coming up from Judge Boasberg that are related to these cases. We certainly don't want to signal that we are trying to weaken any efforts. For the record, I don't think this is weakening anything. I just want to make sure that we're doing our due diligence that pertains to the risk reductions that were done associated with the rules that were implemented in 2021.

CHAIR McNAMEE: Cheri.

MS. CHERI PATTERSON: I can support this motion. My question would be, we're asking to withdraw the Commission's recommendation for these items. I presume that we'll be moving forward with further recommendations in the near future, as opposed to the far future. That would be my only concern. I think that the conservation measures still need to move forward, they just might need to move forward in a different manner, I understand that. But I just don't want to lose that momentum of conservation measures.

CHAIR McNAMEE: David.

MR. BORDEN: I'm glad both Pat and Cheri have raised this, because I think we need some dialogue

on the record, relative to what the intent is. I think Dan said it, but he probably didn't emphasize it enough. At least my intent is to do exactly what Cheri characterized. Looking forward, I think what we have to do is kind of extract ourselves from the proposed rule process, and this will do that.

Then at the next meeting, basically, get to work on what we're going to take for action. Dan and I have discussed this before, and I think what is needed here is, as we go forward, we basically task the LCMTs to go back, review the rules in a broad context, where they would have great flexibility to look at the rules and come up with alternatives that still meet the original objective of what we were trying to get at.

I would add to that, I think they have to factor in some kind of discussion on protected species issues as part of that. The reason I say that is, because I was heavily involved in that aspect of it when I worked for AOLA. The offshore industry got 12 risk reduction points for their actions with the trap cuts.

If they back away from the trap cuts, then they are going to lose that risk reduction. They've already gone on record saying they can't lift with weak ropes. They are going to find themselves in an unenviable position of having nothing that is practical. I think the industry really needs to look at that, look at all the alternatives like consolidation, the way the Canadians did it on fewer boats and cut traps that way, or some other alternative, and come up with alternatives that still meet the original objective.

CHAIR McNAMEE: Okay, a quick last look around the table for any additional comments on the motion. I'm not seeing any. What I would like to do is take a few public comments. I ask that any public commenters, if you made public comments at the workshop we had, please don't repeat those. The Board has that information already.

If you have something new you would like to offer, please, be very concise. We would like to keep it to a minute. We're already over time here by four minutes. With that, I am going to look for some public hands, and the first one we have is Erica Fuller,

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

so Erica, whenever you are ready feel free to unmute and give us your comment.

MS. ERICA FULLER: Thank you, Mr. Chair, and thank you, Allison and Caitlin for the presentations. I want to follow up on the comments that Mr. Keliher and Mr. Borden made. This is really problematic from a conservation perspective, and we do understand the rationales and perhaps these two actions need to be reconsidered. But if the Commission does back away from these measures, and this question may be for NOAA General Counsel.

Does the Agency plan to develop or implement some other comparable measures that achieve the same risk reduction, or does it plan to convene the team that advised on the recommendations, because in our view Congress absolutely relied on these trap cap reductions going into place when the Commission said it was going to, and we would like to see something in place sooner rather than later.

CHAIR McNAMEE: Thank you, Erica, any other hands online? Okay, no other hands online, back to the table. Pat.

MR. KELIHER: Sorry, Mr. Chairman, but David's comments made me just a little bit more uneasy, associated with that referencing the 12 Risk Reduction Points associated with this. It may be better, and I don't think this necessarily changes the intent with the motion as it's been made. But as we're going forward, it may be better to consider what we're replacing this with, from a risk equivalency standpoint, understanding what the interaction is.

We certainly don't want to jeopardize what we have in place, so we need to really think critically about how that is going to play out, while trying to deal with the time lag and how the fishery has evolved over time. Dan eloquently talked about the challenges that we have in place and how the fishery has changed.

Again, Maine's perspective, we don't have a dog in this fight, with the exception of how the Consolidated Appropriations Act played out. I just

want to make sure, again, for the record, that we're taking all of these things into consideration before we're making any final decisions about how this may play out.

CHAIR McNAMEE: Doug, go ahead.

MR. GROUT: Just a follow up of Pat's comment. Is there some benefit to already have an idea of what is going to be replacing those 12 conservation credits, before we withdraw our support for this addendum? Because sitting here and saying, okay we're going to pull this apart, and we're going to convene the LCMTs, give us some ideas of a better way to do this, and then initiate another addendum, assuming it can be done with an addendum, and also implement this. That is going to take a little bit of time, and is that going to be enough time to have something in place to still get those conservation credits. Be careful for what Area 3 and Area 2 wishes for here, they could end up with something a lot worse, if you don't have something in mind in how you're going to replace it.

CHAIR McNAMEE: John Maniscalco.

MR. JOHN MANISCALCO: I have to agree with Doug Grout that the implications of this are not entirely clear, and I think we need to think about that before we kind of take what seems to me to be hasty action. I do think you have to consider right whale conservation.

CHAIR McNAMEE: I've got a couple, so I'll go to first Andy, go ahead. Adam, I always do that. Adam, go ahead.

MR. ADAM NOWALSKY: I've been called far worse on the boat, Mr. Chairman, so okay. Does the Service have any input here they could offer in terms of their process for rulemaking that might give us some more time to figure out what exactly we should be saying, and when we need to say it?

CHAIR McNAMEE: Alli, if you want.

MS. MURPHY: Thank you very much for the question, and Chip, if I get this wrong if you could

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

jump in and correct me. But I think you do have some time here. I think if we were to, let me start over. I don't think we could easily change, just swap out what was included in the Interim Final Rule with the new recommendation. I don't think we could do that easily in a single follow up rule here.

I think a more logical process would be, if this recommendation were to go through, for us to withdraw those measures and start a new rulemaking to consider whatever the Lobster Board's new recommendations are. As we know, NOAA Fisheries is not super-fast in getting new regulations in place. I do think the Board has a little bit of time to contemplate what it might want to do next. Chip, do you have anything else?

MR. LYNCH: To clarify one point that Alli made, maybe it was clear. There is a present Interim Final Rule. It is based upon the Commission process and the Commission recommendation that we previously received. We would be interested in knowing whether the Commission wants to stick with its recommendation, or withdraw their recommendation, or withdraw part of their recommendation.

It would be extraordinarily difficult and potentially not legal to add and amend that recommendation, so that we would be amending this Rule in this Rule. Now if the Commission wanted to do a follow-on addendum, and then make a later recommendation, of course we would treat that as a regular rulemaking. I would further note, just for the sake of clarity that this particular rule was about lobster, and it was promulgated under the Atlantic Coastal Fisheries Cooperative Management Act, that is the Atlantic Coastal Act. It has ancillary benefit to whales; the number was 12 to 14 percent in Area 3. I imagine that would translate to some lower number coastwide. I don't know what the numbers are now, it's fluid, it's dynamic, so those numbers may be different. We just don't know what those numbers are right now. But the Rule wasn't made for whales, so it would be difficult getting a recommendation on this Rule for whales, because the Administrative Record for this Rule was about lobster.

The Commission may want to, or folks may want to consider that the numbers for whale risk reduction are whatever they are. The conversation that Pat referred to earlier, I indicated that depending on the numbers, whether it be now or later, if there was a gap in the numbers at some point in time, people are going to have to pay the piper.

I just want to make that clear on the record that that was part of the conversation, depending on the numbers. I am not sure where that goes here, and how people are considering it, but again, one thing that I want people to be aware of is that this Rule, these Addenda work for lobster, and the record for them was about lobster. While I think it's good to have follow-on measures consider other things, if we're looking to the past, and lawyers like to look at the administrative record. The administrative record here on this particular one was about lobsters.

MR. NOWALSKY: Out of that I hear that the rulemaking process is slow, that is no surprise to any of us. I'm not sure when the Interim Final Rule becomes a final-Final Rule. I don't know if the process working slow would mean there is room for us to table this for a meeting until we get some more information, but I wouldn't want that to happen at the cost of the Rule becoming final-Final, and then putting us in a position we as the Commission didn't want to be in.

I would be willing to make a motion to table this until the spring meeting, but only if I had assurances that we weren't putting ourselves in a position we don't want to be in, and I'm not sure how to get that assurance. I'm just not sure. I understand that the intent here is to do what is more reflective of the current state of management than what these Addenda set forth. I'm crystal clear on that, I'm just not clear that this motion gets us to where we want to be in considering all of the other moving parts, as we sit here today.

MS. KERNS: Alli, if we did not give a recommendation to NOAA until May, what would happen?

MR. LYNCH: This is sort of crystal ball stuff. But the final-Final Rule or these regulations would not be, the regulations are intended to become affective in May, 2025. We are in this interim period; it would be helpful to get a sense of where the Commission were going. But if we didn't hear until the May meeting, the world isn't going to stop spinning.

Again, there are reasons why we need to have an understanding of things going forward. We're in general election coming up. Getting things through becomes more complicated the later we go, she just said there were changes, et cetera. I think that is a factor. But again, the Rule isn't going to be implemented until May of 2025. That is more than a year away.

MS. KERNS: Dan, I'm going to go to you, and then Adam, I'll come back to you if you want to make a motion. I have Dan and then David on the list, and then I'll come back to you.

MR. MCKIERNAN: Thank you, Toni. Maybe I overemphasized this when I talked about the need for new goals. I'm not trying to avoid the actions because the goals have changed. I'm actually identifying serious flaws in the Rules as written that would attempt to accomplish those goals. What I'm getting at is, when you dial down, especially in Area 3.

If you dial down the trap limits, I can envision a scenario where the vessel owner doesn't have to surrender the traps, they just move those traps to another Area 3 permit that they purchased on the market. I don't think that the net effect, especially regarding whale conservation. The benefits of this plan are not what you think it is.

That is why I really wanted to let this, or send a signal to NOAA not to adopt this, and to reconvene these teams to come up with some new objectives and new goals. I hope, and I guess this is a question for Chip. I hope that the mandatory reporting part of the Proposed Rule wouldn't be also put off, because we need the mandatory reporting part of the Proposed Rule to be in effect as quickly as possible.

CHAIR McNAMEE: David.

MR. BORDEN: Just a quick point, Mr. Chairman, that I still support going forward with the motion, with the provision that I think it's important for us to commit ourselves today to between now and the next meeting, basically flesh out what our expectations are for the industry going forward. This could be as simple as doing a tasking memo for the LCMTs.

In other words, we do what Dan advocated as reconstitute the LCMTs and then basically give them a tasking that addresses a lot of the concerns that have been brought up here today, that would be kind of a multi-faceted tasking. Then vote on that at the May meeting, and then start that process.

I think the important point for everybody here is the point that Chip Lynch made. NOAA put this date of May 1, 2025 in the Rule, so nothing is going to happen, nothing is going to be implemented between now and then is my understanding. Chip, correct that if it's wrong. But what that means is we have time to flesh out what we actually intend, and then NOAA will know exactly what we intend to do, and that we intend to pursue an addendum to correct some of the flaws that we've seen in the document.

CHAIR McNAMEE: Had some discussion around the table. I think maybe, just kind of looking for any additional hands. We've got a motion up on the board, I think it's time to dispense with that motion at this point. Kind of looking, making sure nobody flags me down. Okay, I think I'm on the right track. Are there any objections to the motion that is up on the board? Time for a caucus, sorry. Hang on a second. Two minutes for a caucus. One minute for a caucus.

All right, folks, we hit the minute there. Let's bring it back to the table. Okay, Alli, did you want to make a comment? Okay, I think I know where you're at, good. I will now ask the question again. **Are there any objections to the motion? Seeing no objections, I see Alli with her hand up, maybe to abstain.**

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

MS. MURPHY: Yes, that is correct, Mr. Chair, as this is a recommendation to NOAA Fisheries, I'll abstain on the motion. Thank you.

CHAIR McNAMEE: There are no objections, we have one abstention from NOAA, and with that the motion passes. Cheri.

MS. PATTERSON: Could we take a little break so I could put together a motion for tasking, so that we have something on the board to be doing before the May meeting, unless Toni, do you have? Okay, sounds good, thanks.

CHAIR McNAMEE: Got it, thank you, Cheri, we'll come back to you.

CHAIR McNAMEE: We are up to Item 9; this is a Progress Update of State Implementation of Addendum XXIX on Federal Vessel Trackers. I am on here, but I'm going to pass it right to.

MR. KELIHER: Just to clarify the record, Maine is a null.

PROGRESS UPDATE ON STATE IMPLEMENTATION OF ADDENDUM XXIX ON FEDERAL VESSEL TRACKERS

MS. KERNS: Thank you, Mr. Chairman, I will give the Board a very quick update on trackers. Up on the screen in a hot second you will see a list of projected implementation dates for states that are putting the vessel tracker regulations of Addendum XXVII in place. As a reminder for compliance, all states were to put measures in place by December 15. We have a wide variety of implementation dates as of right now for the states.

They vary from the state of Massachusetts implementing these measures in May of this year, to some states not implementing until July. Sorry, May of '23, and some states not implementing until July of 2024. As we've noted, these tracker data are very important. We've already begun to use the information, as Caitlin reported out today, for the measures in the closed area, the northern edge. It is vitally important for these states to get these

regulations in place in a timely fashion. Mr. Keliher, please go away, no.

CHAIR McNAMEE: Was I supposed to go to you?

MR. KELIHER: I guess I have a motion that was prepared for me, I'm sorry for my stepping away from the table.

CHAIR McNAMEE: Going to you, Pat, for this one?

MR. KELIHER: Evidently.

CHAIR McNAMEE: Take it away.

MR. KELIHER: Move to send states who have not implemented electronic vessel tracking requirements for federal lobster permit holders a letter stating that the implementation deadline for this action was December 15, 2023, and states need to implement this requirement in a timely fashion to ensure compliance with the Lobster FMP.

CHAIR McNAMEE: Okay, motion by Pat Keliher, is there a second to that? Doug Grout, second. Any discussion, Pat or Doug, do you want to say anything further? Heads shaking no. Does anyone else have anything to say on this motion? Mike.

MR. MICHAEL LUISI: I'll just clarify for the record that on the table that Toni had just covered a minute ago, it had implementation for the state of Maryland in March of this year. That would be when we would start to work on our rulemaking, which could take six months. But we have every intention to work with the industry. There are only a few federal permit holders, to begin using the trackers, but it won't be enforceable probably until the fall of next year, late summer, fall. I just wanted to make sure that is clear.

CHAIR McNAMEE: Maybe I'll just offer a quick comment for Rhode Island. While we didn't get the regulatory piece going yet, we have it planned and there are actually trackers on vessels in Rhode Island, so we maybe should have done it in reverse order, but lots of trackers on boats in Rhode Island. Was there a hand? Joe, go ahead.

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

MR. JOE CIMINIO: For New Jersey there are some vessels are ready with trackers. I'm actually hopeful that we'll have our regulations in place by end of February, but I left it at end of March just to be safe.

CHAIR McNAMEE: Colleen, go ahead.

MS. COLLEEN BOUFFARD: I just wanted to point out that the July implementation date we have for our regulations I think would be the latest case scenario for us. We are working on these measures as part of a bigger regulation package. Coupled with that, we don't have a lot of federal permit holders to begin with, and the one individual who has fished there indicated to me last fall that he is likely going to be putting his permit into TH, so we may not have any federal permit holders who will need a tracker.

CHAIR McNAMEE: Okay, we have a motion on the table here, any further discussion? Any hands online? Okay, I'm going to assume nobody wants to caucus on this, so why don't I go ahead and call the question. **Are there any objections to the motion that is up on the board? Not seeing anyone raising their hand here, any hands online? No hands online, so we will consider that motion passed by unanimous consent.** Okay, Toni, anything else?

MS. KERNS: There is one other, not on trackers, so we'll do the AP. Actually, we'll do the AP stuff and then come back to Cheri, and then I have one issue pertaining to a motion the Board passed.

PROGRESS UPDATE ON AMERICAN LOBSTER BENCHMARK STOCK ASSESSMENT (DISMISSED)

CHAIR McNAMEE: Before we go over to Tina for the AP, I'll just note we are skipping the update on the benchmark stock assessment. We'll try and squeeze it into the ISFMP if there is time, but if not, we'll send something out by e-mail.

REVIEW AND POPULATE JONAH CRAB ADVISORY PANEL MEMBERSHIP

CHAIR McNAMEE: Tina is ready to go, so Tina, whenever you're ready, take it away.

MS. TINA L. BERGER: I offer for your consideration and approval the nomination of Denny Colbert, offshore commercial trapper from Massachusetts. He replaces Mark Colombo, who is no longer active in the fishery.

CHAIR McNAMEE: Okay, go ahead, Dan.

MR. McKIERNAN: Can I second that, oh, is that my motion? I make the **motion to approve Denny Colbert to the Jonah Crab Advisory Panel.**

CHAIR McNAMEE: Is there a second? I see a second from Dennis. We've got a motion, it's been seconded. I'm going to assume you don't need to caucus, so are there **any objections to the motion up on the board? Seeing none here in the room, I am going to assume no hands online, so that motion passes by unanimous consent**, congratulations to your appointment. Okay, so I think that completes everything on the agenda, and so I'm going to come back now to Cheri, so Cheri, whenever you're ready.

MS. PATTERSON: I will try and speak slowly. I would like to **move to have the PDT review the conservation measures originally set in Addenda XXI and XXII and make recommendations for alternate measures to achieve those reductions inclusive of the LCMTs recommendations by the ASMFC Spring Meeting.**

The justification, while they are typing. The justification is to make sure that there is movement forward, and that it is not stalled between now and the spring meeting to assure that we are going to reach the conservation measures initially intended on, and be inclusive of the LCMTs input during this process of adjusting these thoughts that we have heard around the table today.

CHAIR McNAMEE: We've got a motion up on the board made by Cheri Patterson. Is there a second to that motion? Seconded by Pat Keliher. Okay, we've already had justification by Cheri. Pat, do you want to add anything? No, any discussion on the motion from the Board? Joe.

MR. CIMINO: Just a question, and apologies for not

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

knowing this, but do we need to establish a PDT, because I know kind of, they expire.

CHAIR McNAMEE: Question for Toni.

MS. KERNS: We'll create one.

CHAIR McNAMEE: All right, there you go. Thank you, Joe. Okay, we've got a motion, it's been seconded. Does anybody need time to caucus, please raise your hand. I've got two people online. Colleen, go ahead.

MS. BOUFFARD: Just a question for our northern neighbors. Does this give them enough time to reconstitute the LCMTs, convene them, and provide comment to the PDT?

MS. PATTERSON: I have all the confidence that we have that time.

CHAIR McNAMEE: It looks like the answer is yes, okay. Let's go ahead and call the question. **Are there any objections to the motion that is up on the board, please raise your hand. Seeing none around the table, any online? Okay, no objections to the motion, the motion passes by unanimous consent.** That was one follow up, and lucky us, we've got one more follow up, so go ahead, Toni.

MS. KERNS: I'm sorry to add complications, but the Board previously approved through an addendum to consider a maximum size of imports. The lobster FMP is very specific about what can and cannot be done through an amendment or an addendum. Addendums do not have a lot of flexibility in the fishery management plan, so imports would have to be adjusted through an amendment.

It is my recommendation that you decouple those two issues and do an addendum for the minimum size and an amendment for the maximum size. It may be that you may want to hold off on the maximum size amendment, to hear what the LCMTs come forward with in their shift. It may be that a recommendation that comes forward for that could be something that might need to be done through an amendment or not. We could separate those two

issues, but in order to address imports it has to be done through an amendment.

CHAIR McNAMEE: We passed the motion, I'm not clear on what we need to do at this point with regard to that.

MS. KERNS: I think we could, just clarifying it for the Board, Caitlin in her meeting summary will make sure it's very clear that those two issues have to be done through two different processes, and that it's just more direction to staff whether or not we need a scoping document for May, or if you want us to wait to see if any issues that come out of the action on the Board right now would be added to that document or not.

CHAIR McNAMEE: Go ahead, Pat.

MR. KELIHER: Instead of doing this on the fly, could we take time between now and the Policy Board for the states to figure out what is the best approach, and then resolve this at the Policy Board?

MS. KERNS: That works, Pat.

CHAIR McNAMEE: Okay, I saw nodding this way, everyone okay on the other side, nodding over there as well.

ADJOURNMENT

CHAIR McNAMEE: Great, I think that is it, so that completes the agenda, is there a motion to adjourn this Board? Yes, a couple people made it over there, is there a second, by Jeff. I'm going to assume there is no objections to that motion. Not seeing any around the table, we are adjourned.

(Whereupon the meeting adjourned at 3:00 p.m. on Tuesday, January 23, 2024)

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

Webinar

March 14, 2024

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

TABLE OF CONTENTS

Call to Order, Chair Robert E. Beal1

Approval of Agenda.....1

Public Comment1

Consider Approval of Draft Addendum XXX on the Mitchell Provision for Public Comment1

Adjournment 10

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Move to approve Draft Addendum XXX for public comment as modified today** (Page 9). Motion by Cheri Patterson; second by Jason McNamee. Motion passes by unanimous consent (Page 10).
3. **Move to adjourn** by consent (Page 10).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The American Lobster Management Board of the Atlantic States Marine Fisheries Commission convened via webinar; Thursday, March 14, 2024, and was called to order at 2:00 p.m. by Chair Robert E. Beal.

CALL TO ORDER

CHAIR ROBERT E. BEAL: This is Bob Beal from the Atlantic States Marine Fisheries Commission. I would like to call to order the meeting of the American Lobster Management Board. The Board Chair is Pat Keliher, as noted on the agenda, but Pat has been triple booked today with some legislative issues; so, he is not going to be able to make this call.

Currently there is not a Vice-Chair to the Board, so under the Commission guidelines, the Commission staff can step in and chair the board meeting in the absence of the Chair and Vice-Chair, so that is what I'll be doing today.

APPROVAL OF AGENDA

CHAIR BEAL: With that, it's a pretty straightforward agenda, and I think we can move through it fairly easily. Are there any additional changes or additions to the agenda, or anything else for the agenda?

All right, hearing none the agenda stands approved by Board consent.

PUBLIC COMMENT

CHAIR BEAL: Is there any public comment for items that are not on the agenda? Not seeing any hands for public comment.

CONSIDER APPROVAL OF DRAFT ADDENDUM XXX ON THE MITCHELL PROVISION FOR PUBLIC COMMENT

CHAIR BEAL: So, we'll go ahead and jump right into the meat of the agenda, which is considering Draft Addendum XXX for public comment. With that I'll ask Caitlin to run through a review of the Addendum and its contents, and then we'll have an opportunity for comments and questions, and then consider Board action. With that, Caitlin, take it away, please.

MS. CAITLIN STARKS: Thank you, Mr. Substitute Chair. I'm going to go through a quick presentation on Draft Addendum XXX, and this should say XXX, not XXVII, sorry; on the Foreign Import Minimum Size Recommendation. This was discussed at the last Board meeting, and the Board initiated this Addendum to clarify its intention regarding this issue.

The background on Addendum XXX relates back to the approval of Addendum XXVII, which established a series of management measures to protect the Gulf of Maine and Georges Bank spawning stock biomass. Measures are triggered by an observed decline in a combined recruit abundance index to a threshold, which was met in the fall of last year. Under Addendum XXVII and the implementation date that was set by the Board, this means the changes to the gauge and escape vent sizes in LCMA Areas 1, 3, and Outer Cape Cod will be initiated starting January 1st, 2025.

This schedule shows the changes in measures for Addendum XXVII, and the two yellow highlights are the increases in minimum size in 2025 and 2027 for LCMA 1. These two changes are relevant for this document, because they will be increasing the smallest minimum size for American lobster in the United States, and this change will have impacts to the size of live American lobster that will be allowed to be imported into the country. As we discussed at the January board meeting, the Magnuson-Stevens Act includes the Mitchell Provision, which prohibits the import and sale of lobsters smaller than the minimum possession size in effect under the Commission's FMP. This provision was intended to prevent smaller lobster than what the U.S. industry can catch from coming into the U.S. market.

Given that, the 2025 and 2027 changes in minimum size for LCMA 1 will also change the minimum size for lobster entering the U.S. under the Mitchell Provision. The purpose of Draft Addendum XXX is just a way to clarify the Commission's intentions regarding recommendations to NOAA Fisheries on how the gauge size changes in LCMA 1 would affect foreign import size restrictions under the Mitchell Provision.

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

The Draft Addendum clarifies that the Commission would recommend to NOAA Fisheries that when Addendum XXVII measures go into effect, imports from other countries would be restricted to the smallest LCMA minimum size in effect in any of the LCMA's which will be 3 and 5/16 of an inch in 2025, and then 3 and 3/8 of an inch in 2027.

This is consistent with the intent of the Mitchell Provision to limit live lobster imports into the U.S. to be no smaller than the smallest lobsters that can be legally landed by the U.S. industry. This is the timeline of development and next steps for Draft Addendum XXX. After the Board initiated the Addendum in January, the PDT developed the Addendum document, and that is what is in front of the Board today for consideration for public comment.

Then the next step would be to hold a public comment period, and then for the Board to review public comment, and consider the Addendum for final approval at its spring meeting. After that the Commission's recommendations would be forwarded to NOAA Fisheries. This is what the timeline would look like if we follow the typical process with a 30-Day comment period.

However, since the last Board meeting, we've had a request from NOAA to extend the comment period to 60 days. When I'm done with the presentation, I will go to Alli Murphy to speak to that. With that information, this is the Board action to be considered today, and that is whether there are any changes to the Draft Addendum needed, and then to consider approval of Draft Addendum XXX for public comment. That is the presentation, and I am happy to take questions.

CHAIR BEAL: Great, thanks, Caitlin. As you mentioned, you know we've heard from NOAA that there may be justification for longer than traditional public comment period. With that, Alli, I'll take the privilege and put you on the spot, if you want to comment on that. I know Chip Lynch is on, it appears Chip Lynch is on this webinar as well. I'll go to Alli, and then we'll go back to the Board for questions and comments. Alli, go ahead when you're ready.

MS. ALLISON MURPHY: Thanks, Mr. Chair. As this action would have the potential to effect imports, me and other folks at NOAA Fisheries have been in touch with officials at the Office of the U.S. Trade Representative. We've had a number of conversations over the last few weeks. They've educated me and other NOAA Fisheries folks about how best to comply with the World Trade Organization's technical barriers to trade agreement, as well as the U.S., Mexico Canada Agreement or USMCA. Under these international agreements, the United States needs to provide 60 days for other nations to comment on measures that could impact trade. This is done through a process at the World Trade Organization. As Caitlin kind of outlined, the typical process is for 30 days, and we wanted to ask the Board to consider a similar 60-day comment period on this action, to align those two comment period processes.

CHAIR BEAL: Alli, question for you. Will NOAA need more than 60 days in order to notify World Trade Organization and the other folks that you've been talking to, for them to reach out to the other nations, and then still after those communications happen, still have a 60-day comment period, or will a total of 60 days at ASMFC be enough?

Before you answer, you know having a longer public comment period for the Commission may be okay. In other words, if we do anything more than about 45 days, we're not going to be able to consider final approval of this document by the Board at the spring meeting. If we push this back to the August meeting, we do have a cushion of a fair amount of time.

If you feel that NOAA Fisheries interacting with the international trade groups will actually need more than 60 days to sort of complete all the communications and notifications of a public comment opportunity to the other nations. Do you have a perspective on 60 days or even a little bit longer?

MS. MURPHY: I think if the Board were willing to give us a little bit of additional wiggle room there, that would certainly be appreciated. But I don't think

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

we're asking for several additional weeks. I think a couple of days might be helpful.

CHAIR BEAL: Great, great, thank you that is valuable. Where we are, let's go back to questions to Caitlin regarding the content of the Addendum, and then if there are questions relative to this international trade question and public comment time, we'll tackle those next. Questions to Caitlin. I see Dan McKiernan and then Jason McNamee. Go ahead, Dan, please.

MR. DANIEL MCKIERNAN: Thank you, Bob. I guess my question may be for Attorney Chip Lynch. I'm wondering if we could craft the legal outcomes for the Board decision here. I guess I would describe within the lobster producing states, we would be enacting possession rules, so possession of undersized lobsters would be banned.

But from those states from Vermont to California that don't have lobster fisheries, I guess I'm looking for clarification about how those rules actually get enforced, and what this vote means. Just as a follow up, does NOAA have to complete its own rulemaking in order for this to become a final rule at the federal level?

CHAIR BEAL: Thanks, Dan. Caitlin or Alli, or potentially even Chip Lynch, would any of you like to answer Dan's question? Chip has his hand up, let me go to Chip, and then I'll come to you, Jason McNamee. Go ahead, Chip.

MR. CHIP LYNCH: Dan's question is good. The preliminary issue here is the vote going out to public comment, and that so he doesn't impact anything, particularly if there is 60 days of public commentary with some wiggle room, you know a week or so on either end. The other question as to what would potentially happen after the Board vote. Assume for the sake of argument that the Board approves Addendum XXX, we're in a little bit of a different place here from the typical lobster rulemaking. The typical lobster rulemaking historically has always been, for decades, have been under the Atlantic Coastal Act. We have here the so-called Mitchell Provision, which was an amendment

to the Sustainable Fisheries Act., which was an amendment which was a reauthorization of the Magnuson-Stevens Act.

All of this is under the Magnuson-Stevens Act, so the way in which the federal government would proceed to a rule is a little bit mirky and something that we're trying to, we're examining the congressional record from back in 1989 and '96 when these things were in place, to better decide that, to enact what kind of a rule we would need to enact. Dan, I don't have a hard and fast answer just yet, but I would like to think that we will very soon, and we would certainly be able to alert the Board at that time.

CHAIR BEAL: All right, great, thanks, Chip. There may be some follow up questions though, don't go far. Jason McNamee, go ahead, please.

DR. JASON McNAMEE: Kind of coming into this meeting a question of why status quo wasn't an option came up in some of the correspondence that I was having on this. Toni answered it, but I thought I would bring it up here, just to make sure the entire Board kind of heard the response to that. I'm just sort of offering the question of, you know we've got the one action proposed here, and there was just a question as to why status quo wasn't also an option. Just wondering if Caitlin or Toni could respond to that.

CHAIR BEAL: Toni, do you want to jump in?

MS. TONI KERNS: Sure. We tried to clarify that this was not your typical addendum process in the introduction of the document, just so that folks have that there. But this is more of a process type addendum versus a type of addendum that has different management options that we're taking forward to get people's opinions on. This is just transparency to make it very clear to the public that we are asking NOAA to implement the rules of the Mitchell Provision, so that is status quo. There isn't another alternative to provide, so that was the rationale there.

CHAIR BEAL: Cheri, you have your hand up, please.

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

MS. CHERI PATTERSON: I just wanted to get some clarification, maybe clean this document up for the public process. Under the public comment process and proposed timeline, the second to the last sentence, is the second increase January 1, 2025 or 2027? The document that I have says 2025.

MS. STARKS: Yes, I'm looking at it, Cheri, and I think you are right, but it should say 2027.

MS. PATTERSON: Okay. Then again, of course we've got some of these Addendum XXVIIIs that should be Addendum XXX in the document, is that right?

MS. STARKS: I'll take a look. Some of them are referring to Addendum XXVII, but I'll make sure that each one is correct.

MS. PATTERSON: Okay and one more. Under the introduction, again the second to the last sentence, that first paragraph. In front of Table 1 you have LCMA T-O. That T-O just doesn't make sense to me there. Should that just be taken out?

MS. STARKS: The last sentence in the introduction?

MS. PATTERSON: Yes, the first paragraph under introduction, the second to the last sentence in that first paragraph. I think you just meant to end it with LCMA and then type 1. That was it for what I saw, other than that the document looked fine. Thank you.

CHAIR BEAL: Thanks, Cheri, any other questions or comments on Draft Addendum XXX? Jason has his hand back up, go ahead, Jason.

DR. McNAMEE: Yes, just one other thing that came up, and I'm just throwing this out there so other folks can think about this as well. This may or may not interact with some of, so this is like imports, right from another country. But we have in Rhode Island, and I'm guessing some other states have this as well, because there are differing gauge sizes between states, or have been in the past.

We have a provision, and there are very few people that need it in Rhode Island, but we do issue like a

couple of permits that allow a business to have some undersized lobsters that are coming in from Maine, for instance. I just wanted to flag that this may not matter, like what we're doing today, but it came up.

I just wanted to kind of put that out there as something that we're looking at. I don't have anything. We're trying to sort out whether it matters or not in Rhode Island, and it will probably depend on, you know what happens with this when it is finalized. But that is it. I just wanted to flag that in case other folks need to think about that as well, so thanks, Mr. Chair.

CHAIR BEAL: Anyone else with questions or comments? Alli Murphy, go ahead.

MS. KERNS: Bob, can I just really quickly say to Jason. Since the minimum size in Maine will increase, that the allowance for the undersize lobster in your state would still be equal to that of the smallest minimum size within the United States, so it would still be that same size limit. It wouldn't behave any differently than the rules are now. I don't think it would have any sort of negative consequences, if that makes sense.

DR. McNAMEE: It does, thank you, Toni. I appreciate that.

CHAIR BEAL: Alli, do you still have a comment?

MS. MURPHY: I guess I'm chewing a little bit on Dr. McNamee's comments about this action not having a no-action alternative. I guess from a process standpoint, taking this out to public comment without options in the document seems. I mean I know there is a point to having public comment, but without having options in the document, what is the public supposed to comment on?

CHAIR BEAL: You know one of the options is that the public provides feedback and the Board did not want to move forward with final approval of the Draft Addendum, that almost defaults to a status quo option. However, as Toni has said, this is a very unique document in that it just really clarifying where the Board is on minimum sizes for imports, and it doesn't really create new policy.

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

You know it doesn't affect the ability for U.S. permit holders to harvest lobsters of any size. That has all been established through Addendum XXVII. This is just a clarification and an interpretation of the Mitchell Provision, relative to what has occurred in Addendum XXVII. Toni or Caitlin, do you have anything to add to that?

MS. KERNS: I guess, Bob, as I said before, this is status quo. There wouldn't be another alternative. The Mitchell Provision is as it stands, so we wouldn't have an alternative to provide, unless we were going to ask Congress to not enact the Mitchell Provision, which I think would be a very different document.

CHAIR BEAL: Chips hand just went up, and Alli yours is up, so maybe we'll go to Chip then I'll come back to you if you have a comment, Alli. Chip.

MR. LYNCH: Thank you for recognizing me. I have a question, and this really goes to the legal part of notice. I'm struggling a little bit here to understand what they are notifying. One of the aspects of the technical barriers the trade agreement is for the comment to be meaningful. If the interpretation was that this is just sort of giving notice of what has already been established in XXVII, then that would not necessarily be meaningful comment, because then that would suggest that the import question has been decided.

That is not what NOAA Fisheries memory is of XXVII. I thought XXVII was, as Bob mentioned, XXVII made it clear that U.S. harvesters were restricted to the newer size. That is final action. But the lowest size in the plan was still at 3 and 1/4, I think NOAA thought, and that Addendum XXX was to clarify that the 3 and 1/4 size would now apply to imports as well.

If Addendum XXX did not pass, then the Commission would, and I'm not saying what it is, I'm just telling you what NOAAs understanding is. If Addendum XXX did not pass, then the status of the plan would be U.S. harvesters restricted at 3 and 1/4, excuse me at the new lower size, or more restrictive size, but imports would be still allowed at 3 and 1/4, because

that was the nature of XXVII. It is important to understand the legal status here.

Because we have the potential for, the last time the U.S. went up on the gauge, there was an international dispute, and we want to make sure that things are transparent and clear and comment is meaningful. Obviously, I don't think anybody would prefer that result here as well. My question is, is NOAAs understanding, correct?

MS. KERNS: It was our understanding that the Mitchell Provision says that it is the minimum size in effect, and 3 and 1/4 is not in effect anywhere in the United States after January 1, 2025, so 3 and 1/4 is no longer an option for a size limit in the FMP that is in effect, so we couldn't bring that to the table. We were under the understanding that it wasn't clear in the previous addendum of what we would be recommending to NOAA.

In terms of the Mitchell Provision, and that we needed to make sure that the public understood that we would be making this recommendation, and that it would be best to put an addendum forward to let the public know, that this is indeed what we would be recommending to you all for the Mitchell Provision, because it is the smallest minimum size in effect in the United States.

CHAIR BEAL: Caitlin, did you have anything to add to that?

MS. STARKS: I was just essentially going to say what Toni said. In my presentation at the January meeting, we posed a question to the Board of how to interpret the Addendum, because we weren't clear on that. That is why the Board initiated this Addendum.

CHAIR BEAL: Chip, do you have any follow up, or are you okay with where we are?

MR. LYNCH: I'm just confused. The Mitchell Provision says the smallest size possession, it doesn't say the smallest size harvest. I think NOAAs memory for when Addendum XXVII was going out to public comment was that it was a decided point of going up

on the gauge for harvest, but to specifically not go up on the gauge in the Plan, because that would implicate and trigger the Mitchell Provision.

You can go up in harvesting and still not trigger the Mitchell Provision, so long as the lowest in the Plan is still at 3 and 1/4. I thought there were discussions had at that time, and that was the direction of the Board. It is what it is, but it seems very unclear, and it could create a dicey situation, where NOAA is being asked to provide and allow for 60 days of comment on something that has already been decided, and that is not our memory of what happened, I don't think.

CHAIR BEAL: Chip, you're saying, in order for these international conversations, or in order for, we'll call it Canada in this example, to have a meaningful comment, they have to have the opportunity to comment on a decision point, essentially is what you're saying, rather than just have it a default position.

MR. LYNCH: Correct. The decision point Canada wants to comment upon is whether or not the minimum size pertains to imports. It was not notified on Addendum XXVII, but that was again, NOAAs thinking was that was because Addendum XXVII was increasing the gauge for U.S. waters, and that it was specifically intended not to trigger the Mitchell Provision. Now that Addendum XXX wants the Mitchell Provision triggered, it would be appropriate to notify Canada at this point, because Canada can meaningfully potentially provide information that the Board would deliberate upon when trying to make the decision, as to whether or not this increase should pertain to imports as well.

CHAIR BEAL: Thanks, Chip, you are right. This is confusing, I think you said earlier. Addendum XXVII increased, or has a series of increases that are scheduled once a trigger is met. A trigger has been met and then all those increases take place. But Addendum XXVII, if I remember correctly, maintained the coastwide minimum of 3 and 1/4. Then we had a discrepancy between a coastwide minimum and the minimum size limit that would be

in effect in all of the lobster management areas, between 3 and 1/4 and 3 and 5/16.

I guess where I think we are, is this document is intending to clarify the difference between that 3 and 1/4 coastwide standard and the 3 and 5/16 that is in effect. I think that seems to be sort of the "decision point" here, is that clarification between the coastwide standard and what the minimum size limit will be on January 1, 2025. Does that help you out, Chip?

MR. LYNCH: We're getting there, Bob. You are brilliant at bringing everybody together and clarifying this. But I think you've hit the nub of the issue. I think it even said this in Draft Addendum XXX. The status quo is 3 and 1/4, as for in the Plan. Now all the areas have gone up beyond 3 and 1/4, but right now it is 3 and 1/4 in the Plan.

Addendum XXX would then also bring the 3 and 1/4 in the Plan up consistent with where it is in all the areas, specifically Area 1. That is the decision point. The point being that, and if I'm understanding you correctly. If you approve Addendum XXX as written, then the Mitchell Act is triggered, and there would be an increase restriction on imports. If you do not choose to do Addendum XXX, then you've got 3 and 5/16 of an inch in the areas, but still 3 and 1/4 is the lowest in the Plan which would allow imports.

That gets back to Jason's comment earlier about the no action or status quo alternative. Whether it is in the document or not, what I'm starting to hear and would agree with, is that if the Board chose not to do Addendum XXX, you would then have two minimum sizes in the Plan, the lowest for harvest, which would be 3 and 5/16, and the lowest for imports, which would be 3 and 1/4. If you approve Addendum XXX, then the lowest for imports would then increase, and that is what you would be receiving public comment on, whether or not to increase that.

CHAIR BEAL: That is helpful, Chip. As you said, I think we're getting there. I think we need to maybe have a staff quick conversation on our end. Is everyone okay with about a five-minute pause, just so we can sort this out, to make sure that we all know where

we're going and we can describe it clearly. We need to end up with a document that gives "meaningful opportunity for comment," from our international partners. If it is okay with everyone, we'll take about a five-minute break, and we will be right back, if that works.

(Whereupon a recess was taken.)

CHAIR BEAL: We are back. Sorry for the five-minute break taking about 15, my apologies. We were having some staff conversation, as well as some conversations with NOAA on how to interpret what is going on here. Where we've ended up is that the simple side of it is, if Addendum XXX passes, then the minimum size for imports will be 3 and 5/16, consistent with the minimum size that will be increasing in Area 1. If this document does not pass final vote at either the May or the August meeting, then there will be a lack of clarity on what the minimum size for imports is.

We'll have to get together with the Commission Board again, and NOAA, and sort out exactly how the Mitchell Provision will work, or be interpreted, and what the minimum size is in the fishery management plan, because there is a coastwide standard and there will be what the minimum size that is in effect, and those two will differ.

That seems to be where we are. Again, recapping. If Addendum XXX passes after public comment, then the minimum size is 3 and 5/16. If it doesn't, then we'll have to convene a meeting with NOAA Fisheries, ASMFC, and sort out exactly the interpretation of where we are. I figured that would bring at least one hand up, and Dan McKiernan, go ahead, please.

MR. MCKIERNAN: Bob, for purposes of clarity, would I make sense for this Addendum to state clearly that the Addendum III minimum size language is being replaced, or is no longer valid? Because the Addendum II language says the minimum size shall be no smaller than 3 and 1/4 inches, no lower than 3 and 1/4 inches. Does it make sense for this document to point back to that Addendum III to nullify that?

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

CHAIR BEAL: Is that Addendum III or Amendment 3, Dan?

MS. KERNS: Amendment 3, Dan.

MR. MCKIERNAN: Amendment 3, you are right.

CHAIR BEAL: Yes, I think the difficulty there is we have to do an amendment to modify that is the problem we have. That may be part of the follow up conversation, if this document were not to pass. Are there any other questions on where we've landed? I know it is complicated and nuanced. I think the best thing to do potentially, or you guys' judge what is best, you're the Board.

One of the options moving forward is, take this document out for public comment, see what happens. See what we get from Canada and any other international partners that care to comment, and get back together after a longer than usual public comment period, and discuss our next steps as a Board. Are folks willing to go down that path? I don't see any hands, so I'm not sure what to make of that. Dan, thank you for raising your hand.

MR. MCKIERNAN: Yes, I would be willing to go along with that suggestion, Bob.

CHAIR BEAL: Thanks, Dan, I have Megan and then Jason McNamee. Megan, go ahead.

MS. MEGAN WARE: Just confirming that I am also willing to go along with that suggestion. I guess maybe a question to you, Bob, just to clarify. If this Addendum is not passed, my understanding is that there is no clarity in the Commission's recommendation to NOAA on how to implement the gauge size increase in Area 1. Is that a fair assessment?

CHAIR BEAL: I think the gauge size increase for Area 1 will be, to me that is clear. That goes up to 3 and 5/16 on the first of January, 2025. But what happens with imports from Canada at the same time is where the lack of clarify is, if this does not pass.

MS. WARE: Yes, okay, thank you, I agree.

CHAIR BEAL: Does that work, okay. I have Jason and then Cheri. Jason, go ahead, please.

DR. McNAMEE: Just a quick supporting your suggestion, Bob, so I'm onboard.

MS. PATTERSON: Bob, I don't know if you're muted but I'm going up next. Yes, New Hampshire supports this moving forward, thank you.

CHAIR BEAL: Thanks, Cheri. Where we are is, I saw a couple more hands. I think we should have a formal motion by the Board. If anyone is willing to do that, I think Caitlin may have one drafted. But let me go to John Maniscalco, and then I think I saw Ray Kane's hand. But John, I know yours is up, so go ahead, please.

MR. JOHN MANISCALCO: Just a little confusing. Have we made it clear what the negative would be if we don't move forward in this way? I haven't heard a distinct negative, so I would like a little clarification on that, thank you.

CHAIR BEAL: John, are you asking what is a negative if we don't approve this for public comment, and see what the public has to say?

MR. MANISCALCO: Really what is the negative associated with moving forward and gathering public comment on this? Has this been raised?

CHAIR BEAL: I'm just a Board Chair here, it is up to you, guys. But I don't see a downside to taking it out and hearing what the public has to say, including Canada during that time period, and then decide. You know should this be approved or do we need to go back to the drawing board, so to speak.

MS. STARKS: I may have a kind of answer to John's question.

MR. MANISCALCO: I would appreciate that from you, Caitlin, or any of the other Board members, thank you.

MS. STARKS: If I can speak to that, Mr. Chair.

CHAIR BEAL: Yes, please.

MS. STARKS: I believe at the last Board meeting what I heard was that there is an interest from the Board in clarifying that it is their intention to recommend that imports from other countries be restricted to the smallest LCMA minimum size in effect. That is why this Addendum was initiated. If you don't approve this Addendum, then the Commission wouldn't be making that recommendation, and so we wouldn't be putting forward to NOAA what the Commission's intent and desire is. I guess that is kind of how I understood it.

CHAIR BEAL: Great, that is helpful, Caitlin. John, do you have a follow up to that?

MR. MANISCALCO: Yes, again, I guess I am wondering what negative there is to moving forward with putting this out to public comment. Is there something I'm missing, some hidden negative that if we put this out to public comment, we could trigger something? We need the international response, so why not move forward? Has something been said, or is someone else thinking of a negative that hasn't been mentioned, because I haven't heard one?

CHAIR BEAL: Thanks, John, I have not heard of one either. Ray Kane.

MR. RAYMOND W. KANE: I would like to thank Chip and Alli for being on this call, so I have a comment and a question. My comment is I would support this to go out to the public to hear back from international concern, but in layman's terms, I'm going to have to go out and explain this to the harvesters.

Once this kicks in January 1, the harvesters, their possession size will be 3 and 5/16, yet corporate America will be able to import products from other nations under that size, which would be detrimental to our harvesters. As a layman, I think that is the best way to acknowledge and to get this across to harvesters. My question is, will this have to go before Congress, being how we're talking about the Mitchell Bill, and if so, will ASMFC, you know will Alex

put together a group to go talk to our Congressional people?

CHAIR BEAL: I may ask Chip to answer that question on Congressional involvement. Go ahead, Chip.

MR. LYNCH: I can't really answer that. I mean if Addendum XXX passes, then Ray's hypothetical here kind of goes away. If it doesn't pass, there are just so many variables it's hard to answer. It's just hard to answer. Ultimately what ASMFC wants to do would really be up to you all what you wanted to do. NOAA can't advise you to lobby Congress.

It just seems as though there are so many permutations here in the variables that while I think it's good to have forethought, and to really think about things, where things are moving in the future. What I'm hearing around the Board is almost a consensus to move this out to public comment, and at least at that stage that seems to be somewhat of a no brainer. Depending on what is heard thereafter, some of your decision points may become more obvious to you all.

CHAIR BEAL: Another way to look at it. If the size is increased to 3 and 5/16 for imports through this Addendum, and then subsequent action by NOAA, there is no need for Congressional action to change the import size. But if Congress wanted to get involved and do something different, then obviously they have every ability to do that. There is no obligation for Congressional action to increase the import size if that is what comes out of the Commission and NOAAs processes. Chip, do you still have your hand up, or is that from before?

MR. KANE: Thank you for that, Bob and thank you for that, Chip. I was thinking ahead here. I can go out in layman's terms and explain it to the harvesters, as such, 3 and 5/16, and hopefully the international size will be raised in Addendum XXX, because NOAA and both ASMFC agreed to it.

CHAIR BEAL: Yes, that sound good. Caitlin, do you mind **putting up the draft motion that you have, and then I'll ask for someone to raise their hand if they are willing to make that motion. I think you**

probably want to add, as modified today, since Cheri had a couple of fixes that she suggested that were good. Is anyone willing to make the motion? I see Cheri's hand is raised to make the motion. Is that correct, Cheri?

MS. PATTERSON: Yes, Sir.

CHAIR BEAL: Thank you, is there a second? We've got a few. I saw Jason McNamee first, so Dr. McNamee seconds the motion. Cheri or Jason, would you like to provide any additional comment justifying approving this for public comment?

MS. PATTERSON: No, I think we have discussed it for all the justification that we need to move this forward and increase the length as needed under national and international rules.

DR. McNAMEE: Nothing additional for me either, Bob.

CHAIR BEAL: Great, thank you. Let me try something with this. Are there any other comments on the motion from the Board members, sorry. Not seeing any hands. Not hearing any comments and you know I feel we've talked about this for a bit now. I'll try this. **Is there any opposition to approving Addendum XXX for public comment as modified today, please raise your hand.**

Seeing no hands; are there any abstentions for the motion on the board? Seeing no abstentions; any null votes? No null votes, so the motion that is on the board passes by unanimous consent. That brings us to the end of our agenda. I guess the other remaining question is public comment period time. Is everyone okay, and I think we are, based on the comments that have gone around the Board saying we want to hear from our international partners here.

Everyone is okay on extending the public comment period to 60 or 70 days to accommodate NOAAs notification, et cetera. Is there anyone who wants to comment on that or anyone has concern with extending that? What that would mean ultimately is this would come back before the management board

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

at the August meeting rather than the spring meeting, which is April/May.

Please, raise your hand if you have any concerns with that timeline moving forward. I see no hands, so I think we are all set here.

ADJOURNMENT

CHAIR BEAL: That brings us to Other Business. Is there anything else anyone wants to discuss relative to the American lobster fishery? I see no hands. We are a few minutes past three o'clock, and I thank you all for your time, and appreciate everyone's willingness to work through this somewhat complicated and nuanced issue. We will see what we get from the public, and we will be back in touch at the August meeting. Thank you all for your time, and the Board is adjourned.

(Whereupon the meeting adjourned at 3:03 p.m. on March 14, 2024)



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfmc.org

MEMORANDUM

TO: American Lobster Management Board
FROM: American Lobster Technical Committee
DATE: April 16, 2024
SUBJECT: Technical Report on Lobster Resource and Fishery Effort on the Northern Edge

The Atlantic States Marine Fisheries Commission’s Lobster Technical Committee (TC) was tasked by the American Lobster Management Board (Board) at the Commission’s 2024 Winter Meeting to compile information on the lobster resource and fishery in and around the Northern Edge of Georges Bank. This task is in response to a potential action at the New England Fishery Management Council (NEFMC) that is considering allowing scallop fishery access on the Northern Edge of Georges Bank to a currently closed Habitat Management Area (Figure 1). The Board requested information that could help characterize potential impacts on the lobster population and fishery in the area. The Board was specifically interested in information describing the presence and abundance of lobsters, including ovigerous females, on a seasonal basis, as well as seasonal fishery effort in the area. The TC met via webinar two times following the Winter Meeting to discuss and develop the report.

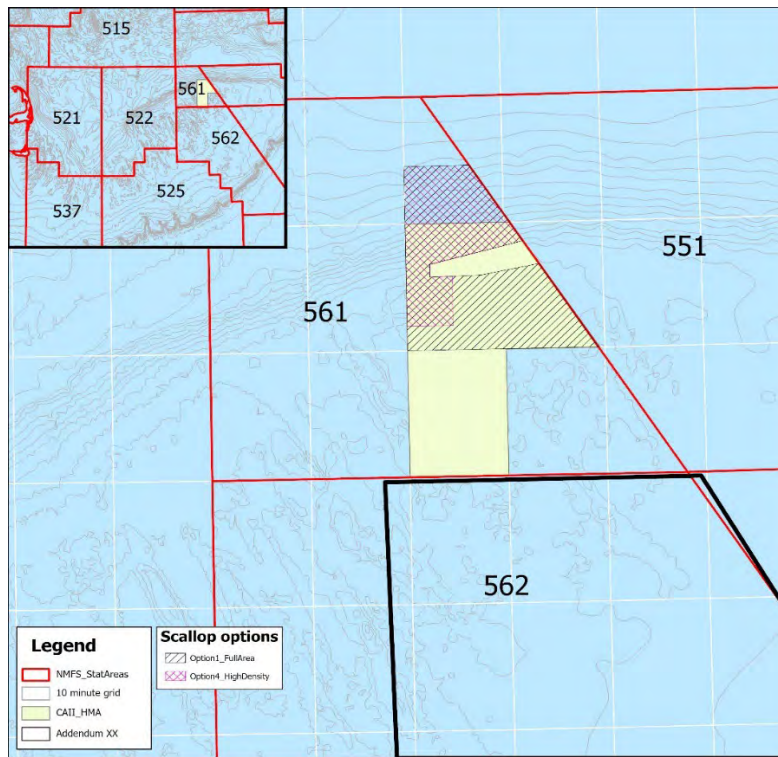


Figure 1. The Habitat Management Area on the northern edge of George’s Bank, along with the portion of Closed Area II affected by the Addendum XX trap gear removal agreement (black outline). Two of the four scallop access options under consideration are shown. Inset: Large scale view of Georges Bank, surrounding NMFS Statistical Areas, and the Habitat Management Area (HMA).

Data Used in the Analysis

The TC explored a number of sources for data within and near the Habitat Management Area (HMA) on the northern edge of the Bank. Note that data specifically within the HMA are relatively limited. The various data sources and how the data were used in this report are described below.

Northeast Fishery Science Center (NEFSC) Trawl Survey

The Northeast Fishery Science Center conducts an annual bottom trawl survey in the spring and fall throughout the Gulf of Maine, Georges Bank, and the Mid-Atlantic Bight and has recorded survey catch data on lobsters since the late 1960’s, including size, sex, and egg-bearing status. This region of Georges Bank receives limited but consistent survey effort. Between 2000 and 2023, this survey completed 60 tows in the deep area off the bank and 122 tows on the bank in NMFS Statistical Area 561, approximately evenly split between the Spring and Fall surveys. We used these data to characterize the spatial distribution and seasonal shifts of the lobster resource.

Coonamessett Farm Foundation (CFF)

The Coonamessett Farm Foundation (CFF) has conducted Seasonal Scallop Surveys on Georges Bank intermittently between 2012 and 2023, using both standard and experimental scallop dredges (Table 1). Specific sample locations, timing and frequency of sampling, and gear designs have varied somewhat over the years in response to specific management concerns raised. Tows did not occur within the HMA, but work was focused on and around the northeastern portion of the Bank. CFF staff collected biological data on all lobsters caught during the survey, including sex, size, shell hardness, egg-bearing status, and damage associated with capture. Available data can be used to describe the seasonality of lobster catch on the Bank in the scallop gear in those years with sufficient sampling. Data can also be used to describe the catch characteristics (size, sex ratio, etc.) and damage to lobsters caught in scallop dredge gear. It is important to note that selectivity of scallop gear for lobsters is unknown.

Table 1. Number of tows conducted each month and year by the CFF scallop survey from 2012-2023.

	Annual tows											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan		92	182		122		98	98				98
Feb		58					98	22	78			98
Mar		150	182					76			100	
Apr		92					98	98				98
May		90									100	
Jun		182					98	96	78			98
Jul		156										
Aug		26		248		84	96	78	76	100	90	
Sep		182				94	90					
Oct		152		122		94	78	72			84	
Nov	152	30		122						80		
Dec	150	182				98	98	68				

Commercial Fisheries Research Foundation (CFRF)

The Commercial Fisheries Research Foundation’s (CFRF) Lobster Research Fleet provides demographic data (sex ratio, size structure, reproductive characteristics) on the lobster catch in traps (commercial and ventless) within the proposed scallop area options. These data are not necessarily representative of overall fishing effort within the areas and should only be interpreted for demographic data in the areas sampled. There were 4,881 lobsters sampled within the areas from September 2013 through March 2023. Only ten of these lobsters were sampled with ventless traps and were excluded from the data set while the remaining lobsters were sampled with commercial traps. Therefore, demographic data are further constrained by gear selectivity of the commercial traps. All lobsters sampled by the CFRF Lobster Research Fleet were sampled

from the northern and eastern overlapping portions of the option 1 (Full), 2 (North), and 4 (High Density) areas. Data were all from a single vessel and, therefore, spatial coordinates are confidential and cannot be shown on a map. No lobsters were sampled from the option 3 (South) area.

Federal Observer Data

Federal fishery observers from NOAA's Northeast Observer Program (NEFOP) record detailed data on vessel fishing activities, gear configurations, and catch. NEFOP observer coverage is generally sparse for the lobster fishery as there is no federal mandate to monitor the lobster fishery. However, due to an interest in finfish bycatch, there was some enhanced coverage from 2013-2015 that can be informative for this work. NEFOP observer coverage from 2013-2015 in Stat Area 561 included precise spatial information on 598 observed hauls, sampling 24,016 lobsters. We used these data for validating spatial patterns observed in the Vessel Trip Reports and characterizing the sex ratios, length compositions, and presence of egg-bearing females.

Harvester Logbook Program

To characterize the spatial distribution of ovigerous lobsters on Georges Bank, AOLA and NHF&G collaboratively developed an industry logbook to collect standardized data from the participating industry members as reported in Henninger and Carloni (2016). The logbook data fields included: date, location, fishing depth, number of traps hauled, total lobsters hauled, and total ovigerous lobsters hauled. Catch information from 2015 was reported from Statistical Areas 464, 465, 512, 561, 562, 522, and 525, representing 16 vessels across three States (New Hampshire, Massachusetts, and Rhode Island). Data were used to calculate the proportion of catch from each trawl that were ovigerous and plotted via ArcView GIS to visualize the spatial distribution.

AOLA Tagging Study

A collaborative grant between AOLA, NH Fish and Game, and Maine Department of Marine Resources was conducted from 2015-2020. A total of 17,704 lobsters were tagged by four organizations: Coonamessett Farm Foundation (CFF, n = 920), Maine Department of Marine Resources (ME DMR, n = 5,377), and MRAG Americas (MRAG, n = 11,407). Tagging took place in both inshore and offshore portions of Lobster Management Area 1 (LMA 1), as well as Lobster Management Area 3 (LMA 3), which included Georges Bank. Here, we present a subset of those data to evaluate movement throughout the area of interest on the northeastern portion of Georges Bank (Rzeszowski in prep.).

Federal Vessel Trip Reports (VTRs)

Until recently, federally-permitted lobster vessels were not required to submit vessel trip reports unless the vessel carried permits for other species that required trip reporting, as is common for vessels lobstering on Georges Bank. Vessel trip reports include information on date and location of fishing effort, reported with a single set of latitude/longitude coordinates, fishing effort, and landings. From querying the CAMS landings database, which accounts for missing trip reports with dealer reports, we determined that virtually all trips in this region since 2013 were represented in federal VTR's. Thus, we consider these data to have effectively captured the effort and landings for the region of interest. We use these data for reporting on the spatial distribution and seasonality of fishing effort and landings in the area of interest and adjacent habitats.

Results: The Lobster Resource in the Northern Edge Area

Relative Abundance, Seasonality, and Spatial Distribution

Catch in the NEFSC spring trawl survey indicates there is relatively higher abundance off the Bank than on, averaging nine lobsters per tow off the bank and three lobsters on the bank. In contrast, the fall survey shows higher abundance on the Bank than off with averages of two lobster per tow off the bank and eleven lobsters on the bank. Tows inside the proposed access areas consistently catch lobsters but in relatively small to moderate numbers (Figure 2). The largest recorded catch in the area, for a single tow, was 303

lobsters, recorded in the Fall of 2022, on the bank, inside the HMA and south of the Full Access area (Figure 2, bottom panel).

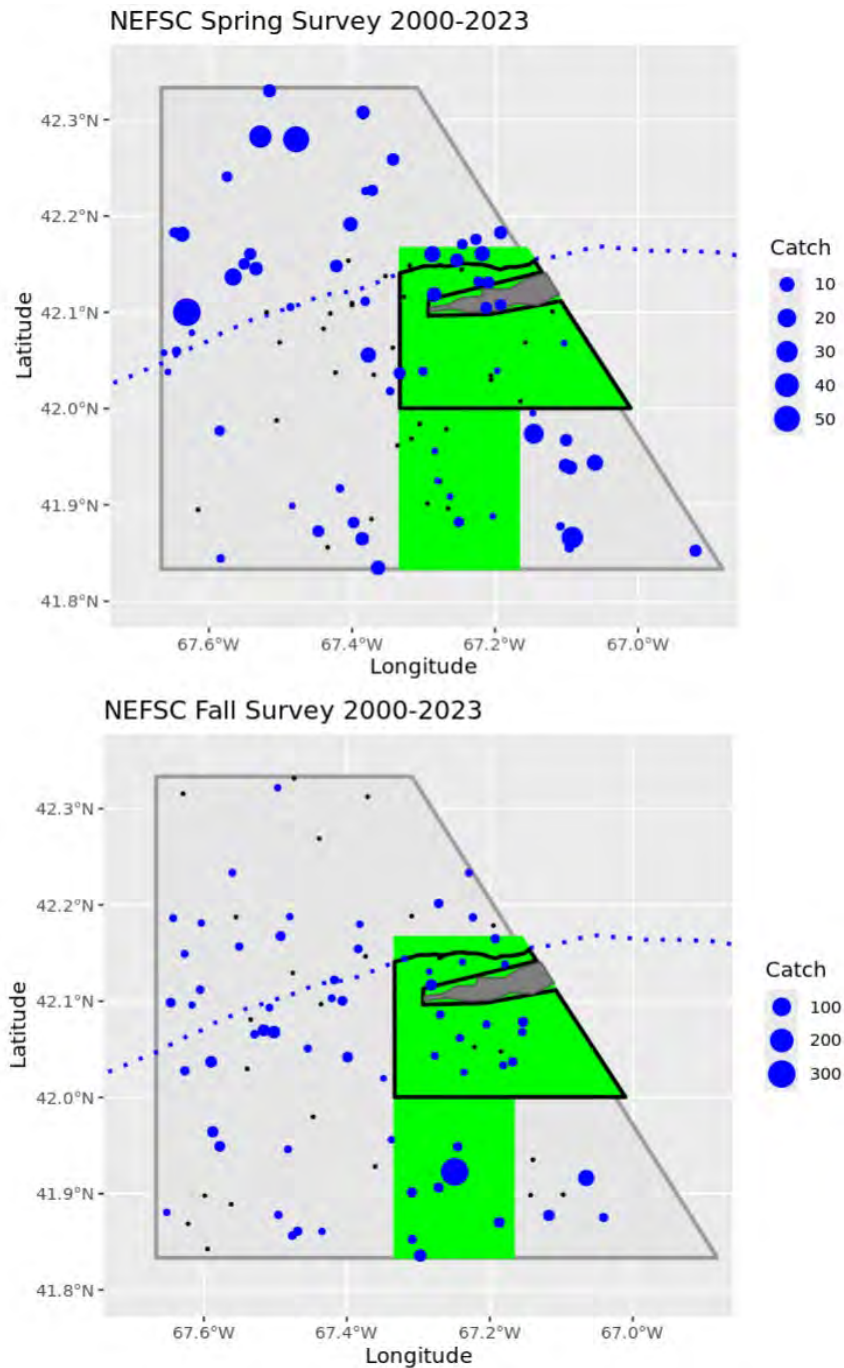


Figure 2. Locations and catch from NEFSC Spring (top) and Fall (bottom) trawl surveys in NMFS Area 561 from 2000-2023. Green shaded area is the HMA, and black outline within it is the Full Access scallop option under consideration by the NEFMC, cropped to the NEFSC scallop strata. The dashed blue line represents the northern-most boundary of the NMFS sea scallop survey strata, near the 100 m depth contour. Catch prior to 2008 are converted to Bigelow units.

The CFF scallop survey tows occurred both on George’s Bank and off the edge into deeper surrounding waters over the course of the survey. To examine seasonality as well as the size and sex of lobsters from this data set, we focused on a time period during which the tows were all on top of the Bank and occurred during a mostly consecutive time period from August of 2017 through the end of 2019 (see Table 1). These data show a consistent seasonal pattern in the catch of lobsters on the Bank in the scallop gear. Catch was low during winter and spring, increased slightly in June, and was highest from August through October before dropping back to low levels in December (Figure 3).

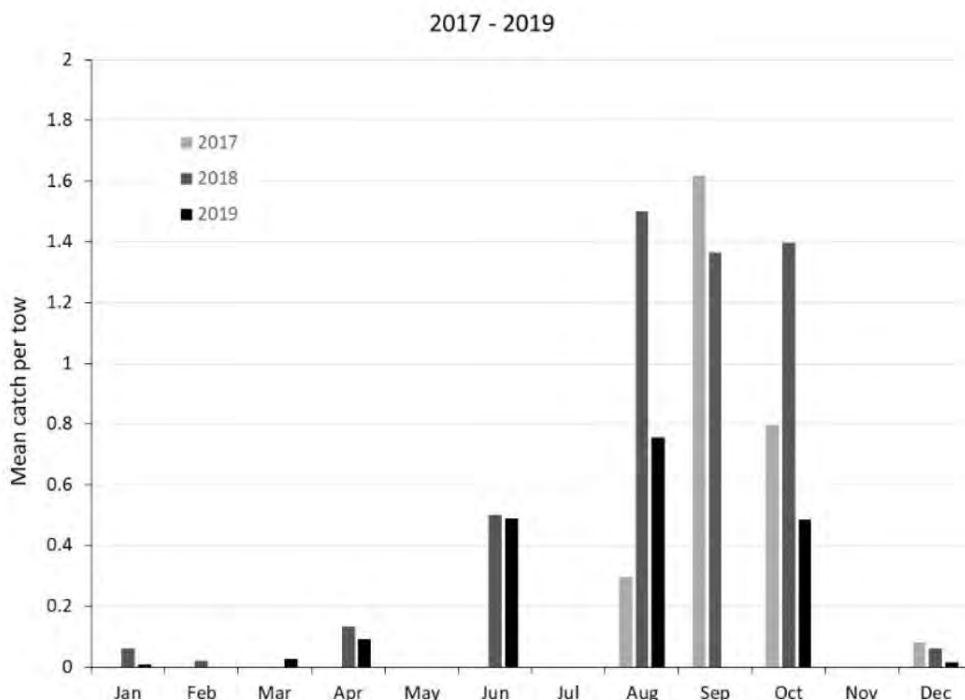


Figure 3. Mean catch of lobsters per tow in the CFF bycatch survey from August 2017 through December 2019.

Sex and Size Composition

The sex ratio of catches in the NEFSC bottom trawl surveys is consistently female-skewed (Figure 4). Catch averages 62% female On-Bank in the spring, but is otherwise typically 80% female or higher for spring Off-Bank and fall On- or Off-Bank. Large females, 95 – 135mm CL, are particularly abundant On- Bank in the Fall.

From 2017-2019 the CFF scallop survey observed 865 lobsters on the Bank, ranging in size from 36 mm CL to 216 mm CL. Most of these lobsters were caught during the late summer to fall months (Figure 3). The catch was predominantly female (91%), and 93% of the lobsters were larger than 100 mm CL (Figure 5). Fifty-seven percent of the females were egg-bearing.

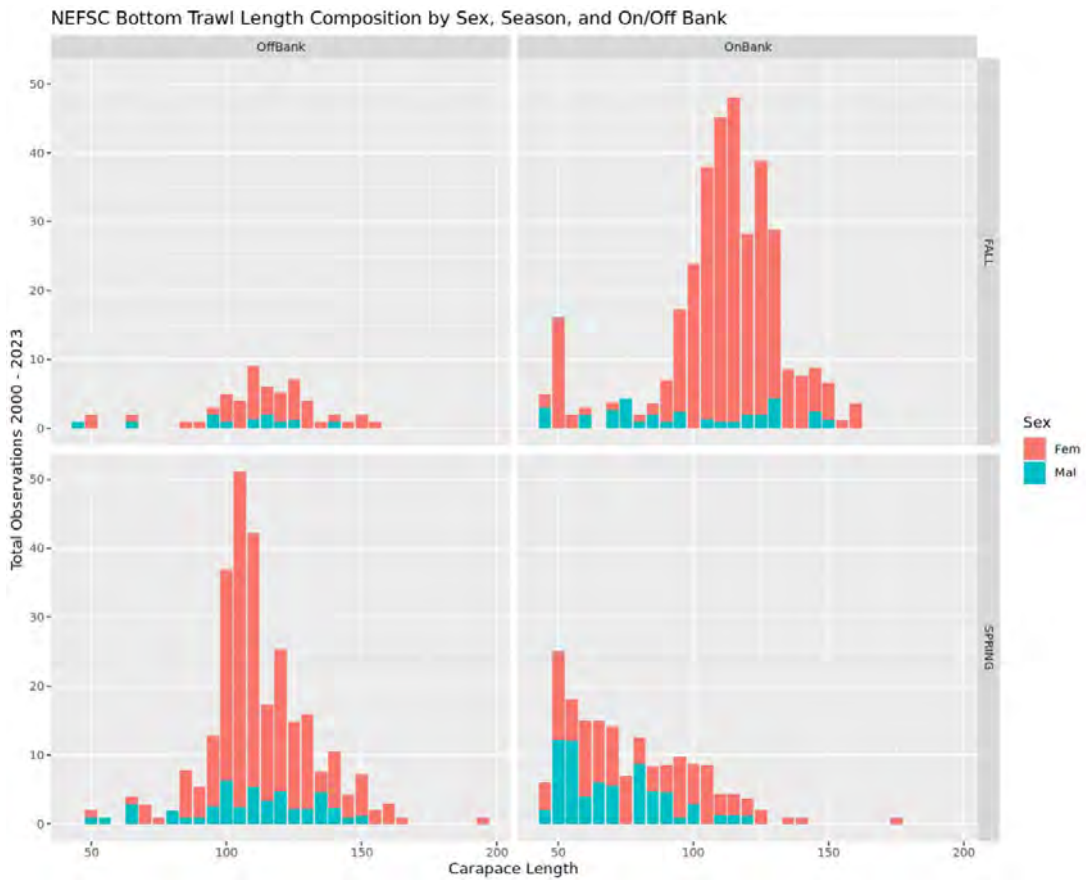


Figure 4. Catch composition in the NEFSC bottom trawl by sex, season, and On/Off Bank.

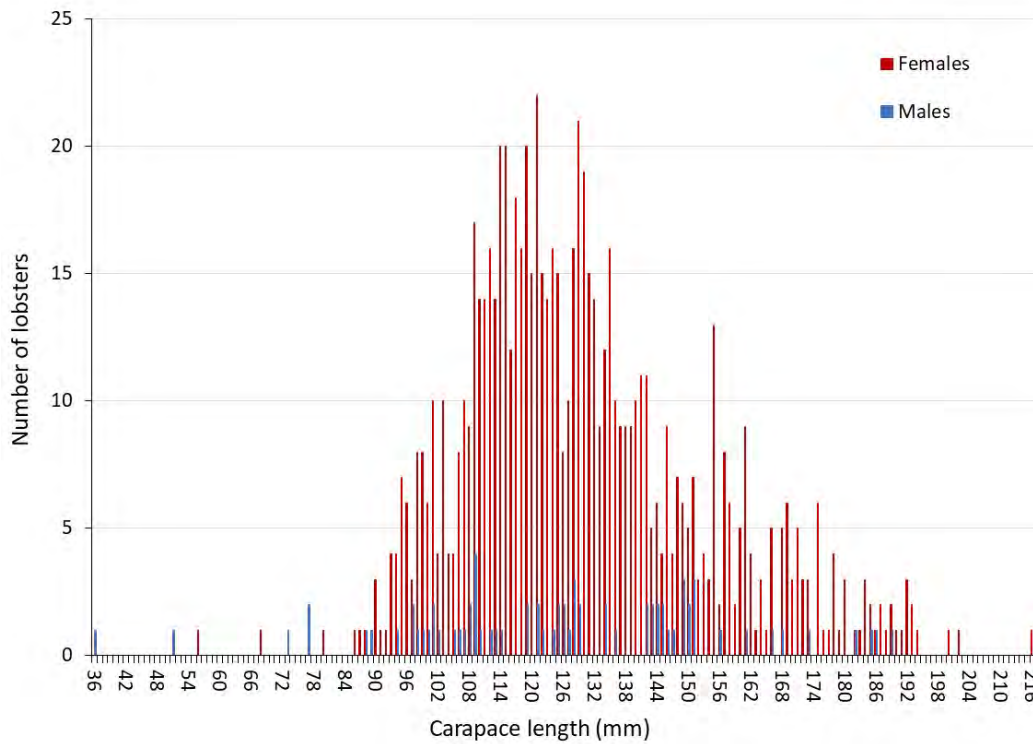


Figure 5. Size distribution of males and females from the CFF bycatch survey, 2017-2019.

Sex ratios from the CFRF fleet data show female-skewed catch within the scallop access areas throughout the year with an increasingly female dominated catch in the spring and summer months (quarters 2 and 3; Figure 6). Length compositions of females are relatively stable throughout the year with peaks in or around the 103mm CL bin (103-107mm CL; Figure 7). Length compositions of males shift from larger sizes in the fall and winter months to slightly smaller size structures in the spring and summer months. The prevalence of egg-bearing females increases with size and is highest across well-sampled sizes in quarter 1, lowest in quarter 2, and similar at intermediate levels during quarters 3 and 4 (Figure 8). The prevalence of females with v-notches also increases with size and is similar throughout the year.

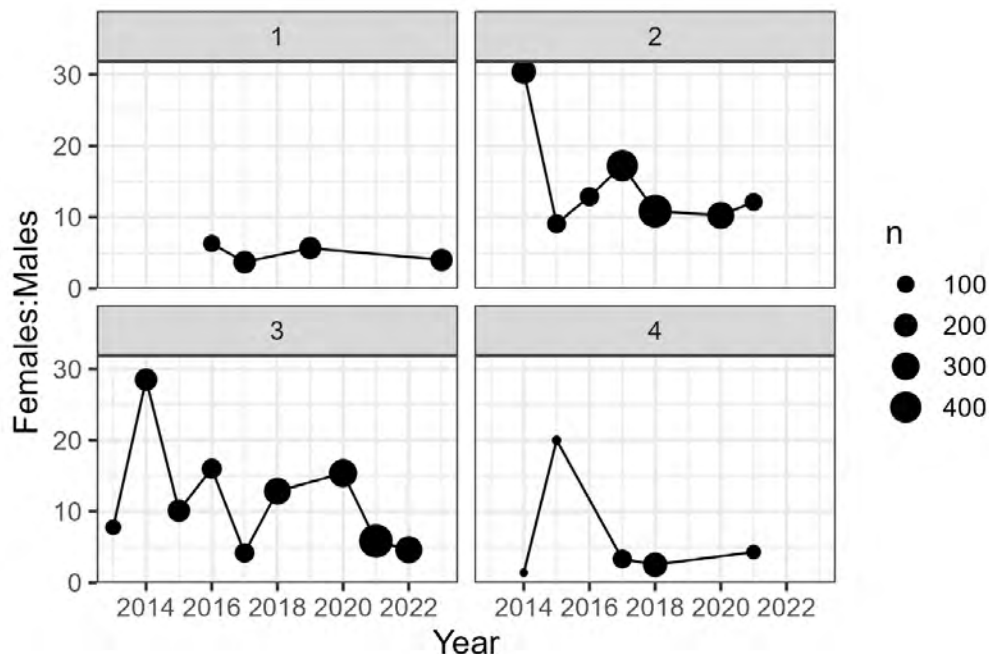


Figure 6. Quarterly (seasonal) ratios of female to male lobsters sampled by the CFRF Lobster Research Fleet. The size of the point is scaled to the number of lobsters sampled. 1 = January – March, 2 = April – June, 3 = July – September, 4 = October – December.

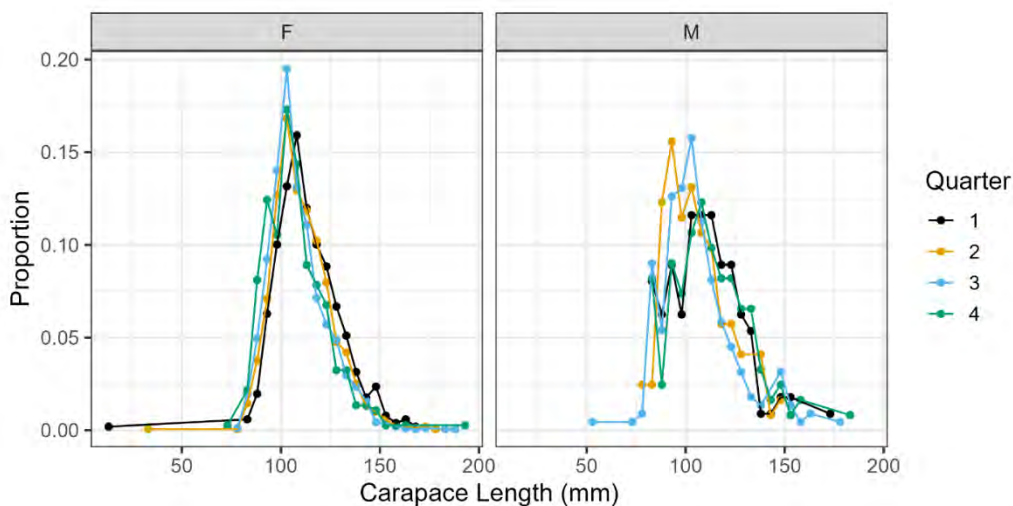


Figure 7. Quarterly length compositions of female and male lobsters sampled by the CFRF Lobster Research Fleet.

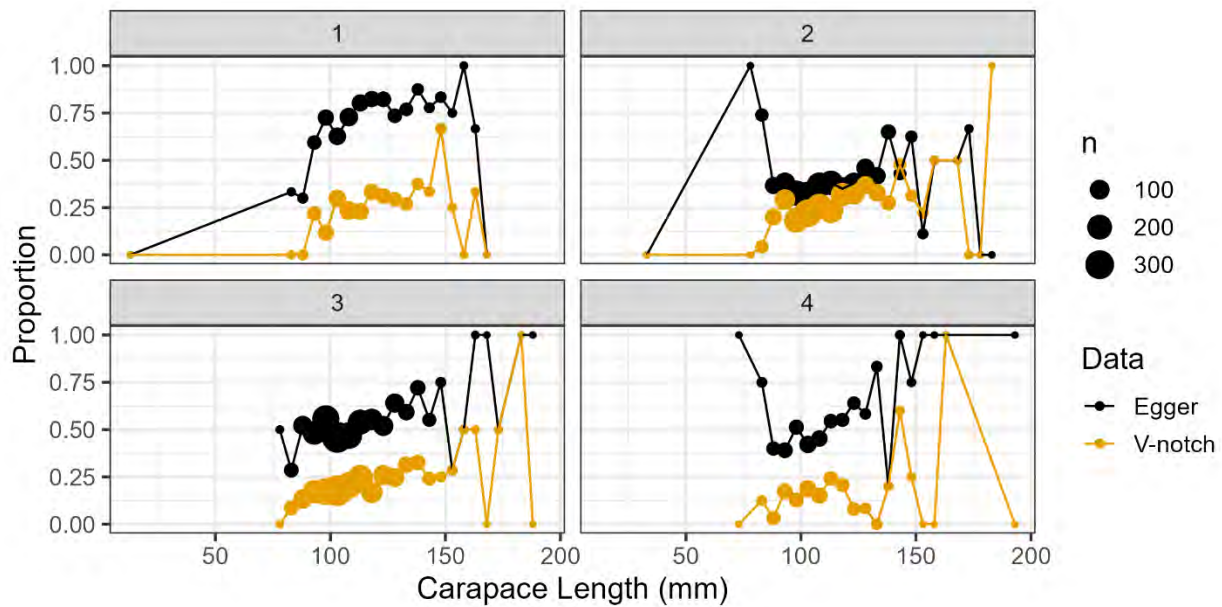


Figure 8. Quarterly proportions of female lobsters sampled by the CFRF Lobster Research Fleet bearing eggs or v-notched. The size of the point is scaled to the number of lobsters sampled.

Most of the available NEFOP observer data were from locations off the Bank; 70% of observed hauls and 78% of sampled lobsters occurred Off Bank. The observed catch was consistently female-dominated (88% of catch) with 34% of females bearing eggs (Figure 9). Modal size compositions for most months are between 100 and 110mm CL.

Distribution of Ovigerous Females

The offshore lobster fleet Harvester Logbook program documented 13,047 trap hauls. Logbooks reported lobster catch activity from Statistical Areas (SA) 464, 465, 512, 561, 562, 522, and 525. A total of 48,342 lobsters were counted, of which 19,051 were ovigerous females. The proportion of ovigerous lobsters per trap trawl is depicted in Figure 10. In general, the proportion of catch comprised of ovigerous lobsters was high on top of the eastern portions of Georges Bank (SA 561 and 562). Lower catch rates were observed on western Georges Bank (SA 522 and 525), as well as areas north of Georges Bank in SA 464 and 465.

NEFOP Seasonal Catch Length Compositions

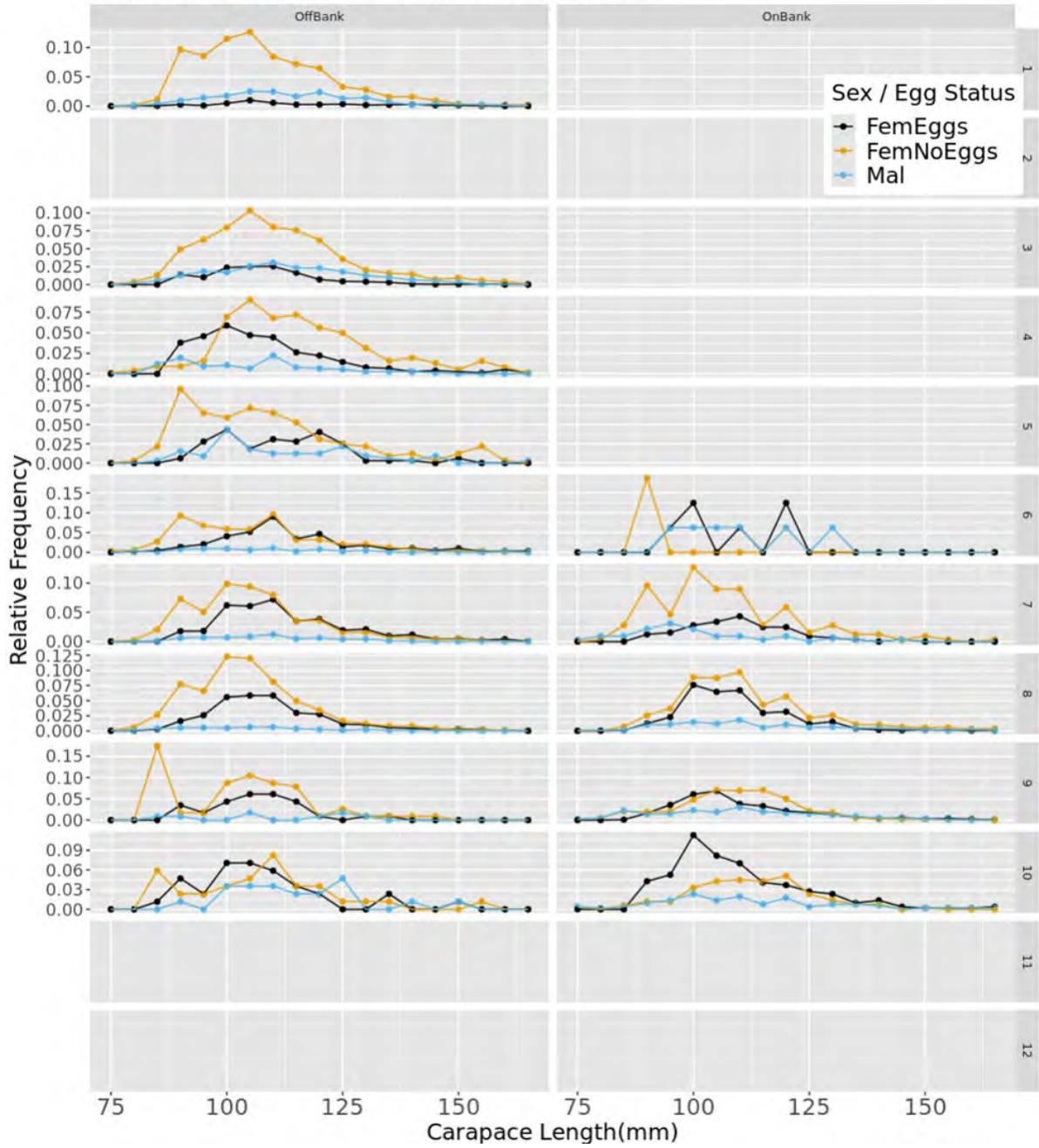


Figure 9. Monthly length compositions by sex and egg-bearing status On and Off Bank from NEFOP observer data.

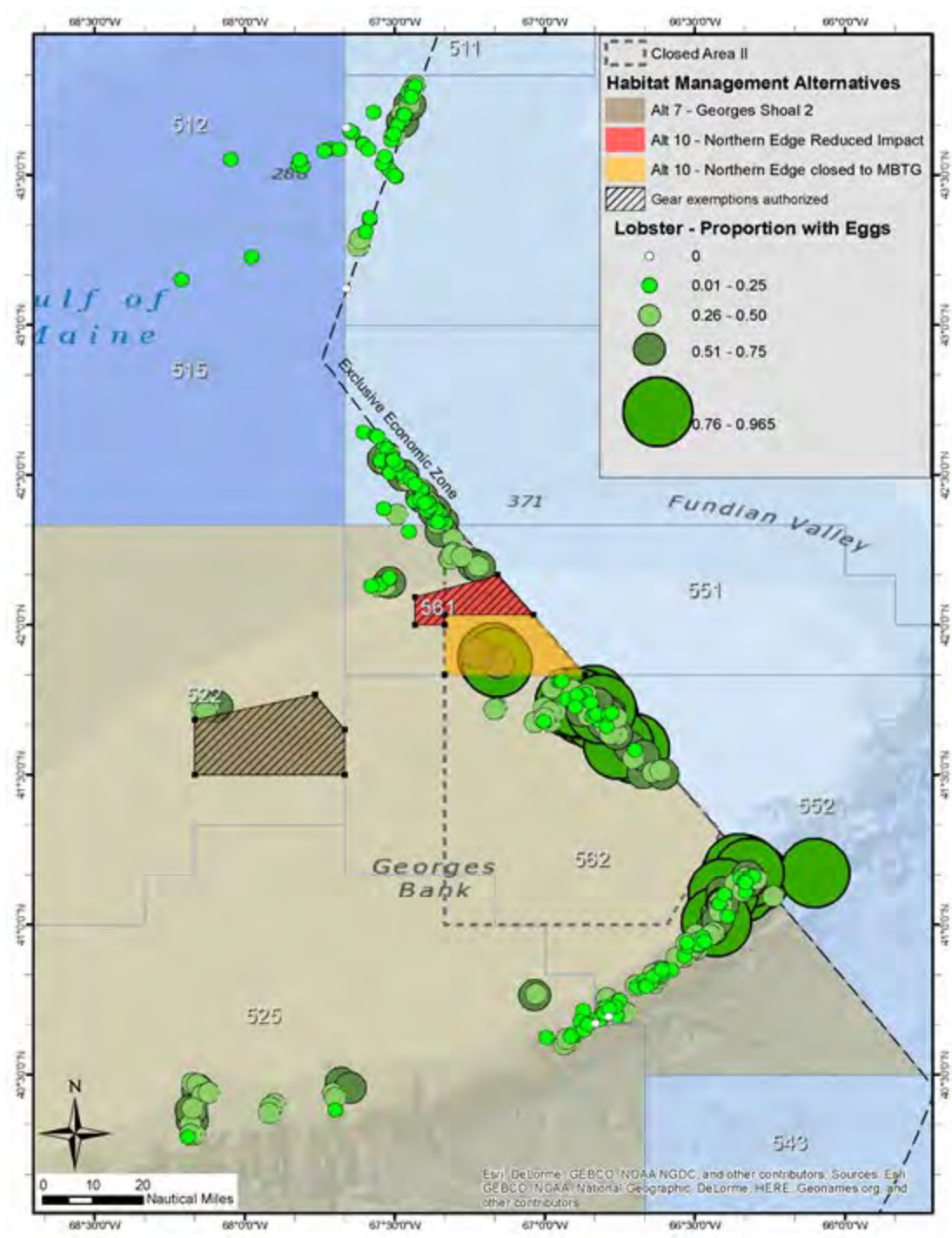


Figure 10. Distribution of ovigerous lobsters reported via industry supported logbooks, 2015. Each bubble represents the proportion of lobsters that were ovigerous from each randomly selected trawl. Plot taken from Henninger & Carloni 2016 to give general idea of spatial distribution of egg bearing lobsters throughout Georges Bank. Note, Habitat Management Alternatives are from past proposals and do not line up with most recent scallop management option.

Movement Patterns

We used release and recapture data from the AOLA tagging project to assess the potential movement of lobsters on/around the Northern Edge of Georges Bank under different management scenarios. We grouped release and recapture data for each individual lobster by the season of release to consider the seasonality of movement. Movement around Georges Bank and the area of interest is most prevalent during quarters 2 through 4, with low levels of movement in quarter 1 (Figure 11).

There are some important caveats to consider when assessing movement with passive tagging:

- 1) There is an industry agreement in portions of this area which doesn't allow for lobster trap fishing annually from November 1 through June 15, and thus recaptures during this closure would be low due to the lack of effort.
- 2) Passive tagging data are inherently biased due to spatial and temporal changes in fishing pressure. Low effort within this area in the winter months does not mean the area is devoid of lobsters, or that lobsters are not moving through the area. These methods rely on recaptures from the commercial fleet, and if effort is low recapture rates will also be low.;
- 3) These plots are only representative of commercial discard lobsters that were tagged and subsequently recaptured.
- 4) All movements are assumed straight lines from release to recapture location. While this method can give us some information as to the movement of lobsters in the area of interest, standardized surveys which are independent of commercial effort are a better method to determine seasonal use.

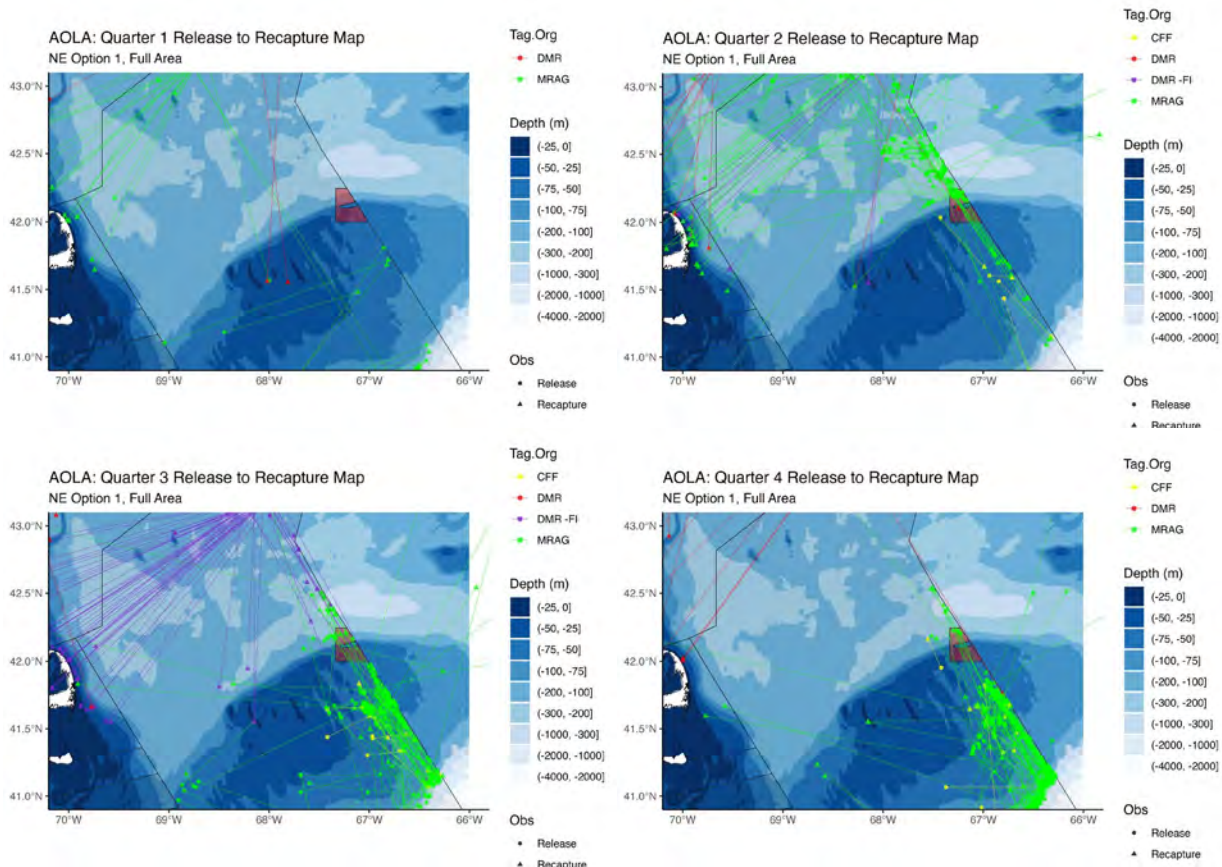


Figure 11: Spatial distribution of lobster release and recapture data grouped by quarter of release with individual path tracks mapped over NOAA's *marmap* bathymetric basemap and the Northern Edge Georges Bank Scallop Management Option 1 area.

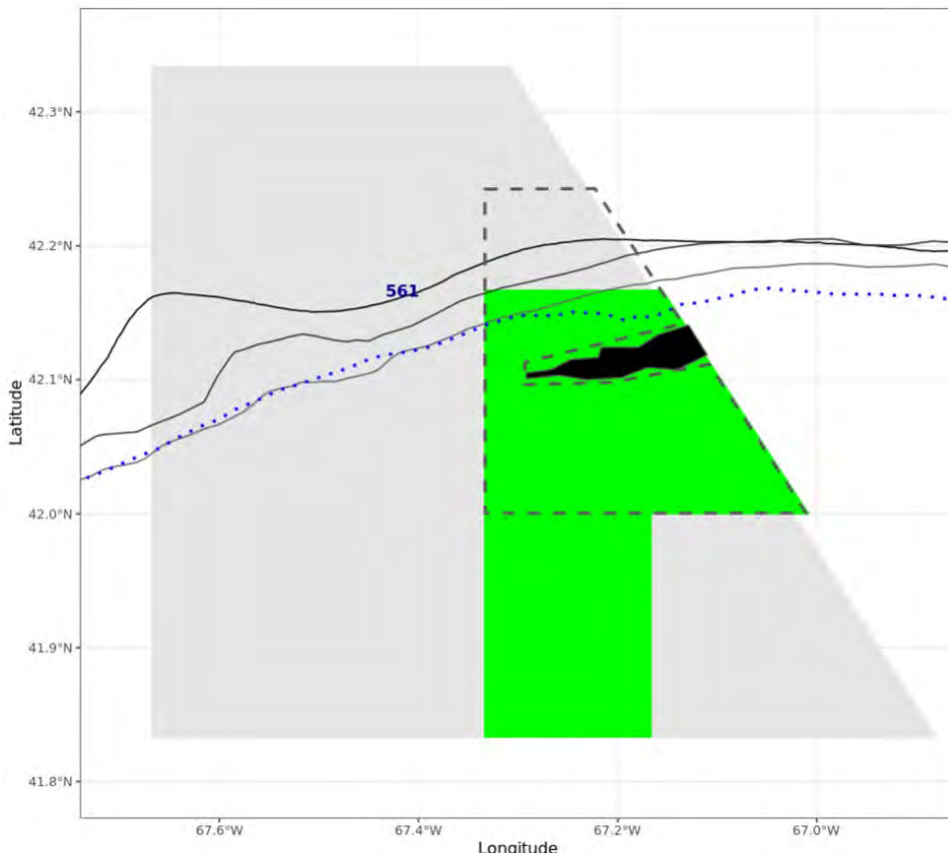


Figure 12. Extent of Statistical Area 561 (gray), the HMA (green), and delineated complex habitat (black). Isobaths of 100m, 140m, and 200m are included to illustrate the sharp change in bathymetry at the northern edge of the bank. The northern extent of the NMFS sea scallop survey strata is represented by the dotted blue line near the 100m isobath.

The spatial extent of the four scallop access areas under consideration extend off the Bank into the deeper waters (Figure 13). However, sea scallop distributions on this part of the Bank are generally constrained to depths of less than 100 m and the NEFSC scallop surveys do not sample deeper habitats to monitor the scallop resource. Thus, while the actual extent of different proposed access areas extend off the bank, we constrain the expected spatial distribution of scallop effort to within the NMFS sea scallop sampling strata and assess spatial overlap with the lobster fishery accordingly.

VTRs only have effort attributed to one location (a single latitude/longitude) but effort takes place over a larger area and supplied coordinate locations may not be accurate enough to characterize fine-scale variations in effort. Thus, we first report aggregate fishing effort information since 2013 for the entire statistical area, where we have higher confidence, and then examine landings patterns at the 10-minute square resolution, for which we have less confidence.

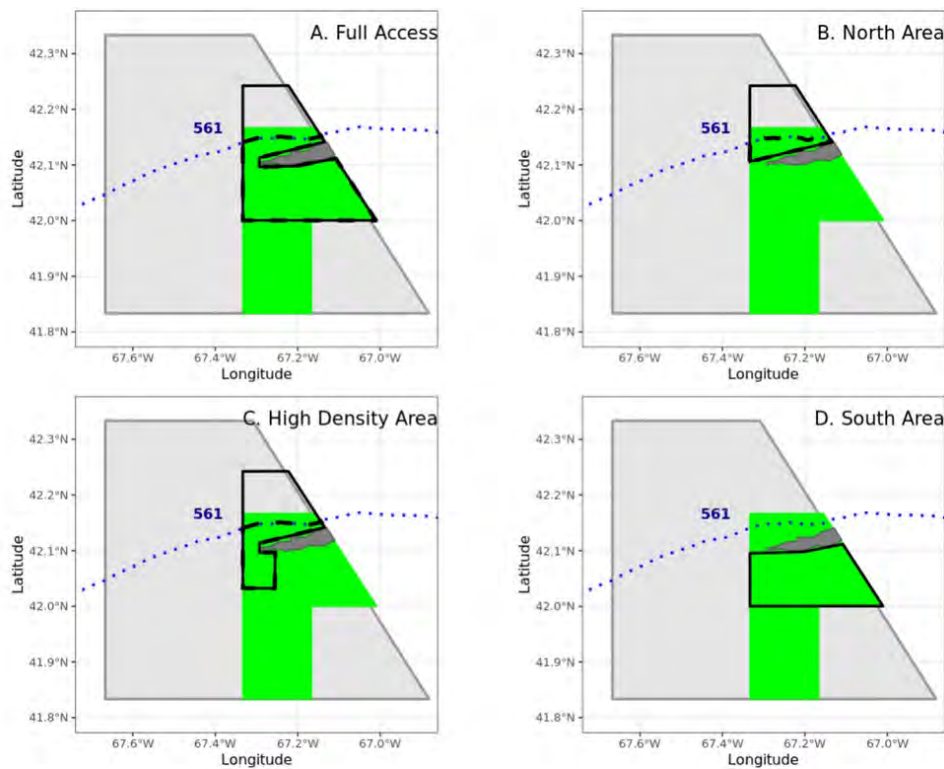


Figure 13. Extent of the alternate proposed access areas (solid black line) and trimmed to within presumed scallop habitat.

Since 2013, annual landings have averaged 740,000 lbs from 153 trip reports per year in SA 561. The number of lobster vessels reporting fishing on and off the bank vary seasonally. On average, five to six vessels have reported fishing north of the bank in the deeper waters December through July. This number then decreased during August through November (Figure 14). Conversely, peak vessel activity up on the bank happens in July through November, peaking around five vessels, then drops to near one vessel, on average, during the winter and spring months. We note that it is possible for one vessel to report fishing both on and off the bank in the same month. The seasonality of landings on the bank parallels the seasonality of vessels, being low in November through June but markedly higher in July through October (Figure 15). In contrast, landings are more constant year-round off the bank, being higher than on-bank in the winter and spring but substantially lower than on-bank during the summer and early fall.

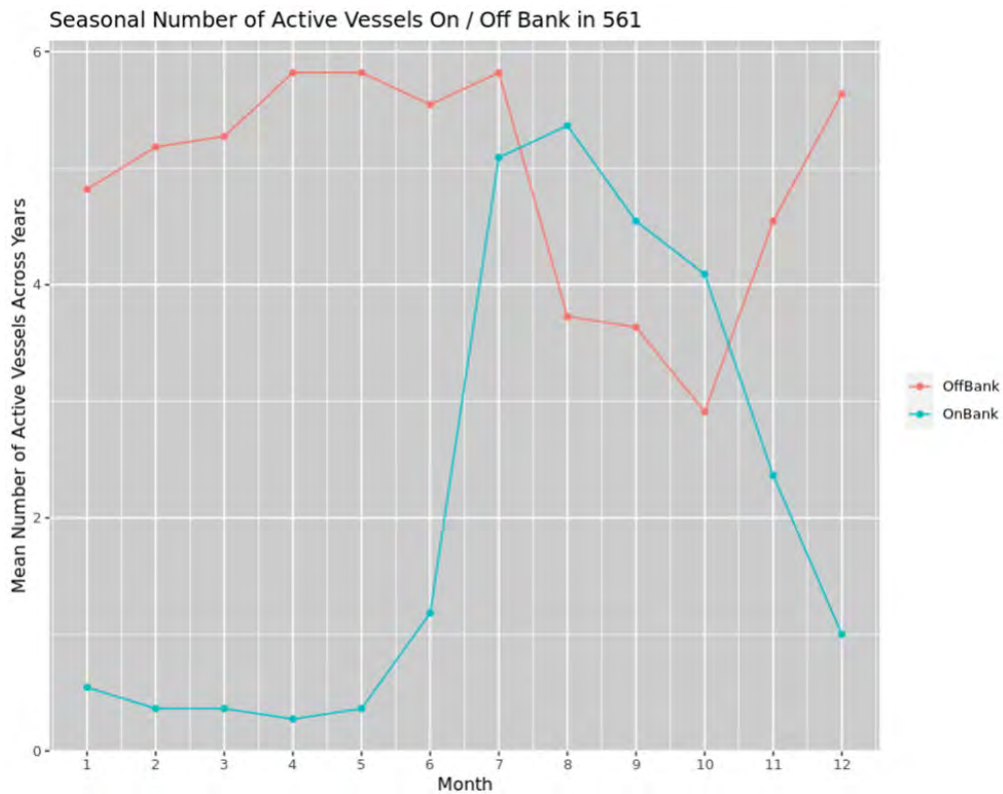


Figure 14. Seasonal average number of vessels reporting on the bank or north, off the bank, in NMFS Area 561. Note that it is possible for the same vessel to be recorded fishing both on and off the bank in the same month.

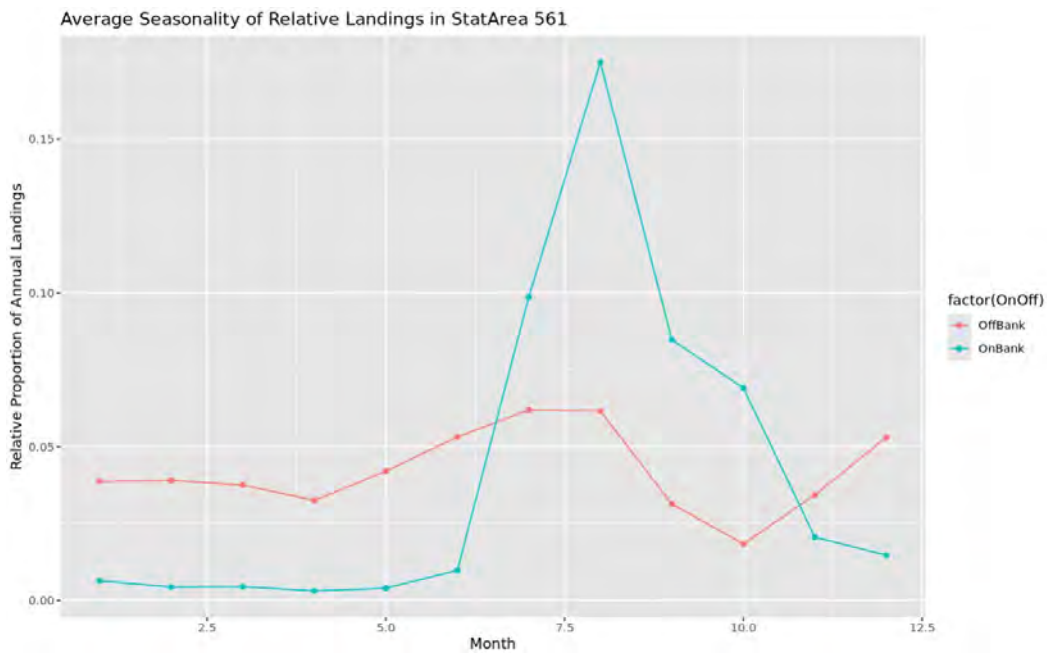


Figure 15. Seasonal average proportion of annual landings in NMFS Statistical Area 561 reported from on or off the bank by month.

This seasonal reversal of landings between off- and on-bank is evident at finer spatial scales as well (Figure 16). Higher landings are reported on the bank, south of the Full Access area in the months of July through October, where fishing in this area is much lower in the remaining months. The Full Access area alone provides a small to moderate amount of landings in these months, entailing less than 5% of the total landings for SA 561. We note that the majority of these landings are reported from the southeast portion of the Full Access area, such that the identified High Density Area represents a still smaller portion of annual landings. As always, our confidence in these low numbers is caveated by the assumption of the accuracy of the reported coordinates in the VTRs.

There is also limited spatial and seasonal data from NEFOP observer trips, mostly in 2014 and 2015, and vessels participating in the Commercial Fisheries Research Foundation (CFRF) biosampling program. While these datasets represent a small subsample of the total effort, our confidence in the spatial distribution of this effort is higher because observers record GPS coordinates for each individual observed haul. Maps from these two data sources are not presented to preserve confidentiality but both support the seasonal and spatial patterns reported above from the VTR data.

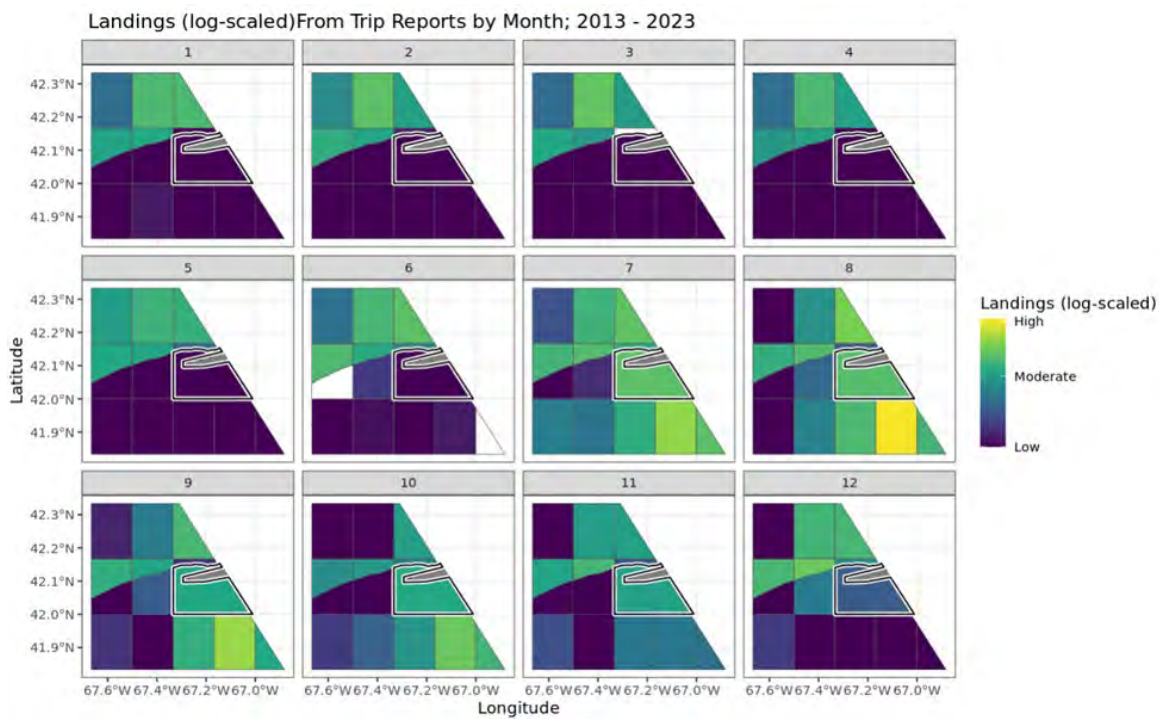


Figure 16. Monthly average seasonal landings for ten-minute squares, split between on- and off-bank. The Full Access extent is highlighted in the center left of each panel.

Results: Impact of scallop dredge gear to lobsters

Previous literature suggests that mobile gear, particularly dredge gear, can cause physical damage to lobsters, particularly those that have recently molted and have not hardened the shell completely. However, much of that work was conducted in inshore waters, where lobsters are much smaller than those observed on Georges Bank. To understand if/how larger lobsters are physically impacted by scallop dredge gear, we examined the full dataset from CFF (2012-2023, all tows).

Overall, 34.3% of all females (n=2060) and 46.3% of all males (n=216) had damage classified as ‘lethal,’ while 28.4% of females and 22.7% of males had moderate damage (Figure 17). Fifty-six percent of the females observed had eggs, and egg-bearing females seemed to be less damaged by the gear than non-ovigerous females; 45% of egg-bearing females had no damage while only 27% of non-egged females showed no damage. Females with eggs very likely had very hard, old shells, given that spawning typically occurs a year after molting. Lobsters that had recently molted were particularly vulnerable to lethal damage; 72.7% of those coded as soft or paper-shelled had lethal damage compared to 33.5% of hard-shelled lobsters.

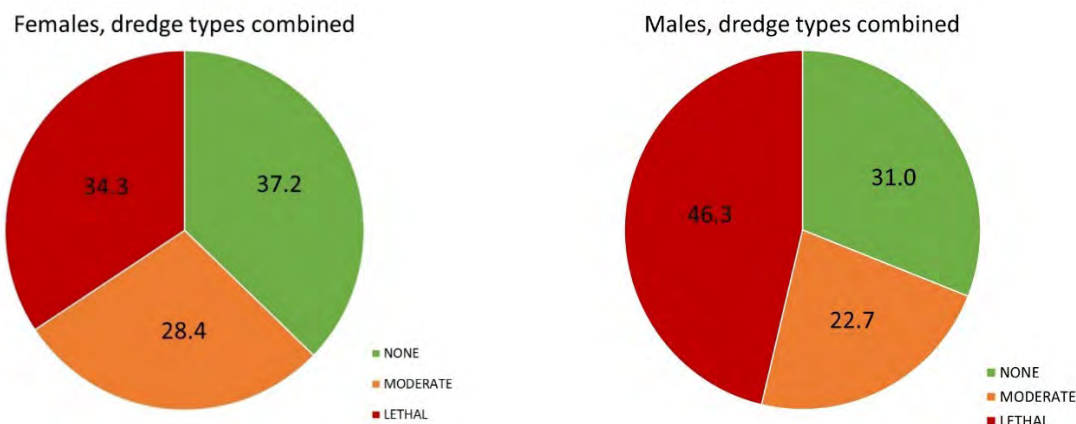


Figure 17. Overall damage rates (% of the catch) for female and male lobsters caught in the CFF scallop dredge bycatch survey (years and dredge types combined). N females = 2,060. N males = 216.

We also explored statistical models to examine the influence of size and shell hardness on damage. Model results were used to predict the probability of lobsters exhibiting major or lethal damage, where lethal damage represents a more severe subset of major damage.

We found that shell hardness was the most important predictor of damage, followed by egg-bearing status and carapace length (Figure 18). “Hardshell” lobsters were the least likely to exhibit major or lethal damage. Females with eggs were less likely to exhibit damage than males or females without eggs, which may also be a proxy for shell hardness as egg-bearing females presumably had molted at least a year prior. Probability of damage also increased above about 110mm CL, and 78% of all lobsters observed were larger than 110 mm. The lowest damage rates are predicted to occur in hardshelled eggers less than 100mm CL with rates of about 25% and 60% respectively for lethal and major damage. In contrast, a similarly sized lobster with a paper shell is predicted to experience lethal or major damage at rates of about 70% and >90%, respectively.

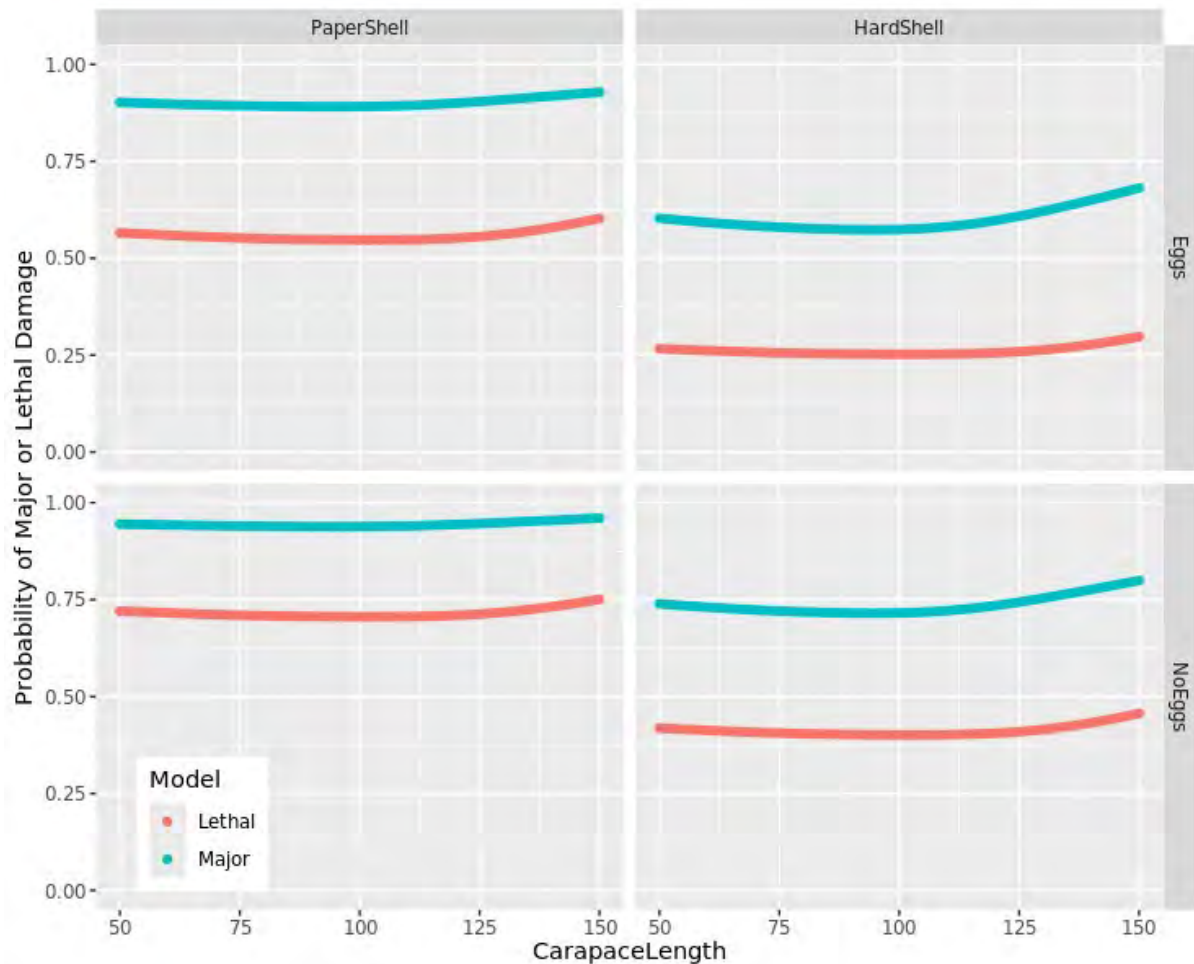


Figure 18. Probability of lobsters exhibiting major or lethal damage as observed in the CFF Seasonal Bycatch Survey.

Summary and Conclusions

Overall, the data indicate that although lobsters are present on top of George’s Bank year-round, numbers are much higher in the late summer into fall. This is particularly true for large females. There are also good indications of large aggregations of egg-bearing females on top of the Bank, in and immediately south of the HMA in the late summer and fall. Industry data show consistently female-skewed sex ratios and catch that is comprised of large lobsters, mostly over 100 mm CL. Based on VTR data, moderate levels of fishing activity occur from July through November in the HMA, overlapping with the proposed scallop access options. In general, lobster fishing on top of the Bank is relatively important to the annual landings reported from NMFS Area 561.

In addition to the analyses described here, the TC has discussed the use of newly required tracking data from the lobster fleet to characterize the impacts to the lobster fishery that could result from opening this area to lobster gear. At this time, tracking data are extremely limited, given that only MA vessels were deployed in 2023 and NH vessels, which likely comprise a much larger component of the activity in the region, only have 1 month's of data available. Additionally, during the first year of data collection, there were known issues with several of the devices, creating gaps in the already limited data. With the incomplete data available at present, we can corroborate that the area is being used by lobster vessels.

However, until a year or more of data from the entire fleet are available, the tracking data cannot be used to quantify impacts.

The above results compiled from readily available data sources are consistent with existing information in the scientific literature. Several studies have shown that adult lobsters tend to exhibit seasonal movement patterns, migrating to deeper water in the colder months and to shoal waters in the warmer months (Cooper and Uzmann 1971; Krouse 1973; Campbell and Stasko 1986; Campbell 1986). Additionally, shoal areas with access to adjacent deep-water like Georges Bank appear to be particularly attractive to egg-bearing lobsters, and aggregations have been reported throughout the species range in areas with these bathymetric characteristics (Campbell and Pezzack 1986, Campbell 1990, Henninger and Carloni 2016, Carloni and Watson 2018, Carloni et al. 2021). These areas are likely attractive due to warm shallow water in the spring/summer months to brood eggs, and nearby deep calm water in the colder months for overwintering. There are still some unknowns regarding where larvae hatched in these areas are transported and eventually settle, however there is some evidence they could be retained on Georges Bank (Harding et al. 2005), or similar to Brown's Bank there may be transport to inshore Gulf of Maine (Harding & Trites 1987). Additional research is needed on this topic, though the high abundance of large (> 100mm CL) highly fecund lobsters on Georges Bank removes any doubt of the importance of this segment of the population to continued sustainability of the resource.

References

- Cooper RA, Uzmann JR. 1971. Migrations and growth of deep-sea lobster, *Homarus americanus*. *Science* 171: 288 – 290.
- Campbell A. 1986. Migratory movements of ovigerous lobsters, *Homarus americanus*, tagged off Grand Manan, eastern Canada. *Mar Biol.* 92(3):393–404.
- Campbell A. 1990. Aggregations of berried lobsters (*Homarus americanus*) in shallow waters off Grand Manan, eastern Canada. *Can J Fish Aquat Sci.* 47:520–523.
- Campbell A, Pezzack DS. 1986. Relative egg production and abundance of berried lobsters, *Homarus americanus* in the Bay of Fundy off southwestern Nova Scotia. *Can J Fish Aquat Sci.* 43:2190–2196.
- Campbell A, Stasko AB. 1986. Movement of lobsters (*Homarus americanus*) tagged in the Bay of Fundy, Canada. *Mar Biol.* 92:393–404.
- Carloni JT, Watson WH. 2018. Distribution of ovigerous American lobsters near the Isles of Shoals, New Hampshire. *Bull Mar Sci* 94:555-570.
- Carloni, J., Goldstein, J., Watson III, W., 2021. Movements of egg-bearing American lobsters (*Homarus americanus*) during late stage brooding and hatching. *Marine Ecology Progress Series* 661, 163–173. <https://doi.org/10.3354/meps13629>
- Harding, G.C., Trites, R.W., 1988. Dispersal of *Homarus americanus* Larvae in the Gulf of Maine from Browns Bank. *Can. J. Fish. Aquat. Sci.* 45, 416–425. <https://doi.org/10.1139/f88-050>
- Henninger HP, Carloni JT. 2016. Improving American lobster biological & catch/effort data for Georges Bank, and characterizing American lobster seasonal egger aggregation in Closed Area II (Statistical Areas 561 & 562). Final Report Project # NA15NMF47440253.
- Krouse JS. 1973. Maturity, sex ratio and size composition of the natural population of American lobster, *Homarus americanus*, along the Maine coast. *Fish Bull.* 71(1):165-174.
- Stasko, A.B., Gordon, D.J., 1983. Distribution and relative abundance of lobster larvae off southwestern Nova Scotia 1977-1978. *Can. Tech. Rep. Fish. Aquat. Sci.* 1175, 23.

Atlantic States Marine Fisheries Commission

Sciaenids Management Board

April 30, 2024
11:45 a.m. – 12:15 p.m.

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>D. Haymans</i>) | 11:45 a.m. |
| 2. Board Consent <ul style="list-style-type: none">• Approval of Agenda• Approval of Proceedings from October 2023 | 11:45 a.m. |
| 3. Public Comment | 11:50 a.m. |
| 4. Consider Spot Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year (<i>T. Bauer</i>) Action | 11:55 a.m. |
| 5. Progress Update on Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments (<i>J. Kipp</i>) | 12:05 p.m. |
| 6. Elect Vice-Chair Action | 12:10 p.m. |
| 7. Other Business/Adjourn | 12:15 p.m. |

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details

MEETING OVERVIEW

Sciaenids Management Board
April 30, 2024
11:45 a.m. – 12:15 p.m.
Hybrid Meeting

Chair: Doug Haymans (GA) Assumed Chairmanship: 02/24	Technical Committee Chairs: Black Drum: Harry Rickabaugh (MD) Atlantic Croaker: Somers Smott (VA) Red Drum: Ethan Simpson (VA) Spot: Harry Rickabaugh (MD)	Law Enforcement Committee Representative: Col. Matthew Rogers (VA)
Vice Chair: Vacant	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: October 19, 2023
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS (10 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 2023

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 Spot Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year (11:55 a.m.-12:05 p.m.) Action

Background

- Spot state compliance reports are due on November 1. New Jersey, Georgia, and Delaware have requested continued *de minimis* status (**Briefing Materials**).
- The Spot Plan Review Team (PRT) met on December 14, 2023, to discuss state compliance reports and the FMP review. The PRT can no longer recommend *de minimis* status for Delaware, as it is the third year in a row the state has been over the 1% *de minimis* threshold. Delaware’s exceedance in 2022 was minimal at 1.05%, and has ranged between 1.05% and 1.20% in the past three years. Delaware requests to be allowed to remain *de minimis*.

Presentations

- 2022 FMP Review for Spot by T. Bauer

Board actions for consideration at this meeting

- Consider approval of the 2022 FMP Review and state compliance reports.
- Consider approval of New Jersey, Georgia, and Delaware’s *de minimis* requests for spot.

5. Progress Update on the Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments (12:05-12:10 p.m.)

Background

- Work on the red drum benchmark stock assessment was initiated in early 2023. In-person Assessment Workshops were held November 6-9, 2023, and March 11-14, 2024. The assessment is scheduled for completion in the fall of 2024.
- Work on the Atlantic croaker and spot benchmark stock assessments was initiated in early 2023. A Data Workshop was held virtually May 15-18, 2023. An Assessment Workshop was held virtually September 11-14, 2023. At their October 2023 meeting, the Policy Board agreed to decouple the spot and Atlantic croaker stock assessments due to the loss of a lead modeler, and move forward with the Atlantic croaker stock assessment to be completed in fall of 2024. Work on the spot stock assessment will resume once the Atlantic croaker assessment is completed and peer-reviewed. A sub-group of the Stock Assessment Subcommittee is meeting biweekly to discuss Atlantic croaker modeling progress.

Presentations

- Stock assessment update by J. Kipp

6. Elect Vice-Chair (12:10 – 12:15 p.m.) Action

7. Other Business/Adjourn

Sciaenids Management Board

Activity level: High

Committee Overlap Score: Moderate (American Eel TC, Cobia TC, Horseshoe Crab TC, Weakfish TC)

Committee Task List

- Red Drum SAS – Conduct Red Drum Benchmark Assessment
- Atlantic Croaker and Spot SAS – Conduct Atlantic Croaker and Spot Benchmark Assessments
- Black Drum TC – Update indicators
- Red Drum TC – Assist with the Red Drum Benchmark Assessment
- Atlantic Croaker TC – Assist with the Atlantic Croaker Benchmark Assessment
- Spot TC – Assist with the Spot Benchmark Assessment
- Atlantic Croaker TC/PRT – July 1: Compliance Reports Due
- Red Drum TC/PRT – July 1: Compliance Reports Due
- Black Drum TC/PRT – August 1: Compliance Reports Due
- Spotted Seatrout PRT – September 1: Compliance Reports Due
- Spot TC/PRT – November 1: Compliance Reports Due

Technical Committee Members:

Atlantic Croaker: Somers Smott (VA, Chair), Kristen Anstead (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Devon Scott (DE), Harry Rickabaugh (MD), Ingrid Braun (PRFC), Willow Patten (NC), Margaret Finch (SC), Dawn Franco (GA), Halie OFarrell (FL)

Black Drum: Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Craig Tomlin (NJ), Jordan Zimmerman (DE), Ethan Simpson (VA), Chris Stewart (NC), Chris McDonough (SC), Ryan Harrell (GA), Shanae Allen (FL)

Red Drum: Ethan Simpson (VA, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Alissa Wilson (NJ), Matthew Jargowsky (MD), Cara Kowalchyk (NC, Vice-Chair), Joey Ballenger (SC), Chris Kalinowsky (GA), Sarah Burnsed (FL)

Spot: Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Devon Scott (DE), Ingrid Braun (PRFC), Somers Smott (VA), Willow Patten (NC), Michelle Willis (SC), BJ Hilton (GA), Halie OFarrell (FL)

Plan Review Team Members:

Atlantic Croaker: Harry Rickabaugh (MD), Ingrid Braun (PRFC), Ethan Simpson (VA), Willow Patten (NC), Chris McDonough (SC), BJ Hilton (GA), Tracey Bauer (ASMFC)

Black Drum: Jordan Zimmerman (DE), Chris Stewart (NC), Chris McDonough (SC), Tracey Bauer (ASMFC)

Red Drum: Matthew Jargowsky (MD), Ethan Simpson (VA), Cara Kowalchyk (NC), Joey Ballenger (SC), Ray Rhodes (COFC), Matt Kenworthy (FL), Tracey Bauer (ASMFC)

Spot: Harry Rickabaugh (MD), Ethan Simpson (VA), Chris McDonough (SC), Dawn Franco (GA), Tracey Bauer (ASMFC)

Spotted Seatrout: Tracey Bauer (ASMFC), Samantha MacQuesten (NJ), Lucas Pensinger (NC), Brad Floyd (SC), Chris Kalinowsky (GA)

Stock Assessment Subcommittee Members:

Red Drum: Joey Ballenger (SC, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Angela Giuliano (MD), CJ Schlick (NC), Jared Flowers (GA), Chris Swanson (FL), Ethan Simpson (VA)

Atlantic Croaker and Spot: Kristen Anstead (ASMFC), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Linda Barry (NJ), Harry Rickabaugh (MD), Brooke Lowman (VA), Somers Smott (VA), Margaret Finch (SC)

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

**Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting**

October 19, 2023

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

TABLE OF CONTENTS

Call to Order, Chair Chris Batsavage..... 1

Approval of Agenda..... 1

Approval of Proceedings from May 1, 2023..... 1

Public Comment 1

Review Annual Update to Black Drum Indicators 1

Consider Approval of Atlantic Croaker, Red Drum, and Spotted Seatrout Fishery Management Plan Reviews and State Compliance for the 2022 Fishing Year 4

Progress Update on 2024 Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessments 10

 Review and Consider Recommended Changes to the Timeline for the Spot and Atlantic Croaker Benchmark Stock Assessments..... 10

Review and Populate Atlantic Croaker and Spot Stock Assessment Subcommittee Membership..... 12

Adjournment 12

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of May 1, 2023** by consent (Page 1).
3. **Move to approve the Red Drum FMP Review for the 2022 fishing year, state compliance reports, and de minimis status for New Jersey and Delaware** (Page 9). Motion by Lynn Fegley; second by Erica Burgess. Motion passes by unanimous consent (Page 9).
4. **Move to approve the Atlantic Croaker FMP Review for the 2022 fishing year, state compliance reports, and de minimis status for New Jersey, Delaware, South Carolina, and Georgia commercial fisheries and New Jersey and Delaware recreational fisheries** (Page 9). Motion by Shanna Madsen; second by Roy Miller. Motion passes by unanimous consent (Page 10).
5. **Move to approve the Spotted Seatrout FMP Review for the 2022 fishing year, state compliance reports, and de minimis status for New Jersey and Delaware** (Page 10). Motion by Ingrid Braun; second by John Clark. Motion passes by unanimous consent (Page 10).
6. **Move to approve the nomination of Trey Mace to the Spot and Atlantic Croaker Stock Assessment Subcommittee** (Page 12). Motion by Lynn Fegley; second by Malcolm Rhodes. Motion passes by unanimous consent (Page 12).
7. **Move to adjourn** by consent (Page 12).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The Sciaenids Management Board of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Thursday, October 19, 2023, and was called to order at 12:05 p.m. by Chair Chris Batsavage.

CALL TO ORDER

CHAIR CHRIS BATSAVAGE: Good afternoon, everyone. I'll go ahead and call the Sciaenids Management Board meeting to order. My name is Chris Batsavage; I'm the Administrative Proxy for North Carolina, serving as Chair of the last meeting of the week. I'll try to move through as quickly as possible.

Helping me do that up at the front of the table is Tracey Bauer and Jeff Kipp. Make sure I'm getting through the agenda quickly, but not too quickly.

APPROVAL OF AGENDA

CHAIR BATSAVAGE: Right now, I am looking for Board consent on Approval of the Agenda. Is there any modifications or other changes needed for the agenda? Seeing none; I'll consider the agenda approved.

APPROVAL OF PROCEEDINGS

CHAIR BATSAVAGE: Next is approval of the proceedings from the May, 2023 meeting. Are there any changes, edits or modifications to those proceedings? Seeing none in the room and none online; we'll also consider those approved.

PUBLIC COMMENT

CHAIR BATSAVAGE: Next up is Public Comment. This is an opportunity for the public to provide any comments related to the Sciaenids Management Board for items that are not on the agenda.

Do we have anyone in the room or online that would like to provide public comment? Seeing none.

REVIEW ANNUAL UPDATE TO BLACK DRUM INDICATORS

CHAIR BATSAVAGE: We're going to move on to the next item, which is a Review of the Annual Update to Black Drum Indicators. We'll have Harry Rickabaugh, the TC Chair, providing that update. Harry, whenever you're ready.

MR. HARRY RICKABAUGH: First, I would like to thank all the people who submitted data for this. It comes from many locations, several states and also the ASMFC staff, for putting this together. Jeff, I know put together most of the slides., and updated some of the indices for us, so thanks. Following the last assessment, it was found that the black drum stock was not overfished, and overfishing was not occurring.

Data for that assessment ran through 2020. During that assessment, empirical indicators were identified that could be used to monitor the stock condition between assessments. Lack of contrast in the black drum datasets, coupled with some high uncertainty in the model, led the TC to recommend they are monitoring these empirical stock indicators annually. The Board agreed to annual monitoring of these empirical indicators, and tasked the TC to do so on an annual basis. This is to assess a new assessment only; it does not trigger management action. The next assessment is preliminarily schedule for 2027. The different indicators that we're looking at are in three different categories. The first one is the abundance indicators. These are made up of four indices from the Mid-Atlantic, which are all YOY.

The Mid-Atlantic region is from Virginia, north. There are three indices in the South Atlantic, which is North Carolina, south. Those include a YOY indices at Age 0-1 indices and a subadult indices. We also look at exploitable biomass, that is through an MRIP CPUE. We do not have a fishery independent index to track adult abundance.

The range expansion indicator is only for interpreting any potential changes of just that. Range expansion is not an indicator of overall stock abundance. Then we also look at some fishery catch metrics, just your

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

recreational live releases, recreational harvest in pounds, and commercial landings in pounds. Those are also structured regionally with the Mid-Atlantic region from Virginia, north and the South Atlantic from North Carolina, south.

The years to be updated in this go round are going to be 2021 and 2022, since again, the assessment only ran data through 2020. In all the figures we're about to see, there is going to be a time series mean that's the dotted dash line. On these slides, all of the abundance slides, the index is scaled to its mean, so that we can put multiple figures up at one time and compare them side by side. We're really looking at the trend here, so the absolute value isn't as important, so they're scaled to a mean.

For the Mid-Atlantic again, that is what is up there now, we have four indices, and once again they are all YOY. The upper left panel is the public service enterprise group seine survey, which is conducted in Delaware Bay in the upper Delaware River. The upper right panel and the lower left panel are the Delaware trawl surveys, which are conducted in the Delaware Bay, and the lower right is the Maryland seine.

For all the figures I'm going to show today, the black dots connected by the black line are the data that was used in the assessment through 2020. The red dots connected with the red line will be the updated years, so they just help you jump out, see what was used in the assessment and what is the new data.

Again, these Mid-Atlantic indicators all kind of vary around the timeseries means. The Delaware Bay indices being below their mean in 2021, and above in 2022, and the Maryland Coastal Bay Seine Survey being above the timeseries mean in 2021 and below in 2022. But they all varied within, sort of the range of their most recent values. There are a few more larger peaks in the early part of the timeseries that don't seem to be as apparent in recent years.

For the South Atlantic, the abundance indicators were mixed, as far as trend, with declines measured in the South Carolina Trawl Survey, which is an Age 0-1, and is in the left panel, and in the Georgia

Trammel Survey, which is a YOY only survey, which is in the far-right panel. It varied around the time series in the North Carolina gillnet survey, the middle panel, which is a subadult survey, so primarily Ages 1 through 3. I had heard about the Georgia Trammel Survey, as there were some questions during the assessment about possible changes in catchability, due to a survey gear change in 2007, that will be explored further in the next assessment, to see whether that was really impacting those really large values you see prior to 2007. The exploitable abundance indicator is based off an MRIP CPUE. It declined below its time series mean for both of the update years. This is the only index we actually use within the model to track abundance, so this is the tuning index for the model.

As you can see through the model time period, the black dots that increased steadily, and then kind of leveled off in a high value. Now these last two years are below the mean, or dropped from where we were in the previous ten years or so. Similar to where we were in the mid-2000s, you can see two values back there, slightly lower than these two.

Not in an area we haven't been in the no-so-distant past, but it is a decline from the trajectory we had in the assessment. The range expansion indicator is from the New Jersey Trawl. Again, this is only to look at range expansion, not actually an indicator of stock status. It was not available in 2021, due to survey restrictions.

The 2022 value is below the time series mean. You can see there was a lot of variability in this early in the timeseries, near zero values and some higher values in more recent years, and pretty much some sort of catch. Certainly, they do seem to be more available, but it's not like a trend of increasing availability seen in this range expansion.

For these next few slides, we're moving to the catch indicators, and these are not scaled to their mean, these ones will be actual the mean, and in this case, this is the recreational live releases, so in millions of fish, and these releases have varied around their time series mean in the Mid-Atlantic with 2021 being above, and 2022 being just below., and above the

These minutes are draft and subject to approval by the Sciaenids Management Board.

The Board will review the minutes during its next meeting

timeseries mean in the South Atlantic during the update years.

Live releases in the South Atlantic have continued to follow a declining trend that was observed at the end of the stock assessment. It is still above, as I mentioned its timeseries mean and the rate of decline seems to have slowed, but it is still on that trajectory. The recreational harvest is in millions of pounds, and again, as you can see from this scale, the South Atlantic does account for a higher proportion of the landings than the North Atlantic.

Just as a reminder, the South Atlantic fishery is primarily subadults, and the North Atlantic is primarily mature adult fish within the recreational harvest. In this case you have higher weight in the smaller fish in the South Atlantic, so by number it will be the greater, but we're showing this by weight, so we can compare it to commercial later.

Recreational harvest is also varied by region, with both update years below the time series mean in the Mid-Atlantic, and both update years above the timeseries in the South Atlantic. The commercial landings have showed a similar pattern to the recreational harvest, with both of the update years below the timeseries mean in the Mid-Atlantic, and both of the update years above the timeseries mean in the South Atlantic.

You can see here, this is in thousands of fish, so that commercial harvest is considerably lower than the recreational harvest, and in this case, even though it's larger fish in the north and smaller fish in the south, we're still kind of that split, even in the commercial fishery. The catches on average, the annual catches are very similar by weight. There was some discussion from the TC about the Mid-Atlantic reduction in harvest, particularly a commercial, is likely due to some reductions in effort. A lot of the Virginia fishery is bycatch within their commercial striped bass gillnet fishery that happens in the spring. There has been decreased effort in that fishery, and in Delaware they've had a reduction in effort, mainly due to a decline in market demand, so it's become less profitable, so there is less commercial fishing in the North Atlantic, most likely than in previous years.

The Black Drum TC met on September 26, to discuss the data that I just showed you, and to come up with recommendations for this Board at this meeting.

Overall, the indicators showed mixed signs of stability and declines since the assessment. The TC did discuss that it's only two years of additional data, and the black drum is a long-lived species. Also, many of our indicators, are their juvenile indices or a lot of the indicators in the South Atlantic, the harvest and releases are on subadult and juvenile fish, so we're kind of looking more at that part of the population.

We do not have an adult index. There are not a lot of surveys up and down the coast that target adult black drum, so that is one piece of information we are missing. Recruitment for black drum is highly variable, and our indices have been relatively low, particularly in the South Atlantic, so it's not real surprising that some of the other indicators are also a little low, since that is part of the population and bulk of the fishery is targeting in the South Atlantic.

The level of hours we are seeing are within the historical range of values we've seen, so we're not into an area we haven't been before that the stock hasn't recovered from. But we do have some declining trends, the TC does feel that's something we need to monitor in the future. It does not feel that initiating an updated stock assessment is necessary at this time. With that I can take any questions.

CHAIR BATSAVAGE: Thank you, Harry, any questions for Harry on the black drum stock indicators? Okay, seeing no questions, just an FYI for the Board, and it's in our compliance report, which you'll see in the FMP review later. But looking at recreational harvest in North Carolina, it did increase by quite a bit in 2022 compared to 2021. It was, I think three and a half higher than it was the previous year, and it was highest since the FMP required bag and size limits were implemented back in like 2014, I think.

We've heard some anglers voice concerns over increased black drum fishing effort in recent years in North Carolina, so we're just kind of monitoring the

These minutes are draft and subject to approval by the Sciaenids Management Board.

The Board will review the minutes during its next meeting

trends in the fishery. I think these indicators also help kind of guide us and the rest of the states, as far as any impacts, you know changes in harvest or fishing effort might have on the stock.

Just wanted to share that with everyone. The TC isn't recommending any changes to the stock assessment schedule, based on the indicators being mixed, and also this is the first time we've used these indicators. I'll just look to see if there is anyone on the Board who feels like anything other than what the TC recommended should be done. If not, then I think we'll just, yes, Shanna.

MS. SHANNA MADSEN: I don't think anything else should be done, but I did have a question. How often does the TC expect to be bringing back these indicators, because it looks like, you know we've got the two-years that we're looking at right now, they have a time series of them. But I do note the TC's point that this is an extremely long-lived species, so I'm just wondering how often a reevaluation of the indicators will be brought to the Board.

MS. TRACEY BAUER: Currently, as far as I'm aware, the plan was annually.

CHAIR BATSAVAGE: Okay, thanks. I guess, would that be something, Tracey, that as the TC goes through this exercise and the Board reviews, that if we felt it was appropriate to look at it maybe not annually, but maybe every two years, or based on life history of the fish, that would be a change that we could just make through Board action or consensus.

MS. BAUER: Yes, yes, absolutely. This is all new for all of us, these black drum indicators. If we find something that works better for the Board, then we can do that.

CHAIR BATSAVAGE: Any follow up on that, Shanna, or is that good.

MS. MADSEN: I think I'm good for now, but I kind of agree that maybe at another time, once the TC brings this back. I feel like yearly is a little bit excessive again, for such a long-lived species. Not that it takes up a ton of our time, but I feel like it could take up

some time for the TC, so maybe a biannual situation might be better in the future. But let's see how this goes, since it's new for all of us.

CHAIR BATSAVAGE: Erika.

MS. ERIKA BURGESS: On the same topic, I would be interested in the TC's thoughts on potentially doing this every three years.

CHAIR BATSAVAGE: I guess, Tracey, that would be something that the next time the TC meets to review these indicators, that could be something that we ask the TC to discuss at that time, and then report back to the Board, probably this time next year.

MS. BAUER: Yes, absolutely, we can have them discuss that next year if that works for everyone on the Board.

CHAIR BATSAVAGE: Okay, does that seem like a reasonable ask? Yes, I'm seeing heads nodding, so yes, we can do that. Yes, thanks, Erika, I think just to kind of provide something a little more concrete from the Board to get input from the TC would be good.

CONSIDER APPROVAL OF ATLANTIC CROAKER, RED DRUM, AND SPOTTED SEATROUT FISHERY MANAGEMENT PLAN REVIEWS AND STATE COMPLIANCE FOR THE 2022 FISHING YEAR

CHAIR BATSAVAGE: If nothing else on this, we'll move on to the next agenda item, which is to Consider Approval of the Atlantic Croaker, Red Drum and Spotted Seatrout FMP Reviews and State Compliance Reports for the 2022 Fishing Year. Tracey is going to go through each one individually, she is going to pause for questions after each, but then we'll take up motions after she's done presenting all three FMP reviews. Tracey, whenever you're ready.

MS. BAUER: Good afternoon, everyone. Like he said, I'm going to be going through the Red Drum, Atlantic Croaker and Spotted Sea Trout FMP Reviews. The Black Drum one is actually finished as well, but you'll

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

get that one through an e-mail vote, so we're not going through so many at this meeting.

I'm going to start off the presentation today by going through the red drum FMP Review. Red Drum are managed by the Commission through Amendment 2 to the Interstate FMP in Addendum I. The Addendum required states to implement recreational creel and size limits to achieve at least a 40 percent static spawning potential ratio, and included a maximum size limit of 27 inches, and maintained existing commercial regulations.

Then Addendum I, which went into effect in 2013 updated Amendment 2's habitat section to include current information on red drum spawning habitat and habitat by life. It also describes key habitats and habitats of concern, including threats and ecosystem considerations. On this slide I'm just going to touch on a couple of the more recent red drum assessments.

As you guys are all probably aware, the 2017 red drum stock assessment and peer review report indicated that overfishing was not occurring for either the northern or southern stocks of red drum. But that assessment was not able to determine an overfished or not overfished status, because of the population abundance could not be reliably estimated, due to limited data for the older ages. That assessment had a terminal year of 2013.

Fairly recently, I just wanted to touch on more local or state-specific stock assessment in Florida. They had completed that in 2020, with a terminal year of 2019, and on the Atlantic coast estimates of current escapement rates, in the formerly defined northeast region, had exceeded their target of 40 percent, where the formerly defined southeast region of Florida exceeded the escapement rate in the terminal year, but the three-year-average did not meet the current escapement rate management target. Now moving on to reviewing the status of the fishery.

I wanted to start off with a high-level overview of the red drum fishery in 2022, so 5.8 million pounds of red drum were harvested in 2022, which is slightly lower

than the previous year at 6.2 million pounds. In 2022, 56 percent of the total landings were from the southern region and 44 percent were from the northern region. This close to equal split of the total landings between the north and the south regions is a somewhat recent trend, whereas in the past the majority of the landings were always from the south.

This is something we've been seeing maybe since 2019 or so. There is no commercial harvest in the southern region, obviously, so the commercial landings given on the slide are all from the northern region, and were about 192,000 pounds in 2022, which was a slight decrease from 2021, when it was about 220,000 pounds.

This harvest, the 192,000 pounds is about 7 percent of the total landings in the northern region. Now I'm going to focus specifically on the recreational landings as the majority of the harvest. In this figure, the orange bars are recreational landings in millions of pounds from the northern region, and the blue bars are recreational landings from the southern region. Just as a reminder, I've been talking about the northern region and southern region a lot. The northern region is New Jersey to North Carolina, and the southern region is South Carolina to Florida. In the northern region recreational landings were estimated to be 2.4 million pounds in 2022, which was just a very slight decrease from the previous year at 2.6.

North Carolina was estimated to have the most recreational landings, followed by Virginia. In the southern region, recreational landings were estimated to be 3.3 million pounds in 2022, which was very similar to 2021, when it was 3.4 million pounds. Florida was estimated to have the most pounds of recreational landings in this region, followed by Georgia.

Just a note that recreational landings declined in Florida by 35 percent, but increased in Georgia by 113 percent, and increased in South Carolina by 32 percent. This figure shows the total removals compared to the number of fish released in both the southern and northern region. The purple bars are total removals, and the red line is releases, both from

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

the northern region, and then in the southern region the maroon bars are the total removals, and the orange line is releases. That is all in millions of fish.

About 500,000 fish were harvested in the recreational fishery in the northern region in 2022, which was a decline about 13 percent from 2021, and 2.9 million fish were released in the northern region, which was a decline of 23 percent from 2021. Since it is estimated to, at least the current estimate that we're using in the stocks assessments and such of 8 percent of released fish size at the result of being caught.

This results in an estimate of dead discards of about 236,000 red drum in 2022 in the northern region. Recreational removals from the fishery are best estimated to be about 736,000 fish in 2022 in the northern region. Moving on to the southern region, about 1.23 million fish were harvested in the recreational fishery in the southern region, which was a slight increase in recreational harvest in 2021, and 7.3 million fish were released in the southern region, which is a slight decrease from 2021.

With that 8 percent discard mortality rate, this results in an estimated about 583,000 dead discarded fish in 2022 in the southern region, and so recreational removals in the southern region are estimated to be about 1.8 million fish in 2022. I next just wanted to briefly touch on and give a high-level overview of one change in Florida's management measures that occurred last year.

In 2022, Florida adopted a more holistic approach to red drum management, to really focus on better capturing regional differences and improved angler satisfaction. Each year, they will be evaluating the red drum stock in each of their management regions using set metrics. Results will be summarized in annual reviews.

Regulations before then may be changed based on the results of these reviews. When I did this for the first time, last year, 2022, reviewing the metrics and getting subsequent stakeholder feedback, regulation changes were approved for red drum in state waters, and went into effect on September 1, 2022. Those

regulations changes for the areas on the Atlantic coast are on the slide, but they are mainly reduced bag limits and vessel limits, though in one region the Indian River Lagoon region, is now currently catch and release only. Finally, PRT recommendations. The PRT, when reviewing the compliance reports found no inconsistencies among states, with regards to the FMP requirements. Both New Jersey and Delaware requested de minimis status through the annual reporting process, and as a reminder, Amendment 2 currently does not include a specific method to determine whether a state qualifies for de minimis.

The PRT has chosen in the past and now to evaluate an individual state's contribution to the fishery, by comparing the two-year average of total landings of the state to that of the management unit. New Jersey and Delaware each harvested zero landings, zero percent of the two-year average of total landings, so they both met those requirements.

Additional research and monitoring recommendations can be found in the FMP review document, and in a simulation assessment and peer review report. I won't spend time going through those today, but you can touch base with me if you have any questions. But that's where I will end for red drum, if anyone has any questions.

CHAIR BATSAVAGE: Thanks, Tracey, any questions on the red drum FMP review? Seeing none; move on to the next one, which is croaker.

MS. BAUER: We're going to be going pretty quickly through the Atlantic croaker FMP review. Atlantic croaker, as a reminder, is currently managed under Amendment 1 to the Atlantic croaker FMP, and then Addenda I through III, which was 2011, 2014, and 2020. Amendment 1 did not require any specific measures restricting harvest, but encouraged states with conservative measures to maintain them.

It also established a set of management triggers. However, Addenda II and III established and revised that traffic light analysis, and the resulting management responses to replace that original set of management triggers. Then Addendum I had

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

revised the management programs biological reference points to assess stock condition on a coastwise basis, as recommended by the 2010 stock assessment.

Really briefly, review current stock status information for Atlantic croaker. The most recent peer reviewed stock assessment is that 2010 stock assessment, with a terminal year of 2008, and found that croaker was not experiencing overfishing. Overfished status could not be determined. As a reminder, the assessment completed in 2017, was not recommended for peer review, so current stock status is unknown.

But as you guys all know, in the absence of a recent peer reviewed assessment we're using the traffic light analysis at this time. Moving on to the status of the fishery. We'll start to look at Atlantic croaker landings. In this figure the black line is commercial landings, and the red dashed line is recreational landings, both in millions of pounds.

Total Atlantic croaker harvest from New Jersey through the east coast of Florida in 2022, was estimated to be 2.8 million pounds, and the commercial and recreational fishery harvested 25 percent and 75 percent of the 2022 total respectively. About 684,000 pounds of Atlantic croaker were harvested commercially in 2022, which is the lowest of the time series, dating back to 1950. Within the management unit, the majority of the 2022 commercial landings came from North Carolina, followed by Virginia and Florida. I will now review the Atlantic croaker recreational landings and releases. In this figure, the blue bars represent landings of Atlantic croaker in millions of fish, and the red bars are fish released alive.

Then the black line is percent of fish that were released out of the total catch. In 2022, anglers released 30.5 million fish, which is an increase from the 27.4 million fish released in 2021. Anglers also released a slightly greater percentage of the total recreational catch in 2022, compared to 2021.

An estimated 85.5 percent of the total recreational croaker catch was released in 2022, which is the

highest percentage on record for a second year in a row. Last year was just slightly lower, 84 percent. The 2022 recreational landings were estimated at 5.1 million fish, and 2.1 million pounds, which was pretty similar to the previous year. The PRT recommendations are pretty straightforward.

They found no inconsistencies among states, in regard to the FMP requirements, and again as a reminder, states are permitted to request de minimis status if for the three previous years which data are available, their average commercial landings or recreational landings by weight constitute less than 1 percent of the coastwide commercial or recreational landings for the same three-year period.

A state seemed to qualify for de minimis in either its recreational or commercial sector, or both, but will only qualify for exemptions in the sector which qualify for de minimis. This year, New Jersey, Delaware, South Carolina and Georgia requested de minimis status for their commercial fisheries, and New Jersey and Delaware requested de minimis for the recreational fishery.

The PRT found that these states met all the requirements of de minimis for the sectors they requested it for. Again, additional research and monitoring recommendations can be found in the FMP Review Document. I'll stop there for any questions.

CHAIR BATSAVAGE: Any questions on the Atlantic croaker FMP review? Okay, seeing none; we'll move on to spotted sea trout.

MS. BAUER: All right, thanks, Mr. Chair. Lastly, Spotted Sea Trout FMP Review. Spotted sea trout is currently managed under the Omnibus Amendment to the Spanish mackerel, spot and spotted sea trout FMPs. This amendment established a 12-inch total length minimum size limit, or a comparable mesh size requirement. It also established de minimis and applies guidelines, keeping the FMP in line with ASMFC guidelines and established adaptive management.

I'll briefly review what is known about the spotted

These minutes are draft and subject to approval by the Sciaenids Management Board.

The Board will review the minutes during its next meeting

sea trout stock status through these state-specific stock assessments. There has been no coastwide assessment of spotted sea trout, as the PRT has not recommended one due to the life history of the species and availability of data. In 2019, the Florida stock assessment update on Florida's Atlantic coast used the regional base assessed model to estimate current transitional spawning potential ratios. It estimated 31 percent in the northeast management region, which was below their 35 percent management target, and then 34 percent in the southeast management region, which was just below or at the management target. Work on a new benchmark stock assessment is underway in Florida, and is scheduled to be completed in the fall of 2024.

Then there was a recently completed, just last year, a benchmark stock assessment for spotted sea trout in North Carolina and Virginia waters. It was completed and approved for management use in North Carolina in late 2022. The assessment indicated the spotted sea trout stock in North Carolina and Virginia waters was not overfished, but overfishing was occurring.

A review of the North Carolina FMP is currently underway, and Amendment 1 to the North Carolina spotted sea trout FMP will focus on management to end overfishing, and ensure sustainable harvest. Again, I'll move into a brief summary of the status of the fishery, starting with an overview of the commercial and recreational harvest.

This figure shows coastwide recreational and commercial harvest for spotted sea trout by year in millions of pounds. In 2022, the commercial landings totaled about 681,000 pounds, which is an 11 percent decrease from 2021, and North Carolina accounted for a majority of the commercial landings with 88 percent, followed by Virginia at 10 percent.

Total recreational landings with the past total commercial landings every year since recreational landings were first recorded in 1981. Recreational harvest has in general remained stable throughout the time series, with an average of 4 billion fish in the last four years, the last five years, and recreational harvest in 2022 was 6.5 million pounds or 3.8 million

fish, with North Carolina, Georgia and Florida responsible for the largest shares in numbers of fish.

I will now focus on the recreational catch and releases. In this figure it shows coastwide recreational catch in millions of fish, with harvest shown on the gray line and releases shown on the black dash line. In 2022, recreational catch totaled 25.9 million fish, which was a 17 percent increase from 2021.

The percent of fish released in 2022, 83 percent was about equal to the percent of fish released in 2021. The number of fish released has averaged 18.9 million fish in the last ten years, and in 2022, 22.1 million fish were released, which is the third highest number released in the time series, and the highest since 2018. Finally, a slide sea trout PRT recommendations. The PRT found no inconsistencies among states with regard to the FMP requirements, and recommended approval of the state compliance reports and de minimis status for New Jersey and Delaware.

For spotted sea trout, a state qualifies for de minimis status if it's previous three-year average of combined commercial and recreational harvest is less than 1 percent of the previous three-year average coastwide. The PRT found that both New Jersey and Delaware met these requirements, so again additional research monitoring recommendations are found in the FMP review document, and I can take any questions.

CHAIR BATSAVAGE: Any questions on the Spotted Sea Trout FMP Review? Joe Cimino.

MR. JOE CIMINO: I was just curious. I know groups tend to look at tagging data for red and black drum. But has there ever been kind of like a review of tagging data for speckled trout, just to get some idea of movement and interstate activity?

MS. BAUER: I know I could speak towards North Carolina's effort. Spotted sea trout tagged in North Carolina have been found up the Chesapeake Bay, up into Virginia and Maryland waters. I'm not sure they've gone any farther than that though. My

information is about a year or so out of date. I don't know if Virginia has any information about theirs.

CHAIR BATSAVAGE: Shanna.

MS. MADSEN: We have, I mean we obviously still continue tagging. We have our tagging program. I don't know who has necessarily been reviewing it, in order see if trends have been changing, or anything like that. But if it's something that you would be interested in, we can definitely look into it.

CHAIR BATSAVAGE: Erika.

MS. BURGESS: Joe, are you interested in it for a stock unit understanding, or are you interested in movement?

MR. CIMINO: A little of both. I'm just wondering if New Jersey has interest in having new regulations, and I'm just trying to kind of understand where our fish are coming from.

MS. BURGESS: I doubt they are coming from Florida, but we have a genetic analysis of the stock units in our state, if you're interested.

CHAIR BATSAVAGE: Good, thanks, yes, I guess this is something, oh we don't have a TC, this is a Plan Review Team, right for speckled trout.

MS. BAUER: Yes, correct, spotted sea trout only has a PRT.

CHIAR BATSAVAGE: Okay, so I guess if it was an interest to the Board and at a future meeting to have some analysis or information on tagging movements. Is that something that could possibly be done, Tracey? It kind of falls out of the typical realm where you have a TC that provides this information. In this case, it could be the individual states providing information, or it could be just kind of done more informally, to where maybe the states can provide, Joe can reach out offline to those states. I'll look to Joe.

MR. CIMINO: That's fine. I'll reach out to the states, I appreciate that.

CHAIR BATSAVAGE: Yes, it might be the easiest solution. Any other questions on spotted sea trout? Okay, then we are at a point for motions. Tracey, I don't know if it's a one large motion, or do we have individual motions for each FMP review?

MS. BAUER: I think we've settled on individual motions for each FMP review.

CHAIR BATSAVAGE: Okay, that makes perfect sense. Starting off, I guess in order with Red Drum. Get a motion up on the board, see who would like to make it. Lynn Fegley.

MS. LYNN FEGLEY: **I would move to approve the Red Drum FMP Review for the 2022 fishing year, state compliance reports and de minimis status for New Jersey and Delaware.**

CHAIR BATSAVAGE: Okay, Erika Burgess seconds the motion. Any discussion on the motion? **Any opposition to the motion? Motion passes unanimously.** Next up will be Croaker. Get it up on the board. Okay, see who would like to make a motion for this. Shanna, want to read that into the record, please?

MS. MADSEN: **Move to approve the Atlantic Croaker FMP Review for the 2022 fishing year, state compliance report and de minimis status for New Jersey, Delaware, South Carolina and Georgia commercial fisheries, and New Jersey and Delaware recreational fisheries.**

CHAIR BATSAVAGE: Okay, Roy, I saw your hand go up too at the same time, you second that? Okay. **Any discussion on the motion? Any opposition to the motion? That motion also carries unanimously.** Last but not least Spotted Sea Trout. All hands go up. Ingrid, read that in the record, please?

MS. INGRID BRAUN: **Move to approve the Spotted Seatrout FMP review for the 2022 fishing year, state compliance reports, and de minimis status for New Jersey and Delaware.**

CHAIR BATSAVAGE: I'll allocate the second, I saw John Clark's hand go up, so second by John Clark. **Is**

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

there any opposition to the motion? That motion also passes unanimously.

PROGRESS UPDATE ON 2024 RED DRUM, ATLANTIC CROAKER, AND SPOT BENCHMARK STOCK ASSESSMENTS

CHAIR BATSAVAGE: Next item to cover is the Progress Update on the 2024 Red Drum, Atlantic Croaker, and Spot Benchmark Stock Assessment. I'll turn to Jeff Kipp to give us an update.

MR. JEFF J. KIPP: There are three items I'll be covering for this agenda item. The first two will be progress updates on the ongoing Red Drum, Spot and Atlantic Croaker assessments. It will require no Board action. The third item will be to consider an update to the Atlantic Croaker and Spot Stock Assessment Subcommittee, which is an action item.

The Red Drum Assessment kicked off earlier this year with data gathering. The TC and SAS met for a virtual data workshop in June, to review the available datasets and identify data development tasks to support the assessment. A particular development from the Data Workshop of interest to the Board was the decision to switch from a calendar year to a fishing year from September through August, for tracking the stocks in the assessment models.

All population estimates and stock status will be based on this fishing year definition. This decision will provide some benefits like matching the model's age structure to the biological age structure, but did require recalculating datasets, so I did want to acknowledge the TC for taking on the additional workload.

The next milestones will be an assessment workshop in a few weeks in Charleston, South Carolina. The SAS will meet to review follow ups from the Data Workshop and model development. For the remainder of the process, we'll have a second assessment workshop in March, to finalize the model results and stock status determinations. A peer review workshop in August, which will be coordinated by SEDAR, and the assessment and peer

review will be presented to the Board at the annual meeting next year.

REVIEW AND CONSIDER RECOMMENDED CHANGES TO THE TIMELINE FOR THE SPOT AND ATLANTIC CROAKER BENCHMARK STOCK ASSESSMENTS

MR. KIPP: Now moving to the Spot and Croaker Assessments, which are going through the assessment process together, with a joint Stock Assessment Subcommittee.

The original timeline was similar to the Red Drum Assessment. We started off earlier this year with data gathering. The TCs and SAS met in May for a virtual data workshop, to review datasets and identify data development tasks. Following the Data Workshop and before our first Assessment Workshop, we did have an unscheduled item come up, which was the lead analyst for the Croaker Assessment model, Laura Lee from NCDMF taking a new position, and she will no longer be able to serve as the lead analyst role.

This development created a personnel and experience bottleneck that required the SAS to revise the assessment timeline and request additional support on the SAS during the Policy Board meeting at the Commission's August meeting. We did not find a new lead analyst, but we did receive a nomination for our SAS member, with stock synthesis expertise that could support our remaining lead analyst for the assessment.

We did move forward with an assessment workshop in September, to review follow ups on data workshop items, and to begin development of a model for croaker, anticipating the delay for the Spot Assessment. I won't go into the top of the slide here, given that this was just presented and approved at the Policy Board. We did modify the assessment timeline, but for a few additional details on the remaining croaker timeline. We do have an assessment workshop in February, and a peer review in the summer of next year.

The assessment and peer review will be presented to

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

the Board at the annual meeting next year, along with Red Drum. Then the new Spot timeline will delay the assessment until November of 2024, when we will revisit updated data. There will be an assessment workshop in February of 2025, and the assessment will be peer reviewed in the summer of 2025.

The assessment and peer review will be presented to the Board at the 2025 annual meeting. I do want to note that this is a fairly aggressive timeline to get both of these assessments completed, following the loss of expertise and support that we experienced, and it will be dependent on having the TCs and SAS fully engaged throughout both assessments over the next several years.

As I noted a few slides back, we did receive a nomination for a new SAS member to help support the assessment. That nomination for your consideration is Trey Mace from Maryland DNR. If approved, Trey would be joining the existing SAS membership listed on the screen, and would fill the spot vacated by Laura Lee. That concludes my presentation, I can take any questions on the assessment.

CHAIR BATSAVAGE: Thanks, Jeff, any questions? Yes, Spud.

MR A. G. "SPUD" WOODWARD: Thank you, Jeff. Obviously, the Data Workshops were conducted before this FES issue was revealed to us. Do you anticipate during the assessment workshops that there are going to be some discussions about the possible bias in some of that data, and how to address it? I think all of us are going to be a little concerned that we may have some distorted results in these assessments, because of that unknown, but probably existing bias.

MR. KIPP: Yes, thanks for that question. We do anticipate having discussions about that. We did proactively meet with MRIP staff, and did discuss some potential sensitivity runs that we could explore during our Assessment Workshops to help understand what the potential implications would

be, noted that some of these assessments will be completed before those adjusted data are available.

We don't anticipate major complications, because what was covered at that MRIP presentation was that MRIP expects these effort changes to be consistent across years. What we think we're going to see is a scaling effect, where we have a lower magnitude in catch, but a similar trend through time.

In terms of the assessment stock and stock status, we would expect certainly the population biomass and abundance estimates to decrease, with effort changes that decrease. But the overall trends in those population estimates should be similar. But we will certainly include those sensitivity runs, to better understand that, and that will be part of that assessment package.

CHAIR BATSAVAGE: Yes, follow up, Spud.

MR. WOODWARD: I'm just looking ahead into the future. We did the sensitivity runs; we make an evaluation of where there is a risk. I guess I'm making erroneous management decisions. I guess the other question is going to be, when we get the results of this expanded FES study, should that affect the timing of when we do the next assessments? I mean if we find something that is of great concern to us, are we going to need to maybe make some adjustments, and update those stock status determinations, maybe earlier than we would have done otherwise?

MR. KIPP: Yes, definitely. I think the SAS can consider that we do have a Term of Reference for the assessment that makes it the responsibility of the SAS and TC to make recommendations on future assessment updates and benchmarks. I think certainly, with some of those preliminary sensitivity runs.

Having an understanding there that will help play into those recommendations, and we could start and make a recommendation to update those assessment models a year or two after, once those updated MRIP data become available, if it does look like there is going to be some implications.

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

CHAIR BATSAVAGE: Yes, I guess that could probably also have potential implications for future management too. Where if there was a management response that was being considered from the assessment. I guess we would have to look at the results and see how that is impacted by the new FES estimates, to determine whether, do the assessment update before considering management, but I guess we'll cross that bridge when we get to it. But I think those are good questions and things to consider over the next few years. Any additional questions for Jeff? Seeing none.

to adjourn. Plenty of hands, we are adjourned, thanks everyone and safe travels home.

(Whereupon the meeting adjourned at 1:00 p.m. on October 19, 2023)

REVIEW AND POPULATE ATLANTIC CROAKER AND SPOT STOCK ASSESSMENT SUBCOMMITTEE MEMBERSHIP

CHAIR BATSAVAGE: Then what we have before us then is to Consider Approval of the Stock Assessment Subcommittee nomination for spot and croaker for Trey Mace. I'll be looking for a motion for that. Lynn.

MS. FEGLEY: I am thrilled to **nominate Trey Mace to the Spot and Atlantic Croaker Stock Assessment Subcommittee.**

CHAIR BATSAVAGE: Okay, and second by Malcolm Rhodes. **Any discussion on the motion? Any objection or opposition? Seeing none; the motion carries.** Greatly appreciate Trey joining the SAS, definitely could use as much stock assessment help as we can, to get both these assessments done, in addition to the other assessments going on too.

ADJOURNMENT

CHAIR BATSAVAGE: That leaves us with Other Business. Is there any other business to come before the Sciaenids Board? Okay, seeing none; this should be my last meeting as Board Chair for the Sciaenids Board.

I appreciate the opportunity to do this over the last couple years. Next time we meet we'll be under the capable leadership of Doug Haymans. Doug, you've got your work cut out for you with a few assessments coming up. I think we'll be fine. Look for a motion

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

DRAFT FOR BOARD REVIEW

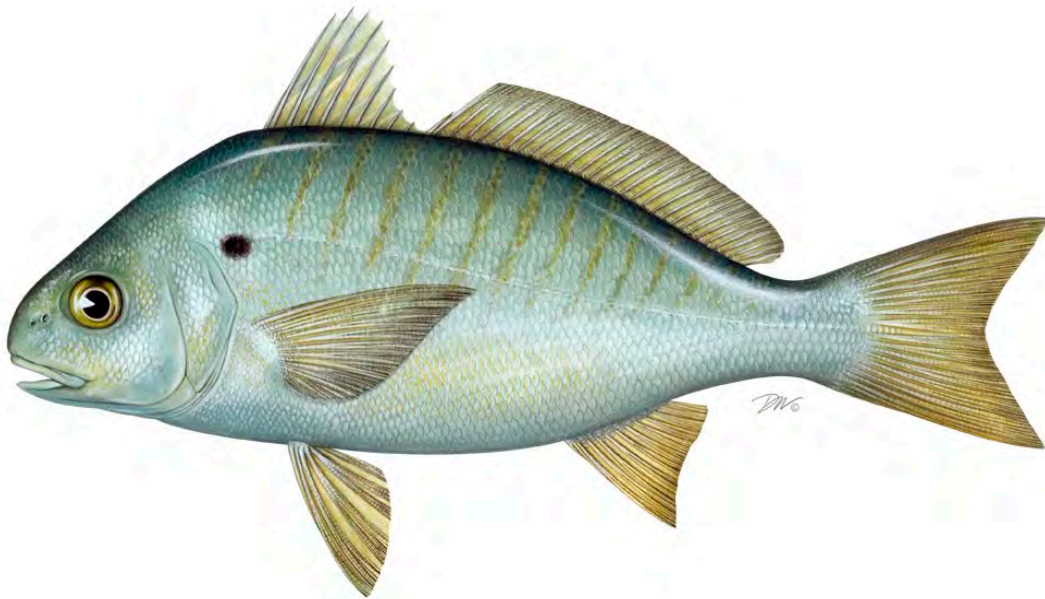
ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR

SPOT
(*LEIOSTOMUS XANTHURUS*)

2022 FISHING YEAR



Drafted by the Plan Review Team
Drafted January 2024



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT FOR BOARD REVIEW

Table of Contents

I. STATUS OF THE FISHERY MANAGEMENT PLAN	2
II. STATUS OF THE STOCK.....	3
III. STATUS OF THE FISHERY	4
IV. STATUS OF ASSESSMENT ADVICE	4
V. STATUS OF RESEARCH AND MONITORING	5
VI. STATUS OF MANAGEMENT MEASURES AND ISSUES	5
VII. DE MINIMIS REQUESTS.....	7
VIII. IMPLEMENTATION OF FMP COMPLIANCE REQUIREMENTS FOR 2022	8
IX. RECOMMENDATIONS OF THE PLAN REVIEW TEAM.....	8
X. REFERENCES	9
XI. FIGURES	10
XII. TABLES.....	15

DRAFT FOR BOARD REVIEW

I. Status of the Fishery Management Plan

Date of FMP Approval: October 1987; Omnibus Amendment August 2011

Amendments and Addenda: Addendum II (2014); Addendum III (February 2020)

Management Area: The Atlantic coast distribution of the resource from Delaware through Florida

Active Boards/Committees: Sciaenids Management Board; Spot Plan Review Team; Spot Technical Committee; Spot and Atlantic Croaker Stock Assessment Subcommittee; South Atlantic Species Advisory Panel

[The Fishery Management Plan \(FMP\) for Spot](#) was adopted in 1987 and includes the states from Delaware through Florida (ASMFC 1987). In reviewing the early plans created under the Interstate Fisheries Management Plan process, the ASMFC found the Spot FMP to be in need of evaluation and possible revision. A Wallop-Breaux grant from the U.S. Fish and Wildlife Service was provided to conduct a comprehensive data collection workshop for spot. The October 1993 workshop at the Virginia Institute of Marine Science was attended by university and state agency representatives from six states. Presentations on fishery-dependent and fishery-independent data, population dynamics, and bycatch reduction devices were made and discussed. All state reports and a set of recommendations were included in the workshop report (Kline and Speir 1993).

Subsequent to the workshop and independent of it, the South Atlantic State/Federal Fisheries Management Board (Management Board) reviewed the status of several plans in order to define the compliance issues to be enforced under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The Management Board found recommendations in the plan to be vague and perhaps no longer valid, and recommended that an amendment be prepared to the Spot FMP to define the management measures necessary to achieve the goals of the FMP. In their final schedule for compliance under the ACFCMA, the ISFMP Policy Board adopted the finding that the FMP does not contain any management measures that states are required to implement. In August 2009, the Management Board expanded the initiated amendment to the Spanish Mackerel FMP to include spot and spotted seatrout, creating the [Omnibus Amendment for Spot, Spotted Seatrout and Spanish Mackerel](#). The goal of the Omnibus Amendment was to update all three plans with requirements specified under the Atlantic Coastal Fisheries Cooperative Management Act (1993) and the Interstate Fishery Management Program Charter (1995). In August 2011, the Management Board approved the Omnibus Amendment for Spot, Spotted Seatrout, and Spanish Mackerel. This Amendment did not set specific management measures for spot but it did align management of the species with the requirements of ACFCMA.

In August 2014, the Board approved [Addendum II to the Omnibus Amendment](#). The Addendum establishes use of a Traffic Light Analysis (TLA) to evaluate fisheries trends and develop state-

DRAFT FOR BOARD REVIEW

specified management actions (e.g., bag limits, size restrictions, time and area closures, and gear restrictions) when harvest and abundance thresholds are exceeded.

In February 2020, the Board approved [Addendum III to the Omnibus Amendment](#), which revised the TLA's trigger mechanism and management responses for the recreational and commercial fisheries. Under Addendum III, management action is triggered if harvest and abundance thresholds within a regional or coastwide TLA analysis are met or exceeded for any two of the three terminal years. If management action is triggered, the coastwide response includes recreational bag limits and quantifiable measures to achieve percent reductions in commercial harvest. Response requirements vary depending on which threshold is exceeded. Addendum III also defines the mechanism by which triggered management actions may be removed, after abundance characteristics are no longer triggering management action.

II. Status of the Stock

A benchmark stock assessment for spot was completed in 2017 but was not recommended for management use by the Peer Review Panel (ASMFC 2017). Therefore, stock status is unknown.

The stock is also monitored annually using the Traffic Light Analysis (TLA), as described below.

Traffic Light Analysis

As part of the requirements under the 2011 Omnibus Amendment, for years in-between benchmark stock assessments, the Spot PRT was tasked with conducting annual monitoring analyses. These trigger exercises compared five data sources to the 10th percentile of the data sets' time series. If two terminal values of the five data sources (at least one of which must be fishery independent) fell below the 10th percentile, the Management Board would be prompted to consider management action.

In August 2014, the Board approved Addendum II to the Omnibus Amendment. The Addendum established the TLA as the new precautionary management framework to evaluate fishery trends and develop management actions. The TLA framework replaces the management trigger stipulated in the Omnibus Amendment after concern that the triggers were limited in their ability to illustrate long-term declines or increases in stock abundance. In contrast, the TLA is a statistically-robust way to incorporate multiple data sources (both fishery-independent and -dependent) into a single, easily understood metric for management advice. It is an effective method to illustrate long-term trends in the fishery.

The TLA was originally developed as a management tool for data poor fisheries. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of population indicators. When a population characteristic improves, the proportion of green in the given year increases. Harvest and abundance thresholds of 30% and 60% red were established in Addendum II, representing moderate and significant concern for the fishery. If thresholds for both adult population characteristics achieve or exceed a threshold for two out of the most recent three years, then management action is enacted. Under recently approved Addendum

DRAFT FOR BOARD REVIEW

III, management action will be triggered if harvest and abundance thresholds within a regional or coastwide TLA analysis are met or exceeded for any two of the three terminal years. Management measures were triggered at the 30% threshold after reviewing the 2020 TLA (2019 terminal year).

III. Status of the Fishery

Total landings of spot in 2022 are estimated at 3.9 million pounds, a decrease of 45% from 2021 (7.1 million pounds) and below the 10 year average of 8.3 million pounds (Tables 1 and 2). It should be noted that recreational and commercial regulations implemented in 2021 and 2022 may be a contributing factor for declines observed in both sectors in 2022. The recreational fishery harvested more than the commercial fishery (62% and 38% respectively, in 2022, by pounds). Although historical harvests were more evenly split between sectors, since 2005 harvests have been heavily recreational (roughly 30% commercial and 70% recreational, by pounds).

From 1950-2022, commercial spot landings have ranged between 632,950 pounds in 2016 and 14.52 million pounds in 1952 (Figure 1). In 2022, 1.5 million pounds were harvested commercially. Virginia landed approximately 55% of the commercial harvest in 2022, followed by North Carolina with 26% (Table 1). Spot are a major component of Atlantic coast scrap landings (NCDMF 2001). A scrap fishery is one in which fish species that are unmarketable as food, due to size or palatability, are sold unsorted, usually as bait. The majority of estimated removals for spot come from the South Atlantic shrimp trawl fishery discards (ASMFC 2017).

The recreational harvest of spot along the Atlantic coast from 1981 to 2022 has varied between 12.8 million fish in 2022 and 54.4 million fish in 1985 (or 2.4 and 17.3 million pounds; Figures 1 and 2). Recreational harvest has fluctuated widely throughout the time series. Harvest has generally declined from the most recent peak in 2014, with the time series low harvest occurring in 2022. In 2022, recreational landings declined by approximately 2.6 million fish from 2021, or a decline of about 52% (Tables 2 and 3). Anglers in Virginia harvested 70% of the coastwide number of fish in 2022, followed by anglers in Maryland (13%). Many anglers are known to catch spot to use as bait, as well as for other recreational purposes. The estimated number of spot released annually by recreational anglers has varied between 4.7 and 30.4 million fish, with 2022 releases estimated at 16.1 million fish, a 1.1 million fish increase from 2021. Releases have been increasing annually since a low in 2018 (Figure 2, Table 4).

IV. Status of Assessment Advice

A benchmark stock assessment for spot was completed in 2017 but was not recommended by the Peer Review Panel for management use because of uncertainty in biomass estimates due to conflicting signals among abundance indices and catch time series, as well as sensitivity of model results to assumptions and model inputs (ASMFC 2017). The Review Panel recommended continued annual monitoring of spot through the TLA, with incorporation of shrimp trawl discard estimates, and another benchmark assessment in 2024. Work on the new benchmark stock assessment began in early 2023, but the completion of this assessment has

DRAFT FOR BOARD REVIEW

been delayed until after the completion of the the Atlantic Croaker benchmark assessment, due to the loss of a lead modeler from the joint stock assessment subcommittee.

V. Status of Research and Monitoring

There are no research or monitoring programs required of the states except for the submission of an annual compliance report. Catch and effort data are collected by the commercial and recreational statistics programs conducted by the states and the National Marine Fisheries Service (NMFS). Biological characterization data from fishery landings are also available from several states. Specifically, age data are now available from Maryland, Virginia, North Carolina, and South Carolina. Recruitment indices are available from surveys in Delaware, Maryland, Virginia, North Carolina, and South Carolina. Adult or aggregate (mix of juvenile and older spot) relative abundance indices are available from New Jersey, Delaware, Maryland, North Carolina, South Carolina, Georgia, and the Southeast Area Monitoring and Assessment Program (SEAMAP) (covering North Carolina through Florida). These surveys, in addition to the Northeast Fisheries Science Center (NEFSC) Bottom Trawl Survey, the Northeast Area Monitoring and Assessment Program (NEAMAP), the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), and the Chesapeake Bay Fishery-Independent Multispecies Survey (CHESFIMS), collect a variety of biological data elements. Many of these surveys were either suspended or interrupted in 2020, and to a lesser extent in 2021, due to the COVID-19 pandemic.

Traffic Light Analysis

The Traffic Light Analysis was not conducted in 2023 so the TC could focus on working on the 2025 benchmark stock assessment. A summary of last year's TLA can be found in last year's FMP Review [here](#), or in the report [here](#).

VI. Status of Management Measures and Issues

The FMP for spot identified two management measures for implementation: 1) promote the development and use of bycatch reduction devices through demonstration and application in trawl fisheries, and 2) promote increases in spot yield per recruit by delaying their entry into the fishery until age one or older.

Considerable progress has been made in developing bycatch reduction devices (BRDs) and evaluating their effectiveness. Proceedings from a 1993 spot and Atlantic croaker workshop summarized much of the experimental work on bycatch reduction, and many states have conducted subsequent testing. For example, North Carolina Division of Marine Fisheries (NCDMF) conducted research on the four main gear types (shrimp trawl, flynet, long haul seine, and pound net) responsible for the bulk of the scrap fish landings in order to reduce the catch of small fish. State testing of shrimp trawl BRDs achieved finfish reductions of 50-70% with little loss of shrimp, although total bycatch numbers relative to shrimp fishery effort are still unknown. The Virginia Marine Resources Commission investigated the use of culling panels in pound nets and long haul seines to release small Atlantic croaker, spot, and weakfish. The

DRAFT FOR BOARD REVIEW

Potomac River Fisheries Commission (PRFC) also investigated the use of culling panels in pound nets, finding that the panels allowed the release of 42% of captured spot less than eight inches in length (Hager 2001).

Following favorable testing, devices have been made mandatory or recommended in several state fisheries. The use of BRDs is required in all penaeid shrimp trawl fisheries in the South Atlantic. The PRFC recommends the use of culling panels in pound nets and allows those nets with panels to keep one bushel of bycatch of flounder and weakfish. In North Carolina, escapement panels have been required in the bunt nets of long haul seines in an area south and west of Bluff Shoals in the Pamlico Sound since April 1999. However, evaluation of the beneficial effects of BRDs to spot stocks continues to need further study.

General gear restrictions, such as minimum mesh sizes or area trawling bans, have helped protect some age classes of spot. Florida banned the use of entangling nets in nearshore and inshore waters in 1995. Georgia banned the use of gillnets (except for shad fishing) in 1957 and banned trawling in the sounds in 1990. Some states had implemented creel limits to regulate harvest prior to 2021. Georgia has had a 25-fish spot creel limit (both recreational and commercial, except for shrimp trawlers). South Carolina has an aggregate bag limit (50 fish) for hook and line fishing of spot, Atlantic croaker, and kingfish/whiting (*Menticirrhus* sp.).

Please see the below section “Recent Changes in State Regulations” for more information on the management measures that were put into place in 2021 or 2022 after management action was triggered at the 30% threshold in the 2020 TLA.

Omnibus Amendment (Interstate)

In August 2011, the Management Board approved the development of an amendment to the Spot FMP to address three issues: compliance measures, consistency with federal management in the exclusive economic zone, and alignment with Commission standards. The updated FMP’s objectives are to: 1) Increase the level of research and monitoring on spot bycatch in other fisheries, in order to complete a coastwide stock assessment; 2) Manage the spot fishery stock to maintain the spawning stock biomass above the target biomass levels; 3) Develop research priorities that will further refine the spot management program to maximize the biological, social, and economic benefits derived from the spot population. The Omnibus Amendment does not require specific fishery management measures in either the recreational or commercial fisheries for states within the management unit.

Addendum II

In August 2014, the Board approved Addendum II which establishes a new management framework (i.e., Traffic Light Analysis) to evaluate fisheries trends and develop state-specified management actions (i.e., bag limits, size restrictions, time & area closures, and gear

DRAFT FOR BOARD REVIEW

restrictions) when harvest and abundance thresholds are exceeded over two years. Management measures would remain in place for two years.

Addendum III

In February 2020, the Board approved Addendum III, which revises the TLA and requires coastwide management action if harvest and abundance thresholds are exceeded in two of the three most recent years. Management measures would remain in place for a minimum of two years and until abundance characteristics are no longer triggering management action.

Recent Changes in State Regulations

Due to the triggering of the 2020 TLA at the moderate 30% threshold, non *de minimis* states were required to implement a 50-fish recreational bag limit and implement commercial regulations that would have reduced the average 10 year commercial harvest by 1%. New regulations were required to be in place by the end of 2021. A summary of spot regulations that were implemented as of January 1, 2023 can be found in Table 5.

De minimis Guidelines

A state qualifies for *de minimis* status if its past 3-years' average of the combined commercial and recreational catch is less than 1% of the past 3-years' average of the coastwide combined commercial and recreational catch. Those states that qualify for *de minimis* are not required to implement any monitoring requirements, none of which are included in the plan, and are not required to implement TLA triggered regulations outlined in Addendum III.

VII. De Minimis Requests

New Jersey, Delaware, and Georgia request *de minimis* status. New Jersey and Georgia meet the requirements, and so the PRT recommends that the Board approve the *de minimis* requests from New Jersey and Georgia.

Delaware exceeds the 1% threshold for the third year in a row. In the [FMP review for fishing year 2021](#), the PRT stated that if Delaware exceeded the percentage for *de minimis* for a third year, they would no longer recommend *de minimis* status for Delaware. However, Delaware's exceedance for fishing year 2022 was extremely minimal at 1.05%, and has ranged between 1.05% and 1.20% in the last three years. Delaware has historically been *de minimis*.

In requesting continued *de minimis*, Delaware notes the following: 1) Delaware's recreational harvest has been below 1% of the coastwide harvest since 2016; 2) Delaware's exceedance of the 1% combined recreational and commercial harvest threshold is due to Delaware's commercial harvest exceeding 1% of coastwide harvest for a majority of the past 10 years; 3) Delaware's exceedance of the 1% *de minimis* threshold for combined harvest over the past few years is due to the coastwide decline in recreational landings being larger than the coastwide decline in commercial landings, thus increasing the importance of commercial landings in the

DRAFT FOR BOARD REVIEW

combined *de minimis* calculations; and 4) Delaware's recreational and commercial harvest are closer to those of the *de minimis* states than to the states responsible for most of the spot harvest.

The PRT does not recommend *de minimis* status for Delaware. In addition to Delaware total harvest being over the 1% threshold for the third year in a row, the PRT notes that the preliminary estimate of 2023 spot recreational harvest in Delaware is nearly 12 times the amount of 2022 harvest, and so Delaware will likely not qualify for *de minimis* in the following year either.

VIII. Implementation of FMP Compliance Requirements for 2022

All states within the management unit have submitted compliance reports for the 2022 fishing year. The PRT found no inconsistencies among states with regards to the requirements of the Omnibus Amendment and Addendum III.

IX. Recommendations of the Plan Review Team

Following the next assessment or when a new management document is initiated, whichever comes first, the PRT recommends that the Board consider changing the *de minimis* process and criteria for spot following the procedures in the recently approved ASMFC *De Minimis* Policy. The PRT would like to see separate commercial and recreational *de minimis* measures in place, rather than the combined recreational and commercial *de minimis* criteria. A change here will not only mirror Atlantic croaker *de minimis* structure, but provide more state flexibility for managing their commercial and recreational fisheries.

Research and Monitoring Recommendations

Additional research recommendations can be found in the most recent stock assessment peer review report found [here](#). The PRT had the additional research recommendations:

- Expand collection of life history data (age, growth, and reproduction data) from fishery dependent sources while maintaining these collections from ongoing state level fishery independent sources as well as multistate monitoring surveys. In addition, investigate identification of coastal stocks and their movement through tagging and genetic studies.
- Increase efforts to characterize commercial discards through expanded observer coverage, particularly within the shrimp trawl fishery, and develop a standardized by-catch protocol with collection of lengths and ages of discards and by-catch. Other sources for discard mortality studies include scrap and bait fisheries, commercial gears and recreational gear, and direct research and engagement of commercial harvesters.
- Investigate environmental impacts of temperature shifts, climate change, and large scale oceanic cycles (e.g., Atlantic Multi-decadal Oscillation [AMO] and El Nino Southern Oscillation [El Nino]) on recruitment, SSB, stock distribution and maturity schedules for incorporation into stock assessment models.

DRAFT FOR BOARD REVIEW

X. References

Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Spot. Washington (DC): ASMFC. Fisheries Management Report #11. 90 p.

ASMFC. 2017. [Spot Stock Assessment Peer Review Report](#). ASMFC, Stock Assessment Peer Review Report, 12 p.

Hager, C. 2001. Efficiency of haul-seine cull panels: A comparison of size selectivity and relative release second season. Fishery Resource Grant FRG 2000-06. Virginia Institute of Marine Science, William & Mary. <https://scholarworks.wm.edu/reports/2220>

Kline LL, Speir H (editors). 1993. Proceedings of a Workshop on Spot (*Leiostomus xanthurus*) and Atlantic Croaker (*Micropogonias undulatus*). Washington (DC): Atlantic States Marine Fisheries Commission. Special Report #25. 175 p.

North Carolina Division of Marine Fisheries (NCDMF). 2001. Assessment of North Carolina commercial finfisheries, 1997–2000. Final Report, North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries, Award Number NA 76 FI 0286, 1-3.

Spot Plan Review Team (PRT). 2012. Spot Data Availability and Stock Monitoring Report. 2009. Washington (DC): Atlantic States Marine Fisheries Commission. Report to the South Atlantic State-Federal Fisheries Management Board. 85 p.

DRAFT FOR BOARD REVIEW

XI. Figures

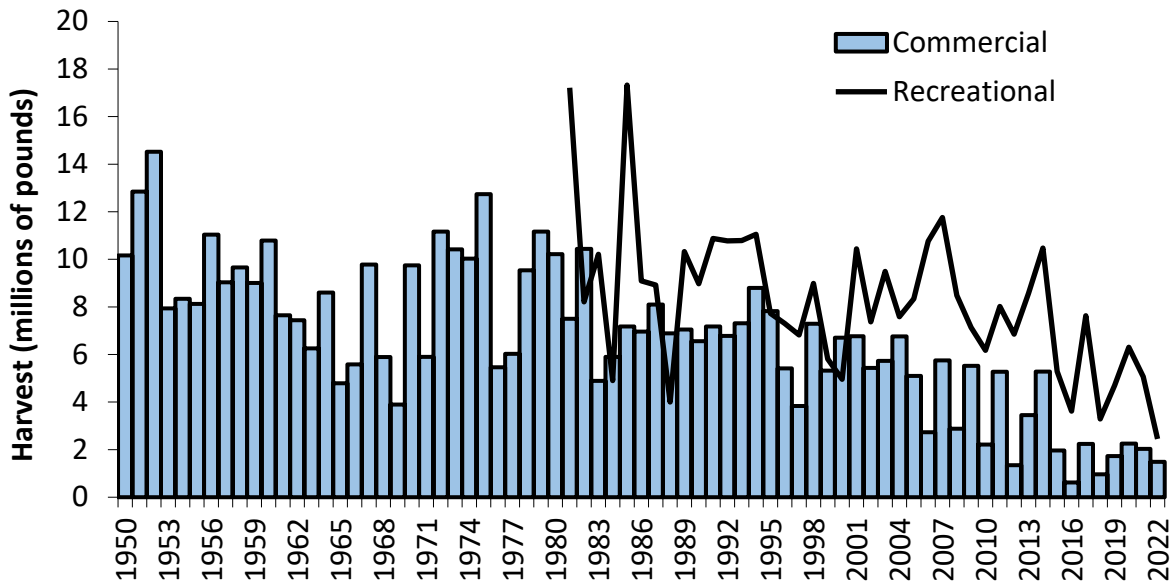


Figure 1. Spot commercial and recreational landings (millions of pounds), 1950-2022. (Recreational landings available from 1981-present; see Tables 1 and 2 for state-by-state values from 2013-2022 and data sources).

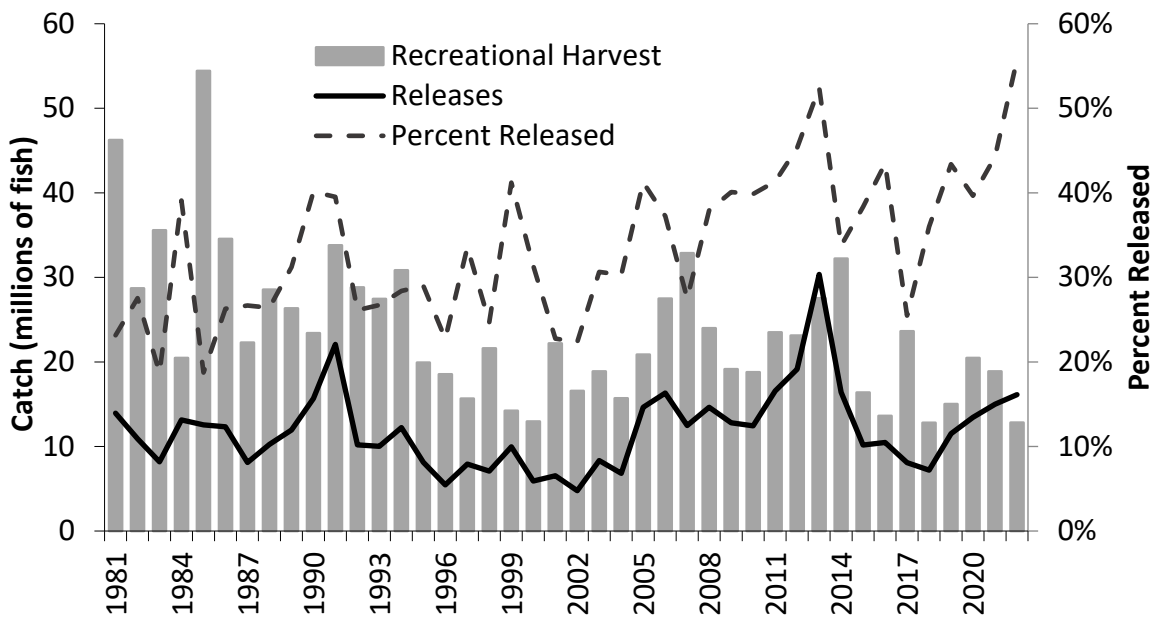


Figure 2. Spot recreational harvest and releases (millions of fish), as well as percent of the total catch that was released, 1981-2022. (See Tables 3 and 4 for state-by-state values from 2013-2022 and data sources).

DRAFT FOR BOARD REVIEW

Table 1. Commercial landings (pounds) of spot by state 2013-2022. (Source: ACCSP for 2021 and earlier for all jurisdictions, except PRFC; annual compliance reports for 2022 and for all PRFC years. “C” values are confidential. Total values adhere to the ACCSP rule of 3, i.e. totals are reflective of the true total if 0 or at least 3 states’ data are confidential in a given year. Otherwise, they are sums of non-confidential data.)

Year	N of NJ	NJ	DE	MD	PRFC	VA
2013	179,980	48,324	C	335,462	41,286	2,044,538
2014	C	29,683	C	348,435	148,908	3,843,869
2015	1,600	86	C	96,102	86,972	1,369,520
2016	1,880	26	C	18,105	8,480	266,859
2017	12,269	2,418	C	117,279	41,748	1,596,523
2018	4,696	10,809	C	58,480	41,747	558,932
2019	22,976	C	C	33,043	C	1,094,523
2020	684	25,882	C	73,669	C	1,512,946
2021	14,646	C	C	50,033	37,503	1,293,353
2022	3,171	C	C	30,912	35,346	816,464
	NC	SC	GA	FL		Total
2013	768,592	2,446	0	31,368		3,451,995
2014	766,224	5,917	C	16,742		5,281,330
2015	376,979	1,619	0	27,969		1,963,850
2016	241,044	1,059	0	82,875		617,288
2017	415,465	3,200	0	47,304		2,237,922
2018	167,696	4,514	0	68,864		960,299
2019	392,206	C	0	108,346		1,727,341
2020	542,870	C	0	22,424		2,255,189
2021	527,468	C	0	39,374		2,029,019
2022	543,104	C	0	22,992		1,487,230

DRAFT FOR BOARD REVIEW

Table 2. Recreational harvest (pounds) of spot by state, 2013-2022. (Source: MRIP for 2021 and earlier and annual compliance reports for 2022. Data dating back to 1981 are available upon request to the NMFS Fisheries Statistics Division.)

Year	N of NJ	NJ	DE	MD	VA
2013	18,889	423,887	244,253	720,315	3,443,742
2014	0	27,847	352,714	1,465,861	4,322,812
2015	0	0	30,693	469,462	551,389
2016	0	678	9,606	278,994	1,211,694
2017	0	1,064	340	1,086,667	5,019,896
2018	8,054	45,879	23,968	327,930	1,753,064
2019	3,719	13,451	72,556	809,736	2,283,558
2020	1,000	450	19,392	1,019,065	4,589,353
2021	0	19,765	54,021	1,071,972	3,231,201
2022	0	26,411	21,381	427,557	1,285,186
	NC	SC	GA	FL	Total
2013	1,789,251	1,708,520	10,525	213,949	8,573,331
2014	2,877,483	415,937	15,371	992,221	10,470,246
2015	833,390	2,539,187	2,573	861,523	5,288,217
2016	558,799	1,437,534	20,727	102,356	3,620,388
2017	909,796	522,645	8,282	76,502	7,625,192
2018	597,511	272,501	5,481	257,594	3,291,982
2019	841,998	105,650	24,107	534,214	4,698,989
2020	297,813	131,952	7,377	234,040	6,300,383
2021	435,231	171,999	3,337	78,463	5,065,989
2022	375,168	281,240	12,712	20,586	2,450,241

DRAFT FOR BOARD REVIEW

Table 3. Recreational harvest (numbers) of spot by state, 2013-2022. (Source: MRIP for 2021 and earlier and annual compliance reports for 2022. Data dating back to 1981 are available upon request to the NMFS Fisheries Statistics Division.)

Year	N of NJ	NJ	DE	MD	VA
2013	51,903	1,177,944	581,699	2,456,346	11,733,669
2014	0	54,853	590,613	4,396,291	13,652,625
2015	0	0	90,796	1,352,278	1,731,063
2016	0	2,052	29,700	1,145,272	5,279,153
2017	0	2,412	1,057	3,250,553	15,944,413
2018	39,083	106,332	70,390	1,209,971	7,360,908
2019	17,517	108,765	220,296	2,643,233	7,647,077
2020	6,046	2,133	58,294	3,640,484	14,963,420
2021	0	72,091	195,688	4,037,517	12,486,597
2022	0	108,648	79,460	1,638,380	8,928,353
	NC	SC	GA	FL	Total
2013	6,120,985	4,704,723	41,546	660,760	27,529,575
2014	8,343,467	1,258,300	68,852	3,847,994	32,212,995
2015	2,572,738	7,538,334	8,489	3,081,786	16,375,484
2016	1,928,716	4,974,300	61,252	203,651	13,624,096
2017	2,418,331	1,897,506	19,789	100,975	23,635,036
2018	2,068,865	895,830	15,553	1,039,402	12,806,334
2019	2,822,884	312,635	97,526	1,154,227	15,024,160
2020	920,512	391,298	24,225	457,671	20,464,083
2021	1,199,080	639,579	14,320	224,910	18,869,782
2022	1,197,145	747,290	43,773	68,340	12,811,389

DRAFT FOR BOARD REVIEW

Table 4. Recreational releases (numbers) of spot by state, 2013-2022. (Source: MRIP for 2021 and earlier and annual compliance reports for 2022. Data dating back to 1981 are available upon request to the NMFS Fisheries Statistics Division.)

Year	N of NJ	NJ	DE	MD	VA
2013	2,203	2,737,742	537,632	7,620,695	7,549,286
2014	0	34,941	237,395	2,206,814	4,125,116
2015	1,585	167,129	38,523	642,459	1,896,698
2016	0	2,705	16,620	713,418	2,858,405
2017	150	15,321	11,768	2,280,482	3,335,800
2018	15,467	37,739	69,619	943,468	3,043,068
2019	23	21,801	125,656	3,311,565	4,509,930
2020	0	36,591	235,832	5,560,590	5,156,762
2021	592	365,908	221,027	6,529,999	3,526,780
2022	0	1,324,071	473,868	3,671,723	7,767,650
	NC	SC	GA	FL	Total
2013	5,513,732	5,891,165	32,719	466,583	30,351,757
2014	4,043,710	1,908,552	74,795	3,781,382	16,412,705
2015	2,984,629	2,818,378	220,253	1,409,895	10,179,549
2016	1,831,415	3,421,589	335,695	1,296,190	10,476,037
2017	1,902,281	368,988	86,668	79,660	8,081,118
2018	2,062,163	315,406	70,598	649,404	7,206,932
2019	2,356,120	263,939	234,016	691,731	11,514,781
2020	1,673,676	384,252	115,347	281,175	13,444,225
2021	2,357,567	977,296	45,746	968,972	14,993,887
2022	2,331,484	192,706	310,532	59,608	16,131,642

DRAFT FOR BOARD REVIEW

Table 5. Summary of state regulations for spot in 2022, unless otherwise stated. For states that implemented regulations in 2021 or 2022, the date those regulations became effective is given.

State	Recreational	Commercial
NJ	None	None
DE	None	None
MD	50 fish/day, with additional charter live bait allowance (effective 6/14/21)	Open 4/10 to 11/24 (effective 6/14/21)
PRFC	50 fish/day (effective 1/1/22)	Open 1/1 to 10/28 (effective 1/1/22)
VA	50 fish/day, with additional charter live bait allowance (effective 4/15/21)	Open 4/15 to 12/8 (effective 4/15/21)
NC	50 fish/day (effective 4/15/21), recreational use of commercial gears with license and gear restrictions	Open 4/5 to 12/9 (effective 4/15/21)
SC	Mandatory for-hire logbooks, small Sciaenidae species aggregate bag limit of 50 fish/day	Small Sciaenidae species aggregate bag limit of 50 fish/day
GA	25 fish/day	25 fish/day limit except for trawlers harvesting shrimp for human consumption (no limit)
FL	50 fish/day (effective 12/1/21)	2,200 lbs vessel limit (effective 12/1/21)

Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

April 30, 2024
1:15 – 2:45 p.m.

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 (*C. McManus*) 1:15 p.m.
2. Board Consent 1:15 p.m.
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment 1:20 p.m.
4. Review Report on Acoustic Survey of Overwintering Atlantic Menhaden Offshore of New Jersey (*G. Nessler*) 1:30 p.m.
5. Updates from State Management Programs 1:50 p.m.
 - Maryland (*L. Fegley*)
 - Virginia (*P. Geer*)
6. Progress Update on 2025 Stock Assessments (*K. Drew*) 2:00 p.m.
 - Ecological Reference Point Benchmark Assessment
 - Atlantic Menhaden Single-Species Assessment Update
7. Elect Vice-Chair **Action** 2:40 p.m.
8. Other Business/Adjourn 2:45 p.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details

MEETING OVERVIEW

Atlantic Menhaden Management Board

April 30, 2024

1:15 p.m. – 2:45 p.m.

Chair: Conor McManus (RI) Assumed Chairmanship: 10/23	Technical Committee Chair: Caitlin Craig (NY)	Law Enforcement Committee Rep: Matthew Corbin (MD)
Vice Chair: Vacant	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: October 17, 2023
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 October 2023

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. Review Report on Acoustic Survey of Overwintering Atlantic Menhaden Offshore of New Jersey (1:30-1:50 p.m.)

Background

- In February 2024, Nesslage et al. submitted the results of a survey to generate estimates of biomass and characterize size, age, and sex, and maturity of the portion of the Atlantic menhaden stock that overwinters off the coast of New Jersey (**Briefing Materials**).

Presentations

- Review of Acoustic Survey by G. Nesslage.

5. Updates from State Management Programs (1:50-2:00 p.m.)

Background

- Maryland and Virginia will provide the latest updates on work relating to the study of Atlantic menhaden in Chesapeake Bay, including Maryland's data synthesis work on communicating the status of predator-prey balance.

Presentations

- Maryland update by L. Fegley
- Virginia update by P. Geer

6. Progress Update on 2025 Stock Assessments (2:00-2:40 p.m.)**Background**

- The Ecological Reference Point (ERP) Benchmark Assessment and the Atlantic Menhaden Single-Species Assessment Update are both scheduled to be completed for the 2025 Annual Meeting.

Presentations

- Update on ERP and single-species assessments by K. Drew.

7. Elect Vice-Chair**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

- 2025 Single-species and Ecological Reference Point Stock Assessments
- Annual compliance reports due August 1st

TC Members: Caitlin Craig (NY, Chair), Josh Newhard (USFWS), 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), Shanna Madsen (VMRC), Chris Swanson (FL), Ray Mroch (NMFS), Sydney Alhale (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), Caitlin Craig (NY, TC Chair), Brooke Lowman (VA), Matt Cieri (ME), Chris Swanson (FL), Sydney Alhale (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ), Katie Drew (ASMFC), Kristen Anstead (ASMFC), James Boyle (ASMFC)

ERP WG Members: Matt Cieri (ME, ERP Chair), Jason Boucher (NOAA), 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), Shanna Madsen (VMRC), Genny Nessler (MD), Kristen Anstead (ASMFC), Katie Drew (ASMFC)

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

**Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting**

October 17, 2024

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

TABLE OF CONTENTS

Call to Order, Vice-Chair Connor McManus1

Approval of Agenda1

Approval of Proceedings from May 1, 2023.....1

Public Comment1

Progress Update on Ecological Reference Point Benchmark Assessment.....3

Review Virginia Chesapeake Bay Menhaden Study Design Report7

Consider Fishery Management Plan Review and State Compliance for the 2022 Fishing Year Review 12

Adjournment 14

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of May 1, 2023** by consent (Page 1).
3. **Move to approve the Fishery Management Plan Review, state compliance reports, and de minimis requests for PA, SC, GA, and FL for Atlantic menhaden for the 2022 fishing year** (Page 14). Motion by Emerson Hasbrouck; second by Roy Miller. Motion passes by unanimous consent (Page 14).
4. **Move to adjourn** by consent (Page 14).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Tuesday, October 17, 2023, and was called to order at 1:30 p.m. by Chair Connor McManus.

CALL TO ORDER

CHAIR CONNOR McMANUS: Good afternoon, everybody. I would like to call to order the Atlantic Menhaden Management Board. By way of introduction, my name is Connor McManus; I'm the Vice-Chair of the Menhaden Management Board. Mel Bell was unable to join us today in person, so I'll be serving in this capacity today as Chair.

APPROVAL OF AGENDA

CHAIR McMANUS: The first item we have in our agenda is approval of the agenda. Is there any interest or questions or modifications to the agenda before us? Seeing no hands; I'll take that as approval by consent.

APPROVAL OF PROCEEDINGS

CHAIR McMANUS: That brings us to our next item on the agenda, for Approval of Proceedings from May, 2023 meeting from the Menhaden Management Board. Are there any amendments or questions or revisions proposed regarding those proceedings? All right, seeing no hands, we'll take that as approval by consent.

PUBLIC COMMENT

CHAIR McMANUS: With that, that moves us on to Public Comment. We'll be looking to take public comment up to three minutes per individual. I'll look first in the room. If there is anybody who would like to make public comment.

MR. SHAUN GEHAN: Thank you, Mr. Vice-Chair and members of the Commission. My name is Shaun Gehan; and I'm here representing Omega Protein and Ocean Harvesters. Over the course of the past year or so, a lot of the opponents of the Atlantic menhaden reduction fishery have taken up a lot of space in the written comments and time at the

microphone, and we've kind of sat back.

But there are a lot new people on the Commission that haven't been deeply involved in the menhaden management process, or seen the fishery that's evolved over the years, so we thought that it would make sense just to take a moment to sort of present a little background and some context for the comments.

I think one of the things it's important to understand here is this fishery used to be comprised of over 150 vessels, up to 20 operating reduction plants from Florida to Maine since the early 1950s. Today it's one plant, nine boats, three of which are just carry vessels. In terms of the health of the fishery, it's been above its ecological reference points, abundance levels since 1991, and it hasn't been subject to overfishing, according to the current definition of overfishing since 1986. Keep in mind that we've only been, the management process prior to that time had much less observed the management target. This fishery has been very healthy for a long time, it's among its second highest biomass estimate in 2021. In terms of the Chesapeake Bay, current harvest levels are about a third of what were prevailing in the mid-1980s, about half of you locals from the early 2000s, both in part to management action, a cap on reduction fishery in the Bay since 2006, and efforts by Omega and Ocean Harvesters to minimize user conflicts and reduce their footprints.

One of the things that has occupied a lot of my time is a new study about osprey in Mobjack Bay, and I'm asked James to forward something, which I really apologize, I just did like half an hour before this meeting. If he hasn't e-mailed it out, you'll see a document that specifically addresses that, and has some of the background materials

I know that Rob LaTour is here, and he can certainly speak to it better than a lawyer can, for scientific merit. But essentially, they fed osprey menhaden, and then determined that the reduction fishery and somehow not the bait fishery in the Chesapeake Bay was causing nest failures. One of the things that will be in that document is Dr. Brian Watts, one of the

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

authors on the study was at the Ecological Reference Points meeting, and it indicated that most of the mortalities, the nest failures had occurred in May.

CHAIR McMANUS: Shaun, just wanted to acknowledge the timer, your three minutes being up, so if you could.

MR. GEHAN: Let me just wrap that, I just wanted to point out that menhaden entered the Bay, but all fishing occurred north of the Bay, so if they entered the Bay, it was not the fishery that was keeping them from osprey's trip. But do take a look, the fishery has been well managed by this Board, and you should congratulate yourself on an excellent job managing the stock. Thank you.

CHAIR McMANUS: Thank you, Shaun, for your comments. Are there any other public comments in the room on items not related to agenda items? Okay, seeing none in the audience, I'll look to those online. We will go to you, James Fletcher. Feel free to unmute yourself.

MR. JAMES FLETCHER: My concern is that we're not talking about the microplastics or the manmade chemicals that are affecting menhaden. If we find out that there are microplastics, manmade chemicals affecting the menhaden, should we not be trying to come up with a way to enhance the management by spawning the eggs and releasing them in the grow-out areas?

In other words, right now, we've not looked anywhere into the future. My question for this Board is, should you direct staff to look at the possibility of just spawning the menhaden and then releasing the eggs by the billions with a B. We're reactive management, and the rest of the world is proactive management.

My question back to the Board. Should you not direct staff to look at microplastics accumulating on the gills of these fish, and then the possibility of enhancing the stock through just spawning the eggs, getting them fertilized and then releasing them? We need to look a different way. Thank you, James Fletcher, United National Fishermen's Association.

CHAIR McMANUS: Thank you, James, for your public comment. Is there anybody else online that would like to make comments on materials not currently on the agenda? Okay, feel free, Tom Lilly, to unmute your microphone. Again, just for folks interested, three minutes.

MR. THOMAS LILLY: Yes, I have a couple questions for the Board. As the Board realizes, the collapse of the striped bass spawning stock has just been recorded for this year, which makes five straight years of the deteriorate of our striped bass spawning stock in Chesapeake Bay. I have some questions, really quick here.

Does the Board agree that the striped bass spawning stock is the Commission's flagship species, and the most important species for food, charter and anglers, not only in Chesapeake Bay, but otherwise. I presume you agree with that. Does the Board agree that the ERP science says that striped bass are the most sensitive species to the menhaden harvest? I believe you probably agree with that, because that's what all of your science says.

Do you also agree, by sensitive in the ERP science, you mean that it is the species most harmed by an improper menhaden harvest. Do you agree with that? Do you agree that the most harmful effect a species can have is reproductive failure? I think you agree with those four things. Okay, since you're likely agree that striped bass are having a terrible problem in the Bay, and you agree the problem is caused by the level of the menhaden harvest.

I think you agree the harvest is too great. I think you agree to all those things, don't you? Do you agree to all those things or not? Okay, so the last and most important question is that affects about all of Chesapeake Bay and the Atlantic Coast wildlife and all the people. The question is this, will this Menhaden Board right now make this an agenda item to be discussed, and the solutions recommended?

In other words, will you make an agenda item right now of the relation between the menhaden harvest and the terrible failure of the striped bass spawning

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

The Board will review the minutes during its next meeting

stock, which your ERP science is connected. Your ERP science establishes the causal connection of these two things. The question is, please make this an agenda item to be discussed right now at this Board meeting. Will you do that? I'm waiting for an answer.

CHAIR McMANUS: Thank you, Phil, for your public comments. The public comment period is a time for comments, not dialogue, so we appreciate your comments, and the Board has heard them, and will consider them moving forward. We have reviewed the agenda already, and have approved that for today, so thank you for your comments. With that, I'll move on to Phil Zalesak.

MR. PHIL ZALESAK: Mr. Chairman, over 60 percent of the coastal stock of striped bass begin as spawn in the Chesapeake Bay, and its tributaries. The mortality rate of striped bass is directly tied to the mortality rate of Atlantic menhaden. The higher the mortality rate of Atlantic menhaden, the higher the mortality rate of the striped bass will be.

The Atlantic menhaden reduction fishery allocation in Virginia is currently 67 percent of the total allowable catch for the entire Atlantic Coast. That is over 158,000 metric tons, or three-quarters of a billion fish being removed from Virginia waters this year. Intense reduction fishing is occurring during the same time when there is little migration of Atlantic menhaden in Virginia waters. That is called localized depletion. Currently the reduction fishery has had great difficulty finding menhaden in the Chesapeake Bay and its entrance.

The latest NOAA data indicates that the recreational harvest of striped bass in Maryland waters has declined 72 percent since 2016, and the Maryland Chesapeake Bay Juvenile Index for striped bass is at an all-time low. The decline of striped bass in the Chesapeake Bay is due to the lack of menhaden in the Chesapeake Bay.

It is not due to overharvesting by recreational fishermen. Further, in 2016, the Maryland GDP associated with striped bass industry was over 800 million dollars. That is no longer true, after a 72

percent decline in recreational harvest. In 2020, this Board reaffirmed its commitment to manage the fishery in a way that accounts for the species role as forage fish. This Board has failed in that commitment.

I attended the Ecological Reference Point Working Group meetings two weeks ago, and heard no discussion of striped bass mortality rates, as it relates to Atlantic menhaden. In the interest of conservation and sound fishery management, it's time to (blacked out) to federal waters. This will bring an end to Governor Yonkin's Canada First fishing policy to the benefit of American taxpayers who fish. It's also time to call Governor Yonkin's office at 804-786-2211, and raise holy hell. I thank you for your time.

CHAIR McMANUS: Thank you, Phil, for your comments. Is there anybody else online with comments not related to agenda items? All right, seeing none.

PROGRESS UPDATE ON ECOLOGICAL REFERENCE POINT BENCHMARK ASSESSMENT

CHAIR McMANUS: That will bring us to our next agenda item, which is a Progress Update on Ecological Reference Point Benchmark Assessment, and with that I will pass it to Dr. Katie Drew.

DR. KATIE DREW: Basically, I'm just going to provide an overview of where we are in terms of our timeline, and then some of the issues that we discussed at our recent Data and Methods Workshop. As you all know, this assessment is scheduled for completion in 2025. We had our Methods Scoping Webinar earlier this year in May.

We had a deadline for new data submissions by September 1st, so that was for data sort of outside of our usual TC and state federal partnership for external data submission. Then we had our Data and Methods Workshop a couple weeks ago, to start discussing some of the high priority issues for this assessment.

Going forward, we anticipate that the 2023 data will

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

be submitted sort of in waves from February to August of next year, so starting with some of our fishery independent data for menhaden, all the way through the multispecies assessments for some of our ERP species, which should be completed over the summer.

Then followed up by a couple more Methods and Assessment Workshops, so that we can ideally have a TC call to kind of approve the reports on our end in mid-July, to go to a peer review through the SEDAR process in August, and have the assessment presented to the Board at annual meeting of October or November next year. At the Data and Methods Workshop, we reviewed new data sources for menhaden and their predators. We identified new predators to explore, adding to the intermediate complexity model. If you recall that previously, our key ERP species were menhaden, with an alternative prey of Atlantic herring in the models, and the key predators were striped bass, bluefish, spiny dogfish and weakfish.

We have identified new potential predators to consider adding, based on existing data, and if we can gather enough information to support, including them in these intermediate complexity models. They are of course included in the full NWACS EWE model. But that includes nearshore piscivorous birds like osprey, bluefin tuna, smooth dogfish, or elasmobranch as a group.

We did consider blue catfish, but decided not to pursue it, based on the limited spatial overlap with menhaden. Right now, blue catfish are only concentrated in the Chesapeake Bay, and are really only in the more freshwater areas. The diet studies indicate menhaden do not make up a large proportion of their diet, so we do recommend, as we get more spatially explicit in the future, benchmark assessments, and as the blue catfish population continues to spread and expand, that that be reconsidered. But for now, we will not be including it in this benchmark.

We discussed high priority updates to our ecosystem models. We will be going forward with the NWACS MICE and NWACS Full models again, as well as the

VADER multispecies statistical catch at age model.

Those were all peer reviewed during the last benchmark assessment, and of course we used the NWACS MICE model to set reference points. We are adding an ecosystem harvest control rule simulation model, in order to provide some context to these models, and explore alternative harvest control rules in an ecosystem context.

The highest priority is increasing the spatial and seasonal detail in the models, but we will likely not produce a fully spatial reference point or management advice with this benchmark assessment. We did discuss ongoing ecosystem indicator work in the Chesapeake Bay, including some work from Maryland and from VIMS, including some of what will be discussed in the next presentation.

The ERP workgroup recommending allowing these projects to sort of come to completion on their own timeline, rather than trying to duplicate effort with what they are doing. If you recall, we did discuss back in 2021, one spatial option for management is to use our current coastwide models with some kind of spatial indicator approach. But the Board was kind of cool on that idea, and was not interested in pursuing it.

The ERP Workgroup recommends allowing these projects to continue on their own, and then if the Board wants to revisit this indicator approach linked to management areas, for the Bay or for other areas, that you can task the workgroup with working on that after the benchmark, after this other work has been completed, and dedicating more time after that. That about sums it up for the main topic of discussion at our Data and Methods Workshop, and I'm happy to take any questions.

CHAIR McMANUS: Are there any questions from the Board? Yes, Jeff Kaelin.

MR. JEFFREY KAELIN: Thank you, Dr. Drew. I listened in on that too. A couple of gentlemen talked about the ERP model outcomes or reference points. Isn't it true that those reference points leave enough menhaden in the water to fully rebuild striped bass

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

by 2029? Is that the reference point that was the outcome from that model?

DR. DREW: The current reference points are based on the coastwide stock of both menhaden and striped bass, and the reference points are designed to leave enough menhaden in the water to support striped bass when they are fully rebuilt to their target. It's not specifically tied to that 2029 deadline, but in the long-term people equilibrium.

MR. KAELIN: Excuse me, can I continue? It's not tied to 2029, I guess I misunderstood that, so it's just generally the fact.

DR. DREW: Right. In the long term, basically, as at equilibrium.

CHAIR McMANUS: Are there any other questions for Katie? Yes, Lynn Fegley.

MS. LYNN FEGLEY: Mr. Chair, if I may, I have a comment and a question. I'll start with a comment. I just wanted to provide some clarity for the Board about the indicators that we've been working on in Maryland. We have a broad array of data that we collected for many, many years on both striped bass, things like striped bass body condition, being one in particular.

The piece that we're working on is really right now going to be geared as a communications tool. It's not geared to be a management tool, but it's really a synthesis of all of the data that we have. We spend a lot of time scrolling through the information that we collect. I think it's going to be a really nice way to inform stakeholders of how we're monitoring the situation around menhaden and striped bass, and the ecosystem in general in the Bay.

We're hoping to be rolling that out in the not to distant future. That's one. I want to make it really clear that that is a communications tool right now, not a management tool. It would be really nice if in the years to come we could take it to the next level, but it's not there yet. That is my comment. My question is for Dr. Drew and then maybe I know Dr. LaTour, you're going to follow on. But you know we

have had our fifth consecutive year of low striped bass recruitment in Chesapeake Bay. We just heard from a couple of our constituents.

There is concern in the Bay about this. Any potential relationship between menhaden abundance in the Bay, and striped bass reproduction? The link is between menhaden abundance and the recruitment of the young striped bass. I wanted to just toss that out to the scientists. I don't know if you can provide an answer now, but I would kind of like to hear your thoughts on that, given the concerns that we're hearing from our stakeholders. Thank you.

DR. DREW: Sure, I would say, I don't want to say there is no relationship. Obviously that menhaden are an important food source for striped bass, and our coastwide ERP model does show that striped bass are sensitive to the amount of menhaden that are available for them. If your menhaden levels are too low, your SSB levels will be too low for striped bass, and that can contribute to low recruitment. But striped bass recruitment is of course driven by a lot of factors. Obviously, of the abundance of the spawning stock is part of that. But we also know environmental conditions like temperature, like water flow, like the availability of the plankton prey for those newly born striped bass. All are significant contributors to the overall success of that year class.

Menhaden abundance is part of that equation, but it's not the only component, and it may not even be the most important component. I will say, our ERP model on the coastwide level, that is what that tracks. That is looking at that relationship of how much menhaden do we need to make sure that striped bass can survive and produce recruitment, and that is all tied together, that stock recruit relationship for striped bass is in that model, and the effects of menhaden on striped bass survival is all in that model.

At the coastwide level, these reference points are intended to leave enough menhaden in the water, so that striped bass can maintain their target biomass, and maintain that spawning stock biomass. Obviously, I think maybe a bigger question that we

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

still need more work on, is that relationship the same at different spatial scales.

What is happening in Chesapeake Bay versus what is happening at the coastwide level, versus what is happening in the Gulf of Maine. Those dynamics we don't have a good handle on. We're hoping to get a better handle on it through this next benchmark assessment, but that is definitely something we need more work on.

CHAIR McMANUS: Great, thank you, Lynn, and we have Allison Colden online with a question, so Allison, feel to unmute when you're ready.

MS. ALLISON COLDEN: Thank you for the presentation, Katie. I also had the opportunity to attend the ERP Workgroup meeting, and observed some of these conversations, and just hope that I have absorbed some of that genius out of this group by osmosis. A lot of really exciting conversations going on, particularly around spatial models and a future benchmark assessment.

But I wanted to just sort of ask a quick question and comment on a couple things as well. Katie, maybe in particularly to the blue catfish issues to start. It's obviously a huge concern for us in the Chesapeake Bay, and we're seeing its influence grow, both in the scope of where they are being found and the species that we believe that they are impacting.

I believe that I saw in the ERP Workgroup, maybe some conflicting data, where one data source was showing that blue catfish were consuming a large quantity of menhaden, or at least menhaden were making up a relatively significant quantity of their diet composition. But then other comments about the lack of spatial overlap between blue catfish and menhaden, because of the difference in the salinity tolerances. Could you just briefly comment on kind of the thought process for the group, in not continuing to pursue blue catfish as an ecosystem component.

DR. DREW: Sure. Some of the initial work on blue catfish did have menhaden making up a bigger percentage of their diet than you would be

comfortable with. But as part of that literature review, we looked at some other studies, and more recent, much more comprehensive studies with thousands of blue catfish stomachs from multiple different areas and multiple different kinds of years. Then multiple different size classes showed that the actual percentage of menhaden in their diet was relatively low, especially compared to some of the other predators that are already in our model.

I think this is because blue catfish are omnivores, incredibly unspecialized. You need a really large sample size in order to be able to get a good handle on their diet, otherwise you're just going to be getting, it's too influenced by small sample size, which is probably why you saw in some of the initial studies.

If the timing was right, you saw a lot of menhaden, but this larger, more comprehensive study said that the proportion of menhaden in their diet was much lower. The Workgroup had some more comfort, as they are not specializing in menhaden, perhaps the way that we had concerns about. Then of course their range right now is predominantly in the more freshwater areas, and again, limited only to the Chesapeake Bay, as opposed to our full coastwide model.

Kind of the overlap of blue catfish versus the rest of the model, we felt that that was a relatively minor component of the total mortality. To be clear, these models, even the intermediate complexity models, have space for additional mortality that is not explained by our explicit predators. It's not like a source of mortality is necessarily being missed, it's just being lumped into other predators.

Given the limited spatial overlap, and the fact that both the fact that they're really only in Chesapeake Bay at the moment, and the fact that they are predominantly in the more freshwater areas of Chesapeake Bay. The Workgroup felt that this was not as useful of a predator to focus on, and that we should instead focus on kind of our other key species, where we expect a stronger relationship, not just between predator abundance and menhaden

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

abundance, but also between menhaden abundance and predator abundance.

That is why we recommended not going forward with it at this benchmark. But we definitely do want to keep an eye on that, so that for the next benchmark, once we have a fully spatial model, and can get down to the more nitty-gritty of modeling the Bay, more distinct, as well as potentially seeing increases in blue catfish out beyond that freshwater range, or into the Delaware Bay, or other areas on the coast. We think it's definitely worthwhile keeping an eye on for the future. I hope that helps.

MS. COLDEN: Yes, it did, thank you so much, Katie. Although I think I read an article, maybe even this week, about catfish being found in Delaware River/Delaware Bay, so hopefully it will continue to stay a relatively confined problem. I have one quick comment to wrap up here. I just wanted to reiterate something that Lynn mentioned earlier, about the options and the efforts that we have going on in the Chesapeake Bay.

I just want to extend some thanks to the folks in Maryland for spending a lot of time doing a deep dive on the striped bass and menhaden indicators. I think Lynn made it clear that it was not intended to be a management tool, and I know we're about to hear a presentation from Virginia on some work that was discussed there. But I think that the Board will see that it's a pretty extensive body of work, that if it were to be completed would be a huge undertaking, especially just if it's being taken on by one state. Some of the other things I noticed in the ERP Workgroup were that at least the spatial models that I saw discussed, were not going to be able to resolve the Chesapeake Bay, or maybe even some of the other estuaries along the coast.

I don't want to lose sight of the issues that we all know are lingering in the Chesapeake Bay, and questions lingering about the Chesapeake Bay. Katie, I don't know if the tasking about indicators is the right path forward. But I just wanted to flag that I don't necessarily know that what the efforts that Maryland and Virginia are undertaking now are going to result in direct management applications.

I would like the Technical Committee and the ERP Workgroup to continue to keep Chesapeake Bay kind of on their minds and in the forefront, as to how we can continue to resolve these questions, and get the data that we need moving forward to resolve these issues. I just wanted to say that, thank you.

CHAIR McMANUS: Are there any other comments or questions from the Board? Seeing none.

REVIEW VIRGINIA CHESAPEAKE BAY MENHADEN STUDY DESIGN REPORT

CHAIR McMANUS: We'll move on to our next agenda item, which is a presentation that reviews the Virginia Chesapeake Bay Menhaden Study Design Report, which will be presented by Dr. Rob Latour, joining us today. With that, take it away, Rob.

DR. ROBERT J. LATOUR: Thank you to Bob for the invitation to come back. It was nice to see some familiar faces last night, and meet some new faces. It's been a while since I've been in the hot seat, as you say. I'm not really sure I really want to come back that often, but I'm happy to be here. The title here indicates menhaden research planning, and by no means am I trying to suggest that all the research for menhaden is happening here at VIMS.

It is certainly in coordination with the TC and the ERP Workgroups. It's a broad, inclusive effort, although it was stimulated this year by some legislation, which I will review briefly. By way of background, the fall of '22 brought a great deal of activity, you could say, from stakeholders, specifically directed at the Governor's office.

That carried forward into the 2023 Virginia Legislative Session of the General Assembly. There is lots of discussion, lots of concern, lots of perspectives raised, such that Senator Lynwood Lewis initiated the introduction of the bill, Senate Bill 1388 that occurred on January 11. It said VIMS shall do everything.

We will solve all the problems, we will study everything, ranging from economics to ecology to fishery impacts to, you name it, movements,

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

everything. In conversations with Senator Lewis and the staff, we sort of tried to manage expectations, and bring us down to a little more level of realism.

Some substitute language was modified and introduced, and amendments were introduced, such that in the end what passed through the General Assembly was a bill that directed VIMS to engage stakeholders for a planning effort. What do we need to know? What are the most crucial things that we should study, and outline them for consideration moving forward? For anyone curious, this is the exact language of the bill. I don't expect you to read everything, other than the highlighted portion here, basically breaks the bill into three sections, Study the Ecology, The Fishery Impacts, and The Economic Importance of Menhaden in the waters of the Commonwealth.

What follows is a summary of our activities relating around those three themes, ecology, fishery impacts, and economics. The way in which we approach this, the bill did not give direct procedural guidance per say. I suppose we could have done it at our desk and come up with some really cool research activities with some ideas.

But rather than doing that we elected to hold a stakeholder workshop, so we invited representatives from all the various sectors, trying to achieve broader representation from the commercial to recreational, the NGOs the academics, the federal agencies, the management community. We held a workshop for a day and a half at William and Mary in August 8 through 9. We engaged a professional facilitator to manage the meeting, and she did a fabulous job, from the Institute of Engagement and Negotiation at UVA.

Just by way of transparency, all the recommendations that you'll see from us were based on consensus. There was voting, but it wasn't really voting in a strict sense, it was more consensus based. In my opinion, and some of you were here, some of you online were there. It was collegial and it was productive. What follows now in the next few slides are just a summary of the three themes.

What I'm providing are the top three consensus items in each of those themes. You can imagine that during the brainstorming sessions we had lots of ideas, including the kitchen sink brought forward. But whittling those down over time, over the course of the workshop, led to these three areas for ecology, and that is number one ranked was estimate the seasonal abundance of Atlantic menhaden in the Bay.

Breaking out abundance estimation, which routinely happens with the coastwide assessment, and also with some of the ERP work. But on a coastwide scale, try to break that down into a Chesapeake Bay versus coast level of estimation. This would be akin to the spatial modeling activities that Katie referred to, and that are perhaps on the horizon.

By way of methods, this was analyzing commercial catch and effort data, and also enacting new survey methods, since the commercial catch and effort data do not cover the entire Bay. Those data are restricted to Virginia. Some of these new survey methods, ASMFC invested in the design of a survey for using aerial methods with the University of Maryland.

Making use of that survey designed for aerial survey, as well as VIMS has capability now of a multi-beam Simrad EK80 hydroacoustic package on their research vessel, The RV Virginia. Making use of that has shown promise in other fisheries and other countries, as a way of estimating abundance for pelagic schooling fishes. Second was evaluate movement rates. This is mainly focused on the exchange between the Bay and the Coast. You might think of this as adding to the body of knowledge, as to whether a depletion is happening at a scale that is measurable or not, so how fast do fish move into the Bay, out of the Bay, how frequently does it happen over seasons, over time? Reproducing the 1960s tagging data, sorry tagging study, would be virtually impossible. We have to resort to some sort of a hydroacoustic or some sort of other technology to do this. The hydroacoustic tagging technology, the tags are getting smaller and smaller. There is hope that this could be utilized for Atlantic menhaden who

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

would be sensitive to capture and sensitive to processing.

The third was assessing impacts of predator demands and consumption of Atlantic menhaden. There are extant data that could be used. But some of the seasons, some of the spaces is where the predator/prey dynamics unfold, are not well sampled, are not well covered, so the combination of data analyses, new methodologies, as well as new field work.

On the fishery impact side, number one ranked concept was to analyze the patterns in the commercial fishing effort and catch data for Chesapeake Bay, the idea being that the fisheries know where the fish are, so they are going where the fish are, maybe we can glean some insight as to possible changes in movement, possible changes in distribution, shifts in abundance and this sort of thing.

Through the analyses of those data acknowledging that those are not necessarily statistically designed catch and effort data, so we would have to bear in mind the associated human element of those data. Number two, assess the possibility of localized depletion. We heard a public comment regarding localized depletion. It is a very difficult concept to address.

Certain criteria need to be met, and we don't know if those criteria are even being met to assess localized depletion. We thought that synthesizing the ecology topics one through three would be necessary, in order to really address this issue in a serious manner, although certainly it's consistently discussed.

Third, kind of surprising to me, was to quantify changes in the recreational fisheries in the Bay. Not a lot of effort has been put forth to understand the demographic changes, the number of licenses, the age structure of the fishery, types of species that are being targeted and how those shifted over time.

Again, this might provide some insight into availability of menhaden and associated

dependencies. Lastly, or thirdly, I should say, Economic Importance. I'm being true to the ranking system here, but to be honest with you, Number two has to happen before Number one. But this is the way it fell out of the group.

But basically, conduct a contemporary assessment of the socio and economic importance of the Atlantic menhaden to the Bay. Certainly, there are some historic studies to draw on, one by Jim Kirkley at VIMS, one funded by ASMFC more recently. But updating those, it's a different fishery, it's a different management regime, it's a different economic climate.

Updating that was of top priority. Given that tool, perhaps we could then assess the economic impacts of management decisions. This is sort of getting at the concept of a management strategy evaluation with an economic component. Decisions that you make as a Board, what are the tradeoffs, what are the implications of those decisions? We learned a lot about how industries, products, ripple through the entire Commonwealth, beyond the Commonwealth, all along the eastern seaboard, even internationally. Honestly, in most of the fishery's management, biological sustainability is the number one priority, but there is some importance to understanding how your management decisions ripple through the economics of the fisheries, and those industries that depend on that.

Evaluating that was certainly of an importance. Third here was, I'm using the word bioeconomic. It wasn't articulated in such a way at the workshop, but there was lots of discussion about moving fishery removals out of Chesapeake Bay to the coast, restricting the harvest by the reduction fleet to the coast.

It's not as simple as it seems, there are lots of tradeoffs there. Irrespective of the impact it would have on the reduction industry, moving all the harvest to the coast means you're harvesting bigger, older animals. These are more fecund, as opposed to those that are typically in the Bay. You would actually be having a larger impact on the spawning stock, and the spawning reproduction of animals than if you keep things as currently status quo.

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

The Board will review the minutes during its next meeting

Bioeconomic mean tradeoffs economically as well as biological impacts to the stock, about where the landings are coming from over time and space. That pretty much summarizes here, I've got just a list of contributors. I want to thank everybody for being involved. In case you're curious about who attended the workshop, these are the participants.

Like I said, we tried to be broadly inclusive for all sectors and all stakeholders. Lastly, before I take any questions, I just want to give some acknowledgement, particularly to Shanna Madsen, and Commissioner Green for allowing Shanna to dedicate some time to this project. I know it's outside the scope of her duties, but she was integral in providing a lot of support and a lot of guidance.

Kristina was our UVA facilitator who did a fabulous job. Mark Luckenbach, Cecilia Lewis and the VIMS administrations for funding the workshop out of here own pocket. This was my idea to have it happen, and VIMS was onboard with it, so I appreciate that, and Jim and Caroline, who are my students and staff for participating in the meeting and being great notetakers. If there are any questions, I will be happy to take them. Thank you.

CHAIR McMANUS: Thank you, Rob, for your presentation. Are there any questions or comments from the Board? Yes, Dennis Abbott.

MR. DENNIS ABBOTT: Thank you, Mr. Latour. What are the plans for achieving results? When will we see something coming out of all these good ideas?

DR. LATOUR: Really good questions. I can't give you an answer, because we haven't been instructed or provided resources to conduct the work. This was a planning exercise. Initial feedback from the General Assembly and from the Governor's Office has been positive, at least with respect to the content of the report. Whether it gains traction with the Governor's budget, which will be released in December, and/or the General Assembly session in 2024, remains to be seen. But I think we tried to do our best in providing a roadmap and a plan with some cost estimates, with some guidance as to who might be most poised to do the work, to give some

instruction and some guidance to the Administration. But where it goes from here is out of my control.

MR. ABBOTT: Thank you, good answer. However, are there any thoughts of looking for money in other directions, from NOAA or any other sources, Omega Protein, anyone else that has deep pockets, and how much money are you talking about to do, at this point, what you planned or would like to do?

DR. LATOUR: The report structure outlined those nine items in a stepwise fashion, and there were cost estimates associated with each. As you can imagine, those that involved novel field work are more expensive than those that involved desk work. The sum total for all of them was under 3 million, spread over three to five years.

We haven't pursued funding opportunities outside of the state, because really, this was initiated by the General Assembly. It's not an unreasonable thing to do. I suppose with some more thinking and some more time, we could come up with ideas and pursue avenues outside of the Legislature, but for right now that is where we are.

CHAIR McMANUS: Thank you, Dennis. Next up I have Roy Miller.

MR. ROY W. MILLER: Dr. Latour, I was wondering who would do the prioritization of all of this work that you outlined, all of which looks like important work. But will the General Assembly be doing the prioritization? Will Virginia Marine Resources Commission? Will VIMS or some combination thereof?

DR. LATOUR: Thank you for the question, it's a good one. Initial indications are that VIMS and VMRC, again, if Commissioner Green is willing to participate, would be involved in shaping any budget amendments that would go through. Therefore, we would be able to prioritize things in such a way that order of operations matters.

Some of these studies depend on other things being done, so we could set that pathway clear from the

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

get go. What we don't know is what the appetite is to fund any of this. You know upon learning that, then we could move into the motion of actually drafting preliminary language for any kind of amendment that would go forward. It would be a combination of VIMS, VMRC, other constituents as well. By no means are we trying to make this a closed process.

CHAIR McMANUS: Are there any other questions or comments from the Board? Yes, Lynn Fegley.

MS. FEGLEY: Just really quick, I just want to thank Dr. Latour and the entire team listed on the screen. I was at that workshop, it was excellent. It was just a great reminder that it's often very helpful to walk into a room and sit down and have very frank and open conversations with a broad cross section of people involved in a fishery. I know I went in with my back up a little bit, and came out having learned a lot, and feeling, it was a great effort, appreciate it.

CHAIR McMANUS: Are there any other questions or comments from the Board? Looking around the room, not seeing any hands. Are there any online? There are no more questions or comments from the Board. We are a bit ahead of schedule, so if there are folks from the public who have comments for some of the scientific presentations we've heard.

We'll be able to take those comments if you so choose to present them. I'll start first with those in the room, if we have anyone with a comment, explicitly comments, no questions. Okay, seeing no one in the room, I'll go to those online. Bill DeSteph, feel free to unmute and when you're ready.

MR. WILLIAM R. DeSTEPH: I apologize. I am trying to figure out this platform still. This is Senator Bill DeSteph, representing Virginia Beach coming up the eastern shore in Norfolk. On menhaden, I listened to the comments. I had heard what I believe his name was Shaun, was speaking, he said that all fishing for menhaden occurred north of the Chesapeake Bay.

I see actually the boats out there with the nets, surrounding the nets and fishing, not just within the Chesapeake Bay, but on the other side on the east

western side of the Chesapeake Bay Bridge Tunnel. There has always been a lot of conflict between the sport fishermen and those out of Reedville with Omega 3 and others.

We're hoping from the Legislature, that we can get a better handle on what is going on. We've had multiple agreements at multiple times, Gentlemen's Agreements of hey, there won't be fishing within three miles of the beach, they will be outside of three miles outside of the Chesapeake Bay Bridge Tunnel.

There has been multiple conversations and multiple agreements that never seem to hold much water, and get violated frequently. I truly just got put on this Commission. I'm looking forward to it, and learning, and seeing what I'm missing. I know a few of the folks that are here and have been briefing. I'm here listening, but I'm having a hard time with understanding that everything is all good and well.

Then, I don't know if this is the platform for it, or if I should write in and ask to VMRC or VIMS. How many violations did Omega receive this year, over the last three years? I'm trying to get a lot smarter on this, because what I'm hearing today is a little different than what I actually see, not just in my neighborhood, but when I cross the Chesapeake Bay Bridge Tunnel. Thank you.

CHAIR McMANUS: Thank you for your comment. I'm going to pass this to Bob Beal really quick, for a response.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Not a direct response to Senator DeSteph's comments, but I just want to let everyone know, Senator DeSteph is the new Legislative Commissioner from Virginia. He was appointed replacing Monty Mason in the last week or so. The previous commenter was one of the new commissioners for ASMFC, and I assume will be participating in future meetings. I just wanted to welcome him, and let the Board know that that is where the comment came from.

CHAIR McMANUS: I'm going to look to staff to see whether the time to provide response to those specific comments is now or subsequent to the

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

meeting, given the scope of the topic. Yes, staff will follow up with you, if that works for you. I appreciate your comment and your time. Is there anybody else online? Brian Collins, feel free to unmute when you're ready.

MR. BRIAN COLLINS: Yes, I've been listening. I had, I guess you could call them comments, questions that I would share. I've been studying this issue as a lay person, and it's a little baffling to me that the Chesapeake Bay is not considered a separate ecosystem. Earlier we heard those estimates that 60 to 90 percent of all Atlantic coast striped bass occupy, or they go in the nursery of the Bay.

It looks like we might be starving them, and we see indicators that striped bass populations are stressed. Most of the time what you see is people blaming sport fishermen, no mention of industrial harvest. I don't think it makes sense to take the Atlantic Coast stock and assume that it's okay to take 51 metric tons, 100 million pounds of fish, menhaden bait fish out of the Bay.

That is separate from the idea that the definition of the Bay boundary is right at the Chesapeake Bay Bridge Tunnel, so just outside the Bay the industrial fishing can use that additional limit to capture all the fish that are funneling into the Bay and out of the Bay. It's quite a way more than 100 million pounds.

You know with this idea that we're doing a Virginia assessment, it doesn't make sense to me that Virginia, in a Bay that is about, I forget, I think Maryland has the biggest portion of the Bay, how can it not be a multi-state effort? How does ASMFC feel about it? Why isn't ASMFC taking the lead on this?

I heard a gentleman earlier saying, why not NOAA? Why isn't the federal government stepping in? Virginia can only do a compromised survey in Virginia waters. I'm wondering right now, I've asked this question before to ASMFC and waiting for a response is, do we know if there are any schools of menhaden in the Bay right now? I don't think anybody knows.

We could be starving. I went to an osprey nesting meeting. The osprey nesting performance for 2023

fell off like a rock. We may not have the time that has been kicked around to actually save the Bay. I mean I think we're actually at a point where we might really want to consider seriously a moratorium, until we can figure out what is going on. I appreciate the opportunity to comment, thank you.

CHAIR McMANUS: Thank you, Brian, are there any other comments specific to the presentations from Katie and Rob? Yes, James, please feel free to unmute when you are ready. James Fletcher, have you unmuted? We are not hearing you, so I might suggest as an alternative to reach out to staff or Rob.

If you have additional questions or comments regarding their work that you would like to discuss. Seeing no more comments on the presentations we received.

CONSIDER FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2022 FISHING YEAR REVIEW

CHAIR McMANUS: I would like to move to our next agenda item on Considering Fishery Management Plan Review for State Compliance regarding the 2022 Fishing Year. With that I will pass it to James.

MR. JAMES BOYLE IV: Good afternoon, everyone, I will just jump right in and start. Here is a quick overview of the presentation. I'll start with a pretty brief reminder of the statuses of the FMP and the fishery, before providing the 2022 landings and monitoring information, and ending with the PRT recommendations.

In 2022, the fishery operated under Amendment 3, which was approved in 2017, and implemented in 2018. The total allowable catch or TAC for the 2021 and 2022 fishing season was set at 194,400 metric tons, based on the Board approved ecological reference points. Also based on those ERPs, which were adopted in 2020, and the 2022 single-species stock assessment update, fishing mortality is below both the ERP target and threshold, and fecundity is above both the ERP targets and thresholds.

Therefore, the stock is neither overfished nor

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

experiencing overfishing. Moving on to 2022 landings. Total commercial Atlantic menhaden landings in 2022, including directed incidental catch and episodic event set aside landings are estimated at 195,387 metric tons, or about 430.8 million pounds, with an approximate 0.15 percent increase relative to 2021, and is 0.51 percent over the TAC.

If you remove the incidental catch and small-scale fishery landings, so that leaves you with just directed landings and the EESA landings, the total for 2022 is estimated 187,231 metric tons, or about 413 million pounds, which is a 1 percent decrease from 2021, and represents approximately 96 percent of the coastwide, around 8,156 metric tons or 18 million pounds, so they did not count towards the coastwide TAC.

The 2022 reduction harvest is estimated at 134,477 metric tons or 296 million pounds, which is a 2 percent decrease from 2021 and 1.5 percent below the previous 5-year average, which is about 301 million pounds. Of that in the Chesapeake Bay, about 50,000 metric tons were taken, which is under the Chesapeake Bay cap, by about 1,000 metric tons.

This figure shows landings from the reduction and bait sectors through time. You have the reduction landings on the left-hand axis and bait landings on the right, and I'll make a note to please notice the different scales of those axes, so reduction landings are generally about an order of magnitude larger than bait landings.

Generally, the trend shows a decline in reduction landings over time. Relative to last year, bait landings had a slight uptick and reduction landings had a slight drop, but the overall trend remains fairly consistent. As mentioned, incidental catch and small-scale fishery landings are estimated at 8,156 metric tons or 18 million pounds, which is a 46 percent increase relative to 2021.

Incidental catch trips also increased to the highest level since 2015. Maine, Massachusetts and Virginia's non purse seine bait fishery specifically, reported incidental catch landings, about 82 percent of which were from purse seines, 10 percent from

gillnets, and Maine accounted for approximately 87 percent of incidental fishery landings in 2022. Maine and Massachusetts were the only participating states in the episodic even set aside program. Their combined landings were 1,992 metric tons, or 4.4 million pounds, which was a 10 percent decrease in 2021, but is over the total set aside by 104,723 pounds. To alleviate this, Massachusetts transferred 64,000 pounds to the EESA in January of 2023, and the remainder was deducted from the 2023 set aside. Quota transfers remained high. There were 24 state to state transfers, some involving several states in 2022, which was an increase from 16 in 2021.

Although the PRT noted in the document that one of the purposes of the commercial allocation changes in Addendum I to Amendment 3, was to reduce the need for quota transfers, and the PRT will monitor the change in quota transfers after implementation in 2023. Non de minimis states are required to conduct biological monitoring based on their bait landings, as well as their geographic region.

From Maine to Delaware, one-ten-fish sample is required for 300 metric tons, and from Maryland to North Carolina, one-ten fish sample is required for 200 metric tons. In 2022, Maine fell just short of their required samples, collecting 35 of 39 required samples. For de minimis, Pennsylvania, South Carolina, Georgia and Florida all requested continued de minimis status, and qualified based on their commercial landings.

As far as PRT recommendations, the PRT continued to discuss whether a sufficient number of biological samples are being collected from different gear types and regions, and whether substituting samples from fishery independent sources is appropriate for meeting the requirement.

Having said that, in discussions with science staff, it will be a topic that is considered in the single-species assessment update, which is scheduled to be presented to the Board in 2025. With that, the action for the Board today to consider or to approve the 2022 FMP Review, State Compliance Reports and

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

de minimis requests. With that I'm happy to take any questions.

CHAIR McMANUS: Thank you for your presentation, James. Questions for James. Yes, Megan Ware.

MS. MEGAN WARE: I just wanted to provide some context for our biological sampling. To bring us back to last year, end of August, Maine closed its small-scale fishery due to the volume of landings we were receiving, so that prohibited us from being able to collect additional samples. We're at 55 samples this year, so we should be well and above what we need for our landings so far.

CHAIR McMANUS: Thank you, Megan, any other questions from the Board, in person or online? Yes, Emerson Hasbrouck.

MR. EMERSON HASBROUCK: It seems like there are no more questions, so if you're ready, I'll make a motion to accept the review.

CHAIR McMANUS: Thank you, Emerson, staff has been kind enough to prepare a motion, if you are willing to read that in for the record.

MR. HASBROUCK: **Move to approve the Fishery Management Plan Review, the State Compliance Reports and De Minimis requests for Pennsylvania, South Carolina, Georgia and Florida for Atlantic menhaden for the 2022 fishing year.**

CHAIR McMANUS: Thank you, Emerson, do I have a second? Seconded by Roy Miller. I may ask to see if **there is any opposition to the motion. Seeing none; I would consider this approved by consent.** Thank you for getting us through that pretty quickly.

ADJOURNMENT

CHAIR McMANUS: With that, now we're on to Other Business. Is there any other business from the Board?

I guess I would just like to say, this would have been Mel Bell's last meeting as Chairing the Menhaden Management Board, so I just wanted to say thank

you to him for his leadership after the last couple of years. Now you have yours truly for the next two years, so thank you for bearing with me. Yes, thank you again, Mel, for your service on the Board as Chair. With that I will look to see if we have a motion to adjourn. I see many hands; thank you and we can consider the meeting adjourned.

(Whereupon the meeting adjourned at 2:32 p.m. on October 17, 2023)

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

Enhancing sustainable development of the winter bait fishery for Atlantic menhaden through the use of industry acoustics

Final Report

Award Number: NOAA Grant #NA20NMF4270163
Award Period: December 1, 2020-November 30, 2023

Submitted to:

National Oceanographic and Atmospheric Administration
Fisheries Headquarters Program Office
&
Saltonstall-Kennedy Competitive Grants Program

By:

Geneviève Nesslage, Ph.D.
University of Maryland Center for Environmental Science
Chesapeake Biological Laboratory
Solomons, Maryland

February 13, 2024

2022 Cooperative Atlantic Menhaden Winter Survey Collaborators

Principal Investigator

Geneviève Nesslage (UMCES Chesapeake Biological Laboratory)

Co-Principal Investigators

James Gartland & Robert Latour (Virginia Institute of Marine Science)

Christopher Gurshin (ASA Analysis & Communication, Inc)

Dong Liang (UMCES Chesapeake Biological Laboratory)

Industry Collaborators

Stefan Axelsson & Leif Axelsson (H&L Axelsson Inc.)

Wayne Reichle & Jeff Kaelin (Lund's Fisheries, Inc.)

Federal & State Partners

Michael Jech (NOAA Fisheries Northeast Fisheries Science Center)

Ray Mroch (NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory)

Jeffrey Brust (New Jersey Department of Environmental Protection)

Field and Laboratory Scientific Teams

Chief Scientist - Dustin Gregg (Virginia Institute of Marine Science)

Survey Team - Charlie Jordan, Matt Farnham, Chris Bonzek (Virginia Institute of Marine Science)

Ageing Team – Jameson Gregg (Virginia Institute of Marine Science), Amanda Rezek (NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory), Jamie Darrow (New Jersey Department of Environmental Protection)

EXECUTIVE SUMMARY

Prior to this study, little information was available to inform sustainable development of winter bait fishing opportunities for Atlantic menhaden (*Brevoortia tyrannus*) by the Mid-Atlantic midwater trawl fleet. Thus, academic, federal, state, and private scientists teamed with fishing industry members to design and implement a cooperative acoustic survey for Atlantic menhaden. The primary goal of this survey was to generate estimates of biomass and characterize size, age, and sex, and maturity of the portion of the Atlantic menhaden stock that overwinters off the coast of New Jersey where the winter Atlantic menhaden bait fishery is concentrated. This survey was funded by the NOAA Saltonstall-Kennedy Competitive Grants Program (Award #NA20NMF4270163), which aims to provide science and technology necessary to support sustainable fisheries development.

The survey was conducted during February 14-24, 2022. We systematically surveyed the primary bait fishing region 13-43 nmi (15-50 mi) offshore of New Jersey from the southern border of Hudson Canyon to the Delaware border using a commercial midwater trawling vessel, the *F/V Dyrsten*, which was equipped with a recordable Simrad ES80 split-beam, hull-mounted 38kHz ES38B transducer and FSV25S (20 kHz) omnidirectional sonar. A subset of schools encountered were ensounded and captured for comparison of acoustic school biomass estimates with school weight measured at port. Biological samples were collected from trawled schools to characterize the age, size, sex, and maturity of fish in each school. Additional samples were collected by the survey team at sea while accompanying fishing operations for five days after the survey and at port throughout the remainder of the winter Atlantic menhaden fishing season. Acoustic data were processed and analyzed to produce estimates of school biomass and to evaluate the utility of industry acoustics in cooperative research. To quantify ageing uncertainty, an exchange of paired hard parts (scales and otoliths) collected from individually sampled fish was conducted among the Virginia Institute of Marine Science (VIMS), NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory (Beaufort), and New Jersey Department of Environmental Protection (NJDEP).

Of the 38 schools identified as Atlantic menhaden along survey transects, 12 were ensounded and three were sampled (2,132 fish were sampled for size and 80 for full workups, including paired scale and otolith ages). During post-survey data collection, an additional 155 schools were identified as Atlantic menhaden, 94 were ensounded, and two were sampled (2,005 size samples and 72 full workups). An additional five fishing trips were sampled at port (150 full workups). Throughout acoustic data collection, an additional 73 schools could not be identified to species and were classified as “other fish” or “small pelagic school”; however, the total unidentifiable biomass was 58,661 kg, representing only 3% of the total biomass of Atlantic menhaden ensounded (1,754,563 kg).

Acoustic estimates of school biomass were similar to trawl catch weight of each trawled school as measured at port. All schools sampled during survey and post-survey operations were highly homogeneous schools of Atlantic menhaden. Out of 1,361 mt (3,110,380 lbs) of Atlantic menhaden landed and over 4,299 fish sampled during the 2022 survey and fishing season, only one American shad (*Alosa sapidissima*) was collected in a sampling bucket during post-survey at-sea sampling operations and <30 fish of other species were noted by survey crew during catch processing. Size of Atlantic menhaden sampled was similar across sampling periods.

Both the NOAA Beaufort Laboratory and VIMS agers estimated that most Atlantic menhaden sampled during this project were ages 3 and 4, regardless of whether ages were based on scales or otoliths. Sampled Atlantic menhaden were 56% female and displayed sexual dimorphism such that average weight and length of females (273 mm, 0.32 kg) was larger than that of males (267 mm, 0.30 kg). Most sampled Atlantic menhaden that received full workups were visually identified as being mature (resting stage). The ageing exchange demonstrated low interlab agreement, likely due to the focus on larger, older fish, the early time of year during which samples collected, and the quality of scale samples collected given the gear used. However, the exchange demonstrated the potential for the use of otoliths in future ageing work, and agers are committed to a second exchange in 2024 to identify differences and come to an agreement on best practices for ageing older Atlantic menhaden.

Total biomass of Atlantic menhaden estimated in the study area ranged between 7,963 mt (17,556,115 lbs) using a traditional ratio estimator and 11,005 mt (24,261,843 lbs) using a spatial model that accounted for changes in school detectability due to large changes in water temperature during the survey period that likely affected schooling behavior. In comparison with the 2022 stock assessment, the biomass of overwintering Atlantic menhaden estimated in the study region is a small fraction (approximately 0.22-0.31%) of estimated coastwide total biomass of age 1+ fish. From a management perspective, New Jersey's winter bait fishery quota in a typical year is approximately 680 mt (1.5 million lbs), which represents a small fraction (6%-9%) of the total estimated biomass in the study area.

This study provided fishery-independent field confirmation that Atlantic menhaden are partial migrants such that a portion of the adult stock resides overwinter along the shelf in the Mid-Atlantic region. Given the dense schooling behavior of Atlantic menhaden, we demonstrated that alternative acoustic survey designs that account for the patchy distribution of large schools across the landscape should be employed when surveying for pelagic clupeids like Atlantic menhaden. Our study provides an effective survey design that may prove useful in future monitoring.

CONTENTS

BACKGROUND	6
METHODS	7
Survey design and preparation.....	7
Survey implementation	7
School biomass estimation.....	11
Echoview calibration	11
Echogram processing	13
School biological structure	15
Study area biomass estimation.....	15
Species distribution modeling.....	15
Detectability estimation	16
Ageing uncertainty.....	17
Data collection	17
Sample processing	17
Ageing methods	18
Statistical Analyses	18
RESULTS	19
Survey data collection.....	19
Post-survey data collection	19
School biomass	20
School biological structure	21
Hydrography	26
Regional stock biomass.....	28
Ageing uncertainty.....	30
MANAGEMENT IMPLICATIONS	32
Estimating regional biomass and structure	32
Use of industry acoustics	33
Evaluating ageing uncertainty.....	34
DATA ARCHIVES	35
ACKNOWLEDGEMENTS.....	35
REFERENCES	35

BACKGROUND

Atlantic menhaden (*Brevoortia tyrannus*) supports the largest commercial fishery by weight on the U.S. East Coast (National Marine Fisheries Service 2018). The commercial fishery consists of two main components, namely a reduction fishery (approximately 70% of landings) located primarily in the Chesapeake Bay and nearby coastal waters, and a coastwide bait fishery (approximately 30% of landings). Although most bait fishing for Atlantic menhaden occurs in estuaries and coastal waters, midwater trawl fishermen initiated a new and highly successful winter bait fishery in 2014 along the offshore portion of the Mid-Atlantic shelf from New Jersey to Southern New England. To help determine if development of this winter bait fishery for Atlantic menhaden is sustainable, more information on the size and age structure of the overwintering stock was needed.

Despite the economic and ecological importance of the Atlantic menhaden stock (Garrison et al. 2010, SEDAR 2015, Buchheister et al. 2016), data to support management is sparse, particularly in the northern portion of the range. Most biological samples used to inform stock assessment are obtained from the reduction fishery which, although well sampled, no longer regularly operates across most of the stock's range, which extends from Florida to Nova Scotia (SEDAR 2015). Thus, data collected during the last few decades have been concentrated in the Chesapeake Bay region south of the winter bait fishery during spring through fall. Although biological samples are collected from the winter bait fishery as required in Amendment II to the Atlantic States Marine Fisheries Commission's Atlantic Menhaden Fishery Management Plan (ASMFC 2012), sampling intensity is landings-based and thus limited by catch-based quotas. Another reason little is known about the northern, overwintering portion of the Atlantic menhaden stock is that there is no dedicated survey designed to target Atlantic menhaden. Traditional bottom trawl surveys rarely encounter Atlantic menhaden because fish are highly mobile and school near the surface throughout most of the year. Although Atlantic menhaden schools typically spend most of the day deep below the surface when water temperatures drop in winter (June and Reintjes 1959, Reintjes 1969, Ahrenholz 1991, Smith 1991), agency surveys do not operate during this time or far enough offshore to reliably encounter overwintering Atlantic menhaden. Thus, a need was identified for the development of new methods for surveying overwintering Atlantic menhaden.

To address this challenge, simulation testing of a novel survey design tailored to Atlantic menhaden winter biology and behavior was conducted during 2017-2018 with funding provided by the National Science Foundation, Science Center for Marine Fisheries (award #1266057). This study estimated the accuracy and precision of a hydroacoustic survey for Atlantic menhaden using a combination of bait fishery Vessel Trip Reports, observed bycatch records, and water condition data collected during winter months off the coast of New Jersey. Results suggested that the use of traditional acoustic survey designs would produce biomass estimates with poor precision and accuracy due to patchiness of large Atlantic menhaden schools across the landscape. Instead, the combined use of downward-viewing echosounder and an omni-directional sonar allowed the search range to be expanded along each transect and generated biomass estimates with a coefficient of variation approximately 25% (Liang et al. 2020). This novel acoustic survey design was implemented in winter 2022 as described below by a team of academic, federal, state, and private scientists and fishing industry members with funding provided by the Saltonstall-Kennedy Competitive Grants Program.

The goals of this cooperative survey were to:

1. address industry's need for collection of novel scientific data to support sustainable development of enhanced fishing opportunities,
2. expand the use of cooperative science, and
3. reduce uncertainty in assessment and management of Atlantic menhaden.

The objectives of this cooperative survey were to:

1. estimate overwintering biomass and structure of Atlantic menhaden in the winter bait fishery's primary fishing area,
2. evaluate performance of industry acoustics in estimating Atlantic menhaden biomass,
3. evaluate ageing uncertainty, and
4. effectively communicate and disseminate project findings to menhaden scientists and fishery managers.

METHODS

Survey design and preparation

Atlantic menhaden encountered by the winter bait fishery typically form large sedentary schools that drop below the surface waters during the day and demonstrate reduced vessel avoidance when water temperatures offshore of New Jersey drop to ~4-6°C. Using a spatially explicit model, the performance of a suite of hydroacoustic survey designs were simulation-tested in order to determine the best approach for surveying Atlantic menhaden during their more sedentary overwintering period and estimate the total transect distance that needed to be surveyed to achieve an acceptable level of precision (Liang et al. 2020). Classical downward-sounding acoustic survey design led to low precision of biomass estimates because Atlantic menhaden form extremely large schools that are patchily distributed across the landscape. Acceptable precision was achieved with a two-stage survey design in which a combination of industry acoustics and midwater trawling was used to estimate stock biomass within the study region. With this design, schools are detected along a series of transects within a wide search area (1,600m on either side of the vessel) using omnidirectional sonar, and a downward-facing echosounder provided *in situ* acoustic-based estimates of school biomass for a subset of schools encountered within the search area. For more details on survey design justification, see Liang et al. 2020.

Prior to survey implementation, a protocol for research involving animals was approved by the UMCES Institutional Animal Care and Use Committee (Protocol F-CBL-21-07), a Scientific Research/Cruise Plan was submitted to UMCES, a Scientific Research Letter of Acknowledgement was obtained from NOAA Fisheries Greater Atlantic Regional Fisheries Office (21003), and a Scientific Collecting Permit was obtained from NJDEP (2022-1903).

Survey implementation

The survey was conducted using a 49 m (160 ft) commercial midwater trawling vessel, the *F/V Dyrsten*, that is owned and operated by H&L Axelsson, Inc. (Fig. 1). The *F/V Dyrsten* utilized a Cosmos Trawl net with an 18-m vertical opening, 51-m horizontal opening, and mesh size of 3.8cm in the cod end. The vessel was equipped with a recordable Simrad ES80 7° split-beam, hull-mounted 38kHz ES38B transducer, and Furuno



Figure 1. *F/V Dyrsten*, Cape May, NJ.

FSV25S (20 kHz) omnidirectional sonar. Unlike previous Simrad industry-grade echosounders, the ES80 echosounder does not contain a systematic “triangle-waver” error component.

The survey was initially scheduled to begin the first week of February 2022, but was delayed until mid-February due to warm ocean temperatures (Table 1). The ES80 echosounder was calibrated offshore of Cape May, NJ February 11-13 using a wireless calibration system developed at the Northeast Fisheries Science Center to position the tungsten carbide (with 6% cobalt binder) sphere (e.g., 38.1-mm diameter) under the transducers to map the beam pattern and measure the on-axis response using the standard sphere method. Additional details on field calibration can be found in Appendix A.

Table 1. 2022 Cooperative Atlantic Menhaden Winter Survey timeline

Date	Survey event
Feb 11-Feb 13, 2022	At-sea sonar calibration
Feb 14-Feb 15, 2022	Transects 1-2 (“Leg 1”)
Feb 16-Feb 19, 2022	Survey suspended due to severe storm
Feb 20-Feb 24, 2022	Transects 3-6 (“Leg 2”)
Feb 28-Mar 4, 2022	Additional at-sea samples collected by VIMS during fishing (“Leg 3”)
Mar 6-Mar 22, 2022	Additional port samples collected by Lund’s Fisheries

Transects 1 and 2 were surveyed February 14-15 during which Atlantic menhaden schools were encountered, and a subset were ensouffied, trawled, and sampled (details below). The vessel returned to port to offload and weigh the catch on February 15. The survey was suspended February 16-19 due to a severe winter storm. When the survey resumed February 20-24 to complete Transects 3-6, oceanographic conditions had changed and the dense menhaden schools observed near the ocean floor prior to the storm had dispersed into small schools near the surface.

The survey was completed earlier than expected on February 24. Given additional sea days were available, the VIMS survey team returned to the vessel February 28-March 4 and continued to ensouffify and sample additional Atlantic menhaden schools and collect hydrographic data during targeted fishing operations. Once VIMS crew were no longer accompanying the vessel, industry partner Lund’s Fisheries collected additional port samples throughout the remainder of the fishing season and delivered them to VIMS for preparation and analysis

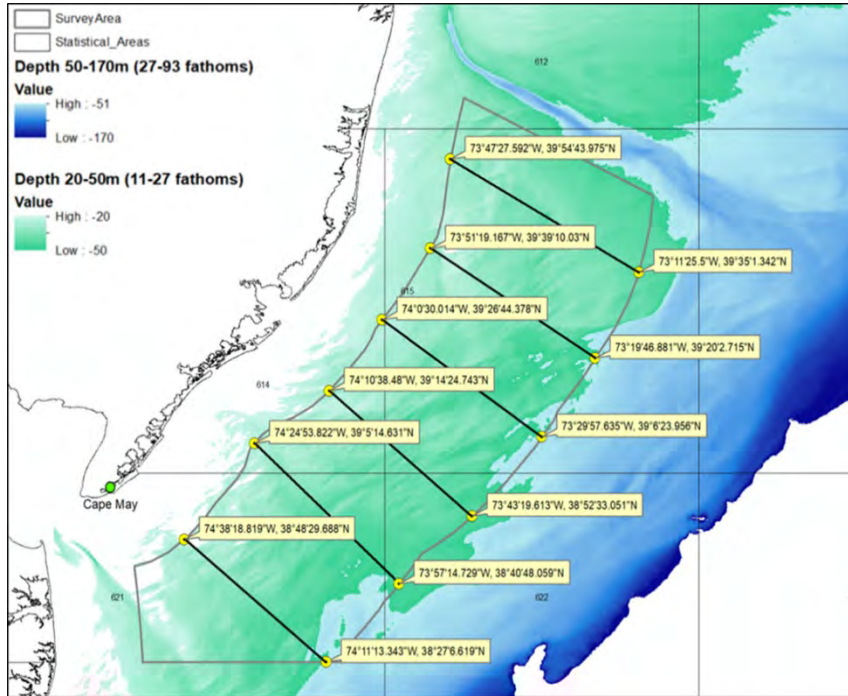


Figure 2. 2022 Cooperative Atlantic Menhaden Winter Survey area (black line) 15-50 miles off the coast of New Jersey. Colors indicate depth (m).

irregular shape of the study area and random start location. GPS coordinates of each transect and the entire survey track were recorded in VIMS’s Fisheries Environment for Electronic Data software.

During the survey (February 14-24), six systematic transects with an average length of 58 km were surveyed with approximately 29 km between transects (Fig. 2). Transects were oriented perpendicular to shore beginning at a random starting latitude between 73°44'56.4919"W 40°5'23.5729"N and 73°51'57.8296"W 39°38'15.5024"N. The survey began with the southernmost Transect 1 at the point nearest to shore and proceeded northward (Table 2). The direction of transects alternated such that Transect 1 was run inshore to offshore, Transect 2 was run offshore to inshore, and so on. Transects were of variable length due to the

Table 2. Starting and ending coordinates of survey transects.

	Direction	Start Longitude	Start Latitude	End Longitude	End Latitude
Transect 1	Offshore	74°38'18.819"W	38°48'29.688"N	74°11'13.343"W	38°27'6.619"N
Transect 2	Inshore	73°57'14.729"W	38°40'48.059"N	74°24'53.822"W	39°5'14.631"N
Transect 3	Offshore	74°10'38.48"W	39°14'24.743"N	73°43'19.613"W	38°52'33.051"N
Transect 4	Inshore	73°29'57.635"W	39°6'23.956"N	74°0'30.014"W	39°26'44.378"N
Transect 5	Offshore	73°51'19.167"W	39°39'10.03"N	73°19'46.881"W	39°20'2.715"N
Transect 6	Inshore	73°11'25.5"W	39°35'1.342"N	73°47'27.592"W	39°54'43.975"N

All transects were surveyed during daylight hours. The vessel sampled along the transects at approximately 7 knots (3.6 m/s) with the ES80 split-beam echosounder while the omnidirectional sonar was used to search for schools within a distance of 1,600 m on either side of the transect (vessel). The ES80 7° split-beam echosounder mounted to the hull of the vessel collected at the fastest ping rate setting in narrowband (“continuous wave”) mode and 0.256-ms pulse duration. The acoustic backscatter from the omnidirectional sonar was scrutinized in real time by experienced fishing captain Stefan Axelsson and Chief Scientist Dustin Gregg. GPS coordinates, heading, and approximate distance from the vessel of all schools identified in real time by the omnidirectional sonar were recorded. If schools were detected, the vessel would break from the planned transects to collect backscatter of the schools encountered (Fig. 3). A unique school ID

number was assigned to each school identified and a log was created with timestamps for corresponding ES80 data files. Before leaving the transect, the vessel marked its location, and, once schools were ensonified, the vessel then proceeded to the closest point on the original transect and resumed searching.

When trawl sets were initiated, GPS coordinates and times (synchronized with the echosounder clock) marking the beginning and end of each tow were recorded in VIMS's Fisheries Environment for Electronic Data software. Trawled catch from each school was pumped into separate tanks and individually weighed dockside by the bait processor for comparison with *in situ* acoustic biomass estimates of each school.

In addition to ensonifying menhaden schools during the day on survey transects, the survey team took the opportunity to collect echosounder data on an additional 30 schools at dusk as schools began to break up and disperse to feed. These data will be used in future analysis of menhaden to explore diel migration patterns, schooling behavior, and target strength.



Figure 3. (Top) Instrumentation and sonar displays at helm of 49-m commercial midwater trawling vessel, F/V Dyrsten, equipped with a recordable 38 kHz Simrad ES80 split-beam echosounder and a Furuno FSV25S omnidirectional sonar. (Bottom) Paired Furuno omnidirectional (left) and ES80 echosounder (right) images of ensonified School 49.

Biological samples were collected from each trawled school to provide information on school structure. VIMS scientists subsampled the catch from the net pump using NEFOP's Catch Composition Technique for purse seine and midwater trawl operations, as recommended by the ASMFC Atlantic Menhaden Technical Committee (August 10, 2020 memo). Once the cod end had been brought alongside the vessel, the chief scientist asked the captain for an estimate of pumping time for that haul. The estimated pumping time was divided by 10 to yield the sampling interval (e.g., estimated pumping time = 20 minutes, sampling interval = 2 minutes, yield = 10 baskets of sample).

From each basket collected, 10 individual fish received full processing, which included the following elements: fork length (mm), total length (mm), whole weight (kg), eviscerated weight (kg), macroscopic sex (male/female/unknown), and macroscopic maturity stage (immature/mature-resting/ mature-ripe /mature-spent). A scale patch (~50 scales) was also collected, stored in labeled vials, and frozen. The head was removed and frozen for later extraction and preparation of both sagittal otoliths for ageing. For female menhaden, both ovaries were removed, weighed, and preserved in Normalin for later reproductive evaluation. Once 10 menhaden from each basket had been sampled in this manner, individual length (fork and total) and individual whole weight were recorded for the remaining Atlantic menhaden specimens. Although very little bycatch was encountered, all other species collected during sampling operations were recorded and individual length and individual whole weight data were collected. School number, set number, and GPS location of the set was associated with each biological sample. Sampled menhaden carcasses and bycatch were deposited overboard once data collection was complete.

Hydrographic data were collected at each trawl set location and systematically 10 km apart along each transect to characterize ocean conditions and habitat use. A profile of depth (m), water temperature (°C), salinity (PSU), and dissolved oxygen concentration (mg/l) was recorded at each location using Hydrolab's Hydras3 LT software.

All biological sampling and water quality data were immediately saved in two locations, the local workstation computer and an onboard server. Upon completion of the cruise, all trawl collection subsampling and hydrographic data were audited at VIMS using a series of custom-built routines designed to effectively and efficiently identify and correct at-sea data entry errors.

School biomass estimation

A summary of acoustic data calibration, processing, and analysis is provided here; complete documentation can be found in Appendix A.

Echoview calibration

Echoview software (version 12.1 or 13, Hobart, Tasmania) was used to process and export acoustic estimates of Atlantic menhaden biomass. ES80 data files of the calibration sphere were used to adjust calibration results from the field. In Echoview, the sound speed was updated based on water temperature in the data file source (surface temperature from the ship's NMEA network) and user-entered salinity estimate. Target strength of the sphere was determined from single echo detections within the region in the echogram corresponding to the echo traces of the sphere (Appendix A Figs. 3-1 and 3-2). Single echo detection criteria selected in Echoview are given in Appendix A Table 3-1. Single echo detections were also analyzed after filtering out single echoes greater than 0.5° off the acoustic axis.

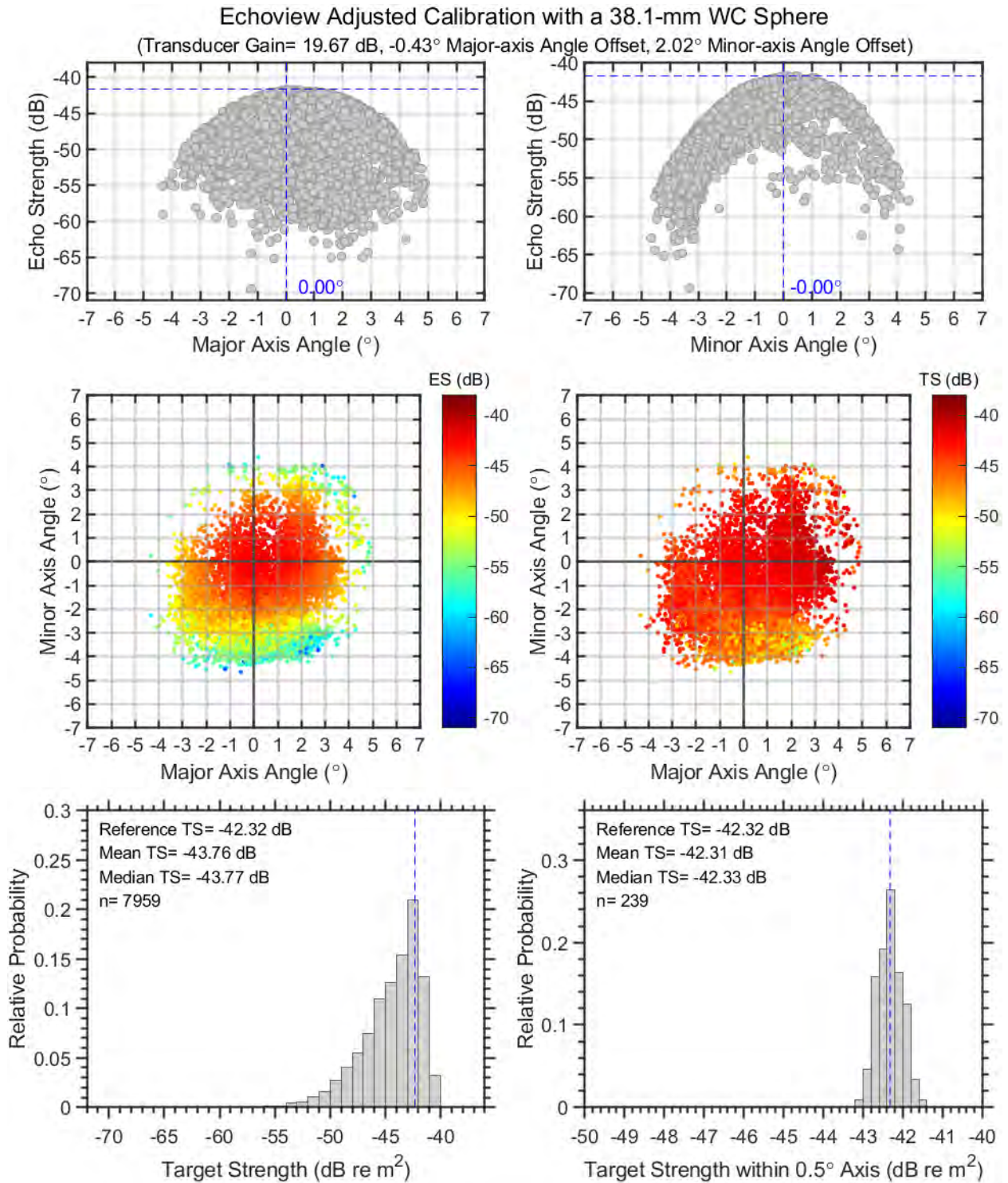


Figure 4. TOP and MIDDLE: Angular target strength plots of 38.1 mm Tungsten Carbide sphere with on-axis adjustments of transducer gain to 19.67 dB and major and minor axis angle offsets of -0.43° and 2.02°; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.

The target strength of the sphere under field conditions prior to field calibration adjustments to angles (Appendix A Figure 3-3) and after angular offsets were applied (Appendix A Figure 3-4) indicated further improvement was possible. Based on all single echo detections in Echoview, the echo strength peaked at a major axis angle offset of -0.43° and minor axis angle offset at 2.02° (Fig. 4; also Appendix A Figure 3-5). The transducer gain was adjusted to 19.67 dB such that the mean target strength of on-axis single echo detections matched the reference target strength of -42.31 dB re m^2 . After the transducer gain was adjusted, a new S_a correction factor of 1.2652 dB was determined based on the on-axis sphere targets and equation 4.9 from Demer (2015). The adjusted transducer gain and S_a correction factor from the post-hoc analysis of the calibration data in Echoview was updated in the Echoview calibration supplement file.

Echogram processing

ES80 data files corresponding to schools identified in real time by the captain and chief scientist from the omnidirectional sonar were processed. The survey generated 2,788 files (878 GB) in raw ES80 data files that were timestamped at the start of each recording. Not all schools detected in the omnidirectional sonar imagery and assigned a school number (i.e., ID #) were observed or passed over with the ES80 split-beam echosounder due to various reasons, including school evasion of vessel, schools being located too high in the water columns, and potential misidentification of schools. Details on ES80 raw files processed can be found in Appendix A.

The *F/V Dyrsten* has a draft estimated to be approximately 4.3 m (14 ft) with no fish/water cargo and 5.2 m (17 ft) under full load. The transducer is mounted 1.8 m (6 ft) below the keel. For purposes of processing data and approximating the water depth, the transducer was assumed to be at a water depth of 6.5 m. The transducer was mounted securely in reverse direction where the forward arrow on the transducer was pointed to the stern. To compensate for this, a beam rotation of 180° was used during processing. The Hydrolab profile measurements were used to estimate representative average water quality conditions during each leg of the survey. The differences on sound speed estimates for each leg were negligible, and the final calibration file was updated for sound speed for each trip taken during the survey and post-survey data collection periods.

Several echograms were examined that contained small pelagic fish backscatter and large benthic Atlantic menhaden school backscatter. Minimum S_v (volume backscattering strength, dB re $m^2 m^{-3}$) threshold curves for selected fish backscatter versus water column background S_v following methods of Jech and Michaels (2006) would indicate a minimum S_v threshold could have been set between -50 dB and -60 dB. However, Rudstam et al. (2009) suggests setting the minimum S_v threshold to be equivalent to the minimum target strength (TS, dB re m^2) of interest. Assuming the minimum TS of interest and minimum single echo detection criterion to be -50 dB, then the TS uncompensated for beam pattern would be -56 dB, which converts to approximately -63 dB assuming sound speed of 1475 m/s and 55 m in range. Given the minimum TS threshold of -63 dB and -66 dB minimum S_v threshold used by Jech and Michaels (2006) for Atlantic herring (*Clupea harengus*), the minimum S_v threshold used in this study was a conservative nominal value of -64 dB. S_v backscatter was filtered by masking the upper water column and removing the impulse noise spikes (Fig. 5, Appendix A Figs. 4-1 and 4-2). Noise may have been due to other depth sensors or the omnidirectional sonar equipped on the vessel.

To convert to fish per m^3 or m^2 , TS was back-transformed from a dB value to a linear quantity called the backscattering cross-section ($\sigma_{bs} = 10^{(TS/10)}$). The TS representative of a single Atlantic

menhaden to use for this study does carry with it a degree of uncertainty given the lack of species-specific experimental data, model estimates, and *in situ* estimates. Exploratory analysis of the echograms containing Atlantic menhaden during this survey indicated that schools were too dense to obtain an *in situ* TS estimate. Instead, TS was estimated based on total length (TL; Simmonds and MacLennan 2008) as was done by Lucca and Warren (2018), who used a generalized TS-TL equation to acoustically estimate distribution and abundance of Atlantic menhaden in estuarine waters of Long Island, New York. Thus, the mean TS (-32.2 dB re 1 m²) of Atlantic menhaden at 38 kHz used in this study was estimated following equation:

$$TS = 19.1\text{Log}_{10}(\text{TL}) + 0.9\text{Log}_{10}(f, \text{kHz}) - 62 \quad (\text{Eq. 1})$$

where TS = target strength (dB re 1 m²), TL = total length (cm), and f = acoustic frequency (kiloHertz, kHz).

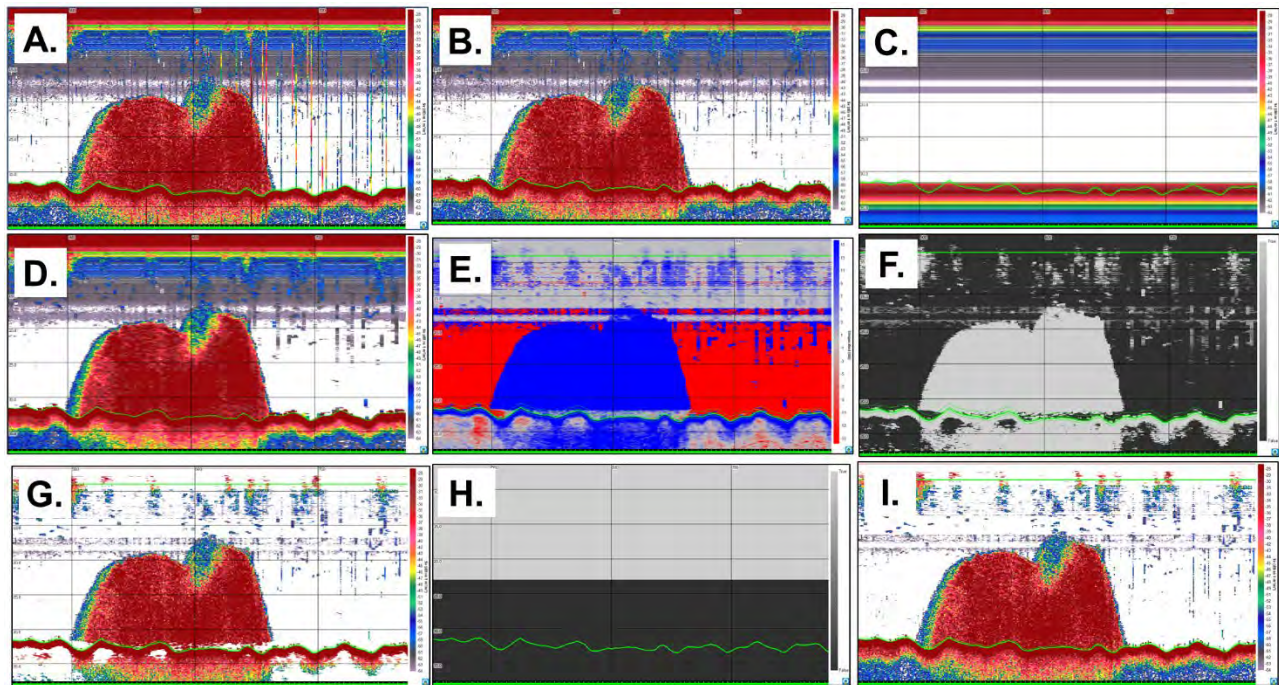


Figure 5. Step by step echogram processing: A. Raw S_v . B. Impulse noise removed. C. Resampled (median of 2000 ping \times 3 sample window and matched S_v pings. D. Smoothed 3×3 S_v . E. Signal-to-Noise Ratio (SNR). F. Mask $|SNR| > 3$ dB. G. Filtered S_v mask to water column. H. Upper (23 m) water column mask. I. Filtered S_v .

Volumetric fish density of each classified echogram region (number of fish per cubic meter) was calculated as $10^{(S_v_mean/10)}/(10^{(meanTS/10)})$. Volumetric biomass density of each classified echogram region (kilograms per cubic meter) was calculated as volumetric fish density multiplied by mean weight from this study (0.285 kg; Appendix A Table 6.1). Given the difference in shape between schools located near the ocean floor and schools located off bottom, we used the equation for a dome to estimate the volume of all schools with a minimum altitude ≤ 0 and we used the equation for an ellipsoid to calculate the volume of all schools with a minimum altitude > 0 ; altitude of each school was based on minimum altitude of the school region's bottom boundary referenced to the

back step off bottom, which allowed minimum altitude to be <0 . Volumetric biomass density was then multiplied by school volume to estimate the biomass of each school (kg). Only conservative estimates that excluded echoes related to side lobe or multiple scattering contributions, ensonified and likely to be menhaden were included. Given logistical constraints, we were unable to re-ensonify the trawled area to estimate trawl efficiency as originally planned. Therefore, we assumed 100% trawl efficiency when estimating biomass. Additional details on school density, volume, and biomass calculations can be found in Appendix A.

Schools were identified as Atlantic menhaden either through direct sampling, visual sighting at surface, or via shoaling behavior (formation of extremely large, dense schools; e.g., Fig. 5). Schools that could not be identified in this way were categorized as “other fish” (e.g., medium to large individual fish echo traces) or “small pelagic school” (e.g., small, less coherent regions of weaker S_v in the mid- to upper water column) based on visual scrutiny of the location, morphology and magnitude of the S_v echogram region.

School biological structure

Size, age, sex, and maturity composition of five Atlantic menhaden schools sampled at-sea and the five fishery trips sampled at port was characterized. Ageing methods are described [below](#) and in Appendix D. Samples were examined for differences in composition by data collection period: fishery-independent samples collected during the survey, post-survey at-sea fishery-dependent samples, and post-survey fishery-dependent port samples. Using all size samples collected, weight-at-length and total length vs fork length relationships were quantified. Size-at-age relationships were characterized using both scale- (Beaufort) and otolith-based (VIMS) ages to reflect differences among reads for each hard part using the part with which each lab was most familiar.

Study area biomass estimation

This survey followed a transect design such that six transects were selected using systematic random sampling. The actual survey protocol slightly deviated from the original design due to a severe storm such that Transects 3 to 6 (“leg 2”) were surveyed 5 days after Transects 1 and 2 (“leg 1”), and the planned trawling of acoustically identified schools during the latter half of the survey was mostly not possible due to high mobility of the population and its location near the surface. Thus, we used acoustic estimates of school biomass and associated hydrographic data to inform a spatial simulation model to estimate the range of total biomass in the region during the study period. This model-based approach examined a suite of alternative biomass estimators, including a ratio estimator appropriate for random sampling along transects with unequal lengths as well as three other approaches that accounted for the potential changes in detectability between the two legs of the survey due to different ocean conditions. To characterize ocean conditions, hydrographic data were exported to a Geographical Information System and interpolated into a raster estimating the contemporary environmental conditions at the centroid of the schools across the study area using inverse distance weighting (R Core Team (2003) Version 4.3.1 and ArcMap 10.8.1).

Species distribution modeling

A species distribution model was developed to estimate the changes in detectability driven by the change in seascape conditions, mainly the temperature changes possibly due to warm eddy and/or storm effects. We assumed that differences observed in schooling intensity and average biomass (i.e., detectability of whole schools) during transects 3-6 (i.e., leg 2 of the survey) were entirely due

to temperature changes, and these changes did not reflect the actual changes in the spatial distribution of the population. The model used other environmental predictors and geographical coordinates to capture residual spatial trends in the population distribution.

The species distribution model was formulated hierarchically for both school location and biomass. Each school was represented as a point location at the horizontal centroid of the school location. Given the relatively small size of the school to the entire study area, this approximation should have a limited impact on biomass estimation. Models varied by whether or not certain environmental variables were used as predictors of school location and biomass, and the spatial autocorrelation process within a marked point pattern model (Diggle et al. 2010). The schooling distribution follows a log-Gaussian Cox process, while the observed biomass follows a log-Gaussian Geostatistical model. We considered shared spatial random effects between the two model components to enable joint estimation of the spatial process governing both the schooling density and the biomass (Conn et al. 2017, Pennino et al. 2019).

We initially considered all environmental covariates such as bathymetry, salinity, temperature, and dissolved oxygen. The variance inflation factor was computed to identify multi-collinearity between the environmental covariates (Fox 2015). Models for spatially auto-correlated random effects followed a Matérn covariance function and were implemented via a computationally efficient approximation (Lindgren et al. 2011, Simpson et al. 2016b). The Geostatistical model was approximated using the Stochastic Partial Differential Equation approach (Lindgren et al. 2011) and implemented using the Integrated Nested Laplace Approximation method (INLA, Rue et al. 2009). We used marginal log-likelihood, as well as mean square errors (MSE) in school intensity and log biomass preschool to estimate the predictive performance of each model.

Detectability estimation

A relative detectability for the leg 2 sampling was estimated by first predicting the schooling density and average biomass per school at leg 2 transects, based on a hypothetical temperature distribution that was similar in range to the temperature during the leg 1 sampling, accounting for the temperature-driven differences of detectability. These model-based predictions of school intensity and biomass were then compared with the model predictions based on the actual observed temperature. The additional number of schools as well as the increase in log average biomass were estimated. These estimated impacts of relative detectability were applied to the actual biomass and schooling data and expanded using a design-based or ratio-based estimator to the entire study area (Thompson 2012). The design-based uncertainty for these estimates was also quantified using the standard deviation and the ratio-based estimates methods (Thompson 2012). Additional details can be found in Appendix C.

Statistical inference was based on approximated Monte Carlo sampling implemented in INLA. All analyses were conducted in R using packages R-INLA (Rue et al. 2009), terra (Hijmans 2023), and sf (Pebesma 2018). To incorporate the uncertainty of both the design-based estimation and the detectability, the design-based errors were randomly sampled from the model-based adjusted transect-specific biomass. Normal approximation was assumed for the design-based error estimates. A Monte Carlo integration was then applied across the approximate posterior sample of adjusted biomass estimates to derive the 90% credible sets for the biomass. This was necessary because the model estimates were highly right-skewed and posterior moments were not robust to outliers and could generate unrealistic uncertainty estimates.

Ageing uncertainty

An ageing exchange of scales and otolith samples was conducted post-survey to quantify ageing uncertainty. The exchange involved project collaborators with ageing programs, namely VIMS, NJDEP, and NOAA Beaufort Laboratory. These three labs were chosen because Beaufort Laboratory is responsible for ageing all port samples used to inform the Atlantic menhaden stock assessment, VIMS was a collaborator on survey implementation and their staff are experienced at ageing Atlantic menhaden otoliths collected in their fishery-independent surveys, and NJDEP was interested in having their ageing team learn to age Atlantic menhaden. Thus, these three labs represented a wide range of different experience levels and expertise in ageing Atlantic menhaden using different methods.

The objectives of the ageing exchange were to:

- 1) quantify intralab and interlab paired age agreement, when possible,
- 2) quantify scale vs otolith paired age agreement, and
- 3) identify patterns, if present, in paired age agreement by sex and size.

Although validated ages were not available to assess accuracy (age estimates compared with true ages), intralab and interlab estimates of precision (repeatability of age estimates by the same or among different readers), and bias (systematic differences in age estimates) can be used to improve ageing methodology, ensure greater consistency among ageing programs, and inform stock assessment uncertainty (Campana et al. 1995, Morison et al. 2005).

Data collection

A total of 81 samples were selected for full data collection, including sex, maturity, eviscerated weight, and age (both scale- and otolith-based reads) during the survey. An additional 72 samples were fully processed from the post-survey sampling conducted by VIMS at-sea. Once the VIMS team had returned to land, Lund's Fisheries continued port sampling throughout the remainder of the winter menhaden fishing season, collecting an additional 150 fish at port (three 10-fish samples/trip collected over five additional trips), and all 150 samples received full workups.

Sample processing

All samples collected in the field for full workups were first transported to VIMS for processing using standard VIMS survey protocols and procedures. VIMS fish ageing protocols were established from procedures developed by NEFSC, Old Dominion University, and VIMS validated and published research developed by NEFSC, Old Dominion University, and VIMS (Bonzek et al. 2017, VanderKooy 2020). VIMS standard ageing protocols have been verified, collaborated, and referenced annually at the ASMFC Fish Ageing QA/QC Workshop (ASMFC 2023).

Scale samples were thawed and lightly scrubbed in a soap and water solution to remove debris and excess slime. Six of the cleanest, undamaged scales from each scale patch were selected, thoroughly dried, and pressed between two glass microscope slides. Many samples included regenerated scales. When possible, replacement scales were found, but some samples included a few regenerated samples on the slides. One sample (Specimen ID #75) contained all regenerated samples with no replacements and was omitted from analysis. Both sagittal otoliths from each sample were extracted, thoroughly dried, and cleaned as necessary.

Ageing methods

Each ageing lab followed their own standard protocols for ageing Atlantic menhaden as described below. VIMS prepared scale samples and evaluated them using a microfiche reader using VIMS Atlantic menhaden protocols (Appendix D). Paired whole otoliths were evaluated in water under a stereo dissecting microscope at 50x magnification with transmitted light. One reader, Jameson Gregg, read each hard part twice using VIMS protocols for scale (June and Roithmayr 1960) and otolith ageing (Deegan and Thompson 1987, Warlen 1988, Warlen 1992, Ahrenholz 1994) of menhaden. In cases where the two reads differed, info on size or location and date of capture was used to inform the final age assignment based on expected timing of mark formation. Upon completion, all samples were mailed to NJDEP.

At NJDEP, two readers, Jamie Darrow (Reader 1) and Alissa Wilson (Reader 2), read each hard part once. Beaufort Laboratory ageing protocols were used to age scales and VIMS protocols were used to age otoliths as detailed in the attached protocols. Prepared scale samples were evaluated using a Microfiche reader. Paired whole otoliths were evaluated in water under a stereo dissecting microscope using reflected light. Upon completion, all samples were mailed to Beaufort.

At Beaufort, one reader, Amanda Rezek, read each hard part once. Prepared scale samples were evaluated using a stereo microscope (10X magnification) with transmitted light and cellSens imaging software to measure. Scales were aged using Beaufort Laboratory scale ageing protocols (attached). Paired whole otoliths were evaluated in 70% ethanol under a stereo dissecting microscope (20X magnification) with transmitted light using VIMS ageing protocols. Upon completion, all samples were archived at Beaufort Laboratory for use in future studies.

Statistical Analyses

Of the 303 samples for which full workups were conducted, 302 were suitable for inclusion in the ageing comparison. However, agers noticed that many of the scales were damaged and difficult to read due to the physical stress of fish caught in the mid-water trawl net used for this survey. In the absence of validated ages, ageing agreement was evaluated. For labs that aged each hard part more than once (VIMS and NJDEP), consistency between two reads by the same reader, and among two different readers was quantified. For the two interlab comparisons, the most experienced ager at the NJDEP lab (Darrow – Reader 1) and VIMS's second read were used.

To quantify ageing agreement within and among ageing labs, the following indices were calculated: percent agreement (PA), average percent error (APE), and Chang's average coefficient of variation (ACV). To evaluate bias within and among ageing labs, the following tests of symmetry were conducted: McNemar's (McNemar; McNemar 1947) and Evans & Hoenig (EvansHoenig; Evans and Hoenig 1998). Although frequently used in other ageing studies, Bowker's test of symmetry (Bowker 1948) was not used here given the overall large number of samples, high variability in age reads, and pattern of decreasing sample size with age would likely generate false positives indicating bias when it is not actually present (Nesslage et al. 2022). Age-bias plots were generated for each comparison and for each comparison with results separated by the sex of each sample. All indices were calculated and tests of symmetry performed using the FSA package (Ogle DH 2023) for R Version 0.9.4 (R Core Team 2023).

RESULTS

Survey data collection

In general, schools were more mobile during the survey periods than anticipated due to warmer than expected water temperatures. Thus, some schools were spotted but fled the vessel, some schools fled or dispersed after initial ensonification (goal had been two perpendicular pre-fishing passes), and some schools remained sedentary enough to be both ensonified and trawled.

Along the six survey transects, a total of 38 schools were identified as Atlantic menhaden with the omnidirectional sonar, 12 were ensonified with the ES80 echosounder, and three were sampled (Fig. 6). Of these, 23 schools were spotted, 8 ensonified, and three sampled prior to the storm. Post-storm, the 15 schools observed on the omnidirectional sonar (and sometimes visually identified from the vessel) were often too near the surface to be detected by the ES80. Although 4 additional schools were ensonified post-storm, no additional schools were sedentary or low enough in the water column to be sampled.

Table 3. Schools or trips/hauls sampled and samples collected pre- and post-survey.

	Schools/trips sampled	Fork length, total length, whole weight	Sex, maturity, eviscerated weight, age (scale & otolith)
Survey (at-sea)	3 schools	2,132	80
Post-survey (at-sea)	2 schools	2,005	72
Post-survey (port)	5 trips/7 hauls	150	150
Total		4,287	302

Post-survey data collection

Additional samples were collected at sea by the VIMS team during targeted fishing operations both inside and outside the study area for five days after completion of the survey. An additional 155 schools were spotted and 94 schools were ensonified (Fig. 6). Two extremely large schools were sampled post-survey as well, providing an additional 2,005 menhaden size samples (Table 3). Of those samples, 72 were sampled for additional data, including sex, maturity, eviscerated weight, and age (both scale- and otolith-based reads). Additional hydrographic data were collected post-survey to document ocean temperature change, which likely influenced menhaden schooling behavior. Once the VIMS team had returned to land, Lund's Fisheries continued port sampling throughout the remainder of the winter menhaden fishing season, collecting an additional 150 fish at port (three 10-fish samples/trip collected over five additional trips). All 150 port samples received full workups.

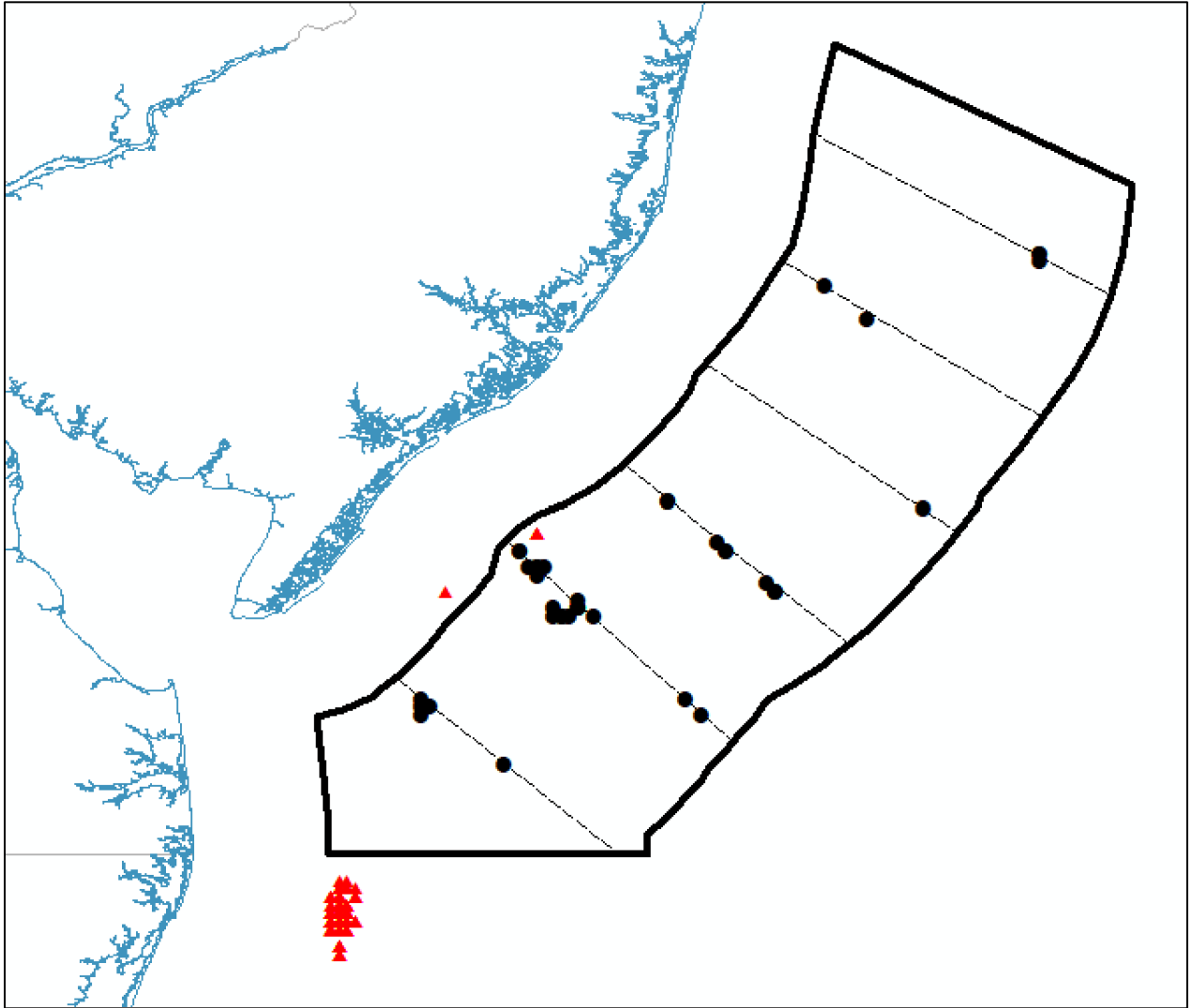


Figure 6. Schools encountered during survey (black circles) along survey transects (dashed lines) in the survey area (black outline), and schools encountered during at-sea sampling post-survey (red triangles).

School biomass

Biomass estimates for all Atlantic menhaden schools ensouified, both during and after the survey period, and their average depth can be found in Appendix B. During Leg 1 of the survey (Transects 1-2), more and larger schools were ensouified than during Leg 2 (Transects 3-6; Table 4). The maximum school ensouified during Leg 1 was 47,291 kg vs 54 kg during Leg 2. The difference between survey Legs may reflect behavioral response of Atlantic menhaden due to large changes in ocean conditions as described [below](#). The 84 schools ensouified post-survey were more similar in depth and size to those ensouified during Leg 1 of the survey, as were ocean conditions.

Table 4. Summary of school biomass by data collection period.

Data Collection Period	Number of ensonified schools	School mean depth (m)	School biomass (kg)	
			Mean	Sum
Survey - Leg 1	20	25.7	47,291	945,811
Survey - Leg 2	3	20.1	54	162
Post Survey - Leg 3	84	26.1	23,662	1,987,620

Acoustically derived biomass estimates and trawl catch weights obtained dockside by individually weighing each school were largely similar in agreement (Fig. 7).

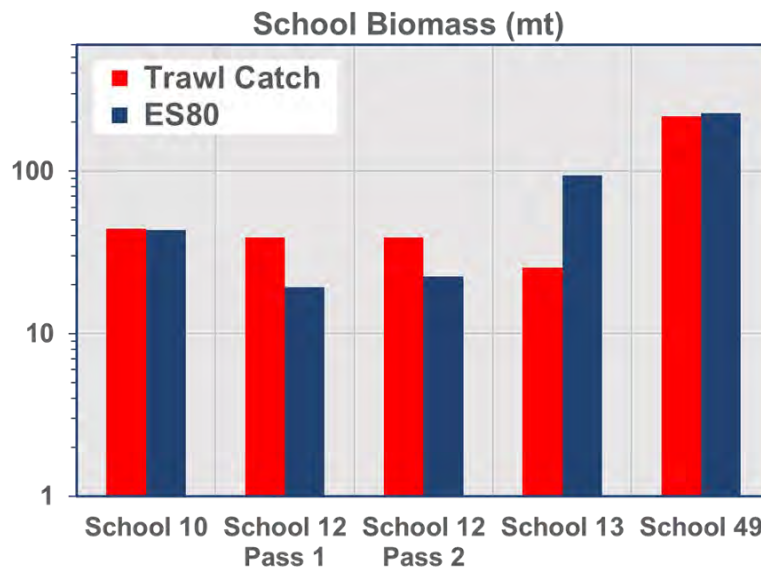


Figure 7. Atlantic Menhaden school biomass estimates by midwater trawl (dockside weigh-out at Lund’s Fisheries in Cape May, NJ) and Simrad ES80 split-beam echosounder. Acoustically-derived density was scaled to biomass (metric tons) based on the ideal dome volume (school height, school length). Note that schools 10, 12, and 13 were ensonified and harvested during the survey period in the survey area, whereas school 49 was ensonified and harvested during the post-survey period just south of the survey area.

During the survey, an additional 49 schools were spotted on the omnidirectional sonar, but could not be identified to species; three were categorized as “other fish” and 46 were categorized as “small pelagic school”). Post-survey, an additional 24 schools were spotted on the omnidirectional sonar, but could not be identified to species (five “other fish” and 19 “small pelagic school”). During this project, the total biomass ensonified that could not be identified to species was relatively small (58,661 kg), only 3% of the total biomass of Atlantic menhaden ensonified (1,754,563 kg).

School biological structure

All schools identified as Atlantic menhaden by the captain and crew with omnidirectional sonar and subsequently sampled during survey and post-survey operations were confirmed to be highly homogeneous schools of Atlantic menhaden. Schools sampled were almost entirely composed of Atlantic menhaden. Out of >3 million pounds of Atlantic menhaden landed and over 4,299 fish

sampled during the 2022 survey and fishing season, only one American shad (*Alosa sapidissima*) was collected in a sampled bucket during post-survey sampling operations. Throughout all survey and post-survey sampling conducted by VIMS scientists, other species were noted when observed in the chute or bycatch grate, recorded in the cruise notes, and given sampling workups for inclusion in the biosamples database when it was safe to collect them. This additional bycatch included one Atlantic mackerel (*Scomber scombrus*), one Atlantic herring (*Clupea harengus*), one spiny dogfish (*Squalus acanthias*) and 10 striped bass, all collected post-survey. An additional 10-15 striped bass were caught but released during catch processing. VIMS survey crew also noted very small operational discards of Atlantic menhaden during mid-water trawling operations.

Size of Atlantic menhaden sampled was similar (Fig. 8) across sampling periods: during the survey (fishery-independent), after the survey at sea (fishery-dependent), or at port (fishery-dependent). Average weight of Atlantic menhaden encountered during February-March off the coast of New Jersey was 0.291 kg and average fork length was 265.7 mm.

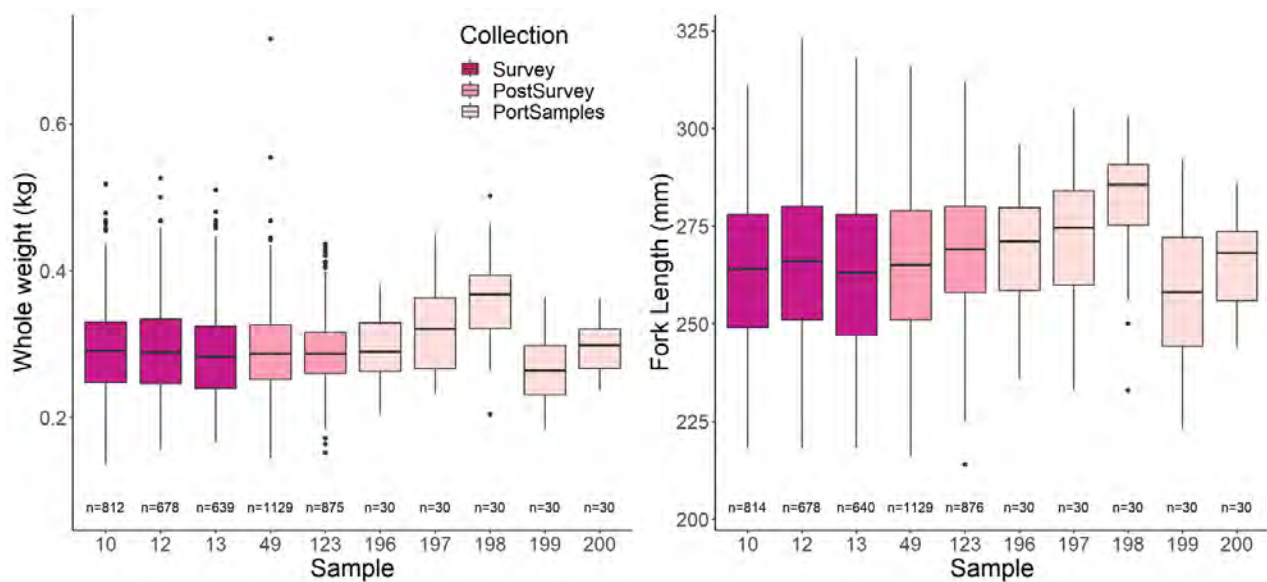


Figure 8. Distribution of weight (kg; LEFT) and fork length (mm; RIGHT) from samples collected during survey, post-survey and port sampling. Survey and post-survey sample x-axis labels represent the number assigned to the school sampled; port samples x-axis labels represent trips sampled.

Relationships between total length and fork length and weight and length of Atlantic menhaden sampled at sea were similar to previously published analyses of port samples collected primarily from the reduction fishery (Figs. 9-10; Smith et al. 2008).

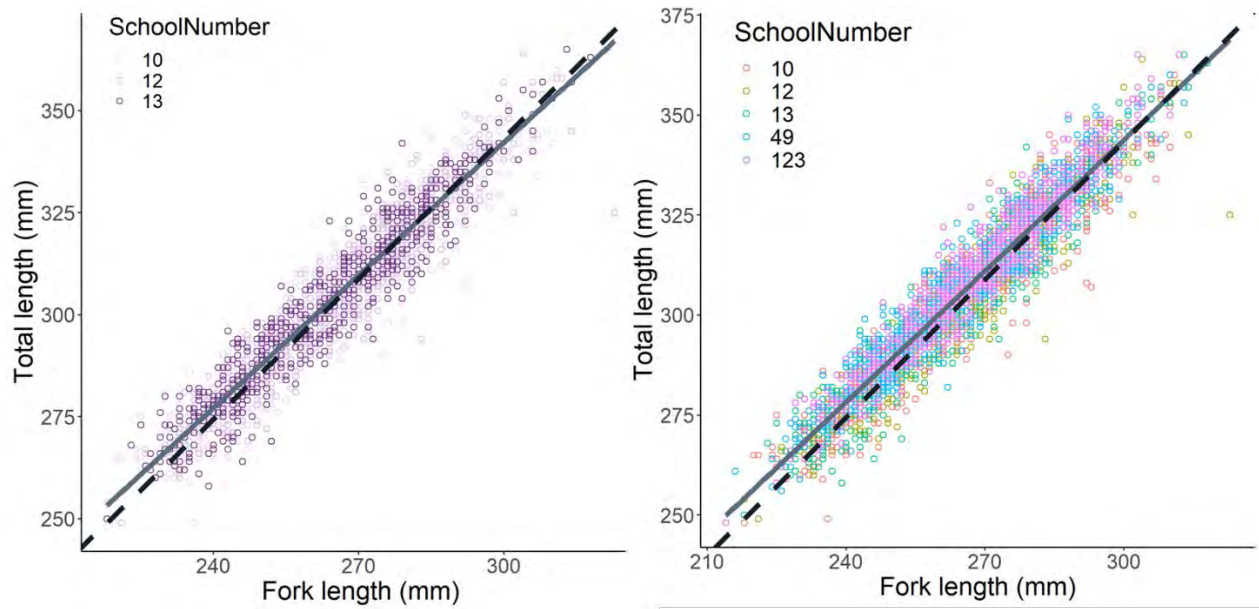


Figure 9. Relationship between total length (mm) and fork length (mm) for Atlantic menhaden sampled during the survey (LEFT) and both survey and post-survey at-sea sampling (RIGHT). Dashed black line represents 2022 data and solid gray line represents reduction fishery port sampling-based relationship published by Smith (2008).

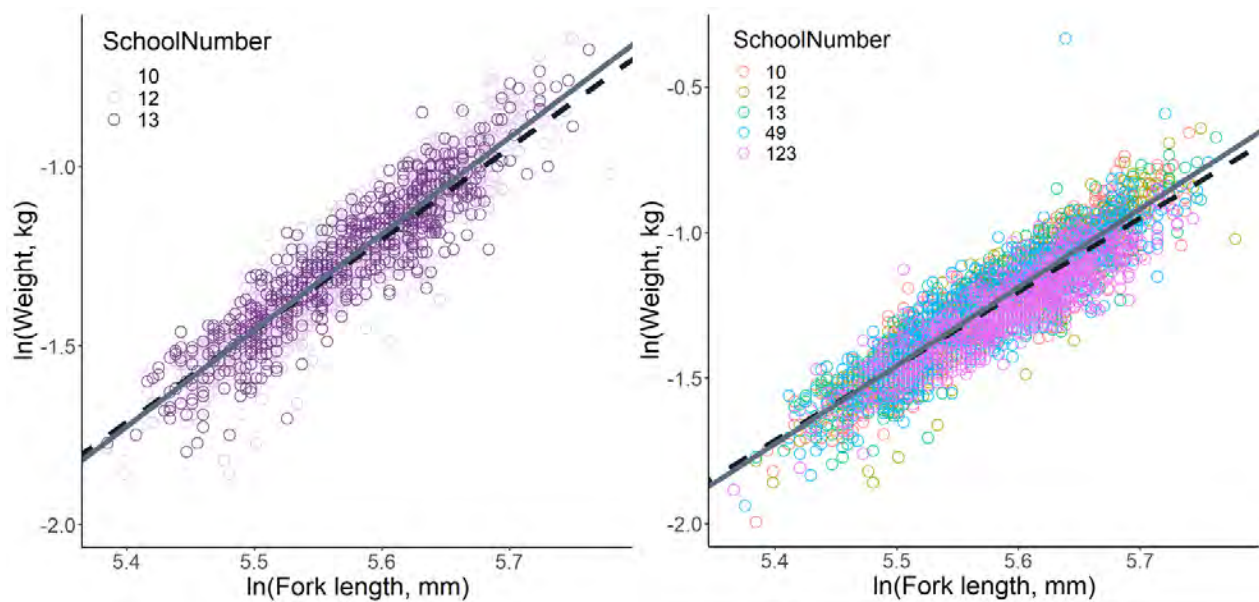


Figure 10. Relationship between the natural log of weight (kg) and the natural log of fork length (mm) for Atlantic menhaden sampled during the survey (LEFT) and both survey and post-survey at-sea sampling (RIGHT). Dashed black line represents 2022 data and solid gray line represents reduction fishery port sampling-based relationship published by Smith (2008).

Atlantic menhaden sampled were 56% female and displayed sexual dimorphism (Fig. 11) such that average weight and length of females (273 mm, 0.32 kg) was larger than that of males (267 mm, 0.30 kg).

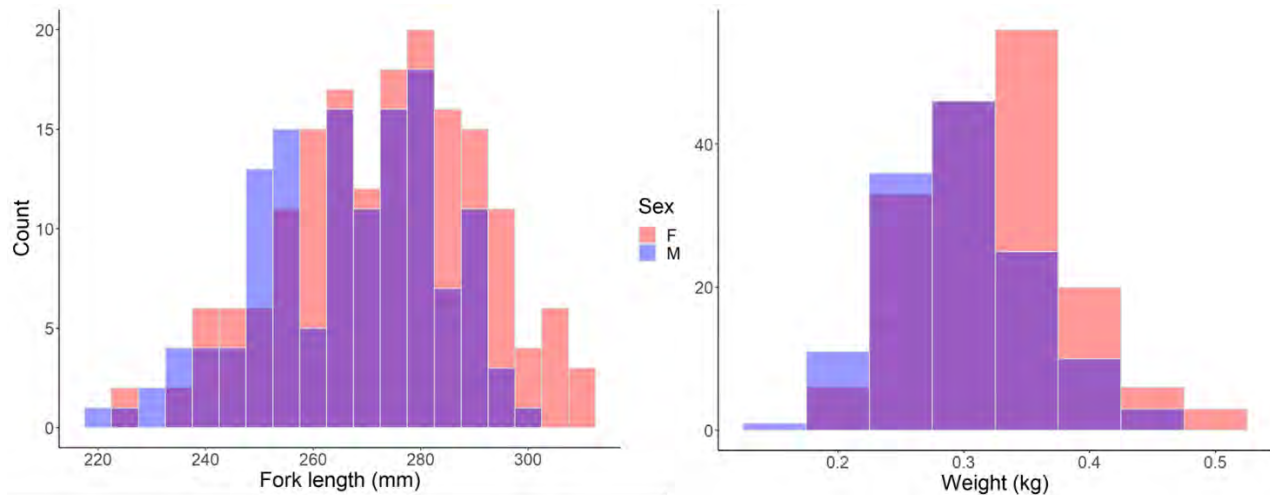


Figure 11. Fork length (mm) and weight (kg) distribution of Atlantic menhaden across all samples collected at-sea and port. “F” denotes female and “M” denotes male.

Most Atlantic menhaden sampled that received full workups were visually identified as being mature (resting), but some were identified as spent, ripe, or immature (Fig. 12). Thus, the survey and post-survey fishing operations did not appear to be sampling on active spawning aggregations.

Both Beaufort Lab and VIMS estimated that most Atlantic menhaden sampled during this project were ages 3 and 4, regardless of whether ages were based on scales or otoliths. Ages ranged from age 2 to age 6 for Beaufort Lab scale-based age estimates and age 2 to age 5 for VIMS otolith-based ages (Fig. 13).

Length-at-age relationships generated from this survey were similar to stock assessment input assumptions (Fig. 14); however, weight-at-age in our survey exhibited an asymptote not observed in the weight-at-age matrix used in the stock assessment (ASMFC 2022). The ASMFC Atlantic Menhaden Technical Committee is exploring these discrepancies for the 2025 stock assessment.

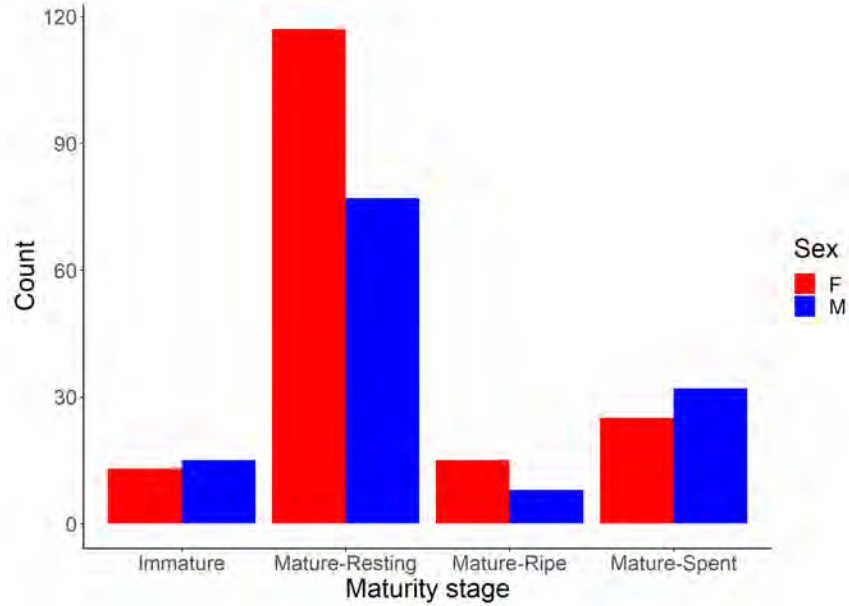


Figure 12. Proportion of all Atlantic menhaden samples receiving full work ups categorized by sex and maturity stage (visual identification). “F” denotes female and “M” denotes male.

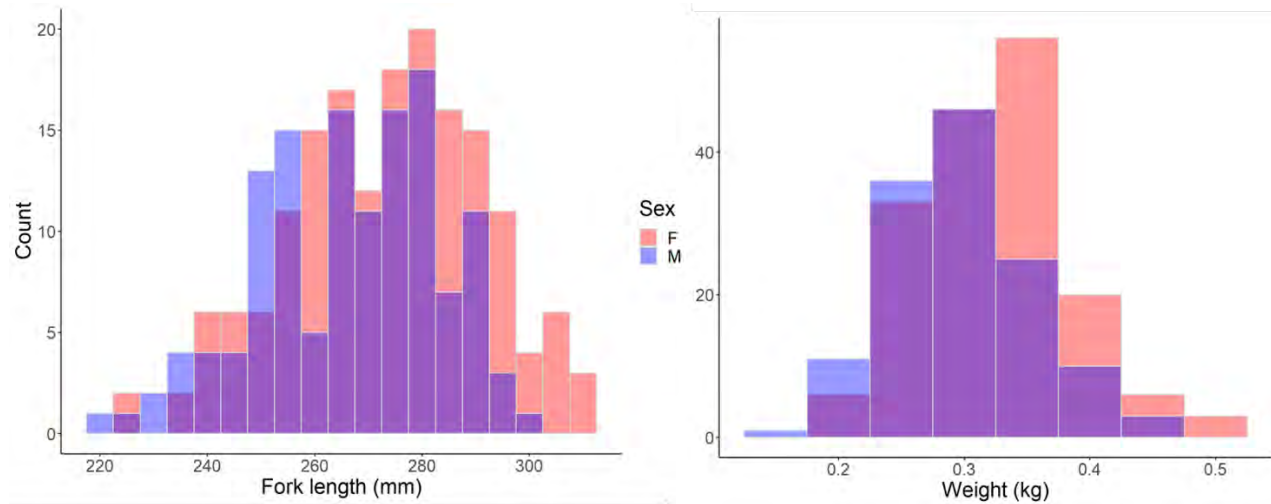


Figure 13. Proportion of all Atlantic menhaden samples receiving full work ups by age and sex determined by Beaufort Lab reading scales (LEFT) and VIMS readings otoliths (RIGHT). “F” denotes female and “M” denotes male.

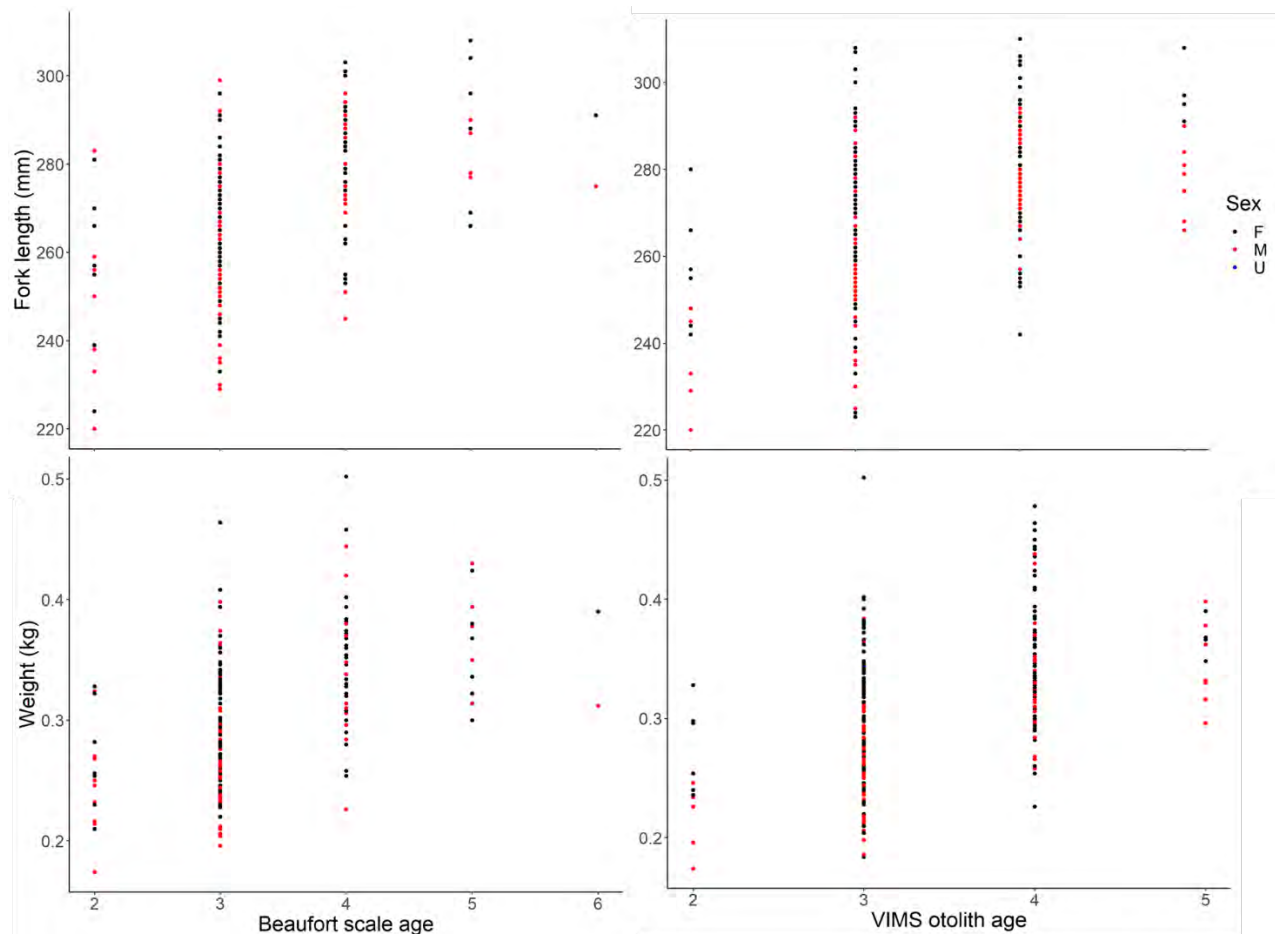


Figure 14. (TOP) Fork length (mm) at age for Atlantic menhaden as estimated by Beaufort Lab using scales (LEFT) and VIMS using otoliths (RIGHT) by sex. (BOTTOM) Weight (kg) at age for Atlantic menhaden as estimated by Beaufort Lab using scales (LEFT) and VIMS using otoliths (RIGHT) by sex. “F” denotes female and “M” denotes male.

Hydrography

Hydrographic data collection at sea indicated that oceanographic conditions underwent large, detectable changes during the survey period that may be linked to observed changes in schooling behavior of Atlantic menhaden. During the first leg of the survey (Transects 1-2), Atlantic menhaden were easily detectable and identifiable as they formed extremely large, dense schools near the sea floor (e.g., Fig. 5). The vessel returned to port to offload and remained off the water for three days due to a severe storm (Table 1). When survey operations resumed for Transects 3-6, median bottom water condition was 0.63°C warmer and 0.31 ppt more saline than when surveying Transects 1-2 (Fig. 15). Atlantic menhaden were no longer found to be forming extremely large, dense schools, but were instead dispersed into small schools at or near the sea surface, making it difficult or impossible to ensonify and sample as described [above](#). The change in ocean conditions was likely due to a warm eddy that formed just prior to the start of the survey, causing warmer and more saline waters to diffuse into the region during the course of our survey (Fig. 16; personal communication, Drs. Glen Gawarkiewicz and Avijit Gangopadhyay), possibly influenced as well by the severe storm of February 16-19.

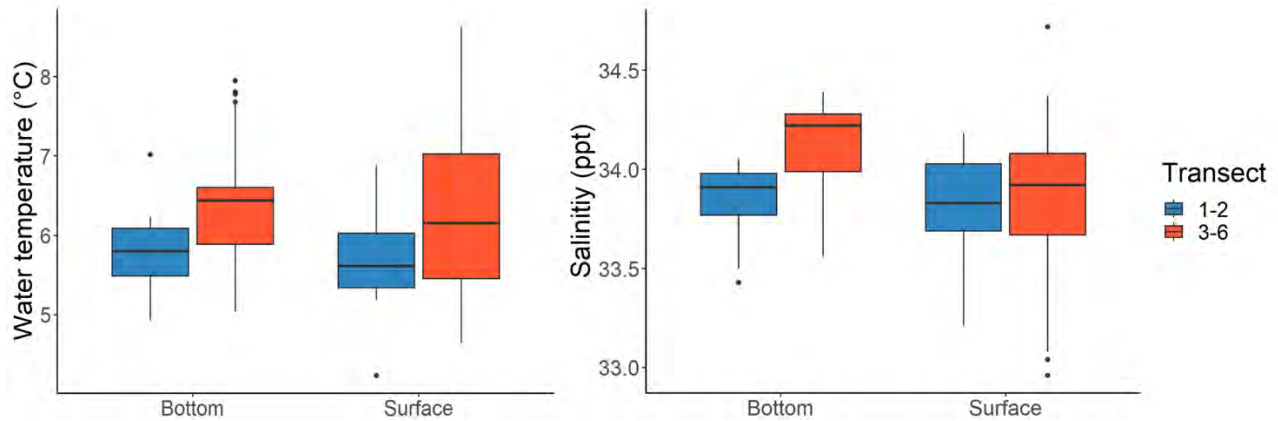


Figure 15. Average water temperature (°C; LEFT) and salinity (ppt; RIGHT) at bottom and surface of water column during the first survey trip (Transects 1-2) and second survey trip (Transects 3-6).

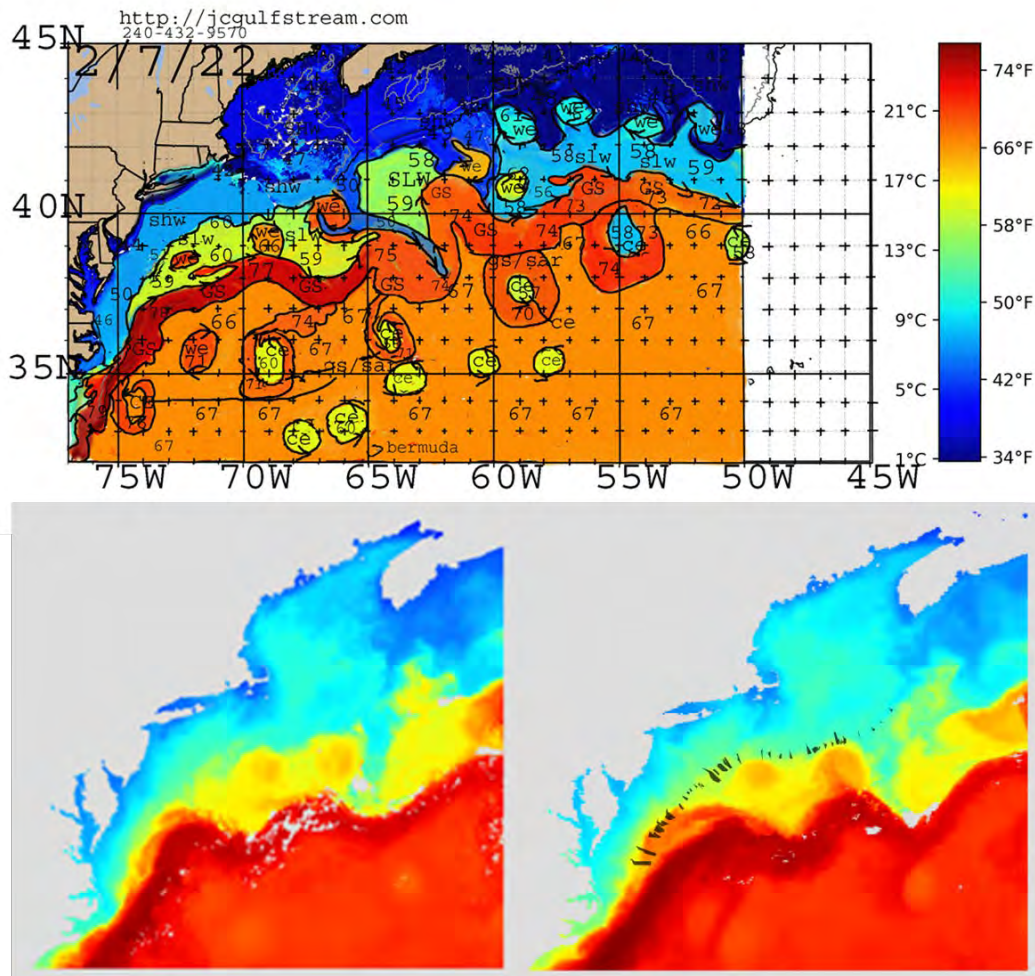


Figure 16. (TOP) Satellite-derived sea surface temperature maps confirming presence of an offshore warm eddy prior to the start of the survey (February 7, 2022; courtesy Dr. Avijit Gangopadhyay, jcgulfstream.com). (BOTTOM) Likely diffusion of warm eddy warmer waters onto the shelf off New Jersey during the survey period (courtesy Sarah Salois, NOAA Cooperative Research Branch, Squid Squad Weekly Viewer). Black markings denote canyon locations.

Regional stock biomass

Salinity was associated with the largest variance inflation factor (>10) and removed from further modeling (Fox 2015). Twenty-four models were built using the remaining environmental covariates and spatial random effects. Marginal likelihood was estimated for each model to measure their predictive capability (Appendix C Table 1). Two models generated extreme marginal log-likelihood. The corresponding residual mean squared errors (RMSE) were large, which indicated numerical issues within INLA. The model with only a fixed effect of temperature and shared spatial random effects between the log intensity and average biomass (Appendix C Figure 1) was best in terms of marginal likelihood, along with a small residual Mean Square Error (MSE). According to the best-fitting model, the temperature had a statistically significant and negative linear effect on both the schooling intensity and the average log biomass per school (Appendix C Table 2).

The adjusted temperature in leg 2 (transects 3-6) had a similar range as the observed temperature in leg 1, but still exhibited the spatial pattern of the actual temperature observed during the survey (Fig. 17). Large uncertainty exists regarding the temperature effects on detectability (Fig. 18), possibly due to the small sample size ($n=23$). More and larger schools on average were expected under the adjusted (and lower) temperature. The relative magnitude of changes in both school intensity and average biomass depends on the assumed changes in the temperature.

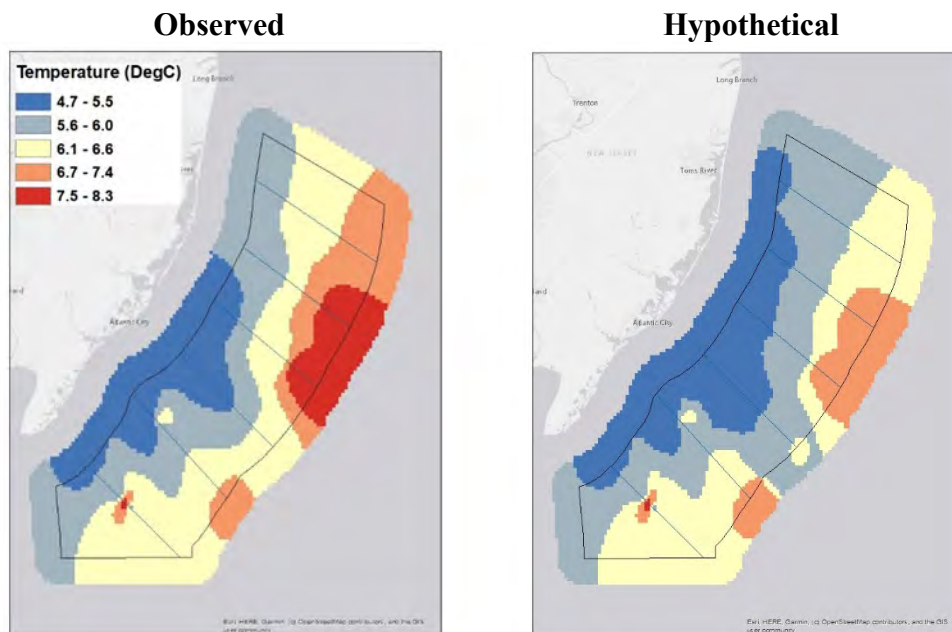


Figure 17. Interpolated water temperature contemporary to the survey in the study area, along with the hypothetical water temperature when the northern area (leg 2, transects 3-6) was adjusted to maintain the same range as the southern area (leg 1, transects 1-2).

Biomass estimates ranged between 8,000 and 11,000 metric tons in the study area (Figure 19, Table 5). Ratio estimates based on the transect area generated 15%-20% lower biomass estimates than the design-based estimates because the design-based estimator expanded to the whole area based on the number of transects, whereas the ratio estimator expanded based on the ratio of biomass per unit area. The design-based estimator of uncertainty was large because it was based on random sampling, which did not fully incorporate the systematic nature of the sampling. The ratio-based

uncertainty estimates were more reasonable. Detectability adjustment led to at most an 18% increase in design-based estimates and a 38% increase in ratio-based estimates.

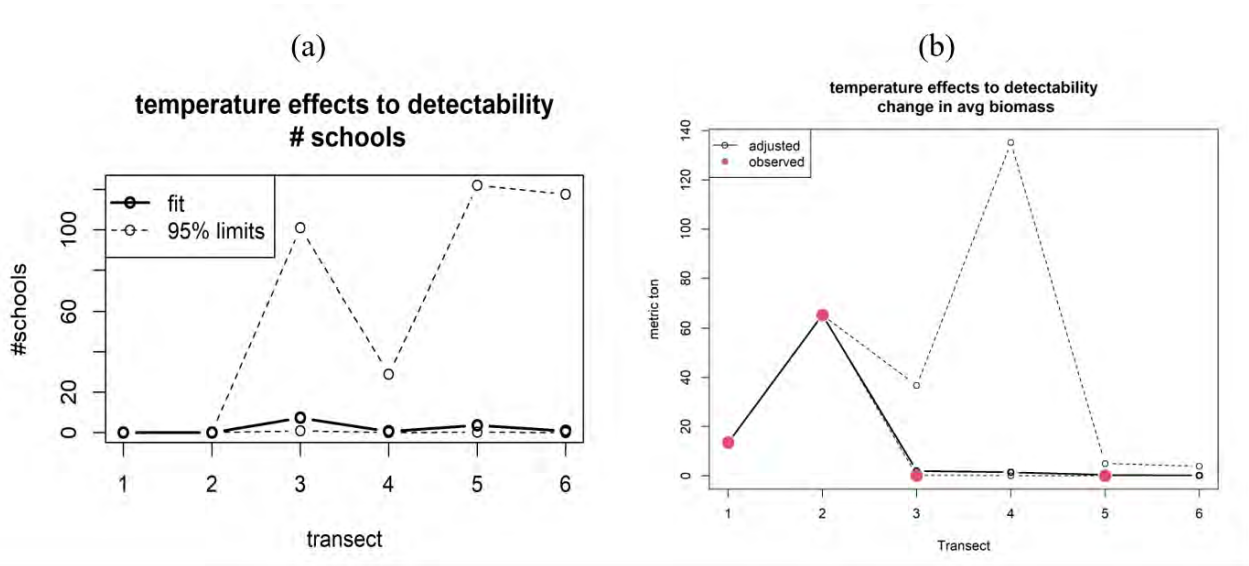
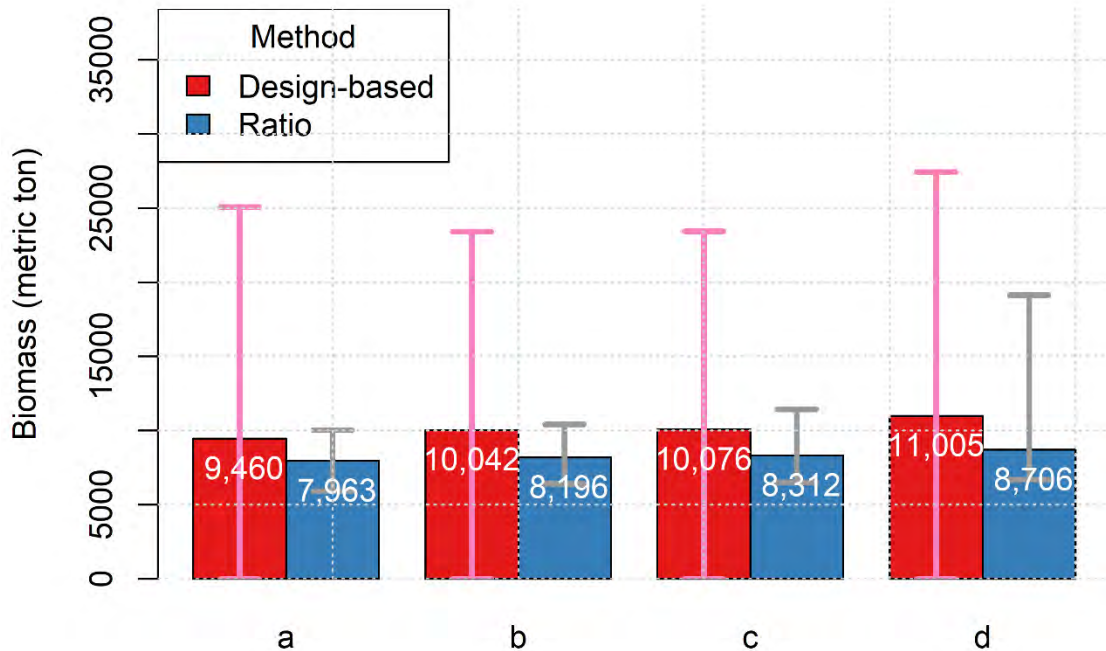


Figure 18. Estimates of temperature effects on (a) school intensity measured as the expected additional number of schools on each transect; and (b) the average biomass per school observed and after the hypothetical temperature change.



Data processing

Figure 19. Biomass estimates (mt) for the study area in terms of posterior median and 90% credit sets according to expansion estimators and detectability adjustment: a) no adjustment, b-d) temperature adjustment to school intensity (b), average biomass (c), and both (d).

Table 5. Biomass estimates for the study area (mt) in terms of posterior median and 90% credit sets according to detectability adjustment and expansion estimators.

Detectability Adjustment	Design-based			Ratio-estimate		
	Estimate	Lower	Upper	Estimate	Lower	Upper
No adjustment	9,460	0	25,065	7,963	5,902	10,024
Adjusted school number	10,042	0	23,422	8,196	6,410	10,432
Adjusted school size	10,076	0	23,441	8,312	6,505	11,434
Adjusted size and number	11,005	0	27,441	8,706	6,703	19,137

Ageing uncertainty

The ageing exchange demonstrated low interlab agreement and intralab precision was high for VIMS and low for NJDEP. VIMS demonstrated high agreement among reads (Table 6, Appendix D Figs. 1-2) for both scales (PA=89%) and otoliths (PA=92%), although scale-based reads were slightly biased such that second reads of scales tended to be older than first reads. Agreement between the two NJDEP readers was low for otoliths (PA=36%), and very low for scales (PA=2%; Table 2, Fig. 2); both sets of intralab NJDEP age comparisons demonstrated significant bias.

Among labs, there was greater agreement in paired ages between VIMS and Beaufort (Appendix D Fig. 3) for both scales (PA=66%) and otoliths (PA=59%) than between VIMS and NJDEP (Appendix D Fig. 4) or between Beaufort and NJDEP (Appendix D Fig. 5), which ranged in PA from 36-48% (Table 6). VIMS Read 2 age determinations were consistently older than that of Beaufort's for younger fish and vice versa for older fish. Although ACV for otolith-based age comparisons between VIMS Read 2 and Beaufort was greater than seven, the overall difference among reads was statistically unbiased (Appendix D Fig. 3). NJDEP Reader 1 age determinations were typically older than that of VIMS Read 2 and Beaufort regardless of hard part examined (Appendix D Figs. 4-5).

VIMS demonstrated good agreement between paired scale and otolith ages (PA=82%; Fig. 20). Paired age agreement between hard parts was lower for Beaufort (54%) and NJDEP (PA=41%). Scale-otolith comparisons for both VIMS and NJDEP were biased, but Beaufort was not. When comparing scale- vs otolith-based age determinations, all three labs demonstrated a pattern of assigning an older age to younger fish and a younger age to older fish when ageing scales.

Table 6. Ageing comparison indices of agreement and tests of symmetry. R=Read (VIMS) or Reader (NJDEP), PA= percent agreement, APE = average percent error, ACV = Average Coefficient of Variation, McNemar = p-value for McNemar's test of symmetry, EvansHoenig = p-value for Evans and Hoenig test of symmetry. Gray shading indicates either ACV > 7 (indicating low precision), or test of symmetry p-value was significant ($\alpha = 0.05$; indicating bias).

Lab	Hard Part	Comparison	PA	APE	ACV	McNemar	EvansHoenig
VIMS	Scales	R1 vs R2	89%	1.64	2.32	0.00026	0.00026
NJDEP	Scales	R1 vs R2	2%	42.61	60.26	0.00000	0.00000
Interlab	Scales	VIMS R2 vs NJDEP R1	44%	8.27	11.70	0.00000	0.00000
Interlab	Scales	Beafort vs VIMS R2	66%	5.52	7.80	0.00013	0.00058
Interlab	Scales	Beafort vs NJDEP R1	36%	10.59	14.97	0.00000	0.00000
VIMS	Otoliths	R1 vs R2	92%	1.32	1.87	0.41422	0.68321
NJDEP	Otoliths	R1 vs R2	36%	12.03	17.02	0.00000	0.00000
Interlab	Otoliths	VIMS R2 vs NJDEP R1	48%	8.72	12.34	0.00000	0.00000
Interlab	Otoliths	Beafort vs VIMS R2	59%	6.64	9.38	0.08897	0.17260
Interlab	Otoliths	Beafort vs NJDEP R1	45%	9.47	13.40	0.00000	0.00000
VIMS	Both	R2 Scales vs Otoliths	82%	2.72	3.85	0.00000	0.00000
NJDEP	Both	R1 Scales vs Otoliths	41%	9.04	12.78	0.00097	0.00182
Beaufort	Both	Scales vs Otoliths	54%	8.00	11.32	0.16339	0.44192

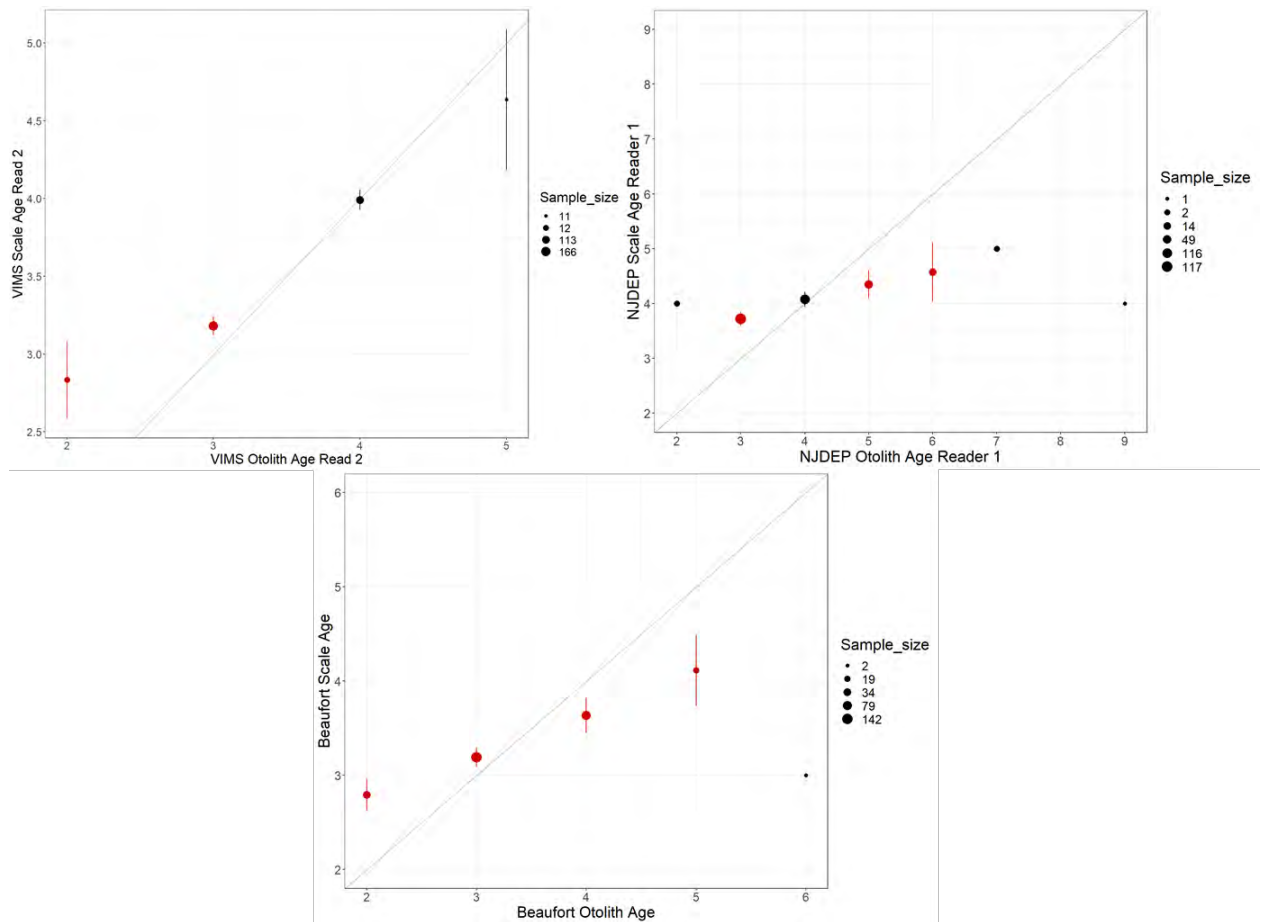


Figure 20. Scale vs otolith paired age comparisons for VIMS Read 2 (top left), NJDEP Reader 2 (top right), and Beaufort (bottom). Solid symbols and bars represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red solid symbols indicate the difference among reads was significantly different from 0. The dashed line represents the 1:1 relationship.

MANAGEMENT IMPLICATIONS

Estimating regional biomass and structure

This study provided field confirmation that a portion of the adult Atlantic menhaden stock does indeed overwinter in the offshore Mid-Atlantic region. Until recently, scientists assumed that most spawning-age Atlantic menhaden migrate south in winter to congregate offshore of Cape Hatteras based on historical tagging data and frequent fall encounters of the reduction fishery with large schools of fish ages 3+ passing through coastal areas from Chesapeake Bay to North Carolina (Nicholson 1978). However, re-analysis of historical tagging data indicated Atlantic menhaden are partial migrants and that a portion of each local population remains resident coastwide in winter (Liljestrand 2017, Liljestrand et al. 2019a, b). Also, analysis of long-term (1977-1987, 2000-2013) ichthyoplankton survey data provided evidence of the year-round presence of spawning Atlantic menhaden across the Mid-Atlantic (Simpson et al. 2016a, Simpson et al. 2017). This study provides updated fishery-independent and fishery-dependent data to corroborate previous studies demonstrating that Atlantic menhaden are partial migrants.

Our study can also help provide context for stock assessment model estimates of spawner biomass not encountered by the reduction fishery or inshore fishery-independent surveys. We estimated that biomass in the study region ranged between 7,963 and 11,005 mt (Table 7). Thus total biomass of overwintering Atlantic menhaden in the study region is a small fraction (approximately 0.22-0.31%) of coastwide total biomass of age 1+ fish estimated by the stock assessment (ASMFC 2022). Although efficiency of the midwater trawling gear used in this study has not been quantified, our assumption of 100% trawl efficiency is unrealistic. Other published estimates of mid-water trawl efficiency range from 1-80% (Williams et al. 2015). Thus, our biomass estimates are conservative and likely underestimate school size as well as overall biomass in the study region.

This study also has implications for the development of future surveys that target Atlantic menhaden. Conclusions drawn from simulation studies (Liang et al. 2020) proved correct in that a traditional acoustic survey design employing only a downward-facing echosounder collecting data only below the vessel along the transect will not be successful in estimating regional biomass of Atlantic menhaden. Given the dense schooling behavior of Atlantic menhaden, alternative survey designs that account for the patchy distribution of schools across the landscape should be employed when surveying for pelagic clupeids across a large geographic region. Our study provides an effective survey design that may prove useful in future monitoring. We also found that Atlantic menhaden schooling behavior was highly dependent on water temperature; thus, future winter surveys should incorporate real-time oceanographic condition monitoring tools to determine the most appropriate time to survey.

The estimates of regional Atlantic menhaden stock biomass generated by this study should also be useful in informing management of New Jersey's Atlantic menhaden bait fishery. New Jersey's winter bait fishery quota in a typical year is approximately 680 mt (1.5 million lbs), which represents a small fraction (6%-9%) of the estimated biomass in the study area (Table 7). Also, visual inspection of fish examined for maturity stage indicated that most of the Atlantic menhaden encountered were not actively spawning, which suggests the fishery in 2022 was not targeting spawning aggregations. Biomass estimates and life history information from this study can provide valuable context for future management actions and help ensure sustainable development of the fishery in this region.

Although we only sampled a relatively small number of schools (i.e., independent sample collections), most of the Atlantic menhaden encountered in winter were larger and older than fish typically encountered in the reduction fishery and inshore surveys used to inform the stock assessment. Information on size-at-age for older, larger Atlantic menhaden is rare, and we anticipate that data collected from this survey will help inform future stock assessment assumptions regarding growth.

Use of industry acoustics

By employing advanced echosounder and sonar equipment already present on an active fishing vessel, we were able to explore the utility of industry-series acoustic technology in cooperative research. Additional post-survey calibration and processing of ES80 files was required relative to the use of scientific-grade sonar. Thus, future acoustic studies that plan to use commercial sonar should anticipate substantial additional processing time and expense.

Despite these complications, we found the ES80 produced estimates of Atlantic menhaden school biomass that were similar to weigh-outs of individual schools at the dock. Acoustically derived biomass estimates and trawl catch weights obtained dockside by individually weighing each school were largely similar in magnitude (Fig. 7). Therefore, there is potential for the use of industry sonar to provide reasonable estimates of Atlantic menhaden biomass across a larger survey without the need to capture and weigh each school encountered. Obtaining CT or MRI digital scans of a subset of sampled fish to inform species-specific TS values would substantially reduce the uncertainty of abundance and biomass estimates generated by this and any future acoustic surveys targeting Atlantic menhaden.

Table 7. Atlantic menhaden biomass estimates for the study area relative to a suite of stock assessment and management metrics in both metric tons and pounds.

	Metric tons	Pounds
Study area biomass estimate min	7,963	17,556,115
Study area biomass estimate max	11,005	24,261,843
Coastwide age 1+ biomass from 2022 assessment	3,594,979	7,925,562,603
2022 NJ winter bait landings	1,411	3,110,380
2022 NJ winter trawl quota	1,361	3,000,000
More typical NJ winter trawl quota	~680	~1,500,000
NJ bait quota (all gears)	25,691	56,637,857
Coastwide 2022 bait landings	60,100	132,497,662
Coastwide 2022 reduction landings	134,000	295,419,080
Coastwide 2021 bait landings	North: 41,170 South: 17,830	North: 90,764,205 South: 39,308,375
Coastwide 2021 reduction landings	North: 59,620 South: 77,070	North: 131,439,444 South: 169,910,063

Evaluating ageing uncertainty

We found overall low agreement among ageing labs in this study, likely due to the focus on larger, older fish, the early time of year during which samples collected, and the quality of the samples collected given the gear used. Interlab agreement among the VIMS, NJDEP, and Beaufort ageing labs in this study was much lower than that of the 2015 Atlantic Menhaden scale ageing exchange (ASMFC 2015). In the 2015 study, scale age agreement was >80% among all three labs compared with percent agreement in this study which ranged from 36%-66% (Table 6). Similarly, ACV was low among the three labs in the 2015 study, but consistently exceeded the threshold of 7 in this study (range 7.8-14.97). Systematic differences among labs were also identified in this study with the high proportion of significant tests of symmetry for interlab comparisons vs the lack of bias evident in the previous ageing exchange.

The findings of this ageing exchange were presented at the ASMFC ageing workshop November 14-15, 2023 in Beaufort, NC. Due to significant disagreement among ageing labs, samples from this survey will be further examined by workshop participants in a second exchange in 2024 to refine Atlantic menhaden ageing protocols and determine best practices. VIMS, NJDEP, and Beaufort Laboratory will also repeat the ageing exchange from this study to further refine best practices for larger Atlantic menhaden encountered early in the year. This second survey exchange will also include Maryland Department of Natural Resources age and growth lab given their long history of and interest in ageing Atlantic menhaden.

DATA ARCHIVES

All raw echosounder and calibration data have been submitted to the archives at the [National Centers for Environmental Information](#) (URL pending). All scales and otoliths collected for this survey have been archived at the Beaufort Laboratory for use in future ageing studies.

ACKNOWLEDGEMENTS

Funding for this project was provided by the NOAA Saltonstall-Kennedy Program under award #NA20NMF4270163. Special thanks to New Jersey Department of Environmental Conservation and the states of Delaware, North Carolina, and South Carolina for ensuring adequate Atlantic menhaden quota was available to conduct the survey. We thank the captains and crew of the *F/V Dyrsten* and the staff at Lund's Fisheries in Cape May, NJ for their enthusiastic participation and support. We thank Eban Charles for assistance with data analysis and Mike Wilberg for data analysis advice. We thank Sarah Salois, Glen Gawarkiewicz, and Avijit Gangopadhyay for sharing data and advice on interpreting oceanographic conditions during our survey. Finally, we thank the Atlantic States Marine Fisheries Commission's Atlantic Menhaden Management Board for support of this project, the ASMFC Atlantic Menhaden Technical Committee for initial review and constructive feedback on survey design.

REFERENCES

- Ahrenholz, D. 1994. Confidence of otolith ageing through the juvenile stage for Atlantic menhaden (*Brevoortia tyrannus*). *Fishery Bull.* **93**:209-216.
- Ahrenholz, D. W. 1991. Population biology and life history of the North American menhadens, *Brevoortia* spp. *Marine Fisheries Review* **53**:3-19.
- ASMFC. 2012. Amendment 2 to the Interstate Fishery Management Plan for Atlantic Menhaden. Arlington, VA.
- ASMFC. 2015. Atlantic Menhaden Ageing Workshop Report. ASMFC, Arlington, VA.
- ASMFC. 2022. Atlantic Menhaden Stock Assessment Update. Arlington, VA.
- ASMFC. 2023. Report of the Quality Assurance/Quality Control Fish Ageing Workshop St. Petersburg, Florida March 7-9, 2023. Arlington, VA.
- Bonzek, C. F., J. Gartland, D. J. Gauthier, and R. J. Latour. 2017. Northeast Area Monitoring and Assessment Program (NEAMAP) 2016 data collection and analysis in support of single and multispecies stock assessments in the Mid-Atlantic: Northeast Area Monitoring and Assessment Program Near Shore Trawl Survey. Virginia Institute of Marine Science, William & Mary. <https://doi.org/10.25773/7206-KM61>.
- Bowker, A. H. 1948. A test for symmetry in contingency tables. *Journal of the American statistical Association* **43**:572-574.
- Buchheister, A., T. J. Miller, E. D. Houde, D. H. Secor, and R. J. Latour. 2016. Spatial and temporal dynamics of Atlantic menhaden (*Brevoortia tyrannus*) recruitment in the

- Northwest Atlantic Ocean. *ICES Journal of Marine Science* **73**:1147-1159.
- Campana, S. E., M. C. Annand, and J. I. McMillan. 1995. Graphical and statistical methods for determining the consistency of age determinations. *Transactions of the American Fisheries Society* **124**:131-138.
- Conn, P. B., J. T. Thorson, and D. S. Johnson. 2017. Confronting preferential sampling when analysing population distributions: diagnosis and model-based triage. *Methods in Ecology and Evolution* **8**:1535-1546.
- Deegan, L. A., and B. A. Thompson. 1987. Growth Rate and Life History Events of Young-of-the-Year Gulf Menhaden as Determined from Otoliths. *Transactions of the American Fisheries Society* **116**:663-667.
- Demer, D. 2015. Calibration of acoustic instruments. ICES Cooperative Research Report No. 326. 133 pp.
- Diggle, P. J., R. Menezes, and T.-I. Su. 2010. Geostatistical inference under preferential sampling. *Journal of the Royal Statistical Society Series C: Applied Statistics* **59**:191-232.
- Evans, G. T., and J. M. Hoenig. 1998. Testing and viewing symmetry in contingency tables, with application to readers of fish ages. *Biometrics*:620-629.
- Fox, J. 2015. Applied regression analysis and generalized linear models. Sage Publications.
- Garrison, L. P., J. S. Link, D. P. Kilduff, M. D. Cieri, B. Muffley, D. S. Vaughan, A. Sharov, B. Mahmoudi, and R. J. Latour. 2010. An expansion of the MSVPA approach for quantifying predator-prey interactions in exploited fish communities. *ICES Journal of Marine Science* **67**:856-870.
- Hijmans, R. J. 2023. terra: Spatial Data Analysis. CRAN, Vienna, Austria.
- Jech, J. M., and W. L. Michaels. 2006. A multifrequency method to classify and evaluate fisheries acoustics data. *Canadian Journal of Fisheries and Aquatic Sciences* **63**:2225-2235.
- June, F. C., and J. W. Reintjes. 1959. Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1952-55: with a brief review of the commercial fishery. US Department of Interior, Fish and Wildlife Service.
- June, F. C., and C. M. Roithmayr. 1960. Determining age of Atlantic menhaden from their scales. US Fish and Wildlife Service.
- Liang, D., G. M. Nessler, and M. J. Wilberg. 2020. A spatial simulation approach to hydroacoustic survey design: A case study for Atlantic menhaden. *Fisheries Research* **222**:105402.
- Liljestrand, E. M. 2017. Mortality and movement of adult Atlantic menhaden during 1966-1969 estimated from mark-recapture models. Master's Thesis. University of Maryland Center for Environmental Science Chesapeake Biological Laboratory.
- Liljestrand, E. M., M. J. Wilberg, and A. M. Schueller. 2019a. Estimation of movement and mortality of Atlantic menhaden during 1966-1969 using a Bayesian multi-state mark-recovery model. *Fisheries Research* **210**:204-213.
- Liljestrand, E. M., M. J. Wilberg, and A. M. Schueller. 2019b. Multi-state dead recovery mark-recovery model performance for estimating movement and mortality rates. *Fisheries Research* **210**:214-223.
- Lindgren, F., H. Rue, and J. Lindström. 2011. An explicit link between Gaussian fields and Gaussian Markov random fields: the stochastic partial differential equation approach. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* **73**:423-498.
- Lucca, B. M., and J. D. Warren. 2018. Acoustically measured distribution and abundance of Atlantic menhaden (*Brevoortia tyrannus*) in a shallow estuary in Long Island, NY. *Estuaries and coasts* **41**:1436-1447.

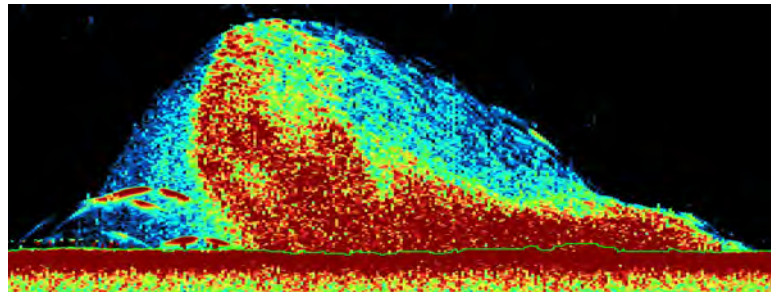
- McNemar, Q. 1947. Note on the sampling error of the difference between correlated proportions or percentages. *Psychometrika* **12**:153-157.
- Morison, A., J. Burnett, W. McCurdy, and E. Moksness. 2005. Quality issues in the use of otoliths for fish age estimation. *Marine and Freshwater Research* **56**:773-782.
- National Marine Fisheries Service. 2018. Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017. Available at: <https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states#current-report>.
- Nesslage, G., A. M. Schueller, A. R. Rezek, and R. M. Mroch III. 2022. Influence of sample size and number of age classes on characterization of ageing error in paired-age comparisons. *Fisheries Research* **249**:106255.
- Nicholson, W. R. 1978. Movements and population structure of Atlantic menhaden indicated by tag returns. *Estuaries* **1**:141-150.
- Ogle DH, D. J., Wheeler AP, Dinno A 2023. FSA: Simple Fisheries Stock Assessment Methods. R package version 0.9.5, <https://fishr-core-team.github.io/FSA/>.
- Pebesma, E. J. 2018. Simple features for R: standardized support for spatial vector data. *R Journal* **10**:439.
- Pennino, M. G., I. Paradinas, J. B. Illian, F. Muñoz, J. M. Bellido, A. López-Quílez, and D. Conesa. 2019. Accounting for preferential sampling in species distribution models. *Ecology and evolution* **9**:653-663.
- R Core Team. 2023. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Reintjes, J. W. 1969. Synopsis of biological data on the Atlantic menhaden, *Brevoortia tyrannus*. US Bureau of Commercial Fisheries.
- Rudstam, L. G., S. L. Parker-Stetter, P. J. Sullivan, and D. M. Warner. 2009. Towards a standard operating procedure for fishery acoustic surveys in the Laurentian Great Lakes, North America. *ICES Journal of Marine Science* **66**:1391-1397.
- Rue, H., S. Martino, and N. Chopin. 2009. Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations. *Journal of the Royal Statistical Society Series B: Statistical Methodology* **71**:319-392.
- SEDAR. 2015. SEDAR 40 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 643 pp. available online at: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=40. North Charleston, SC
- Simmonds, J., and D. N. MacLennan. 2008. Fisheries acoustics: theory and practice. John Wiley & Sons.
- Simpson, C., H. Bi, D. Liang, M. Wilberg, A. Schueller, G. Nesslage, and H. Walsh. 2017. Spawning locations and larval dispersal of Atlantic menhaden during 1977-2013. *ICES Journal of Marine Science* **74**:1574-1586.
- Simpson, C., M. Wilberg, H. Bi, A. Schueller, G. Nesslage, and H. Walsh. 2016a. Trends in relative abundance and early life survival of Atlantic menhaden during 1977-2013 from long-term ichthyoplankton programs. *Transactions of the American Fisheries Society* **145**:1139-1151.
- Simpson, D., J. B. Illian, F. Lindgren, S. H. Sørbye, and H. Rue. 2016b. Going off grid: Computationally efficient inference for log-Gaussian Cox processes. *Biometrika* **103**:49-70.
- Smith, J. W. 1991. The Atlantic and gulf menhaden purse seine fisheries: Origins, Harvesting technologies, biostatistical monitoring, recent trends in fisheries statistics, and forecasting.

- Marine Fisheries Review **53**:28-41.
- Smith, J. W., W. B. O'Bier, and N. A. McNeill. 2008. Length and weight relationships for Atlantic menhaden (*Brevoortia tyrannus*). Journal of the North Carolina Academy of Science **124**:102-105.
- Team, R. C. 2003. R: A Language and Environment for Statistical Computing R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org>.
- Thompson, S. K. 2012. Sampling. John Wiley & Sons.
- VanderKooy, S. 2020. A practical handbook for determining the ages of Gulf of Mexico and Atlantic coast fishes. Gulf States Marine Fisheries Commission: Ocean Springs, MS, USA.
- Warlen, S. M. 1988. Age and growth of larval gulf menhaden, *Brevoortia patronus*, in the northern Gulf of Mexico. Fishery Bulletin **86**:77-90.
- Warlen, S. M. 1992. Age, Growth, and Size Distribution of Larval Atlantic Menhaden off North Carolina. Transactions of the American Fisheries Society **121**:588-598.
- Williams, K., J. K. Horne, and A. E. Punt. 2015. Examining influences of environmental, trawl gear, and fish population factors on midwater trawl performance using acoustic methods. Fisheries Research **164**:94-101.

Appendix A
Acoustic Survey Estimates of Atlantic Menhaden

Acoustic Survey Estimates of Atlantic Menhaden

Enhancing Sustainable Development of the
Winter Bait Fishery for Atlantic Menhaden
through the Use of Industry Acoustics
(NOAA-NMFS-FHQ-2020-2006111)



Prepared For
GENEVIÈVE NESSLAGE, PH.D.
Chesapeake Biological Laboratory
University of Maryland Center for Environmental Science
P. O. Box 38
Solomons, MD 20688

Prepared By
NORMANDEAU ASSOCIATES, INC.
30 International Drive, Suite 6
Portsmouth, NH 03801
www.normandeau.com



September 26, 2023

Normandeau Project No. 24579.0

TABLE OF CONTENTS

Table of Contents	ii
List of Tables	iii
List of Figures.....	iv
Acronyms and Abbreviations	v
1 INTRODUCTION	1
1.1 Background.....	1
1.2 Objectives	1
2 OVERVIEW OF THE SURVEY DESIGN	2
3 CALIBRATION.....	5
3.1 Field Calibration.....	5
3.2 Echoview Calibration.....	5
4 ECHOGRAM PROCESSING	11
4.1 ES80 Data.....	11
4.1.1 ES80 Raw Data File Structure.....	11
4.1.2 ES80 Processed Data	11
4.2 Echoview Settings and Configurations.....	11
4.2.1 Transducer Location and Orientation	11
4.2.2 Timestamp and Clock Synchronization.....	11
4.2.3 Environmental Settings and Calibration Files	12
4.2.4 Minimum S_v Threshold	12
4.3 Echoview Processing Steps	12
5 TARGET STRENGTH AND INDIVIDUAL BODY SIZE.....	21
5.1 Target Strength.....	21
5.2 Individual Body Size	21
6 ANALYTICAL METHODS	22
6.1 Volume Calculations	23
7 RESULTS	24
8 LITERATURE CITED	25
Appendix A. Reference Target Strength.....	A-1
Appendix B. Placeholder	B-1

LIST OF TABLES

Table 3-1	Single echo detection criteria used in Echoview software settings.	7
Table 4-1	ES80 raw files with real-time school identifications during Leg 1 as documented in <i>ES80 File Guide.xlsx</i>	13
Table 4-2	ES80 raw files with real-time school identifications during Leg 2 as documented in <i>ES80 File Guide.xlsx</i>	13
Table 4-3	Echoview files with real-time school identifications associated with ES80 raw files of fished schools (10, 12, 13, 49, 123).	14
Table 4-4	ES80 raw files with real-time school identifications during Leg 3 as documented in <i>ES80 File Guide.xlsx</i>	15
Table 4-5	Echoview and ES80 raw files included in the processed data containing real-time school identifications during Leg 3 as documented in <i>ES80 File Guide.xlsx</i>	17
Table 4-6	Mean maximum depth, and depth-averaged water temperature and salinity from profile ¹ measurements taken by a Hydrolab MS5 multi-parameter sonde during each survey leg.	18

LIST OF FIGURES

Figure 1-1	The primary bait fishery region 24–80 km offshore of the New Jersey coast was surveyed systematically over six transects perpendicular to the coast and spaced 23 km apart (~400 km total).	3
Figure 1-2	(Top) 49-m commercial midwater trawling vessel, <i>F/V Dyrsten</i> , equipped with a recordable 38 kHz Simrad ES80 split-beam echosounder and a Furuno FSV25S omnidirectional sonar. (Bottom) Instrumentation and sonar displays at the helm.	4
Figure 3-1	(A) Raw echo strength (40Log R) ES80 amplitudes during calibration on 11 February 2022, (B) single echo detections sphere near 11 m.	6
Figure 3-2	Angular TS compensation plots of 38.1 mm Tungsten Carbide sphere with default Transducer Gain at 23 dB.	7
Figure 3-3	TOP and MIDDLE: Angular target strength plots of a 38.1-mm Tungsten Carbide sphere with field-calibrated transducer gain of 20.1 dB and major and minor axis angle offsets from field calibrations removed; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.	8
Figure 3-4	TOP and MIDDLE: Angular target strength plots of a 38.1-mm Tungsten Carbide sphere with field-calibrated transducer gain of 20.1 dB and major and minor axis angle offsets applied; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.	9
Figure 3-5	TOP and MIDDLE: Angular target strength plots of 38.1 mm Tungsten Carbide sphere with on-axis adjustments of transducer gain to 19.67 dB and major and minor axis angle offsets of -0.43° and 2.02° ; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.	10
Figure 4-1	Example of Sv backscatter of School 49 in ES80 raw data. (TOP) shows apparent noise ringing down to approximately 20 m and random impulse noise. (BOTTOM) Filtered Sv backscatter after masking the upper water column and remove the impulse noise spikes.	19
Figure 4-2	Step by Step Echogram Processing: A. Raw S_v . B. Impulse noise removed (Ryan et al. 2015). C. Resampled (median of 2000 ping \times 3 sample window and matched S_v pings. D. Smoothed 3×3 S_v . E. Signal-to-Noise Ratio (SNR). F. Mask $ \text{SNR} > 3$ dB. G. Filtered Sv Mask to water column. H. Upper (23 m) water column mask. I. Filtered S_v	20
Figure 7-1	Atlantic Menhaden school biomass estimates by midwater trawl and Simrad ES80 split-beam echosounder. Acoustically-derived density was scaled to biomass (metric tons) based on the ideal dome volume (school height, school length).	24

ACRONYMS AND ABBREVIATIONS

°C	Celsius
dB	decibels
NOAA	National Oceanic and Atmospheric Administration
Sa	Area backscattering strength (dB re m ² /m ²)
Sv	Volume backscattering strength
S-K	Saltonstall-Kennedy
TS	target strength (dB re 1 m ²)
UMCES	University of Maryland Center for Environmental Science

1 INTRODUCTION

1.1 Background

National Oceanic and Atmospheric Administration (“NOAA”) Fisheries awarded a FY2020 Saltonstall-Kennedy (“S-K”) Grant to University of Maryland Center for Environmental Science (“UMCES”) for collaborative research project titled *Enhancing sustainable development of the winter bait fishery for Atlantic menhaden through the use of industry acoustics* (NOAA-NMFS-FHQ-2020-2006111; “the Project”). The Project addresses S-K Priority #2 for “Science or Technology that Promotes Sustainable U.S. Seafood Production and Harvesting” by providing scientific information necessary to support sustainable development of the winter bait fishery for Atlantic Menhaden and maximize fishing opportunities for the Mid-Atlantic midwater trawl fleet. While Atlantic Menhaden stocks have supported a successful winter bait fishery since 2014, historically low catch-based quotas have limited fishing opportunities despite recent stock assessments indicate that total spawning stock biomass has doubled in the last two decades, the stock is not overfished and overfishing is not occurring. Before alternative quotas can be established, estimates of the biomass and size structure of the overwintering stock believed to be elusive to traditional bottom trawl surveys are needed. The Project sought to fill that data gap by conducting an adaptive acoustic survey for Atlantic Menhaden along approximately 400 kilometers of transects approximately 24–32 km (15–20 miles) offshore from the Hudson Canyon to the New Jersey/Delaware border based on simulations for an optimal survey design (Liang et al 2020). After delays related to COVID-19 pandemic and warm winter water temperatures, this survey was completed between February 14 and March 3, 2022. February 14–15 and February 20–March 3, 2022.

Normandeau Associates, Inc. (“Normandeau”) received a subaward to collaborate with UMCES on this Project. Normandeau’s role in the Project is to process and analyze data collected from the *F/V Dyrsten’s* Simrad ES80 split-beam echosounder for purposes of estimating Atlantic Menhaden abundance and biomass. This report documents the echogram processing methods and estimates of school biomass based on the ES80 echosounder data.

1.2 Objectives

The Project’s objectives were to:

1. Estimate overwintering biomass and structure of Atlantic Menhaden in the winter bait fishery’s primary fishing area,
2. Evaluate performance of industry acoustics in estimating Atlantic Menhaden biomass,
3. Evaluate ageing uncertainty, and
4. Effectively communicate and disseminate project findings to scientists and fishery managers.

This report presents the methods and results addressing Research Objective #2 above. The specific objective of this report is to:

- Estimate biomass and abundance of Atlantic Menhaden schools from volume backscatter collected by a Simrad ES80 echosounder and compare acoustic and trawl abundance/biomass estimates from coincidental data to assess relative performance.

2 OVERVIEW OF THE SURVEY DESIGN

The acoustic survey design was based on spatial simulations to account for challenges of patchy distributions that pelagic schooling species like Atlantic Menhaden display (Liang et al. 2020). This acoustic survey was designed to target Atlantic Menhaden during cold winter months when their behavior is easier to acoustically survey. Once water temperatures drop below 6°C, Atlantic Menhaden form recognizable schools near the bottom and exhibit sedentary behavior, which makes them easier to classify and minimizes bias associated with vessel avoidance and double counting. The survey was conducted in an area approximately 24–80 km (15–50 miles) off the coast of New Jersey in water depths of 20–50 m, where a winter bait fishery typically operates, and Atlantic Menhaden bycatch is concentrated. Based on anticipated school size and patchiness, this area was acoustically sampled along six transects with an average length of 54 km spaced 24–32 km apart and perpendicular to the coast (Figure 1-1).

The research vessel used for this survey was a 49-m commercial midwater trawling vessel, *F/V Dyrsten*, which was equipped with a recordable 38-kHz Simrad ES80 split-beam echosounder, Furuno FSV25S omnidirectional sonar, midwater water trawl (net dimensions of 18 m high, 51 m wide and 3.25-cm mesh), and other navigation systems (Figure 1-2). Unlike previous Simrad industry-grade echosounders, the ES80 echosounder does not contain a systematic “triangle-waver” error component. A Hydrolab MS5 multi-sonde was used to measure depth profiles of water temperature (°C), salinity (PSU) and dissolved oxygen (mg/L) at the start and end of each transect and every 10 km along the transect.

Once the survey began, the vessel sampled along the transects at approximately 7 knots (3.6 m/s) with the ES80 split-beam echosounder while the omnidirectional sonar was used to search for schools within a distance of 1,600 m on either side of the transect (vessel). The ES80 split-beam echosounder collected at the fastest ping rate setting in narrowband (“continuous wave”) mode and 0.256-ms pulse duration. The acoustic backscatter from the omnidirectional sonar was scrutinized in real time by the captain and if schools were detected, the vessel would break from the planned transects to collect backscatter of the schools and on occasion fished with the midwater trawl. Five schools were fished with the midwater trawl to collect biological samples. A unique school ID number was assigned to each school (discrete or close aggregation) identified in real time by the omnidirectional sonar and a log was created with timestamps for corresponding ES80 data files.

The survey cruise was completed over several periods (legs):

- February 11, 2022 – Calibration
- February 14–15, 2022 – Leg 1 (Transects 1–2)
- February 20–22, 2022 – Leg 2 (Transects 4–6)
- February 23–22, 2022 – Leg 2 transit and opportunistic sampling
- February 28–March 3, 2022 – Leg 3 (opportunistic during fishing)

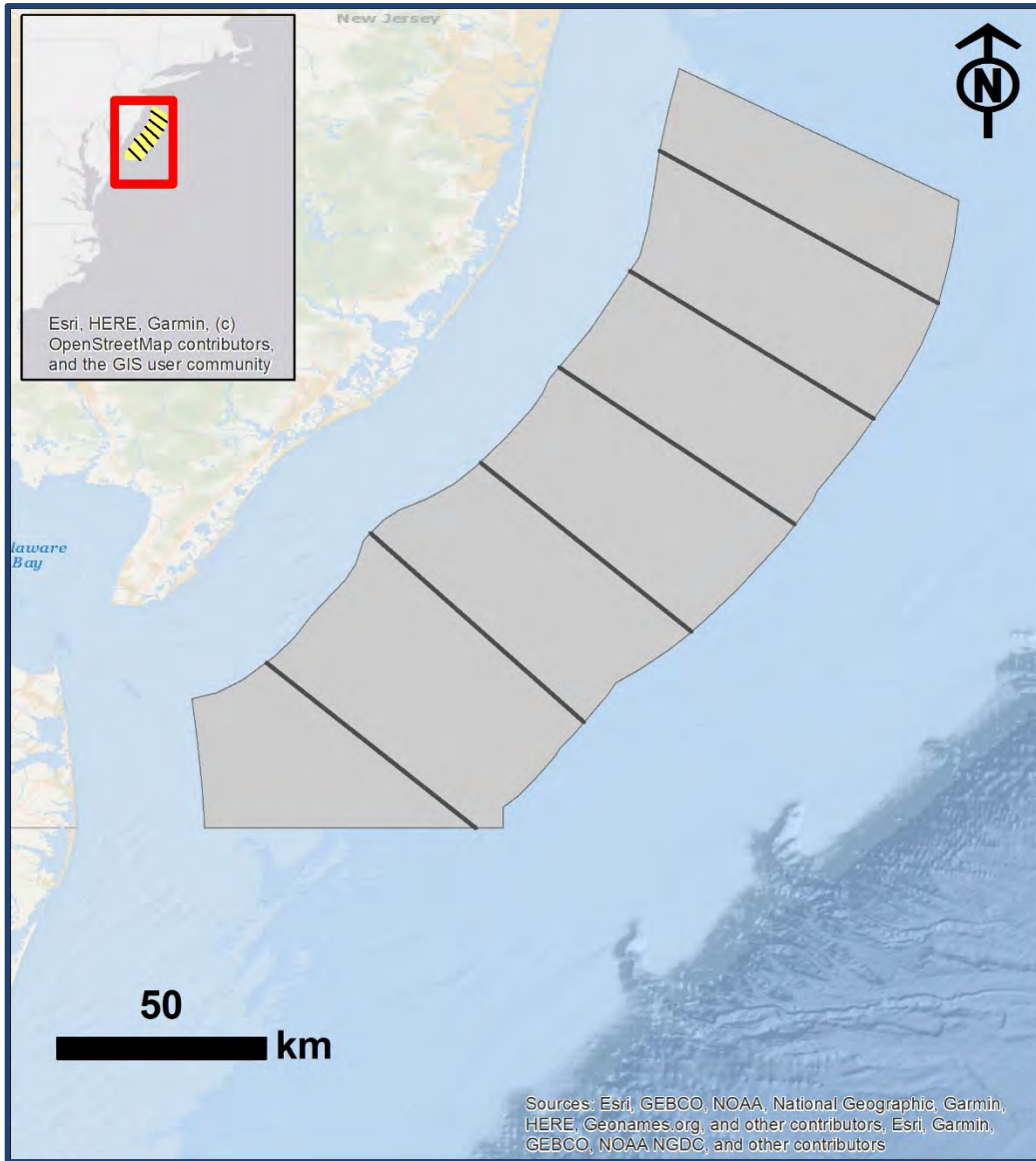


Figure 1-1 The primary bait fishery region 24–80 km offshore of the New Jersey coast was surveyed systematically over six transects perpendicular to the coast and spaced 23 km apart (~400 km total).



Figure 1-2 (Top) 49-m commercial midwater trawling vessel, *F/V Dyrsten*, equipped with a recordable 38 kHz Simrad ES80 split-beam echosounder and a Furuno FSV25S omnidirectional sonar. (Bottom) Instrumentation and sonar displays at the helm.

3 CALIBRATION

3.1 Field Calibration

The Simrad ES80 echosounder with a 7° split-beam 38-kHz ES38B transducer mounted to the hull of the 48.8-m commercial mid-water trawler *F/V Dyrsten*, was calibrated by the standard sphere method (Foote et al. 1987, Demer 2015) off the southern New Jersey shore on 11 February 2022. A solid 38.1-mm tungsten carbide (with 6% cobalt binder) sphere was used as the standard target for calibration. The sphere was attached by monofilament line to a wireless calibration system developed by the Northeast Fisheries Science Center (“NEFSC”). The calibration sphere was lowered under the transducer to a range of approximately 8.3 to 11.9 m with weights added to the line approximately 2 m below the sphere to provide additional stability in the currents (Figure 3-1). The calibration system communicated wirelessly with the downriggers via control circuitry that was housed in waterproof Pelican cases (one case per downrigger). Open-source JAVA software called EchoCal was used written to control the downriggers from a laptop PC. The user used a digital joystick to instruct EchoCal where to position the calibration sphere to map the beam pattern and measure on-axis response.

The reference target strength of the sphere was estimated by NOAA/SWFSC/AST (2022) as -42.31 dB re m² at nominal environmental conditions (water temperature = 5.75°C; salinity = 35 PSU; pressure = 2 atmospheres [20.3 dbar]) during the field calibration (Appendix A). Using the default transducer gain setting of 23 dB, the mean target strength of the sphere was -49.48 dB re m² but more peculiar was the angular dependence of the TS estimates (increases with off-axis angle that is more exaggerated in the minor-axis angle (Figure 3-2). In the field, the calibration was adjusted by setting the major-axis angle offset to -0.10°, minor-axis angle offset to 2.0°, transducer gain of 20.1 dB and S_a correction factor to 0.8318 dB, which resulted in the single echo detections of the sphere to have a mean TS of -44.72 dB re m².

3.2 Echoview Calibration

Since Echoview software (version 12.1 or 13, Hobart, Tasmania) was used to process and export acoustic estimates of Atlantic Menhaden biomass, the ES80 data files of the calibration sphere were used to adjust calibration results from the field. In Echoview, the sound speed was updated based on water temperature in the data file source (surface temperature from the ship’s NMEA network) and user-entered salinity estimate. Target strength of the sphere was determined from single echo detections within region in the echogram corresponding to the echo traces of the sphere (Figure 3-1). Single echo detection criteria selected in Echoview are given in Table 1-1. Single echo detections were also analyzed after filtering out single echoes greater than 0.5° off the acoustic axis following the on-axis definition by Demer et al. (2015). The target strength of the sphere under field conditions prior to field calibration adjustments to angles (Figure 3-3) and after angular offsets were applied (Figure 3-4) indicate further improvement was possible. Based on all single echo detections in Echoview, the echo strength peaked at a major axis angle offset of -0.43° and minor axis angle offset at 2.02° (Figure 3-5). The transducer gain was adjusted to 19.67 dB such that the mean target strength of on-axis single echo detections matched the reference target strength of -42.31 dB re m². After the transducer gain was adjusted, a new S_a correction factor of 1.2652 dB was determined based on the on-axis sphere targets and equation 4.9 from Demer et al. (2015). The adjusted transducer gain and S_a correction factor from the post-hoc analysis of the calibration data in Echoview was updated in the Echoview calibration supplement file (*Dyrsten-cal_11February2022-Final20221220.ecs*).

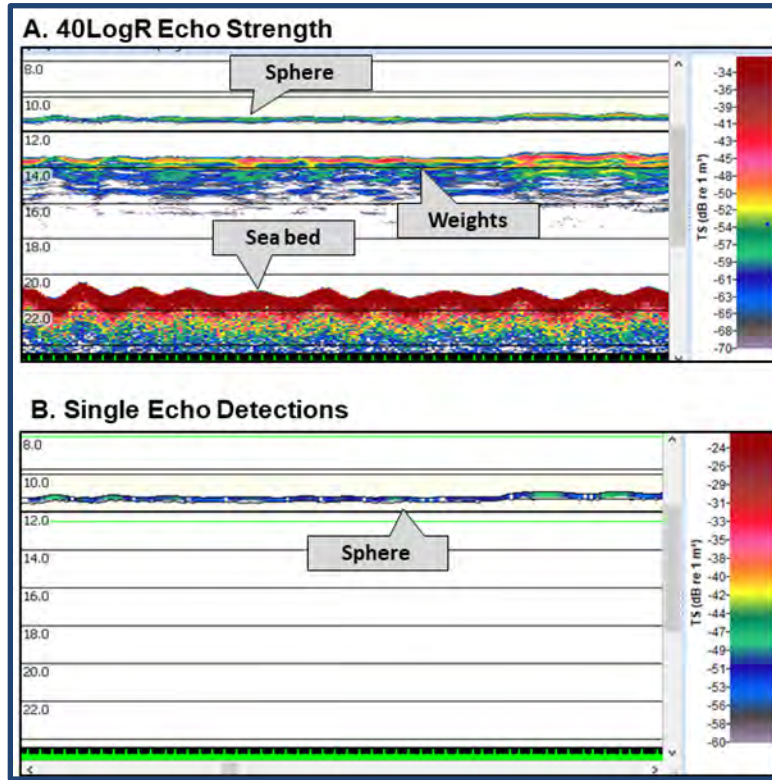


Figure 3-1 (A) Raw echo strength (40Log R) ES80 amplitudes during calibration on 11 February 2022, (B) single echo detections sphere near 11 m.

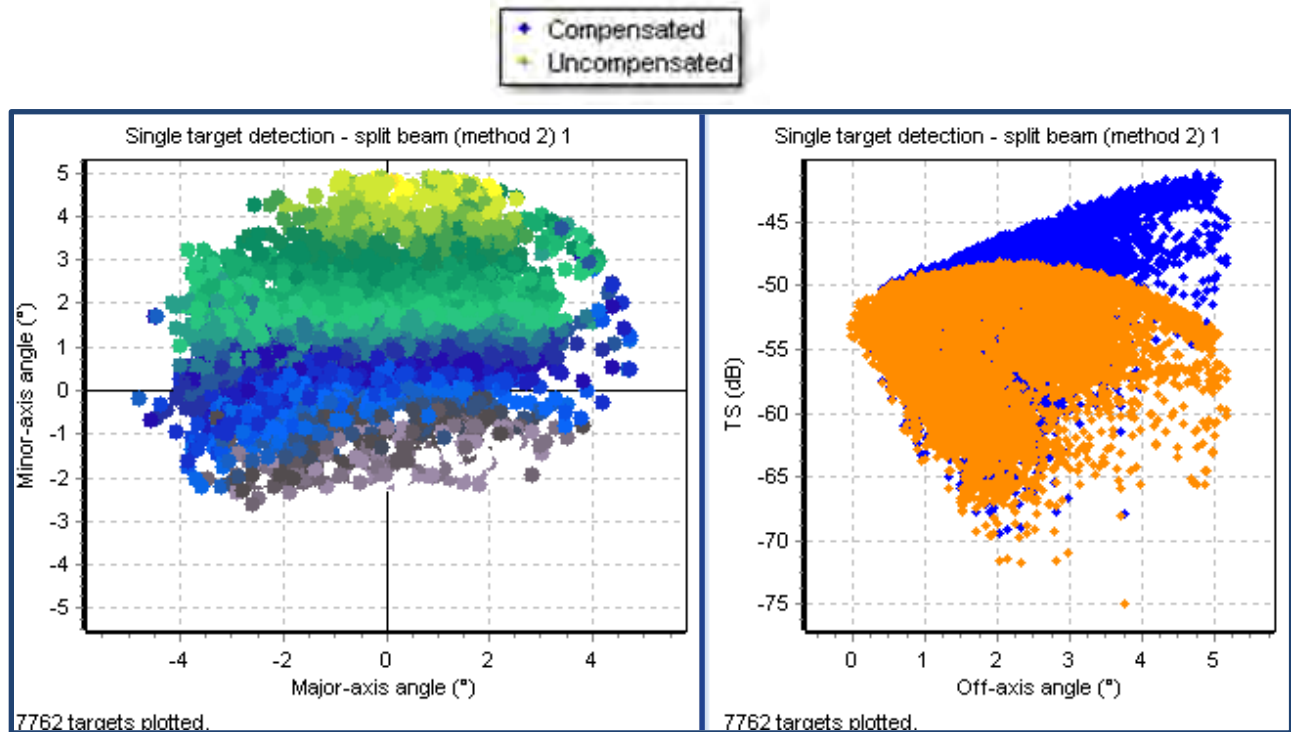


Figure 3-2 Angular TS compensation plots of 38.1 mm Tungsten Carbide sphere with default Transducer Gain at 23 dB.

Table 3-1 Single echo detection criteria used in Echoview software settings.

Parameter	Value Setting
Echoview algorithm	Split Beam Method 2
TS threshold	-70 dB
Pulse length determination level	6 dB
Minimum normalized pulse length	0.5 dB
Maximum normalized pulse length	2.0 dB
Beam compensation model	Simrad LOBE
Maximum beam compensation	12 dB
Minor-axis angles	1°
Major-axis angles	1°

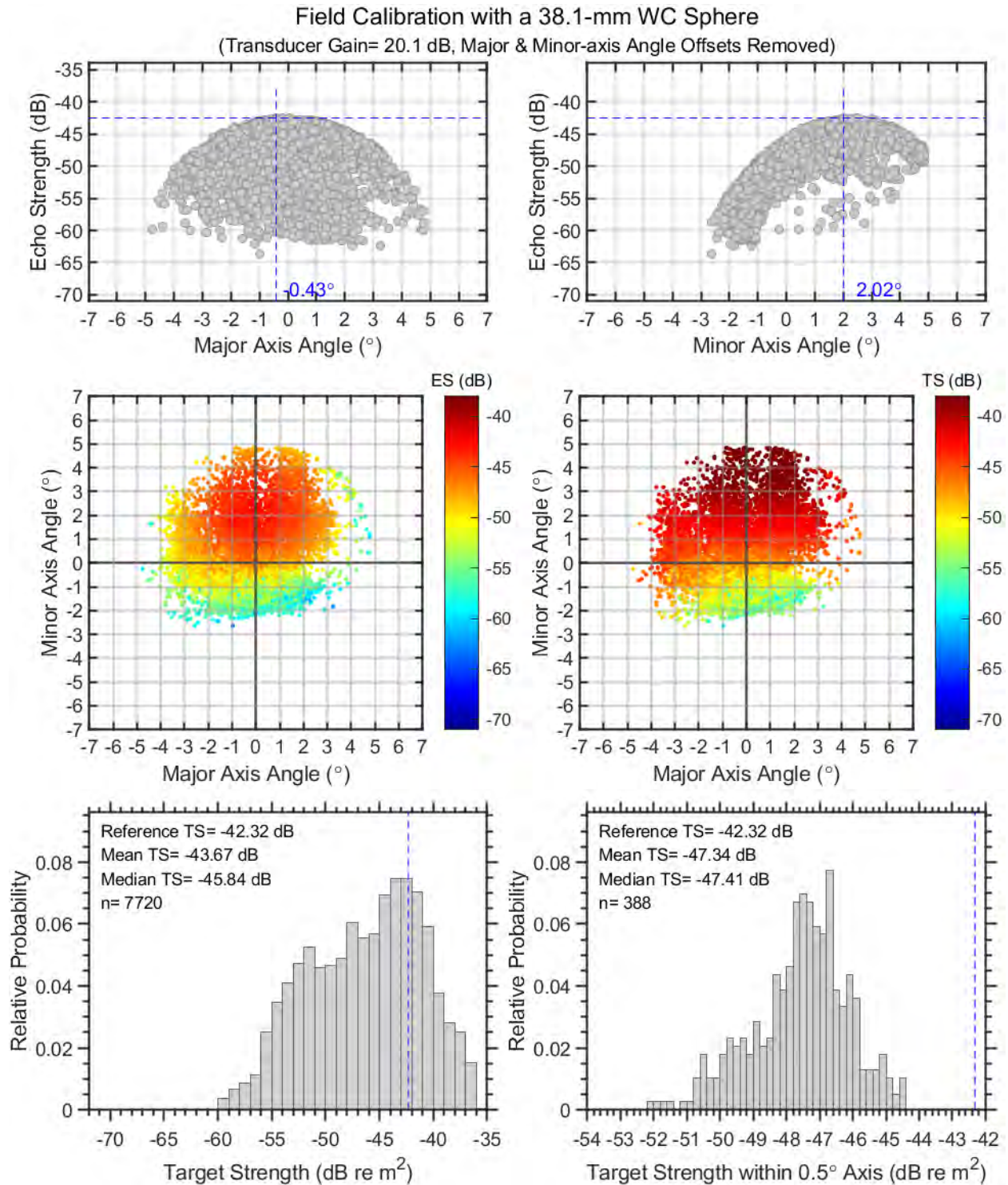


Figure 3-3 TOP and MIDDLE: Angular target strength plots of a 38.1-mm Tungsten Carbide sphere with field-calibrated transducer gain of 20.1 dB and major and minor axis angle offsets from field calibrations removed; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.

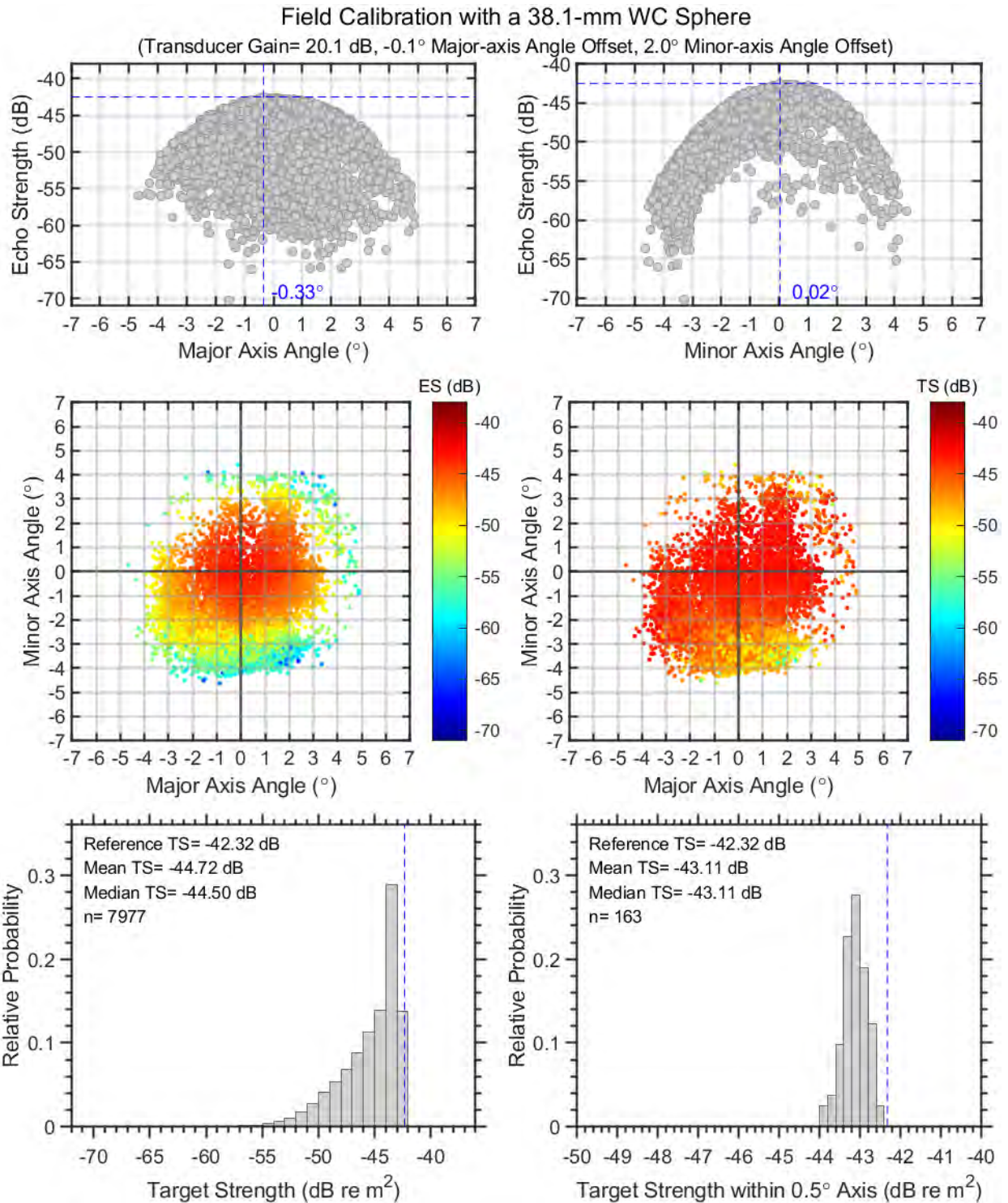
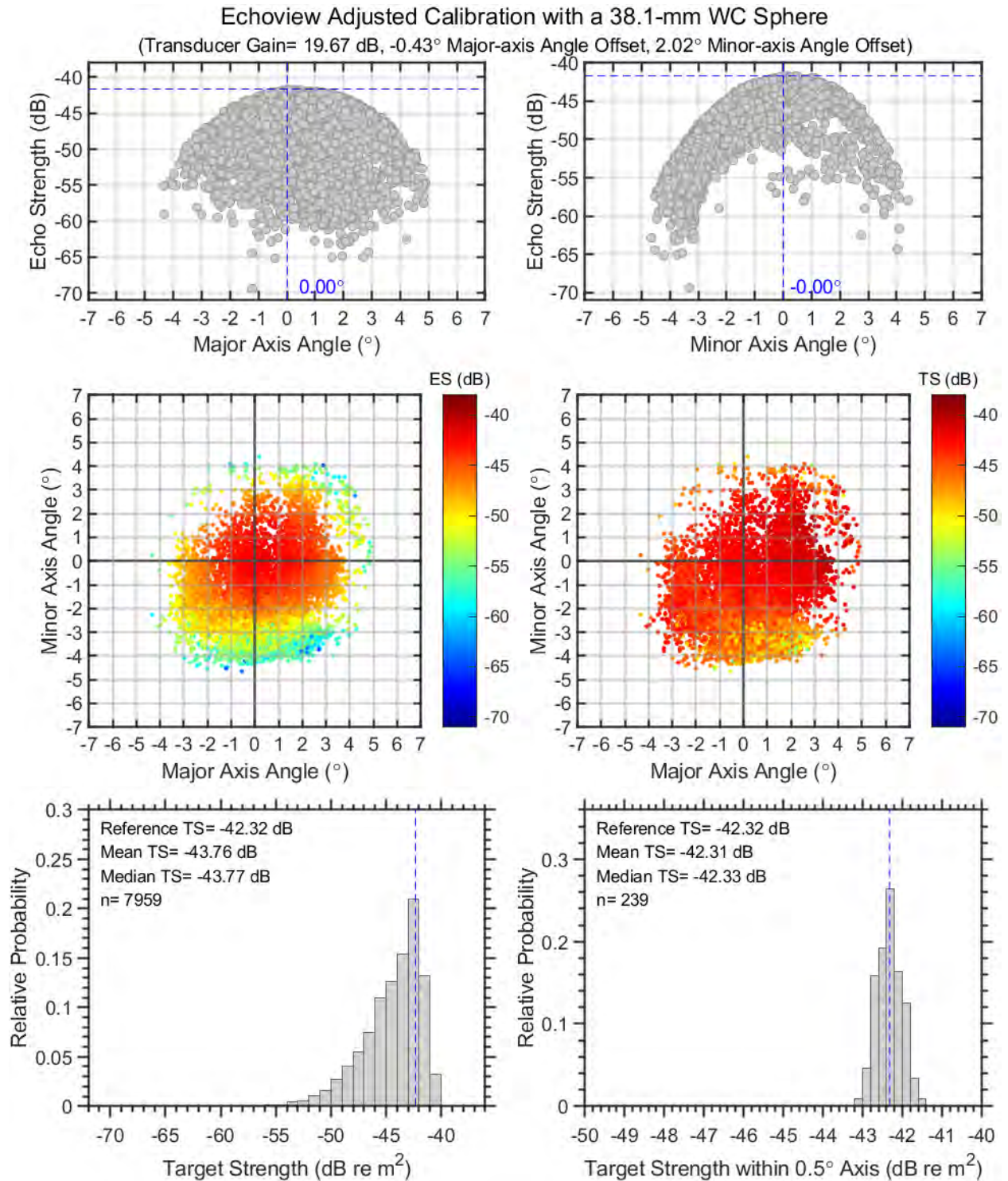


Figure 3-4 TOP and MIDDLE: Angular target strength plots of a 38.1-mm Tungsten Carbide sphere with field-calibrated transducer gain of 20.1dB and major and minor axis angle offsets applied; BOTTOM: target strength histograms of all (left) and on-axis (right) single echo detections.



4 ECHOGRAM PROCESSING

4.1 ES80 Data

4.1.1 ES80 Raw Data File Structure

The survey generated 2,788 files (878 GB) in raw ES80 data files that were timestamped at the start of each recording. File names also were saved with prefixes exemplified as follows:

- TS1_1* = transect 1, segment 1
- PREF1_1* = pre-fishing school number 1, pass 1 (i.e., ES80 data collected on the first pass over school ID 1 before it was fished)
- FISH1_1* = pass 1 of school ID 1 while fishing
- POSF1_1* = post-fishing school number 1, pass 1 (i.e., ES80 data collected on the first pass over school ID 1 after it was fished)
- TS0 = used during transit between transects, to and from port, and ancillary searching for schools after the vessel completed surveying the six transects.

4.1.2 ES80 Processed Data

The primary objective was to process the ES80 data files corresponding to schools identified in real time by the captain and technician from the omnidirectional sonar. Not all schools detected in the omnidirectional sonar imagery and assigned a school number (i.e., ID #) were observed or passed over with the ES80 split-beam echosounder. Video recordings of the omnidirectional sonar were made but synchronization and/or school morphometric analysis was outside of the scope of this report. A log was maintained to record ES80 data files corresponding with observed co-located schools, which composed the list of data processed here. The data processed included ES80 data files corresponding to the five schools fished (IDs 10, 12, 13, 49 and 123). School ID 123 was observed in Leg 3, which followed a storm event and when schools became less dense and coherent (i.e., School ID 123 represented multiple discrete schools in the echogram).

The data processed as described above are itemized in Table 4-1 through Table 4-5.

4.2 Echoview Settings and Configurations

4.2.1 Transducer Location and Orientation

The *F/V Dyrsten* has a draft estimated to be approximately 4.3 m (14 ft) with no fish/water cargo and 5.2 m (17 ft) under full load. The transducer is mounted 1.8 m (6 ft) below the keel. For purposes of processing data and approximating the water depth, the transducer was assumed to be at a water depth of 6.5 m. The transducer was mounted securely in reverse direction where the forward arrow on the transducer was pointed to the stern. To compensate for this, a beam rotation of 180° was used during processing.

4.2.2 Timestamp and Clock Synchronization

Timestamps in the ES80 data were GMT zone (EST+5 hours). However, the clock for the ES80 data collection computer and times ES80 files were offset (fast) by approximately 58 minutes. Actual EST can be adjusted as GMT- 4:02. Notes and logged observations with timestamps corresponding to the omnidirectional sonar or fishing may be variably off from the observed times in the ES80 echograms because of time elapsed to transit to and over the schools.

4.2.3 Environmental Settings and Calibration Files

The Hydrolab profile measurements were used to estimate representative average water quality conditions during each leg of the survey. The differences on sound speed estimates for each leg were negligible (Table 4-1). The final calibration file (*Dyrsten-cal_11February2022-Final20221220.ecs*) was updated for sound speed in each leg (*Dyrsten-cal_Leg1.ecs*, *Dyrsten-cal_Leg2.ecs*, and *Dyrsten-cal_Leg3.ecs*).

4.2.4 Minimum S_v Threshold

Several echograms were examined that contained small pelagic fish backscatter and large benthic Atlantic Menhaden school backscatter. Minimum S_v Threshold curves for selected fish backscatter versus water column background S_v following methods of Jech and Michaels (2006) would indicate a minimum S_v threshold could have been set between -50 dB and -60 dB. However, Rudstam et al. (2009) suggests setting the minimum S_v threshold to be equivalent to the minimum TS of interest. Assuming the minimum TS of interest and minimum single echo detection criterion to be -50 dB, then the TS uncompensated for beam pattern would be -56 dB, which converts to approximately -63 dB assuming sound speed of 1475 m/s and 55 m in range. Given the minimum TS threshold of -63 dB and -66 dB minimum S_v threshold used by Jech and Michaels (2006) for Atlantic Herring (*Clupea harengus*), the minimum S_v threshold used in this study was a conservative nominal value of -64 dB.

4.3 Echoview Processing Steps

Final steps toward establishing an Echoview template to batch process the echograms and export volume and area backscattering data required to optimize several data flow steps. Figure 4-1 shows an example echogram of Atlantic Menhaden schools (Schools 2 and 3) that shows the long ring down from the transducer, which contaminates the upper water column down just past 20 m water depth, and how the echogram was cleaned. Figure 4-2 illustrates these steps.

Table 4-1 ES80 raw files with real-time school identifications during Leg 1 as documented in ES80 File Guide.xlsx.

No.	Filename	Sampling Type	Comment
1	Schools_PREF11_1-D20220215-T174356.raw	Pre-fishing pass	
2	Schools_PREF14_1-D20220215-T223025.raw	Pre-fishing pass	
3	Schools_PREF19_1-D20220215-T232246.raw	Pre-fishing pass	
4	Schools_PREF2_1-D20220214-T145605.raw	Pre-fishing pass	File started recording mid passage over a school; no raw files immediately prior to this file
5	Schools_PREF21_1-D20220215-T232704.raw	Pre-fishing pass	Empty (no regions)
6	Schools_PREF3_1-D20220214-T145830.raw	Pre-fishing pass	
7	Schools_PREF4_2-D20220214-T152458.raw	Pre-fishing pass	
8	Schools_TS2_10-D20220215-T234606.raw	Transect 2 (Segment 10)	
9	Schools_PREF18_1-D20220215-T223419	Pre-fishing pass	

Table 4-2 ES80 raw files with real-time school identifications during Leg 2 as documented in ES80 File Guide.xlsx.

No.	Filename	Sampling Type	Comment
1	Schools_PREF27_1-D20220220-T183757.raw	Pre-fishing pass	Empty (no regions)
2	Schools_PREF33_1-D20220220-T211238.raw	Pre-fishing pass	
3	Schools_PREF38_1-D20220221-T201049.raw	Pre-fishing pass	
4	Schools_TSO_2-D20220220-T165655.raw	Transect Crossover	No apparent school or related backscatter in echogram
5	Schools_TS3_4-D20220220-T194134.raw	Transect 3 segment 4	

Table 4-3 Echoview files with real-time school identifications associated with ES80 raw files of fished schools (10, 12, 13, 49, 123).

No.	Filename	Sampling Type	Raw Files	School ID (Pass)	Comment
1	FSchools_FISH10_1-D20220215-T162130.EV	FISH	FISH10_1-D20220215-T162130.raw FISH10_1-D20220215-T162316.raw FISH10_1-D20220215-T162558.raw FISH10_1-D20220215-T163220.raw	10-1	16:26:20 16:29:37
2	FSchools_FISH12_1-D20220215-T181907.EV	FISH	FISH12_1-D20220215-T181907.raw	12-1	18:22:25
3	FSchools_FISH12_2-D20220215-T183841.EV	FISH	FISH12_2-D20220215-T183841.raw FISH12_2-D20220215-T184249.raw	12-2	18:41:08
4	FSchools_FISH13_1-D20220215-T200734.EV	FISH	FISH13_1-D20220215-T200734.raw FISH13_1-D20220215-T203359.raw FISH13_1-D20220215-T203630.raw FISH13_1-D20220215-T204516.raw FISH13_1-D20220215-T205402.raw	13-1	20:09:55 20:43:38 20:53:23
5	Schools_TSO_13-D20220301-T133900.EV	TSO	TSO_13-D20220301-T133900.raw	49	13:41:53
6	FSchools_FISH123_1-D20220303-T162416.EV	FISH	FISH123_1-D20220303-T162416.raw	123-1	16:24:17
7	FSchools_FISH123_1-D20220303-T164028.EV	FISH	FISH123_1-D20220303-T164028.raw FISH123_1-D20220303-T164311.raw	123-1	16:42:59
8	FSchools_FISH123_1-D20220303-T165225.EV	FISH	FISH123_1-D20220303-T165225.raw	123-1	16:53:59
9	FSchools_FISH123_1-D20220303-T165555.EV	FISH	FISH123_1-D20220303-T165555.raw	123-1	16:57:34
10	FSchools_FISH123_1-D20220303-T171703.EV	FISH	FISH123_1-D20220303-T171703.raw FISH123_1-D20220303-T171944.raw FISH123_1-D20220303-T172226.raw	123-1	17:17:57 17:19:38
11	FSchools_FISH123_1-D20220303-T172704.EV	FISH	FISH123_1-D20220303-T172704.raw	123-1	Smpelagic schools, no clear large menhaden schools
12	FSchools_FISH123_2-D20220303-T174800.EV	FISH	FISH123_2-D20220303-T174800.raw FISH123_2-D20220303-T175040.raw FISH123_2-D20220303-T175320.raw FISH123_2-D20220303-T175456.raw	123-2	17:49:32 SPelagic 17:51:30 Menh 17:54:04 OtherFish 17:57:03sPelagic
13	FSchools_FISH123_2-D20220303-T180536.EV	FISH	FISH123_2-D20220303-T180536.raw FISH123_2-D20220303-T180816.raw FISH123_2-D20220303-T181058.raw FISH123_2-D20220303-T181338.raw	123-2	18:06:06 Menh 18:06:45 Menh 18:06:45 Menh 18:07:06 Menh
14	FSchools_FISH123_2-D20220303-T182141.EV	FISH	FISH123_2-D20220303-T182141.raw	123-2	18:22:31 Menh

Table 4-4 ES80 raw files with real-time school identifications during Leg 3 as documented in ES80 File Guide.xlsx.

No.	Note	Filename	School Number	Recorded ES80 Time	Field Comment
1		TSO_11-D20220301-T001218.raw	44	0:15:00	
2		TSO_11-D20220301-T001218.raw	45	0:17:45	
3		TSO_11-D20220301-T001946.raw	46	0:20:30	
4		TSO_13-D20220301-T133900.raw	49	13:41:45	PREF PASS IN TSO_13
5		TSO_14-D20220301-T213020.raw	59	21:31:08	
6		TSO_14-D20220301-T213020.raw	60	21:32:55	ES80 IN TSO_14 FILE AT 15:35
7		TSO_14-D20220301-T213020.raw	61	21:33:56	ES80 DATA ON TSO_14 AT 15:34
8		TSO_14-D20220301-T213603.raw	62	21:36:15	ES80 IN TSO_14 AT 13:35
9		TSO_14-D20220301-T213603.raw	63	21:36:58	ES80 IN TSO_14 AT 15:37 - DISPERSED AS WE WENT OVER
10		TSO_17-D20220303-T135611.raw	67	13:57:50	
11		TSO_17-D20220303-T135848.raw	68	13:59:00	
12	1	TSO_17-D20220303-T140622.raw	76	14:07:20	
13	1	TSO_17-D20220303-T140622.raw	77	14:08:00	
14	2	TSO_17-D20220303-T140859.raw	78	14:11:20	
15		TSO_17-D20220303-T141510.raw	79	14:16:00	
16		TSO_17-D20220303-T142157.raw	82	14:22:30	
17		TSO_17-D20220303-T142434.raw	83	14:24:50	
18		TSO_17-D20220303-T150226.raw	89	15:02:40	
19		TSO_17-D20220303-T150226.raw	90	15:04:35	
20		TSO_17-D20220303-T150738.raw	97	15:07:40	
21		TSO_17-D20220303-T151014.raw	98	15:10:45	
22		TSO_17-D20220303-T151014.raw	99	15:12:30	
23		TSO_17-D20220303-T151014.raw	101	15:12:30	
24		TSO_17-D20220303-T151337.raw	102	15:15:30	
25		TSO_17-D20220303-T151613.raw	106	15:16:15	
26		TSO_17-D20220303-T151613.raw	107	15:17:33	
27		TSO_17-D20220303-T151849.raw	108	15:19:05	
28		TSO_17-D20220303-T152229.raw	111	15:23:00	
29		TSO_17-D20220303-T152400.raw	112	15:26:10	
30		TSO_17-D20220303-T152637.raw	113	15:27:56	
31		TSO_17-D20220303-T152637.raw	114	15:28:18	
32		TSO_17-D20220303-T153358.raw	115	15:35:25	
33		TSO_17-D20220303-T153634.raw	116	15:37:10	
34		TSO_17-D20220303-T153911.raw	117	15:39:15	EVADED AS WE APPROACHED - VERY LIGHT FISH BACKSCATTER ON ECHOGRAM UP HIGH
35		TSO_17-D20220303-T153911.raw	119	15:41:20	
36		TSO_17-D20220303-T154148.raw	120	15:42:10	
37		TSO_17-D20220303-T154659.raw	126	15:49:05	ONLY GOT A SMALL PIECE
38		TSO_17-D20220303-T154935.raw	127	15:51:20	
39		TSO_17-D20220303-T155212.raw	128	15:52:30	

No.	Note	Filename	School Number	Recorded ES80 Time	Field Comment
40		TSO_18-D20220303-T212855.raw	129	21:30:05	
41		TSO_18-D20220303-T213134.raw	130	21:31:36	
42		TSO_18-D20220303-T213134.raw	132	21:33:35	
43		TSO_18-D20220303-T213413.raw	134	21:35:15	SURFACE SCHOOL ON ES80
44		TSO_18-D20220303-T213653.raw	135	21:36:55	
45		TSO_18-D20220303-T213844.raw	136	21:39:30	STRIPERS SEEN ON ES80 RIGHT AFTER THE SCHOOL
46		TSO_18-D20220303-T214124.raw	137	21:42:30	STRIPERS FEEDING ON SCHOOL ON ES80 - VERY CLEAR
47		TSO_18-D20220303-T214124.raw	138	21:43:50	SCATTERED SCHOOL, SAWN SOME SINGLE TARGETS - COULD BE MENHADEN OR STRIPER
48		TSO_18-D20220303-T222142.raw	139	22:21:40	COUNTING LOOSE JOINING SPOTS AS ONE - MANY STRIPERS SEEN AROUND THIS SCHOOL AND ON ES80
49		TSO_18-D20220303-T222422.raw	141	22:24:44	
50		TSO_18-D20220303-T222532.raw	142	22:27:33	
51		TSO_18-D20220303-T222811.raw	143	22:28:38	
52		TSO_18-D20220303-T222811.raw	145	22:30:45	
53	3	TSO_18-D20220303-T223051.raw	147	22:33:26	
54		TSO_18-D20220303-T223609.raw	149	22:36:10	
55		TSO_18-D20220303-T223851.raw	150	22:40:50	LOOSE SPOTS ON SONAR - BREAKING AS WE APPROACH, BUT SHOWED A SMALL SCHOOL TIGHT TO THE BOTTOM
56	4	TSO_18-D20220303-T224132.raw	151	22:42:10	DIDNT SHOW ON ES80 BUT RAN OVER - MAYBE SURFACE SCHOOL? - CAN BARELY SEE FISH MARKS BELOW NEARFIELD ON ES80 RECORDING POST
57		TSO_18-D20220303-T224412.raw	152	22:44:32	SPLIT AS WE APPROACHED - FISH SURE LOOK ON THE MOVE ON ES80 SIGNATURE
58	5	TSO_18-D20220303-T224501.raw	154	22:45:40	ALL SECTIONS OF SCHOOL WAY MORE THAN 400T - JUST HUGE - STRIPERS SEEN ON ES80 ON MANY OF THE SCHOOLS IN THIS AREA - SEEN HERE CHARGING INTO THE SCHOOL
59		TSO_18-D20220303-T224741.raw	155	22:49:25	
60		TSO_18-D20220303-T225242.raw	158	22:54:00	
61	6	TSO_18-D20220303-T225242.raw	160	22:55:18	

1 Schools were truncated, added TSO_17-D20220303-T141135.raw

2 Concatenated with TSO_17-D20220303-T140622.raw to avoid truncated schools

3 Schools were truncated, added TSO_18-D20220303-T223334.raw

4 No menhaden or other schools (excluded from further analysis)

5 Concatenated with TSO_18-D20220303-T224412.raw to avoid truncated schools

6 Schools were truncated, added TSO_18-D20220303-T225523.raw

Table 4-5 Echoview and ES80 raw files included in the processed data containing real-time school identifications during Leg 3 as documented in *ES80 File Guide.xlsx*.

No.	EV Filename	Raw Files
1	Schools_TSO_11-D20220301-T001218.EV	TSO_11-D20220301-T001218.raw
2	Schools_TSO_11-D20220301-T001946.EV	TSO_11-D20220301-T001946.raw
3	Schools_TSO_13-D20220301-T133900.EV	TSO_13-D20220301-T133900.raw
4	Schools_TSO_14-D20220301-T213020.EV	TSO_14-D20220301-T213020.raw
5	Schools_TSO_14-D20220301-T213603.EV	TSO_14-D20220301-T213603.raw
6	Schools_TSO_17-D20220303-T135611.EV	TSO_17-D20220303-T135611.raw
7	Schools_TSO_17-D20220303-T135848.EV	TSO_17-D20220303-T135848.raw
8	Schools_TSO_17-D20220303-T140622.EV	TSO_17-D20220303-T140622.raw TSO_17-D20220303-T141135.raw TSO_17-D20220303-T140859.raw
9	Schools_TSO_17-D20220303-T141510.EV	TSO_17-D20220303-T141510.raw
10	Schools_TSO_17-D20220303-T142157.EV	TSO_17-D20220303-T142157.raw
11	Schools_TSO_17-D20220303-T142434.EV	TSO_17-D20220303-T142434.raw
12	Schools_TSO_17-D20220303-T150226.EV	TSO_17-D20220303-T150226.raw
13	Schools_TSO_17-D20220303-T150738.EV	TSO_17-D20220303-T150738.raw
14	Schools_TSO_17-D20220303-T151014.EV	TSO_17-D20220303-T151014.raw
15	Schools_TSO_17-D20220303-T151337.EV	TSO_17-D20220303-T151337.raw
16	Schools_TSO_17-D20220303-T151613.EV	TSO_17-D20220303-T151613.raw
17	Schools_TSO_17-D20220303-T151849.EV	TSO_17-D20220303-T151849.raw
18	Schools_TSO_17-D20220303-T152229.EV	TSO_17-D20220303-T152229.raw
19	Schools_TSO_17-D20220303-T152400.EV	TSO_17-D20220303-T152400.raw
20	Schools_TSO_17-D20220303-T152637.EV	TSO_17-D20220303-T152637.raw
21	Schools_TSO_17-D20220303-T153358.EV	TSO_17-D20220303-T153358.raw
22	Schools_TSO_17-D20220303-T153634.EV	TSO_17-D20220303-T153634.raw
23	Schools_TSO_17-D20220303-T153911.EV	TSO_17-D20220303-T153911.raw
24	Schools_TSO_17-D20220303-T154148.EV	TSO_17-D20220303-T154148.raw
25	Schools_TSO_17-D20220303-T154659.EV	TSO_17-D20220303-T154659.raw
26	Schools_TSO_17-D20220303-T154935.EV	TSO_17-D20220303-T154935.raw
27	Schools_TSO_17-D20220303-T155212.EV	TSO_17-D20220303-T155212.raw
28	Schools_TSO_18-D20220303-T212855.EV	TSO_18-D20220303-T212855.raw
29	Schools_TSO_18-D20220303-T213134.EV	TSO_18-D20220303-T213134.raw
30	Schools_TSO_18-D20220303-T213413.EV	TSO_18-D20220303-T213413.raw
31	Schools_TSO_18-D20220303-T213653.EV	TSO_18-D20220303-T213653.raw
32	Schools_TSO_18-D20220303-T213844.EV	TSO_18-D20220303-T213844.raw
33	Schools_TSO_18-D20220303-T214124.EV	TSO_18-D20220303-T214124.raw
34	Schools_TSO_18-D20220303-T222142.EV	TSO_18-D20220303-T222142.raw
35	Schools_TSO_18-D20220303-T222422.EV	TSO_18-D20220303-T222422.raw
36	Schools_TSO_18-D20220303-T222532.EV	TSO_18-D20220303-T222532.raw
37	Schools_TSO_18-D20220303-T222811.EV	TSO_18-D20220303-T222811.raw
38	Schools_TSO_18-D20220303-T223051.EV	TSO_18-D20220303-T223051.raw TSO_18-D20220303-T223334.raw
39	Schools_TSO_18-D20220303-T223609.EV	TSO_18-D20220303-T223609.raw
40	Schools_TSO_18-D20220303-T223851.EV	TSO_18-D20220303-T223851.raw
41	Schools_TSO_18-D20220303-T224412.EV	TSO_18-D20220303-T224412.raw TSO_18-D20220303-T224501.raw
42	Schools_TSO_18-D20220303-T224741.EV	TSO_18-D20220303-T224741.raw
43	Schools_TSO_18-D20220303-T225242.EV	TSO_18-D20220303-T225242.raw TSO_18-D20220303-T225523.raw

Table 4-6 Mean maximum depth, and depth-averaged water temperature and salinity from profile¹ measurements taken by a Hydrolab MS5 multi-parameter sonde during each survey leg.

Leg	Dates (including transit)	Transects	Number of Profiles	Maximum Depth (m)	Mean Depth-averaged Temperature (°C)	Mean Depth-averaged Salinity (PSU)	Sound Speed ² (m/s)
1	13–15 Feb 2022	1–2	17	50.6	6.0	33.8	1473.5
2	19–25 Feb 2022	3–6	30	51.3	6.3	34.0	1475.0
3	27 Feb–3 Mar 2022		6	32.7	6.4	33.7	1475.0
All	13 Feb–4 Mar 2022		53	51.3	6.2	33.9	1474.5

1 Profile measurements excluded data above the nominal transducer depth (6.5 m).

2 Sound speed was estimated from temperature and salinity assuming depth = 25 m (MacKenzie 1981).

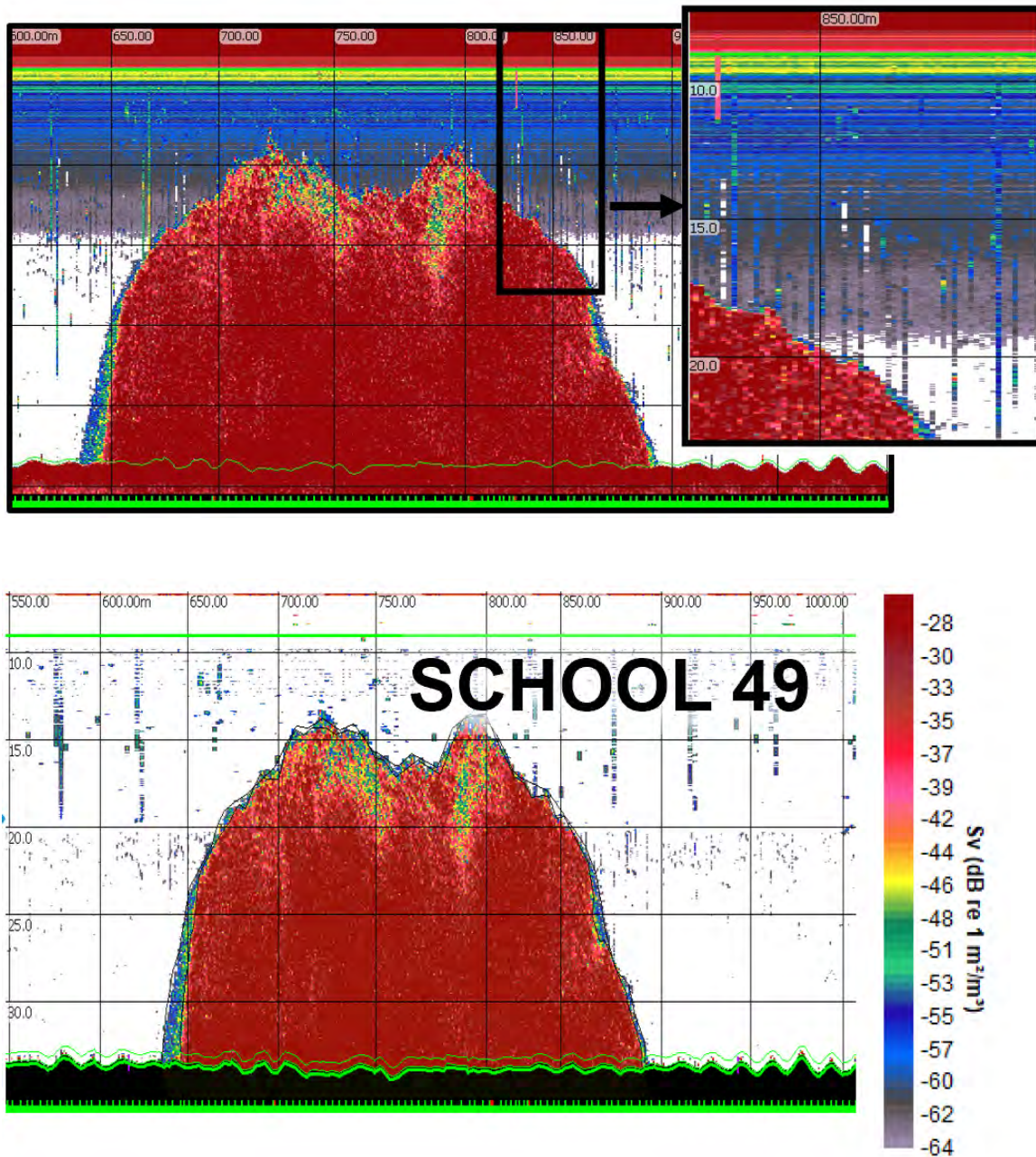


Figure 4-1 Example of Sv backscatter of School 49 in ES80 raw data. (TOP) shows apparent noise ringing down to approximately 20 m and random impulse noise. (BOTTOM) Filtered Sv backscatter after masking the upper water column and remove the impulse noise spikes.

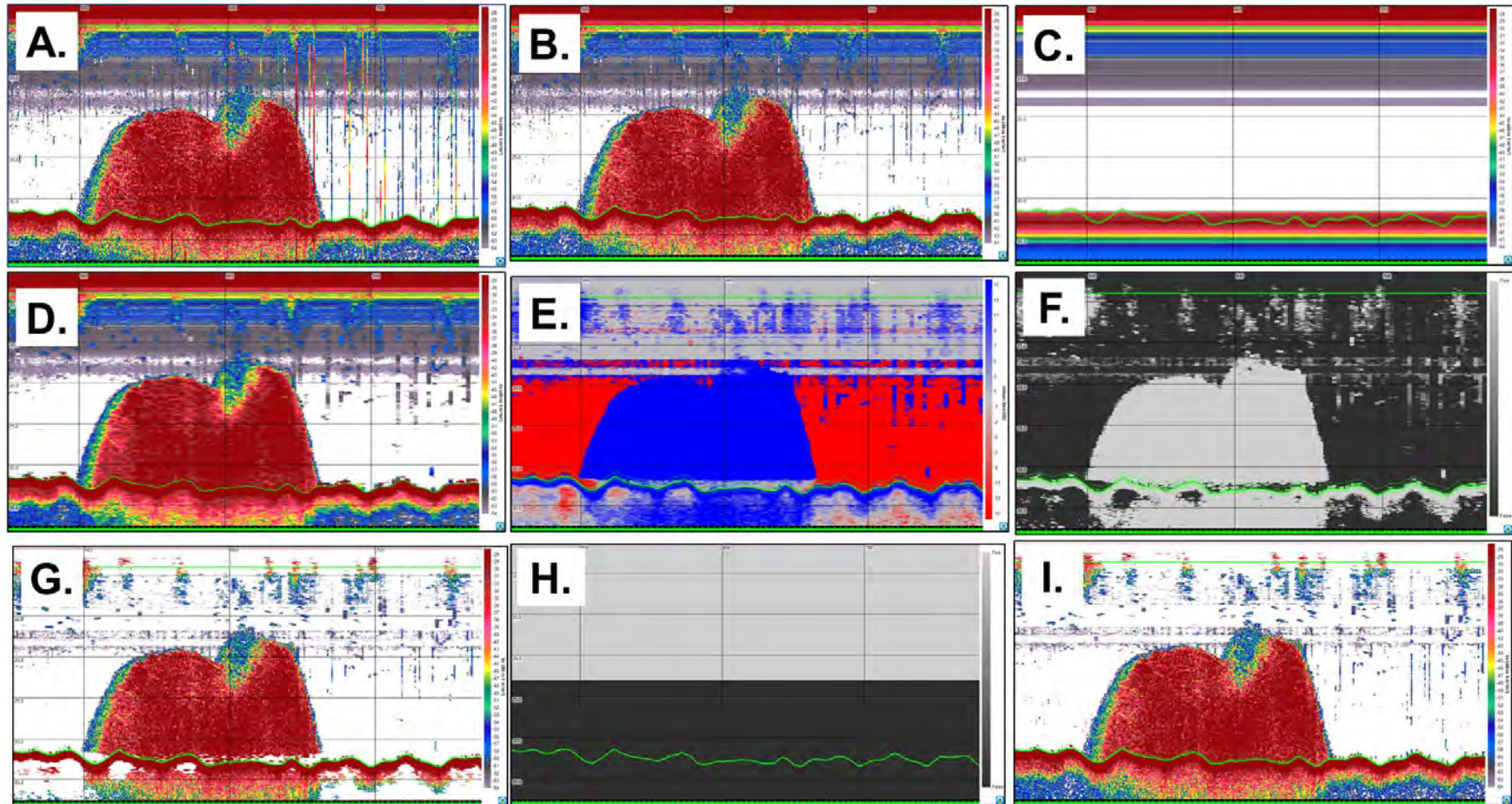


Figure 4-2 Step by Step Echogram Processing: A. Raw S_v . B. Impulse noise removed (Ryan et al. 2015). C. Resampled (median of 2000 ping \times 3 sample window and matched S_v pings). D. Smoothed 3×3 S_v . E. Signal-to-Noise Ratio (SNR). F. Mask $|\text{SNR}| > 3$ dB. G. Filtered S_v Mask to water column. H. Upper (23 m) water column mask. I. Filtered S_v .

5 TARGET STRENGTH AND INDIVIDUAL BODY SIZE

5.1 Target Strength

Target strength is important in estimating volumetric and areal density of Atlantic Menhaden from the mean volume backscattering and area backscattering coefficients, respectively. To convert to fish per m³ or m², TS was back-transformed from a dB value to a linear quantity called the backscattering cross-section ($\sigma_{bs} = 10^{(TS/10)}$); however, TS is often used to characterize the acoustic quantity representative of a target or fish. The TS representative of a single Atlantic Menhaden to use for this study does carry with it a degree of uncertainty given the lack of specific-specific experimental data, model estimates, and *in situ* estimates. Exploratory analysis of the echograms containing Atlantic Menhaden during this survey indicated that schools were too dense to obtain an *in situ* TS estimate. Instead, TS was estimated based on total length (TL), which is an established method in acoustic surveys (Simmonds and McLennan 2005).

Without species-specific TS data or equations for Atlantic Menhaden, Lucca and Warren (2018) used a generalized TS-TL equation (Emmrich et al. 2012, Love 1971) to acoustically estimate distribution and abundance of Atlantic Menhaden in estuarine waters of Long Island, New York. The mean TS (-32.2 dB re 1 m²) of Atlantic Menhaden at 38 kHz used in this study was estimated following equation:

$$TS = 19.1\text{Log}_{10}(\text{TL}) + 0.9\text{Log}_{10}(f, \text{kHz}) - 62 \quad (\text{Eq. 1})$$

where TS = target strength (dB re 1 m²),
 TL = total length (cm), and
 f = acoustic frequency (kiloHertz, kHz)

In another study, Lucca and Warren (2019) made fishery-independent observations of adult Atlantic Menhaden in coastal waters south of New York where they used an alternative TS-TL equation for 120-kHz data based on models of other clupeids but without specific details on its derivation:

$$TS = 20.40\text{Log}_{10}(\text{TL}) - 68.88 \quad (\text{Eq. 2})$$

If Equation 2 was applied to the 38-kHz ES80 in this study, the mean TS would be -38.59 dB re 1 m², which would increase abundance by over four-fold. However, Lucca and Warren (2019) determined mean *in situ* TS at 120 kHz was -32.8 dB re 1 m² at Atlantic Beach and -35.7 dB re 1 m² at Hempstead. To further advance acoustic surveys of Atlantic Menhaden, TS measurements and models specific to the species is area of research for improving the uncertainty of abundance and biomass.

5.2 Individual Body Size

Length measurements among the five midwater trawl catches from all legs of the survey were similar, and as such, all individual measurements from biological samples were pooled. The mean TL was 30.5 cm and mean fork length (FL) was 26.5 cm using the following equation developed from measurements taken in this study:

$$\text{TL (mm)} = 1.091988 (\text{FL, mm}) + 16.09377 \quad (\text{Eq. 3})$$

For biomass estimation, the individual mean body weight (W) of 0.285 kg was based on the length-weight equation developed from biological samples collected in this study:

$$W \text{ (kg)} = (1.352604 \times 10^{-7}) \times (\text{TL, mm})^{2.544937} \quad (\text{Eq. 4})$$

6 ANALYTICAL METHODS

Table 6-1. List of exported analysis variables from Echoview are below with analyzed variables explained.

Variable	Comment
ABC	area backscattering coefficient (m2/m2), primary acoustic metric, see EV help
Area_Backscatter_Strength	
Depth_mean	
Good_samples	
Lat_E	
Lat_M	
Lat_S	
Leg	Survey leg number
Lon_E	
Lon_M	
Lon_S	
NASC	
Ping_E	
Ping_M	
Ping_S	
Region_ID	
Region_bottom_altitude_max	
Region_bottom_altitude_mean	
Region_bottom_altitude_min	
Region_class	
Region_top_altitude_max	
Region_top_altitude_mean	
Region_top_altitude_min	
Sv_max	
Sv_mean	
Sv_min	
Thickness_mean	
Time_E	
Time_M	
Time_S	
date_e	
date_m	

Variable	Comment
date_s	
fish_m2	Areal Fish Density of classified echogram region (Number of fish per square meter) = $ABC/(10^{(\text{meanTS}/10)})$
fish_m3	Volumetric Fish Density of classified echogram region (Number of fish per cubic meter) = $10^{(Sv_mean/10)}/(10^{(\text{meanTS}/10)})$
kg_m2	Areal Biomass Density of classified echogram region (Kilograms per square meter) = fish_m2 X meanKg
kg_m3	Volumetric Biomass Density of classified echogram region (Number of kilograms per cubic meter) = fish_m3 X meanKg
meanKg	0.285 kg $W \text{ (kg)} = (1.352604 \times 10^{-7}) \times (\text{TL, mm})^{2.544937}$ (this study) where mean TL = 305.4 mm, based on $\text{TL (mm)} = 1.091998 \times (\text{FL, mm}) + 16.096377$ (this study) where mean FL = 265 mm
meanTS	$\text{TS (dB)} = 19.1 \text{Log}_{10}(\text{TL, cm}) - 60.58$ (at 38 kHz)
region_name	
start_date	Reformatted start date (mm/dd/yy) of echogram region
Volume_shape	Shape of the school volume approximated as a "Dome" if the region (school) extending to seafloor or an "Ellipsoid" if the region is in the water column off seafloor
Volume_m3	Volume in cubic meters of in ideal symmetrical dome or ellipsoid
school_fish	=fish_m3 x volume_m3
school_kg	=kg_m3 x volume_m3
svfile	Individual Echoview export filename

6.1 Volume Calculations

1. Only schools regions classified as **MenhadenRegion** or **MenhadenSchool**
2. **Volume Shape.** Benthic versus midwater/surface schools:

```
if region_bottom_altitude_min <= 0 then Volume_Shape = 'Dome';
if region_bottom_altitude_min >0 then Volume_Shape = 'Ellipsoid';
```

3. **Dome volume.** The tallest pixel with the classified region represent the dome height and is described in the Echoview export as Region_Top_Altitude_Max. A spherical, symmetrical dome approximates the volume of a benthic school with a dome or hump like echo trace. The volume is given $V = \frac{1}{6}\pi h(3r^2 + h^2)$

```
dome_height = region_top_altitude_max;
volume_m3 = (1/6)*constant('PI')*dome_height*((3*(0.5*uncorrected_length)**2)
+ dome_height**2);
```

4. **Ellipsoid volume.** Assume the maximum height of the school in water (height) and assumes in the planar cross-sectional view (i.e., seen from the vessel down onto the school) is a circle (symmetrical) with a radius equivalent to half of the observed school echo trace length (i.e., uncorrected_length). The ellipsoid volume was calculated as:

$$V = \frac{4}{3} \pi r_L^2 r_H$$

```

if volume_shape = 'Ellipsoid' then do;

*volume of ideal ellipsoid;
*4/3 x pi x RL^2 x RH;
*where RL = radius or half of observed trace length (uncorrected length);
*where RH = half of the height (tallest dimension);
volume_m3 =
(4/3)*constant('PI')*((0.5*uncorrected_length)**2)*(0.5*(region_top_altitude_
max-region_bottom_altitude_min));

end;

```

7 RESULTS

Biomass and numeric densities and abundance estimates for Atlantic Menhaden were delivered to UMCES with accompanying data deliverable memos. Based on discrete benthic “dome-like” Menhaden schools directly fished, the acoustically derived biomass estimates and trawl catch were often in similar agreement (Figure 7-1).

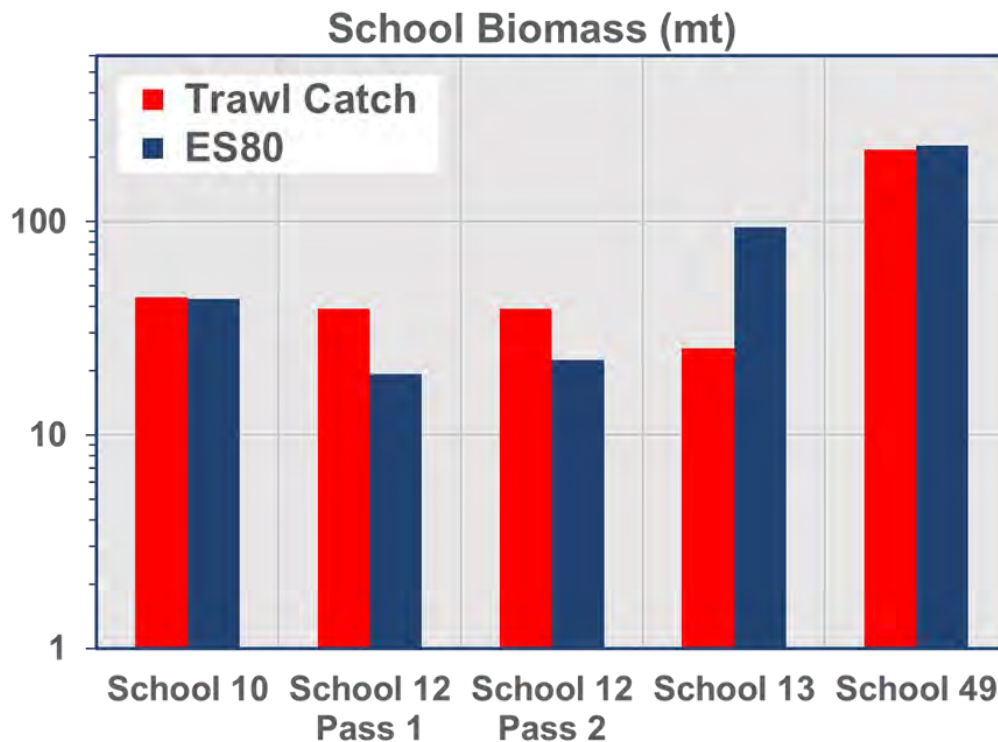


Figure 7-1 Atlantic Menhaden school biomass estimates by midwater trawl and Simrad ES80 split-beam echosounder. Acoustically-derived density was scaled to biomass (metric tons) based on the ideal dome volume (school height, school length).

8 LITERATURE CITED

- Demer, D. 2015. Calibration of acoustic instruments. ICES Cooperative Research Report No. 326. 133 pp.
- Emmrich, M., I.J. Winfield, J. Guillard, A. Rustadbakken, C. Verges, P. Volta, E. Jeppesen, T.L. Lauridsen, S. Brucet, K. Holmgren, C. Argillier, and T. Mehner. 2012. Strong correspondence between gillnet catch per unit effort and hydroacoustically derived fish biomass in stratified lakes. *Freshwater Biology* 57(12): 2436-2448.
- Foote, K. G., H. P. Knudsen, G. Vestnes, D. N. MacLennan, and E. J. Simmonds. 1987. Calibration of acoustic instruments for fish density estimation: A practical guide. ICES Coop. Res. Rep., No. 144. 69 pp.
- Liang, D., G. M. Nessler, and M. J. Wilberg, 2020. A spatial simulation approach to hydroacoustic survey design: A case study for Atlantic menhaden. *Fisheries Research* 122: 105402. <https://doi.org/10.1016/j.fishres.2019.105402>
- Love, R. H. 1971. Dorsal-aspect target strength of an individual fish. *Journal of the Acoustical Society of America* 49: 816-823.
- Lucca, B. M., and J. D. Warren. 2018. Acoustically measured distribution and abundance of Atlantic Menhaden (*Brevoortia tyrannus*) in a shallow estuary in Long Island, NY. *Estuaries and Coasts* 41:1436-1447.
- Lucca, B.M. and J.D. Warren. 2019. Fishery-independent observations of Atlantic menhaden abundance in the coastal waters south of New York. *Fisheries Research* 218: 229-236.
- Mackenzie, K.V. 1981. Nine-term equation for sound speed in the ocean. *Journal of Acoustical Society of America* 70: 807-812.
- NOAA Fisheries/SWFSC/AST. (National Oceanic and Atmospheric Administration Fisheries /Southwest Fisheries Science Center/Advanced Survey Technologies). 2022. Standard Sphere Target Strength Calculator. <https://www.fisheries.noaa.gov/data-tools/standard-sphere-target-strength-calculator>
- Ryan T. E., Downie R. A., Kloser R. J., Keith G. 2015. Reducing bias due to noise and attenuation in open-ocean echo integration. *ICES Journal of Marine Science* 72, 2482-2493
- Simmonds, J., and D. MacLennan. 2005. *Fisheries Acoustics: Theory and Practice*, Second edition. Blackwell Science, Oxford, UK.

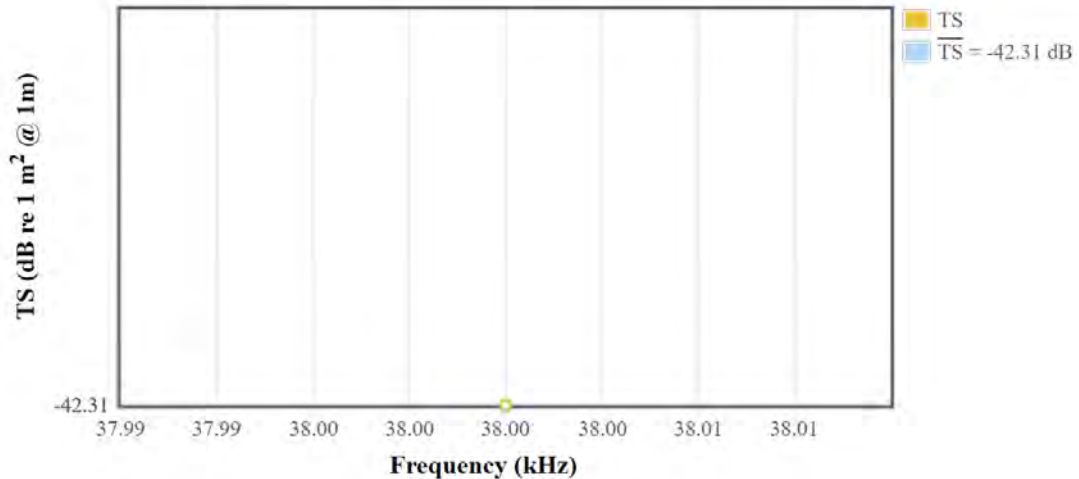
Appendix A. Reference Target Strength



Advanced Survey Technologies
Southwest Fisheries Science Center

Standard Sphere Target Strength Calculator

Sphere parameters	Water parameters	Signal parameters
Material: <input type="text" value="WC"/>	<input checked="" type="radio"/> Temperature: <input type="text" value="5.75"/> °C	<input type="radio"/> Center frequency: <input type="text" value="38"/> kHz
Diameter: <input type="text" value="38.1"/> mm	Salinity: <input type="text" value="35"/> PSU	Pulse duration: <input type="text" value="256"/> μs
Density: <input type="text" value="14900"/> kg/m ³	Pressure: <input type="text" value="20.3"/> dbar	<input checked="" type="radio"/> Bandwidth: <input type="text" value="38"/> to <input type="text" value="38"/> kHz
Longitudinal sound speed: <input type="text" value="6853"/> m/s	<input type="radio"/> Sound speed: <input type="text" value="1473.81"/> m/s	Resolution: <input type="text" value="0.04"/> kHz
Transversal sound speed: <input type="text" value="4171"/> m/s	Density: <input type="text" value="1027.68"/> kg/m ³	



Appendix B. Placeholder

Appendix B

Atlantic Menhaden School Biomass Estimates

Data Collection Period	Date	Mean depth (m)	School biomass (kg)	School biomass (mt)
Survey - Leg 1	2/14/2022	28.16	381.68	0.38
Survey - Leg 1	2/14/2022	28.58	1,379.05	1.38
Survey - Leg 1	2/14/2022	26.43	77,887.39	77.89
Survey - Leg 1	2/14/2022	16.72	499.24	0.50
Survey - Leg 1	2/14/2022	20.12	2,064.57	2.06
Survey - Leg 1	2/14/2022	10.55	937.60	0.94
Survey - Leg 1	2/14/2022	25.55	11,620.19	11.62
Survey - Leg 1	2/15/2022	38.27	2.78	0.00
Survey - Leg 1	2/15/2022	31.27	78,246.04	78.25
Survey - Leg 1	2/15/2022	33.82	28,112.10	28.11
Survey - Leg 1	2/15/2022	32.52	18,150.45	18.15
Survey - Leg 1	2/15/2022	27.32	144,707.01	144.71
Survey - Leg 1	2/15/2022	28.70	462,288.93	462.29
Survey - Leg 1	2/15/2022	20.06	48.24	0.05
Survey - Leg 1	2/15/2022	33.92	46,571.75	46.57
Survey - Leg 1	2/15/2022	14.52	8.26	0.01
Survey - Leg 1	2/15/2022	14.80	1.87	0.00
Survey - Leg 1	2/15/2022	24.63	70,209.34	70.21
Survey - Leg 1	2/15/2022	32.13	219.16	0.22
Survey - Leg 1	2/15/2022	26.72	2,474.88	2.47
Survey - Leg 2	2/20/2022	23.19	3.55	0.00
Survey - Leg 2	2/20/2022	20.94	148.29	0.15
Survey - Leg 2	2/21/2022	16.18	9.88	0.01
Post Survey - Leg 3	3/1/2022	25.40	582,588.46	582.59
Post Survey - Leg 3	3/1/2022	22.67	10,926.57	10.93
Post Survey - Leg 3	3/1/2022	27.12	223.77	0.22
Post Survey - Leg 3	3/1/2022	19.71	5,826.53	5.83
Post Survey - Leg 3	3/1/2022	25.40	582,588.46	582.59
Post Survey - Leg 3	3/1/2022	27.02	22,697.61	22.70
Post Survey - Leg 3	3/1/2022	26.95	130,973.04	130.97
Post Survey - Leg 3	3/1/2022	27.25	55,581.34	55.58
Post Survey - Leg 3	3/1/2022	29.61	2,855.61	2.86
Post Survey - Leg 3	3/1/2022	26.78	126,253.24	126.25
Post Survey - Leg 3	3/3/2022	22.25	749.60	0.75
Post Survey - Leg 3	3/3/2022	26.20	1,112.99	1.11
Post Survey - Leg 3	3/3/2022	25.07	4,555.39	4.56
Post Survey - Leg 3	3/3/2022	29.59	106.87	0.11
Post Survey - Leg 3	3/3/2022	29.97	105.99	0.11
Post Survey - Leg 3	3/3/2022	29.39	318.92	0.32
Post Survey - Leg 3	3/3/2022	25.99	11,253.05	11.25
Post Survey - Leg 3	3/3/2022	27.93	1,685.58	1.69
Post Survey - Leg 3	3/3/2022	29.40	135.54	0.14
Post Survey - Leg 3	3/3/2022	28.35	1,505.24	1.51
Post Survey - Leg 3	3/3/2022	28.44	763.49	0.76

Data Collection Period	Date	Mean depth (m)	School biomass (kg)	School biomass (mt)
Post Survey - Leg 3	3/3/2022	29.31	0.78	0.00
Post Survey - Leg 3	3/3/2022	22.97	2.57	0.00
Post Survey - Leg 3	3/3/2022	28.45	10,461.68	10.46
Post Survey - Leg 3	3/3/2022	22.26	0.02	0.00
Post Survey - Leg 3	3/3/2022	26.18	2,219.64	2.22
Post Survey - Leg 3	3/3/2022	25.27	1,564.54	1.56
Post Survey - Leg 3	3/3/2022	27.33	694.78	0.69
Post Survey - Leg 3	3/3/2022	26.05	14,925.04	14.93
Post Survey - Leg 3	3/3/2022	25.61	19,364.15	19.36
Post Survey - Leg 3	3/3/2022	25.28	8,833.03	8.83
Post Survey - Leg 3	3/3/2022	28.62	744.18	0.74
Post Survey - Leg 3	3/3/2022	19.92	0.78	0.00
Post Survey - Leg 3	3/3/2022	24.56	5,954.29	5.95
Post Survey - Leg 3	3/3/2022	24.67	21,192.19	21.19
Post Survey - Leg 3	3/3/2022	27.54	14,291.16	14.29
Post Survey - Leg 3	3/3/2022	29.07	3,105.40	3.11
Post Survey - Leg 3	3/3/2022	29.20	108.17	0.11
Post Survey - Leg 3	3/3/2022	29.05	59,734.53	59.73
Post Survey - Leg 3	3/3/2022	28.36	23,121.03	23.12
Post Survey - Leg 3	3/3/2022	28.71	2,667.81	2.67
Post Survey - Leg 3	3/3/2022	30.58	15.32	0.02
Post Survey - Leg 3	3/3/2022	29.94	711.83	0.71
Post Survey - Leg 3	3/3/2022	29.49	3,131.96	3.13
Post Survey - Leg 3	3/3/2022	28.50	13,496.06	13.50
Post Survey - Leg 3	3/3/2022	28.55	10,035.22	10.04
Post Survey - Leg 3	3/3/2022	27.30	10,065.23	10.07
Post Survey - Leg 3	3/3/2022	27.92	11,711.95	11.71
Post Survey - Leg 3	3/3/2022	28.58	694.40	0.69
Post Survey - Leg 3	3/3/2022	29.19	293.49	0.29
Post Survey - Leg 3	3/3/2022	27.35	2,359.35	2.36
Post Survey - Leg 3	3/3/2022	26.01	24,611.68	24.61
Post Survey - Leg 3	3/3/2022	26.75	4,533.55	4.53
Post Survey - Leg 3	3/3/2022	25.13	17,761.95	17.76
Post Survey - Leg 3	3/3/2022	25.63	3,706.19	3.71
Post Survey - Leg 3	3/3/2022	25.26	1,079.91	1.08
Post Survey - Leg 3	3/3/2022	28.01	427.69	0.43
Post Survey - Leg 3	3/3/2022	27.59	0.04	0.00
Post Survey - Leg 3	3/3/2022	27.06	11.90	0.01
Post Survey - Leg 3	3/3/2022	25.75	478.05	0.48
Post Survey - Leg 3	3/3/2022	24.56	723.17	0.72
Post Survey - Leg 3	3/3/2022	20.60	2,242.56	2.24
Post Survey - Leg 3	3/3/2022	23.02	604.74	0.60
Post Survey - Leg 3	3/3/2022	20.61	7,285.31	7.29
Post Survey - Leg 3	3/3/2022	10.53	14.71	0.01
Post Survey - Leg 3	3/3/2022	28.92	3,652.10	3.65

Data Collection Period	Date	Mean depth (m)	School biomass (kg)	School biomass (mt)
Post Survey - Leg 3	3/3/2022	28.39	7,185.56	7.19
Post Survey - Leg 3	3/3/2022	28.33	4.79	0.00
Post Survey - Leg 3	3/3/2022	25.78	1,767.94	1.77
Post Survey - Leg 3	3/3/2022	20.50	6,376.42	6.38
Post Survey - Leg 3	3/3/2022	23.36	36,724.80	36.72
Post Survey - Leg 3	3/3/2022	22.98	3,195.59	3.20
Post Survey - Leg 3	3/3/2022	23.64	430.80	0.43
Post Survey - Leg 3	3/3/2022	22.57	5,777.20	5.78
Post Survey - Leg 3	3/3/2022	23.16	5,225.25	5.23
Post Survey - Leg 3	3/3/2022	22.60	2,651.38	2.65
Post Survey - Leg 3	3/3/2022	23.98	2,825.23	2.83
Post Survey - Leg 3	3/3/2022	25.28	351.31	0.35
Post Survey - Leg 3	3/3/2022	27.10	41.91	0.04
Post Survey - Leg 3	3/3/2022	25.73	16,690.06	16.69
Post Survey - Leg 3	3/3/2022	24.31	17,392.12	17.39
Post Survey - Leg 3	3/3/2022	25.93	20,634.05	20.63
Post Survey - Leg 3	3/3/2022	28.82	2,346.98	2.35
Post Survey - Leg 3	3/3/2022	25.33	6,557.40	6.56

Appendix C
2022 Cooperative Winter Atlantic Menhaden Survey
Biomass Estimation Report

2022 Cooperative Winter Atlantic Menhaden Survey

Biomass Estimation Report

Dong Liang

The hydroacoustic survey of Atlantic menhaden in the shelf waters off New Jersey followed a transect design. Six transects were selected using systematic random sampling. Due to the abnormally warm water conditions, possibly related to the disturbance of a storm, the actual survey protocol slightly deviated from the original design. Transects 3 to 6 (“leg 2”) were surveyed 5 days after Transects 1 and 2 (“leg 1”), after the storm, when the water column was warmed possibly due to the storm disturbance. The planned trawling of acoustically identified schools was mostly not possible due to the mobility of the population. We applied alternative biomass estimators to account for the potential changes in detectability in the surveys incurred via a model-based approach.

MATERIALS AND METHODS

Hydrographic data: Hydrographic data were collected using a Hydrolab MS5 multi-sonde at the location of each Atlantic Menhaden school encountered along each transect. Additional readings were made at the start and end of each transect as well as locations 10 km apart within each transect to characterize water conditions across the study area. A profile of depth (m), water temperature (°C), salinity (PSU), and dissolved oxygen concentration (mg/l) was recorded at each location using Hydrolab’s Hydras3 LT software. Data collected by this software were exported to a Geographical Information System and interpolated into a raster estimating the contemporary environmental conditions at the centroid of the schools across the study area using inverse distance weighting. The analysis was conducted in ArcMap 10.8.1.

Species distribution modeling: A species distribution model was developed to estimate the changes in detectability driven by the change in seascape conditions, mainly the temperature changes possibly due to the storm effects. We assumed that differences observed in schooling intensity and average biomass (i.e. detectability of the whole schools) at transects 3-6 (i.e. leg 2 of the survey) were entirely due to temperature changes, and these changes did not reflect the actual changes in the spatial distribution of the population. The model used other environmental predictors and geographical coordinates to capture residual spatial trends in the population distribution.

The species distribution model was formulated hierarchically for both school location and biomass. Each school was represented as a point location at the horizontal centroid of the school location. Given the relatively small size of the school to the entire study area, this approximation should have a limited impact on biomass estimation. Models varied by whether or not certain environmental variables were used as predictors of school location and biomass, and the spatial autocorrelation process within a marked point pattern model (Diggle et al. 2010). The schooling distribution follows a log-Gaussian Cox process while the observed biomass follows a log-Gaussian Geostatistical model. We considered shared spatial random effects between the two

model components to enable joint estimation of the spatial process governing both the schooling density and the biomass (Conn et al. 2017, Pennino et al. 2019).

We initially considered all environmental covariates such as bathymetry, salinity, temperature, and dissolved oxygen. The variance inflation factor was computed to identify multi-collinearity between the environmental covariates (Fox 2015). Models for spatially auto-correlated random effects followed a Matérn covariance function and were implemented via a computationally efficient approximation (Lindgren et al. 2011, Simpson et al. 2016). The Geostatistical model was approximated using the Stochastic Partial Differential Equation approach (Lindgren et al. 2011) and implemented using the Integrated Nested Laplace Approximation method (INLA, Rue et al. 2009). We used marginal log-likelihood, as well as mean square errors (MSE) in school intensity and log biomass preschool to estimate the predictive performance of each model.

Detectability estimation: A relative detectability for the leg 2 sampling after the storm was estimated by first predicting the schooling density and average biomass per school at leg 2 transects, based on a hypothetical temperature distribution that was similar in range to the temperature during the leg 1 sampling, accounting for the temperature-driven differences of detectability. These model-based predictions of school intensity and biomass were then compared with the model predictions based on the actual observed temperature. The additional number of schools as well as the increase in log average biomass were estimated. These estimated impacts of relative detectability were applied to the actual biomass and schooling data and expanded using a design-based or ratio-based estimator to the entire study area (Thompson 2012). The design-based uncertainty for these estimates was also quantified using the standard deviation and the ratio-based estimates methods (Thompson 2012). The model framework is described in Appendix C1.

Although additional data were collected during normal fishing operations (“leg 3”), only data on the first two survey legs were included in the detectability estimation because the detectability during leg 3 after the random survey might be subject to the regular fishing process and therefore might differ systematically from those during the random survey and because schools were detected outside and just south of the pre-defined survey area. Post-survey leg 3 data were assumed to represent an upper limit of the school intensity. The observed intensity at leg 3, along with the total biomass were used to derive a prior for the species distribution model. Since only part of the study area was covered by the survey effort, the estimated average log intensity was adjusted upwards by a factor of the ratio between the total study area and the transect area.

Statistical inference was based on approximated Monte Carlo sampling implemented in INLA. All analyses were conducted in R using packages R-INLA (Rue et al. 2009), terra (Hijmans 2023), and sf (Pebesma 2018). To incorporate the uncertainty of both the design-based estimation and the detectability, the design-based errors were randomly sampled from the model-based adjusted transect-specific biomass. Normal approximation was assumed for the design-based error estimates. A Monte Carlo integration was then applied across the approximate posterior sample of adjusted biomass estimates to derive the 90% credible sets for the biomass (Appendix C1). This was necessary because the model estimates were highly right-skewed and

posterior moments were not robust to outliers and could generate unrealistic uncertainty estimates.

RESULTS

Salinity was associated with the largest variance inflation factor (>10) and removed from further modeling (Fox 2015). Twenty-four models were built using the remaining environmental covariates and spatial random effects. Marginal likelihood was estimated for each model to measure their predictive capability (Table 1). Two models generated extreme marginal log-likelihood. The corresponding residual mean squared errors (RMSE) were large, which indicated numerical issues within INLA. The model with only a fixed effect of temperature and shared spatial random effects between the log intensity and average biomass (Figure 1) was best in terms of marginal likelihood, along with a small residual Mean Square Error (MSE). According to the best-fitting model, the temperature had a statistically significant and negative linear effect on both the schooling intensity and the average log biomass per school (Table 2).

The adjusted temperature in leg 2 (transects 3-6) had a similar range as the observed temperature in leg 1, but still exhibited the spatial pattern of the actual temperature observed during the survey (Figure 2). Large uncertainty exists regarding the temperature effects on detectability (Figure 3), possibly due to the small sample size ($n=23$). More schools on average were expected under the adjusted (and lower) temperature, and larger schools were predicted as well. The relative magnitude of changes in both school intensity and average biomass depends on the assumed changes in the temperature.

Biomass estimates ranged between 8,000 and 11,000 metric tons in the study area (Figure 4, Table 3). Ratio estimates based on the transect area generated 15%-20% lower biomass estimates (Figure 4, Table 3) than the design-based estimates. The design-based estimator expanded to the whole area based on the number of transects, while the ratio estimator expanded based on the ratio of biomass per unit area. The design-based estimator of uncertainty was large because it was based on random sampling, which did not fully incorporate the systematic nature of the sampling. The ratio-based uncertainty estimates were more reasonable. Detectability adjustment led to at most an 18% increase in design-based estimates and a 38% increase in ratio-based estimates.

Eighty schools were observed in a post-survey period leg 3 around an area of 23 km². We assume an upper limit of the school intensity of 3.47 schools km⁻². The total biomass during leg 3 was 1,844 metric tons, which was assumed as the upper limit of the average biomass per school. Incorporating these limits as prior constraints did not significantly change the original biomass estimates (Supplementary Figure 1).

Table 1: Model comparison of the location and biomass of the Atlantic menhaden, based on marginal log-likelihood, mean squared error (MSE) in schooling intensity and log biomass per school. Random effects include separate spatial random effects for schooling and biomass (spatial), or a shared spatial random effect (joint spatial).

Fixed	Random	Marginal loglik	MSE- school intensity	MSE- log(biomass)
wtemp	None	-61.83	42.16	11.13
wtemp	Spatial	-58.18	30.12	11.08
wtemp	Joint Spatial	-53.48	27.20	9.90
wtemp+oxygen	None	-66.70	42.15	11.43
wtemp+oxygen	Spatial	617.93	>1,000	11.41
wtemp+oxygen	Joint Spatial	-58.26	>1,000	>100
wtemp+bathy	None	-72.76	41.95	11.12
wtemp+bathy	Spatial	-65.81	33.38	11.09
wtemp+bathy	Joint Spatial	-63.87	>1,000	>100
wtemp+bathy+oxygen	None	-77.65	41.98	11.43
wtemp+bathy+oxygen	Spatial	-66.59	60.03	11.39
wtemp+bathy+oxygen	Joint Spatial	-2418.28	20.08	12.13
None	None	-74.39	42.68	14.20
None	Spatial	-62.26	36.40	14.12
None	Joint Spatial	-56.23	34.78	11.91
oxygen	None	-69.98	42.41	14.05
oxygen	Spatial	-61.25	34.22	13.98
oxygen	Joint Spatial	-56.69	33.29	12.30
bathy	None	-82.75	42.57	14.15
bathy	Spatial	-74.09	36.57	14.12
bathy	Joint Spatial	-67.62	>1,000	11.96
bathy+oxygen	None	-81.36	42.42	14.06
bathy+oxygen	Spatial	-73.43	>1,000	13.99
bathy+oxygen	Joint Spatial	-65.80	43.09	14.07

Table 2: Coefficient estimates (posterior median, and limits of the 95% credible sets) of the selected model with respect to the log intensity of the school locations (Intensity) and the average biomass (Biomass). Wtemp denotes water temperature.

Model	Parameter	Estimate	Lower	Upper
Intensity	Intercept	25.67	9.64	46.42
	wtemp	-4.63	-8.27	-1.84
Biomass	Intercept	42.92	12.50	72.12
	wtemp	-6.98	-12.29	-1.45

Table 3: Biomass estimates (metric tons) in terms of posterior median and 90% credit sets according to detectability adjustment and expansion estimators.

Detectability Adjustment	Design-based			Ratio-estimate		
	Estimate	Lower	Upper	Estimate	Lower	Upper
No adjustment	9,460	0	25,065	7,963	5,902	10,024
Adjusted school number	10,042	0	23,422	8,196	6,410	10,432
Adjusted school size	10,076	0	23,441	8,312	6,505	11,434
Adjusted size and number	11,005	0	27,441	8,706	6,703	19,137

Figure 1: The fitted spatial random effects from the selected model, overlaid with school locations as circles and survey transects as lines. Color boundary denotes the study area (with geographic coordinates re-scaled to avoid numerical issues).

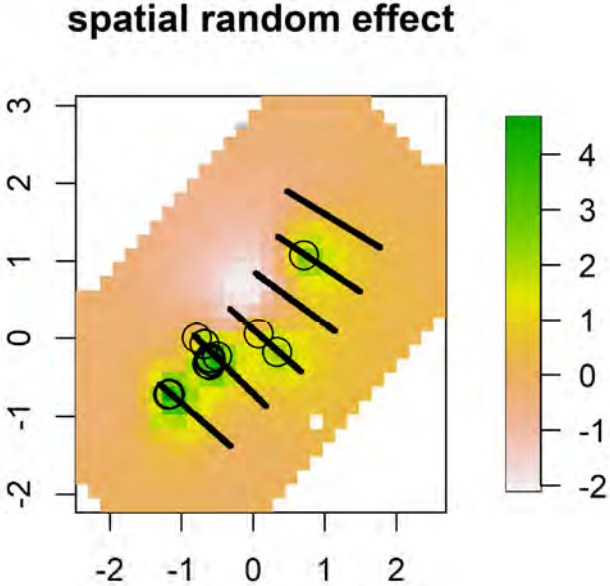


Figure 2: Interpolated water temperature contemporary to the survey in the study area, along with the hypothetical water temperature when the northern areas (leg 2, transects 3-6) were adjusted to maintain the same range as the southern part (leg 1, transects 1-2).

Observed

Hypothetical

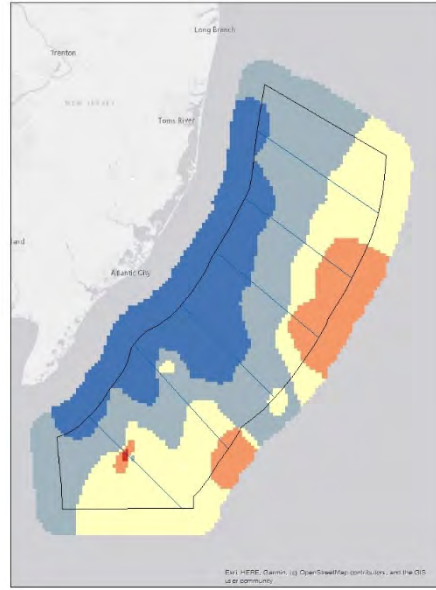
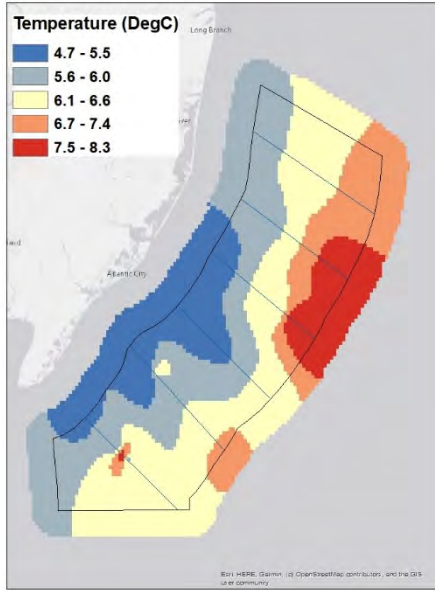


Figure 3: Estimates of temperature effects on (a) school intensity measured as the expected additional number of schools on each transect; and (b) the average biomass per school observed and after the hypothetical temperature change.

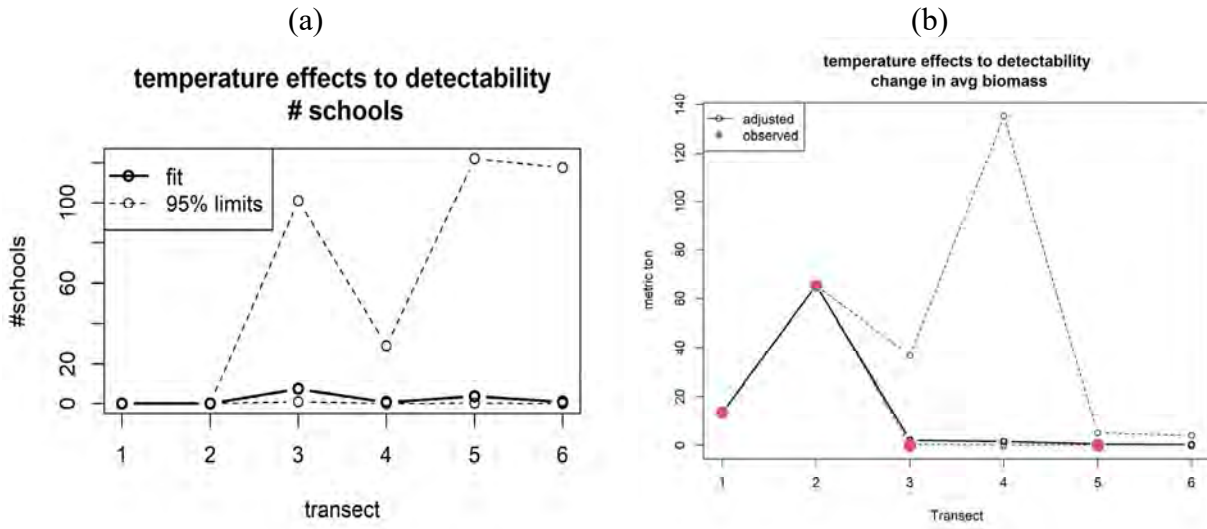
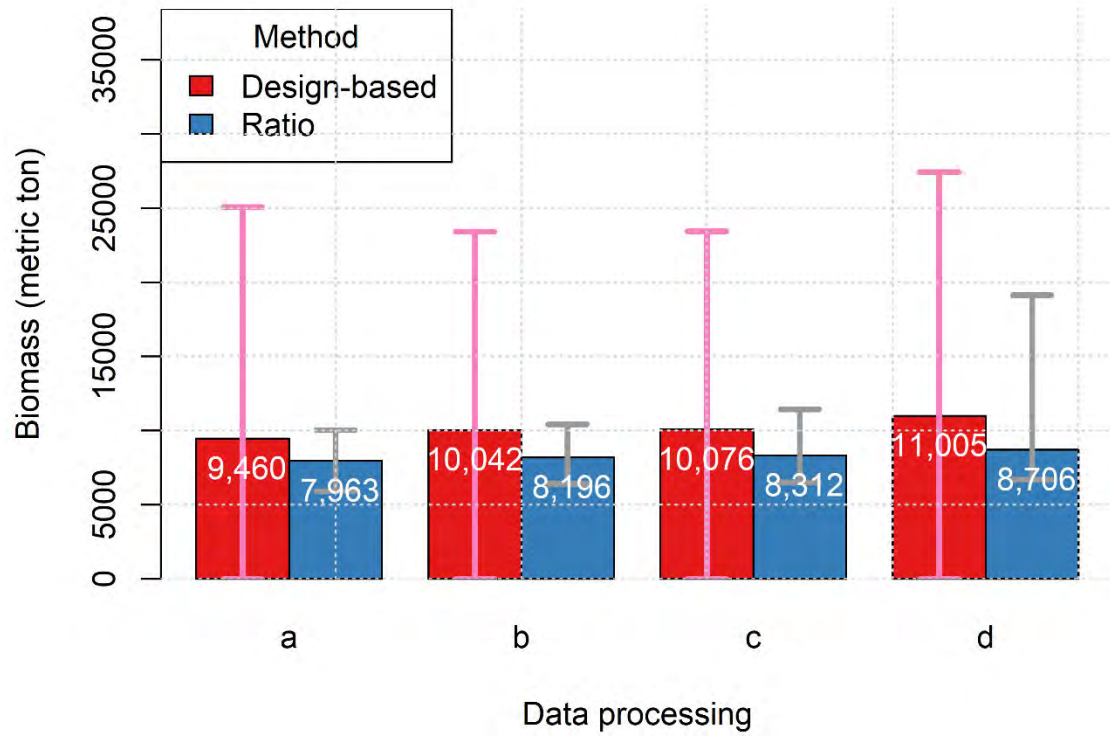
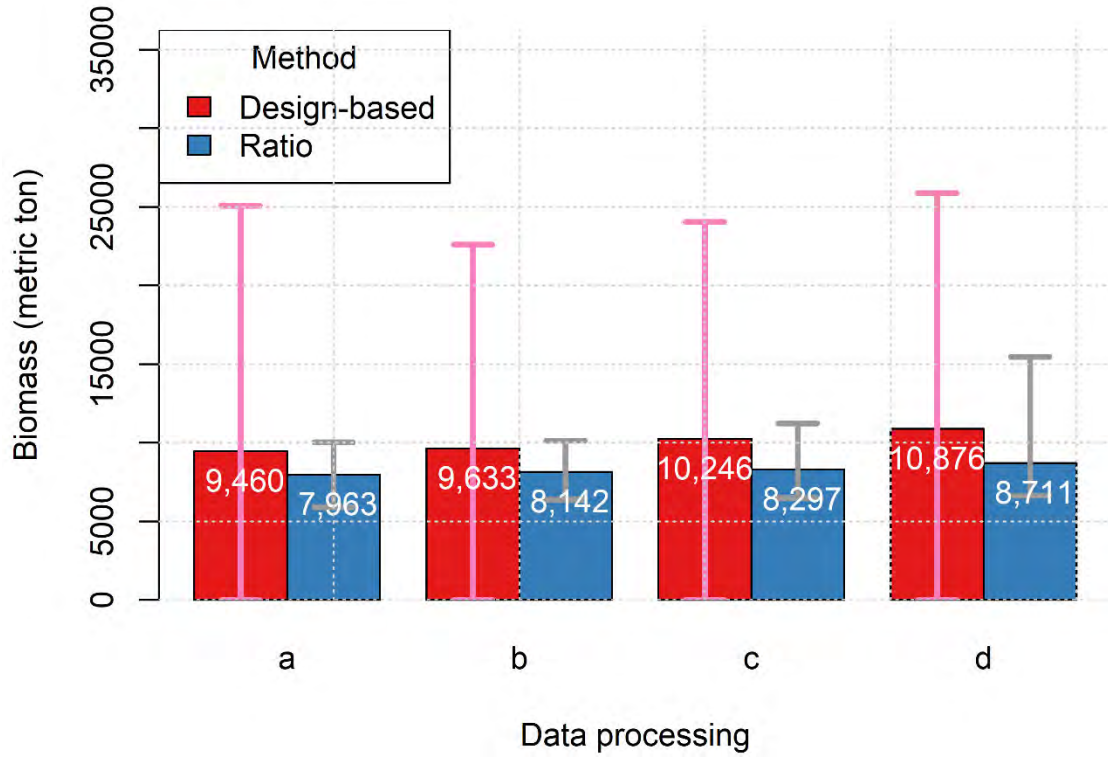


Figure 4: Biomass estimates (metric tons) in terms of posterior median and 90% credit sets according to expansion estimators and detectability adjustment: a) no adjustment, b-d) temperature adjustment to school intensity (b), average biomass (c), and both (d).



Supplementary Figure 1: Biomass estimates (metric tons) in terms of posterior median and 90% credit sets according to expansion estimators and detectability adjustment: a) no adjustment, b-d) temperature adjustment to school intensity (b), average biomass (c), and both (d). Prior constraints were set based on the observed schooling intensity and biomass.



LITERATURE CITED

- Conn, P.B., Thorson, J.T. and Johnson, D.S. (2017) Confronting preferential sampling when analysing population distributions: diagnosis and model-based triage. *Methods in Ecology and Evolution* 8(11), 1535-1546.
- Diggle, P.J., Menezes, R. and Su, T.-I. (2010) Geostatistical inference under preferential sampling. *Journal of the Royal Statistical Society Series C: Applied Statistics* 59(2), 191-232.
- Fox, J. (2015) *Applied regression analysis and generalized linear models*, Sage Publications.
- Hijmans, R.J. (2023) *terra: Spatial Data Analysis*, CRAN, Vienna, Austria.
- Lindgren, F., Rue, H. and Lindström, J. (2011) An explicit link between Gaussian fields and Gaussian Markov random fields: the stochastic partial differential equation approach. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 73(4), 423-498.
- Pebesma, E.J. (2018) Simple features for R: standardized support for spatial vector data. *R Journal* 10(1), 439.
- Pennino, M.G., Paradinas, I., Illian, J.B., Muñoz, F., Bellido, J.M., López-Quílez, A. and Conesa, D. (2019) Accounting for preferential sampling in species distribution models. *Ecology and evolution* 9(1), 653-663.
- Rue, H., Martino, S. and Chopin, N. (2009) Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations. *Journal of the Royal Statistical Society Series B: Statistical Methodology* 71(2), 319-392.
- Simpson, D., Illian, J.B., Lindgren, F., Sørbye, S.H. and Rue, H. (2016) Going off grid: Computationally efficient inference for log-Gaussian Cox processes. *Biometrika* 103(1), 49-70.
- Thompson, S.K. (2012) *Sampling*, John Wiley & Sons.

Appendix C1. Detectability adjustment framework

Model Framework: For each cell denoted by i , let $y_i \sim \text{GPPP}(\lambda_i, \theta_i)$ denote a Geostatistical point pattern process (GPPP) model with λ_i the school per unit area (i.e. intensity) and θ_i the log biomass per school. We adopt the following log-linear models of the intensity and average biomass:

$$l_i = \log(\lambda_i) = \beta_0 + \beta_1 x_i + b_i, \text{ and } \theta_i = \gamma_0 + \gamma_1 x_i + \beta b_i \quad (1)$$

The coefficients β_0 and β_1 denote the association between temperature x and intensity, the coefficients γ_0 and γ_1 denote the association between temperature and average biomass, and the random effect b denotes the residual spatial pattern in species distribution. The random effect was shared between the log intensity and log biomass model, with β a scaling parameter linking log intensity and log average biomass. We adopted a Stochastic Partial Differential Equation field on the spatial random effects b_i , with a prior constructed to penalize the complexity of the random field (Fuglstad et al. 2019).

Define x_i^* a novel temperature over which the detectability was estimated. According to model (1)

$$l_i^* = \log(\lambda_i^*) = \beta_0 + \beta_1 x_i^* + b_i, \quad \theta_i^* = \gamma_0 + \gamma_1 x_i^* + \beta b_i \quad (2)$$

Thus the change in the average number of schools per unit area can be estimated as follows.

$$d_i = \exp\{\beta_0 + \beta_1 x_i^* + b_i\} - \exp\{\beta_0 + \beta_1 x_i + b_i\} \quad (3)$$

The change in average biomass per unit area can be estimated as

$$b_i = \exp(l_i^*) \exp(\theta_i^*) - \exp(l_i) \exp(\theta_i) \quad (4)$$

The changes in schools and biomass for a transect can be aggregated across all the unit areas making up the transect. Let a denote the area for each cell.

$$d = a \sum_{i=1}^n d_i, \quad b = a \sum_{i=1}^n b_i \quad (5)$$

The estimates and their uncertainty can be obtained via Monte Carlo Integration.

Monte Carlo Integration: Monte Carlo integration was used to incorporate both design-based uncertainty corresponding to the expansion estimator (i.e. the uncertainty from sampling of transect around the study area), and the uncertainty corresponding to the detectability adjustment according to the GPPP model above. Let $\{b_m, m = 1, \dots, M\}$ denote an approximate Monte Carlo sample of total biomass from the model (1) above representing the uncertainty of detectability adjustment. Let s denote a design-based estimate of standard deviation, we sampled the adjusted biomass from a conditional Normal distribution.

$$\theta_m \sim [\theta | b = b_m] \sim N(b_m, s) \quad (6)$$

It follows the un-conditional distribution of biomass θ can be obtained by Monte Carlo integration over the samples $\{\theta_m, m = 1, \dots, M\}$.

Appendix C2. Sample analysis R code.

```
rm(list=ls())
## Load packages
library(INLA)
library(terra)
library(rgeos)
library(FNN)
library(sf)
library(ggplot2)
library(foreign)
source("Codes/book_lgcp_geo_2.R")
## parameter: Monte Carlo samples
nMC <- 9999

## data input - UTM
menhaden <- read.dbf("../Data/GIS files/AllSchoolsUpdate.dbf")

## study area
loc1 <- st_read("../Data/GIS files/SurveyAreaUTM.shp")
loc.d.0 <- loc1$geometry[[1]][[1]]
loc.d <- scale(loc.d.0)

## prepare the scale the domain
center_ <- attr(loc.d,"scaled:center")
scale_ <- attr(loc.d,"scaled:scale")

menhaden$POINT_X_2 <- (menhaden$POINT_X-center_[1])/scale_[1]
menhaden$POINT_Y_2 <- (menhaden$POINT_Y-center_[2])/scale_[2]

## subset to legs 1 and 2
menhaden <- subset(menhaden,Survey_Leg<3)

## mesh for the area
mesh <- inla.mesh.2d(loc.domain = loc.d, offset = c(0.25, 0.5),
                    max.edge = c(0.1, 0.2), cutoff = 0.1)

## rescale area to improve numerical stability
source("rscale.R")

wtemp <- rast("../Data/GIS
files/idw_temp_surveyarea_buffered_UTM.tif")
wtemp2 <- rscale(wtemp,center_,scale_)

wtemp.adj <- rast("../Data/GIS
files/idw_temp_surveyarea_buffered_UTM_Adj.tif")
wtemp.adj.2 <- rscale(wtemp.adj,center_,scale_)

covariates <- list(wtemp=wtemp2)
covariates.p <- list(wtemp=wtemp.adj.2)
```

```

## assemble data
xyz <- with(menhaden, cbind(POINT_X_2, POINT_Y_2, log(School_Bio)))

## predictive inference
## survey transects
area <- rast("../Data/GIS files/transectsUTM.tif")
area2 <- rscale(area, center_, scale_)
area_ <- as.points(area)
area_cell <- prod(res(area2))
area_transects <- nrow(area_)*prod(res(area))/1e6 ## in km2
area_study <- 10990.87 ## in km2
#transect area to predict relative detectability
newloc <- data.frame(geom(area_)[,c("x", "y")],
                    transect=as.integer(unlist(area_[[1]]))+1)
newloc[,1] <- (newloc[,1]-center_[1])/scale_[1]
newloc[,2] <- (newloc[,2]-center_[2])/scale_[2]

## align schools to the nearest transect
library(FNN)
school.cell.fnn <- get.knnx(data=newloc[,1:2],
                           query=xyz[,1:2], k=1)
## some schools are far away from the transect
## just assume they are close and aligned with the nearest cell
newloc$n <- 0
table.school <- table(school.cell.fnn$nn.index[,1])
newloc$n[as.integer(names(table.school))] <- as.vector(table.school)

## average biomass per school per cell.
newloc$b <- NA ## no biomass if number of school is zero
biomass.school <- tapply(menhaden$School_Bio,
                        school.cell.fnn$nn.index[,1],
                        mean)
newloc$b[as.integer(names(biomass.school))] <-
as.vector(biomass.school)

## temperature difference at transects
wtemp.adj.2s <- resample(wtemp.adj.2, wtemp2, method="near")
dwtemp0 <- wtemp2-wtemp.adj.2s
dwtemp <- dwtemp0[cellFromXY(dwtemp0, newloc[,1:2])]$lyr.1
## model
res <- book.LGCP.geo(
  xyz=xyz, mesh=mesh, domain=loc.d,
  prior.range=c(2, 0.01), prior.sigma=c(1, 0.01),
  rast=covariates, newrast = covariates,
  newloc = as.matrix(newloc[,1:2]), spde_in = T, copy = T
)
## approximate posterior samples
set.seed(12345)
sam <- inla.posterior.sample(n=nMC, result=res)

```

```

## recover the predicted values
library(stringr)
tmp_ <- str_split(dimnames(sam[[1]]$latent)[[1]],pattern="\\:")
table(sapply(tmp_,function(elmt) elmt[1]))

fitted_index <- grep("Predictor",dimnames(sam[[1]]$latent)[[1]])
## environmental impacts to intensity

## adjust the intensity according the survey area
log_area_ratio <- log(area_study/area_transects)

## total number of schools
nschool <- tapply(newloc$n,newloc$transect,sum)

## additional schools expected on each transect
dhat <- sapply(sam,function(elmt){
  ## current log lambda
  li <- elmt$latent[fitted_index,1][res$DLindPred$pp]
  ## adjusted for survey area
  li.area <- li+log_area_ratio
  ## changed log lambda
  li.area.star <- li.area+elmt$latent[,1][ "wtemp.pp:1" ]*(-1*dwtemp)
  ## changed in lambda
  di <- exp(li.area.star)-exp(li.area)
  ## changed school expected per transect
  tapply(di*area_cell,newloc[, "transect" ],sum)
})

## additional biomass expected per transect
bhat.lst <- lapply(sam,function(elmt){
  ## current log lambda
  li <- elmt$latent[fitted_index,1][res$DLindPred$pp]
  ## adjusted for survey area
  li.area <- li+log_area_ratio
  ## changed log lambda
  li.area.star <- li.area+elmt$latent[,1][ "wtemp.pp:1" ]*(-1*dwtemp)
  ## current log avg biomass
  mi <- elmt$latent[fitted_index,1][res$DLindPred$resp]
  ## changed log avg biomass
  mi.star <- mi+elmt$latent["wtemp.y:1",1]*(-1*dwtemp)
  ## change in biomass:
  ### only change in lambda
  delta1 <- area_cell*(exp(li.area.star)-exp(li.area))*exp(mi)
  ### only change in avg biomass
  delta2 <- area_cell*exp(li.area)*(exp(mi.star)-exp(mi))
  ## changes in lambda and avg biomass
  delta3 <- area_cell*(exp(li.area.star+mi.star)-exp(li.area+mi))
  ## aggregate over transects
  cbind(
    tapply(delta1,newloc$transect,sum),
    tapply(delta2,newloc$transect,sum),
    tapply(delta3,newloc$transect,sum)
  )
})

```

```

    )
  })
  ## total biomass before the adjustment
  y2 <- with(newloc,tapply(n*b,transect,sum,na.rm=T))
  id <- as.integer(names(y2))
  # Design based----
  ## Design based estimates of total biomass
  frame <- st_read("../Data/GIS files/SurveyAreaUTMLine.shp")

  source(file="R/sys_utils_3.R")
  Y0 <- esys(s=id,id=frame$Id,y=y2/1e3) ## mt
  R0 <- esys.ratio(s=id,id = frame$Id,y = y2/1e3,w = frame$Area)
  ## extract total biomass estimates Monte Caro
  model_est <- function(col,b0,ratio=F){
    ##col: column from the bhat.lst entries
    ##    indicating scenario of modeling
    ## ratio: whether to conduct ratio estimation
    lst <- lapply(bhat.lst,function(entry){entry[,col]})
    if(ratio){
      bio <- sapply(lst,function(delta){
        esys.ratio(s=id,id=frame$Id,y=(b0+delta)/1e3,w=frame$Area)
      })
    }else{
      bio <- sapply(lst,function(delta){
        esys(s=id,id=frame$Id,y=(b0+delta)/1e3)
      })
    }
    t(bio)
  }
  ## only change in lambda
  bio1 <- model_est(1,y2,ratio=F)
  bio1r <- model_est(1,y2,ratio=T)

  ## only change in avg biomass
  bio2 <- model_est(2,y2,ratio = F)
  bio2r <- model_est(2,y2,ratio = T)

  ## changes in both
  bio3 <- model_est(3,y2,ratio=F)
  bio3r <- model_est(3,y2,ratio = T)
  ## Monte carlo integartion estimates of biomass
  ## estimate, standard error and components of the variance
  mc_integ <- function(bio,alpha=0.10){
    ## assume Normal distribution given biomass
    ## adjustment
    err <- rnorm(nrow(bio),sd=bio[,2])

    bio.design <- bio[,1]+err
    lwr2 <- quantile(bio.design,prob=alpha/2)
    fit2 <- quantile(bio.design,prob=0.5)
    upr2 <- quantile(bio.design,prob=1-alpha/2)
  }

```

```
    c(fit=fit2,lwr=lwr2,upr=upr2)
  }
set.seed(123456)
## Adjusted for intensity ----
Y1 <- mc_integ(bio1)
R1 <- mc_integ(bio1r)

## Adjusted for biomass ----
Y2 <- mc_integ(bio2)
R2 <- mc_integ(bio2r)

## Adjusted for intensity and biomass ----
Y3 <- mc_integ(bio3)
R3 <- mc_integ(bio3r)
```

LITERATURE CITED

Fuglstad, G.-A., Simpson, D., Lindgren, F. and Rue, H. (2019) Constructing priors that penalize the complexity of Gaussian random fields. *Journal of the American Statistical Association* 114(525), 445-452.

Appendix D

**2022 Cooperative Atlantic Menhaden Winter Survey
Ageing Exchange Report**

**2022 Cooperative Atlantic Menhaden Winter Survey
Ageing Exchange Report**

**Prepared for the ASMFC Atlantic Menhaden Ageing Workshop
November 14-15, 2023**

Ageing Team

Jameson Gregg - Virginia Institute of Marine Science

Jamie Darrow - New Jersey Department of Environmental Protection

Amanda Rezek - NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory

Principal Investigator

Geneviève Nesslage (UMCES Chesapeake Biological Laboratory)

Co-Principal Investigators

James Gartland & Robert Latour (Virginia Institute of Marine Science)

Christopher Gurshin (Normandeau Associates, Inc.)

Dong Liang (UMCES Chesapeake Biological Laboratory)

Industry Collaborators

Stefan Axelsson & Leif Axelsson (H&L Axelsson Inc.)

Wayne Reichle & Jeff Kaelin (Lund's Fisheries, Inc.)

Field Team

Chief Scientist - Dustin Gregg (Virginia Institute of Marine Science)

Survey Team - Charlie Jordan, Matt Farnham, and Chris Bonzek (Virginia Institute of Marine Science)

Federal & State Partners

Michael Jech (NOAA Fisheries Northeast Fisheries Science Center)

Ray Mroch (NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory)

Jeffrey Brust (New Jersey Department of Environmental Protection)

INTRODUCTION

Atlantic menhaden (*Brevoortia tyrannus*) supports the largest commercial fishery by volume on the U.S. East Coast (NMFS 2022). Management of Atlantic menhaden is supported by a statistical catch-at-age model that estimates fishing mortality and stock abundance primarily using information on the change in age composition of the stock over time (SEDAR 2020). Thus, accuracy of assessment model estimates relies heavily on accuracy of the ages assigned to fish sampled dockside from the reduction and bait fisheries by NOAA Fisheries and state agencies.

Atlantic menhaden exhibit size-based migration along the East Coast such that larger, older fish are more frequently encountered in the northern portion of their range (SEDAR 2020). Despite

the fact that Atlantic menhaden are thought to reach age-10 (SEDAR 2020), few ageing studies have focused on larger fish found in the northern portion of their range due to the fact that majority of the fishery occurs in the Chesapeake Bay region such that sampling efforts do thoroughly encompass the full extent of the fish's range. Most fishery-independent surveys that collect menhaden scales and otoliths are sampling in the spring to fall in estuarine or nearshore areas where smaller fish are typically encountered. Thus, there has been limited opportunity to study ageing precision for Atlantic menhaden from the northern portion of their range due to relatively low sample size.

A new opportunity to conduct an ageing exchange arose in February-March 2022 when a cooperative acoustic survey of the overwintering resident stock of Atlantic menhaden was conducted offshore of the New Jersey coast to generate estimates of local stock biomass, structure, and habitat use. A subset of schools detected were trawled and Atlantic menhaden samples were collected from each school for laboratory analysis, including the determination of age, size, sex, and maturity. Additional opportunistic samples were collected by the survey team at sea for five days after the survey and at port throughout the remainder of the winter menhaden fishing season.

An ageing exchange of scales and otolith samples was conducted post-survey to quantify ageing uncertainty. The exchange involved project collaborators with ageing programs, namely the Virginia Institute of Marine Science (VIMS), New Jersey Department of Environmental Protection (NJDEP), and the NOAA Fisheries Southeast Fisheries Science Center Beaufort Laboratory (Beaufort). The objectives of this ageing exchange was to:

- 1) quantify intralab and interlab paired age agreement, when possible,
- 2) quantify scale vs otolith paired age agreement, and
- 3) identify patterns, if present, in paired age agreement by sex and size.

Although validated ages were not available to assess accuracy (age estimates compared with true ages), intralab and interlab estimates of precision (repeatability of age estimates by the same or among different readers), and bias (systematic differences in age estimates) can be used to improve ageing methodology, ensure greater consistency among ageing programs, and inform stock assessment uncertainty (Campana et al. 1995, Morison et al. 2005).

METHODS

Data Collection

Biological samples were collected from each trawled school to provide information on school structure. VIMS scientists subsampled the catch from the vessel's net pump using NEFOP's Catch Composition Technique for purse seine and midwater trawl operations. Once the cod end had been brought alongside the vessel, the chief scientist asked the captain for an estimate of pumping time for that haul. The estimated pumping time was divided by 10 to yield the sampling interval (e.g., estimated pumping time = 20 minutes, sampling interval = 2 minutes, yield = 10 baskets of sample). From each basket collected, 3 individual fish received full processing, which included the following elements: fork length (mm), total length (mm), whole weight (g), eviscerated weight (g), macroscopic sex (male/female/unknown), macroscopic maturity stage (immature/mature-resting/ mature-ripe /mature-spent). For female menhaden, both ovaries were removed, weighed, and preserved in Normalin for later reproductive evaluation. A scale patch

(~50 scales) was also collected, stored in labeled vials, and frozen. The head was removed and frozen for later extraction and preparation of both sagittal otoliths for ageing. Once 10 menhaden from each basket had been sampled in this manner, individual length (fork and total) and individual whole weight were recorded for the remaining menhaden specimens.

A total of 2,133 menhaden were sampled for fork length, total length, and whole weight during the survey (Table 1). Of those survey samples, 81 were selected for additional data collection, including sex, maturity, eviscerated weight, and age (both scale- and otolith-based reads). Additional opportunistic samples were collected at sea by the VIMS team during Atlantic menhaden fishing operations for five days after completion of the survey. An additional 155 schools were spotted and 94 schools were ensouled. Two extremely large schools were sampled post-survey, providing an additional 2,016 menhaden size samples (Table 1). Of those samples collected at sea post-survey, 72 were sampled for additional data (10 from each basket), including sex, maturity, eviscerated weight, and age (both scale- and otolith-based reads). Once the VIMS team had returned to land, Lund's Fisheries continued port sampling throughout the remainder of the winter menhaden fishing season, collecting an additional 150 fish at port (three 10-fish samples/trip collected over five additional trips), and all 150 samples received full workups.

Ageing exchange

Sample processing

All samples collected in the field for full workups were first transported to VIMS for processing using standard VIMS survey protocols and procedures. VIMS fish ageing protocols were established from procedures developed by NEFSC, Old Dominion University, and VIMS validated and published research developed by NEFSC, Old Dominion University, and VIMS (Bonzek et al. 2017, VanderKooy 2020). VIMS standard ageing protocols have been verified, collaborated, and referenced annually at the ASMFC Fish Ageing QA/QC Workshop (ASMFC 2023).

Scale samples were thawed and lightly scrubbed in a soap and water solution to remove debris and excess slime. Six of the cleanest, undamaged scales from each scale patch were selected, thoroughly dried, and pressed between two glass microscope slides. Many samples included regenerated scales. When possible, replacement scales were found, but some samples included a few regenerated samples on the slides. One sample (fish Specimen ID #75) contained all regenerated samples with no replacements and was omitted from analysis. Both sagittal otoliths from each sample were extracted, thoroughly dried, and cleaned as necessary.

Ageing Methods

Each ageing lab followed their own standard protocols for ageing Atlantic menhaden as described below. VIMS prepared scale samples and evaluated them using a microfiche reader using VIMS Atlantic menhaden protocols (attached). Paired whole otoliths were evaluated in water under a stereo dissecting microscope at 50x magnification with transmitted light. One reader, Jameson Gregg, read each hard part twice using VIMS protocols for scale (June and Roithmayr 1960) and otolith ageing (Deegan and Thompson 1987, Warlen 1988, Warlen 1992,

Ahrenholz 1994) of menhaden. In cases where the two reads differed, info on size or location and date of capture was used to inform the final age assignment based on expected timing of mark formation. Upon completion, all samples were mailed to NJDEP.

At NJDEP, two readers, Jamie Darrow (Reader 1) and Alissa Wilson (Reader 2), read each hard part once. Beaufort Laboratory ageing protocols were used to age scales and VIMS protocols were used to age otoliths as detailed in the attached protocols. Prepared scale samples were evaluated using a Microfiche reader. Paired whole otoliths were evaluated in water under a stereo dissecting microscope using reflected light. Upon completion, all samples were mailed to Beaufort.

At Beaufort, one reader, Amanda Rezek, read each hard part once. Prepared scale samples were evaluated using a stereo microscope (10X magnification) with transmitted light and cellSens imaging software to measure. Scales were aged using Beaufort Laboratory scale ageing protocols (attached). Paired whole otoliths were evaluated in 70% ethanol under a stereo dissecting microscope (20X magnification) with transmitted light using VIMS ageing protocols. Upon completion, all samples were archived at Beaufort Laboratory for use in future studies.

Statistical Analyses

Of the 303 samples for which full workups were conducted, 302 were suitable for inclusion in the ageing comparison. In the absence of validated ages, ageing agreement was evaluated. For labs that aged each hard part more than once (VIMS and NJDEP), consistency between two reads by the same reader, and among two different readers was quantified. For the two interlab comparisons, the most experienced ager at the NJDEP lab (Darrow – Reader 1) and VIMS’s second read were used.

To quantify ageing agreement within and among ageing labs, the following indices were calculated: percent agreement (PA), average percent error (APE), and Chang's average coefficient of variation (ACV). To evaluate bias within and among ageing labs, the following tests of symmetry were conducted: McNemar’s (McNemar; McNemar 1947) and Evans & Hoenig (EvansHoenig; Evans and Hoenig 1998). Although frequently used in other ageing studies, Bowker's test of symmetry (Bowker 1948) was not used here given the overall large number of samples, high variability in age reads, and pattern of decreasing sample size with age would likely generate false positives indicating bias when it is not actually present (Nesslage et al. 2022). Age-bias plots were generated for each comparison and for each comparison with results separated by the sex of each sample. All indices were calculated and tests of symmetry performed using the FSA package (Ogle DH 2023) for R Version 0.9.4 (R Core Team 2023).

RESULTS

Intralab precision was high for VIMS and low for NJDEP. VIMS demonstrated high agreement among reads (Table 2, Fig. 1) for both scales (PA=89%) and otoliths (PA=92%), although scale-based reads were slightly biased such that second reads of scales tended to be older than first reads. Agreement between the two NJDEP readers was low for otoliths (PA=36%), and very low for scales (PA=2%; Table 2, Fig. 2); both sets of intralab NJDEP age comparisons demonstrated significant bias.

Among labs, there was greater agreement in paired ages between VIMS and Beaufort (Fig. 3) for both scales (PA=66%) and otoliths (PA=59%) than between VIMS and NJDEP (Fig. 4) or between Beaufort and NJDEP (Fig. 5), which ranged in PA from 36-48% (Table 2). VIMS Read 2 age determinations were consistently older than that of Beaufort's for younger fish and vice versa for older fish. Although ACV for otolith-based age comparisons between VIMS Read 2 and Beaufort was greater than seven, the overall difference among reads was statistically unbiased (Fig. 3). NJDEP Reader 1 age determinations were typically older than that of VIMS Read 2 and Beaufort regardless of hard part examined (Figs. 4-5).

VIMS demonstrated good agreement between paired scale and otolith ages (PA=82%). Paired age agreement between hard parts was lower for Beaufort (54%) and NJDEP (PA=41%). Scale-otolith comparisons for both VIMS and NJDEP were biased, but Beaufort was not. When comparing scale- vs otolith-based age determinations, all three labs demonstrated a pattern of assigning an older age to younger fish and a younger age to older fish when aging scales.

Overall, evaluation of paired age agreement by sex did not reveal significant differences potentially due to sexually dimorphic growth (Figs. 7-12). Although sample size was low at older ages, VIMS and Beaufort ages agreed more closely for female than male samples (Fig. 9).

DISCUSSION

This ageing exchange study was novel in several ways. First, this was one of the largest interlab Atlantic menhaden ageing exchange study to date (302 paired scales and otoliths), and this was the only ageing study focused solely on Atlantic menhaden samples collected during a season (winter) and region (offshore NJ) that is sparsely sampled. Previous interlab ageing exchanges focused primarily on port samples collected from the large reduction fishery in Reedville, VA, with no samples examined from January or February (ASMFC 2015). Fish encountered in the 2022 winter cooperative survey were on average larger in size than what is typically encountered in the reduction fishery port samples or inshore state surveys (Table 3, Fig. 13). The only comparable samples aged on a regular basis are the winter bait fishery port samples collected annually. Thus, some of the agers in this study may have been unaccustomed to ageing overwintering adult Atlantic menhaden collected early in the year.

Another way in which this Atlantic menhaden ageing study differed from previous ageing exchanges is that it included a scale vs otolith paired age comparison. Most ageing of Atlantic menhaden is conducted using scales through the extensive reduction and bait fishery menhaden ageing program at the Beaufort Lab spanning 1955 to the present (Chester and Waters 1985, Smith 1991). Yet, previous comparisons of Atlantic menhaden scale vs whole otoliths age determinations at the Beaufort Laboratory resulted in low APE (4.2%; Wilburn et al. unpublished). VIMS regularly ages Atlantic menhaden with otoliths as part of their multispecies monitoring program (NEAMAP and ChesMMAP surveys), which may explain the good agreement between scales and otoliths for that lab. We reiterate the 2015 exchange workshop recommendation that an ageing validation study comparing scales and otolith across all ages using radio isotope analysis of archived scales would be extremely valuable. When possible, paired scales and otoliths should be collected across the stock's range to support this type of

research.

In this study, the same person aged each hard part twice at VIMS, allowing for comparison with a previous intralab ageing study conducted in 2009 at Beaufort (SEDAR 2015). In the 2009 study, in a total of 3,711 Atlantic menhaden scales collected in 2008 were re-aged by the lab's one menhaden ager at the time, Ethel Hall. Agreement among paired scale ages by the same reader at Beaufort was approximately 80%, and thus was similar to that of VIMS in this study (89%; Table 2). The 2009 Beaufort study found that precision varied with age such that precision was relatively high for age-0s (95.2%), age-1s (74.5%), age-2s (87.0%), and age-3s (74.4%), but declined to 51.9% for age-4 and 19.1% for age-5 fish. When ages determinations disagreed, most disagreements were within one year for age-1 through age-3, but discrepancies increased with age. In contrast, VIMS scale read comparisons did not demonstrate such a steep a decline in precision above age-3.

Interlab agreement among the VIMS, NJDEP, and Beaufort ageing labs in this study was much lower than that of the 2015 Atlantic Menhaden scale ageing exchange (ASMFC 2015). In the 2015 study, scale age agreement was >80% among all three labs compared with percent agreement in this study which ranged from 36%-66% (Table 2). Similarly, ACV was low among the three labs in the 2015 study, but consistently exceeded the threshold of 7 in this study (range 7.8-14.97). Systematic differences among labs were also identified in this study with the high proportion of significant tests of symmetry for interlab comparisons vs the lack of bias evident in the previous ageing exchange. Lack of agreement among labs in this study may be due to the focus on larger, older fish, the early time of year during which samples collected, and the quality of the samples collected given the gear used.

CONCLUSIONS

TBD – after discussion post-workshop.

ACKNOWLEDGEMENTS

This study was a collaboration between fishing industry members and federal, state, private, and academic scientists funded by the Saltonstall-Kennedy Program award NOAA Grant NA20NMF4270163. Additional support for survey operations was provided by the Atlantic States Marine Fisheries Commission.

REFERENCES

- Ahrenholz, D. 1994. Confidence of otolith ageing through the juvenile stage for Atlantic menhaden (*Brevoortia tyrannus*). *Fishery Bull.* **93**:209-216.
- ASMFC. 2015. Atlantic Menhaden Ageing Workshop Report. ASMFC, Arlington, VA.
- ASMFC. 2023. Report of the Quality Assurance/Quality Control Fish Ageing Workshop St. Petersburg, Florida March 7-9, 2023. Arlington, VA.
- Bonzek, C. F., J. Gartland, D. J. Gauthier, and R. J. Latour. 2017. Northeast Area Monitoring and Assessment Program (NEAMAP) 2016 data collection and analysis in support of single and multispecies stock assessments in the Mid-Atlantic: Northeast Area Monitoring and Assessment Program Near Shore Trawl Survey. Virginia Institute of Marine Science, William & Mary. <https://doi.org/10.25773/7206-KM61>.
- Bowker, A. H. 1948. A test for symmetry in contingency tables. *Journal of the American*

- statistical Association **43**:572-574.
- Campana, S. E., M. C. Annand, and J. I. McMillan. 1995. Graphical and statistical methods for determining the consistency of age determinations. *Transactions of the American Fisheries Society* **124**:131-138.
- Chester, A. J., and J. R. Waters. 1985. Two-Stage Sampling for Age Distribution in the Atlantic Menhaden Fishery, with Comments on Optimal Survey Design. *North American Journal of Fisheries Management* **5**:449-456.
- Deegan, L. A., and B. A. Thompson. 1987. Growth Rate and Life History Events of Young-of-the-Year Gulf Menhaden as Determined from Otoliths. *Transactions of the American Fisheries Society* **116**:663-667.
- Evans, G. T., and J. M. Hoenig. 1998. Testing and viewing symmetry in contingency tables, with application to readers of fish ages. *Biometrics*:620-629.
- June, F. C., and C. M. Roithmayr. 1960. Determining age of Atlantic menhaden from their scales. US Fish and Wildlife Service.
- McNemar, Q. 1947. Note on the sampling error of the difference between correlated proportions or percentages. *Psychometrika* **12**:153-157.
- Morison, A., J. Burnett, W. McCurdy, and E. Moksness. 2005. Quality issues in the use of otoliths for fish age estimation. *Marine and Freshwater Research* **56**:773-782.
- Nesslage, G., A. M. Schueller, A. R. Rezek, and R. M. Mroch III. 2022. Influence of sample size and number of age classes on characterization of ageing error in paired-age comparisons. *Fisheries Research* **249**:106255.
- NMFS. 2022. Fisheries of the United States, 2020. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2020 Available at: <https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states>.
- Ogle DH, D. J., Wheeler AP, Dinno A 2023. FSA: Simple Fisheries Stock Assessment Methods. R package version 0.9.5, <https://fishr-core-team.github.io/FSA/>.
- R Core Team. 2023. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- SEDAR. 2020. SEDAR 69 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 691 pp. available online at: <http://sedarweb.org/sedar-69>. North Charleston, SC
- Smith, J. W. 1991. The Atlantic and gulf menhaden purse seine fisheries: Origins, Harvesting technologies, biostatistical monitoring, recent trends in fisheries statistics, and forecasting. *Marine Fisheries Review* **53**:28-41.
- VanderKooy, S. 2020. A practical handbook for determining the ages of Gulf of Mexico and Atlantic coast fishes. Gulf States Marine Fisheries Commission: Ocean Springs, MS, USA.
- Warlen, S. M. 1988. Age and growth of larval gulf menhaden, *Brevoortia patronus*, in the northern Gulf of Mexico. *Fishery Bulletin* **86**:77-90.
- Warlen, S. M. 1992. Age, Growth, and Size Distribution of Larval Atlantic Menhaden off North Carolina. *Transactions of the American Fisheries Society* **121**:588-598.

TABLES

Table 1. Schools sampled and samples collected pre- and post-survey at sea and at port.

	Schools sampled	Fish sampled: fork length, total length, whole weight	Full workups: sex, maturity, eviscerated weight, age (scale & otolith)
Survey (at sea)	5	2,133	81
Post-survey (at sea)	2	2,016	72
Post-survey (port)	-	150	150
Total		4,299	303

Table 2. Ageing comparison indices of agreement and tests of symmetry. R=Read (VIMS) or Reader (NJDEP), PA= percent agreement, APE = average percent error, ACV = Average Coefficient of Variation, McNemar = p-value for McNemar’s test of symmetry, EvansHoenig = p-value for Evans and Hoenig test of symmetry. Gray shading indicates either ACV > 7 (indicating low precision), or test of symmetry p-value was significant ($\alpha = 0.05$; indicating bias).

Lab	Hard Part	Comparison	PA	APE	ACV	McNemar	EvansHoenig
VIMS	Scales	R1 vs R2	89%	1.64	2.32	0.00026	0.00026
NJDEP	Scales	R1 vs R2	2%	42.61	60.26	0.00000	0.00000
Interlab	Scales	VIMS R2 vs NJDEP R1	44%	8.27	11.70	0.00000	0.00000
Interlab	Scales	Beafort vs VIMS R2	66%	5.52	7.80	0.00013	0.00058
Interlab	Scales	Beafort vs NJDEP R1	36%	10.59	14.97	0.00000	0.00000
VIMS	Otoliths	R1 vs R2	92%	1.32	1.87	0.41422	0.68321
NJDEP	Otoliths	R1 vs R2	36%	12.03	17.02	0.00000	0.00000
Interlab	Otoliths	VIMS R2 vs NJDEP R1	48%	8.72	12.34	0.00000	0.00000
Interlab	Otoliths	Beafort vs VIMS R2	59%	6.64	9.38	0.08897	0.17260
Interlab	Otoliths	Beafort vs NJDEP R1	45%	9.47	13.40	0.00000	0.00000
VIMS	Both	R2 Scales vs Otoliths	82%	2.72	3.85	0.00000	0.00000
NJDEP	Both	R1 Scales vs Otoliths	41%	9.04	12.78	0.00097	0.00182
Beaufort	Both	Scales vs Otoliths	54%	8.00	11.32	0.16339	0.44192

FIGURES

Figure 1. Paired age comparisons among reads by the same reader at VIMS for scales (top) and otoliths (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red indicates the difference among reads is significantly different from 0.

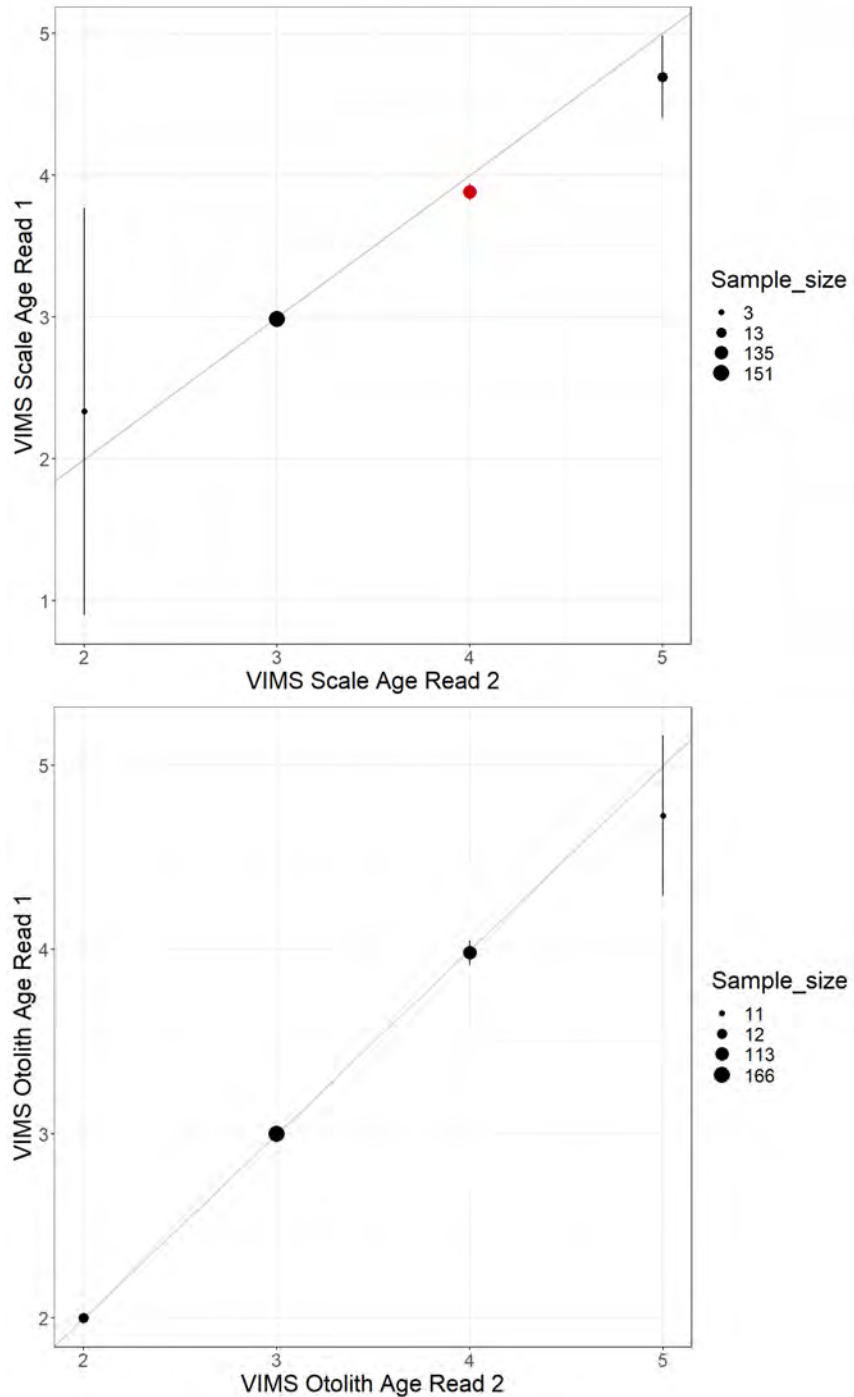


Figure 2. Paired age comparisons among NJDEP readers for scales (top) and otoliths (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red dots indicate the difference among reads is significantly different from 0.

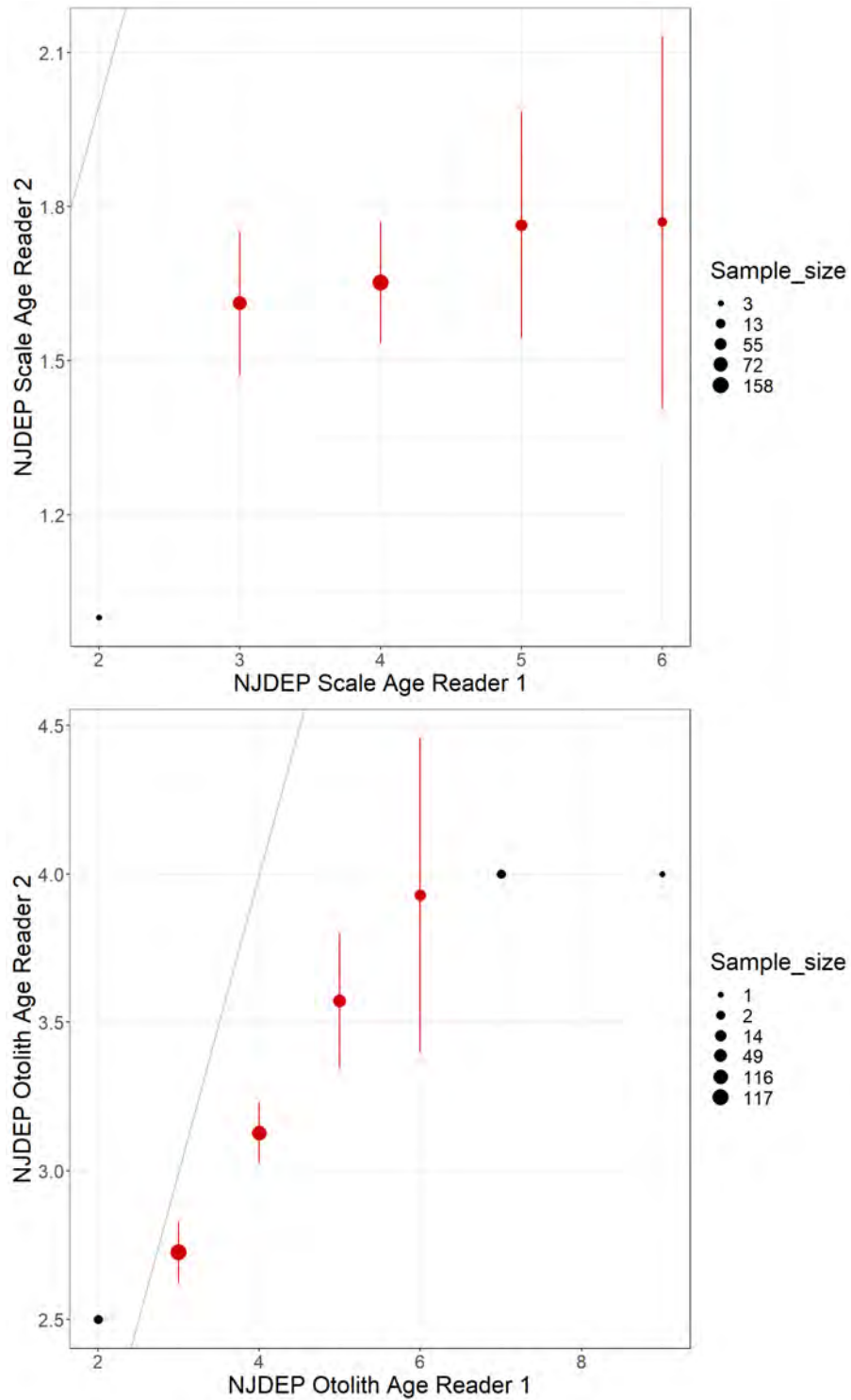


Figure 3. Paired age comparisons between Beaufort and VIMS Read 2 for scales (top) and otoliths (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red dots indicate the difference among reads is significantly different from 0.

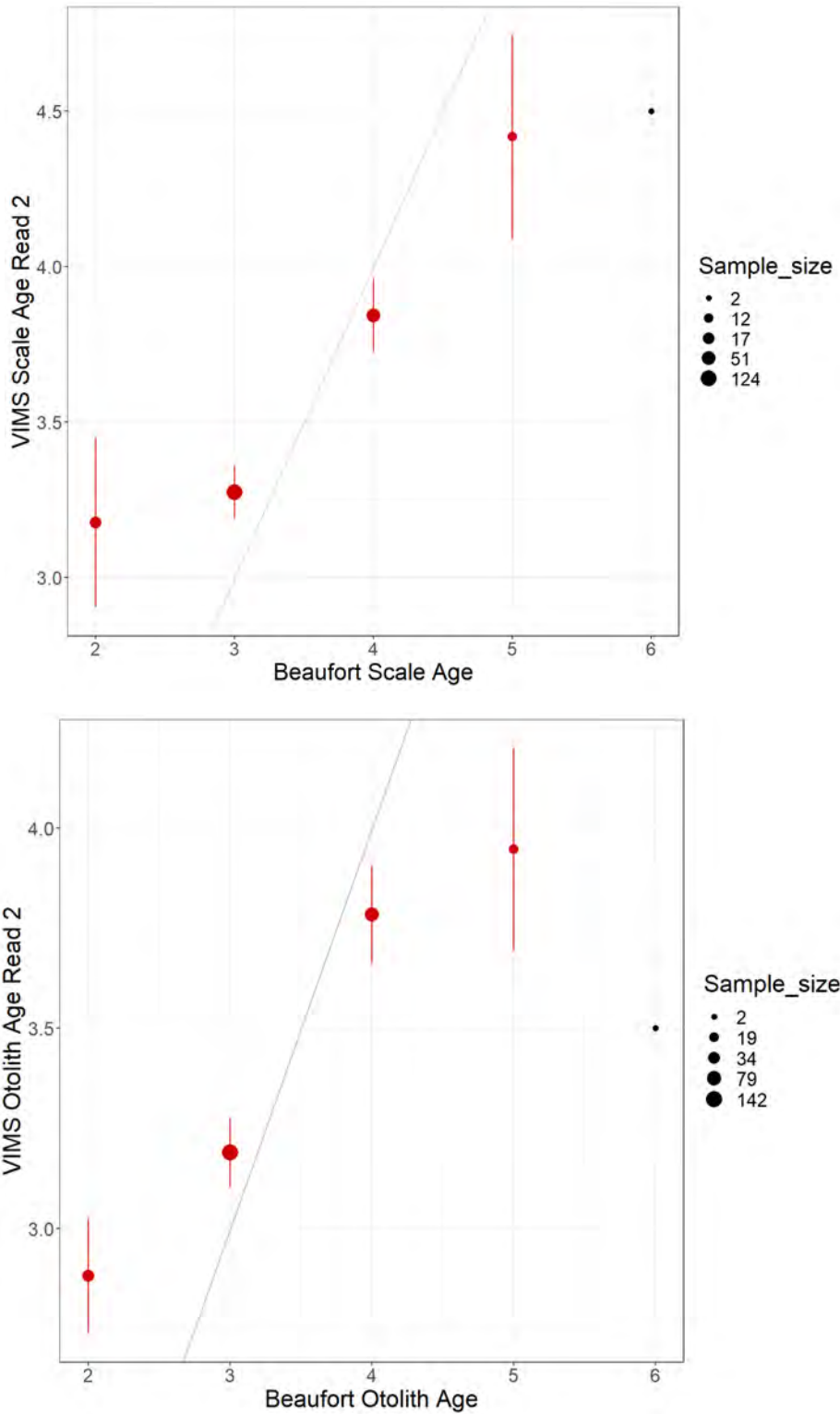


Figure 4. Paired age comparisons between VIMS Read 2 and NJDEP Reader 1 for scales (top) and otoliths (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red dots indicate the difference among reads is significantly different from 0.

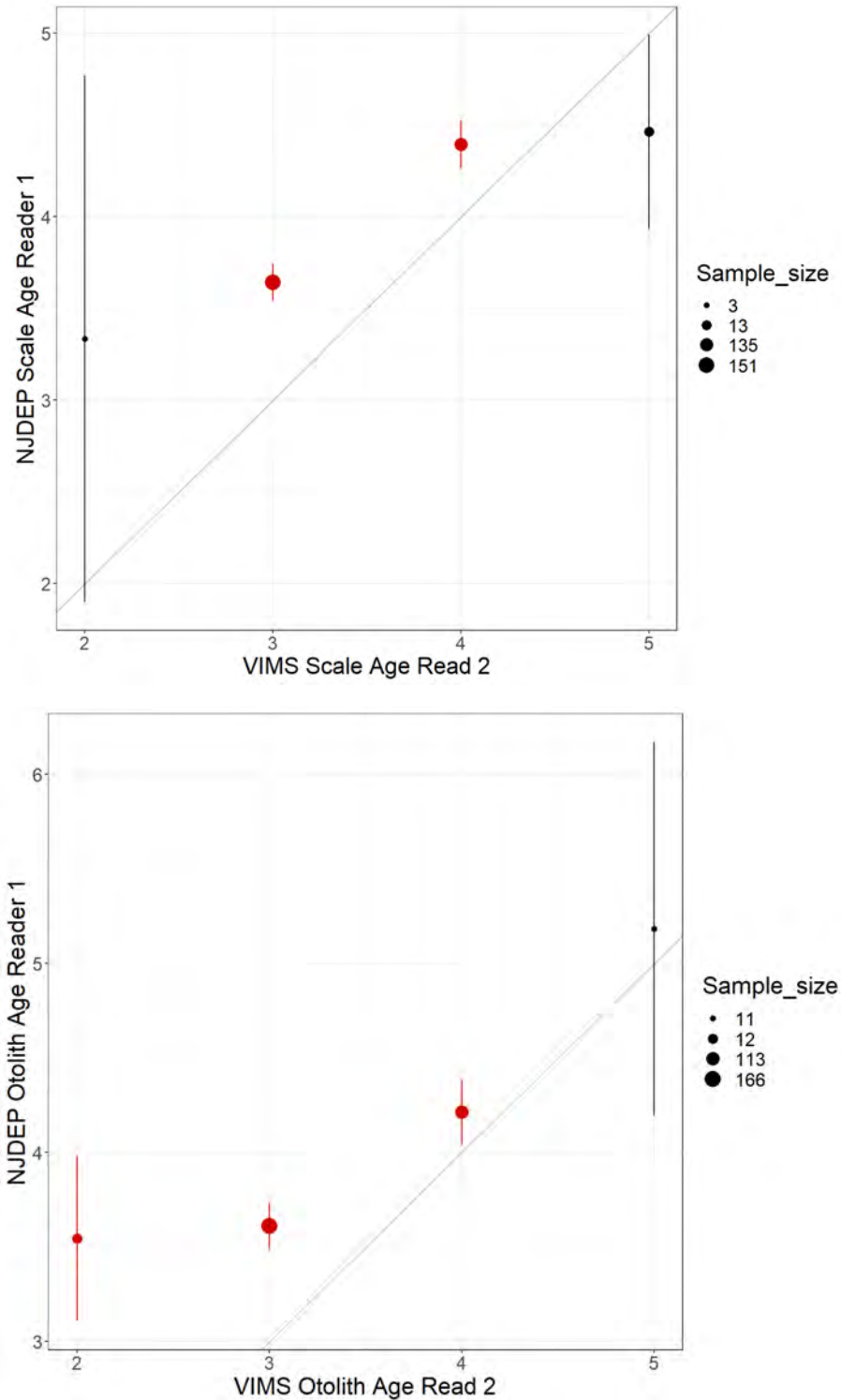


Figure 5. Paired age comparisons between Beaufort and NJDEP Reader 1 for scales (top) and otoliths (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red dots indicate the difference among reads is significantly different from 0.

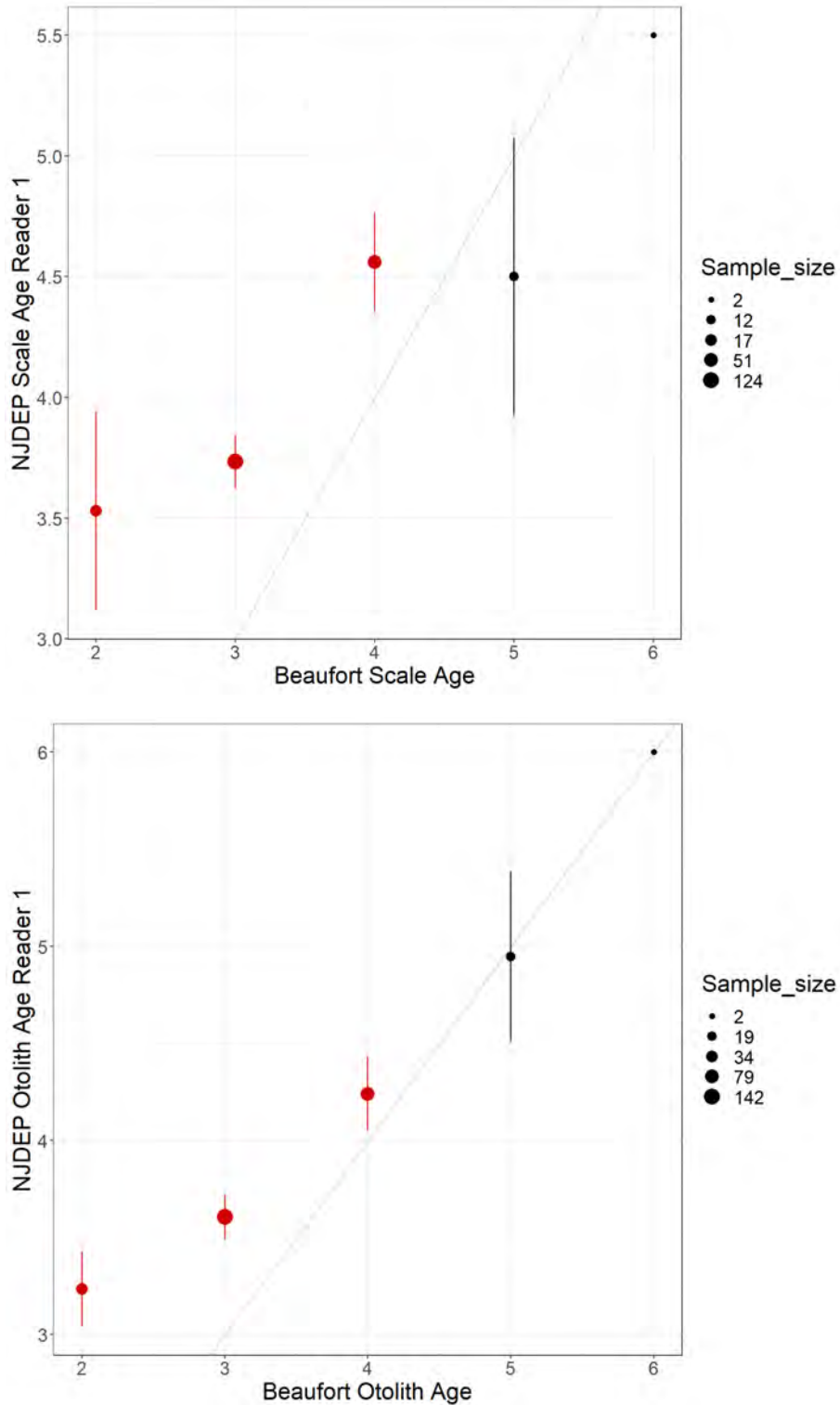


Figure 6. Scale vs otolith paired age comparisons for VIMS Read 2 (top left), NJDEP Reader 2 (top right), and Beaufort (bottom). Dots and lines represent mean and 95% confidence intervals, respectively, for the y-axis age relative to the x-axis age. Red dots indicate the difference among reads is significantly different from 0.

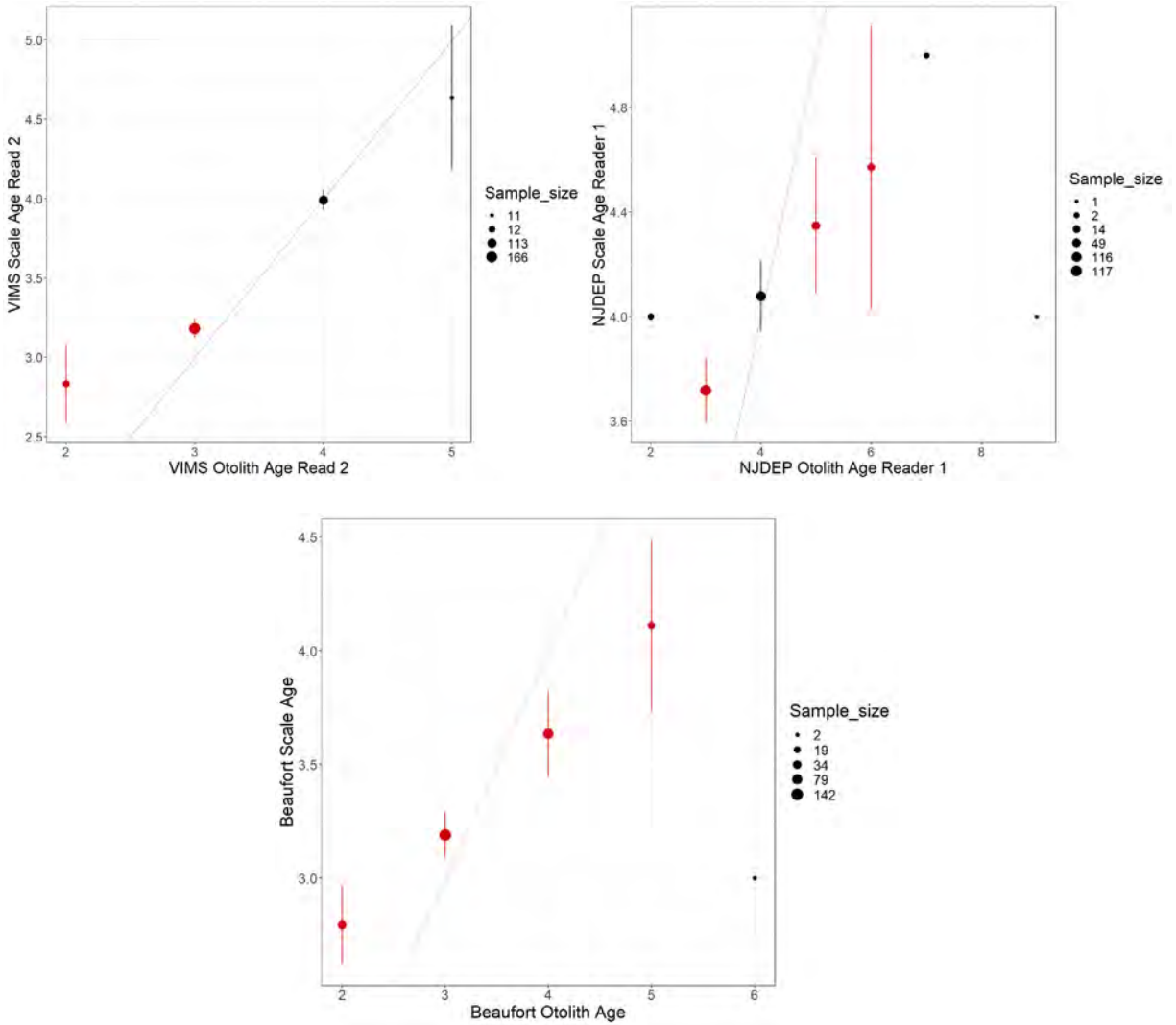


Figure 7. Paired age comparisons among reads by the same VIMS reader for scales (top) and otoliths (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

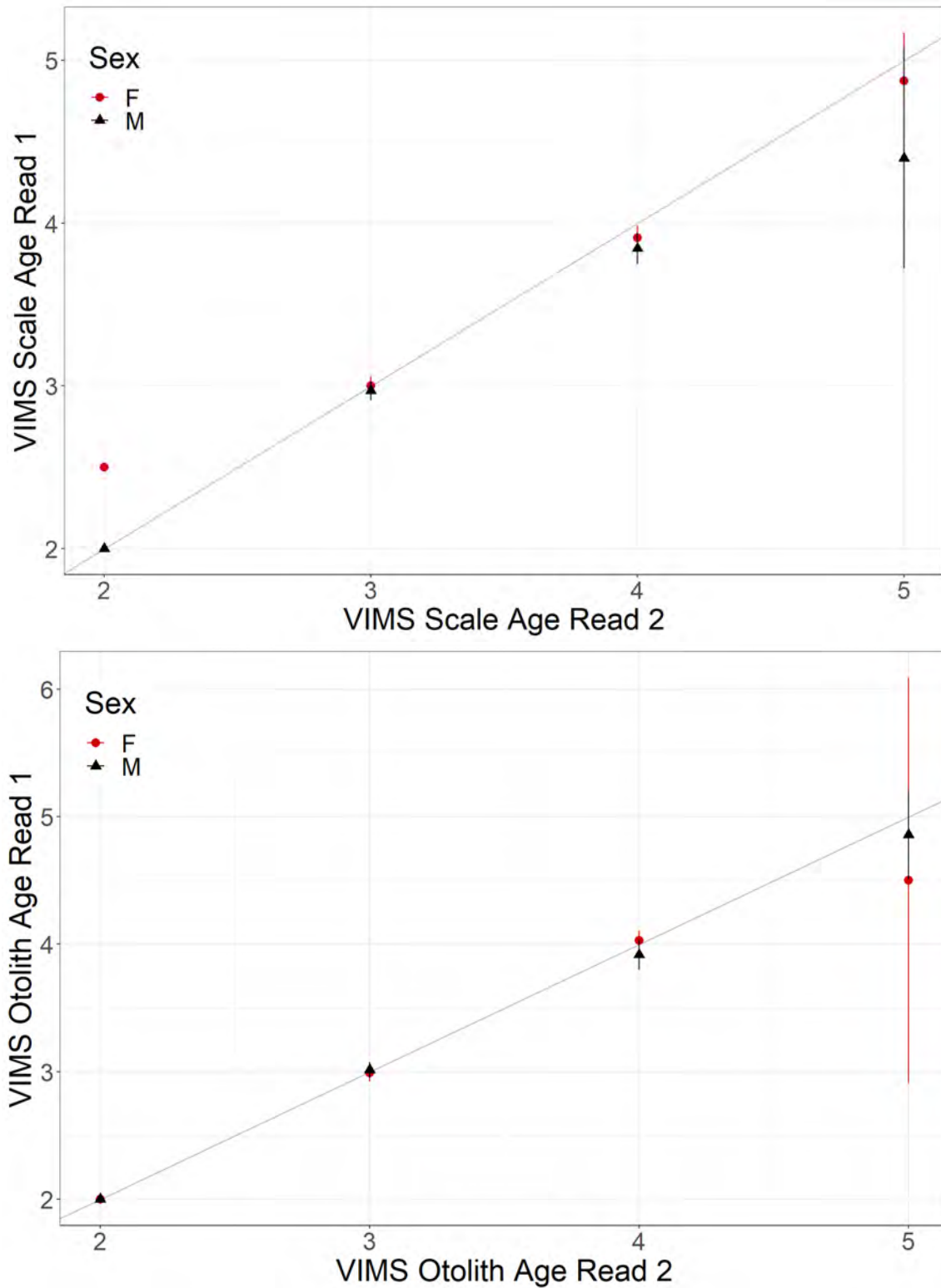


Figure 8. Paired age comparisons among reads by the same NJDEP Reader 1 for scales (top) and otoliths (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

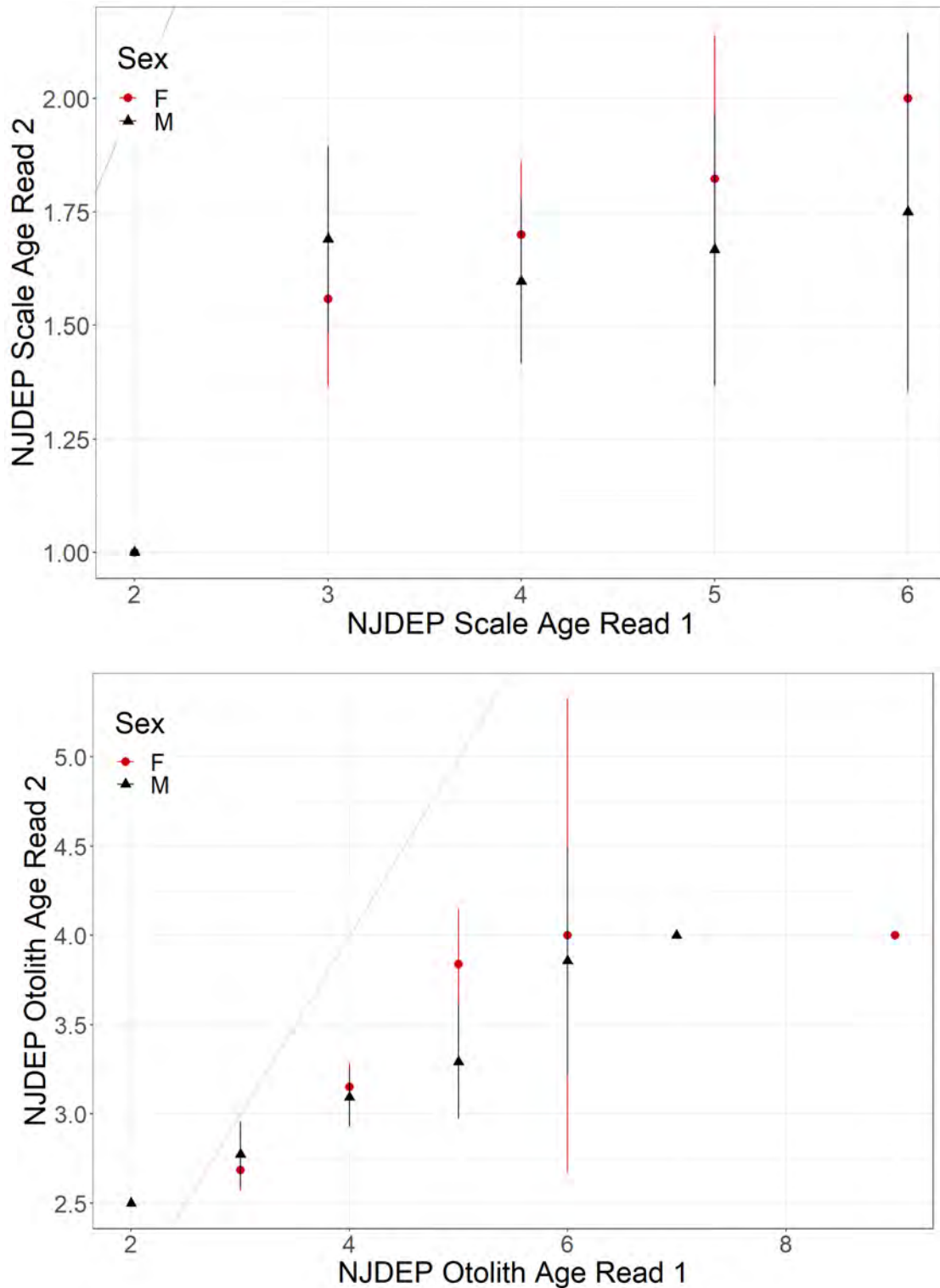


Figure 9. Paired age comparisons between Beaufort and VIMS Read 2 for scales (top) and otoliths (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

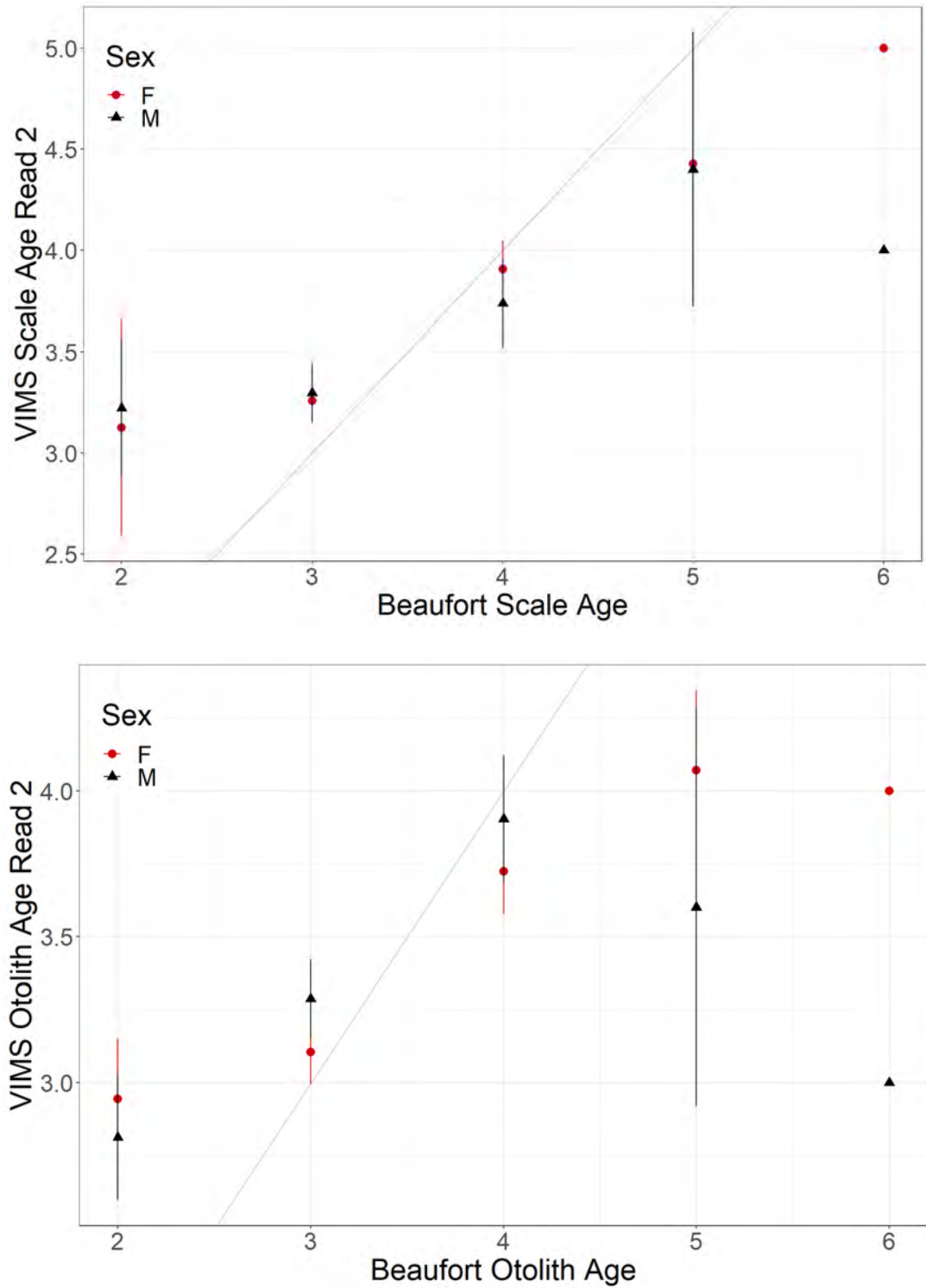


Figure 10. Paired age comparisons between NJDEP Reader 1 and VIMS Read 2 for scales (top) and otoliths (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

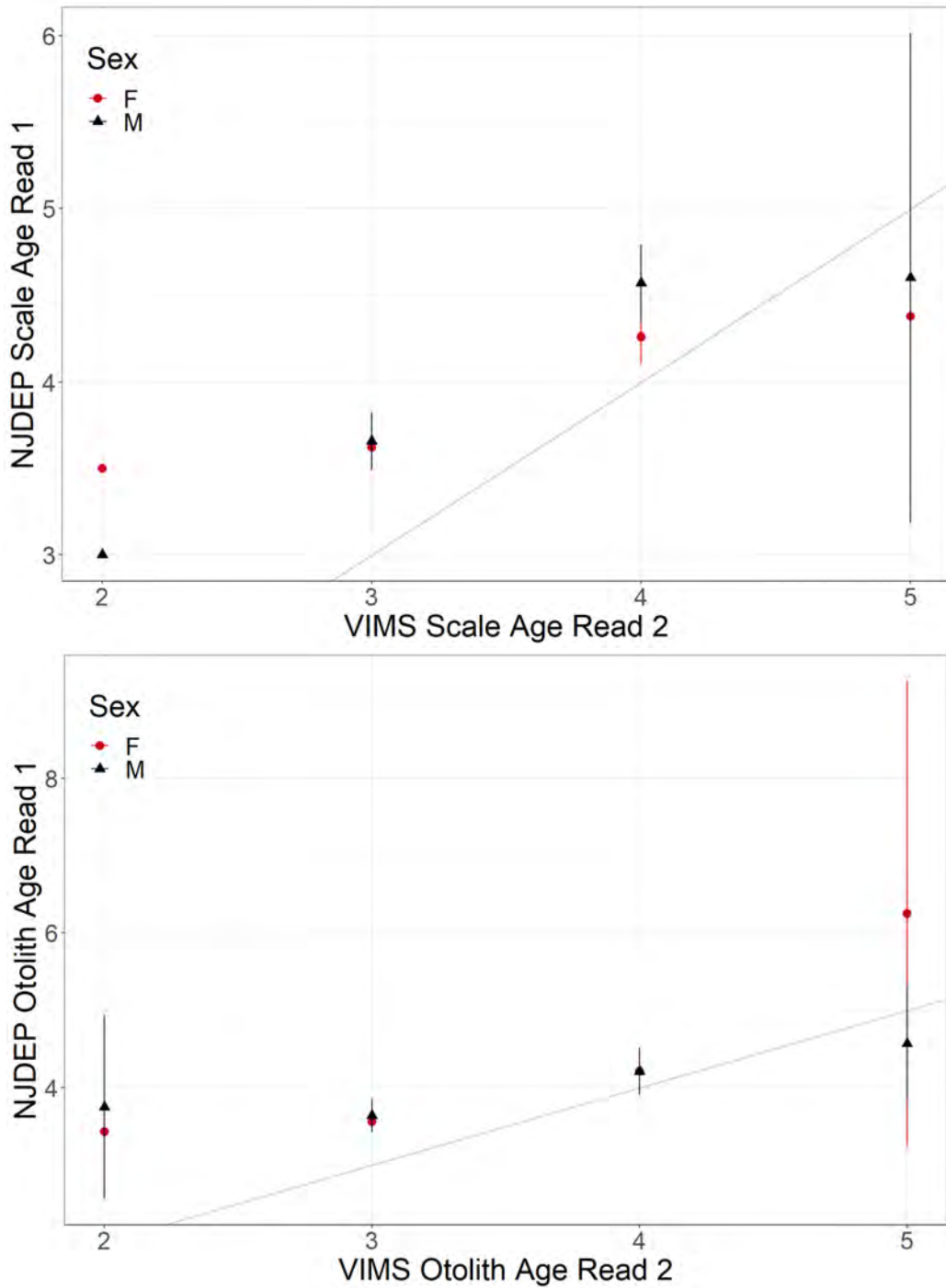


Figure 11. Paired age comparisons between NJDEP and Beaufort for scales (top) and otoliths (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

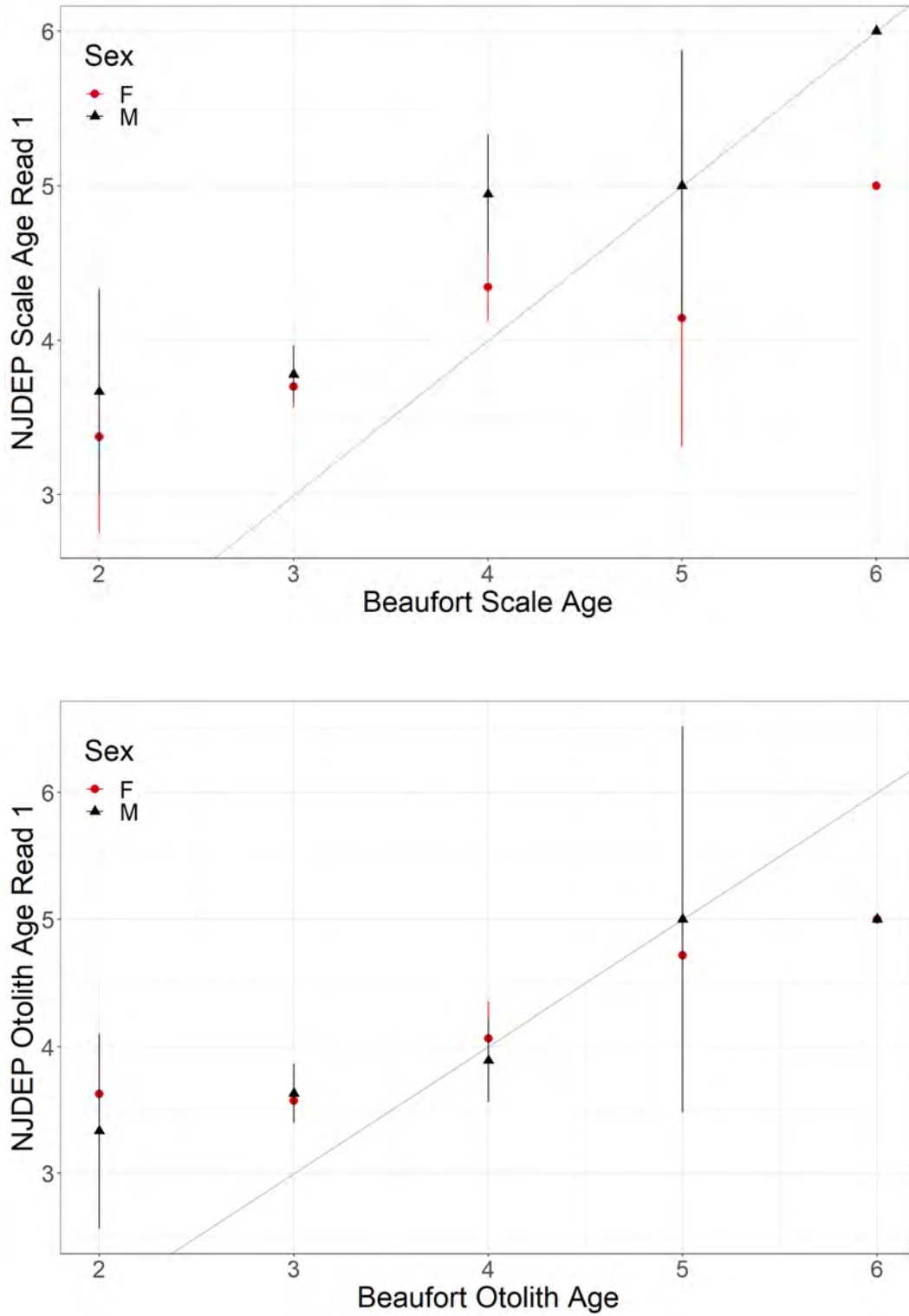


Figure 12. Scale vs otolith paired age comparisons for VIMS Read 2 (top left), NJDEP Reader 2 (top right), and Beaufort (bottom) by sex. Dots represent mean and lines represent 95% confidence intervals for the difference between ages relative to the reference (x-axis) age.

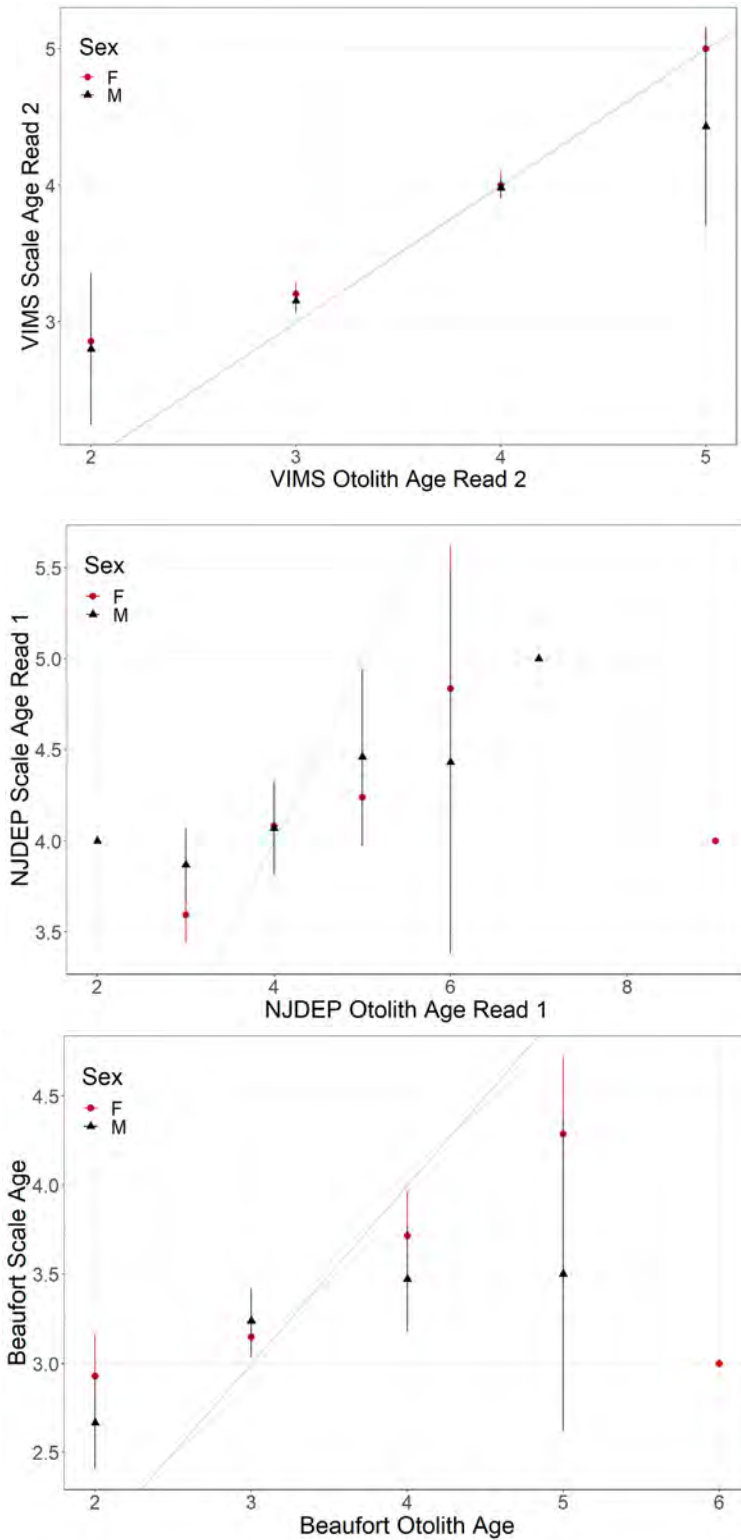
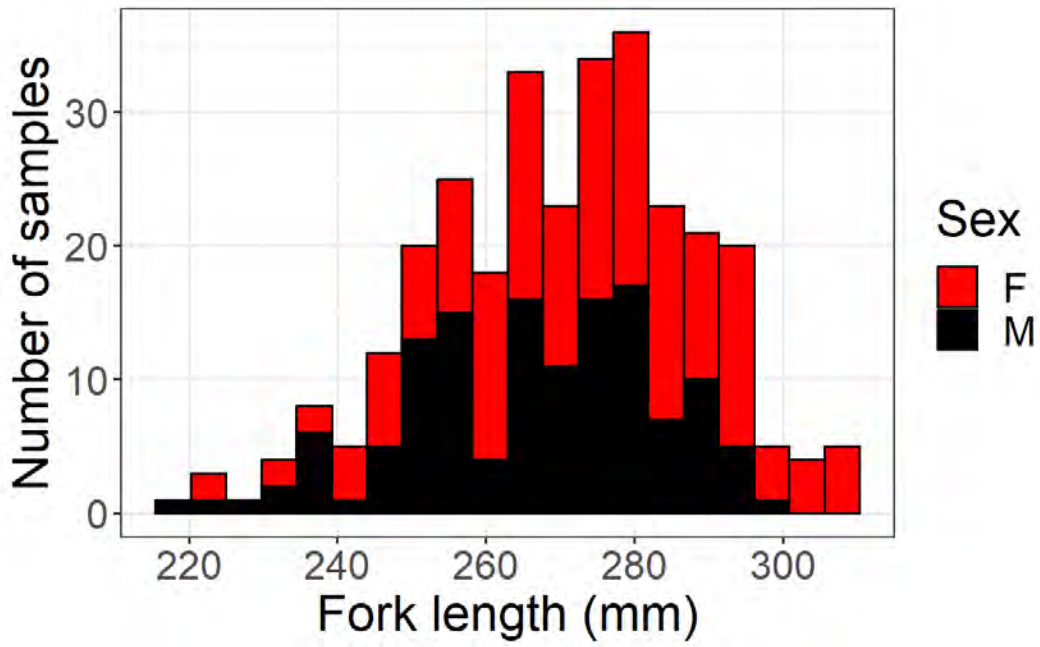


Figure 13. Size distribution of Atlantic menhaden samples used in ageing exchange. All samples were collected either at sea or at port in February 2022.



Ageing Atlantic Menhaden Scales (Beaufort lab)

12/15/22

A. Rezek

Reading scales to assign age

- 1- Note scale sample's fork length (FL), weight (Wt.) and capture date.
- 2- Using a stereo microscope with transmitted light, look at all mounted scales to see which are readable (clean, uniform, not torn, have distinct rings) and which rings are common among scales.
- 3- After finding the best scale, with ctenii pointed downward, locate the focus for a starting point (middle of the reading plane) and count annuli straight up the middle of the scale to the edge. Assign and record final age.
- 4- If the scale is questionable/unreadable, assign an age of 40, which indicates "unageable".

Identifying true annuli

- 1st annulus usually occurs ≥ 1.2 mm from focus.
- A true annulus will appear as a consistent dark line and is roughly parallel to the edge of the scale.
- A true annulus will hold up in the "shoulders" of the scale and cross the reading plane on both sides.
- Each consecutive annulus is $\sim \frac{1}{2}$ the distance of previous annuli. If ring spacing does not make sense but ring follows other "rules" and is seen in most/all other scales, consider FL/Wt. May count questionable annulus as true.
 - You may have a false annulus if it has black dashes ("stiches"), is inconsistent, looks smudged or is right next to another annulus. In some instances, a band of close rings may be counted as one annulus.

Assigning fish to the correct cohort

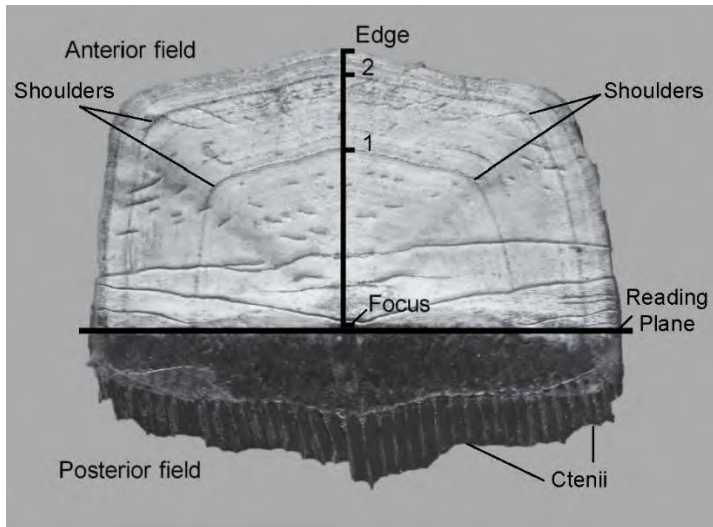
- 5- Pre June 1st: A virtual annulus is added to the seen annulus count if the scale has a wide margin (distance from last annulus to edge) where you expect to see an annulus soon and the fish was captured before June 1st. (=bumping age). Annuli should be deposited by June 1st for the spring cohort.
- 6- Post June 1st: Do not count an annulus near or on the edge, especially in the fall. Closely spaced annuli may be seen near the edge in older fish, so marginal increments vary.

Radius measurements to annuli and edge of the scale

- 7- Measure from the focus to each annulus and to the edge, up the middle of the scale and record. Do not measure scales with a virtual annulus (see Item 5).

Tips

- Generally, the smaller the scale, the younger the fish. The longer the ctenii, the older the fish.
- Ages 0-5 are seen in currently received bait and reduction fishery samples. [Reduction fishery samples May-October]



2 year old Atlantic menhaden scale



False annulus between 2 true annuli

VIMS MRG Atlantic Menhaden Ageing

Sample collection-

Atlantic Menhaden is a “Priority” species for its two major trawl surveys, NEAMAP and ChesMMAP. Priority species means that length, weight, sex, maturity state, stomach, and otoliths are collected for 5 individuals from each length bin on each tow. Paired otolith and scale samples were collected from the NEAMAP fisheries-independent trawl survey from 2015-2018. As otoliths are the preferred hard part for ageing other species, menhaden otoliths have been collected and aged from 2008 to present.

Additionally, smaller grant funded projects and collaborations have paired scales and otoliths in 2018-2019 and again in 2022. The total number of whole otoliths that have been aged from the NEAMAP and ChesMMAP Trawl Surveys to date is 4,897 (NM 2,116, CM 2,781).

Scales-

Paired Atlantic menhaden scales and otolith samples will be removed from specimens at sea. Approximately 30-50 scales will be removed from each specimen. After collection, these scales are properly labeled and stored in capped vials in the freezer for later cleaning and processing in the laboratory. By freezing the scales rather than drying them, the scales will less likely be damaged. At the laboratory the scales will be thawed and lightly scrubbed in a soap and water solution to remove any debris and excess slime. Six of the best scales will be selected, thoroughly dried and pressed between two glass microscope slides with the sides of the slides taped closed on the ends. Due to variations in the scales, six samples are selected to provide the most accurate age for each specimen. Scale sample slides are preferably read using a microfiche reader. If no microfiche is available, then a stereo dissecting scope with transmitted light will suffice. Additionally, if the stereo microscope has imaging capabilities, larger images can be displayed to mimic the microfiche.

Whole Otoliths-

Atlantic menhaden sagittal otoliths are removed in the field as part of full specimen workup for up to 5 individuals of each size group from each station (sampling site). Both otoliths are extracted by making a shallow cut to the dorsal surface of the head of the menhaden with a serrated knife. In this case, shallow is defined as 0.25cm to 1cm, depending on the size of the individual. The otic capsule is located relatively close to the top of the skull. Otoliths can then be extracted using a pair of forceps. To assist in extraction, the otolithic membrane can be removed from the otic capsule, which often also removes the sagittal otoliths with it. The otoliths can then be carefully removed from the otolithic membrane for collection. Alternatively, the whole head of each menhaden sample can be removed with a serrated knife behind the operculum, labeled and frozen in storage bags to later have their delicate otoliths removed back at the laboratory. Due to the size and fragile nature of menhaden otoliths, careful extraction can more easily occur at the stable laboratory setting.

After otolith extraction, samples are dried and stored in small vials. Otoliths are read whole in a petri dish full of water or ethanol (Ethanol dries quickly and samples can be sealed back in storage vials more quickly), under a stereo dissecting microscope with transmitted light for the best contrast. Depending on the clarity and size of the otolith 25x zoom should be used with the otolith viewed in a watch glass full of 70% EtOH. This will assure no “clearing” (loss of visible annuli) will occur if the otoliths are dried, then stored. Wet stored otoliths straight from the otic cavity, read in water or read in ethanol can cause

clearing if sealed in a vial before drying. Sometimes a combination of reflected and transmitted light is necessary to distinguish annuli separation and boundaries.

The core of the otolith will appear as a circular, hollow shape in the center of the otolith. The core has a dark/opaque outline. This outline will be called the core boundary. The core boundary extends away from the core slightly up both the rostrum (long point) and antirostrum (“thumb”) of each otolith. Figure 1.

The first annulus is often a thicker, darker band. Establishing the first annulus is critical to proper age assignment. The first annulus will often not have a lot of separation from the core boundary. The clearest separation to identifying the first annulus will occur on the rostrum.

Similar to the first annulus, any of the additional annuli will be best identified on the rostrum of the otolith. Starting with the first annulus, the annuli will gradually get thinner and lighter as the fish grows older. The best and clearest annuli can be traced all the way around the otolith. More difficult annuli can be checked by observing annuli on both the rostrum and antirostrum. Annuli are often less visible on the antirostrum, however the annuli often morphometrically visible by raised bumps along the inner edge of the antirostrum. Additionally, these raised bumps can be seen as layers of the otolith (like a topographical map). These layers can be traced to individual annuli around the otolith and are usually most visible on fish exhibiting more than one annulus.

Age Determination-

Spawning has been observed year-round with a concentration across fall and winter, October through March. Atlantic menhaden annuli deposition typically occurs from February to June depending on the latitude of the capture location. Annulus formation occurs post-spawn. The annulus formation on scales will usually be visible prior to the visible annulus formation on the otoliths.

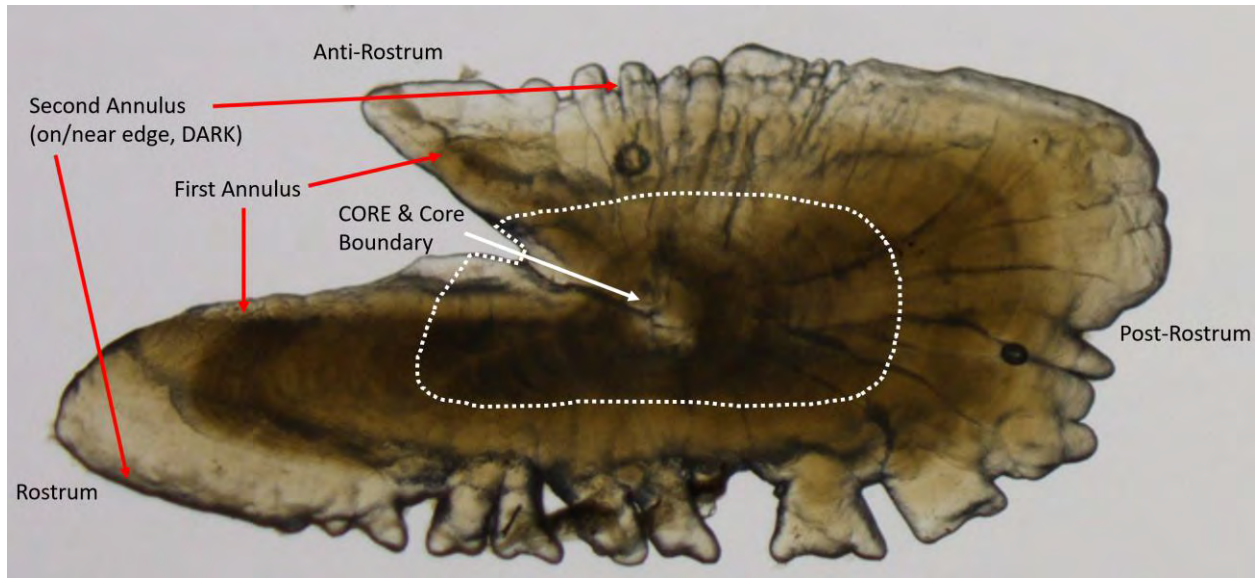
Specimens caught by the VIMS ChesMMAAP and NEAMAP surveys are randomly numbered to reduce bias. No specimen biological information is included with the three reads. Additionally, only the survey cruise is included with the random specimen number to serve as a capture date for final age determination. To reduce the subjective classification of margin codes, VIMS uses a simplified in-house version of margin coding. VIMS readers use the survey cruise number coupled with annulus formation proximity to the outer edges of the structure to assign either a Light or Dark “Edge Code”, simply L or D. (The terms Light and Dark are used due to the nature of the otolith structure when read with transmitted light. The opaque banding of the annuli appears as a darker color with the transmitted light from the microscope). The larger translucent banding is observed as Light.

Typically, specimens caught during or around spawning will often have a new annulus forming on the edge of the structure, and these specimens will be observed with a Dark edge. Specimens caught prior to annuli deposition will be observed with the number of annuli present. These specimens will have their final age “bumped” +1 to account for the near-future deposition. The same Light and Dark edge code method can be applied to scale structure age determination as well.

There are three readers at VIMS and the mode age for each sample (both scales and otoliths) is provided as the final age. If there is no mode from the initial read, the readers reread the sample and if there is still no mode, they examine the sample together and come to a consensus age. If a consensus age cannot be determined the sample is discarded. Very few samples are discarded. Precision tests are

performed within each reader (multiple reads of the same sample) and between readers. VIMS uses similar precision and symmetry tests to the NEFSC.

Figure 1. (NM1604, final Age-2. VIMS recorded as 2 D).



April 8, 2024

The Atlantic States Marine Fisheries Commission (ASMFC)
1050 N. Highland St., Suite 200 A-N
Arlington, VA 22201

Virginia Marine Resources Commission (VMRC)
Building 96, 380 Fenwick Road
Ft. Monroe, VA 23651

Maryland Department of Natural Resources (MD DNR)
580 Taylor Ave.
Tawes State Office Building
Annapolis, MD 21401

Dear Commissioners and Secretary Kurtz,

The undersigned organizations respectfully urge you to review and support the Save Our Menhaden Coalition Resolution (enclosure (1)). The Coalition has resolved to end Atlantic menhaden reduction fishing in Virginia waters and to limit Omega Protein and Ocean Harvesters to federal waters 3 nautical miles off the Atlantic Coast just like all the other states on the Atlantic Coast.

The ASMFC Atlantic Menhaden Management Board's goals and objectives are "to manage the Atlantic menhaden fishery in a manner which equitably allocates the resource's ecological and economic benefits between all user groups."

The Board has managed the allocation of Atlantic menhaden reduction fishery in the Chesapeake Bay and Atlantic Ocean separately since 2006 as the marine environments are known to be different.

However, when the Board knowingly ignores this fact, and allocates over 75% of the total allowable catch for the entire Atlantic Coast to the State of Virginia, it violates its own goals and objectives as the historical harvest of a state is not an element of the stated goals and objectives of the Board.

In 2024, Omega Protein has been allocated over 158,000 metric tons of Atlantic menhaden by Virginia or over 2 / 3 of the total allowable catch of 233,550 metric tons for the entire Atlantic Coast. That's a total of 3 / 4 of a billion fish being removed from the Chesapeake Bay and its entrance.

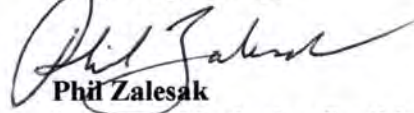
This creates the conditions for localized depletion based on the latest science, empirical data, and common sense. See enclosure (2).

In summary, the Coalition is requesting the immediate end to Atlantic menhaden reduction fishery in Virginia waters now.

Save Our Menhaden Coalition
<https://www.saveourmenhaden.org/take-action.html>

If you have any questions, please contact me via email at flypax@md.metrocast.net.

Very Respectfully,



Phil Zalesak

Save Our Menhaden Coalition Member

Resolution Supporters

Senator Jack Bailey
MD Legislative Sportsmen's Caucus
jack.bailey@senate.state.md.us

Academia

Dr. Noah Bressman, PhD
Assistant Professor of Physiology
Department of Biology
Salisbury University
noahbressman@gmail.com

Tom Burkett
Research Specialist, University of Virginia
pnj9ud@virginia.edu

Michael Academia, Msc.
Osprey Watch
The Center for Conservation Biology
macademia@wm.edu

National & Local Non Profits

Remy Moncrieffe
Marine Conservation Policy Manager
National Audubon Society (1.6 million members)
703-225-9549
romaric.moncrieffe@audubon.org

Molly Moore,
President
Southern Maryland Audubon
president.somdaudubon@gmail.com

Save Our Menhaden Coalition
<https://www.saveourmenhaden.org/take-action.html>

Julie Kacmarcik
Conservation
Richmond Audubon Society (1,400 members)
juliekazz@comcast.net

Tom Blackburn
Audubon Society of Northern Virginia (5,000 Members)
tomblackburn@gmail.com

Shruti Bhatnagar
Conservation Chair
Sierra Club Maryland Chapter (70,000 Members)
shruti.bhatnagar@msierra.org

Connor Kish
Director
Sierra Club Virginia Chapter (20,000 Members)
connor.kish@sierraclub.org

Chris Eberly
Acting Executive Director
Interfaith Partners for the Chesapeake
chris@interfaithchesapeake.org

Kathryn Brintnall
President
The International Osprey Foundation
ospirecbva@gmail.com

Joanie Millward
President
Virginia Osprey Foundation
ospirecbva@gmail.com

Sal Icaza
President and Founder,
Maryland Osprey and Nature Festival
www.marylandospreyfestival.org

Emma Green
Executive Director
St. Mary's River Watershed Association (92 Members)
emmasmrwa@gmail.com

Mark Swingle
Conservation Consultant
Virginia Aquarium & Marine Science Center Foundation
MSwingle@VirginiaAquarium.com

Alice Volpitta
Blue Water Baltimore
avolpitta@bluewaterbaltimore.org

Liz Curtz, President
Friends of St Clements Bay
curtzeli@gmail.co

Debbie Campbell
Editor, Menhaden Founder, Little Fish, Big Deal! Facebook Site
debbiescampbell@icloud.com

Christi Medice
Contributor to Little Fish, Big Deal! Facebook Site
cmedice10@gmail.com

James McConnell
Rotary Club of Orange, Virginia
jamie@sequoiaspringsinc.com

Fishing Organizations

Stephen Shechtel
Former President
Maryland Saltwater Sportfishing Association
Stephen@shechtel.com

Phil Zalesak
President
Southern Maryland Recreational Fishing Organization (Membership 149)
Smrfo2021@gmail.com

Ron Smith
President
Atlantic Coast Sportfishing Association
smitty3894@aol.com

John O'Dell
Advisor
Atlantic Coast Sportfishing Association
ridgegrassmusic@gmail.com

Bert Olmstead
President
Kent Island Fishermen (296 Members)
boatman5@ymail.com
Jerry Leuters
Administrator
Ocean Pines Anglers Club
dorado1045@yahoo.com

Cliff Phipps
President
Virginia Anglers Club
contact@virginiaanglersclub.org

Individuals

H. Bruce Franklin
Author
The Most Important Fish in the Sea
hbf@scarletmail.rutgers.edu

Dale William Neal
Senior Editor
SaveOurMenhaden.org
dalewilliamneal@gmail.com

Tom Lilly, Maryland resident and advocate
foragematters@aol.com

William McKeever
Author, Filmmaker, Ocean and Shark Enthusiast
<https://williammckeever.com/>

Captain Bill Pappas
Charter Captain
playinhokeychartersvb@gmail.com

Capt. Mike Ostrander
Discover the James
Upper Tidal Osprey Tours
mike@discoverthejames.com

George Socca
Founder
george@nyangler.com

Save Our Menhaden Coalition
<https://www.saveourmenhaden.org/take-action.html>

Brian Collins, Virginia resident and advocate
brian.c1@me.com

Emma Cummings
emma@pfdsoftware.com

Dave Wilson
Marshhawk67@gmail.com

Connor Rust
Cbr4gx@virginia.edu

Frances Lynn Jenkins
LdyhwkVA@aol.com

**SAVE OUR MENHADEN COALITION RESOLUTION:
END ATLANTIC MENHADEN REDUCTION FISHING
IN THE CHESAPEAKE BAY AND ITS ENTRANCE**

WHEREAS, the Chesapeake Bay fishery is at a point of ecological crisis due to federal and Virginia state mismanagement of the Atlantic menhaden reduction fishery; and

WHEREAS, the Atlantic States Marine Fisheries Commission and the Virginia Marine Resources Commission can not provide scientific evidence that the spatial or seasonal stock of menhaden in the Chesapeake Bay is healthy, and have failed to study the severity of localized menhaden and juvenile menhaden depletion due to menhaden reduction fishing; and

WHEREAS, the Atlantic States Marine Fisheries Commission menhaden quota for the Chesapeake Bay does not recognize the bay as a unique ecosystem, the current annual menhaden quota for the bay of 112 million pounds was made without consideration of regional ecosystem-based reference points or measurements of the Bay's ability to sustain life; and

WHEREAS, menhaden reduction lobbyists continue to block proposed scientific studies and public transparency measures needed to responsibly manage the menhaden fishery in the Chesapeake Bay and ensure the regional resource is available for future generations; and

WHEREAS, the Chesapeake Bay is the largest nursery for Atlantic menhaden, an ecologically essential and nutrient-rich forage fish for species such as osprey, pelicans, herons, terns, gannets, dolphins, sharks, whales, tuna, bluefish, striped bass, redfish, weakfish, flounder, and speckled trout, all of which contribute to important commercial and recreational fisheries and regional economies; and

WHEREAS, federal and Virginia state agencies continue to allow up to 750 million menhaden to be removed from the Chesapeake Bay and its entrance every year, making the Chesapeake Bay the most concentrated menhaden extraction zone on the East Coast; and

WHEREAS, federal and Virginia state agencies continue to ignore regional ecological reference points in the Chesapeake Bay, such as the devastated and starving striped bass and osprey populations which are dependent on the menhaden fishery for nutrients and survival; and

WHEREAS, the Chesapeake Bay striped bass population is at record low recruitment levels. The Maryland Department of Natural Resources 2023 juvenile striped bass survey for the Chesapeake Bay reported the young-of-year index as 1.0, well below the long-term average of 11.1 and the fifth straight year of poor reproductive success for Striped Bass, reproduction and survival rates are impacted by starvation which predispose striped bass to mycobacteriosis (fish wasting disease); and

WHEREAS, the Chesapeake Bay osprey population is at record low recruitment levels. According to Dr. Bryan Watts of the College of William and Mary, reductions in menhaden stocks have caused osprey reproductive productivity to decline to below DDT-era rates; and

WHEREAS, the Atlantic States Marine Fisheries Commission and the Virginia Marine Resources Commission have not provided an accumulative environmental and economic impact assessment for the concentrated menhaden extraction and persistent fish spills occurring on the Eastern Shore of Virginia; and

WHEREAS, all other states on the Atlantic Coast have removed industrial menhaden reduction fishing from their bays, and have now recorded positive ecological and economic responses in doing so.

We are therefore committed to ending Atlantic menhaden reduction fishing in the Chesapeake Bay and its entrance.

Adopted: February 26, 2024

Save Our Menhaden Coalition



Localized Depletion of Atlantic Menhaden in the Chesapeake Bay and Its Impact on Maryland and Virginia Fisheries



April 8, 2024

Phil Zalesak

Save Our Menhaden Coalition

<https://www.saveourmenhaden.org/take-action.html>

Executive Summary

Although the statement that “Atlantic menhaden are not over fished and overfishing is not occurring” may apply to the Atlantic Coast, it does not apply to the Chesapeake Bay.

The latest scientific data indicates that there are insufficient Atlantic menhaden in Virginia waters during the Atlantic menhaden reduction fishing season to sustain life for fish and birds dependent on Atlantic menhaden for their survival.

This lack of menhaden is caused by the removal of 3/4 of a billion fish from the Chesapeake Bay and its entrance by the Atlantic menhaden reduction fishing industry. See slide 8.

The solution to this problem is to end the Atlantic menhaden reduction fishing in Virginia waters and limit reduction fishing to federal waters east of the 3 nautical mile Exclusive Economic Zone.

Background

- There are many environment stresses on the Chesapeake Bay (e.g., pollution), however, very few are supported by science and empirical data to take decisive action.
- Localized depletion of Atlantic menhaden is occurring in the Chesapeake Bay. The root cause is the depletion of Atlantic menhaden in Virginia waters. As the mortality rate of Atlantic menhaden rises, so does the consequential survival rates of marine life that depend of Atlantic menhaden for subsistence (a) and (b). This assertion finds validation in scientific research and empirical evidence.
- The Total Allowable Catch (TAC) for the entire Atlantic Coast for 2024 -2025 is 233,550 metric tons (c).
- Virginia is allocated over 75% of the TAC for a total of 175,630 metric tons (c).
- Virginia allocates over 90% of its quota to their reduction fishery for a total of 158,137 metric tons (d). That is over 2/3 of the coast-wide TAC.
- At .46 pounds per fish (NOAA), this amounts to 3 / 4 of a billion fish being removed from the Chesapeake Bay and just outside the Bay.
- There is no science to support this allocation.

References

- (a) https://asmfc.org/uploads/file/63d8390fAtlMenhadenERPAssmt_PeerReviewReports.pdf, pages iii & 375
- (b) <https://www.frontiersin.org/articles/10.3389/fmars.2023.1172787/full>
- (c) https://asmfc.org/uploads/file/636e6629pr32AtlMenhaden2023TAC_AddendumIApproval.pdf
- (d) <https://www.mrc.virginia.gov/Regulations/fr1270.shtm>

Background (Continued)

Impact to Recreational Fisheries

- **Striped Bass are dependent on Atlantic menhaden for their survival. The higher the mortality rate for Atlantic menhaden, the higher the mortality rate of Striped Bass will be. The lack of Atlantic menhaden has been particularly destructive to Striped Bass, Bluefish, and Weakfish in the Chesapeake Bay. See slides 9 to 11.**
- **This lack of forage fish available to Striped Bass in the Chesapeake Bay is reflected in Maryland's Juvenile Striped Bass Index which has been poor or the last 5 years. See slide 12.**

Impact to Osprey

- **Osprey are particularly dependent on Atlantic menhaden for their survival in the main stem of the Chesapeake Bay. See slides 14 to 18.**
- **Their reproductively rate is well below DDT era levels of the 1970s and well below survivability in the main stem of Chesapeake Bay.**

Background (Continued)

Economic Impact to the Striped Bass Industry

- In 2016, the Atlantic Coast GDP associated with just the recreational Striped Bass industry was \$7.7 billion dollars. The employment associated with this industry was over 104,000 jobs. See slide 19.
- In Maryland and Virginia, the GDP totaled over \$909 million dollars and over 11,600 jobs. See slides 20 to 22.
- Maryland Striped Bass recreational harvest in 2016 was 10,919,265 pounds. The harvest in 2022 was 3,083,037 pounds for a 72% decline. See slide 23.
- Virginia Striped Bass recreational harvest in 2016 was 1,024,390 pounds. The harvest in 2022 was 282,789 pounds for a 72% decline also. See slide 24.
- This is an economic disaster for both the Maryland and Virginia recreational fishing industries. This data is supported by the experience and sworn testimony of both Maryland and Virginia charter captains and every day recreational fishermen.
- This also impacts the economy of the entire Atlantic Coast as over 60% of the Atlantic Coast stock of Striped Bass begin as spawn in the Chesapeake Bay and its tributaries. See slide 23.

Economic Impact of Ending Reduction Fishing

New York and New Jersey Benefited Ecologically and Economically from Ending Atlantic Menhaden Reduction Fishing in their State Waters.

See slides 26 and 27.

The Solution

End Atlantic menhaden reduction harvesting in Virginia waters and limit industrial reduction harvesting to federal waters 3 nautical miles off the Atlantic Coastline like all of the other Atlantic States

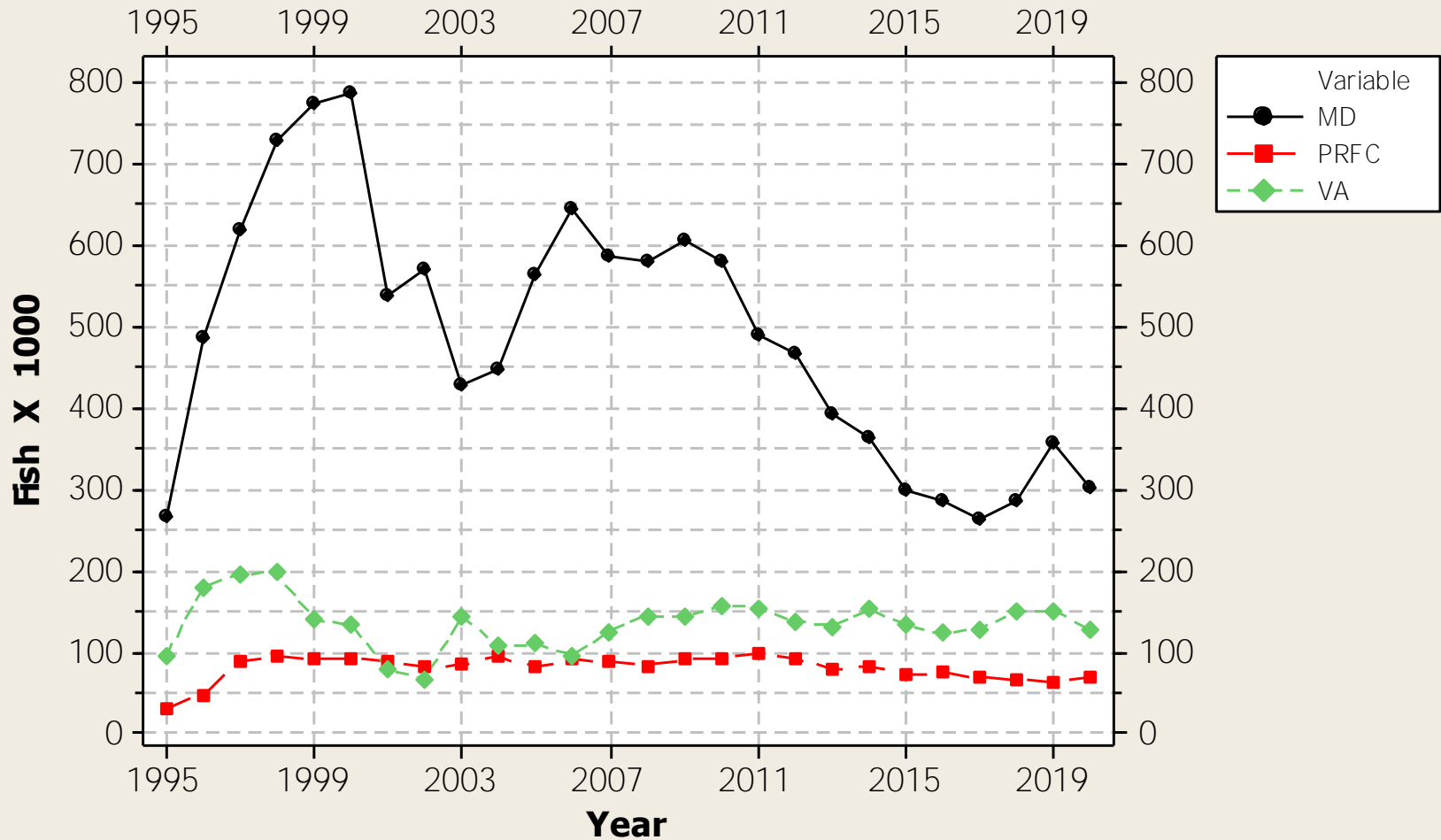
Atlantic Menhaden Purse Seine Settings

Figure 4.1.3.4.3. Locations of all purse-seine sets by Omega Protein vessels (red) and last sets of trips that were sampled for age and size composition of the catch (= port samples; green) during 2013; data are from CDFR data base.



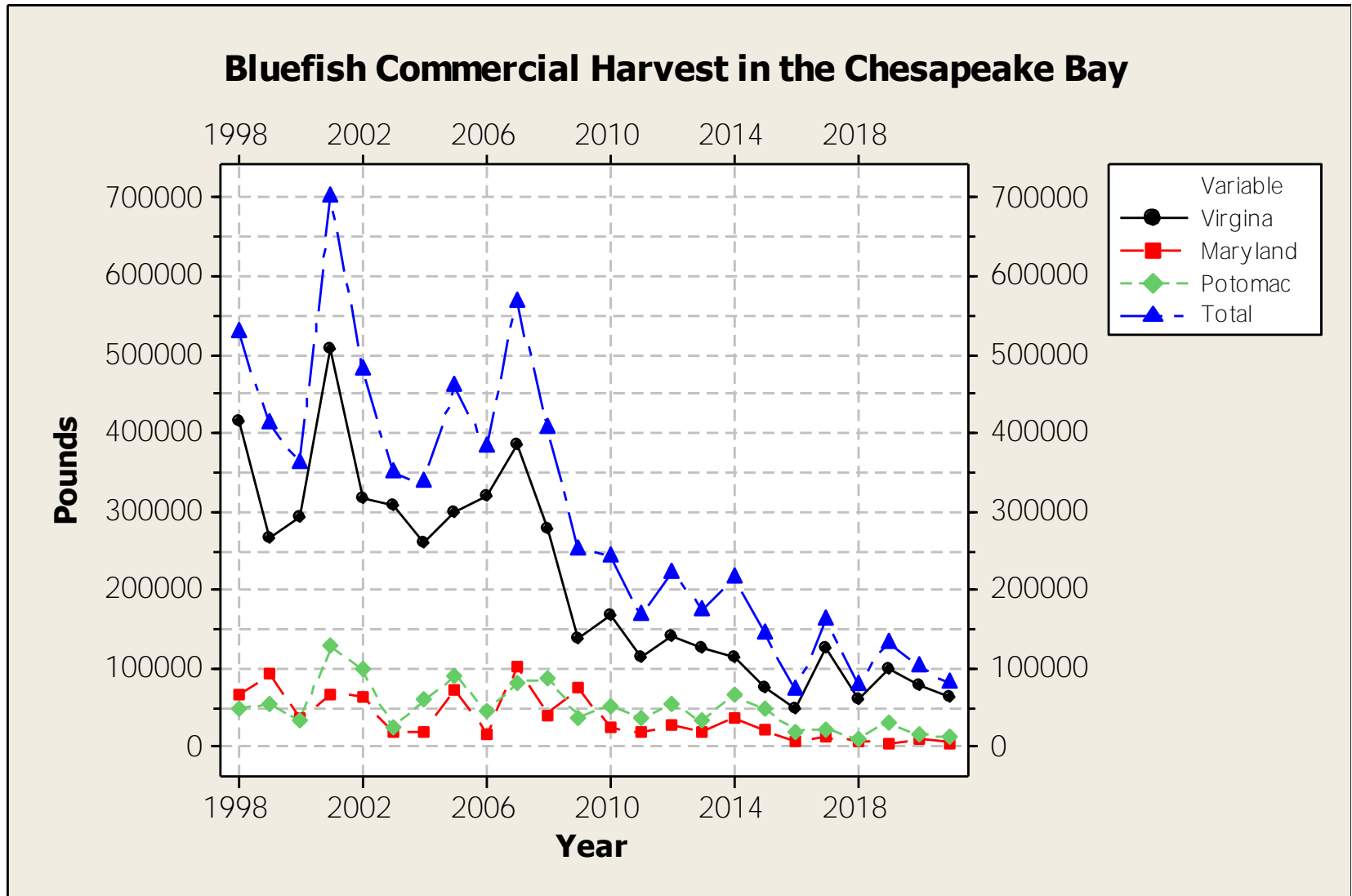
Ecological Impact – Striped Bass

Striped Bass Chesapeake Bay Commercial Harvest and Discards



Ref: ASMFC Draft Amendment 7 IFMP for Atlantic Striped Bass, dated 2/2022, page 132, Table 15

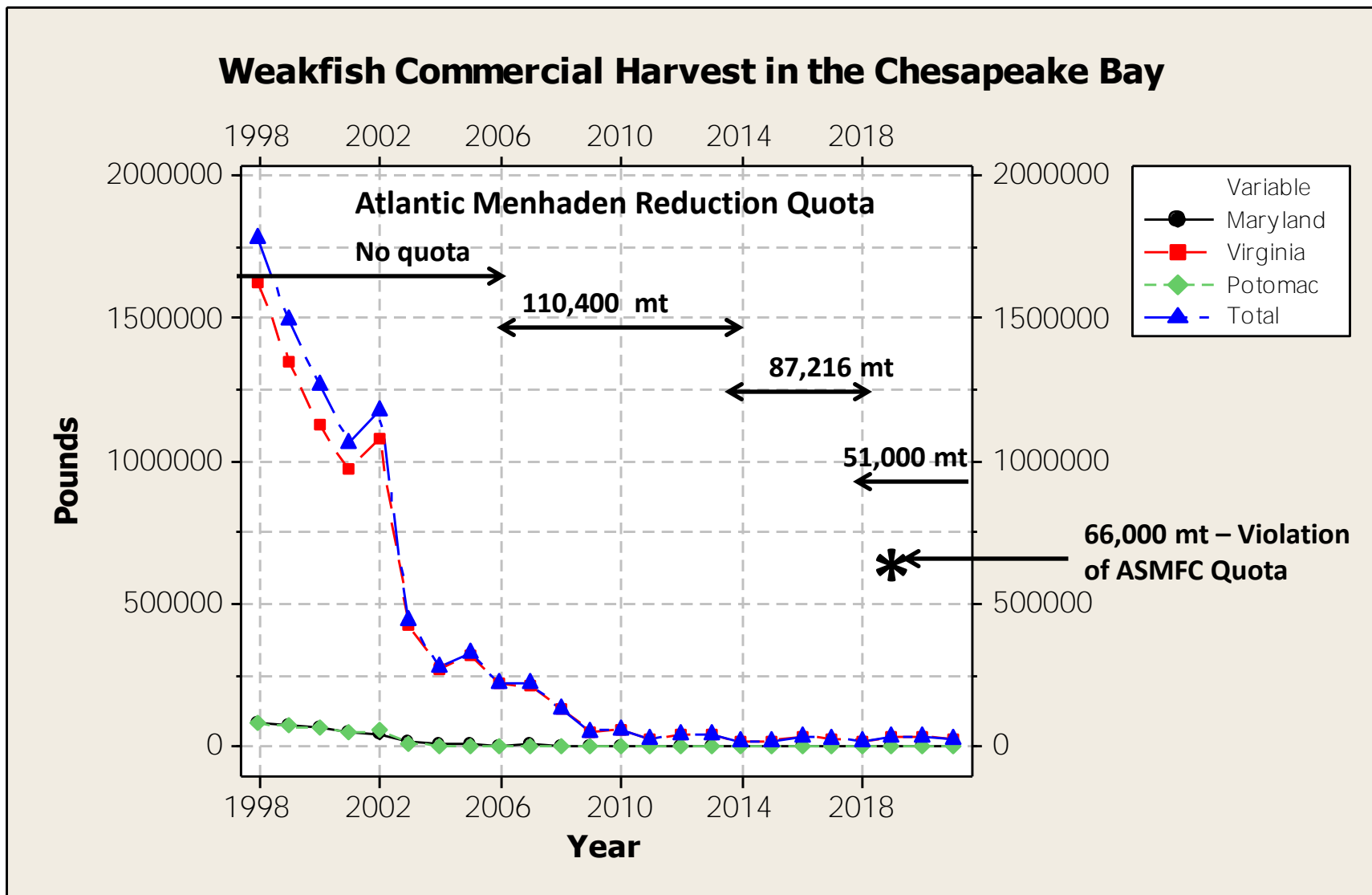
Ecological Impact - Bluefish



References

- (a) MD DNR, Connie Lewis email of 1/9/23
- (b) VMRC, Stephanie Iverson email of 1/10/23
- (c) PRFC Commercial Fish Fish Landings for 2022

Ecological Impact - Weakfish



References

- (a) MD DNR, Connie Lewis email of 1/9/23
- (b) VMRC, Stephanie Iverson email of 1/10/23
- (c) PRFC Commercial Fish Landings for 2022

**Dr. Noah Bressman Assessment
Salisbury University**

“Virginia based menhaden fishery is overfishing the stock in and around the Chesapeake Bay, which is preventing the important forage fish from making its way into the Bay and its tributaries.”

**Dr. Noah Bressman’s email to Secretary Jeanie Riccio,
Maryland Department of Natural Resources, 10/21/21**

Dr. Bryan Watts
College of William and Mary

According to Dr. Bryan Watts of the College of William and Mary reductions in menhaden stocks have caused osprey reproductive productivity to decline to below DDT-era rates. This is based on 50 years of research. Dr. Watts provided sworn testimony before the Virginia Marine Resources Commission on 8/22/23. He stated the following:

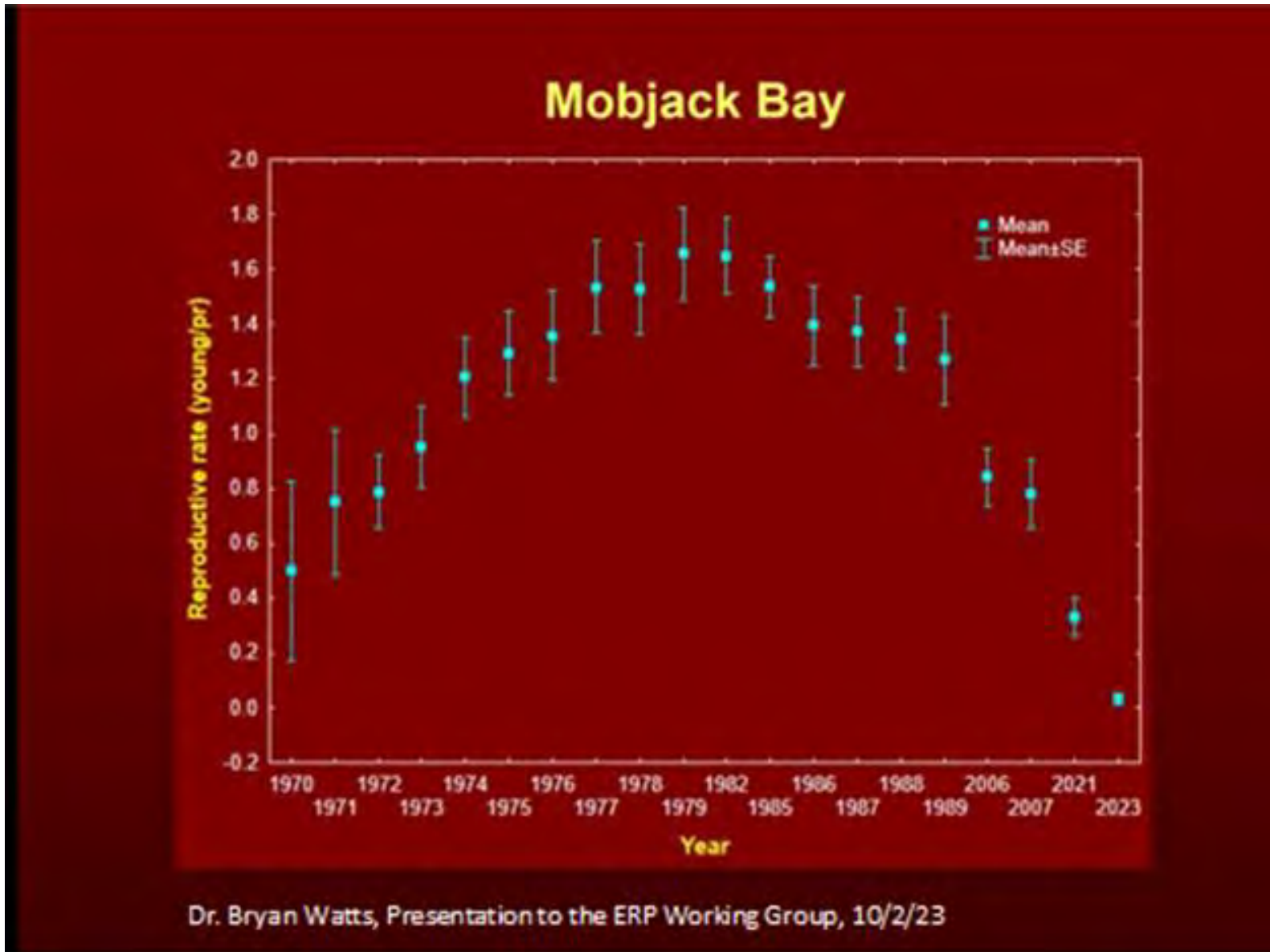
“The reason we decided to finally to begin to make statements about this issue is that we had moved from several 100 chicks starving in the nests to now 1,000s of chicks starving in the nests in the lower Bay.”

He went on to state **“If you look at the relationship between reproductive rates over the last 40 years and the Atlantic menhaden relative abundance index, they are directly related.”**

See reference (n) and the link below.

<https://www.youtube.com/watch?v=hf58Z9SLNlg> (14:43)

Ecological Impact - Ospreys



Reference: Watts, et al. 2024) Watts BD, Stinson CH, McLean BK, Glass KA, Academia, MH, Demographic Response of Osprey

Dr. Bryan Watts
College of William and Mary

Osprey Reproductive Rate	Chicks/Active Nest
Requirement	1.15
1970	0.50
1980	2.00
2006	0.75
2021	0.30
2023	0.10

See reference

<https://www.youtube.com/watch?v=hf58Z9SLNlg> (14:43).

Osprey Reproductive Performance Data



Food Supplementation Increases Reproductive Performance of Ospreys



| Results |

Food Addition Group



13 of the 16 nests succeeded at 81%.

3 nests failed during the first **1.38** weeks.

Productivity rate - **1.13** young per active nest.

Control Group



5 of 15 nests succeeded at 33%.

10 nests failed during the first **2.2** weeks.

Productivity rate - **0.47** young per active nest.

Food Supplementation Increases Reproductive Performance of Ospreys in the Lower Chesapeake Bay, Michael Academia of the College of William & Mary, October 6, 2022

Impact to Osprey in the Chesapeake Bay

Food supplementation Increases Reproductive Performance of Ospreys in the Lower Chesapeake Bay, Frontiers and Marine Science - 4/23/23

“Reproductive rates within the control group were low and unsustainable suggesting that current menhaden availability is too low to support a demographically stable osprey population. Menhaden populations should be maintained at levels that will sustain a stable osprey population in which they are able to produce 1.15 young/active nest to offset mortality.”

Michael Academia and Dr. Bryan Watts

Reference: Academia MH and Watts BD (2023), Food Supplement Increases

Atlantic Coast Economic Impact of Striped Bass (2016)

Commercial GDP: \$103,200,000
Commercial Jobs 2,664

Recreational GDP: \$7,731,600,000
Recreational Jobs 104,867

Comparisons Between the Fisheries

Table R-7. 2016 Comparison of commercial and recreational impacts: North Carolina to Maine

	Commercial Fishery	Recreational Fishery	Total	Commercial Fishery	Recreational Fishery	Total
Pounds landed (000s)	4,978.3	43,731.9	48,710.2	10%	90%	100%
Jobs supported	2,664	104,867	107,531	2%	98%	100%
Income (\$millions)	\$72.7	4,726.0	\$4,726.1	< 1%	>99%	100%
GDP (\$millions)	\$103.2	7,731.6	\$7,731.7	< 1%	>99%	100%

The Economic Contributions of Recreational and Commercial Striped Bass Fishing, Southwick Associates, 4/12/19, page 16

See reference (q)

Striped Bass Economic Impact to Maryland (2016)

Commercial GDP: \$17,109,700

Commercial Jobs 584

Recreational GDP: \$802,791,200

Recreational Jobs 10,193

Comparisons Between the Fisheries

Table MD-8. Comparison of commercial and recreational impacts: Maryland 2016

	Commercial Fishery	Recreational Fishery	Total	Commercial Fishery	Recreational Fishery	Total
Pounds landed (000s)	1,709.4	10,919.1	12628.5	14%	86%	100%
Jobs supported	584	10,193	10,777	5%	95%	100%
Income (\$000s)	\$12,569.6	\$496,859.8	\$509,429.7	2%	98%	100%
GDP (\$000s)	\$17,109.7	\$802,791.2	\$819,900.9	2%	98%	100%

Ref: The Economic Contributions of Recreational and Commercial Striped Bass Fishing, Southwick Associates, 4/12/19, page 26

See reference (q)

Striped Bass Economic Impact to Virginia (2016)

Commercial GDP: \$12,198,100
Commercial Jobs 384

Recreational GPD: \$106,623,300
Recreational Jobs 1,444

Comparisons Between the Fisheries

Table VA-7. Comparison of commercial and recreational impacts: Virginia

	Commercial Fishery	Recreational Fishery	Total	Commercial Fishery	Recreational Fishery	Total
Pounds landed (000s)	1,333.6	1,024.4	2358.0	57%	43%	100%
Jobs supported	384	1,444	1828	21%	79%	100%
Income (\$000s)	\$9,016.0	\$67,550.7	\$76,566.7	12%	88%	100%
GDP (\$000s)	\$12,198.1	\$106,623.3	\$118,821.4	10%	90%	100%

Ref: The Economic Contributions of Recreational and Commercial Striped Bass Fishing, Southwick Associates, 4/12/19

See reference (q), page 45

Economic Impact

Striped Bass Related GDP for Maryland and Virginia Economies (2016)

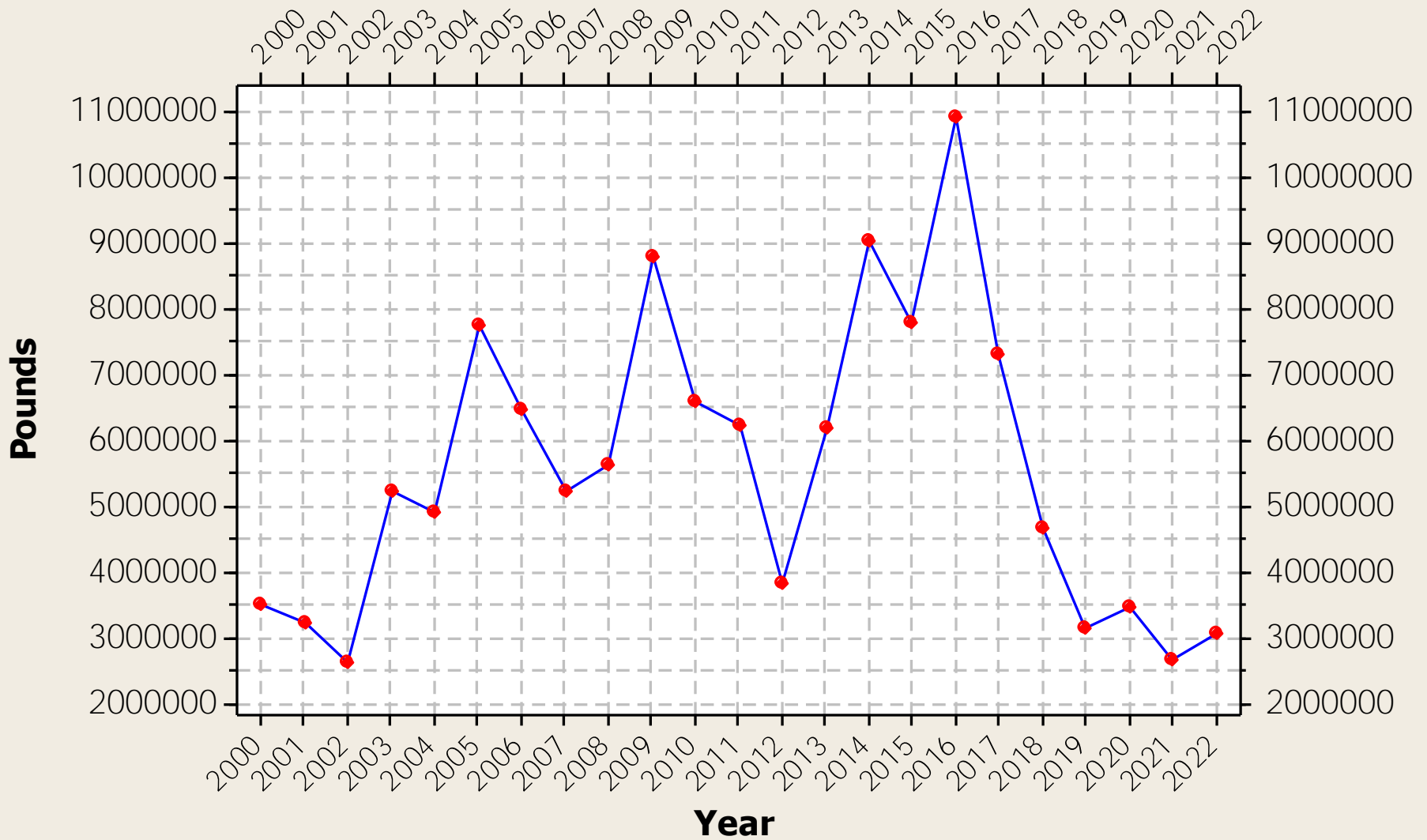
	Recreational GDP	Recreational Jobs	Commercial GDP	Commercial Jobs
Maryland	\$802,791,200	10,193	\$17,109,200	584
Virginia	\$106,623,300	1,444	\$12,198,100	384
Total	\$909,414,500	11,637	\$29,307,300	968

Reference:

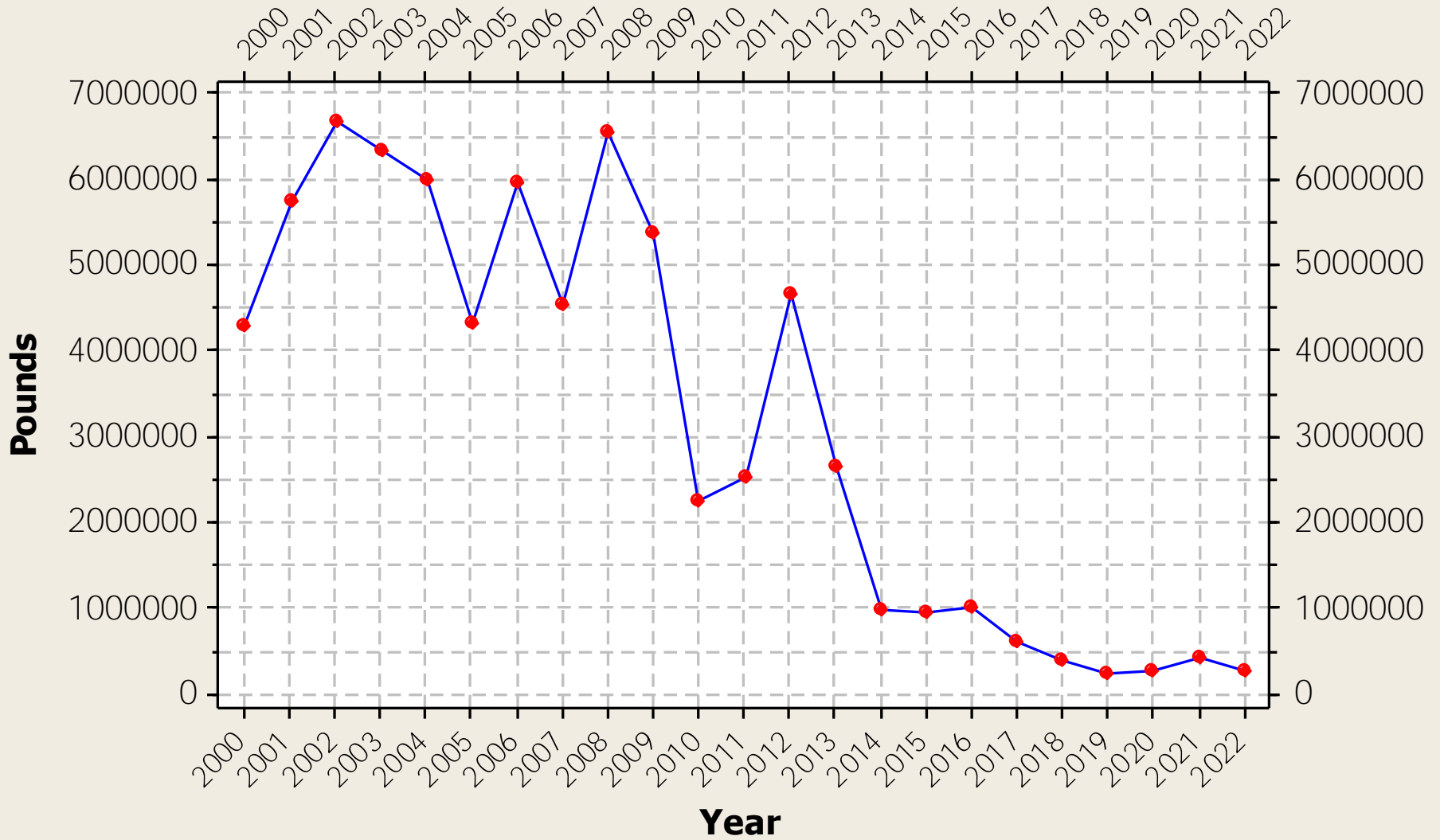
https://mcgraw.org/wp-content/uploads/2022/01/McGraw-Striped-Bass-Report-FINAL_compressed.pdf

See reference (q)

Maryland Recreational Striped Bass Harvest by Year



Virginia Recreational Striped Bass Harvest by Year



Ecological Impact

Striped Bass

Chesapeake Bay Contribution to Coastal Stock (>60%)

Striped Bass

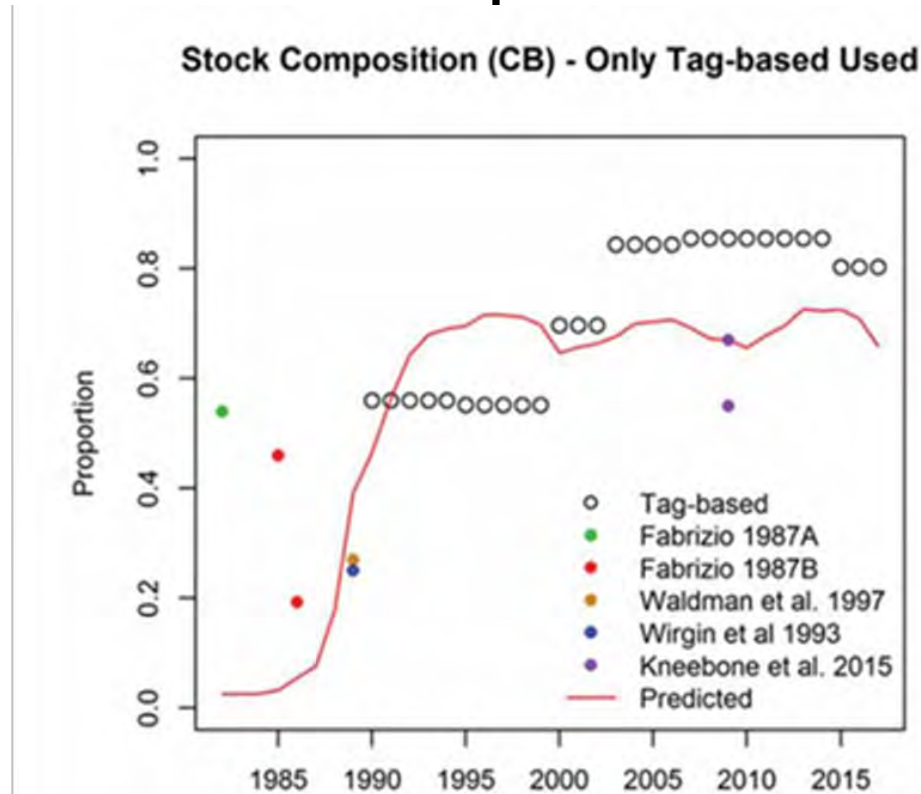


Figure B7.9. Observed versus predicted stock composition for the Chesapeake Bay stock. Literature values not used in the model fitting are indicated by the solid circles for comparison.

See reference (s)

<https://repository.library.noaa.gov/view/noaa/23031>

New York Experience – 3/8/21

FWD: Menhaden

From: George Scocca george@nyangler.com

To: Tom foragematters@aol.com

Date: Mon, March 8, 2021 7:15am

Hello Tom:

I am the person that spearheaded the bill that has kept reduction fishing out of NY waters. The changes here have been unbelievable. I can talk about it all day. My single greatest accomplishment in 35 years of fisheries management.

The availability of bunker throughout our season has seen an increase in both charter and party boats carrying anglers to get in on our great striped bass fishery. Bass stick with their food source and this has kept a healthy population of stripers in our waters. It's sparked a number of for hire boats to carry more anglers than ever before.

It has also had a profound effect on our bird population. We now have about 12 dozen nest pair eagles on long island and the osprey population is thriving. All due to the amount of forage for them to eat.



And lets not forget the importance of their filtering our waters.

Thank you.

George R. Scocca
nyangler.com

[Check out my LinkedIn profile](#)

“I am the person that spearheaded the bill that has kept reduction fishing out of NY waters . . .

The availability of bunker throughout our has seen an increase in charter and party boats carrying anglers to get in on our great striped bass fishery.

Bass stick with their food source and this has kept a healthy population of stripers in our waters. It's sparked a number of for hire boats to carry more anglers than ever before.

It has had a profound effect on our bird population. We now have about a dozen nest par eagles on long island and the osprey population is thriving.”

**George Scocca
Editor, nyangler.com**

New Jersey Experience

Salt Water Sportsmen – 4/27/23

“Jersey politicians did one thing right: Getting the Omega 3 bunker boats out of state waters.

That has allowed a vast biomass of menhaden to proliferate throughout the year in Jersey waters. This draws behemoth bass into the bays, river systems and alongshore to fatten up on omnipresent adult bunker.”

<https://www.saltwatersportsman.com/howto/is-new-jersey-the-new-striped-bass-mecca/>

References

- (a) Report on the evaluation of the Chesapeake Bay Fisheries Science Program: Atlantic Menhaden Research Program Laurel, MD, April 22-24, 2009. [2009_05_08_Maguire_Chesapeake_Bay_menhaden_program_review_report.pdf \(noaa.gov\)](#)
- (b) Atlantic Menhaden Board Sets 2023 TAC at 233,550 MT & Approves Addendum I to Address Commercial Allocations, Episodic Event Set Asides, and Incidental Catch/Small-scale Fisheries [636e6629pr32AtlMenhaden2023TAC_AddendumIApproval.pdf \(asmfc.org\)](#)
- (c) Report on the evaluation of the Chesapeake Bay Fisheries Science Program: Atlantic Menhaden Research Program Laurel, MD, April 22-24, 2009 [sedarweb.org/documents/sedar-40-stock-assessment-report-atlantic-menhaden/](#)
- (d) VIRGINIA MARINE RESOURCES COMMISSION “PERTAINING TO ATLANTIC MENHADEN” CHAPTER 4 VAC 20-1270-10 ET SEQ. [REGULATION: PERTAINING TO ATLANTIC MENHADEN \(virginia.gov\)](#)
- (e) Atlantic States Marine Fisheries Commission 2019 Atlantic Menhaden Ecological Reference Point Stock Assessment Report [6436c5022019AtlMenhadenERPStockAssessmentReport.pdf \(asmfc.org\)](#)
- (f) Estimation of movement and mortality of Atlantic menhaden during 1966–1969 using a Bayesian multi-state mark-recovery model, February 2019 [Estimation of movement and mortality of Atlantic menhaden during 1966–1969 using a Bayesian multi-state mark-recovery model - ScienceDirect](#)
- (g) ASMFC Draft Amendment 7 Striped Bass FMP, table 18, page 135, 2/4/2022
- (h) ASMFC Draft Amendment 7 Striped Bass FMP, table 15, page 132, 2/4/2022
- (i) Maryland Department of Natural Resource, Connie Lewis email of 1/9/23
- (j) Virginia Marine Resources Commission, Stephanie Iverson email of 1/10/23
- (k) Potomac River Fisheries Commission Potomac River Commercial Finfish Landings for 2022 [http://prfc.us/pdfs/2023/Finfish-Harvest-Report.pdf](#)
- (l) Chesapeake Bay 2023 Young-of-Year Striped Bass Survey Results Announced [Chesapeake Bay 2023 Young-of-Year Striped Bass Survey Results Announced \(maryland.gov\)](#)
- (m) Dr. Noah Bressman email to Secretary Jeannie Riccio, Maryland Department of Natural Resources, 10/21/2021
- (n) (Watts, et al. 2024) Watts BD, Stinson CH, McLean BK, Glass KA, Academia MH, Byrd MA
- (o) Watts BD, Stinson CH, McLean BK, Glass KA, Academia MH, Byrd MA, Demographic response of Osprey
- (p) Academia MH and Watts BD (2023), Food Supplemental Increases
- (q) The Economic Contributions of Recreational and Commercial Striped Bass Fishing, April 12, 2019 [McGraw-Striped-Bass-Report-FINAL_compressed.pdf](#)
- (r) NOAA Fisheries Landing Data [Fisheries One Stop Shop \(FOSS\) | NOAA Fisheries | Landings](#)
- (s) 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report, 2019 [66th Northeast Regional Stock Assessment Workshop \(66th SAW\) Assessment Report \(noaa.gov\)](#) page 806
- (t) VMRC FISHERIES MANAGEMENT DIVISION EVALUATION, 12/6/2022 [https://mrc.virginia.gov/Notices/2022/2022-12-Menhaden-Buffers.pdf](#)
- (u) Omega Protein adds vessel to clean up net spills by: Charlie Paullin, July 7, 2023 [https://virginiamercury.com/2023/07/07/omega-protein-adds-vessel-to-clean-up-net-spills/](#)

Atlantic States Marine Fisheries Commission

Horseshoe Crab Management Board

April 30, 2024
3:00 – 5:15 p.m.

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*) 3:00 p.m.
2. Board Consent 3:00 p.m.
 - Approval of Agenda
 - Approval of Proceedings from October 2023
3. Public Comment 3:05 p.m.
4. Consider 2024 Horseshoe Crab Stock Assessment Update (*K. Rodrigue*) **Action** 3:15 p.m.
5. Discuss Horseshoe Crab Bait Demand (*C. Starks*) 4:00 p.m.
 - Possible Impact of State Harvest Regulations on Bait Demand
6. Adaptive Resource Management Subcommittee (ARM) Report (*J. Sweka*) 4:15 p.m.
 - Technical Response to External Review of ARM Framework Revision
7. Update on Horseshoe Crab Management Objectives Workshop (*C. Starks*) 5:00 p.m.
8. Elect Vice-Chair **Action** 5:10 p.m.
9. Other Business/Adjourn 5:15 p.m.

The meeting will be held at The Westin Crystal City, 1800 Richmond Highway, Arlington, VA; 703.486.1111, and via webinar; click [here](#) for details.

MEETING OVERVIEW

Horseshoe Crab Management Board

April 30, 2024

3:00 – 5:15 p.m.

Chair: Justin Davis (CT) Assumed Chairmanship: 02/24	Technical Committee Chair: Ethan Simpson (VA)	Law Enforcement Committee Rep: Nick Couch (DE)_
Vice Chair: Vacant	Advisory Panel Chair: Brett Hoffmeister (MA)	Previous Board Meeting: October 16, 2023
Voting Members: MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 2023

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 2024 Horseshoe Crab Stock Assessment Update (3:15-4:00) Action

Background

- A stock assessment update for horseshoe crab was initiated in 2023 and scheduled for completion in late 2024.
- The SAS completed the stock assessment update ahead of schedule, and the TC approved it for consideration by the Board (**Briefing Materials**).

Presentations

- Horseshoe Crab Stock Assessment Update by K. Rodrigue

Board actions for consideration at this meeting

- Accept assessment update for management use

5. Discuss Horseshoe Crab Bait Demand (4:00-4:15 p.m.)

Background

- At the October 2023 Board meeting, the Board tasked staff with compiling information from the states with horseshoe crab fisheries on bait landings, exports, and demand, and on regulations restricting horseshoe crab harvest.
- Staff collected and summarized the information from the states to better understand possible impacts of restrictive regulations in one state on bait demand and fishing pressure in other states (**Supplemental Materials**).

Presentations

- Summary of state horseshoe crab bait fisheries and regulations by C. Starks

6. Adaptive Resource Management Subcommittee (ARM) Report (4:15-5:00 p.m.)**Background**

- Since the ARM Revision was completed in 2021 there has been widespread public concern regarding the possibility of female horseshoe crab harvest. Earthjustice, a non-profit public interest organization, hired experts to do their own technical review of the ARM Revision in 2022 and again in 2023 before the annual meeting of the Board to set harvest specifications for the Delaware Bay region.
- In October 2023, the Board tasked the Adaptive Resource Management (ARM) Subcommittee with preparing a response to the September 2023 review of the ARM Framework by Dr. Kevin Shoemaker (**Briefing Materials**).

Presentations

- Technical Response to External Review of the ARM Framework Revision by J. Sweka

7. Update on Horseshoe Crab Management Objectives Workshop (5:00-5:10 p.m.)**Background**

- As part of its ongoing discussions regarding how best to manage Delaware Bay-origin horseshoe crabs and in response to the 2023 Stakeholder Survey, the Board agreed to hold Horseshoe Crab Management Objectives Workshop. The Workshop will include a small group of managers, scientists, and stakeholders to explore different management objectives for the Delaware Bayorigin horseshoe crab, with a focus on multi-year specification setting and modeling approaches when selecting no female harvest.
- The Workshop has been scheduled for July 2024. A report from the workshop including recommendations will be provided to the Board at the October 2024 meeting so that it can be considered during the 2025 specification setting process.

Presentations

- Update on Horseshoe Crab Management Objectives Workshop by C. Starks

8. Elect Vice Chair (5:10-5:15 p.m.) Action**Background**

- The vice chair seat is empty since Justin Davis has assumed the role of chair.

Board actions for consideration at this meeting

- Elect Vice Chair

9. Other Business/Adjourn (5:15 p.m.)

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

**Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting**

October 16, 2024

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

TABLE OF CONTENTS

Call to Order, Chair John Clark1

Approval of Agenda.....1

Approval of Proceedings from May 3, 2023.....1

Public Comment1

Set 2024 Delaware Bay Harvest Specifications1

 Review Horseshoe Crab and Red Knot Abundance Estimates and Model Results from the Adaptive Resource Management Framework Revision2

 Set 2024 Specifications4

Consider Results of Stakeholder Survey on Delaware Bay Management Objectives5

Consider Approval of FMP Plan Review and State Compliance for 2022 Fishing Year 11

Report on Status of Synthetic Endotoxin Testing Reagents..... 12

Review and Populate Advisory Panel Membership 15

Other Business..... 15

 Response to Earth Justice/Shoemaker Horseshoe Crab ARM Framework Analysis..... 16

Adjournment 18

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of May 3, 2023** by consent (Page 1).
3. **Move to accept the 2024 Adaptive Resource Management harvest specifications with 500,000 males and no female harvest on Delaware Bay-origin crabs. In addition, the 2:1 offset will be added to MD's and VA's allocations due to no female harvest** (Page 5). Motion by Shanna Madsen; second by Craig Pugh. Motion passes by unanimous consent (Page 5).
4. **Move to use the Stakeholder Survey Report as a basis for a Horseshoe Crab Management Objectives workshop, which would include a small group of managers, scientists, and stakeholders to explore different management objectives for the Delaware Bay-origin horseshoe crabs. This workshop should focus on multi-year specification setting and modeling approaches when selecting no female harvest. The intent would be to provide a report to the full Board in time for the 2025 specification setting process** (Page 11). Motion by Shanna Madsen; second by Joe Cimino. Motion passes by unanimous consent (Page 11).
5. **Move to approve the FMP Review, state compliance reports, and de minimis requests for South Carolina, Georgia, and Florida for the 2022 fishing year** (Page 12). Motion by Mike Luisi; second by Emerson Hasbrouck. Motion passes by unanimous consent (Page 12).
6. **Move to approve Advisory Panel nomination for Sam Martin from Maryland** (Page 16). Motion by Mike Luisi; second by Shanna Madsen. Motion passes by unanimous consent (Page 16).
7. **Move to task the Adaptive Resource Management Subcommittee with preparing a response to the September 2023 review of the ARM Framework by Dr. Kevin Shoemaker** (Page 16). Motion by Bill Hyatt; second by Mike Luisi. Motion passes by unanimous consent (Page 18).
8. **Move to adjourn** by consent (Page 18).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission convened in the Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Monday, October 16, 2023, and was called to order at 3:15 p.m. by Chair John Clark.

CALL TO ORDER

CHAIR JOHN CLARK: Welcome to the Horseshoe Crab Board. I think most of the Board is here and getting to the table. We are running behind, so I will talk fast. Welcome everybody. I am the Chair for the meeting, I'm John Clark from Delaware. I'm joined up here by Program Plan Coordinator extraordinaire, Caitlin Starks.

We have from the Law Enforcement Committee, Captain Nick Couch from Delaware, and we also have our Assessment Wonder Team here of John Sweka and Kristen Anstead here, so we are well represented up front.

APPROVAL OF AGENDA

CHAIR CLARK: Let's move right into the Consent Agenda. The agenda, right now there will be a change in the agenda you have.

The Item Number 5 will be considered before Item Number 4, so Item 5 becomes Number 4. In addition, we will have an Other Business Item, actually I think there is a couple of Other Business items that will come up, so we will get to that at the Other Business section of the agenda. Are there any other revisions to the agenda? Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR CLARK: Are there any changes or revisions to the proceedings from the May, 2022 meeting of this Board? Seeing none; the proceedings are approved by consent.

PUBLIC COMMENT

CHAIR CLARK: Do we have any public comment? Okay, this is public comment for items that are not on the agenda. Is there anybody in the room that has

any comment? Not seeing any hands, we do not have comments.

SET 2024 DELAWARE BAY HARVEST SPECIFICATIONS

CHAIR CLARK: Now we'll move right into Agenda Item 4, which is Item 5 on your agenda. Take it away, John.

DR. JOHN SWEKA: As you all remember, the ARM Framework was revised and accepted for management use back in 2022. Under Addendum VIII, the ARM Framework will be used annually to produce state harvest recommendations to the Delaware Bay. Within that Addendum we have a maximum harvest that can be recommended of either 210,000 females and 500,000 males. Last year 125,000 females and 475,000 males were recommended for the 2023 harvest season.

However, the Board did elect to implement a 0 female harvest last year. Within the ARM Framework, the overall objective statement, as you've all seen before, is to 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. The data that go into the ARM on an annual basis that we use then to make a decision, includes the red knot population estimates from a mark-resight analysis. This is conducted by Jim Lyons of USGS, and is based on visual counts of birds along Delaware Bay beaches, along with the number of birds that showed unique flags or marks on their legs.

The horseshoe crab population estimates come from three trawl surveys, the Virginia Tech Trawl Survey, the Delaware Adult Trawl, and the New Jersey Ocean Trawl Surveys. These trawl surveys then are incorporated into what is known as our Catch Multiple Survey Analysis Model, which also includes bait landings, dead discards and biomedical mortality, to ultimately come up with a population estimate of horseshoe crabs.

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

**REVIEW HORSESHOE CRAB AND RED KNOT
ABUNDANCE ESTIMATES AND MODEL RESULTS
FROM THE ADAPTIVE RESOURCE MANAGEMENT
FRAMEWORK REVISION**

DR. SWEKA: Here we have the red knot population estimates through time, dating back to 2011. These are the mark-resight population estimates that as I mentioned, Jim Lyons calculates these each year for us. In 2023, there were 39,361 red knots with confidence intervals ranging from 33,000 to 47,000. In 2022 there were 39,800 red knots, with confidence intervals ranging from 35,000 to 51,000.

When we make an annual harvest recommendation, for this year we will actually use the 2022 estimate, and this aligns the bird count, along with the population estimate of horseshoe crabs from 2022, which is the time period for which we have complete data for. Don't worry, there is two-year delay between when we have our population estimates from 2022, when harvest would be implemented in 2024.

That two-year time lag was incorporated in the ARM optimization. For female harvest of horseshoe crabs, this is a time series going back to 2003. You can see in more recent years the female harvest in the bait landings has declined greatly, because of the annual ARM recommendation of 0 female harvest.

The black portion of these bars are the dead discards, and in 2016 to 2021, the dead discards went up for females quite a bit, and that was because we had a very high dredge ratio, which influences the overall estimates. Now we must admit that our estimates of dead discards are pretty uncertain. There is a lot of variability, and just reporting issues within the NEFOP data to generate those.

The gray bars here represent biomedical mortality, and in the interest of protecting confidential data, here we represent the biomedical mortality as the total coastwide biomedical mortality, assuming it all comes from Delaware Bay. This graph just shows the male harvest through time. You can see since 2013 the bait landings are obviously much higher than that for males than they are for females, because we have

consistently recommended 500,000 bait harvest.

But in reality, even the bait harvest, even though the ARM had recommended 500,000, still are a few hundred thousand less than the actual ARM implementation through time. Again, in black there are the dead discards, and in gray the coastwide biomedical mortality. Moving on to the indices of abundance. These are the female indices of abundance of horseshoe crab from the various trawl surveys. The first line I want to draw your attention to is the black solid line. That represents the fully mature or the multiparous animals from the Virginia Tech Trawl Survey. You can see in the last two years we've hit our greatest number over the course of the time series. The black dash line represents the newly mature, or the primiparous crabs in the Virginia Tech Trawl Survey.

Over the last couple years, it's been very low, and in fact it was 0 in 2022. I'll discuss this more as we move on in the presentation. The other trawl surveys there, the gray dash line represents New Jersey Trawl Survey, and it had some missing years due to COVID pandemic, but came back online in 2022.

The most recent values through New Jersey Trawl Survey happens to be the highest value over the time series, dating back to 2003. Then finally, the solid gray line is Delaware Trawl Survey, and since approximately 2010, 2011, it has shown a consistent increase through time. Likewise, the male horseshoe crab indices, again Virginia Tech in black there.

The two highest values occurred in the last two years for the multiparous for mature individuals. The newly mature or primiparous individuals, they were more than what the females were. You can see in 2022 was actually the highest value for newly mature individuals from the Virginia Tech Trawl Survey.

Then likewise, the Delaware and New Jersey Trawl Surveys, they generally showed an increase since about 2010. I mentioned the Virginia Tech had 0 primiparous, or newly mature individuals in 2022. Well, this is a problem. This is a problem for our catch multiple survey analysis, and we had to come

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

up with a way to address it.

In 2022, 0 primiparous or newly mature individuals. The catch multiple survey analysis is really a simple state-structured model that sums the newly mature plus the mature animals. Subtract the harvest and natural mortality, and then predict the population next year. If you have a 0 in there, the model will not run.

This is concerning, and we've discussed it among the Technical Committees, three possible hypotheses for why the Virginia Tech Trawl Survey ended up with a 0 year. One of them could be catchability. Perhaps the catchability between the fully mature and newly mature individuals has changed, or suddenly changed through time, and the trawl survey just don't encounter them.

Second hypothesis is a recruitment failure. Perhaps approximately ten years ago something caused a decline in the new female horseshoe crabs that has then become evident here in recent years, or the third thing is possibly an identification issue within the Virginia Tech Trawl Survey. Perhaps many of the newly mature individuals are being misidentified as fully mature individuals.

Of these three possible hypotheses, it seems to me that the recruitment failure one is probably the least likely, because it is difficult to think of some sort of a mechanism, where newly mature males continue to increase, where females all of a sudden tanked and dropped off to 0. You know what would it be that would affect immature female crabs and not immature male crabs. This is an issue that the Technical Committees have given quite a bit of thought to and discussion. One way that we could deal with this, we had to come up with a method to fill in this gap from 2022, with a 0. We looked back at the time series of data from 2003 to 2019. The newly mature portion of the female population is approximately 20 percent of the total mature, you know the newly plus the mature.

That was very consistent up until 2019, and then all of a sudden, the newly mature animals just seemed to kind of disappear. We also have some

corroborating evidence from the Delaware Trawl Survey, which in recent years also started to stage crab. From 2017 to 2022, Delaware comes up with nearly the same proportion of newly mature individuals at 19.86 percent. Both lines of evidence how that typically there is about 20 percent newly matured animals in the mature population.

The ARM and the Delaware Bay Ecosystem TC decided to adjust the 2020 to 2022 data, so that the newly mature females are approximately 20 percent of the total mature population. This maintained a total number of mature crabs, but this also allows us then to continue to run the catch multiple survey analysis.

This is also supported by the biology of the horseshoe crab. It doesn't seem like we could possibly get the increase in mature females, without some level of newly mature females also being in the population. It doesn't make sense that they would increase, but you didn't have any newly mature entering the population.

This graph just shows the Delaware adult trawl survey partitioned into mature and newly mature individuals. You can see how the two track each other through time. Here we have just a percent newly mature in the Virginia Tech Trawl Survey and also the Delaware Trawl Survey. As you can see from 2003 up through 2018, on average we're right about 20 percent in the Virginia Tech Survey.

But then all of a sudden in 2019 it declines greatly. Whereas, in the Delaware Trawl Survey we're still on average around 20 percent there. When we take all this information and put it into the catch survey analysis model, this is the population estimate for mature females in the Delaware Bay through time, starting in 2003 up through 2022.

You can see our point estimate at this point in time is the highest it has been yet. In the Catch Multiple Survey Analysis, we conducted two ways to show publicly. We consider coastwide biomedical mortality, and then absolutely no biomedical mortality, and kind of bracket where the truth is. You can see that the inclusion or exclusion of biomedical

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

mortality makes very, very little difference, and in fact these lines are basically on top of one another.

Here we have the population estimates coming out of the catch multiple survey analysis model for males. Then again, the point estimate is at an all time high, and really no affect of inclusion or exclusion of coastwide biomedical mortality. Just for a direct comparison, because everybody got used to the Virginia Tech Trawl Survey and the swept area estimate of abundance being the way that we assessed the horseshoe crab. This graph just shows how to do a direct comparison to the Virginia Tech Trawl Survey here in gray, and then the Catch Multiple Survey Analysis in black, in the black dash line. You would see in the few most recent years our analysis, they line up very, very closely between Virginia Tech and the Catch Multiple Survey Analysis. There are some years where the CMSA was higher, some years when it was lower than the Virginia Tech estimate. This is the same comparison, the CMSA in black and the Virginia Tech Trawl Survey in gray for the male horseshoe crab abundance.

It's interesting that in the most recent years the Virginia Tech Survey actually gave us a higher abundance estimate than what the CMSA does. But they are still, both of them are at their highest levels in the most recent year. Taking this information, we then can make a harvest recommendation based upon the current state of the system, so that means the abundance of male and female crabs along with red knots.

Coming out of the ARM Framework and our optimization we have what were known as harvest policy functions. These harvest policy functions then allow us to take the abundance of both species, and recommend an optimal harvest. AS per Addendum VIII, the recommended harvest is then rounded down to the nearest 25,000 crab.

This is in an effort to protect confidential biomedical data, because if we put out the exact population estimate, somebody could work backwards and essentially solve for what the biomedical harvest was in Delaware Bay.

SET 2024 SPECIFICATIONS

DR. SWEKA: For 2024, the recommended harvest coming out of the ARM Framework would be 500,000 males and 175,000 females.

This is based off 39,800 red knots in 2022, approximately 16 million female horseshoe crabs, and approximately 40 million male horseshoe crab.

When we then take these harvest recommendations and apply the allocation scheme that was part of the Addendum VIII, and also maintain, you know we partitioned horseshoe crab based on their proportions are actually Delaware Bay origin, and also institute an Addendum IV cap for Maryland and Virginia.

These are the harvest quotas that would ultimately result for 2024. You can see of Delaware Bay origin, you sum the crabs up across the state, 500,000 males, 175,000 females. For the total quota, it's slightly more with 513,000 total male and 185,000 total female. With that I can take any questions on the 2023 results and the 2024 harvest recommendations.

CHAIR CLARK: Before we take those questions, I'm going to turn it over to Caitlin to put up a couple slides.

MS. CAITLIN STARKS: Just to start the conversation off for the Board's consideration today is to set the 2024 Delaware Bait harvest specifications. I just provided this as an alternative as well, considering what was approved last year. This is here as well, if it needs to be used or discussed.

CHAIR CLARK: Thank you, Caitlin, and with that we'll take questions for John, or comments about the harvest specifications. Any questions? Okay, I'm not seeing any, oh, Shanna Madsen.

MS. SHANNA MADSEN: I was seeing no questions, so I was prepared to make a motion.

CHAIR CLARK: Very good, in that case, go right ahead, Shanna.

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

MS. MADSEN: All right, I'll wait for a second, because I know I've got it up there. The motion is **move to accept the 2024 Adaptive Resource Management harvest specifications with 500,000 males and no female harvest on Delaware Bay-origin crabs. In addition, the 2 to 1 offset will be added to Maryland's and Virginia's allocations due to no female harvest.**

CHAIR CLARK: Thank you, Shanna, do I have a second? Craig Pugh seconds. Any discussion on the motion? Shanna, did you want to say anything about it?

MS. MADSEN: Sure, yes, I can make a couple of comments on the motion. My justification for making this motion is similar to the one that we made last year. You know I think that we've heard from the public that right now there is not an appetite for female harvest, so the Mid-Atlantic states have decided to continue utilizing the offset, and only having male harvest.

I do think that setting the specifications this way leads very well into our next agenda item, and some ideas that I have moving forward, on how to handle years where we're going to continue to only have male harvest, even though the ARM recommends to us that we can also harvest females.

CHAIR CLARK: Craig, did you have any comments you would like to add?

MR. CRAIG PUGH: Yes, I agree, at this time I know we've explored the female harvest, but it's obvious to us, the people of the state of Delaware really don't want to accept that. They have no appetite for that. This seems to be the most reasonable solution, and we're willing to accept it.

CHAIR CLARK: Any further comments on the motion? I see Joe Cimino.

MR. JOE CIMINO: Thank you, John, for the presentation. I'm encouraged by the recent numbers, but it was a long time getting here, so I fully support this motion, because I think we need to get a few more years under our belt, before we really start seeing stuff. In fact, I know we can't make

motions, that we have to revisit this every year and can't make a motion for no female harvest into the future. But I certainly hope that others around the Board would support that until we see this positive trend increasing for a fair amount of time.

CHAIR CLARK: Thanks, Joe, and I think that will probably segway into a topic we'll be touching on. But for the meantime, because I don't see any more hands, are there any hands online? None online, so in that case I don't think anybody needs to caucus. Is there any need to caucus? Seeing none; why don't we try doing this the easy way.

Is there any objection to the motion? Seeing none; the motion is passed by consent. Before we leave this topic, anybody want to talk about the specifications going into the future? Okay, we'll get back to that after we talk about the results of the survey.

CONSIDER RESULTS OF STAKEHOLDER SURVEY ON DELAWARE BAY MANAGEMENT OBJECTIVES

CHAIR CLARK: I'm going to turn it back over to Caitlin, to cover the stakeholder survey.

MS. STARKS: I'm going to try and go quickly through this given the time. I hope you all had a chance to read the report. But in this presentation, I'm going to cover the background on the survey, the methods used, the results and then talk about next steps. To start, the ARM Framework was established back in 2013, implemented in 2013, and that has been used to set bait harvest specifications for horseshoe crabs of Delaware Bay origin, with consideration of abundance of horseshoe crab and red knots.

That was peer reviewed in 2020, the revision was peer reviewed in 2021, and approved by the Board for use in 2022, and officially adopted for setting Delaware Bay specifications under Addendum VIII. During the public comment process for Addendum VIII, the public expressed significant concerns and over 30,000 comments about the status of the red knot population in the Delaware Bay and the potential impacts that could have with the limited female harvest that was allowed for under the

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

revised ARM.

In light of those concerns, the Board set the 2023 specifications with 0 females and using the 2 to 1 offset. This May, the Board discussed approaches for evaluating the current goals and objectives for the Delaware Bay horseshoe crab fishery and ecosystem, and they decided to form a workgroup to develop a survey that would be distributed to stakeholders of the region, including bait harvesters and dealers, biomedical fishery and industry participants, and environmental groups in the Delaware Bay Region.

The purpose of the survey was to provide the Board with information to help them evaluate this current management objectives. The workgroup met four times in June through September, to develop the survey. These are the overarching questions that the group aimed to get insight into through this survey.

A key question that could help inform management is whether or not there is demand for the harvest of female crabs in the fishery. Knowing that many feel female harvest should not be allowed at present from those public comments, what are the conditions that would make stakeholders comfortable allowing female harvest?

What management goals for the Delaware Bay Region are important to stakeholders, and ultimately, should the Board consider changes to the management program for the Delaware Bay bait fishery. The survey was developed by the workgroup and reviewed by a social science researcher, to improve the questions and remove sources of bias.

The workgroup then identified a pool of stakeholders from the Delaware Bay states of New Jersey, Delaware, Maryland and Virginia, collected their contact information, and were able to send the survey out to 107 individuals through Survey Monkey at the end of August. The table here is showing the numbers of stakeholders in the target stakeholders' group and state.

Now I'll move on to the results. We had a 38 percent response rate to the survey, with 40 responses. The largest numbers of respondents were from New

Jersey, and the largest number for primary field of work were from commercial fisheries. As you'll see later, the groups that were identified from their responses in Question 2 about field of work, were used to break out the responses to some of the later survey questions, to see how the stakeholder group responded. Additionally, the commercial fisheries group was administered a specific set of questions that were aimed to get a better understanding of the fishery, and the perspective of the commercial industry. First the commercial fisheries group was asked what the horseshoe crabs they harvest or sell are used for.

Most said bait or both bait and biomedical, and one said they did not know. Fourteen respondents also said they have harvested female horseshoe crabs in the past, and five had not. When asked how important it is to be able to harvest or sell female horseshoe crabs for bait in the future, the majority said it was very important, and the next largest group said of average importance, and then absolutely essential, and only two of those respondents said it was of little or no importance to them.

A strong majority of the commercial harvesters or dealers also agreed that female horseshoe crabs are worth more than males, and similarly a strong majority disagreed with the statement that there is no market demand for female horseshoe crab. When asked to choose between two quota scenarios, one where they would have a larger overall quota of only male horseshoe crabs, and another where they would have a smaller overall quota, including some female horseshoe crabs, there was an even split in the responses.

When you look at them by state, you will see that the respondents from New Jersey tended to the majority prefer the larger overall quota, but respondents from Virginia all preferred the smaller overall quota, including females, and there were insignificant trends in the other states. That was the end of the slides that were administered only to the commercial fisheries group.

The rest of these were applied to all of the survey responding. These next few slides are showing the results of Question 8 in the survey, which asks

These minutes are draft and subject to approval by the Horseshoe Crab Management Board.

The Board will review the minutes during its next meeting

participants to respond to six statements about different components of the Delaware Bay ecosystem, with their level of agreement on a scale of one to five, where one is strongly agree and five is strongly disagree.

On this slide are the results to two statements, the first is the Delaware Bay population of horseshoe crabs is healthy, and the that's on the left. Then on the right the number of horseshoe crabs in the Delaware Bay population is increasing. The general thing to note with these graphs is how the responses are distributed for each of the respondent's groups, which are shown as different colors in those bars.

For some groups the answers are generally similar among all the respondents in that group, but in some cases, there is not as much agreement, and those responses are more spread out. One challenge that is to be noted for all of these questions, is that we don't have equal numbers of respondents in each of those groups, and some of those groups did not have very many respondents, so that makes it difficult to look at those trends.

These are the responses to the statement the horseshoe crab bait fishery is negatively impacting the Delaware Bay population of horseshoe crab on the left, and on the right horseshoe crab bait fishery is negatively impacting red knots in the Delaware Bay. Then these are responses to fishermen should be allowed to harvest female horseshoe crabs from the Delaware Bay population if it is at a healthy level, and fishermen should not be allowed to harvest male horseshoe crabs from the Delaware Bay population if it is at a healthy level. When you look at the average response to each of those statements by group, which is what's shown in each cell of this table, you can see that there is a lot of disagreement between groups on each of the statements. In this table, the cells are color coated with the averages that fall on the side of agreement shaded in green, and the averages that fall in the side of disagreement shaded in red, and averages that are more in the neutral range are white.

You can see as it alternates back from green to red to white to green, there is not a lot of agreement

going across a row with each individual statement by each group. The next two questions were focused on the perception of different impacts on the horseshoe crabs and red knots. Here we see that of climate change, horseshoe crab harvest and human development of the shoreline.

The average response from these individuals they ranked to be human development of the shoreline as having the greatest impact on the Delaware Bay population of horseshoe crab. That is again the average of all responses. It should be noted that some of the group responded differently, so the respondents in the environmental group and the academia or research group ranked horseshoe crab harvest as having the greatest impact on the horseshoe crab population. Then the pattern in the results for the second question are quite similar to the last.

When they ranked the impact of these three things on the red knots that stopover in the Delaware Bay, so we ranked climate change, reduced egg availability due to horseshoe crab harvest, and human development of the shoreline by the level of impact. The environmental and academia group both ranked reduced suitability due to the horseshoe crab harvest as the highest impact, and the commercial fisheries and biomedical groups ranked human development of the shoreline as having the highest impact.

The next set of questions focused on the importance of different management objectives to the respondents. First, they were asked how important each of these seven items on the left were on a scale of one to five, from not important at all to absolutely essential. When all of the responses were averaged, that is what is showing in this bar graph. The two most important issues were using the best available science to inform management and maintaining a healthy population of horseshoe crab.

Again, it should be noted that there were differences when this is broken out by groups. To test this question another way, the responses were also asked to rank the first five of those objectives by their importance, and in this case the results more

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

distinctly show the pattern where maintaining a healthy horseshoe crab population is on average the most important of the five objectives.

This matrix shows that the breakdown from that last question, when the responses were averaged by group. Green is indicating a higher rank was assigned, on average. Red is indicating a lower rank was assigned on average, and yellow is an average that falls more in the middle. You can see here that three of the five stakeholder group on average, ranked maintaining a healthy horseshoe crab population as most important. There was a tie for the biomedical group with allowing horseshoe crabs to be used in the biomedical industry for human health. Then three out of five groups on average ranked maximizing horseshoe crab bait harvest as the least important objective. Then protecting female horseshoe crabs ranked in the middle for four out of the five groups, based on group average. But the rank of the other two issues were less consistent among the group.

The next question was asking the respondents if the ARM model should be modified, and of the 36 responses, 47 percent said yes, 20 percent said no, and 33 percent said, I don't know. The respondents who answered yes to this question were then presented with another question, which asks why they think it should be modified, and 16 open-ended responses were given to this.

There was a wide range of responses, but among the commercial fishery members who responded, there was a theme that stuck out, which was the idea that the ARM is underestimating the number of horseshoe crab. Then seven responses, mostly from the academic or environmental conservation respondents spoke about issues with the model and built in assumptions in the framework.

Then two comments stated that the horseshoe crab population should be large before the harvest is allowed to be increased. Question 15 then asks survey participants if they think a limited amount of female horseshoe crab bait harvest should be allowed at this point in time, and 35 responses, we

had and 49 percent said yes, 37 percent said no, and 14 percent said, I don't know.

This graph is showing how the responses were distributed within each group in the chart. This next question aimed to understand the stakeholder opinions on whether female horseshoe crabs should be collected for biomedical purposes, and again we had 35 responses, 46 percent said yes, 43 percent said no, and 11 percent said, I don't know. Again, the trends were different in how the numbers of each of those groups responded as shown in the graph.

Then the last question in this survey was an open-ended question, and it provided an opportunity for the respondents to add information that might not have been considered in the other survey questions. They asked, what you think is the most important, what is most important for managers to consider when making decisions about the management of the Delaware Bay horseshoe crab population.

The more prominent themes in the responses about what is most important were the health of the horseshoe crab population, basing management decisions in robot science, allowing sufficient bait harvest, and impacts on fishermen in coastal communities. Then some other mentions included the larger ecosystem as a whole. Allowing for biomedical use, switching to synthetic alternatives to LAL and bait, and making sure there are adequate spawning beaches, and improving the data that are used for management.

To wrap up, I have summarized some of the key takeaways from the survey that respond to the overarching questions posed by the workgroup. First, the commercial industry respondents did show with their responses that there is demand for female horseshoe crabs, and they are considered more valuable than males. The majority of the commercial industry respondents also thought female harvest should be allowed now, but the majority of other respondents did not. Maintaining a healthy horseshoe crab population is considered one of the most important goals across the stakeholder groups, and many of the respondents do think the current ARM Framework should be modified, but there are

These minutes are draft and subject to approval by the Horseshoe Crab Management Board.

The Board will review the minutes during its next meeting

varying reasons behind that option or opinion. Lastly, in general, stakeholders highly value the use of the best available science to inform management. In response to the survey results. If the Board wishes to consider any next steps moving forward, these are a few potential paths. The Board could task the workgroup with going back and developing additional recommendations based on these results.

The Board could also direct staff to conduct a more in-depth process involving stakeholders from these various groups, like we outlined when we proposed the options for investigating this issue. If the Board does want to make a change to the management program that was established under Addendum VIII, then a new addendum or amendment would be required. With that I can take any questions.

CHAIR CLARK: Thank you very much, Caitlin, I think the survey did a great job of confirming what we suspected the different groups think about this. Before we get further in the discussion, I just wanted to acknowledge the phenomenal amount of work that Caitlin put in to bring this survey together, get it out, and compile that great report. Very much appreciated, Caitlin. With that do we have any questions or comments about the survey? I see Dan McKiernan, go ahead, Dan.

MR. DANIEL MCKIERNAN: Caitlin, is there any explanation for why females horseshoe crabs are considered more valuable?

MS. STARKS: The survey did not address that question.

MS. MCKIERNAN: Is there anyone in the room who could?

CHAIR CLARK: Dan, the horseshoe crab, well, Craig can get that. But I think it will be about eels, right, Craig?

MR. PUGH: Well, it's not just the eels. The female horseshoe crab is used for bait for conchs, catfish and eels as well. Where your most marketed difference is in landing is when the female horseshoe crab was eliminated in American eel landings. I know

that they consider that as depleted resource, but for most of us that fished it, understood why the landings were tremendously lower after they eliminated that from our options.

Anybody that is my age, I consider myself one of the new old guys, and I've said that here before. I'll repeat it again, if you have fished with that, and I would say most of the fellows of that age group would be between 50 to 70, understand, because they've used that bait in the past, and they know that there is nothing comparable to that bait for that type of fishery.

It works better than anything else that is out there. You know trial and error, there is no artificial bait that can even match it, not touch it. It would be like putting a piece of sandpaper in there, anything else other than that. It is that extreme in its catchability, especially when they are producing eggs. Even the frozen, we used to freeze them, cut them, harvest them, pack them, freeze them up for bait, so that we could use them through the winter and fall months as well. Because of that their value was well over 100 percent of what the male was, and much, much well over any artificial bait that you could ever imagine. But yet, it was a huge resource for us that was taken away about 20 years ago or so. In saying that and giving you what my age is, some of the newer fellows that are in our fisheries that are in their 20s, in their 40s, have not experienced that.

They don't know the catchability of that product and what it will do. Their standards are a little lower than ours because of that, but value wise, yes, without a doubt. It was highly prized, highly valued. But I think as our groups of fishermen age out, it looks as though the appetite for this is somewhat extinguished.

CHAIR CLARK: Thanks, Craig, and I confirm what Craig said there. The year after females were banned in Delaware, from 2007 to 2008, our eel landings dropped by 50 percent. It really is an amazing bait for eels in the Delaware Region. Mike Luisi, and then Shanna.

MR. MICHAEL LUISI: I also wanted to acknowledge Caitlin's hard work. You stole the words out of my

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

mouth, as Chair. Being part of the working group, not only was it amazing to watch Caitlin put together the survey, but to deal with the five or six of us was another challenge all of its own, whether tracking us down or dealing with John, Mr. grumpy.

You know, you can't find him and then he's grumpy about things, so Caitlin did an amazing job. I do want to say and I do want to say this for the record, and I've made this point a number of times before, in regard to the female horseshoe crab harvest for bait. I don't know how many years it has been now, but we slowly went from a female crab majority of the harvest down to a 50/50 down to a 2 to 1, down to nothing, as far as female harvest in Maryland.

I don't want the Board to get the impression that there is no interest in the female crab for harvest and for use of bait, it's just that the fishermen right now, given the amount of interest in the topic of horseshoe crab, shorebirds and other things, would just rather leave things alone. Although they would make more money, and probably for eels and conch pots, would probably do a little better if they were able to buy and sell the females.

I just wanted to make it clear that there is an interest there, and I don't know what the best word is, but the drama around it is more than what the fishermen are willing to deal with, so they would rather just make use of what they have with the males. I think in moving forward, if we're taking this survey and thinking of it as giving us a push towards next steps. I think there should be something, if a modification to the ARM is the way we go.

There should be something there so that when the modeling is telling us that something is allowed to be harvested sustainably, that it's not a fight, it's the best available science. This is what it's telling us we can do, and that next level of argument would be unnecessary, and maybe our fishermen, if the populations of the birds and the crabs were high enough, would be able to benefit from that.

CHAIR CLARK: Shanna Madsen.

MS. MADSEN: I have a question for, I guess the dynamic duo, as you called them, Dr. Sweka and Anstead. I want to preface this question with saying that the reason that I'm asking it is not because the ARM "sucks." It's because I have a question regarding what we could potentially consider moving forward. I would like to know if the ARM team or the Assessment Team has started to consider any modeling approaches or information that you could give the Board, if we continue to decide to only harvest males.

DR. SWEKA: We haven't really discussed it formally amongst the ARM Workgroup. I certainly have a few ideas that if we're going to continue with male only harvest, essentially the process could be a lot simpler, and rely on a lot less data. But again, there is the conversation. You know I have some thoughts. They haven't been discussed with the entire committee or with other stakeholders yet.

CHAIR CLARK: Further questions, discussions? Okay, I believe at this point, is there anybody online, Caitlin? Okay. Do you want to put the slide back up that had possible actions here for this, Caitlin? Caitlin outlined the next steps, and Shanna, you have a proposal.

MS. MADSEN: Yes, I actually have a motion prepared, which is in essence bullet point 2, which Caitlin has up on the screen, and I'll wait until the motion gets up and I will speak to it. Okay, great, thank you. My motion is, **move to use the Stakeholder Survey Report as a basis for a Horseshoe Crab Management Objectives workshop, which would include a small group of managers, scientists, and stakeholders to explore different management objectives for the Delaware Bay-origin horseshoe crabs.**

This workshop should focus on multi-year specification setting and modeling approaches when selecting no female harvest. The intent would be to provide a report to the full Board in time for the 2025 specification setting process.

CHAIR CLARK: Thank you, Shanna, do we have a second? Joe Cimino. Would you like to speak to the motion, Shanna?

MS. MADSEN: Sure, thank you, John. I would also like to echo my big thanks to Caitlin. I think that the survey was definitely the correct move forward. However, the results of the survey lead me to believe that we definitely need to start to have more open conversations about what our management objectives should be. If we are not going to continue to harvest female horseshoe crabs, I think that the Delaware Bay states have had conversations.

Like Mike just commented, it's not that our harvesters don't wish to harvest females, or don't have a market for harvesting females, but at the time right now, you know the public is very interested in us not moving forward with harvesting females. In that case I think it's incredibly important for stakeholders, managers and scientists that have an interest in this Delaware Bay origin stock to have a discussion on what our management objectives should be, and find those.

They are going to oftentimes be conflicting, but make that determination on what we do when we don't harvest female crabs, and hopefully can move forward in a multi-year specification setting process. The Board can make a decision, hopefully ahead of time, as to the period of time that they would like to select, not harvest female horseshoe crabs and move forward with that. I think that this really mirrors what we did for Atlantic menhaden, and that turned out incredibly well. It was really, really helpful to have everyone in the room discuss how to move forward. I look forward to hopefully getting this process up and going, if the Board agrees.

CHAIR CLARK: Joe, did you have anything you wanted to add to that?

MR. CIMINO: Just quickly. I think unfortunately we're saying that impact of climate change progressing possibly faster than we thought. Certainly, we're at a level far beyond what we experienced when we first started this process. I am proud of this process, and I just think this is a next

step forward for it.

CHAIR CLARK: Do we have further discussion of this motion? Anybody have anything you would like to add? Not seeing any, is there any need to caucus? Not seeing any, let's see if we can do this the easy way again. **Are there any objections to the motion from the Board? Not seeing any; the motion is approved by consent.**

CONSIDER APPROVAL OF FMP PLAN REVIEW AND STATE COMPLIANCE FOR 2022 FISHING YEAR

CHAIR CLARK: We're going to move on now to Item Number 6, which is Consider Approval of the Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year.

MS. STARKS: Again, I'm going to move quickly, to try and make up our time. This is our management history for horseshoe crabs. The most recent edition is of course, Addendum VIII in 2022. Then this figure shows the annual values of reported horseshoe crab bait harvest in orange, and biomedical collections in light blue, and estimated biomedical mortality in dark blue, and values are in millions of crabs.

The total reported bait harvest in 2022 was 570,988 crabs, and this excludes confidential landings from Rhode Island and Florida. The 2022 landings were a 23 percent decrease from 2021, and still well below the Commission's coastwide quota, which is 1.59 million crabs, and the total state-imposed quota, which is 1.03 million crabs.

The states of Delaware, Massachusetts, New York, Virginia and Maryland made up 99.7 percent of the 2022 coastwide landings, with Delaware, Maryland and New York harvesting the highest numbers. Then for biomedical, in 2022 the number of crabs that were selected for the sole purpose of LAL production was 911,826 (my brain is going today) crabs, and this is a 26.8 percent increase from 2021.

The estimated biomedical mortality was 145,920 crabs, and this number includes the observed mortalities reported by each state, as well as an additional 15 percent of the total crabs that were

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

bled and are assumed to die. In 2022 the biomedical mortality represents about 20 percent of the total directed mortality for horseshoe crabs, which is about 717,000 crabs. Compared to 2021, in 2022 the biomedical mortality estimates increased, but the overall total removals, including bait harvest, decreased.

This graph is just showing the total coastwide mortality of horseshoe crabs by year, broken out by bait and biomedical mortality, so you can see the relative magnitude of each of these sources of mortality. For de minimis states, states can qualify if their combined average bait landings for the last two years are less than 1 percent of the coastwide total for the same two-year period. In 2022, requests from South Carolina, Georgia and Florida were submitted, and they meet their criteria for de minimis status. The PRT made a few recommendations based on the review of the annual compliance reports. First, as usual is to seek long term funding for the Virginia Tech Trawl Survey, which is critical data for our current management program. Then they also recommend working towards getting annual estimates of horseshoe crab discard removals.

Then with regard to the state compliance, the only minor issue noted by the PRT is that reports from Massachusetts and Connecticut were not submitted by the deadline, and other than that all states and jurisdictions appear to be in compliance. The PRT recommends approval of the state compliance reports, de minimis requests and the FMP review for the 2022 fishing year. I'll take any questions.

CHAIR CLARK: Any questions for Caitlin about the FMP review? Roy Miller.

MR. ROY W. MILLER: Caitlin, do we have any information on what percent of the biomedical take and/or mortality are female horseshoe crabs as opposed to males?

MS. STARKS: We do. It would take me a minute to track down the numbers of male and female percent for the biomedical mortality. That's what you're looking for? Okay, I can look that up.

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

CHAIR CLARK: Okay, while Caitlin is doing that are there any other questions about the FMP review? Seeing none; in that case, would somebody like to make the motion to approve? I have Mike Luisi.

MR. LUISI: Is there a motion?

CHAIR CLARK: Do you want to go ahead?

MR. LUISI: I'm part of the new/old, I'm getting close to the new/old.

CHAIR CLARK: Can you read that, is it big enough?

MR. LUISI: Of course, it is, John. **Move to approve the FMP Review, state compliance reports and de minimis requests for South Carolina, Georgia and Florida for the 2022 fishing year.**

CHAIR CLARK: Okay, we have a motion is there a second? Emerson Hasbrouck. Is there any discussion of this motion? Seeing none; **is there any objection to this motion? Seeing none; the motion is approved by consent.** Caitlin, you have the numbers for Roy?

MS. STARKS: I hope so. I have a massive spreadsheet, and I believe that in 2022 the males collected were 43.9 percent and the females were 34 percent, and the rest were unknown.

CHAIR CLARK: Okay, we finished Item Number 6.

REPORT ON STATUS OF SYNTHETIC ENDOTOXIN TESTING REAGENTS

CHAIR CLARK: Now we are on to the Number 7, which is Report on the Status of Synthetic Endotoxin Testing Reagents, and that is Caitlin also.

MS. STARKS: Give me one moment to catch up. All right, so I want to start off by saying that I'm obviously not an expert on this subject, but at the last meeting the Board requested a speaker from a nonbiased third party, like the FDA. I am not the FDA, but we did reach out and we weren't able to find a speaker for this meeting, so I pulled some

information together and did my best to gather what might be helpful.

For some quick background. LAL has been used to detect pathogens from endotoxins in patients and medical devices and injectable drugs for over 40 years, and it's currently the standard endotoxin test in the U.S. As you all know, there has been building public interest in transitioning to synthetic tests in the U.S.

Alternatives to LAL that are not derived from horseshoe crab blood directly, they have already been developed, they are called Recombinant Factor C (rFC) and Cascade Reagents, which is (rCR), and these are available for use in the U.S., but they are subject to additional testing every time they are requested to be used., to validate that they are comparable to using the LAL test.

Part of this is related to the standards that are set by the U.S. Pharmacopeia and I'll state USP for short. This is an independent scientific nonprofit organization, and its purpose is to set standards for healthcare products in the U.S., collect information on those and disseminate it to providers and consumers on using the products.

The USP standards have legal recognition in the U.S. and they are also used in many countries around the world. At this time in the U.S., my understanding is that the two recombinant endotoxin tests (rFC) and (rCR) are considered alternative methods to the LAL test, and that means that using them requires demonstration that they are comparable to the LAL test for each and every product that they would be used for.

Recently, though, the USD has proposed adding a chapter to their compendium that would specifically provide standards for the use of these two recombinant tests, and as supposed under those standards that are in this new chapter, it would mean that moving forward if a manufacturer wants to use one of these two tests on the new biopharmaceutical products, that it would not require the comparability validation that is currently required.

However, for products that are currently being tested with LAL, they would need to demonstrate comparability in order to switch over to using the synthetic test. In summary, what I think this means is that if the proposed USD chapter is adopted by the Pharmacopeia, it would open up a pathway for more use of (rFC) and (rCR) in the U.S. and there may be additional requirements from the FDA related to its use, but it is a step forward.

It's clear from their information that it wouldn't mean that LAL would go away. It just means that manufacturers would have more options that are more easily accessible to that. This is a proposed chapter, and it has a comment period that will be open from November 1 through January 31, 2024. I can attempt to answer questions, but again, I'm not an expert, so I can always just write them down and bring answers back with it.

CHAIR CLARK: Thank you, Caitlin, very interesting. Just one thing that I wasn't clear about. Are (rFC) and (rCR) pretty much do the same thing? I mean are they like Coke and Pepsi?

MS. STARKS: Yes, my understanding is they are just different genetic combinations.

CHAIR CLARK: Okay, great. Are there any questions for Caitlin about the LAL and the synthetic endotoxins here? Oh, I see Dr. Rhodes in the back there.

DR. MALCOLM RHODES: Yes, I'm afraid I'm the one that brought this up at the time, because we did have a presentation quite a while ago where they were talking about these new combinations being used. This information is interesting, but it's basically just saying, if you want to change from the gold standard you have to prove it's as good as.

We haven't learned what the, as good as is. Maybe it is Coke and Pepsi, and we're dealing with Coke, which I still think is number one, and want to know if Pepsi is going to be as good as. I think the problem, if you're trying to look it up. There is lots of information about the recombinant testing agents, for want of a better word, that they tend to come

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

from the industry, and you know each one is going to have their own bias about it, which would be the hard part.

At some point, and like I said at the meeting before, it might be a year from now, if we could get someone from NIH or a PharmD possibly that could come in and kind of explain the process and where we are. I mean it's great where we're at, but as far as I know, most drugs are still LAL. Every vaccine that is used in the United States, LAL is what is used to prove its safety, that it has no endotoxins in it at this point.

Just for our knowledge, since frequently every letter we get says, well why are you all still using this when there is a safe alternative? You know as far as I've read, it probably is, but probably isn't safe enough for the public, when we're talking about health concern. That is why I would like to see if at some point, you know we could get someone.

I would think it would probably be when we're in Washington, where we could get someone from one of the branches. I know how impossible it might be to do, but you know I would love to talk to you at some point, and see if we could get kind of, this is what it does. Because when you read about the specific tests, there are certain ones that have problems with drugs that have proteases, and some with glutens, and they have shortcomings, as does LAL.

But you know LAL is a huge step above the rabbit test that was before that. I won't go on and on about it. But you know, I appreciate getting that to this page, but it's more about, well, if you can prove this and you don't have to use it, as opposed to, is this as good as, which was what I was hoping for?

CHAIR CLARK: Thank you, Dr. Rhodes, it's a complicated issue, isn't it. We have a couple of online commenters. First up is Allen Burgenson.

MR. ALLEN BURGENSEN: Good afternoon. My name is Allen Burgenson, and I am an author of several of those papers that folks have been discussing. One thing about recombinant Factor C and R, the r test aids, it's not Coke and Pepsi, it's Coke and lemonade,

both satisfy your thirst but using different mechanisms, (rFC) it's just the recombinant of the detention protein, with a different measurement. It uses light, whereas the (rCR) also has the same enzyme system that LAL does, the complete cascade.

But it yields a turbidity or a chromogenic result. Now one thing that I published back in March of this year was in the Pharmacopeia Forum, which is the official journal of the United States Pharmacopeia, was a comparison of two standard LAL products against two of the (rFC) products. One thing to note, and folks have to understand, all the reagents don't work the same on every time.

In my study I showed that some reagents underpredict the amount of endotoxin in a sample, and this is natural endotoxin from a water system, which is what would be contaminating your products. Your product is not contaminated with the standard, which is known as RSE or reference standard endotoxins, or controlled standard endotoxin.

If you have either one of those in your product, you don't have contamination you have sabotage, because those two don't exist in nature. What does exist in nature is what is in your water system. I published a study using four different drugs and four different kits, and in some instances the recombinant product underpredicted the amount of endotoxin in a drug by more than a twofold, which means nothing if you are testing down around normal processing.

Very low levels of endotoxins, plus or minus a twofold is negligible. However, when you are up around the endotoxin relief level, or if you're testing at the maximum valid solution, which is the most you can dilute and still detect the endotoxin, and you have a plus or minus twofold difference, and you're underpredicting the amount of endotoxin by more than a twofold, then there is the potential health issue.

It concerns me that the USP has said that all new biopharmaceuticals, if this chapter is approved, do not have to do the comparability, because that is the

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

most dangerous part right there. The company may recover their PBC spike, I'm sorry, I'm over time.

CHAIR CLARK: Thank you, Mr. Burgenson, that was very interesting. I think that gets to some of what you brought up, Dr. Rhodes, about that. Appreciate that, and we have another online commenter, and that is Joe Gresko. Go ahead, Joe.

MR. JOE GRESKO: Just a quick follow up to the Doctor's line of questioning, and to be clear, the synthetic alternatives would need to be validated by the FDA, right?

CHAIR CLARK: Is that true, Caitlin?

MS. STARKS: I am not an expert, again. I don't know if we can answer that question with certainty.

MR. BURGENSEN: I can answer that if you want.

CHAIR CLARK: Is that a, no? It just has to be done by USP, not FDA?

MR. BURGENSEN: No, it's done by the individual end user, the individual pharmaceutical company on a per product basis. They have to do the side-by-side comparisons and validate it, and then submit that validation data to the FDA, in the form of a regular FOIA application. The individual end user, the individual pharmaceutical company has to do the validation.

CHAIR CLARK: Thank you, thank you very much, Mr. Burgenson. I think that concluded that. Okay, I'm sorry, we have another online commenter, that is Karen Hedstrom. Go right away, Karen.

MS. KAREN HEDSTROM: Yes, thanks, I was late getting in there. I was just trying to gather my thoughts. Is it the Eli Lilly Company already has some products on the market that are using the (rFC) instead of the LAL? Can anybody, you know one of the doctors, comment on how they got to the point that they're at?

I understood that companies could independently pay for their own validations, but with the USP now

is advancing to do is to actually take on some of that validation, and of course some of the cost of it, to allow companies that want to go down the route of using the synthetic, to just make it a little bit more viable for them to be doing it, economical and otherwise. Can somebody comment on that? Thank you.

CHAIR CLARK: Thank you, Karen. I don't know that we have anybody here that could answer that, but we will be returning to this issue in future meetings, I believe, so we will definitely be looking to get answers to that and other questions.

REVIEW AND POPULATE ADVISORY PANEL MEMBERSHIP

CHAIR CLARK: In trying to save time here, let's move on to our next item, which is to Review and Populate the Advisory Panel membership, and Tina, do you have that ready?

MS. TINA L. BERGER: I do, thank you, Mr. Chairman. I offer for the Board's consideration and approval the nomination of Sam Martin, a commercial mobile tending gear fisherman from Maryland. Sam's nomination form said that he was convicted of a felony. That is an error, and that was validated by the state, so simply ignore that. But I offer it for your consideration.

CHAIR CLARK: Mike, would you like to make this motion?

MR. MICHAEL LUISI: I sure can, you can put that back up, I'll go ahead and read it. **Move to approve Advisory Panel nomination for Sam Martin from Maryland.**

CHAIR CLARK: Do we have a second? Shanna Madsen. **Any objections to this nomination? Seeing none; the nomination is approved by consent.**

OTHER BUSINESS

CHAIR CLARK: Okay, that brings us on to Other Business. We definitely have a few items, but first I wanted to clear up, Caitlin, as far as the specifications, are we done with that? Did we want

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

to discuss? I think it was kind of covered in the motion, right? Okay, so we're done with that. Dan, did you have something else that you want to bring up, because there is an "other business" motion also.

MR. McKIERNAN: I want to plant a question, it's a rhetorical question at this point. Maybe we could pick it up at the Policy Board. Are we doing enough around the table as Board members to estimate the use of horseshoe crabs in our various fisheries for other species, such as American eel, and of course whelk, which is not an ASMFC managed species. I would like to pick that question up at the Policy Board. I don't want to discuss it; I just want to plant a question.

RESPONSE TO EARTH JUSTICE/SHOEMAKER HORSESHOE CRAB ARM FRAMEWORK ANALYSIS

CHAIR CLARK: Okay, and then the Other Business item that I spoke of at the beginning of the meeting. I think everybody saw in the meeting materials that there was another item from Earth Justice. They went back to one of the scientists they had worked for, for the previous analysis of the ARM. This time he was supplied with the data from the trawl surveys, and he had the code, I believe, for the ARM model, right this time?

As you probably saw, he had several criticisms of the ARM that were then turned into a huge press release snafu, and I think there is clearly a debate within our Board, I'm sure, as to whether to respond and how to respond. To kind of kick this discussion off, I would like to turn it over to Bill Hyatt, who I think has a motion.

MR. WILLIAM HYATT: Yes, I do have a motion, and I believe you have it, if you could put it up, please. Very simple: **Move to task the Adaptive Resource Management Subcommittee with preparing a response to the September 2023 review of the ARM Framework by Dr. Keven Shoemaker.**

CHAIR CLARK: I have a second from Mike Luisi, and Bill, would you like to speak to that?

MR. HYATT: Sure. All of you had the opportunity to

read Dr. Shoemaker's analysis in our meeting materials. His analysis is detailed, and it raises some serious questions regarding the ARM model. For me as a Board member, and I suspect from many others around the table as well, it's difficult to evaluate the credibility of this alternative analysis, without having a response from our own folks, and the folks who have developed the ARM model.

The management of horseshoe crabs is obviously far reaching and complex, that is what keeps us around this table for so long at these meetings. For all these and many other reasons, but particularly, so that we as Board members can better understand these issues. I believe it's important for the Commission to develop a response to Dr. Shoemaker's analysis. I'll add, and I think this speaks to some of the previous discussion on this topic. I'll add that I doubt that this response will be the end of this discussion, but I believe it's a very important first step.

CHAIR CLARK: I'm going to ask Mike as the seconder, and then I would like to take it over to John Sweka.

MR. LUISI: I seconded this, because what Bill said I truly believe in. I think when somebody goes out there, puts themselves out there and criticizes or, not to say that's the only reason we would respond is in a critical way. But if somebody is out there putting information together, expecting everyone to listen, and we don't have the opportunity to debate that. It really ends up a one-sided argument, and there is never any real accountability on the individual or individuals that have put together the document that now has generated what I used before, the drama around the issue. I just think it's a good idea. I think it's something we should do more of with other species that we manage, and that is why I seconded the motion.

CHAIR CLARK: Now I would like to turn it over to John, John and Kristen will have to spearhead the work on this, so take it away, John.

DR. SWEKA: Just a point of clarification if this motion should pass. I would like to remind the Board that Earth Justice also supplied comments from September, 2022, they were very lengthy as well, so

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

just up for discussion. If this motion passes and we are to respond, do we restrict our comments to those from September, 2023, or September 2022 and '23 included?

CHAIR CLARK: Well, from my perspective, John, I think that if you're going to comment, including all I think would be very useful. Any other comments around the Board? Bill.

MR. HYATT: Yes, certainly, my intent was what was included in our September, 2023 for this meeting, meeting materials. In particular, I know that the Earth Justice letters and Dr. Shoemaker's analysis sort of parrot one another. But I think from my perspective, particularly interested in the detail within Dr. Shoemaker's report, as opposed to Earth Justice's cover letters, if you will.

CHAIR CLARK: Conor McManus.

MR. CONOR McMANUS: John, from the two sets of comments, to what degree is there overlap, or has some of the 2022 comments already been addressed via our work since then, I should say.

DR. SWEKA: Nothing has been addressed to the 2022 comments. With what was supplied in the Board materials, they had their new, recent 2023 comments, and then the 2022 comments tacked on as an appendix. I guess it's all there altogether, but no, as the ARM Workgroup we haven't done anything with those comments or discussed it or made any changes resulting from it.

CHAIR CLARK: Any further comments on this? Shanna Madsen.

MS. MADSEN: I'm certainly not going to oppose this motion, but I do just want to warn that I feel that a lot of the questions and concerns that are in Dr. Shoemaker's paper have also been addressed quite a bit in the minority report, if I remember correctly. I appreciate whatever Dr. Sweka and Dr. Anstead put together for us to review, directly in relation to this 2023 updated report.

But I just want to make sure we don't run down a path of continuously asking our incredibly busy TC and ARM group to make responses to what frankly equates to misinformation. Some of the information already contained in the report we can look at and know that they are incorrectly using some of the trawl information. I just wanted to kind of make that point, to not set a precedent for continuing to chase our tails on some of this information.

CHAIR CLARK: That is a point well taken, Shanna. But this is quite an extreme situation we're dealing with. Roy Miller.

MR. ROY W. MILLER: Quickly in response to Shanna's suggestion. I think that this particular response on our part is in a different category, because Dr. Shoemaker's response I think, is driving the impetus for consideration of additional legislation in one or more states, and therefore, I think it is incumbent upon us to respond to this particular set of comments.

CHAIR CLARK: Yes, it certainly has been resonant in our little state, that's for sure. Joe Cimino.

MR. CIMINO: Just a follow up. I mean for something like this it goes back to something Mike Luisi said about accountability. We had a chance to review the draft, since New Jersey's trawl data was included, noticed that the way it was run in Dr. Shoemaker's model was not comparable to what was used for the peer review assessment or ARM Framework, so we confronted Dr. Shoemaker on that, and he confirmed that he did not use the data in the same.

Not that if he had time he would go back and rerun that. I think you know for this kind of information to be at management level, it would also need an independent peer review, and go through the work. I don't see any other way around that. I certainly don't think it's there. I apologize to John and Kristen for having to do this work, but I think at least some review for the Board's sake will be valuable.

CHAIR CLARK: Are there any other questions, comments? Seeing none; does the Board need time to caucus on this? Seeing no need to caucus, **are there any objections to this motion? Seeing none;**

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

then the motion is approved by consent, and thank you very much, John and Kristen. The ARM has done phenomenal work. We're sorry to put extra work on you, but I think this is important to do. Thank you.

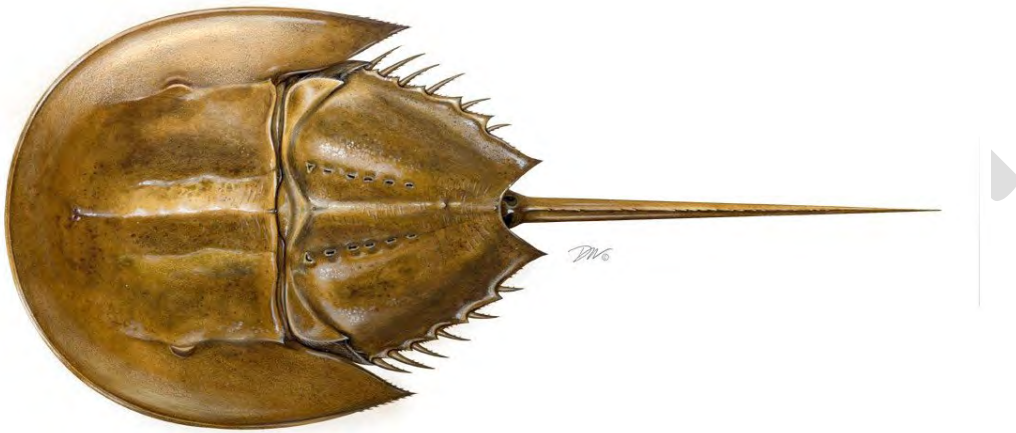
ADJOURNMENT

CHAIR CLARK: Okay, that was our main Other Business item, and is there anything else to come before the Board? Seeing none; then we are adjourned.

(Whereupon the meeting adjourned at 4:36 p.m. on October 16, 2023)

Atlantic States Marine Fisheries Commission

2024 Horseshoe Crab Stock Assessment Update



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Atlantic States Marine Fisheries Commission

Horseshoe Crab Stock Assessment Update

Prepared by the

ASMFC Horseshoe Crab Stock Assessment Subcommittee:

Katherine Rodrigue (Chair), Rhode Island Department of Environmental Management

Kristen Anstead, Atlantic States Marine Fisheries Commission

Linda Barry, New Jersey Division of Fish and Wildlife

Margaret Conroy, Delaware Division of Fish and Wildlife

Jeffrey Dobbs, North Carolina Division of Marine Fisheries

Derek Perry, Massachusetts Division of Marine Fisheries

Daniel Sasson, South Carolina Department of Natural Resources

Caitlin Starks, Atlantic States Marine Fisheries Commission

John Sweka, U.S. Fish and Wildlife Service

with additional support from:

Josh Newhard, US Fish and Wildlife Service

And the ASMFC Horseshoe Crab Technical Committee:

Kristen Anstead, Atlantic States Marine Fisheries Commission

Ingrid Braun, Potomac River Fisheries Commission

Jeff Brunson, South Carolina Department of Natural Resources

Joanna Burger, Rutgers University

Claire Crowley, Florida Fish and Wildlife Research Institute

Jeffrey Dobbs, North Carolina Department of Environmental Quality

Steve Doctor, Maryland Department of Natural Resources

Jennifer Lander, New York Department of Environmental Conservation

Eddie Leonard, Georgia Department of Natural Resources

Samantha MacQuesten, New Jersey Division of Fish and Wildlife

Kelli Mosca, Connecticut Department of Energy and Environmental Protection

Derek Perry, Massachusetts Division of Marine Fisheries

Katherine Rodrigue, Rhode Island Department of Environmental Management

Ethan Simpson, Virginia Marine Resource Commission

Caitlin Starks, Atlantic States Marine Fisheries Commission

Chris Wright, NOAA Fisheries

Jordan Zimmerman, Delaware Division of Fish and Wildlife

A publication of the Atlantic States Marine Fisheries Commission pursuant to National Oceanic and Atmospheric Administration Award No. _____

ACKNOWLEDGEMENTS

The Atlantic States Marine Fisheries Commission (ASMFC) thanks all of the individuals who contributed to the development of the horseshoe crab stock assessment update. The Commission specifically thanks the ASMFC Horseshoe Crab Technical Committee (TC) and Stock Assessment Subcommittee (SAS) members who provided data and developed the stock assessment update report. Thank you to Atlantic Coastal Cooperative Statistics Program staff Heather Power for validating landings. Additionally, the SAS thanks Josh Newhard (USFWS) for providing the tagging analysis for this assessment despite taking another position within the USFWS during its development.

DRAFT

EXECUTIVE SUMMARY

The purpose of this assessment is to update the 2019 Horseshoe Crab Benchmark Stock Assessment (ASMFC 2019) with recent data from 2018-2022 and evaluate the current status of horseshoe crabs along the US Atlantic coast. This coastwide assessment is different from the Adaptive Resource Management (ARM) Framework, which evaluates the population in the Delaware Bay and recommends harvest with consideration for migratory shorebirds.

Commercial Fisheries

All quantifiable sources of horseshoe crab removals were updated as part of this stock assessment. Horseshoe crabs are harvested commercially as bait and landings have remained well below the coastwide quota since it was implemented in 2000. Generally, the majority of horseshoe crab harvest comes from the Delaware Bay, followed by the New York, the Northeast, and the Southeast regions, although in 2021 and 2022 the landings from the Northeast were greater than those from the New York region. Coastwide, horseshoe crab landings for 1998-2022 peaked in 1999 at 2.6 million horseshoe crabs and have decreased since the late 1990s. Landings have remained under 1 million horseshoe crabs since 2003 and were 573,633 horseshoe crabs in 2022.

Horseshoe crabs are also collected by the biomedical industry to support the production of Limulus ameobocyte lysate (LAL), a clotting agent that aids in the detection of endotoxins in patients, drugs, and intravenous devices. Biomedical use has increased since 2004, when reporting began, and the estimated total mortality due to the biomedical industry in 2022 was 145,920 horseshoe crabs coastwide, the highest value in the time series.

Horseshoe crabs are caught as bycatch in several other commercial fisheries. Commercial discards were estimated for the Delaware Bay region as part of this assessment with data from the Northeast Fisheries Observer Program. Estimates indicate a variable amount of horseshoe crabs are captured and discarded in other fisheries, although a large amount of uncertainty is associated with the estimates.

Indices of Relative Abundance

All fishery-independent surveys along the Atlantic coast that were used to develop abundance indices in the 2019 benchmark stock assessment were updated for this report, although several had missing data points or reduced sampling during the COVID years which impacts the uncertainty of recent trends. The indices are used in the trend analysis both regionally and coastwide to determine stock status.

Assessment Methods

A tagging model was used in the 2019 benchmark stock assessment to estimate survival rates regionally. Tagging effort was greatly reduced in 2020-2022 due to COVID and reduced effort impacted the survival estimates. The substantial reduction of tagged horseshoe crabs in 2020, coupled with reductions in recapture reports in 2020 and 2021, likely caused the tagging model to underestimate survival rates. A substantial reduction in reporting rate will cause tagging models to account for "missing" tag recaptures as mortalities or emigrants and subsequently reduce survival estimates. And, in fact, all regions saw a decline in survival and an increase in the uncertainty of the estimates since the benchmark with the exception of coastal New York-

New Jersey, which did not see a substantial reduction in its tagging effort during COVID. The survival estimates should be interpreted with caution and this analysis should be updated in the next assessment when tagging effort has resumed to normal levels in all regions.

The catch multiple survey analysis (CMSA) was developed in the 2019 benchmark stock assessment and further developed for the 2022 ARM Revision. The CMSA is not used for management in this coastwide stock assessment, although the results are included in this report. Based on the CMSA, there were approximately 40 million mature male and 16 million mature female horseshoe crabs in the Delaware Bay region in 2022. Mature female horseshoe crabs have been steadily increasing in the region since the implementation of the initial ARM Framework in 2012.

The coastwide horseshoe crab population is primarily evaluated using autoregressive integrated moving average models (ARIMA). ARIMA is a simple trend analysis on the current suite of fishery-independent indices developed for horseshoe crab. The results are used to determine stock status.

Stock Status

To date, no overfishing or overfished definitions have been adopted by the Management Board. Stock status is determined using the results of the ARIMA. The reference point from the ARIMA is the 1998 index-based reference point because this reference point represents the point in time when horseshoe crabs became actively managed by the ASMFC and status relative to this reference point gives an indication of the effects of management on populations. Stock status is determined by the ARIMA analysis and how many surveys are currently below where they were in 1998.

The current stock status indicates that the Northeast region is in a neutral state and the New York region continues to be in a poor state, with three out of four surveys being below 1998 reference points. Based on the ARIMA results, the Delaware Bay, Southeast, and coastwide populations are in good condition, an improvement since the 2019 benchmark.

Region	2009 Benchmark	2013 Update	2019 Benchmark	2024 update	2024 Stock Status
Northeast	2 out of 3	5 out of 6	1 out of 2	1 out of 2	Neutral
New York	1 out of 5	3 out of 5	4 out of 4	3 out of 4	Poor
Delaware Bay	5 out of 11	4 out of 11	2 out of 5	0 out of 5	Good
Southeast	0 out of 5	0 out of 2	0 out of 2	0 out of 2	Good
Coastwide	7 out of 24	12 out of 24	7 out of 13	4 out of 13	Good

Summary

- Data gaps due to reduced sampling during COVID impacts the trends in fishery-independent indices and the tagging model, making some results uncertain.
- Stock status has improved in the Delaware Bay and at the coastwide level.
- Stock status remains good in the Southeast, although some abundance indices may be trending down.
- Stock status remains neutral in the Northeast.
- Stock status in the New York region continues to be poor.

Table of Contents

INTRODUCTION..... 1

TOR 1. Fishery-Dependent Data 1

TOR 2. Fishery-Independent Data 2

TOR 3. Life History Information and Model Parameterization 3

TOR 4. Updated CMSA and ARIMA..... 5

TOR 5. Stock Status..... 8

TOR 6. Projections 9

TOR 7. Research Recommendations 9

REFERENCES..... 12

TABLES..... 14

FIGURES..... 36

APPENDICES 67

DRAFT

LIST OF TABLES

Table 1.	Coastwide horseshoe crab commercial bait landings in numbers, 1998-2022, as validated by ACCSP.....	14
Table 2.	Numbers of horseshoe crabs collected and bled, by sex, and estimated mortality for the biomedical industry as reported in annual Fishery Management Plan Reviews.	15
Table 3.	Estimated number of dead horseshoe crabs caught and discarded from other commercial fisheries.....	16
Table 4.	Fishery-independent surveys used for developing indices of relative horseshoe crab abundance.....	17
Table 5.	Results of the power analysis by survey.....	19
Table 6.	Data and results for the Mann-Kendall test of temporal trends in sex ratios	22
Table 7.	Sex ratio and proportion female information, with associated confidence limits, for the New Jersey Ocean Trawl.	23
Table 8.	Sex ratio and proportion female information, with associated confidence limits, for the Delaware Adult Trawl.....	24
Table 9.	Recapture rate relative to total recaptures for each region of release	25
Table 10.	Regional apparent annual survival rates	26
Table 11.	Number of tag releases (top) and recaptures (bottom) from 2009-2022.....	27
Table 12.	ARIMA summary statistics for horseshoe crab surveys.	28
Table 13.	Reference points from the ARIMA model for each survey and the probability (P) that the terminal year's fitted index (i_t) is below the reference point.	31
Table 14.	Stock status determination for the coastwide and regional stocks based on the 1998 index-based reference points from ARIMA models.....	34
Table 15.	Details of surveys used in determining regional stock status of horseshoe crabs.....	35

LIST OF FIGURES

Figure 1.	Coastwide horseshoe crab bait landings, 1998-2022, by sex where available. Coastwide ASMFC quota indicated in orange. Source: ACCSP.....	36
Figure 2.	Map of the Atlantic coast showing the regions for horseshoe crab assessment.....	37
Figure 3.	Horseshoe crab bait harvest by region, 1998-2022.	38
Figure 4.	Horseshoe crab bait landings of Delaware Bay-Origin, 2003-2022, by sex.....	38
Figure 5.	Coastwide number of horseshoe crabs (HSC) collected and bled by the biomedical industry and the total resulting mortality	39
Figure 6.	Estimated number of dead horseshoe crabs discarded in the Delaware Bay region from commercial fisheries.....	40
Figure 7.	Indices of relative abundance of horseshoe crabs developed from the Massachusetts Trawl Survey for north and south of Cape Cod (CC).....	41
Figure 8.	Indices of relative abundance of horseshoe crabs developed from the Connecticut Long Island Sound Trawl (CT LISTS), New York Peconic Bay Trawl, and New York Western Long Island Sound (WLIS) Surveys.....	42
Figure 9.	Indices of relative abundance of horseshoe crabs developed from the Northeast Area Monitoring and Assessment Program (NEAMAP) and Maryland Coastal Bays Surveys	43
Figure 10.	Indices of relative abundance of horseshoe crabs developed from the New Jersey Ocean Trawl (NJ OT) Survey.....	44
Figure 11.	Indices of relative abundance of horseshoe crabs developed from the Delaware 30' Adult Trawl Survey.....	45
Figure 12.	Indices of relative abundance of horseshoe crabs developed from the Virginia Tech Trawl Survey.....	46
Figure 13.	Indices of relative abundance of horseshoe crabs developed from the North Carolina Estuarine Gill Net, South Carolina Crustacean Research and Monitoring (CRMS; recently renamed as Estuarine Trawl Survey), South Carolina Trammel, and Southeast Area Monitoring and Assessment Program (SEAMAP) Surveys.....	47
Figure 14.	Indices of relative abundance of horseshoe crabs developed from the Southeast Area Monitoring and Assessment Program (SEAMAP) and Georgia Ecological Monitoring Trawl Surveys	48
Figure 15.	Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Northeast region	49
Figure 16.	Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the New York region	50
Figure 17.	Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Delaware Bay region.....	51

Figure 18.	Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Delaware Bay region used in the ARM Framework	52
Figure 19.	Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Southeast region	53
Figure 20.	Number of tag releases by region, 2009-2022.	54
Figure 21.	Number of tag recaptures by region, 2009-2022.	55
Figure 22.	Comparison between the benchmark stock assessment (2019) and update (2024) estimates for survival rate (%) with 95% confidence intervals by region	56
Figure 23.	Population estimates from the CMSA for mature female horseshoe crabs	57
Figure 24.	Population estimates from the CMSA for male horseshoe crabs	58
Figure 25.	Comparison between population estimates from the CMSA for mature females (top) and males (bottom) using two natural mortality estimates and coastwide biomedical data.	59
Figure 26.	ARIMA model fits to horseshoe crab indices Massachusetts and Rhode Island Trawl Surveys in the Northeast Region.	60
Figure 27.	ARIMA model fits to horseshoe crab indices in the New York Region.	61
Figure 28.	ARIMA model fits to horseshoe crab indices from the Delaware Trawl Survey in the Delaware Bay Region.	62
Figure 29.	ARIMA model fits to horseshoe crab indices from the New Jersey Ocean Trawl Survey in the Delaware Bay Region.	63
Figure 30.	ARIMA model fits to horseshoe crab indices from Delaware Bay NEAMAP and Maryland Coast Bays Surveys in the Delaware Bay Region.	64
Figure 31.	ARIMA model fits to horseshoe crab indices from the Virginia Tech Trawl Survey in the Delaware Bay Region.	65
Figure 32.	ARIMA model fits to horseshoe crab indices from the surveys in the Southeast Region.	66

INTRODUCTION

This Terms of Reference (TOR) Report describes the update to the most recent benchmark stock assessment for horseshoe crab (ASMFC 2019). This assessment extends the fishery-independent and –dependent data for horseshoe crab through 2022, reruns the tagging model, sex-ratio analysis, catch multiple survey analysis (CMSA), and determines stock status using the autoregressive integrated moving average (ARIMA) reference points defined in ASMFC 2019 and accepted for management use in 2019.

TOR 1. Fishery-Dependent Data

Update fishery-dependent data (landings, discards, catch-at-age, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

There are three sources of fishery-dependent data used in the horseshoe crab stock assessment: bait landings, biomedical harvest and mortality, and commercial discards from other fisheries.

Since 1998, states have been required to report annual bait landings of horseshoe crab through the compliance reporting process and to the Atlantic Coastal Cooperative Statistics Program (ACCSP) Data Warehouse. Landings used in this assessment for 1998-2022 were validated by state agencies through ACCSP. Since the 2019 benchmark, coastwide landings decreased in 2020 due to the COVID-19 pandemic and then increased in 2021 and 2022 to levels similar to the recent years preceding 2020 (Table 1; Figure 1). Landings have remained well-below the coastwide quota since its implementation in 2000. Stock status is determined by four regions: Northeast, New York, Delaware Bay, and Southeast (Figure 2). Regionally, the majority of bait landings are harvested from the Delaware Bay region (Figure 3) and are predominately males due to harvest restrictions from the ARM Framework (Figure 4).

Since 2004, ASMFC has required states to monitor the biomedical use of horseshoe crabs to determine the source of crabs, track total harvest, and characterize pre- and post-bleeding mortality. In recent years, sex data is also provided. The bleeding mortality rate of 15% from the meta-analysis of bleeding studies during the benchmark was applied to the numbers of bled crabs to estimate bleeding mortality. This was added to the number of crabs observed dead during the biomedical process to estimate the total mortality attributable to biomedical use (Table 2; Figure 5). These values represent the number of horseshoe crabs estimated to have died coastwide as a result of the biomedical industry. The number of horseshoe crabs collected and bled has increased over time. The estimated mortality from the biomedical industry in 2022 was 145,920 horseshoe crabs, the highest in the time series.

Discard information from observed commercial fishing trips was obtained from NOAA Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer Program (NEFOP). The NEFOP program collects data on harvested and discarded catch, gear, effort, and species' lengths and weights using trained fishery observers from Maine to North Carolina. Data on horseshoe crabs have been collected since 2004 and discard estimates for the Delaware Bay were completed using the methods described in ASMFC 2019 and updated for ASMFC 2022. The estimated number of dead horseshoe crab discards in the Delaware Bay region has been

variable through time, with the highest values in 2016 and 2021 and the lowest value in 2022 (Table 3; Figure 6). The variability can be attributed to influential observed trips, such as a dredge trip in 2016 that discarded numerous horseshoe crabs. Since dredge landings for other species (e.g., surf clam, sea scallop) in the Delaware Bay are larger than landings from gill nets and trawls, when the discard estimates are scaled up to the landings in the region these influential trips result in large discard estimates.

TOR 2. Fishery-Independent Data

Update fishery-independent data (abundance indices, age-length data, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

For the last assessment (ASMFC 2019), the SAS explored using nominal and generalized linear model (GLM) standardization for developing abundance indices from fishery-independent surveys but encountered issues with these methods due to the high proportion of zero catch in many of the sampling events. Therefore, all indices in ASMFC 2019 were developed using the delta distribution for the mean and variance to take into account the number of zero catches (Pennington 1983). During the peer review for the Revision to the Adaptive Resource Management Framework (ARM Revision, ASMFC 2022) for horseshoe crab in the Delaware Bay, the panel noted that the delta mean should not be used for fixed stations surveys (e.g., the Delaware Bay Adult Trawl). In this stock assessment update, all fixed station surveys were standardized using a GLM instead of the delta mean (Table 4; Figure 7- Figure 14; Table A1). Since ASMFC 2019, the name of the South Carolina Crustacean Research and Monitoring Survey has been changed to the Estuarine Trawl Survey. The previous name was maintained in this report for consistency with the benchmark but the name change is acknowledged throughout the tables and figures.

Correlation between indices for horseshoe crabs was evaluated by region using the methods in ASMFC 2019. Of the three comparisons in the Northeast Region, none were significantly correlated (Figure 15). Of the 10 comparisons in the New York Regions, 4 were significant and positively correlated (Figure 16). For the Delaware Bay, 28 out of the 91 comparisons were significant and positively correlated (Figure 17). The Delaware Bay indices were subset to those used in the ARM Revision and of the 28 comparisons, 12 were significant and positively correlated (Figure 18). Of the 15 comparisons in the Southeast Region, 3 were significant and positively correlated and 1 was significant and negatively correlated (Figure 19).

a. Sampling Issues

Several surveys collected no data in 2020-2021 due to restricted sampling during the pandemic years. Additionally, the South Carolina Trammel Net and Southeast Area Monitoring and Assessment (SEAMAP) surveys had reduced sampling in 2020-2022. For the Trammel Net Survey, strata used in the index (ACE Basin/St. Helena Sound, Charleston Harbor, Muddy and Bulls Bays, and Romain Harbor) were sampled monthly through 2019. Beginning in 2020, strata were sampled two of three months per quarter or one or two times quarterly depending on the strata. The 2020 data were dropped because there was incomplete sampling in the months used in the survey (March-May) in addition to the decreased sampling events. For SEAMAP,

some strata were not sampled due to storms or boat issues in recent years. Additionally, the seasons used in SEAMAP have changed from three (April-May, July-August, and September-November) to two that straddle the previous seasons (mid-April-June and mid-August-October). With the reduced sampling in 2020-2022, the decline in the abundance index for those years could be due to a real decline in abundance or an artifact of the change in sampling. Similarly, 1995-1997 for the Trammel Net Survey and 2019 for SEAMAP (GA-FL index) should also be interpreted cautiously. Index standardization can mitigate the effects of some missing data, but in this case, whole strata were unsampled for multiple years. Typically, the SAS would stop updating an index when a survey changes sampling design, as was done for the New Jersey Surf Clam Dredge Survey for horseshoe crab (ASMFC 2019), and the SAS should consider this in the next benchmark.

For additional supporting information about the sampling issues, see Appendix Table A2 - Table A3.

b. Power Analysis

Power analysis was used to calculate the probability of detecting trends in the abundance indices developed from fishery-independent data using the methods of Gerrodette 1987. As was done in ASMFC 2019, all fishery-independent surveys that were developed into abundance indices were tested in the power analysis. Briefly, variability in abundance as a function of both linear and exponential change was tested using a one-tailed test. Power was calculated for a change of $\pm 50\%$ over a 20-year time period for both a linear and exponential trend. It should be noted that this is not a retrospective power analysis (e.g., one done after a statistical test for a trend is conducted). It is an indication of the probability of detecting a trend if it should actually occur. A fishery-independent survey could have high power, but still not show any increasing or decreasing trend if it does not occur. Likewise, a survey with low power could show a statistically significant trend if that trend is large enough in magnitude or the time series is long enough. This power analysis is a means to qualify the data from a given survey.

Median coefficients of variation (CVs) for horseshoe crab surveys ranged from 0.13 – 0.78 and as the CV increased, the power to detect a linear or exponential trend decreased. Overall, only 8 out of 42 surveys had estimated power to detect a $\pm 50\%$ change over a 20-year period exceeding 0.80. These included the Connecticut Long Island Trawl, New York Peconic Bay Trawl, Delaware Adult Trawl (fall and spring indices for combined sexes), New Jersey Ocean Trawl (spring index for females), Virginia Tech Trawl (all crabs combined), Georgia Trawl, and the North Carolina Gill Net Surveys (Table 5).

TOR 3. Life History Information and Model Parameterization

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.

c. Sex ratio

Updated temporal trends in sex ratios of males to female horseshoe crabs from the New Jersey Ocean Trawl and Delaware Adult Trawl Survey are shown in Table 6. As in the 2019 benchmark, a Mann-Kendall analysis was used to test for trends in the sex ratio data over time. All surveys except for the New Jersey Ocean Trawl spring indices show significantly increasing male biased sex ratios. In the 2019 benchmark, only the spring Delaware Bay Adult Trawl Survey had a significant positive trend in the sex ratio. The sex ratio from the New Jersey Ocean Trawl did not significantly differ between the spring and the fall (paired t-test, $P = 0.26$). However, like in the 2019 benchmark, the sex ratio in the Delaware Adult Trawl Survey was higher in the fall than in the spring (paired t-test, $P < 0.001$).

The year-by-year proportion female and sex ratio data for each trawl survey, along with their lower and upper confidence limits, can be found in Table 7 - Table 8. There are occasional minor differences in these results from the 2019 benchmark due to slight differences in the data provided by the states. Additionally, the New Jersey Ocean Trawl Survey was not conducted in 2020 or 2021.

d. Survival Rates and Natural Mortality

Tagging data from the US Fish and Wildlife Service (USFWS) horseshoe crab database were analyzed by region to estimate apparent survival rates using the same methods as ASMFC 2019. The regions used in this analysis are slightly different from the four management regions used elsewhere in the assessment and include the Northeast, coastal New York-New Jersey, Delaware Bay, coastal Delaware-Virginia, and the Southeast. Northeast, coastal New York-New Jersey, Delaware Bay, and the Southeast showed high rates (>90%) of within-region recaptures (Table 9).

Survival analysis was conducted using program MARK (White and Burnham 1999) which showed regional variation in annual survival rate (Table 10). As in ASMFC 2019, releases were sufficient to support survival analysis for the Northeast, coastal New York-New Jersey, Delaware Bay, coastal Delaware-Virginia, and the Southeast. The highest survival rates were in Delaware Bay. The lowest were in the Southeast. All regions saw a decline in survival since the benchmark with the exception of coastal New York-New Jersey.

The observed declines in survival rate may be due to reduced tagging and resight efforts in recent years due to the COVID pandemic. While there was enough data to complete the analysis, all regions had significant reductions in tagging effort in 2020 and, in some regions, those reductions were also seen in 2021-2022 (Table 11; Figure 20 - Figure 21). The reductions ranged between -23% and -99% of the average number of releases from the pre-pandemic years, 2009-2019. While not to the same degree, reductions in recapture reports also occurred, ranging between -2% to -79% of the average number of recaptures reported between 2009-2019. The decline in effort varied between the regions. The Northeast and Southeast region had declines in both releases and recaptures for 2020-2022, and the Delaware Bay had declines in recaptures for 2020-2022 and declines in releases for 2020-2021. The comparison of tags released in 2020-2022 to the 2009-2019 average in the Northeast is somewhat skewed since there was a larger tagging effort in that region in the early part of the time series, but the effort

was low during the COVID years nonetheless. Conversely, some regions maintained their tagging effort after the decline in 2020, such as in coastal New York-New Jersey. That region was the only one that did not see a significant decrease in survival and had the most consistent survival estimates from ASMFC 2019 to this stock assessment update (Table 10).

Additionally, apparent survival rates do not distinguish between mortality and emigration, so any horseshoe crab missing from the analysis leads to a reduction in survival. The significant reduction of tagged horseshoe crabs in 2020, coupled with reductions in recapture reports in 2020 and 2021 would likely cause the tagging model to underestimate survival rates (Table A4). Tagging models rely on consistent reporting rates (number of recaptures/number of releases) to produce reliable estimates. Reporting rates can change with changes in tagging effort and/or changes in recapture effort. Any significant reduction in reporting rate will cause tagging models to account for “missing” tag recaptures as mortalities or emigrants and subsequently reduce survival estimates. While tagging effort varies from year-to-year, significant changes in effort can impact the results by having increased error and wider confidence intervals (Figure 22), making it challenging to detangle real changes in survival from data issues. Therefore, due to the lower sampling effort during the COVID years, the revised survival rates should be interpreted with caution and the data should be re-analyzed once tagging efforts resume to pre-pandemic levels. Yet, even with those caveats, the benchmark estimates for all regions except the Southeast fall within the stock assessment update confidence intervals (Figure 22).

Using the methods from ASMFC 2019 and the updated tagging data through 2022, an instantaneous natural mortality rate (M) for the Delaware Bay was estimated for use in the catch multiple survey analysis (CMSA). In Delaware Bay, the estimate was $M=0.4$ (from the estimated survival of 67%), which is higher than the $M=0.274$ used in ASMFC 2019 or $M=0.3$ used in ASMFC 2022 based on the same analysis. Because the natural mortality rate is derived from the survival rate in the Delaware Bay region, it should also be used with caution due to the reduced sampling effort during the pandemic. The SAS decided to use the $M=0.3$ for the CMSA base run since it did not use the recent years with reduced sampling in the region. A sensitivity run of the CMSA was done and a research recommendation for estimating M was developed. During the development of this assessment, the SAS also noted that the calculation from survival rate (S) to mortality ($S=e^{-Z}$) results in an estimate of total mortality (Z ; $Z=M+F$ where F is fishing mortality), not solely M , and the assessment team should consider this in the next assessment.

TOR 4. Updated CMSA and ARIMA

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.

a. Catch Multiple Survey Analysis

The catch multiple survey analysis (CMSA) for horseshoe crab was developed for ASMFC 2019 and updated in ASMFC 2022. The CMSA is updated annually as part of the ARM Framework to

support harvest specification setting in the Delaware Bay region. The CMSA uses quantifiable sources of mortality (i.e., bait harvest in Delaware Bay states, coastwide biomedical mortality, and commercial dead discards; Figure 4 - Figure 6) to estimate male and female horseshoe crab populations. 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 since Delaware Bay-specific data is confidential. The Virginia Tech Trawl Survey estimates are used in the CMSA along with the spring portion of the New Jersey Ocean Trawl and the Delaware Adult Trawl Surveys (Figure 10 - Figure 12).

The CMSA was updated in 2023 with a terminal year of 2022. In 2021, the number of newly mature female horseshoe crabs estimated in the Virginia Tech Trawl survey was zero (Figure 12). This data point is lagged forward to represent 2022, the terminal year of the current model, and poses an issue for the CMSA. 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. The model will not run with an estimate of zero newly mature horseshoe crabs and has struggled to reconcile the high mature female horseshoe crab population estimates in the Virginia Tech Trawl Survey with the low newly mature population estimates for the last few years. The ARM Subcommittee and Delaware Bay Ecosystem Technical Committee (DBETC) previously discussed three hypotheses for the low newly mature horseshoe crabs in the Virginia Tech Trawl Survey: 1) a catchability issue where newly mature crabs are not in the same location as mature crabs, 2) a multi-year recruitment failure beginning in 2010 that began to show up 9 years later (the length of time to maturity) in 2019, the first year of low newly mature crabs, or 3) an identification issue where the onboard technicians since 2019 have been misclassifying newly mature horseshoe crabs as mature or immature. Recruitment failure seems like the least likely hypothesis because multiparous females continued to increase and there was not a concurrent decrease in primiparous males.

To gap-fill the newly mature female horseshoe crab time series so there are no zeros, the ARM Subcommittee and DBETC used an average ratio of newly mature to mature females from previous years based on stage data from the Virginia Tech Trawl and Delaware Adult Trawl Surveys (Figure A6). Using the average of 19.9%, the years of 2019-2022 in the Virginia Tech Trawl were adjusted such that the observed newly mature and mature female horseshoe crabs were added together and then 19.9% of the total were attributed to the newly mature stage. This method did not increase the number of total female horseshoe crabs in the model, but rather re-proportioned them between the two stages of newly mature and mature. This approach is supported by the biology of horseshoe crabs since it is not possible to have an increase in mature females with no newly mature females in the previous year. This approach also resulted in CMSA estimates of total females that were closer to swept area estimates from the Virginia Tech Trawl Survey. If the trend of low newly mature female horseshoe crabs continues in the future, the ARM and DBETC will re-evaluate gap-filling methods as needed. No adjustments had to be made for the male horseshoe crab model.

Using the CMSA model, there were approximately 40.3 million mature male and 16.1-16.2 million mature female horseshoe crabs in the Delaware Bay region in 2022, depending on the use of coastwide or no biomedical data (Figure 23 - Figure 24). The swept area estimates from

the Virginia Tech Trawl were 44.9 million male and 15.5 million female mature horseshoe crabs for comparison (Figure 12).

While the CMSA used the natural mortality estimate ($M=0.3$) from ASMFC 2022 due to the data caveats from the reduced sampling effort in the tagging model, a sensitivity run was done using the revised $M=0.4$ for both sexes. The population estimates from the sensitivity runs varied minimally from the base runs but resulted in higher terminal year population estimates using coastwide biomedical data: 16.8 million mature female and 40.9 million mature male horseshoe crabs (Figure 25).

For additional supporting information about the CMSA, see Appendix Table A5 and Figure A1 - Figure A8.

b. ARIMA

The autoregressive integrated moving average models (ARIMA, Box and Jenkins 1976) were applied to the fishery-independent indices using the same methods as ASMFC 2019. Like ASMFC 2019, two index-based reference points were considered: 1) the bootstrapped lower quartile of the fitted abundance index (Q_{25}) as proposed by Helder and Hayes (1995); and 2) the bootstrapped fitted abundance index from 1998 (i_{1998}) representing the time of the initiation of the Horseshoe Crab Fishery Management Plan. Neither reference point should be viewed as a biological reference point for determining overfished status. The ARIMA reference points allow qualitative evaluation of status with respect to historic levels and when a change in management occurred. Trends since the terminal years in the last benchmark stock assessment (2017) and last stock assessment update (2012) are also provided and were determined via Mann-Kendall tests for monotonic trends.

The residuals of ARIMA model fits were tested for normality using a Shapiro-Wilk test and if residuals were found to be non-normal, caution should be used interpreting the probability of the terminal year being greater than an index-based reference point.

ARIMA model fit results were summarized within a region with respect to the Q_{25} and 1998 reference points (Table 12). The fraction of surveys whose $P(i_f < Q_{25})$ and $P(i_f < i_{1998})$ values were greater than 0.50 was enumerated for each region. If an abundance index time series did not extend back to 1998, it was not included in the regional summary.

The Northeast region showed mixed ARIMA model results. Massachusetts Trawl Surveys showed increasing or stable trends with low probabilities of being less than the Q_{25} or 1998 reference points (Figure 26; Table 13). Contrary to the surveys in Massachusetts, the ARIMA fit to the Rhode Island Trawl Survey has continued to decrease since 2003 with the terminal year of 2022 having a high probability of being less than both the Q_{25} and 1998 reference points (Figure 26; Table 13).

The New York region generally continued to show declining trends, as has been evident since the 2009 benchmark stock assessment. The Jamaica Bay, Littleneck and Manhasset Bay, and Peconic Bay Surveys all had high probabilities of their terminal year ARIMA indices being lower than their 1998 reference points (Figure 27; Table 13). The Connecticut Long Island Sound has

an increasing trend since 2012 and Northeast Area Monitoring and Assessment Program (NEAMAP) and the New York Peconic Trawl Surveys increased over the last five years.

ARIMA model fits to the Delaware Bay surveys generally all showed increasing trends and low probabilities of being less than Q_{25} and 1998 reference points by the terminal year (Figure 28 - Figure 31; Table 13). One exception is the Virginia Tech Trawl Survey for primiparous females which has shown low abundance since 2019. As discussed in TOR 4a, three possible hypotheses for this observation have been discussed among SAS and TC members: 1) recruitment failure in recent years; 2) a change in the spatial distribution of primiparous females resulting in lower catchability; or 3) misclassification of primiparous individuals as multiparous individuals. Recruitment failure seems like the least likely hypothesis because multiparous females continued to increase and there was not a concurrent decrease in primiparous males.

Previous benchmark assessments and stock assessment updates for the Southeast Region generally showed increasing or stable trends in horseshoe crab abundance. This update indicates that there may now be some decline in abundance. The South Carolina Trammel Net, Georgia Trawl, and the Georgia-Florida portion of the Southeast Area Monitoring and Assessment Program (SEAMAP) Surveys showed declining trends in recent years, although probabilities of being less than Q_{25} and 1998 reference points were still rather low (i.e., <50%; Figure 32; Table 13). As discussed in TOR 2a, the South Carolina Trammel Net and Southeast Area Monitoring and Assessment (SEAMAP) Surveys had reduced sampling in 2020-2022. Because it is unknown if their recent trends are due to abundance or reduced sampling, those recent trends should be interpreted with caution.

TOR 5. Stock Status

*Update the biological reference points or trend-based indicators/metrics for the stock.
Determine stock status.*

As in ASMFC 2019, stock status was based on the percentage of surveys within a region (or coastwide) having a >50% probability of their terminal year fitted value being less than the 1998 index-based reference point from ARIMA model fits. This reference point represents the point in time when horseshoe crabs became actively managed by ASMFC and status relative to this reference point gives an indication of the effects of management on populations. ARIMA results from surveys used to determine stock status included those surveys with combined-sex indices, time series extended back to at least 1998, and 2022 as the terminal year. Within a region, “Poor” status was considered >66% of surveys meeting the >50% criterion, “Good” status was <33% of surveys, and “Neutral” status was 34 – 65% of surveys.

The stock status of the Northeast region was “Neutral”; New York region was “Poor”; Delaware Bay region was “Good”; and Southeast region was “Good” (Table 14). These regional stock status determinations remained the same as was found in the 2019 benchmark assessment except that the Delaware Bay region improved from a “Neutral” status to a “Good” status. When taken as a whole, the coastwide stock status also moved from a “Neutral” status in the 2019 benchmark assessment to a “Good” stock status in 2024. A more detailed description of the surveys used to determine stock status is provided in Table 15. Trends since the terminal years in the last benchmark stock assessment (2017) and last stock assessment update (2012)

are also provided and were determined via Mann-Kendall tests for monotonic trends. All surveys used for stock status in the Delaware Bay region showed increasing trends since the last stock assessment update (2012 terminal year). Other regions showed mixed recent trends. Stock status in the New York region remained “Poor” since the 2019 benchmark stock assessment. Two surveys (Jamaica Bay and Littleneck and Manhasset Bays) continued to decrease since 2012, but the Connecticut Long Island Sound Trawl Survey increased since 2012. The two hypotheses for the status of the New York region put forth in the 2019 benchmark assessment remain possible: 1) bait harvest remains at a level that is not sustainable in the New York region; or 2) the habitat has changed and cannot support the number of horseshoe crabs it once did.

Although the stock status of the Southeast region was determined to be “Good” according to the methods and surveys included in the 2019 stock status determination, this stock status should be viewed with caution. Stock status in the Southeast region is based on only two surveys that extend back to 1998, one of which showed recent declining trends (South Carolina Trammel Net). Also, other surveys in the Southeast that were not used to make the stock status determination for that region have shown decreasing trends (Georgia Trawl and Georgia-Florida portion of SEAMAP) or no trend (South Carolina portion of SEAMAP) since 2012. Regardless, none of these surveys showed a high probability of being less than their Q_{25} reference points, so they are certainly not near their lowest recorded levels, but recent possible declines may be noteworthy to managers. As discussed in TOR 2a, the South Carolina Trammel Net and Southeast Area Monitoring and Assessment (SEAMAP) Surveys had reduced sampling in 2020-2022. Because it is unknown if their recent trends are due to abundance or reduced sampling, those recent trends should be interpreted with caution.

TOR 6. Projections

Conduct short term projections when appropriate. Discuss assumptions if different from the benchmark and describe alternate runs.

There are no projections associated with any model in this stock assessment.

TOR 7. Research Recommendations

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.

Several studies published since the 2019 benchmark have addressed the research recommendation to collect more information on horseshoe crab ecology and movement. Two studies focused on juvenile habitat use. Cheng et al. (2021) used SCUBA-diving methods to survey juveniles in Great Bay, New Hampshire, which found that horseshoe crabs were generally occupying sub- and inter-tidal mudflats within 2.5 km of known spawning beaches. Colon et al. (2021) found that salt marsh tidal creeks and restored intertidal flats may be important habitat for juveniles in Plumb Beach, New York, and that the presence of juveniles in these habitats fluctuated both seasonally and annually. Increasing evidence also suggests that adults may use salt marsh habitat for spawning. Kendrick et al. (2021) found developing eggs in

the salt marshes of South Carolina, and Sasson et al. (2024) found that horseshoe crab spawning densities in salt marshes are similar to those on beaches in New Hampshire, Connecticut, and South Carolina. Bopp et al. (2023) used stable isotopes to investigate ontogenetic shifts and regional differences in the diets of juveniles and adults in Long Island, New York; while confirming that horseshoe crabs at all stages are dietary generalists, resource use differed by location and sex. A mark-recapture study in that same region also found spatial and sex differences in the movement patterns and survival of adult horseshoe crabs (Bopp et al. 2019).

Numerous studies focusing on the biomedical industry have also been published since ASMFC 2019. Several papers focused on horseshoe crab aquaculture for use by the biomedical industry (Tinker-Kulberg et al. 2020a, 2020b, 2020c). A large-scale mark-recapture analysis of crabs tagged in the Delaware Bay and coastal Delaware and Virginia found higher survival for bled male crabs than unbled males; results were more mixed for females (Smith et al. 2020). The authors suggest this may, in part, be due to a selection bias for healthier or younger crabs in the biomedical industry. Bleeding also led to a reduced post-release capture probability, potentially indicating decreased spawning activity, which was a pattern also seen in a study that attached acoustic transmitters to bled and unbled crabs (Owings et al. 2019). Further acoustic telemetry research by Watson et al. (2022) showed that bled females were less likely to spawn than unbled females. Owings et al. (2020) also found that while bleeding alone resulted in low (6%) mortality, adding multiple stressors such as exposure to direct sunlight or heat greatly increased mortality rates. Finally, Litzenberg (2023) found that the age of male horseshoe crabs or the temperature of the water in which they were kept did not correlate with amoebocyte and hemocyanin concentration. However, water temperature affected metabolic rates, and both age and water temperature correlated with metabolomic signatures of stress.

ASMFC 2019 recommended that the ARM Subcommittee consider using the CMSA model, discard estimates, and biomedical data in the ARM Framework and that change was made and peer reviewed in the ARM Revision (ASMFC 2022). Additionally, the CMSA was peer reviewed and published in Anstead et al. 2023. The CMSA depends on the Virginia Tech Trawl Survey and a research recommendation in ASMFC 2019 was to fund and operate that survey annually, which has been done through 2023. The CMSA also depends on staged data from the Virginia Tech Trawl Survey, although collecting more stage-based data was a research recommendation, and that work has begun in New Jersey, Delaware, and South Carolina in various fishery-independent surveys.

All research recommendations from ASMFC 2019 remain important to the continued assessment of horseshoe crabs, including those updated in this section. The complete list of research recommendations can be found in Appendix c. In addition, the SAS would like to add the following research recommendations:

- Consider abbreviating the time series for the South Carolina Trammel Net and SEAMAP surveys for years with reduced sampling in the strata/stations used for the relative abundance indices.

- Maintain pre-pandemic levels of tagging effort along the Atlantic coast and revise the natural mortality estimate in the Delaware Bay region once tagging efforts resume to pre-pandemic levels.
- Evaluate the use of Z instead of M calculated from the survival estimates that are used in the CMSA for the Delaware Bay.
- Reexamine stock structure, especially in the northeast region, given more recent genetic analysis and tagging data analysis.

REFERENCES

- Anstead, K.A., J.A. Sweka, L. Barry, E.M. Hallerman, D.R. Smith, N. Ameral, M. Schmidtke, and R.A. Wong. 2023. Application of a catch multiple survey analysis for Atlantic horseshoe crab *Limulus polyphemus* in the Delaware Bay. *Marine and Coastal Fisheries* 15(5): e10250.
- Atlantic States Marine Fisheries Commission (ASMFC). 2019. Horseshoe Crab Benchmark Stock Assessment and Peer Review Report. Arlington, VA.
- Atlantic States Marine Fisheries Commission (ASMFC). 2022. Revision to the Adaptive Resource Management Framework and Peer Review Report. Arlington, VA.
- Bopp, J., J.A. Olin, M. Sclafani, B. Peterson, M.G. Frisk, and R.M. Cerrato. 2023. Contrasting trophic niche and resource use dynamics across multiple American horseshoe crab (*Limulus polyphemus*) populations and age groups. *Estuaries and Coasts* 46(1): 227-245.
- Bopp, J., M. Sclafani, D.R. Smith, K. McKown, R. Sysak, and R.M. Cerrato. 2019. Geographic-specific capture–recapture models reveal contrasting migration and survival rates of adult horseshoe crabs (*Limulus polyphemus*). *Estuaries and Coasts* 42: 1570-1585.
- Box, G. E. and G. M. Jenkins. 1976. Time series analysis: forecasting and control, revised ed. Holden-Day, Oakland, CA.
- Cheng, H., C.C. Chabot, and W.H. Watson III. 2021. Distribution of juvenile American horseshoe crabs *Limulus polyphemus* in the Great Bay Estuary, New Hampshire, USA. *Marine Ecology Progress Series* 662: 199-203.
- Cheng, H., V. Vaattovaara, M. Conelly, B. Looney, C. Chabot, and W. Watson. 2022. Temperature and Salinity Preferences of Adult American Horseshoe Crabs (*Limulus polyphemus*) in the Great Bay Estuary, New Hampshire USA. Eds. Tanacredi, J.T, Botton, M.L., Shin, P.K.S., Iwasaki, Y., Cheung, S.G., Kwan, K. Y., Mattei, J.H. International Horseshoe Crab Conservation and Research Efforts: 2007-2020: Conservation of Horseshoe Crabs Species Globally. Cham: Springer International Publishing, 2022. 581-598.
- Colon, C.P., M.L. Botton, P. Funch, E. Hoffgaard, K. Mandeep, and K. Mansfield. 2022. Ecology of Juvenile American Horseshoe Crabs (*Limulus polyphemus*) at Plumb Beach, Jamaica Bay, New York. In International Horseshoe Crab Conservation and Research Efforts: 2007-2020: Conservation of Horseshoe Crabs Species Globally (pp. 669-690). Cham: Springer International Publishing.
- Gerrodette, T. 1987. A power analysis for detecting trends. *Ecology*, 68(5): 1364-1372.
- Helser, T. E. and D. B. Hayes. 1995. Providing quantitative management advice from stock abundance indices based on research surveys. *Fishery Bulletin* 93: 290 – 298.
- Kendrick, M.R., J.F. Brunson, D.A. Sasson, K.L. Hamilton, E.L. Gooding, S.L. Pound, and P.R. Kingsley-Smith. 2021. Assessing the viability of American horseshoe crab (*Limulus*

- polyphemus*) embryos in salt marsh and sandy beach habitats. *The Biological Bulletin* 240(3): 145-156.
- Litzenberg, K.L. 2023. The Physiological Effects of Age and Temperature on Blood Chemistry, Metabolism, and Mortality of Harvested Horseshoe Crabs (*Limulus polyphemus*) (Doctoral dissertation, College of Charleston).
- Owings, M., C. Chabot, and W. Watson III. 2019. Effects of the biomedical bleeding process on the behavior of the American horseshoe crab, *Limulus polyphemus*, in its natural habitat. *The Biological Bulletin* 236(3): 207-223.
- Owings, M., C. Chabot, and W. Watson III. 2020. Effects of the biomedical bleeding process on the behavior and hemocyanin levels of the American horseshoe crab (*Limulus polyphemus*). *Fishery Bulletin* 118.3.
- Pennington, M. 1983. Efficient estimators of abundance, for fish and plankton surveys. *Biometrics*: 281-286.
- Sasson, D.A., C.C. Chabot, J.H. Mattei, J.F. Brunson, F.K. Hall, J.H. Huber, J.E. Kasinak, C. McShane, P.T. Puckette, G. Sundin, P.R. Kingsley-Smith, and M.R. Kendrick. 2024. The American horseshoe crab, *Limulus polyphemus*, spawns regularly in salt marshes. *Frontiers in Ecology and the Environment*: e2738.
- Smith, D.R., J.J. Newhard, C.P. McGowan, and C.A. Butler. 2020. The long-term effect of bleeding for limulus amebocyte lysate on annual survival and recapture of tagged horseshoe crabs. *Frontiers in Marine Science* 7: 607668.
- Tinker-Kulberg, R., A. Dellinger, T.E. Brady, L. Robertson, M.K. Goddard, J. Bowzer, S.K. Abood, C. Kepley, and K. Dellinger. 2020a. Effects of diet on the biochemical properties of *Limulus* amebocyte lysate from horseshoe crabs in an aquaculture setting. *Frontiers in Marine Science* 7: 541604.
- Tinker-Kulberg, R., K. Dellinger, T. E. Brady, L., Robertson, J.H. Levy, S.K. Abood, F.M. LaDuca, C.L. Kepley, and A.L. Dellinger. 2020b. Horseshoe crab aquaculture as a sustainable endotoxin testing source. *Frontiers in Marine Science* 7: 153.
- Tinker-Kulberg, R., A.L. Dellinger, L.C. Gentit, B.A. Fluech, C.A. Wilder, I.L. Spratling, C.L. Kepley, L. Robertson, M.K. Goddard, and K. Dellinger. 2020c. Evaluation of indoor and outdoor aquaculture systems as alternatives to harvesting hemolymph from random wild capture of horseshoe crabs. *Frontiers in Marine Science* 7: 568628.
- Watson III, W.H., A.G. Lemmon, and C.C. Chabot. 2022. Impacts of biomedical bleeding on locomotion and mating behavior in the horseshoe crab *Limulus polyphemus*. *Marine Ecology Progress Series* 699: 65-74.

TABLES

Table 1. Coastwide horseshoe crab commercial bait landings in numbers, 1998-2022, as validated by ACCSP.

Year	Female Horseshoe Crabs (#s)	Male Horseshoe Crabs (#s)	Unclassified Sex (#s)	Total Horseshoe Crabs (#s)
1998	382,199	413,698	732,119	1,916,450
1999	388,280	466,540	1,219,625	2,605,280
2000	189,653	392,123	822,207	1,676,913
2001	155,561	280,626	215,077	785,407
2002	299,296	558,704	270,181	1,266,794
2003	233,583	415,456	273,697	1,048,100
2004	146,399	201,252	239,363	656,441
2005	142,303	258,774	253,614	710,534
2006	201,063	212,478	241,602	796,697
2007	141,705	186,625	363,462	785,855
2008	89,817	229,265	246,361	661,209
2009	115,590	339,447	208,119	757,550
2010	97,546	269,118	176,384	599,562
2011	79,827	315,679	212,768	697,656
2012	135,266	287,991	248,962	796,867
2013	83,161	477,844	241,640	951,362
2014	38,314	423,265	196,028	787,398
2015	33,398	247,593	198,044	596,646
2016	42,636	402,770	235,166	790,971
2017	151,157	659,947	166,061	977,165
2018	128,379	375,093	173,620	677,092
2019	127,963	465,461	219,107	812,531
2020	34,956	222,084	182,997	440,037
2021	91,191	483,785	181,207	756,183
2022	80,958	348,128	144,547	573,633

Table 2. Numbers of horseshoe crabs collected and bled, by sex, and estimated mortality for the biomedical industry as reported in annual Fishery Management Plan Reviews.

Year	Horseshoe Crabs Collected	Males Bled	Females Bled	Unsexed Bled	Total Horseshoe Crabs Bled	Total Mortality
2004	284,215	488	20,276	80,256	101,020	25,298
2005	248,475	52,308	25,171	112,883	190,362	31,584
2006	237,822	41,751	15,053	120,795	177,599	29,090
2007	416,824	61,656	18,209	272,780	352,645	57,560
2008	422,958	79,976	25,664	292,169	397,809	66,147
2009	414,959	88,678	35,712	261,728	386,118	64,236
2010	480,914	108,941	42,118	261,722	412,781	68,746
2011	545,164	122,999	82,002	281,849	486,850	97,166
2012	541,956	134,807	103,025	260,124	497,956	82,063
2013	464,657	114,459	84,914	241,029	440,402	71,507
2014	467,897	124,965	83,135	224,240	432,340	70,509
2015	494,123	139,135	92,289	233,082	464,506	75,038
2016	344,495	31,214	46,320	240,989	318,523	48,782
2017	483,245	262,133	141,903	40,079	444,115	72,674
2018	510,407	279,013	156,450	43,679	479,142	77,459
2019	637,029	353,609	235,752	0	589,361	101,193
2020	697,025	393,919	255,627	0	649,546	106,339
2021	718,809	388,220	279,731	0	667,951	112,104
2022	911,826	358,602	284,066	185,513	828,181	145,920

Table 3. Estimated number of dead horseshoe crabs caught and discarded from other commercial fisheries with upper and lower 95% confidence intervals (LCI, UCI) by sex for use in the catch multiple survey model.

Year	Males			Females		
	Dead Discards	LCI	UCI	Dead Discards	LCI	UCI
2003	9,117	2,545	16,623	6,567	1,722	11,455
2004	13,265	3,882	22,649	9,554	2,796	16,313
2005	4,209	1,709	7,009	3,031	1,231	5,048
2006	12,028	1,066	22,992	8,664	768	16,560
2007	9,024	2,716	15,333	6,500	1,956	11,043
2008	7,059	2,580	11,537	5,084	1,859	8,309
2009	11,767	3,317	20,218	8,475	2,389	14,562
2010	16,004	7,403	24,623	11,527	5,332	17,735
2011	20,468	8,627	32,310	14,742	6,213	23,271
2012	6,488	1,684	11,336	4,673	1,213	8,165
2013	15,179	3,391	26,966	10,933	2,443	19,423
2014	21,919	578	53,372	15,787	417	38,441
2015	16,096	7,944	24,247	11,593	5,722	17,464
2016	70,904	31,211	110,597	51,069	22,480	79,658
2017	43,451	4,527	82,374	31,295	3,261	59,330
2018	12,752	1,263	24,240	9,184	910	17,459
2019	50,177	20,042	80,312	36,140	14,435	57,845
2020	32,057	7,485	56,630	23,089	5,391	40,788
2021	76,078	70	173,196	54,795	50	124,745
2022	3,040	554	5,526	2,190	399	3,980

Table 4. Fishery-independent surveys used for developing indices of relative horseshoe crab abundance. Additional information on season, horseshoe crab sex, model used, and time series for each index provided. Information on covariates used in the generalized linear model (GLM) standardization can be found in Table A1. Table continues on next page. Surveys with an * indicate there was reduced sampling in the strata used in the index in 2020-2022 and therefore those trends should be interpreted cautiously.

Survey	Region	Season	Sex	Model	Time Series
Massachusetts Trawl - North of Cape Cod	Northeast	Fall	All	Delta	1982-2019, 2021-2022
Massachusetts Trawl - South of Cape Cod	Northeast	Fall	All	Delta	1982-2019, 2021-2022
Rhode Island Monthly Trawl	Northeast	Fall	All	Negative binomial (NB) GLM	1998-2022
Connecticut Long Island Sound Trawl Survey (LISTS)	New York	Fall	All	Delta	1997-2009, 2011-2019, 2021-2022
New York Peconic Trawl	New York	Fall	All	Delta	1987-2022
New York Western Long Island Sound (WLIS) Beach Seine - Jamaica Bay	New York	Spring	All	NB GLM	1987-2019, 2021-2022
New York WLIS Beach Seine - Little Neck and Manhasset Bays	New York	Spring	All	NB GLM	1987-2019, 2021-2022
NEAMAP - New York	New York	Fall	All	Delta	2007-2022
NEAMAP - Delaware Bay	Delaware Bay	Fall	All	Delta	2007-2022
New Jersey Ocean Trawl (NJ OT)	Delaware Bay	Spring	All	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Spring	Females	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Spring	Males	Delta	1999-2019, 2022
New Jersey Ocean Trawl (NJ OT)	Delaware Bay	Spring	All	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Spring	Females	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Spring	Males	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Fall	All	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Fall	Females	Delta	1999-2019, 2022
NJ OT	Delaware Bay	Fall	Males	Delta	1999-2019, 2022

Table 4 continued from previous page. Surveys with an * indicate there was reduced sampling in the strata used in the index in 2020-2022 and therefore those trends should be interpreted cautiously. ** Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Survey	Region	Season	Sex	Model	Time Series
Delaware Adult 30' Trawl	Delaware Bay	Spring	All	NB GLM	1990-2022
Delaware Adult 30' Trawl	Delaware Bay	Spring	Females	NB GLM	1990-2022
Delaware Adult 30' Trawl	Delaware Bay	Spring	Males	NB GLM	1990-2022
Delaware Adult 30' Trawl	Delaware Bay	Fall	All	NB GLM	1990-2022
Delaware Adult 30' Trawl	Delaware Bay	Fall	Females	NB GLM	1990-2022
Delaware Adult 30' Trawl	Delaware Bay	Fall	Males	NB GLM	1990-2022
Maryland Coastal Bays	Delaware Bay	Spring	All	NB GLM	1990-2022
Virginia Tech Trawl	Delaware Bay	Fall	Females	Delta	2002-2011, 2016-2022
Virginia Tech Trawl	Delaware Bay	Fall	Females	Delta	2002-2011, 2016-2022
North Carolina Gill Net	Southeast	Spring	All	Delta	2001-2016, 2018-2019, 2022
* SEAMAP - South Carolina	Southeast	Fall	All	Delta	2001-2019, 2021-2022
* SEAMAP - Georgia and Florida	Southeast	Fall	All	Delta	2001-2019, 2021-2022
**South Carolina Crustacean Research Monitoring Survey (CRMS)	Southeast	Spring	All	NB GLM	1995-2019, 2021-2022
* South Carolina Trammel Net	Southeast	Spring	All	NB GLM	1995-2019, 2021-2022
Georgia Ecological Monitoring Survey	Southeast	Spring	All	NB GLM	1999-2023

Table 5. Results of the power analysis by survey for linear and exponential trends in horseshoe crab abundance indices over a twenty-year period. Power was calculated as the probability of detecting a 50% change following the methods of Gerrodette (1987). Table continues on next two pages.

Survey	Median CV	Exponential		Linear	
		50%	-50%	50%	-50%
Northeast Region					
MA Trawl North of Cape Cod - Fall Combined Sexes	0.78	0.13	0.20	0.11	0.16
MA Trawl South of Cape Cod - Fall Combined Sexes	0.55	0.20	0.32	0.18	0.27
RI Monthly Trawl - Fall Combined Sexes	0.45	0.27	0.43	0.25	0.38
New York Region					
CT Long Island Sound Trawl - Fall Combined Sexes	0.23	0.70	0.90	0.69	0.89
NY Jamaica Bay Beach Seine - Spring Combined Sexes	0.46	0.26	0.41	0.24	0.37
NY Little Neck and Manhasset Bay Beach Seine - Spring Combined Sexes	0.29	0.51	0.73	0.50	0.71
NY NEAMAP - Fall Combined Sexes	0.38	0.34	0.53	0.32	0.49
NY Peconic Bay Trawl - Fall Combined Sexes	0.13	0.99	1.00	0.99	1.00
Delaware Bay Region					
DE Adult Trawl - Fall Combined Sexes	0.15	0.96	1.00	0.96	1.00
DE Adult Trawl - Fall Female	0.62	0.17	0.27	0.15	0.22
DE Adult Trawl - Fall Male	0.27	0.57	0.80	0.56	0.78
DE Adult Trawl - Spring Combined Sexes	0.13	1.00	1.00	0.99	1.00
DE Adult Trawl - Spring Female	0.36	0.38	0.58	0.36	0.55
DE Adult Trawl - Spring Male	0.29	0.53	0.76	0.51	0.73

Table 5 Continued.

Survey	Median CV	Exponential		Linear	
		50%	-50%	50%	-50%
Delaware Bay Region (continued)					
Delaware Bay NEAMAP - Fall Combined Sexes	0.31	0.47	0.69	0.46	0.66
MD Coastal Bays - Spring Combined Sexes	0.42	0.30	0.47	0.28	0.43
NJ Ocean Trawl - Fall Adults Combined Sexes	0.33	0.42	0.64	0.41	0.61
NJ Ocean Trawl - Fall All Crabs Combined Sexes	0.32	0.44	0.66	0.43	0.63
NJ Ocean Trawl - Fall Female	0.31	0.48	0.70	0.47	0.68
NJ Ocean Trawl - Fall Male	0.37	0.36	0.55	0.34	0.51
NJ Ocean Trawl - Spring Adults Combined Sexes	0.29	0.52	0.75	0.51	0.72
NJ Ocean Trawl - Spring All Crabs Combined Sexes	0.29	0.53	0.76	0.52	0.74
NJ Ocean Trawl - Spring Female	0.25	0.64	0.85	0.63	0.84
NJ Ocean Trawl - Spring Male	0.30	0.50	0.73	0.49	0.70
VA Tech Trawl - All Crabs	0.16	0.94	1.00	0.94	1.00
VA Tech Trawl - Immature Female	0.31	0.47	0.69	0.46	0.67
VA Tech Trawl - Immature Male	0.33	0.42	0.64	0.41	0.60
VA Tech Trawl - Multiparous Female	0.28	0.56	0.78	0.54	0.76
VA Tech Trawl - Multiparous Male	0.28	0.54	0.77	0.53	0.75
VA Tech Trawl - Primiparous Female	0.31	0.48	0.71	0.47	0.68
VA Tech Trawl - Primiparous Male	0.34	0.40	0.61	0.39	0.58

Table 5 Continued. * Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey (CRMS) has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Survey	Median CV	Exponential		Linear	
		50%	-50%	50%	-50%
Southeast Region					
GA Trawl - Spring Combined Sexes	0.23	0.72	0.91	0.72	0.90
GA-FL SEAMAP - Fall Combined Sexes	0.39	0.33	0.52	0.32	0.48
NC Gill Net - Spring Combined Sexes	0.15	0.96	1.00	0.96	1.00
* SC CRMS - Spring Combined Sexes	0.55	0.20	0.32	0.18	0.27
SC SEAMAP - Fall Combined Sexes	0.50	0.22	0.36	0.21	0.32
SC Trammel Net - Spring Combined Sexes	0.35	0.39	0.59	0.37	0.56

Table 6. Data and results for the Mann-Kendall test of temporal trends in sex ratios, defined as the ratio of males to females. Significant *P*-values are in bold. The New Jersey Ocean trawl did not operate in 2020-2021 due to COVID.

Survey	Season	Sex Ratio	tau	<i>P</i> -value	Years included in analysis
DE Adult Trawl	Spring	1.21	0.44	0.00	1990 - 2022
DE Adult Trawl	Fall	2.10	0.30	0.02	1990 - 2022
NJ Ocean Trawl	Spring	1.18	0.16	0.32	1999 - 2022
NJ Ocean Trawl	Fall	1.36	0.35	0.02	1999 - 2022

Table 7. Sex ratio and proportion female information, with associated confidence limits, for the New Jersey Ocean Trawl. There was no sampling in 2020-2021 due to COVID.

Season	Year	Proportion Female	LCL	UCL	Sex Ratio	LCL	UCL
Spring	1996	60%	52%	68%	0.67	0.44	0.91
Spring	1999	44%	36%	52%	1.26	0.86	1.67
Spring	2000	49%	43%	54%	1.05	0.82	1.28
Spring	2001	45%	38%	53%	1.20	0.85	1.56
Spring	2002	63%	51%	74%	0.60	0.30	0.90
Spring	2003	48%	41%	55%	1.08	0.77	1.40
Spring	2004	51%	45%	57%	0.97	0.75	1.19
Spring	2005	47%	41%	54%	1.11	0.82	1.39
Spring	2006	54%	38%	70%	0.85	0.30	1.41
Spring	2007	53%	40%	65%	0.90	0.45	1.35
Spring	2008	50%	45%	55%	1.00	0.81	1.18
Spring	2009	44%	37%	51%	1.25	0.90	1.61
Spring	2010	42%	38%	45%	1.41	1.19	1.63
Spring	2011	56%	47%	65%	0.79	0.49	1.08
Spring	2012	46%	41%	52%	1.16	0.89	1.43
Spring	2013	53%	44%	61%	0.90	0.59	1.21
Spring	2014	52%	40%	63%	0.94	0.52	1.36
Spring	2015	46%	32%	60%	1.18	0.52	1.83
Spring	2016	49%	43%	54%	1.06	0.81	1.30
Spring	2017	43%	29%	57%	1.31	0.57	2.06
Spring	2018	41%	34%	48%	1.43	1.03	1.83
Spring	2019	54%	41%	68%	0.84	0.39	1.30
Spring	2022	39%	33%	45%	1.59	1.18	2.00

Season	Year	Proportion Female	LCL	UCL	Sex Ratio	LCL	UCL
Fall	1996	44%	39%	48%	1.30	1.04	1.56
Fall	1999	52%	46%	58%	0.93	0.71	1.14
Fall	2000	51%	41%	60%	0.98	0.61	1.35
Fall	2001	52%	44%	60%	0.94	0.63	1.24
Fall	2002	50%	42%	58%	1.00	0.69	1.31
Fall	2003	46%	38%	54%	1.19	0.81	1.58
Fall	2004	51%	47%	56%	0.96	0.78	1.13
Fall	2005	38%	32%	44%	1.63	1.19	2.07
Fall	2006	44%	37%	51%	1.28	0.90	1.66
Fall	2007	44%	39%	49%	1.28	1.01	1.54
Fall	2008	59%	49%	68%	0.70	0.42	0.98
Fall	2009	50%	36%	64%	1.02	0.45	1.59
Fall	2010	46%	31%	62%	1.16	0.45	1.86
Fall	2011	43%	31%	55%	1.34	0.68	2.01
Fall	2012	45%	31%	60%	1.22	0.51	1.94
Fall	2013	65%	42%	88%	0.54	0.00	1.07
Fall	2014	43%	34%	52%	1.32	0.83	1.81
Fall	2015	47%	37%	58%	1.12	0.64	1.60
Fall	2016	40%	28%	52%	1.52	0.75	2.29
Fall	2017	47%	33%	62%	1.12	0.47	1.77
Fall	2018	38%	26%	50%	1.62	0.79	2.44
Fall	2019	32%	25%	39%	2.10	1.43	2.78
Fall	2022	47%	37%	57%	1.14	0.69	1.58

Table 8. Sex ratio and proportion female information, with associated confidence limits, for the Delaware Adult Trawl.

Season	Year	Proportion Female	LCL	UCL	Sex Ratio	LCL	UCL
Spring	1990	54%	45%	63%	0.86	0.55	1.16
Spring	1991	50%	44%	56%	1.00	0.77	1.23
Spring	1992	50%	41%	60%	0.99	0.63	1.35
Spring	1993	45%	35%	55%	1.23	0.71	1.74
Spring	1994	41%	30%	51%	1.45	0.82	2.08
Spring	1995	51%	43%	59%	0.96	0.64	1.28
Spring	1996	65%	56%	75%	0.53	0.31	0.75
Spring	1997	46%	36%	55%	1.20	0.75	1.65
Spring	1998	55%	44%	65%	0.82	0.47	1.17
Spring	1999	48%	38%	57%	1.11	0.70	1.51
Spring	2000	47%	39%	54%	1.14	0.80	1.48
Spring	2001	52%	43%	61%	0.92	0.58	1.25
Spring	2002	65%	30%	100%	0.54	0.00	1.38
Spring	2003	49%	36%	61%	1.06	0.54	1.58
Spring	2004	60%	0%	100%	0.67	0.00	2.40
Spring	2005	67%	28%	100%	0.50	0.00	1.36
Spring	2006	53%	42%	63%	0.90	0.53	1.28
Spring	2007	37%	27%	47%	1.73	1.00	2.46
Spring	2008	44%	23%	65%	1.27	0.21	2.34
Spring	2009	40%	28%	52%	1.50	0.75	2.25
Spring	2010	28%	11%	45%	2.55	0.40	4.69
Spring	2011	29%	18%	41%	2.43	1.09	3.76
Spring	2012	46%	31%	60%	1.20	0.50	1.90
Spring	2013	36%	1%	70%	1.80	0.00	4.50
Spring	2014	38%	30%	47%	1.61	1.02	2.19
Spring	2015	37%	26%	48%	1.71	0.88	2.55
Spring	2016	43%	34%	51%	1.34	0.89	1.80
Spring	2017	34%	26%	41%	1.99	1.34	2.64
Spring	2018	34%	29%	38%	1.98	1.55	2.41
Spring	2019	37%	29%	44%	1.74	1.15	2.32
Spring	2020	42%	25%	59%	1.39	0.44	2.35
Spring	2021	33%	27%	39%	2.04	1.49	2.59
Spring	2022	37%	27%	48%	1.68	0.94	2.42

Season	Year	Proportion Female	LCL	UCL	Sex Ratio	LCL	UCL
Fall	1990	41%	33%	48%	1.47	1.01	1.92
Fall	1991	43%	33%	54%	1.30	0.76	1.85
Fall	1992	26%	17%	36%	2.83	1.45	4.22
Fall	1993	33%	26%	40%	2.04	1.43	2.64
Fall	1994	29%	7%	50%	2.50	0.00	5.14
Fall	1995	47%	37%	57%	1.12	0.68	1.56
Fall	1996	30%	24%	37%	2.32	1.61	3.04
Fall	1997	37%	25%	49%	1.70	0.82	2.58
Fall	1998	33%	20%	45%	2.08	0.88	3.27
Fall	1999	36%	24%	49%	1.76	0.81	2.70
Fall	2000	50%	39%	61%	1.00	0.57	1.43
Fall	2001	44%	0%	96%	1.25	0.00	3.87
Fall	2002	39%	6%	72%	1.57	0.00	3.77
Fall	2003	35%	21%	50%	1.82	0.67	2.98
Fall	2004	50%	0%	100%	1.00	0.00	13.71
Fall	2005	43%	0%	100%	1.33	0.00	4.50
Fall	2006	29%	22%	36%	2.48	1.62	3.33
Fall	2007	30%	14%	45%	2.38	0.65	4.11
Fall	2008	27%	0%	61%	2.67	0.00	7.22
Fall	2009	24%	2%	47%	3.13	0.00	6.95
Fall	2010	32%	0%	63%	2.14	-0.96	5.25
Fall	2011	25%	0%	54%	3.00	0.00	7.58
Fall	2012	23%	0%	48%	3.40	0.00	8.20
Fall	2013	39%	30%	49%	1.55	0.93	2.16
Fall	2014	30%	17%	44%	2.30	0.85	3.74
Fall	2015	42%	32%	52%	1.38	0.81	1.95
Fall	2016	27%	22%	32%	2.67	2.02	3.32
Fall	2017	26%	17%	34%	2.88	1.62	4.13
Fall	2018	37%	30%	44%	1.72	1.19	2.25
Fall	2019	23%	18%	27%	3.41	2.51	4.30
Fall	2020	35%	25%	45%	1.89	1.05	2.74
Fall	2021	24%	15%	32%	3.26	1.70	4.83
Fall	2022	28%	22%	34%	2.56	1.77	3.34

Table 9. Recapture rate relative to total recaptures for each region of release (source: USFWS tagging database).

	Released	Northeast	Coastal NY-NJ	Delaware Bay	Coastal DE-VA	Southeast
Northeast	100,379	93%	7%	0%	0%	0%
Coastal NY-NJ	62,083	6%	92%	1%	0%	0%
Delaware Bay	96,973	0%	3%	92%	4%	0%
Coastal DE-VA	124,835	1%	2%	31%	66%	0%
Southeast	16,458	0%	0%	1%	1%	97%

Table 10. Regional apparent annual survival rates and associated 95% confidence intervals (CI) and standard errors (SE), averaged among years 2009-2022 (source: USFWS tagging database).

Region	2019 Benchmark		2024 Update	
	Survival Rate (CI)	SE	Survival Rate (CI)	SE
Northeast	67% (66 - 68%)	0.006	63% (51 - 73%)	0.057
Coastal NY-NJ	62% (59 - 65%)	0.016	63% (46 - 76%)	0.079
Delaware Bay	76% (73 - 78%)	0.014	67% (48 - 81%)	0.087
Coastal DE-VA	71% (69 - 73%)	0.012	60% (40 - 74%)	0.100
Southeast	63% (55 - 69%)	0.035	41% (17 - 62%)	0.129

Table 11. Number of tag releases (top) and recaptures (bottom) from 2009-2022 and the percent change of tagging effort during the COVID years (2020-2022; source: USFWS tagging database).

RELEASES															2009-2019 Average Releases	2020 Difference from Average	2021 Difference from Average	2022 Difference from Average
Region	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022				
Northeast	14,954	17,197	16,487	11,154	7,616	3,802	3,726	3,964	1,869	2,937	2,275	1,345	1,225	1,174	7,816	-83%	-84%	-85%
Coast NY- NJ	3,331	2,194	2,130	7,075	4,568	2,913	3,868	4,343	4,570	4,850	5,435	2,560	4,645	5,617	4,116	-38%	13%	36%
Delaware Bay	546	1,976	3,625	2,277	1,314	4,222	4,231	5,625	5,597	5,640	4,966	30	2,784	4,937	3,638	-99%	-23%	36%
Coast DE- VA	4,721	5,413	6,844	9,873	6,813	4,237	3,574	4,170	5,193	5,018	5,897	4,042	6,166	7,382	5,614	-28%	10%	31%
Southeast	325	2,588	957	442	412	1,757	2,015	1,865	418	502	608	65	1,206	773	1,081	-94%	12%	-28%

RECAPTURES															2009-2019 Average Recaps	2020 Difference from Average	2021 Difference from Average	2022 Difference from Average
Region	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022				
Northeast	2,208	3,533	3,901	1,593	2,268	1,050	1,086	1,108	784	877	1,092	1,001	756	627	1,773	-44%	-57%	-65%
Coast NY- NJ	215	440	481	615	818	1,030	657	554	589	629	1,083	612	926	1,438	646	-5%	43%	122%
Delaware Bay	660	553	962	541	944	594	776	673	926	962	1,415	748	800	775	819	-9%	-2%	-5%
Coast DE- VA	431	327	435	1,040	630	604	474	507	411	738	404	268	505	815	546	-51%	-7%	49%
Southeast	11	51	138	94	49	355	245	195	38	71	75	25	60	49	120	-79%	-50%	-59%

Table 12. ARIMA summary statistics for horseshoe crab surveys. *W* is the Shapiro-Wilk test statistic for normality of residuals; *P* is the *P*-value of the normality test; *n* is the number of years in the time series; *r*1, *r*2, and *r*3 are the first three autocorrelations; θ is the moving average parameter; SE is the standard error of θ ; and σ_c^2 is the variance of the index. Table continued on next few pages.

Survey	Years	<i>n</i>	<i>W</i>	<i>P</i>	<i>r</i> 1	<i>r</i> 2	<i>r</i> 3	θ	SE	σ_c^2
Northeast Region										
MA Trawl North of Cape Cod - Fall Combined Sexes	(1982 - 2022)	41	0.85	0.00	-0.31	-0.39	0.26	0.95	0.21	3.11
MA Trawl South of Cape Cod - Fall Combined Sexes	(1982 - 2022)	41	0.93	0.02	-0.33	-0.25	0.18	0.93	0.17	2.42
RI Monthly Trawl - Fall Combined Sexes	(1998 - 2022)	25	0.97	0.62	-0.58	0.18	0.15	0.67	0.17	0.41
New York Region										
CT Long Island Sound Trawl - Fall Combined Sexes	(1997 - 2022)	26	0.93	0.11	-0.51	0.02	-0.03	0.44	0.20	0.18
NY Jamaica Bay Beach Seine - Spring Combined Sexes	(1987 - 2022)	36	0.96	0.16	-0.44	0.10	0.08	0.80	0.10	0.55
NY Little Neck and Manhasset Bay Beach Seine - Spring Combined Sexes	(1987 - 2022)	36	0.95	0.12	-0.30	-0.14	-0.07	0.60	0.13	0.26
NY NEAMAP - Fall Combined Sexes	(2007 - 2022)	16	0.96	0.71	-0.28	-0.12	0.13	0.41	0.35	0.62
NY Peconic Trawl - Fall Combined Sexes	(1987 - 2022)	36	0.66	0.00	-0.48	0.01	0.08	0.65	0.12	0.79

Table 12 Continued.

Survey	Years	n	W	P	r1	r2	r3	θ	SE	σ^2_c
Delaware Bay Region										
DE Adult Trawl - Fall Combined Sexes	(1990 - 2022)	33	0.97	0.46	-0.24	-0.54	0.33	0.69	0.13	1.05
DE Adult Trawl - Fall Female	(1990 - 2022)	33	0.95	0.17	-0.26	-0.45	0.31	0.60	0.15	1.11
DE Adult Trawl - Fall Male	(1990 - 2022)	33	0.97	0.47	-0.22	-0.62	0.45	0.65	0.13	1.24
DE Adult Trawl - Spring Combined Sexes	(1990 - 2022)	33	0.96	0.19	-0.33	-0.19	0.15	0.55	0.16	1.06
DE Adult Trawl - Spring Female	(1990 - 2022)	33	0.98	0.72	-0.35	-0.18	0.16	0.55	0.15	1.08
DE Adult Trawl - Spring Male	(1990 - 2022)	33	0.96	0.22	-0.34	-0.25	0.19	0.58	0.15	1.36
Delaware bay NEAMAP - Fall Combined Sexes	(2007 - 2022)	16	0.91	0.11	-0.31	-0.38	0.30	1.00	0.67	0.44
MD Coastal Bays - Spring Combined Sexes	(1990 - 2022)	33	0.96	0.26	-0.52	0.04	0.17	1.00	0.10	0.51
NJ Ocean Trawl - Fall All Crabs Combined Sexes	(1988 - 2022)	35	0.96	0.28	-0.30	0.06	-0.20	0.73	0.16	0.56
NJ Ocean Trawl - Fall Female	(1999 - 2022)	24	0.96	0.48	-0.10	-0.30	-0.03	0.72	0.22	0.42
NJ Ocean Trawl - Fall Male	(1999 - 2022)	24	0.94	0.22	-0.16	-0.11	-0.13	0.67	0.22	0.61
NJ Ocean Trawl - Spring All Crabs Combined Sexes	(1989 - 2022)	34	0.98	0.67	-0.36	-0.11	0.08	0.45	0.17	0.32
NJ Ocean Trawl - Spring Female	(1999 - 2022)	24	0.94	0.23	-0.43	0.10	-0.04	0.46	0.19	0.34
NJ Ocean Trawl - Spring Male	(1999 - 2022)	24	0.94	0.21	-0.18	-0.16	-0.04	0.20	0.27	0.29

Table 12 Continued. * Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey (CRMS) has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Survey	Years	n	W	P	r1	r2	r3	θ	SE	σ ² _c
Delaware Bay Region (continued)										
VA Tech Trawl - All Crabs	(2002 - 2022)	21	0.98	0.98	-0.45	0.03	0.01	0.76	0.20	0.22
VA Tech Trawl - Immature Female	(2002 - 2022)	21	0.95	0.40	-0.66	0.35	-0.10	1.00	0.16	0.35
VA Tech Trawl - Immature Male	(2002 - 2022)	21	0.95	0.54	-0.66	0.37	-0.17	1.00	0.18	0.49
VA Tech Trawl - Multiparous Female	(2002 - 2022)	21	0.92	0.16	-0.10	-0.43	-0.26	0.48	0.31	0.18
VA Tech Trawl - Multiparous Male	(2002 - 2022)	21	0.93	0.25	-0.18	-0.42	-0.21	0.68	0.16	0.29
VA Tech Trawl - Primiparous Female	(2002 - 2022)	21	0.90	0.08	-0.23	0.14	-0.48	0.22	0.26	1.23
VA Tech Trawl - Primiparous Male	(2002 - 2022)	21	0.94	0.38	-0.47	0.10	-0.15	0.56	0.23	0.85
Southeast Region										
NC Gill Net - Spring Combined Sexes	(2001 - 2022)	22	0.93	0.17	-0.05	-0.07	0.12	0.18	0.32	0.15
* SC CRMS - Spring Combined Sexes	(1995 - 2022)	28	0.95	0.20	-0.32	0.05	-0.18	0.53	0.27	0.61
SC SEAMAP - Fall Combined Sexes	(2001 - 2022)	22	0.85	0.00	-0.56	0.36	-0.18	0.61	0.17	5.88
SC Trammel Net - Spring Combined Sexes	(1995 - 2022)	28	0.94	0.09	-0.16	-0.40	0.05	0.49	0.23	0.49
GA Trawl - Spring Combined Sexes	(1999 - 2023)	25	0.87	0.00	-0.48	-0.04	0.04	0.73	0.17	0.35
GA-FL SEAMAP - Fall Combined Sexes	(2001 - 2022)	22	0.93	0.11	-0.19	-0.17	0.15	0.51	0.17	3.82

Table 13. Reference points from the ARIMA model for each survey and the probability (P) that the terminal year's fitted index (i_f) is below the reference point. The 1998 reference is i_{1998} and the lower quartile reference is Q_{25} . Reference points are based on ln transformed index values. Surveys that began after 1998 do not have a 1998 reference value. Relative trends since the last benchmark assessment (trend since 2017) and last stock assessment update (trend since 2012) are indicated. Table continued on the next few pages.

Survey	i_f	i_{1998}	$P(i_f < i_{1998})$	Q_{25}	$P(i_f < Q_{25})$	Trend since 2017	Trend since 2012
Northeast Region							
MA Trawl North of Cape Cod - Fall Combined Sexes	-0.99	-1.07	35%	-1.19	21%	No Trend	↑
MA Trawl South of Cape Cod - Fall Combined Sexes	-1.49	-1.47	37%	-1.63	21%	No Trend	↑
RI Monthly Trawl - Fall Combined Sexes	-1.09	-0.34	96%	-0.70	67%	↓	↓
New York Region							
CT Long Island Sound Trawl - Fall Combined Sexes	1.02	0.89	37%	0.35	11%	No Trend	↑
NY Jamaica Bay Beach Seine - Spring Combined Sexes	-1.73	-1.00	99%	-1.52	70%	↓	↓
NY Little Neck and Manhasset Bay Beach Seine - Spring Combined Sexes	0.19	1.43	100%	0.26	62%	No Trend	↓
NY NEAMAP - Fall Combined Sexes	2.03			1.02	4%	↑	No Trend
NY Peconic Trawl - Fall Combined Sexes	-1.43	0.15	100%	-1.39	55%	↑	No Trend

Table 13 Continued.

Survey	i_f	i_{1998}	$P(i_f < i_{1998})$	Q ₂₅	$P(i_f < Q_{25})$	Trend since 2017	Trend since 2012
Delaware Bay Region							
DE 30 ft Trawl - Fall Combined Sexes	1.96	1.05	2%	0.82	0%	No Trend	↑
DE 30 ft Trawl - Fall Female	0.49	-0.25	5%	-0.82	0%	No Trend	↑
DE 30 ft Trawl - Fall Male	1.54	0.52	1%	0.13	0%	No Trend	↑
DE 30 ft Trawl - Spring Combined Sexes	1.73	1.15	9%	0.41	1%	No Trend	↑
DE 30 ft Trawl - Spring Female	0.53	0.35	35%	-0.76	1%	No Trend	↑
DE 30 ft Trawl - Spring Male	1.13	0.26	6%	-0.50	0%	No Trend	↑
Delaware bay NEAMAP - Fall Combined Sexes	2.93			2.83	5%	No Trend	No Trend
MD Coastal Bays - Spring Combined Sexes	1.05	0.75	0%	0.74	0%	No Trend	↑
NJ Ocean Trawl - Fall All Crabs Combined Sexes	2.36	1.88	16%	1.67	10%	No Trend	↑
NJ Ocean Trawl - Fall Female	1.49			0.79	9%	No Trend	↑
NJ Ocean Trawl - Fall Male	1.88			0.88	8%	No Trend	↑
NJ Ocean Trawl - Spring All Crabs Combined Sexes	3.09	2.33	8%	1.67	5%	No Trend	↑
NJ Ocean Trawl - Spring Female	2.09			0.77	8%	No Trend	↑
NJ Ocean Trawl - Spring Male	2.79			0.66	7%	No Trend	↑

Table 13 Continued. * Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey (CRMS) has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Survey	i_f	i_{1998}	$P(i_f < i_{1998})$	Q ₂₅	$P(i_f < Q_{25})$	Trend since 2017	Trend since 2012
Delaware Bay Region (continued)							
VA Tech Trawl - All Crabs	4.76			4.48	21%	↑	↑
VA Tech Trawl - Immature Female	2.94			2.82	19%	↓	↓
VA Tech Trawl - Immature Male	2.55			2.38	18%	↓	↓
VA Tech Trawl - Multiparous Female	3.34			2.43	18%	↑	↑
VA Tech Trawl - Multiparous Male	3.99			3.31	19%	↑	↑
VA Tech Trawl - Primiparous Female	-1.62			-0.48	92%	↓	↓
VA Tech Trawl - Primiparous Male	2.36			0.90	17%	↑	↑
Southeast Region							
NC Gill Net - Spring Combined Sexes	0.00			-1.23	16%	No Trend	No Trend
* SC CRMS - Spring Combined Sexes	0.24	-0.44	7%	-0.43	10%	No Trend	↑
SC SEAMAP - Fall Combined Sexes	-0.69			-0.34	21%	No Trend	↓
SC Trammel Net - Spring Combined Sexes	-1.05	-0.99	22%	-0.73	41%	↓	↓
GA Trawl - Spring Combined Sexes	0.90			1.12	45%	↓	↓
GA-FL SEAMAP - Fall Combined Sexes	-1.72			-1.14	38%	No Trend	↓

Table 14. Stock status determination for the coastwide and regional stocks based on the 1998 index-based reference points from ARIMA models. Status was based on the percentage of surveys within a region (or coastwide) having a >50% probability of their terminal year fitted value being less than the 1998 index-based reference point. “Poor” status (red) was >66% of surveys meeting this criterion, “Good” status (green) was <33% of surveys, and “Neutral” status (yellow) was 34 – 65% of surveys. The same criteria were applied to results from the 2019 benchmark assessment, 2013 stock assessment update, and 2009 benchmark assessment for comparison purposes.

Region	2009 Benchmark	2013 Update	2019 Benchmark	2024 update	2024 Stock Status
Northeast	2 out of 3	5 out of 6	1 out of 2	1 out of 2	Neutral
New York	1 out of 5	3 out of 5	4 out of 4	3 out of 4	Poor
Delaware Bay	5 out of 11	4 out of 11	2 out of 5	0 out of 5	Good
Southeast	0 out of 5	0 out of 2	0 out of 2	0 out of 2	Good
Coastwide	7 out of 24	12 out of 24	7 out of 13	4 out of 13	Good

Table 15. Details of surveys used in determining regional stock status of horseshoe crabs. $P(i_f < Q_{25})$ and $P(i_f > 1998)$ represent the probability of the terminal year's fitted index value (i_f) being less than the 25th percentile or 1998 index-based reference points. Trends as determined by a Mann-Kendal test for monotonic trends (increasing, decreasing, or no trend) from the last stock assessment update terminal year (2012) and the last benchmark assessment terminal year (2017) are also indicated. * Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey (CRMS) has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Region	Survey	$P(i_f < Q_{25})$	$P(i_f < 1998)$	Since 2017	Since 2012
Northeast	MA Trawl South of Cape Cod - Fall Combined Sexes	21%	35%	No Trend	↑
	RI Monthly Trawl - Fall Combined Sexes	67%	96%	↓	↓
New York	CT Long Island Sound Trawl - Fall Combined Sexes	11%	37%	No Trend	↑
	NY Jamaica Bay Beach Seine - Spring Combined Sexes	70%	99%	↓	↓
	NY Little Neck and Manhasset Bay Beach Seine - Spring Combined Sexes	62%	100%	No Trend	↓
	NY Peconic Trawl - Fall Combined Sexes	55%	100%	↑	No Trend
Delaware Bay	DE 30 ft Trawl - Fall Combined Sexes	0%	2%	No Trend	↑
	DE 30 ft Trawl - Spring Combined Sexes	1%	9%	No Trend	↑
	MD Coastal Bays - Spring Combined Sexes	0%	0%	No Trend	↑
	NJ Ocean Trawl - Fall All Crabs Combined Sexes	10%	16%	No Trend	↑
	NJ Ocean Trawl - Spring All Crabs Combined Sexes	5%	8%	No Trend	↑
Southeast	* SC CRMS - Spring Combined Sexes	10%	7%	No Trend	↑
	SC Trammel Net - Spring Combined Sexes	41%	22%	↓	↓

FIGURES

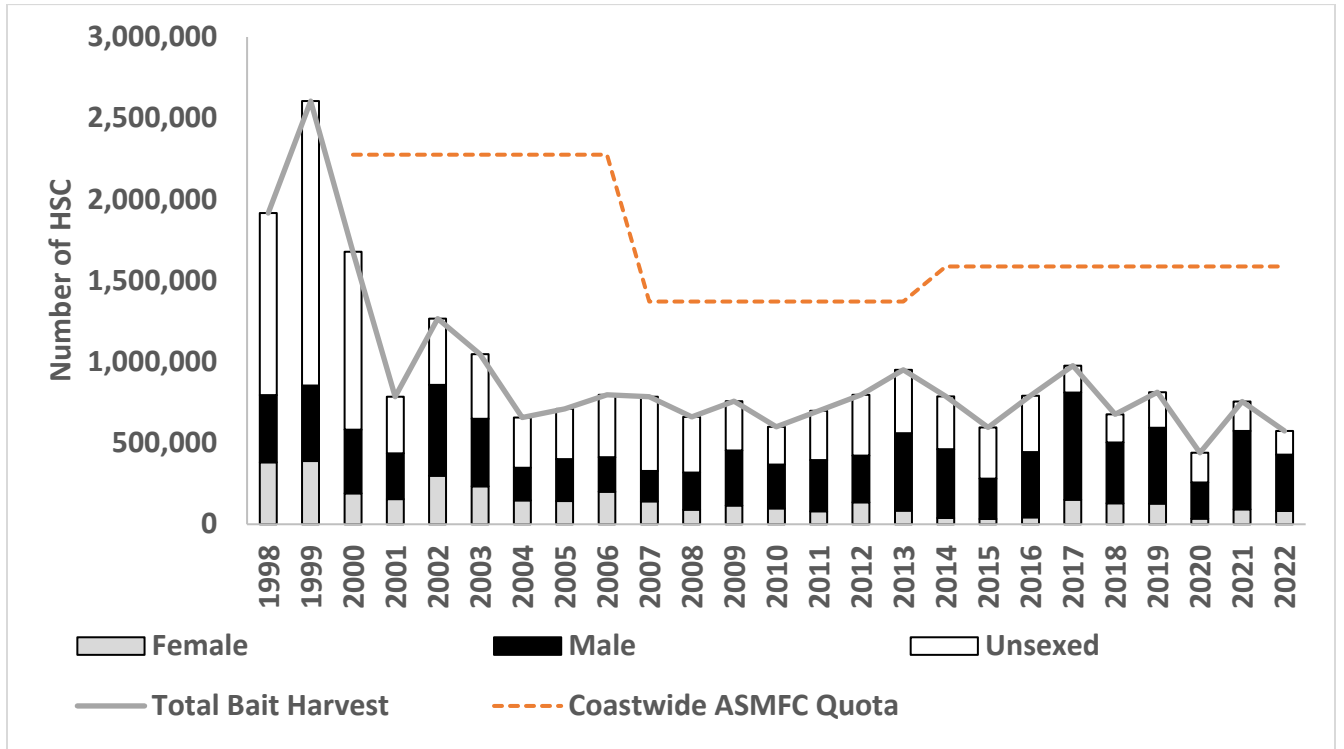


Figure 1. Coastwide horseshoe crab bait landings, 1998-2022, by sex where available. Coastwide ASMFC quota indicated in orange. Source: ACCSP.

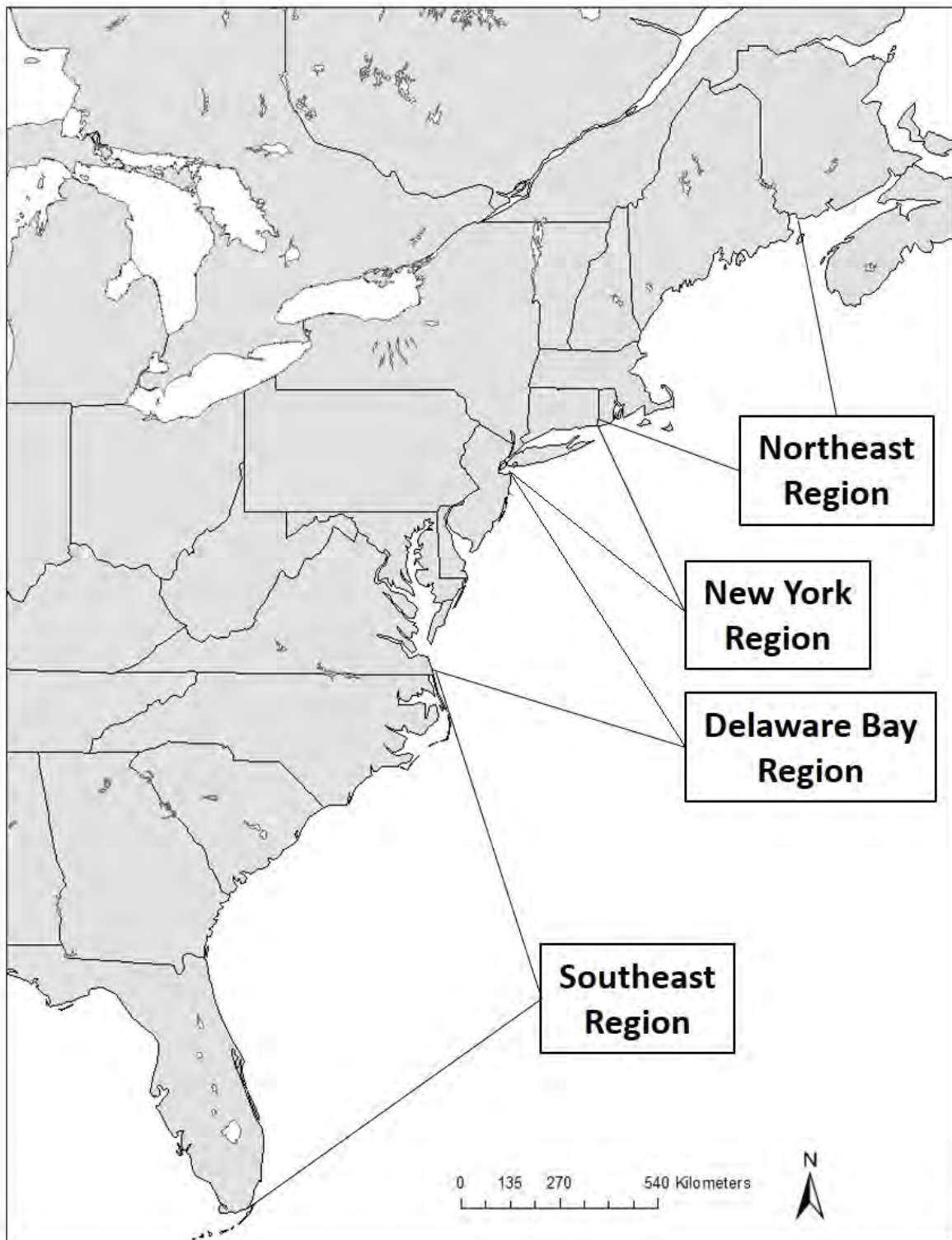


Figure 2. Map of the Atlantic coast showing the regions for horseshoe crab assessment.

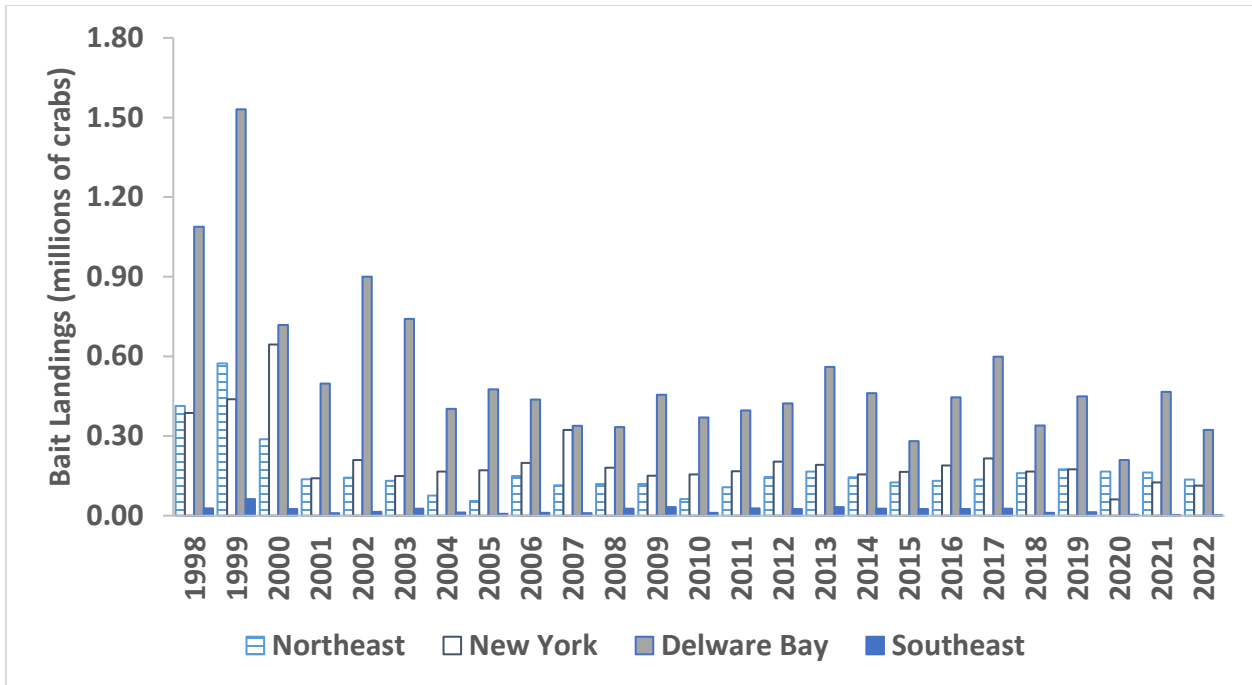


Figure 3. Horseshoe crab bait harvest by region, 1998-2022. The four regions are the Northeast (Maine-Rhode Island), New York (Connecticut-New York), Delaware Bay (New Jersey-Virginia), and Southeast (North Carolina-Florida).

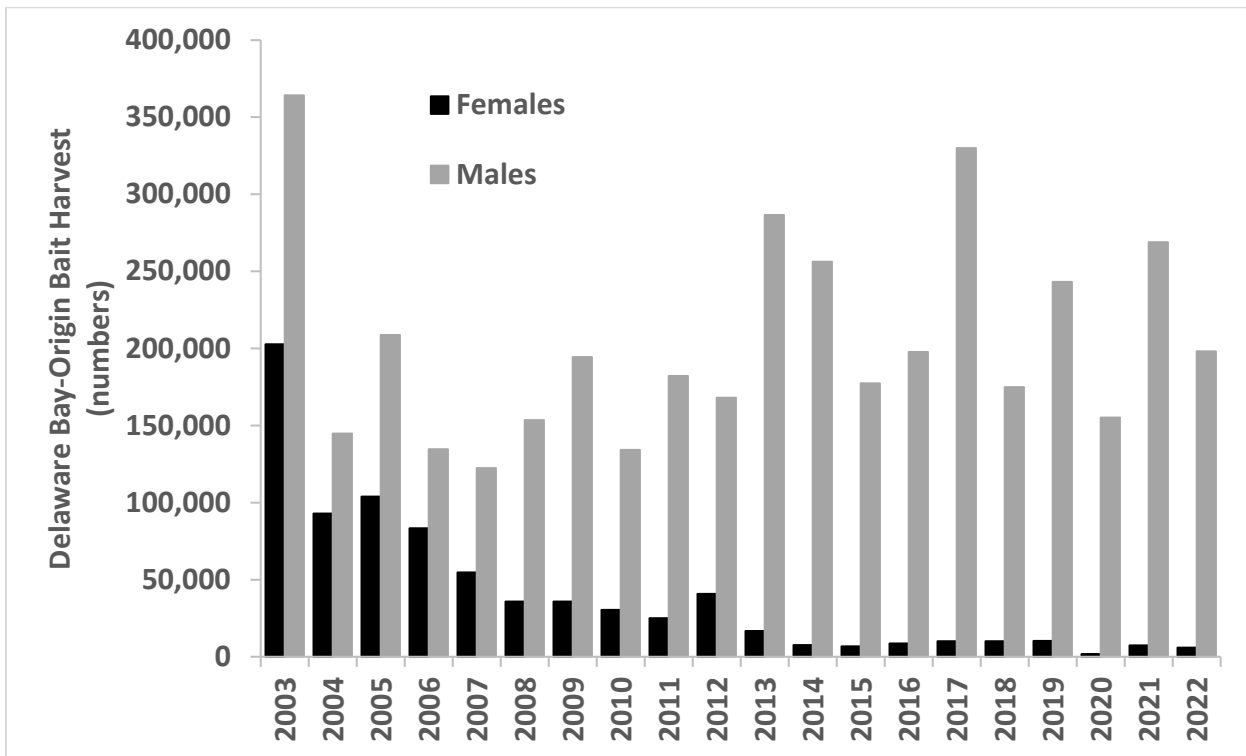


Figure 4. Horseshoe crab bait landings of Delaware Bay-Origin, 2003-2022, by sex for use in the CMSA. Source: ACCSP.

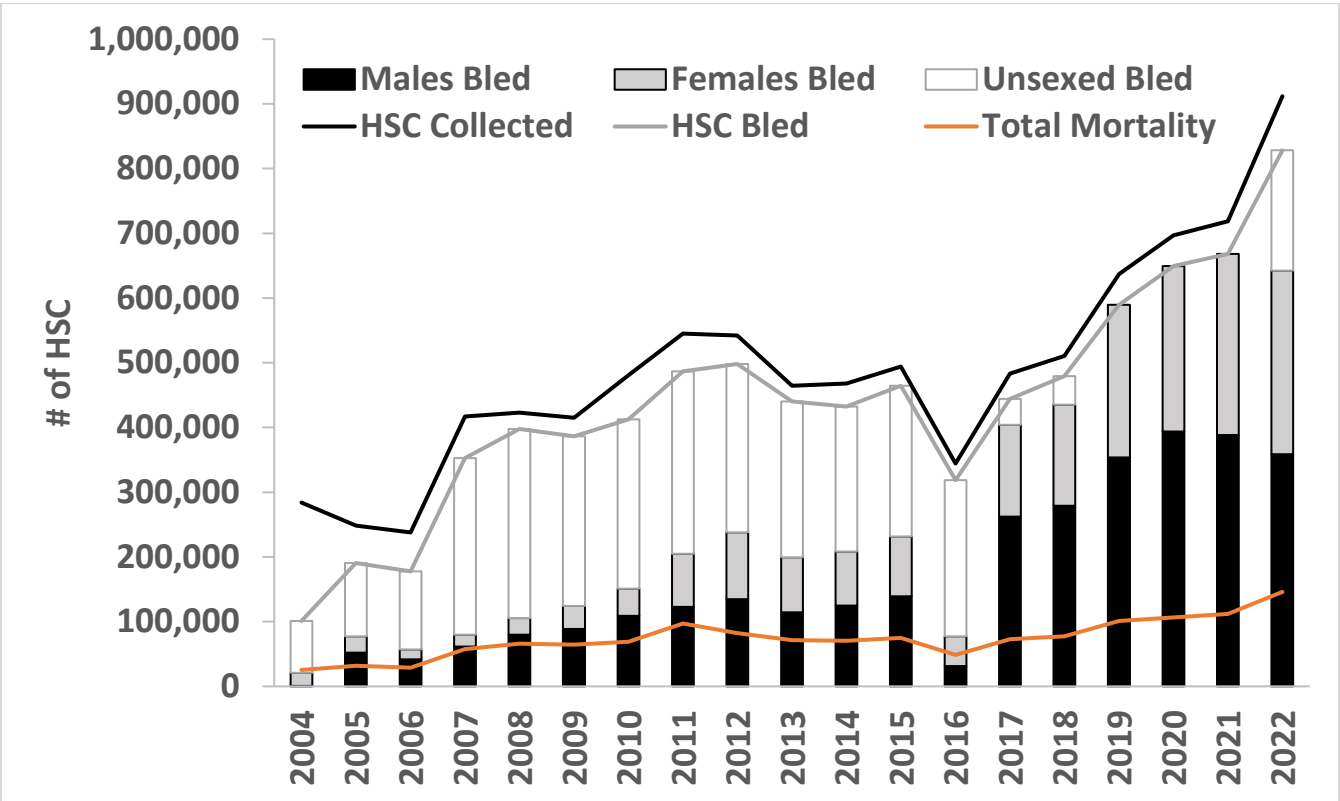


Figure 5. Coastwide number of horseshoe crabs (HSC) collected and bled by the biomedical industry and the total resulting mortality (observed mortality during the bleeding process plus 15% of those bled and released alive).

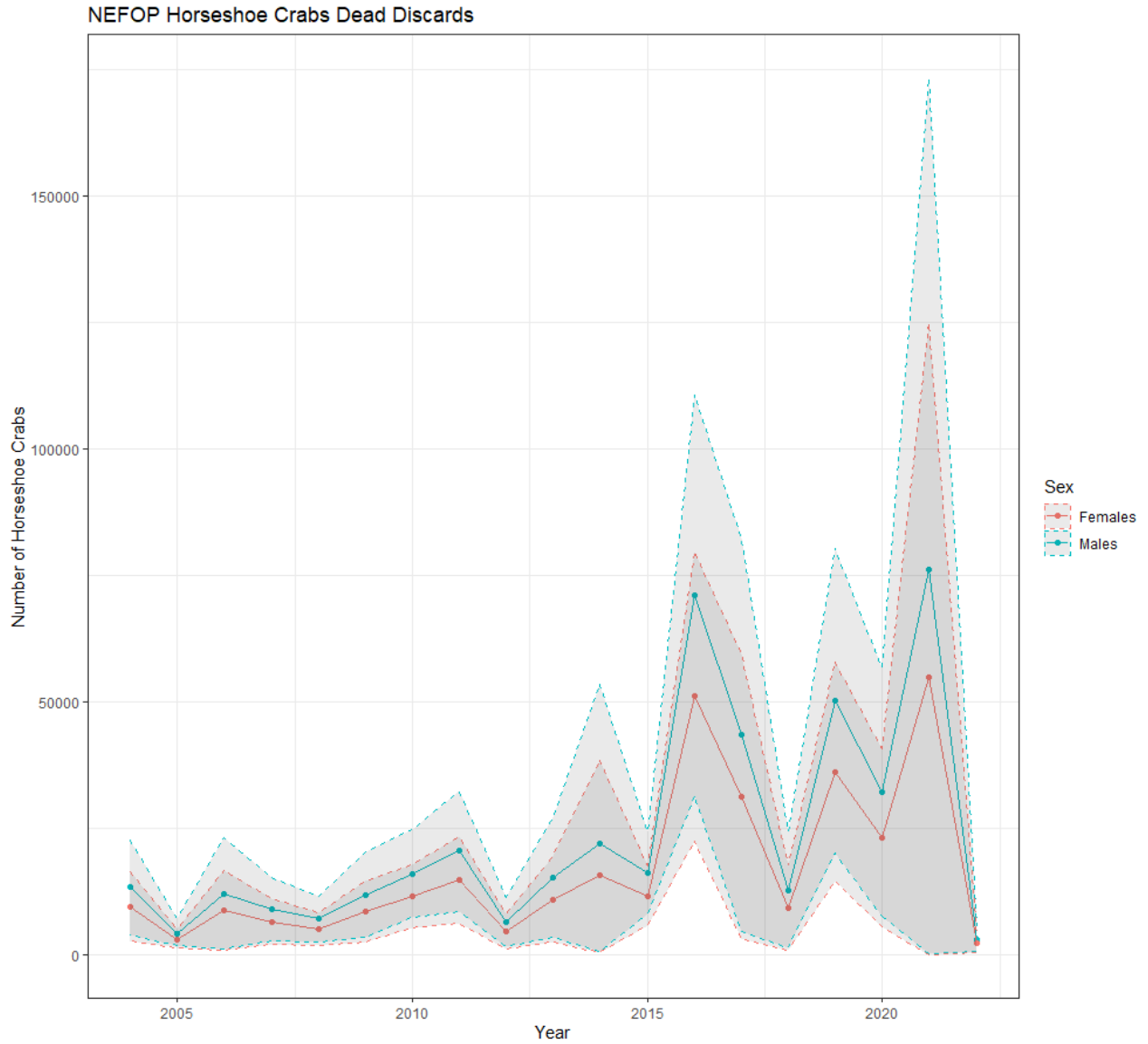


Figure 6. Estimated number of dead horseshoe crabs discarded in the Delaware Bay region from commercial fisheries, 2004-2022, by sex with 95% confidence intervals. Source: NEFOP.

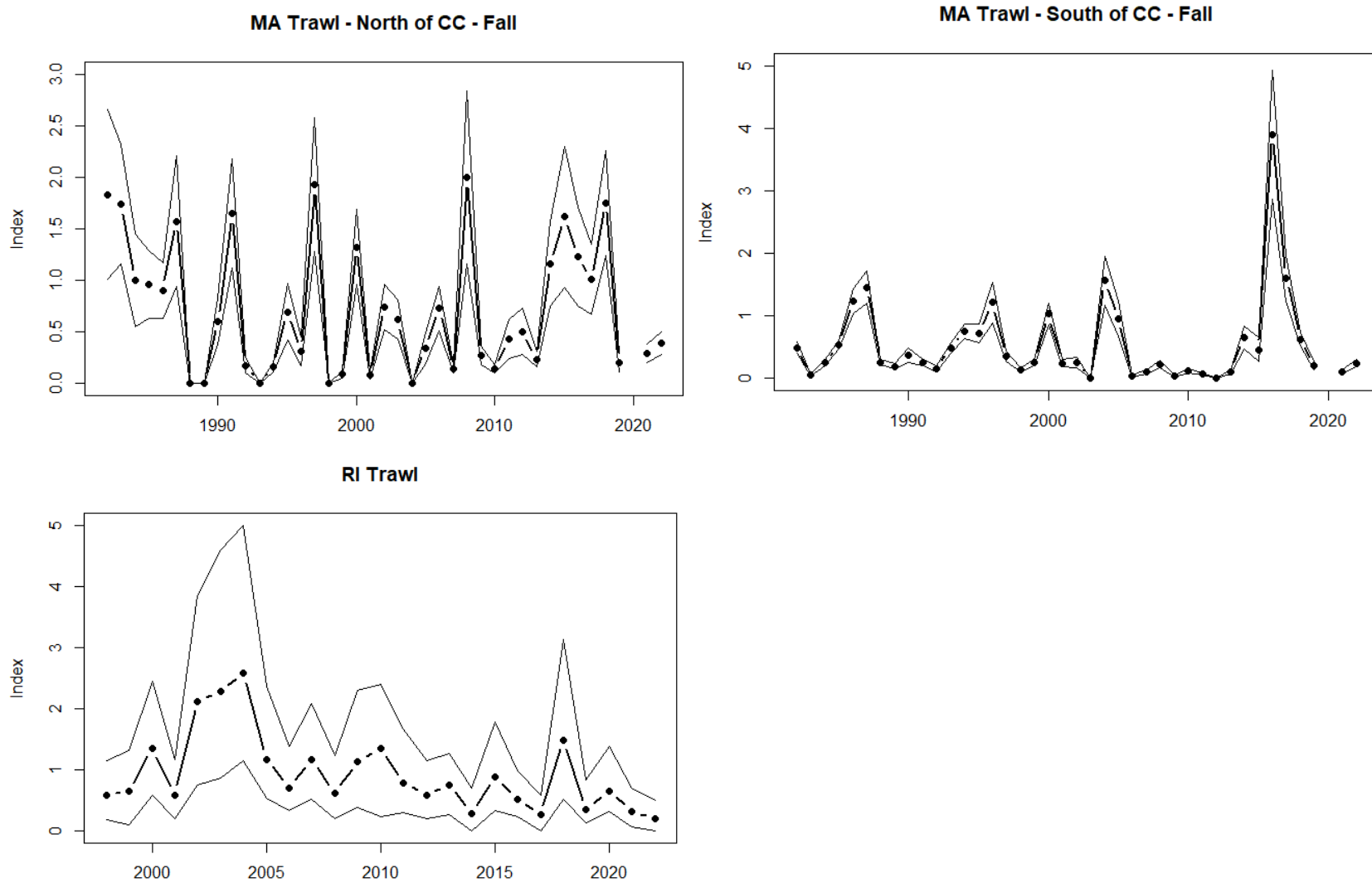


Figure 7. Indices of relative abundance of horseshoe crabs developed from the Massachusetts Trawl Survey for north and south of Cape Cod (CC) in the fall months and the Rhode Island Monthly Trawl Survey with 95% confidence intervals.

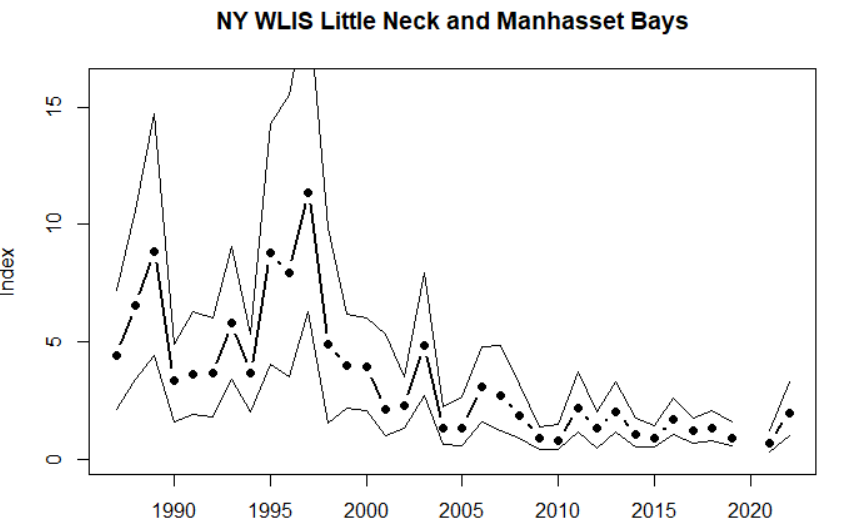
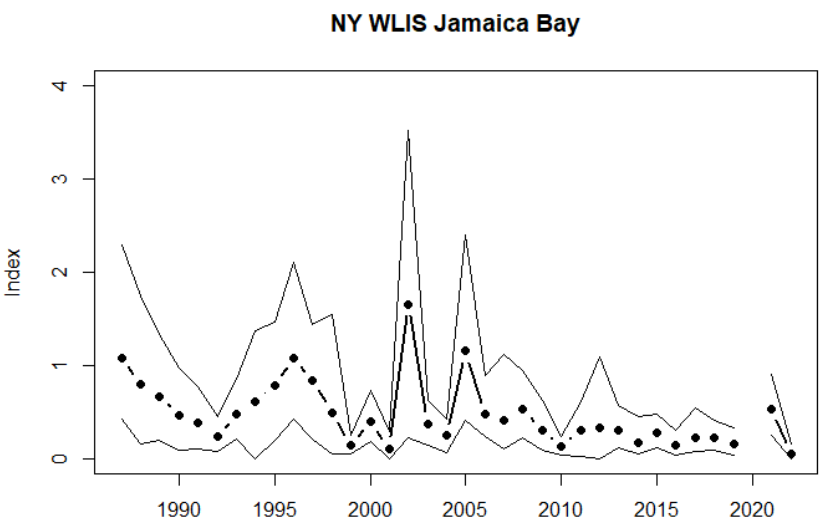
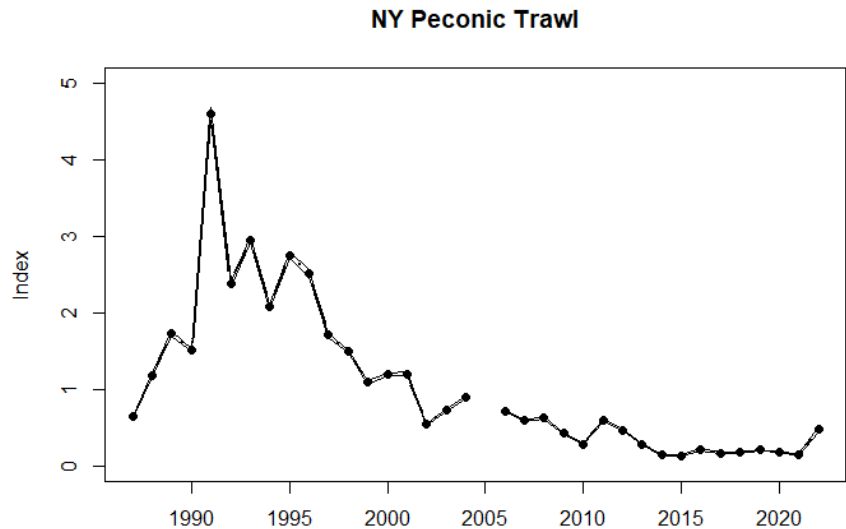
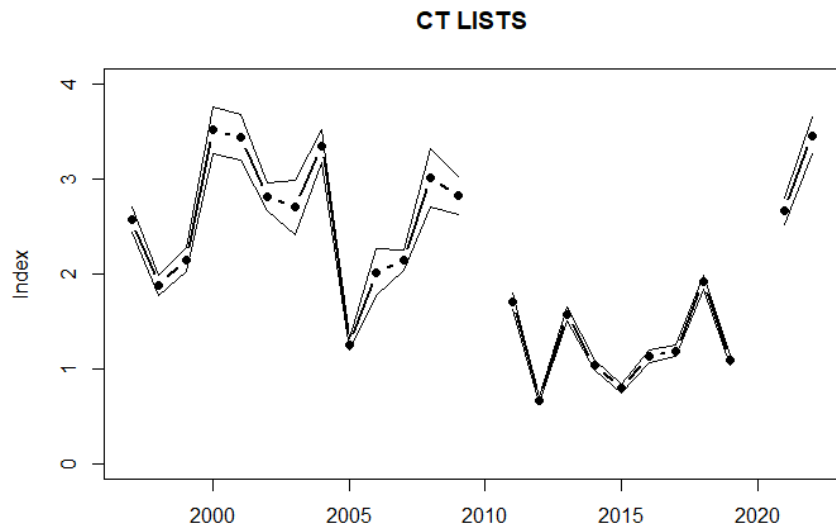


Figure 8. Indices of relative abundance of horseshoe crabs developed from the Connecticut Long Island Sound Trawl (CT LISTS), New York Peconic Bay Trawl, and New York Western Long Island Sound (WLIS) Surveys with 95% confidence intervals.

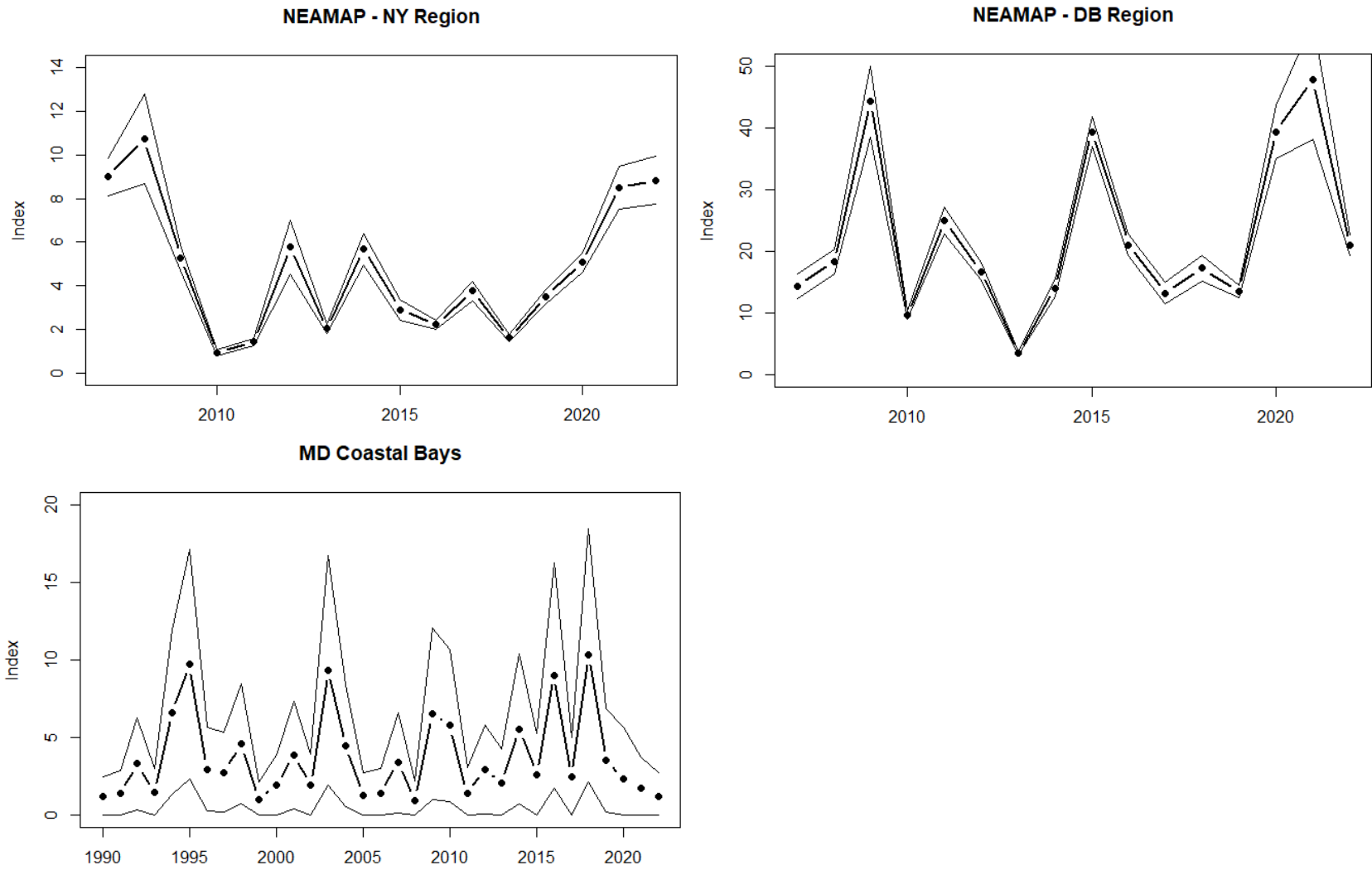


Figure 9. Indices of relative abundance of horseshoe crabs developed from the Northeast Area Monitoring and Assessment Program (NEAMAP) and Maryland Coastal Bays Surveys with 95% confidence intervals.

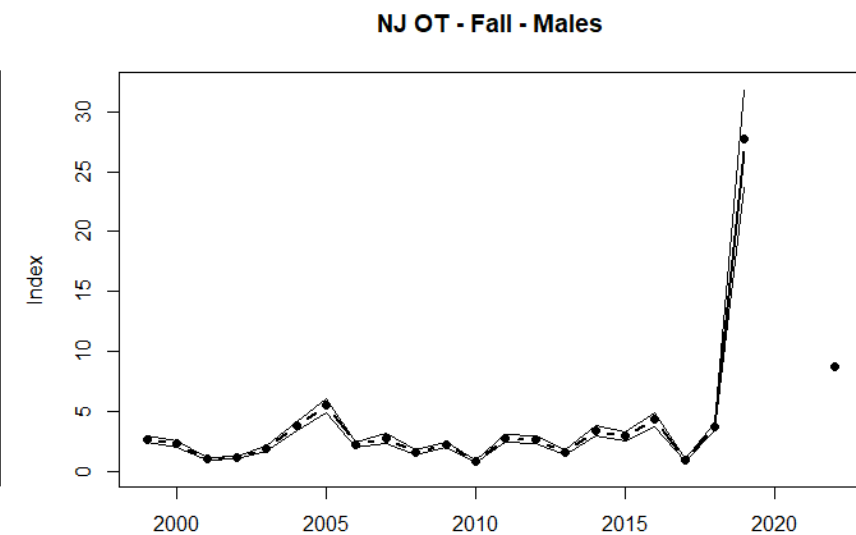
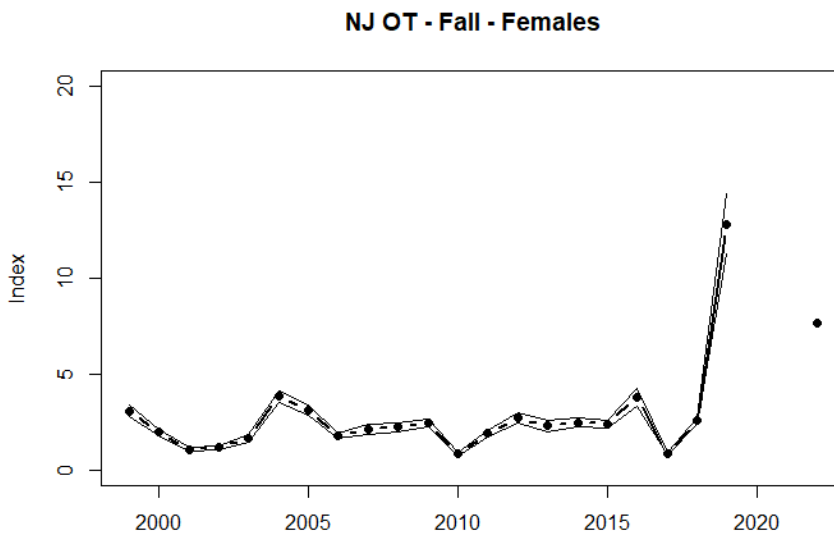
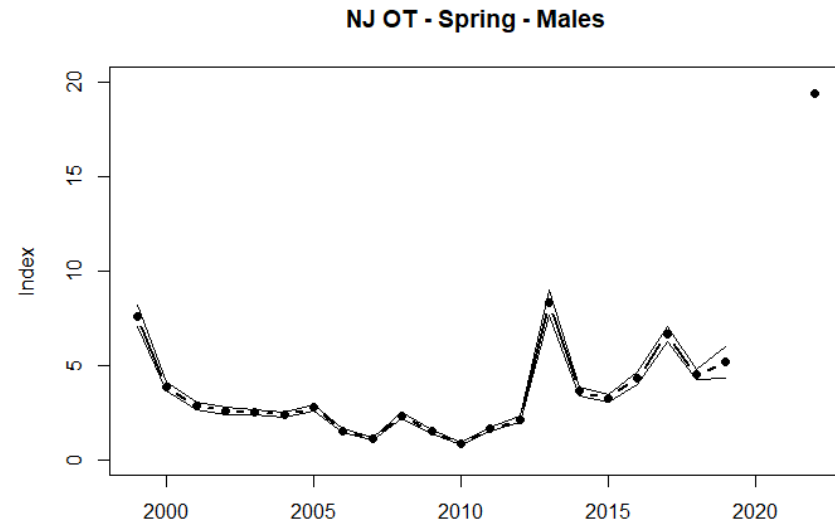
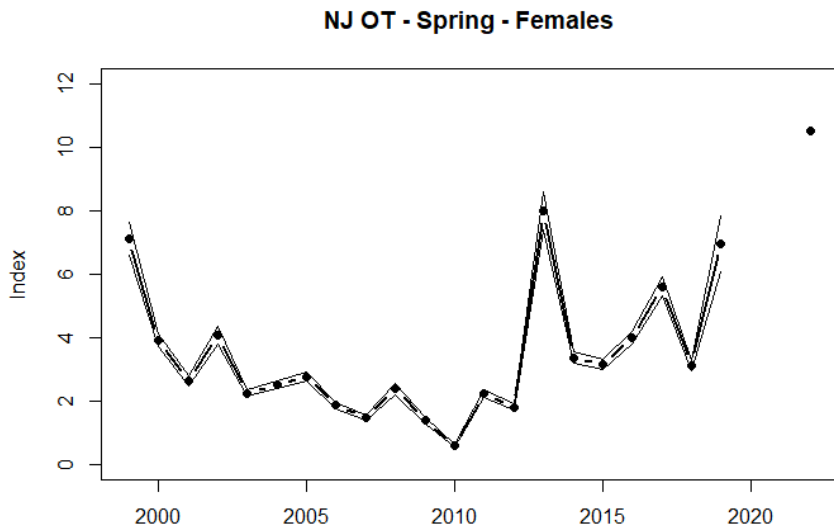


Figure 10. Indices of relative abundance of horseshoe crabs developed from the New Jersey Ocean Trawl (NJ OT) Survey by sex and season with 95% confidence intervals.

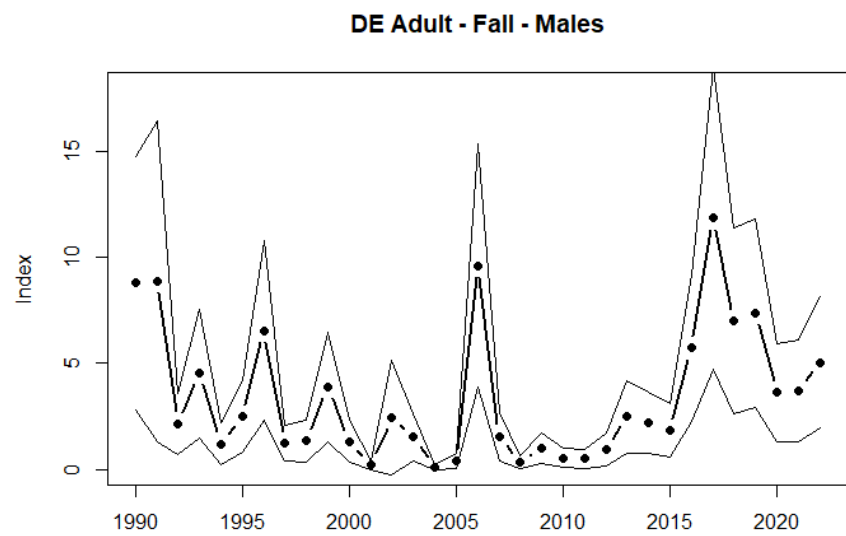
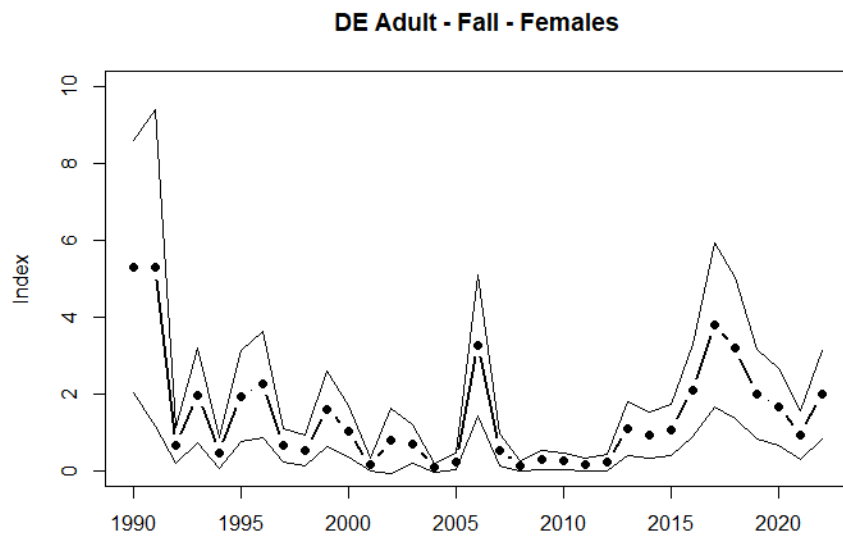
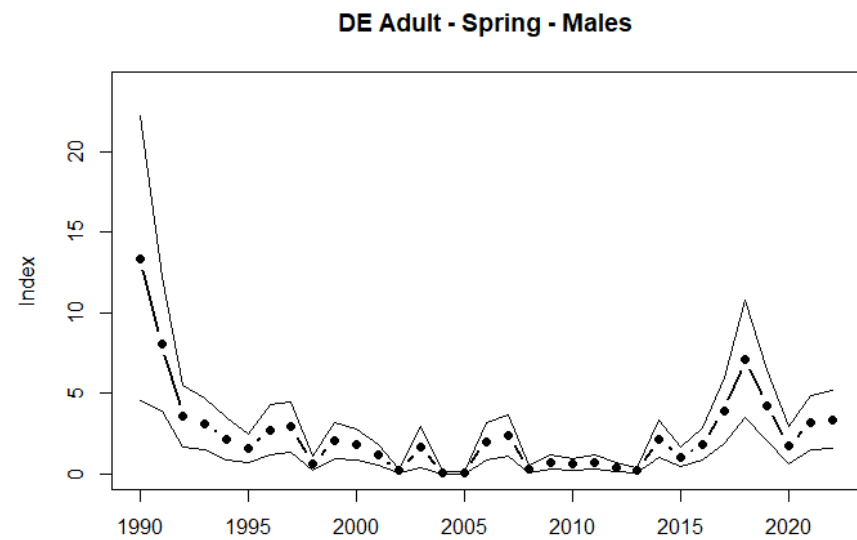
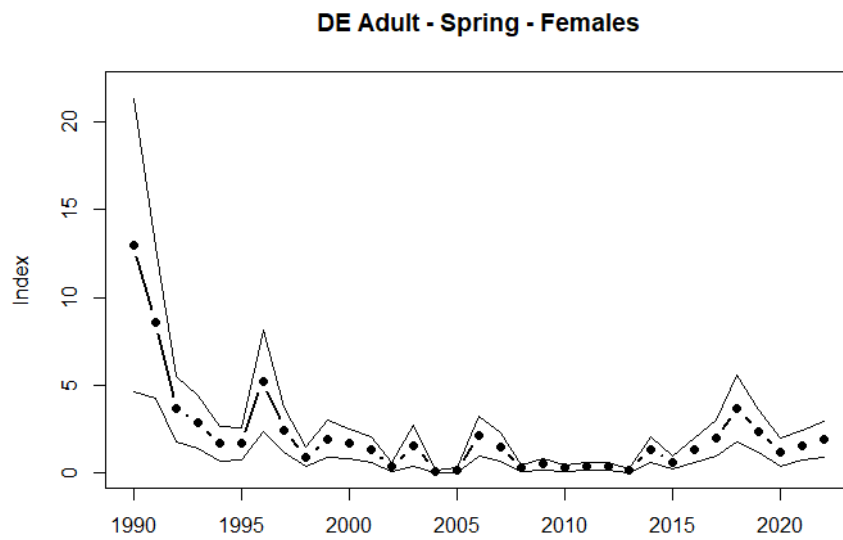


Figure 11. Indices of relative abundance of horseshoe crabs developed from the Delaware 30' Adult Trawl Survey by sex and season with 95% confidence intervals.

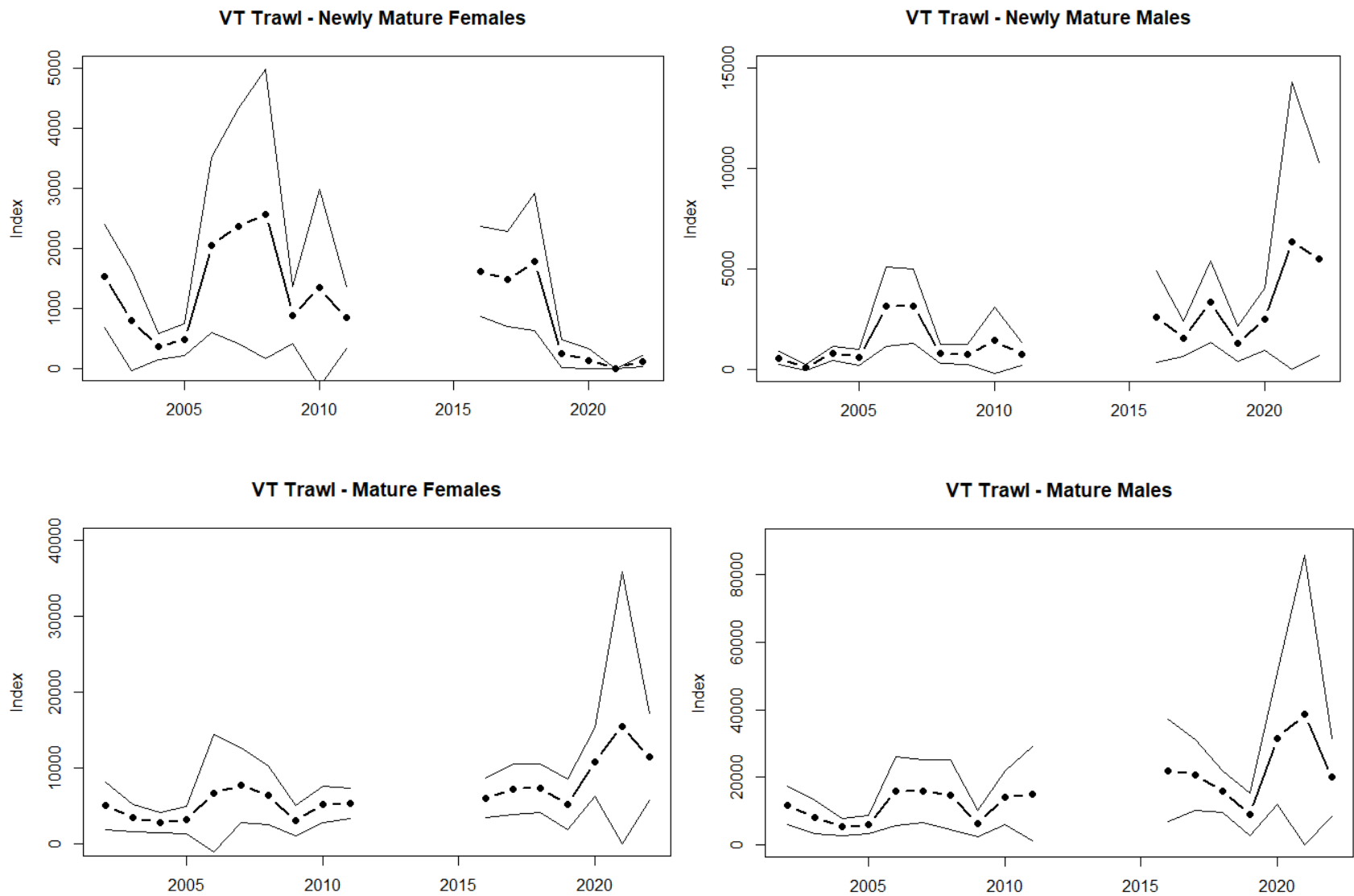


Figure 12. Indices of relative abundance of horseshoe crabs developed from the Virginia Tech Trawl Survey by sex and maturity stage with 95% confidence intervals.

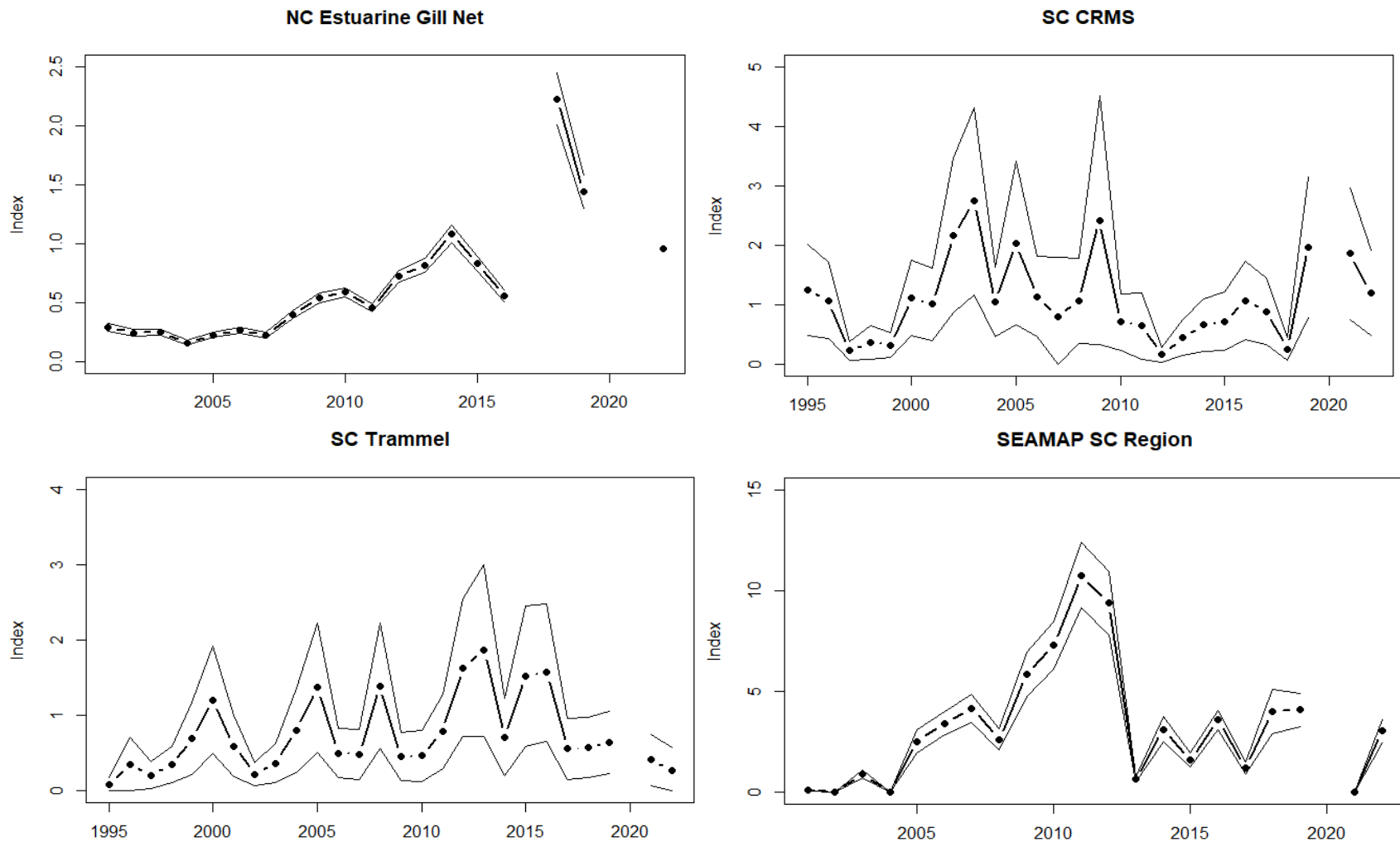


Figure 13. Indices of relative abundance of horseshoe crabs developed from the North Carolina Estuarine Gill Net, South Carolina Crustacean Research and Monitoring (CRMS; recently renamed as Estuarine Trawl Survey), South Carolina Trammel, and Southeast Area Monitoring and Assessment Program (SEAMAP) Surveys with 95% confidence intervals. Both the SC Trammel and SEAMAP had reduced sampling in the strata used in the index in 2021-2022 and therefore those trends should be interpreted cautiously.

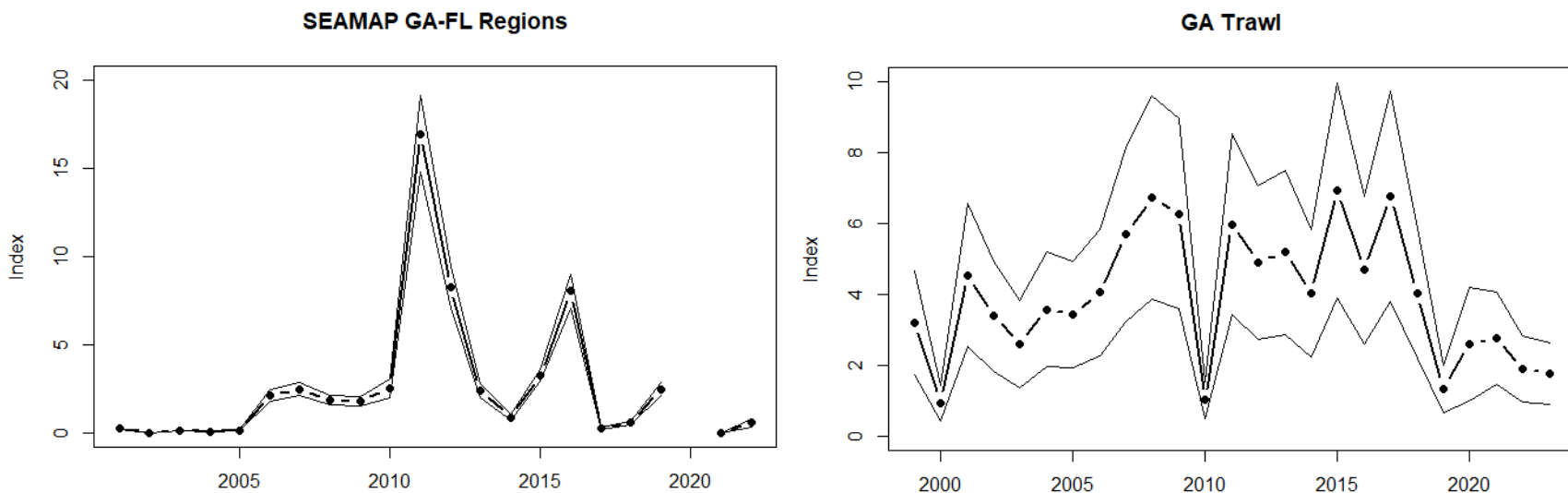


Figure 14. Indices of relative abundance of horseshoe crabs developed from the Southeast Area Monitoring and Assessment Program (SEAMAP) and Georgia Ecological Monitoring Trawl Surveys with 95% confidence intervals. SEAMAP had reduced sampling in the strata used in the index in 2021-2022 and therefore those trends should be interpreted cautiously.

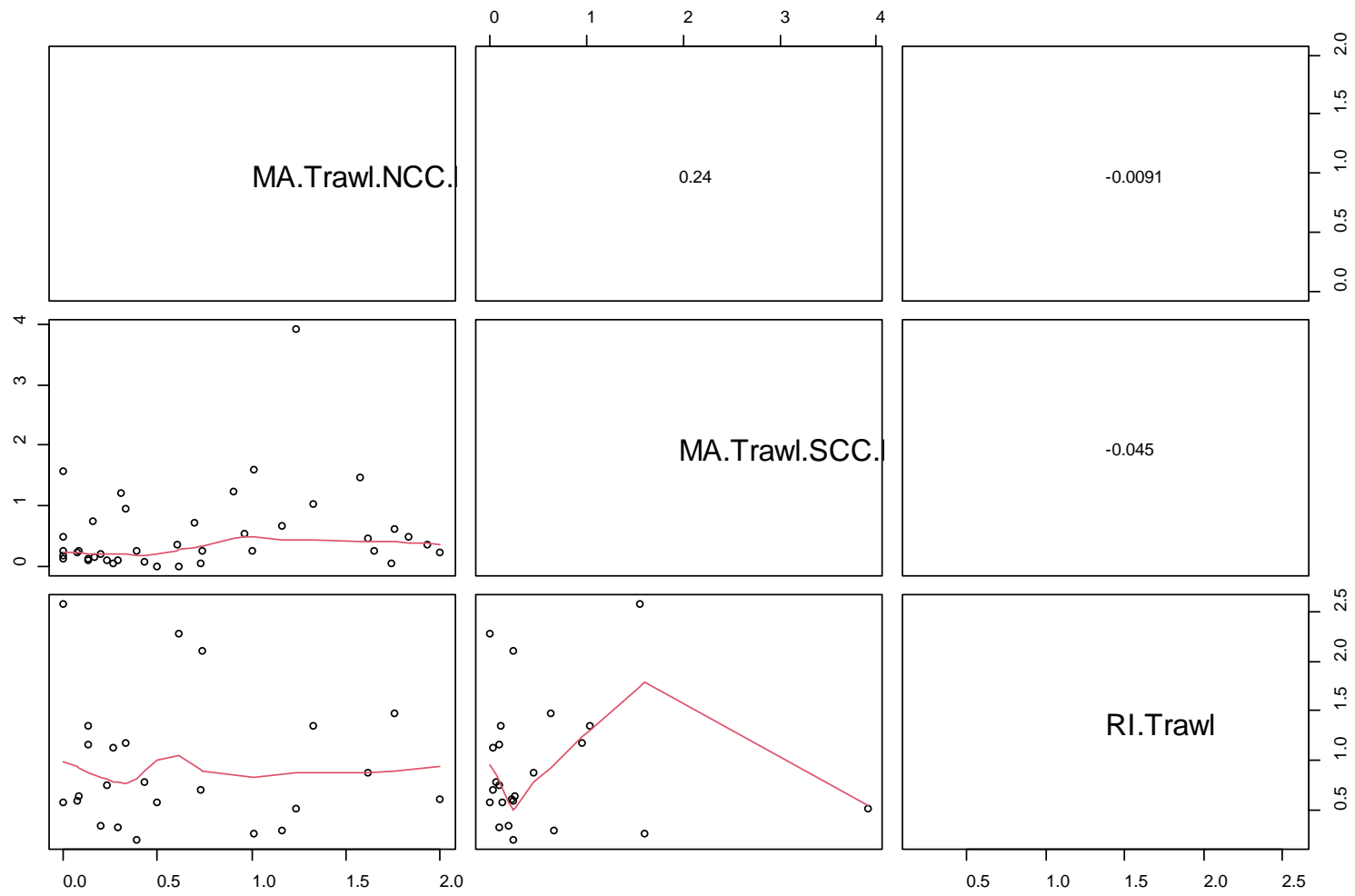


Figure 15. Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Northeast region. None of the correlations were significant ($P < 0.05$).

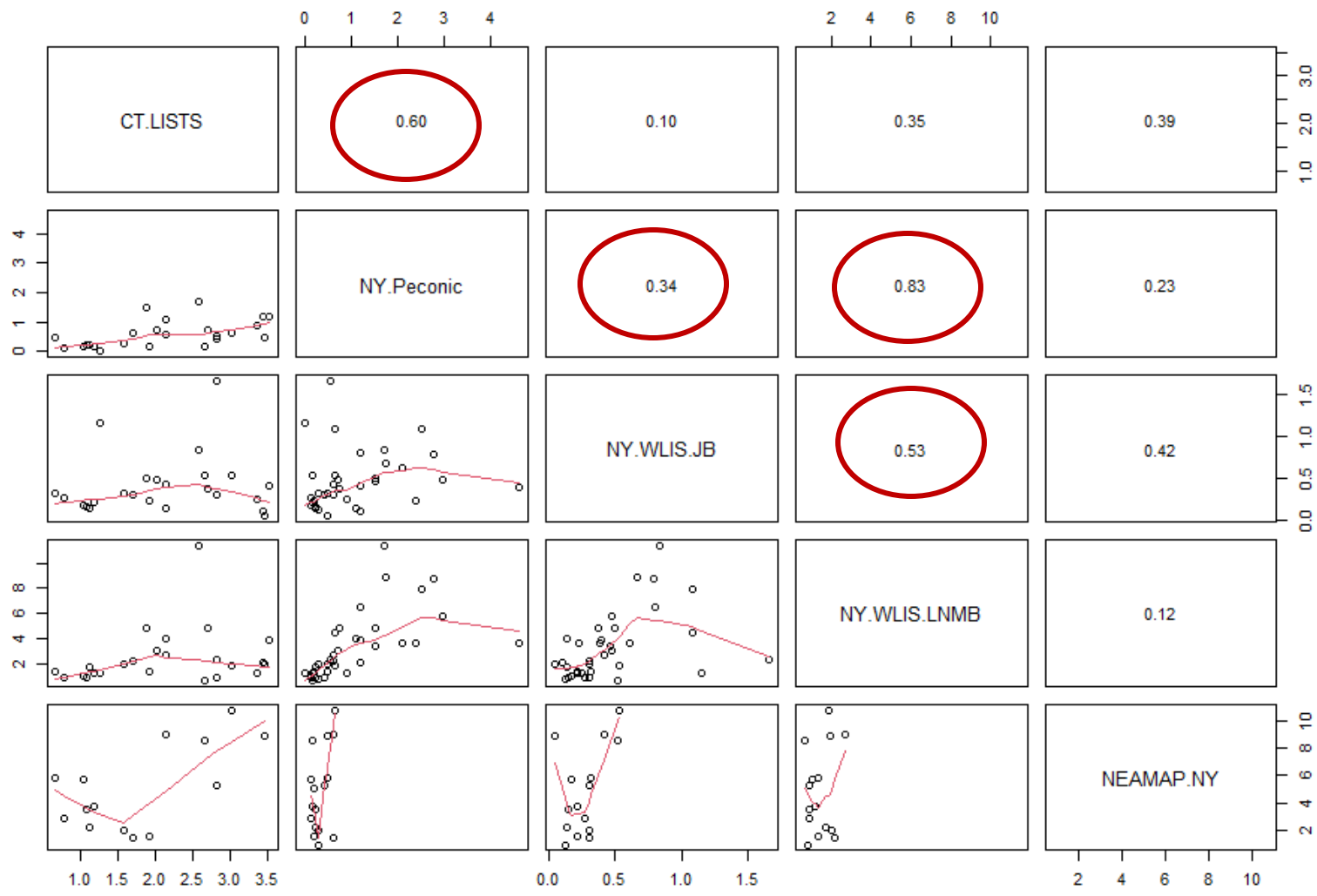


Figure 16. Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the New York region. Significant correlations ($P < 0.05$) are circled in red.

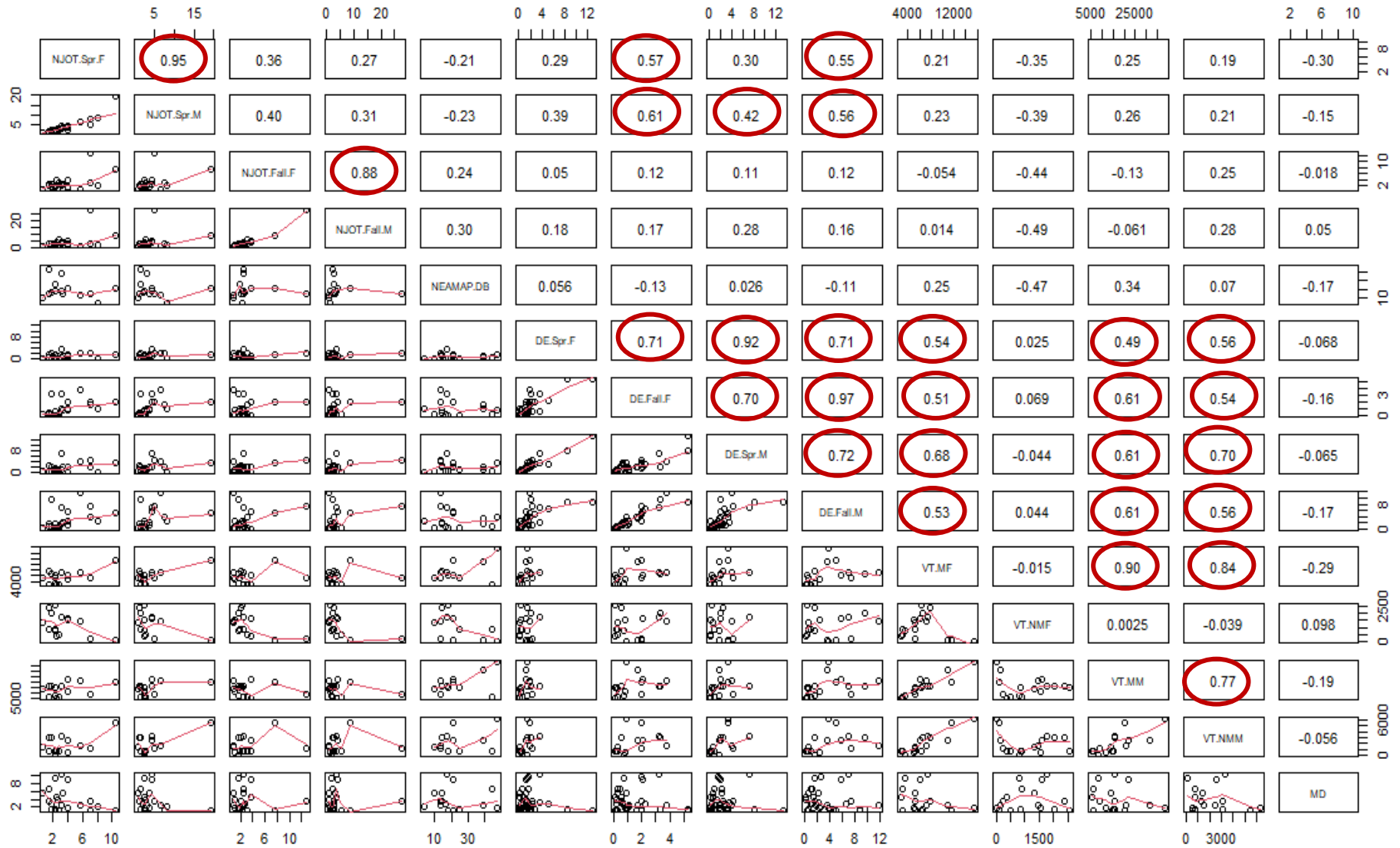


Figure 17. Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Delaware Bay region. Significant correlations ($P < 0.05$) are circled in red.

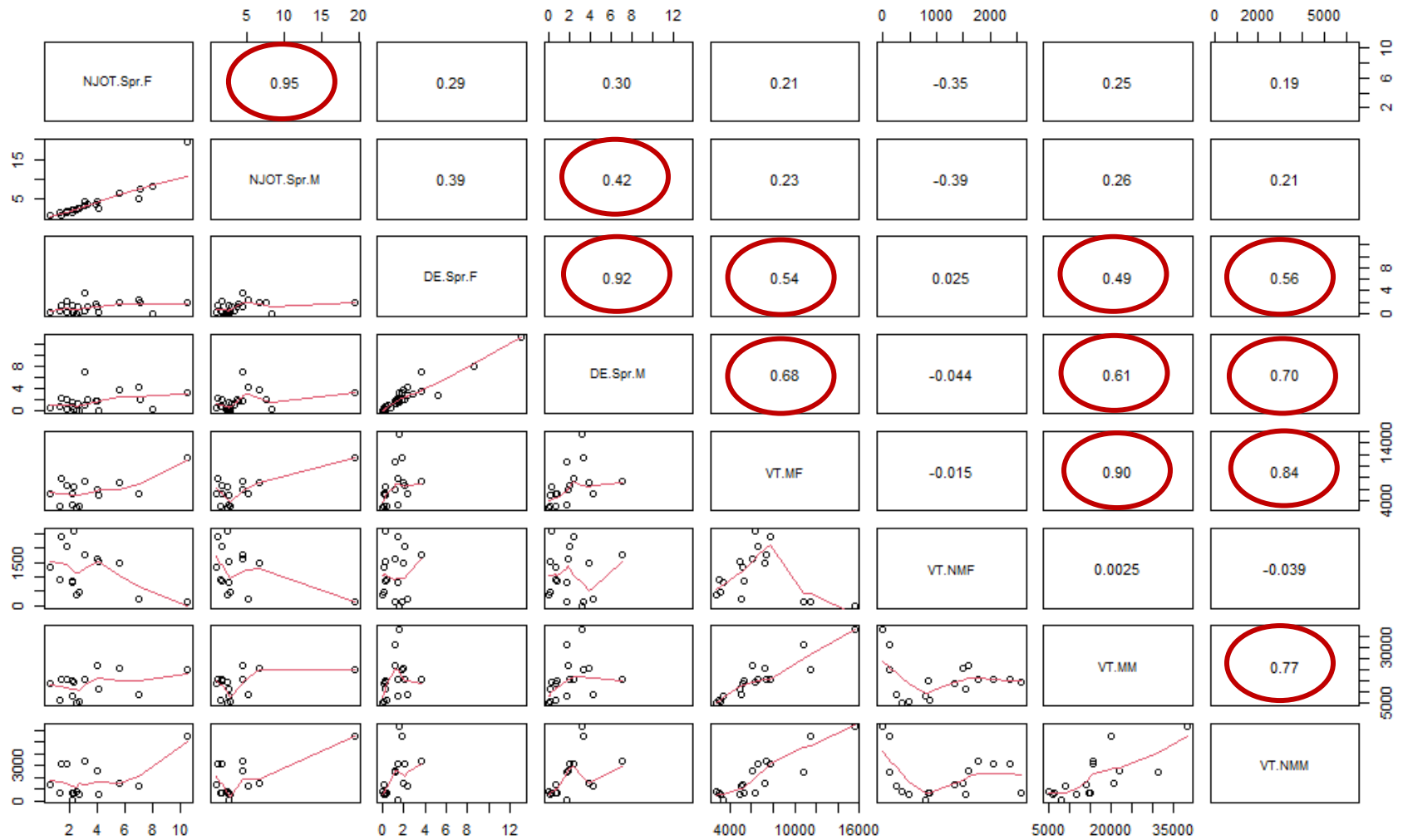


Figure 18. Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Delaware Bay region used in the ARM Framework, 2003-2022, where the Virginia Tech Trawl Survey has been lagged forward one year as it is in the CMSA. Significant correlations ($P < 0.05$) are circled in red.

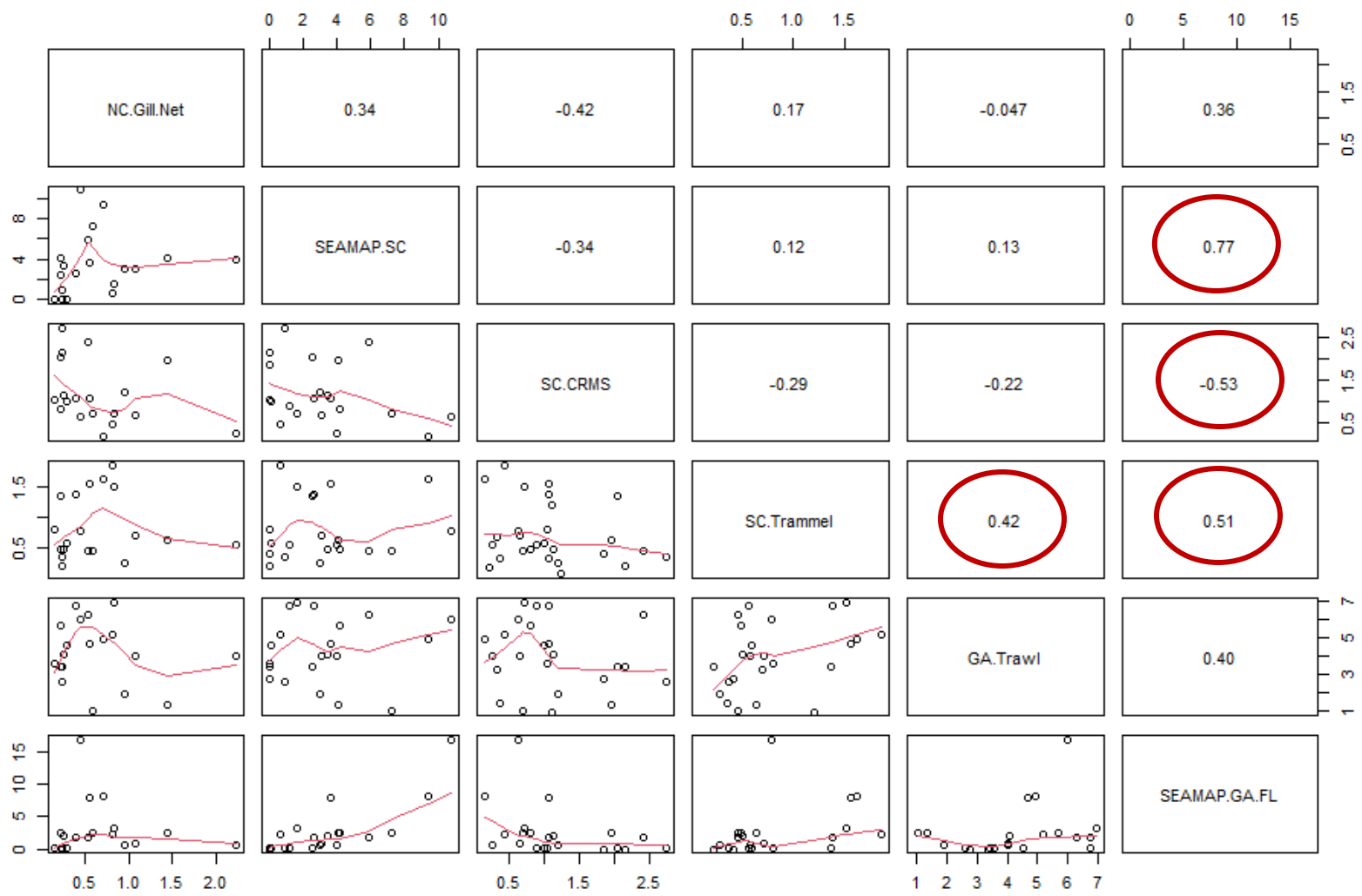


Figure 19. Spearman correlation coefficients and scatter plots for the horseshoe crab abundance indices in the Southeast region. Significant correlations ($P < 0.05$) are circled in red.

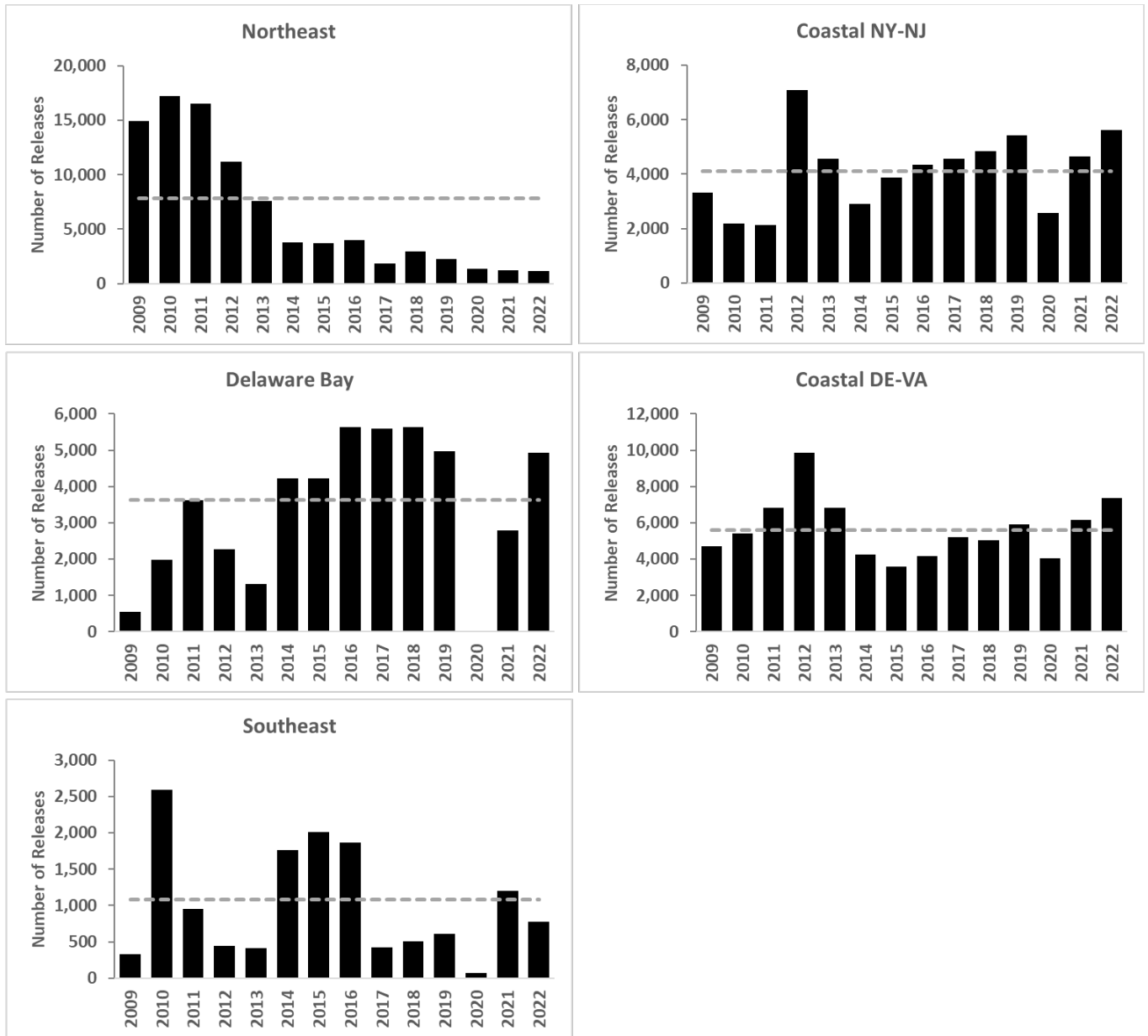


Figure 20. Number of tag releases by region, 2009-2022. Grey dashed line indicates the average number of tag releases from 2009-2019 (the years before COVID) by region (source: USFWS tagging database).

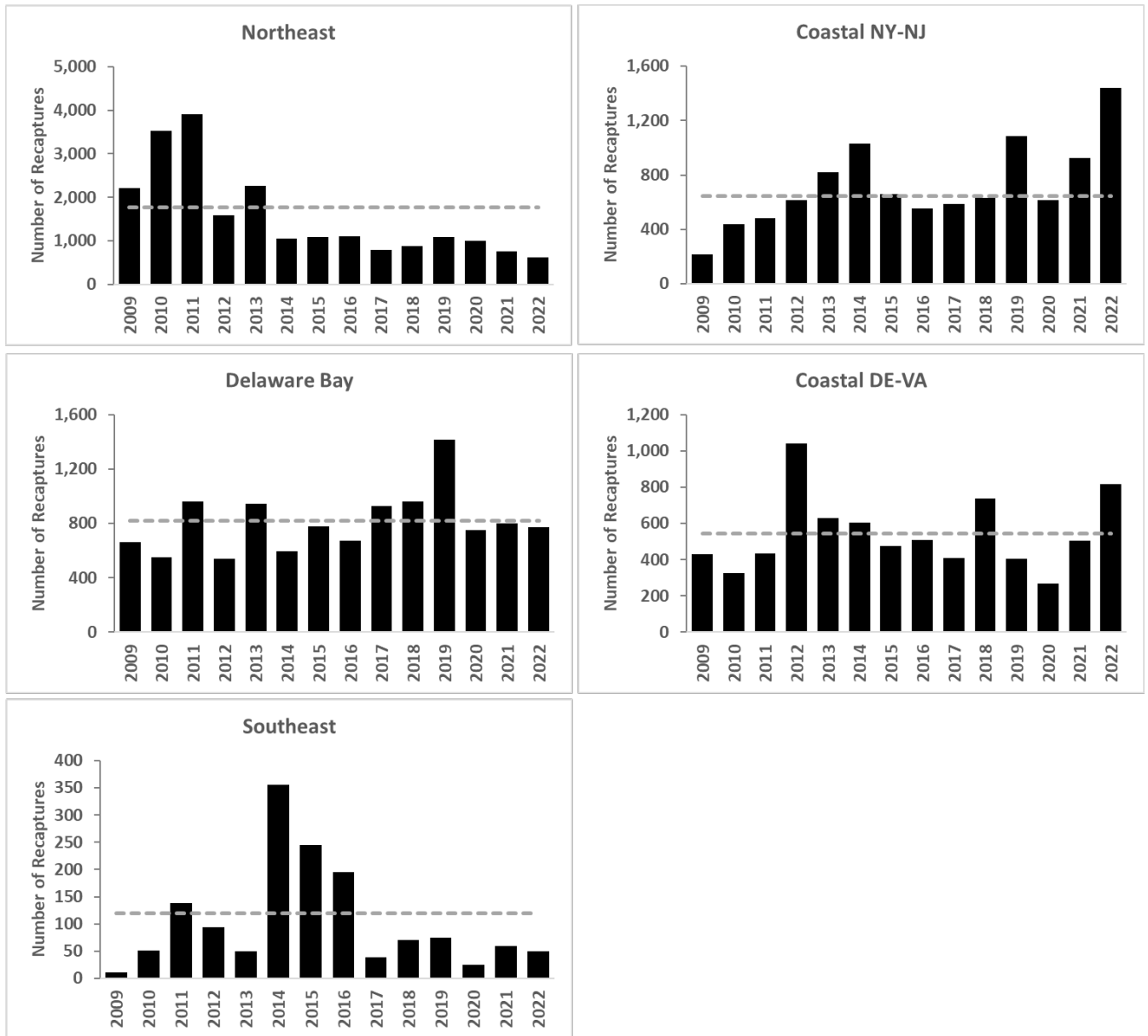


Figure 21. Number of tag recaptures by region, 2009-2022. Grey dashed line indicates the average number of tag releases from 2009-2019 (the years before COVID) by region (source: USFWS tagging database)..

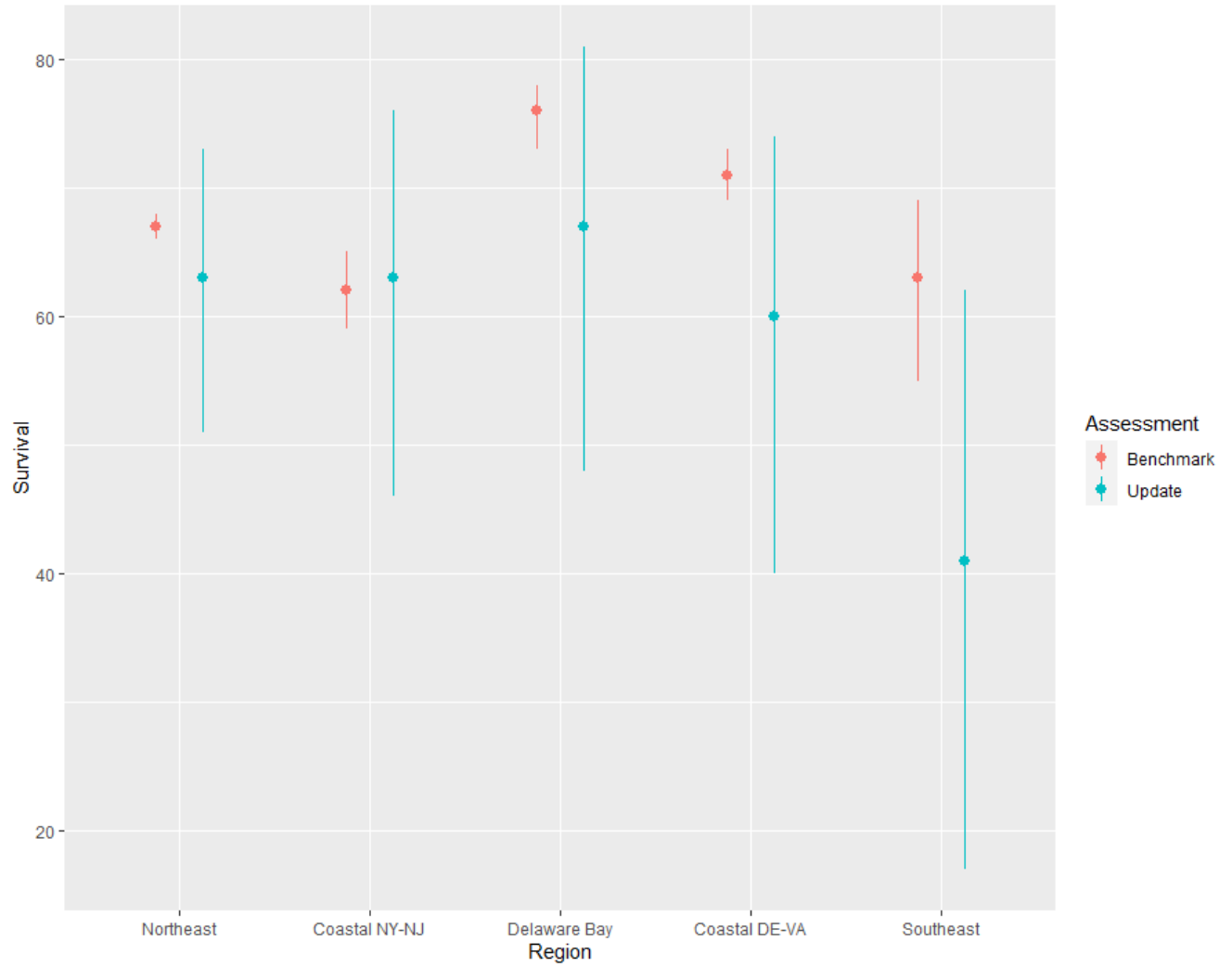


Figure 22. Comparison between the benchmark stock assessment (2019) and update (2024) estimates for survival rate (%) with 95% confidence intervals by region.

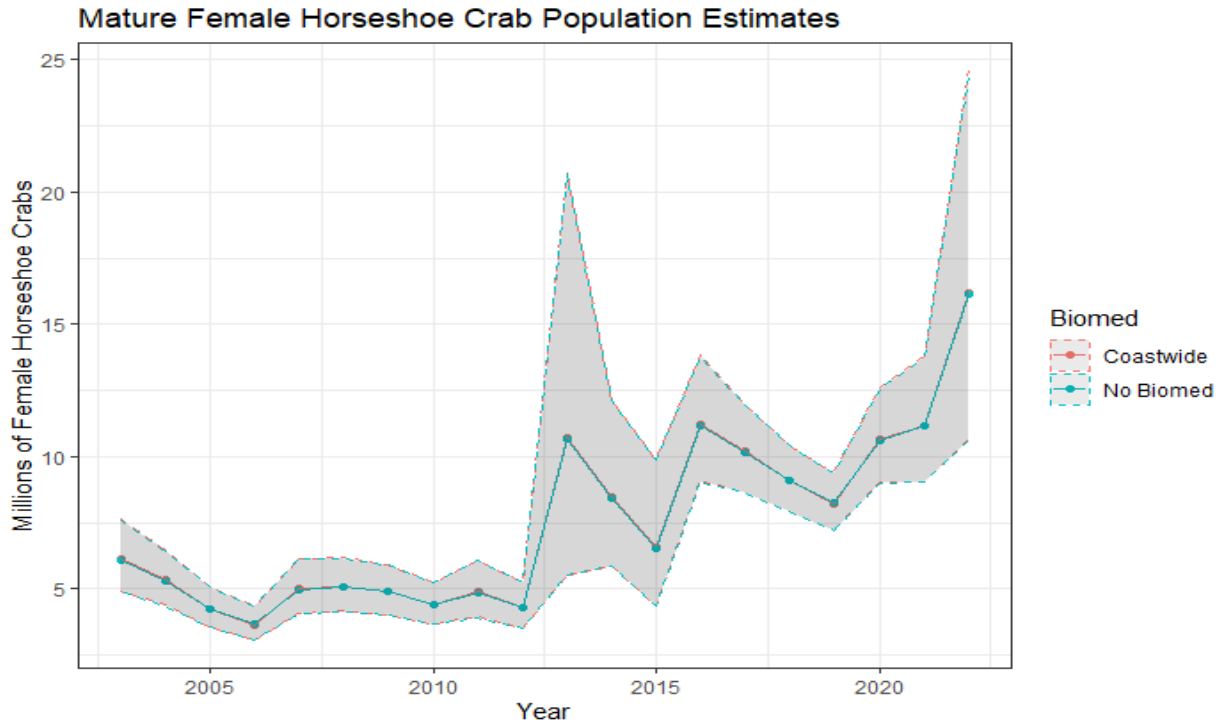


Figure 23. Population estimates from the CMSA for mature female horseshoe crabs with 95% confidence intervals. Delaware Bay biomedical data is confidential so population estimates using coastwide and zero biomedical data provide upper and lower bounds, although there is very little difference between the two and the time series overlap on the figures.

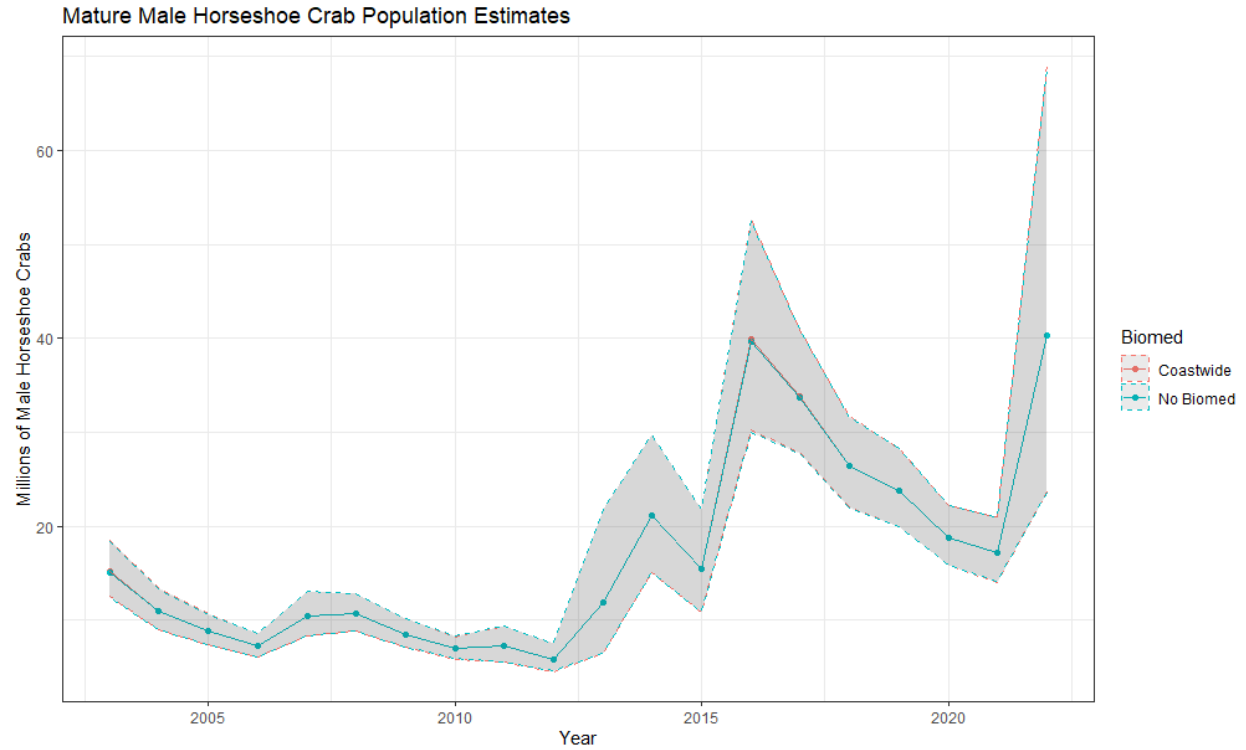


Figure 24. Population estimates from the CMSA for male horseshoe crabs with 95% confidence intervals. Delaware Bay biomedical data is confidential so population estimates using coastwide and zero biomedical data provide upper and lower bounds, although there is very little difference between the two and the time series overlap on the figures.

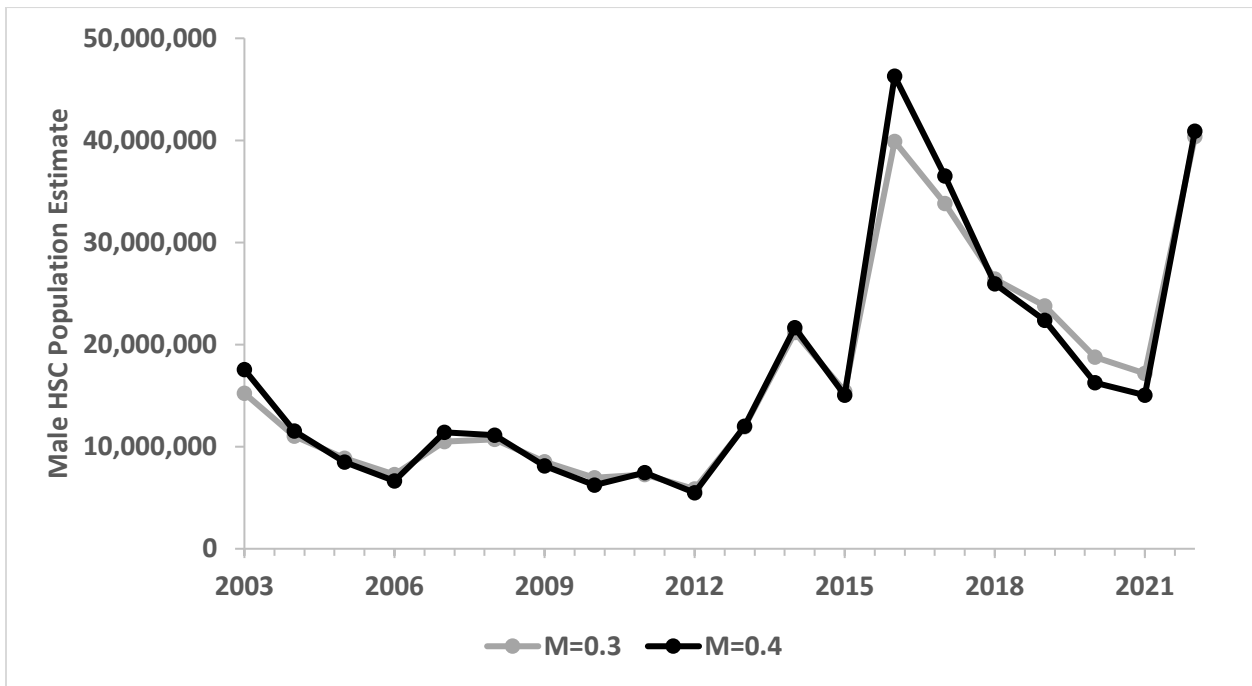
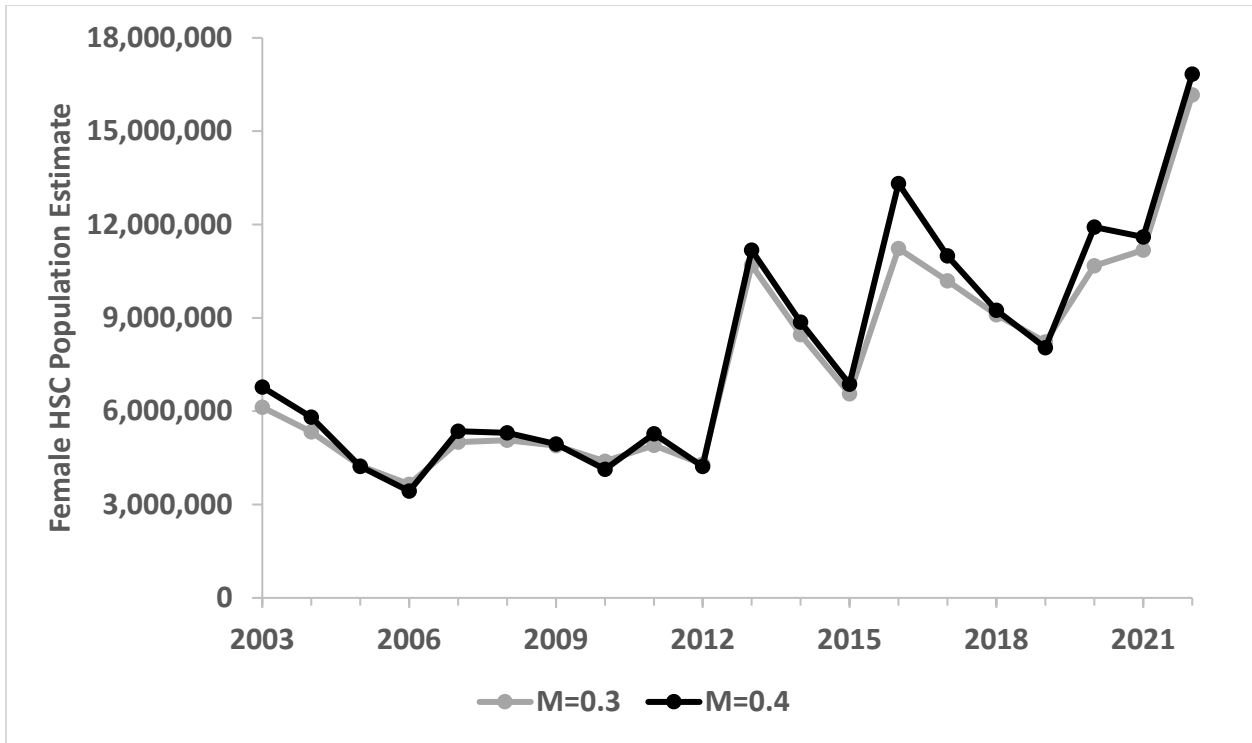


Figure 25. Comparison between population estimates from the CMSA for mature females (top) and males (bottom) using two natural mortality estimates and coastwide biomedical data.

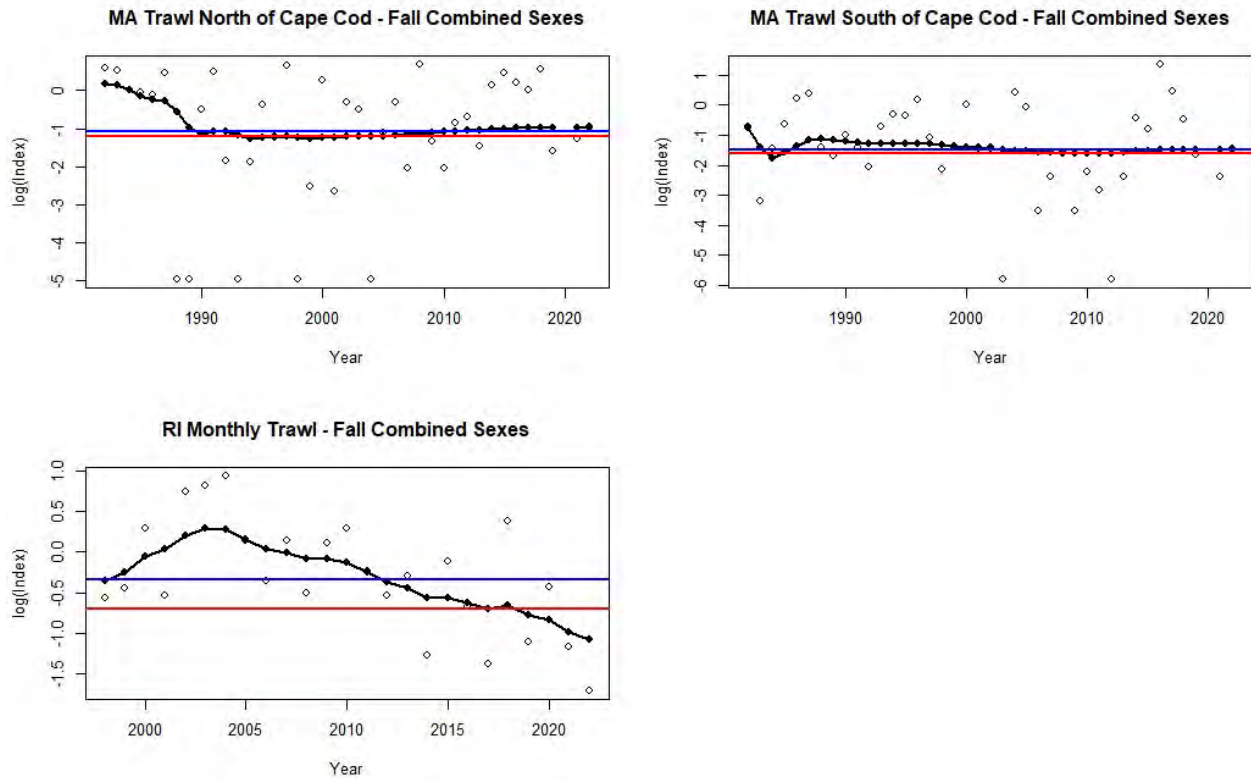


Figure 26. ARIMA model fits to horseshoe crab indices Massachusetts and Rhode Island Trawl Surveys in the Northeast Region. The red horizontal line represents the Q₂₅ reference point and the blue horizontal line represents the 1998 reference point.

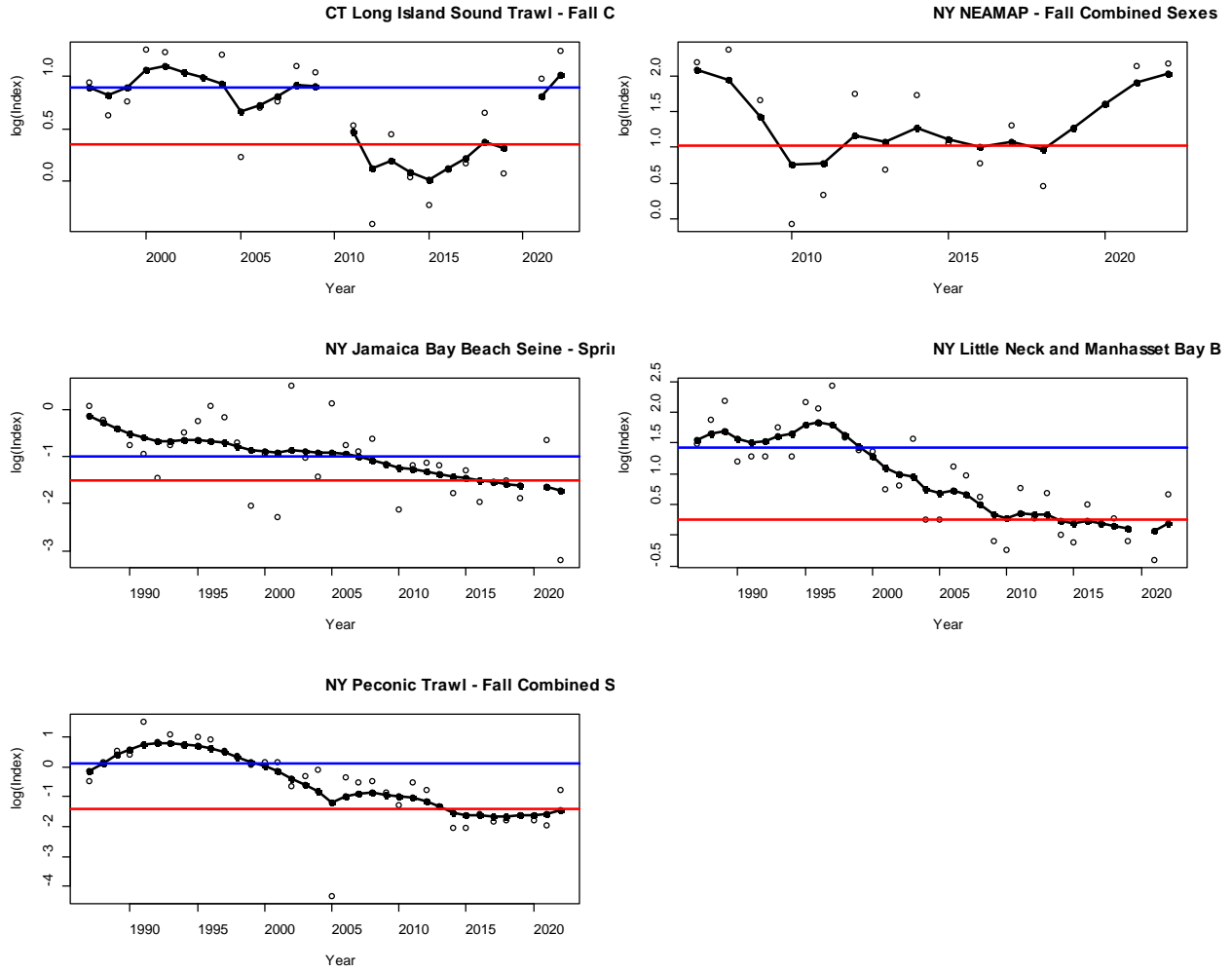


Figure 27. ARIMA model fits to horseshoe crab indices in the New York Region. The red horizontal line represents the Q₂₅ reference point and the blue horizontal line represents the 1998 reference point.

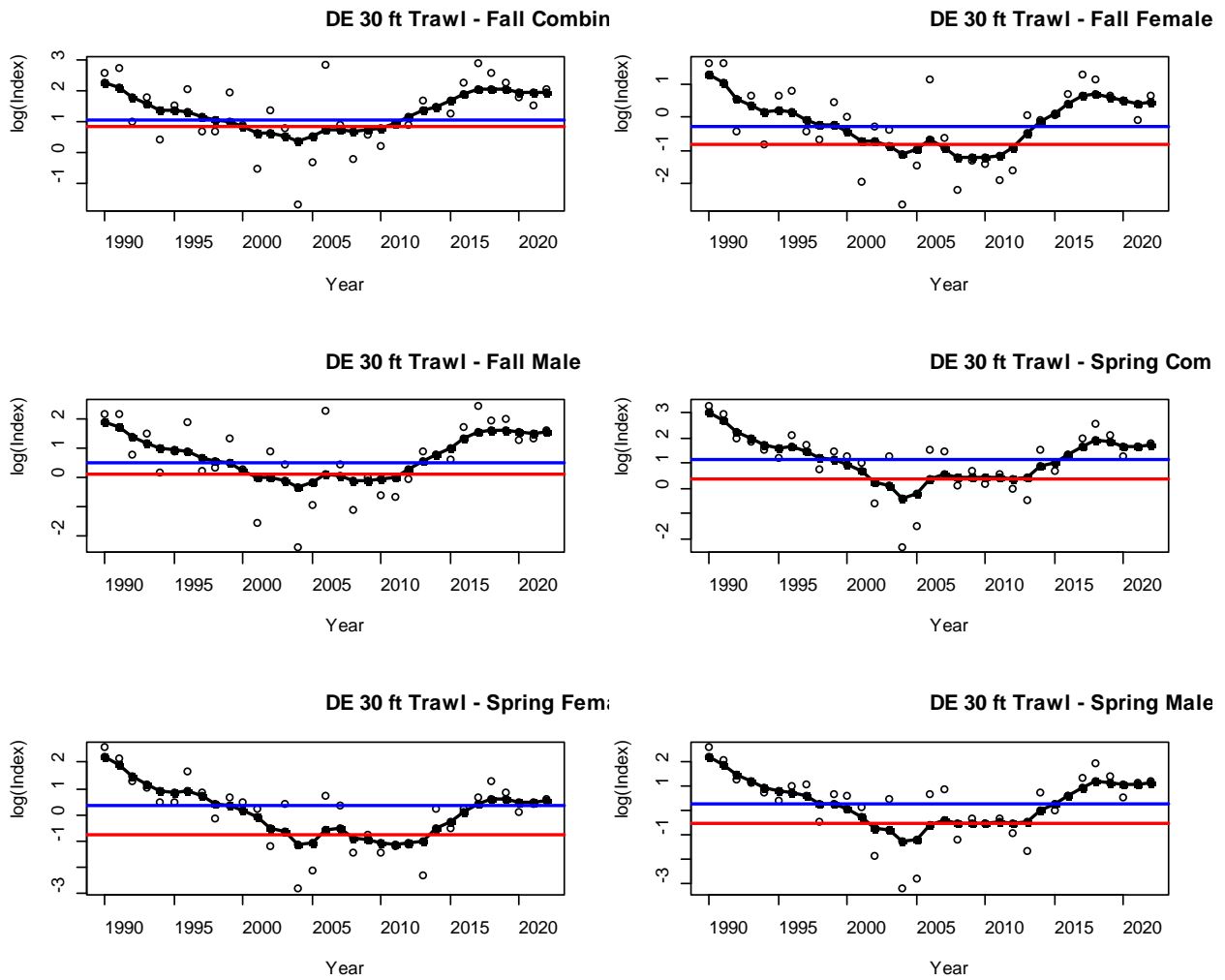


Figure 28. ARIMA model fits to horseshoe crab indices from the Delaware Trawl Survey in the Delaware Bay Region. The red horizontal line represents the Q₂₅ reference point and the blue horizontal line represents the 1998 reference point.

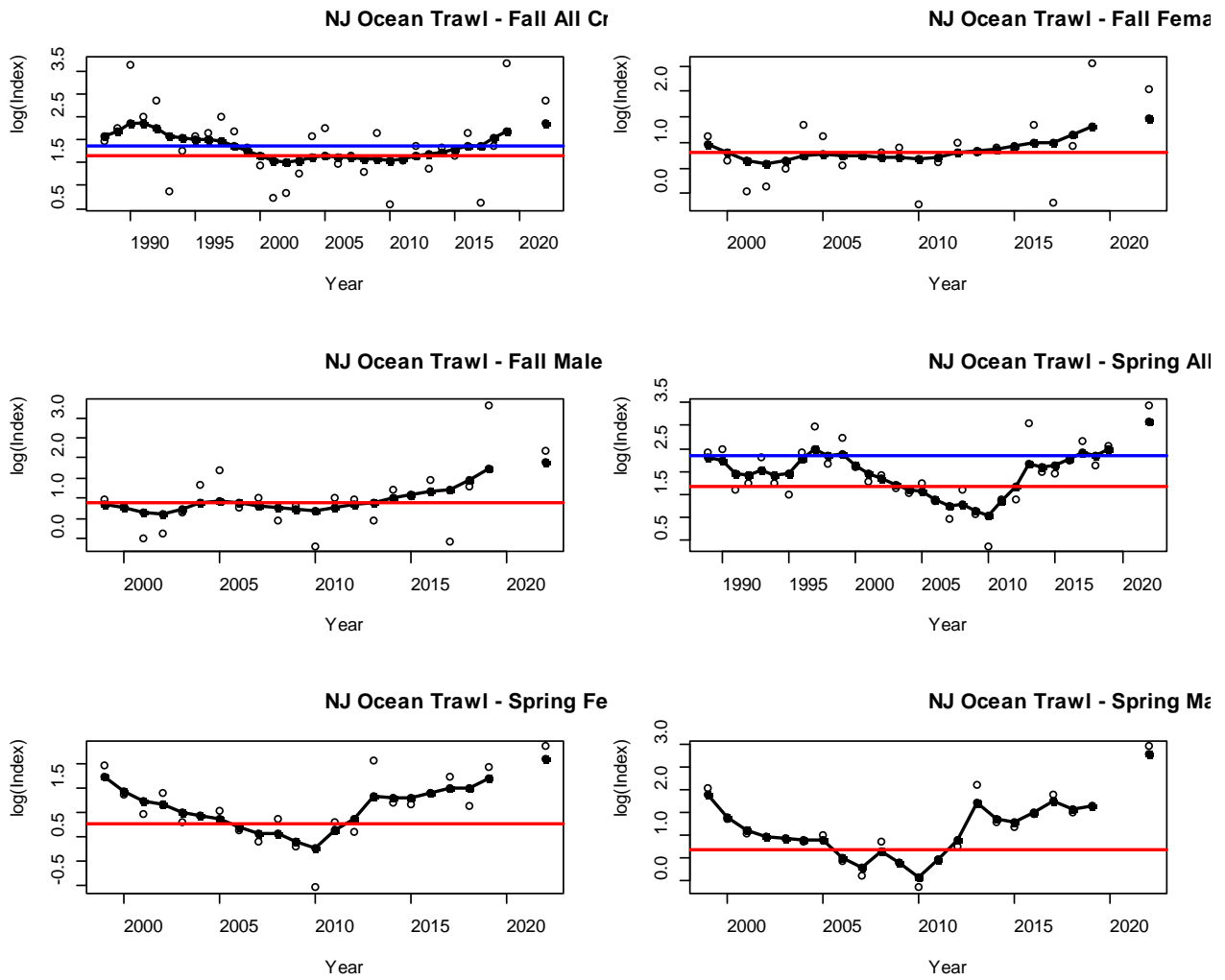


Figure 29. ARIMA model fits to horseshoe crab indices from the New Jersey Ocean Trawl Survey in the Delaware Bay Region. The red horizontal line represents the Q_{25} reference point and the blue horizontal line represents the 1998 reference point.

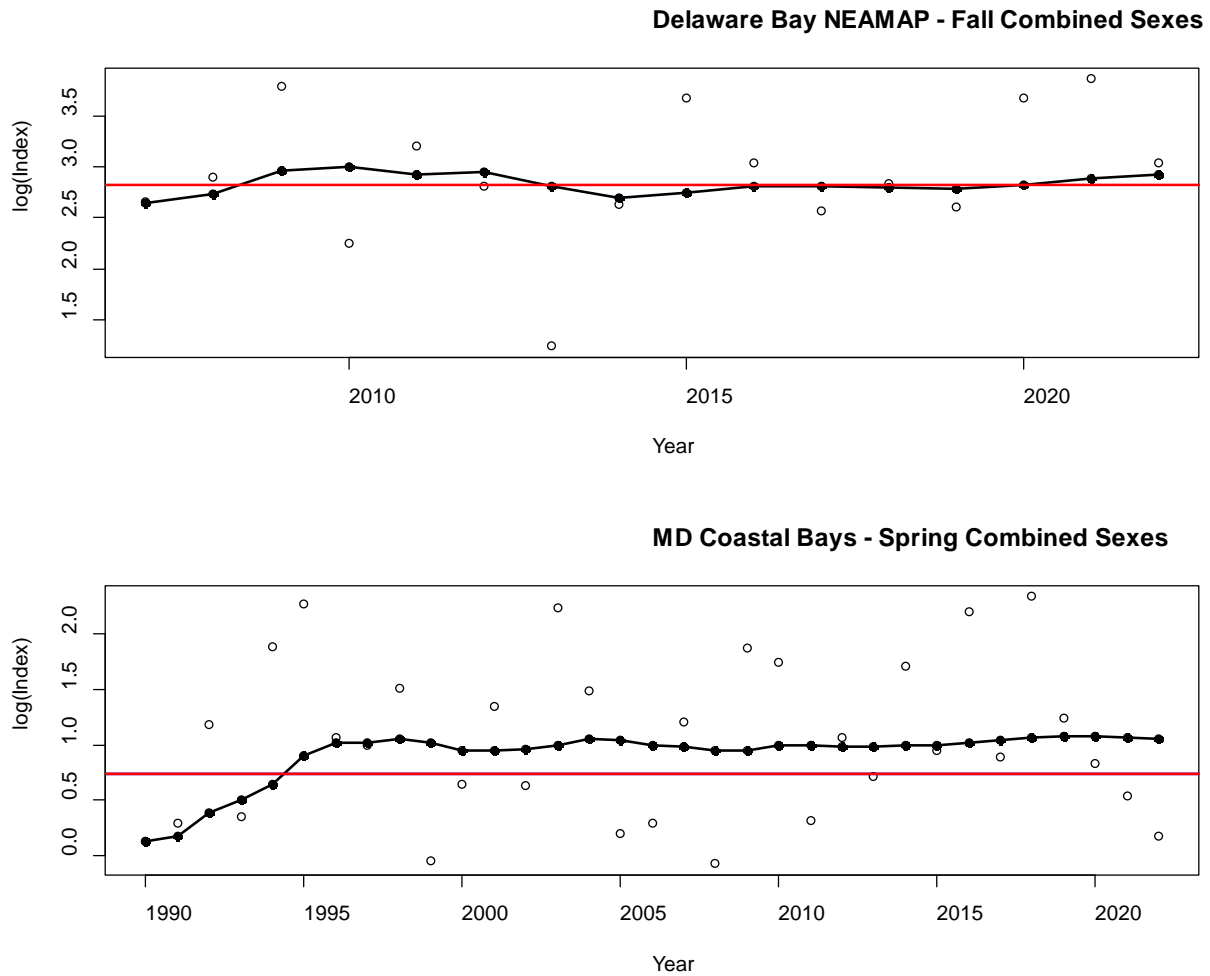


Figure 30. ARIMA model fits to horseshoe crab indices from Delaware Bay NEAMAP and Maryland Coastal Bays Surveys in the Delaware Bay Region. The red horizontal line represents the Q_{25} reference point and the blue horizontal line represents the 1998 reference point. For the Maryland Coastal Bays survey, red and blue lines overlap.

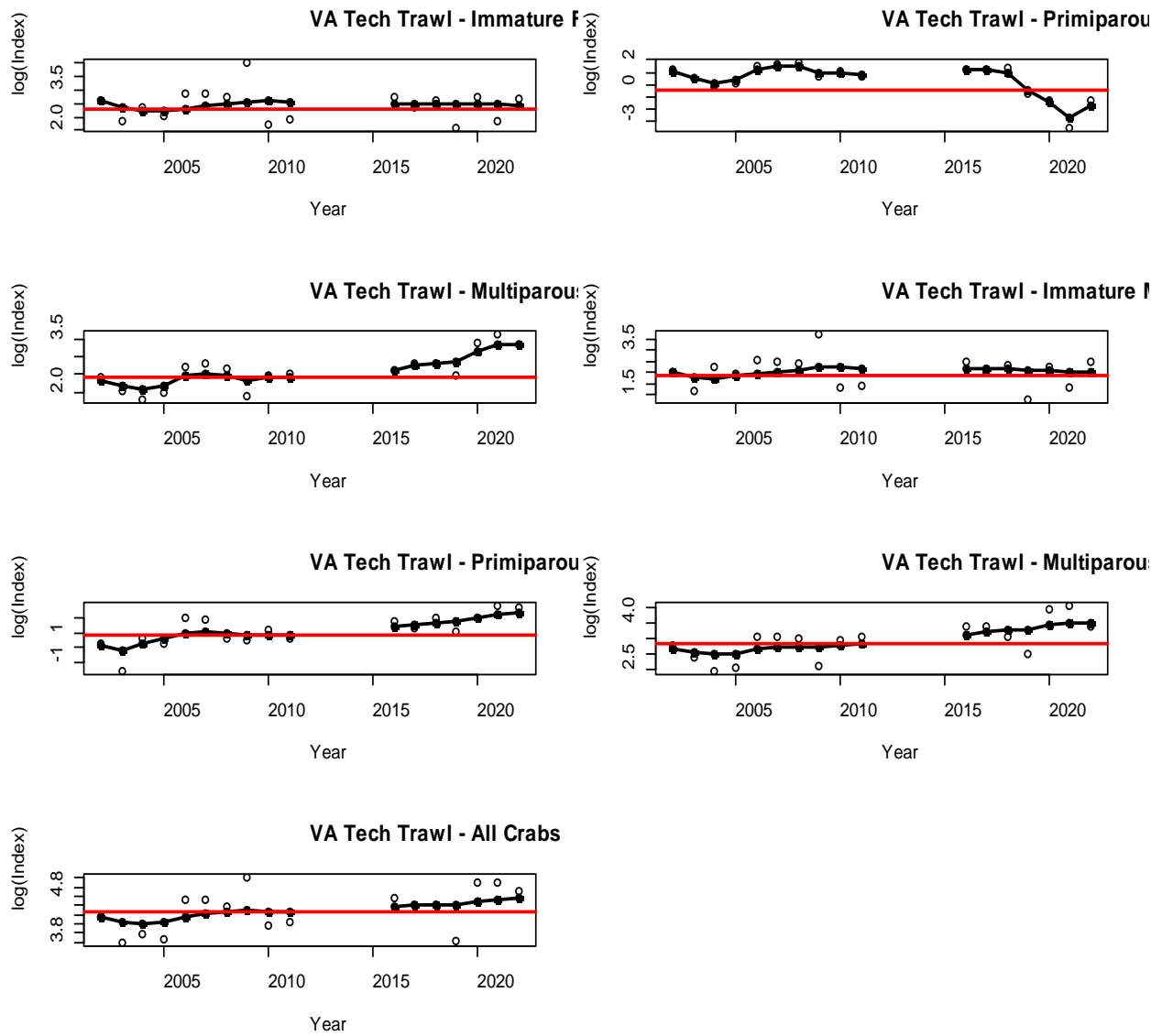


Figure 31. ARIMA model fits to horseshoe crab indices from the Virginia Tech Trawl Survey in the Delaware Bay Region. The red horizontal line represents the Q₂₅ reference point.

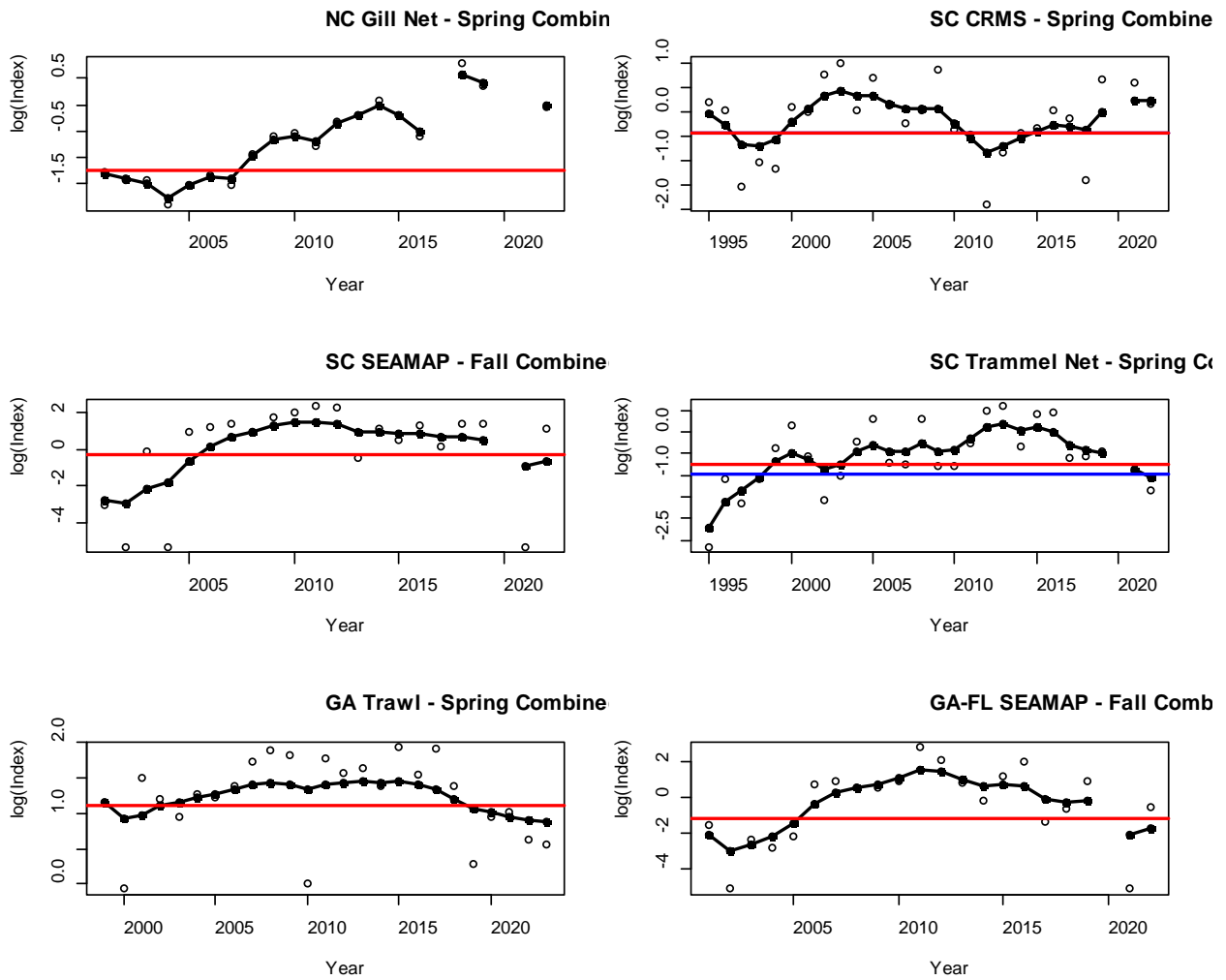


Figure 32. ARIMA model fits to horseshoe crab indices from the surveys in the Southeast Region. The red horizontal line represents the Q₂₅ reference point and the blue horizontal line represents the 1998 reference point.

APPENDICES

a. Appendix Tables

Table A1. Models used for generalized linear model (GLM) standardization of fixed station surveys and covariates used to estimate the abundance index. * Since ASMFC 2019, the South Carolina Crustacean Research and Monitoring Survey (CRMS) has been renamed as the Estuarine Trawl Survey but this update uses the older name for consistency with the benchmark.

Survey	Model	Covariates in Model
Rhode Island Monthly Trawl	Negative binomial (NB) GLM	Year, Station, Month
New York Western Long Island Sound (WLIS) Beach Seine - Jamaica Bay	NB GLM	Year, Station, Month
New York WLIS Beach Seine - Little Neck and Manhasset Bays	NB GLM	Year, Station, Bottom Temperature
Delaware Adult 30' Trawl	NB GLM	Year, Station
Maryland Coastal Bays	NB GLM	Year, Site
* South Carolina Crustacean Research and Monitoring Survey (CRMS)	NB GLM	Year, Salinity, Region
South Carolina Trammel Net	NB GLM	Year, Temperature, Stratum, Depth
Georgia Ecological Monitoring Survey	NB GLM	Year, Temperature, Station

Table A2. Number of tows by strata in the South Carolina Trammel Net Survey, 1995-2022. Strata used in the index were limited to ACE Basin/St. Helena Sound (AB), Charleston Harbor (CH), Muddy and Bulls Bays (MB), and Romain Harbor (RH) and the months March, April, and May.

Year	AB	CH	MB	RH	Total
1995	26	20			46
1996	21	28			49
1997	33	30			63
1998	35	30	32	36	133
1999	33	30	34	24	121
2000	34	30	35	35	134
2001	22	30	35	31	118
2002	34	30	30	35	129
2003	35	29	33	34	131
2004	32	28	30	31	121
2005	34	27	28	32	121
2006	32	29	36	33	130
2007	29	29	33	31	122
2008	32	29	36	34	131
2009	28	26	32	34	120
2010	31	30	23	32	116
2011	34	29	34	36	133
2012	35	28	35	34	132
2013	34	27	31	31	123
2014	22	29	32	32	115
2015	31	27	33	32	123
2016	32	30	29	35	126
2017	28	25	11	26	90
2018	30	25	33	32	120
2019	31	28	33	28	120
2020	13			12	25
2021	23	33		12	68
2022	20	7	21		48

Table A3. Number of tows by state in Southeast Area Monitoring and Assessment Program (SEAMAP) Survey, 2001- 2022. Two indices were developed from this data: South Carolina and Georgia-Florida for the months October and November.

Year	SC	GA	FL
2001	26	26	19
2002	25	28	19
2003	25	28	19
2004	25	25	19
2005	25	25	19
2006	26	26	20
2007	30	25	19
2008	29	27	19
2009	36	26	20
2010	30	28	23
2011	26	28	25
2012	28	25	26
2013	26	23	23
2014	25	23	16
2015	26	25	26
2016	26	23	24
2017	26	19	22
2018	25	19	18
2019	26	20	6
2020			
2021	27	19	11
2022	19	2	5

Table A4. Number of tagged horseshoe crab recaptures based on release year and recapture year from 2009-2022 by region. Annual recapture percent is based on the total number of recaptures for a given release year for the entire time period. Average recapture percent over time is split from 2009-2019 (pre-pandemic) and 2020-2022 (pandemic affected years). All recaptures listed are horseshoe crabs reported alive and greater than 90 days following their release. Table continues on next few pages (source: USFWS tagging database).

Northeast Region

Release Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Recaptures	Total Releases	Annual Recapture %	Average Recapture %
2009	25	794	381	96	118	79	54	46	10	6	11	4	4		1,628	14,954	10.9%	8.40%
2010		18	881	184	229	106	74	40	15	17	29	10	9	3	1,615	17,197	9.4%	
2011			15	300	352	174	95	57	38	34	27	29	10	6	1,137	16,487	6.9%	
2012				8	358	134	81	53	28	18	22	14	8	8	732	11,154	6.6%	
2013					3	187	109	60	33	31	31	19	11	16	500	7,616	6.6%	
2014						6	107	42	28	26	20	16	15	16	276	3,802	7.3%	
2015							1	126	41	37	54	26	21	12	318	3,726	8.5%	
2016								5	86	62	58	31	34	17	293	3,964	7.4%	
2017									2	63	52	34	36	19	206	1,869	11.0%	
2018										2	155	59	33	32	281	2,937	9.6%	
2019											1	101	54	30	186	2,275	8.2%	
2020												3	64	22	89	1,345	6.6%	4.20%
2021													1	71	72	1,225	5.9%	
2022														2	2	1,174	0.2%	

Table A4 Continued.

Coastal NY-NJ

Release Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Recaptures	Total Releases	Annual Recapture %	Average Recapture %
2009	2	87	61	21	16	6	8	2	4		2		1		210	3,331	6.3%	4.80%
2010		4	67	21	12	10	4	4	2	2		1		127	2,194	5.8%		
2011			1	35	20	10	11	2	1	1	4	1	2	88	2,130	4.1%		
2012				5	117	55	36	12	9	13	2	3	4	256	7,075	3.6%		
2013					1	81	55	19	13	8	18	14	6	7	222	4,568	4.9%	
2014						1	59	19	29	8	16	11	7	6	156	2,913	5.4%	
2015							3	39	28	20	27	7	11	9	144	3,868	3.7%	
2016								3	58	32	56	21	13	36	219	4,343	5.0%	
2017									3	70	49	25	23	27	197	4,570	4.3%	
2018										3	123	53	42	55	276	4,850	5.7%	
2019											1	74	73	65	213	5,435	3.9%	
2020													80	38	118	2,560	4.6%	
2021													2	193	195	4,645	4.2%	
2022														4	4	5,617	0.1%	3.00%

Delaware Bay

Release Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Recaptures	Total Releases	Annual Recapture %	Average Recapture %
2009	0	11	20	11	6	1	2	1							52	546	9.5%	8.50%
2010		1	90	53	57	21	19	18	4	6	5				274	1,976	13.9%	
2011			2	89	105	40	37	27	14	6	4	4			328	3,625	9.0%	
2012					91	43	36	27	18	7	10	3			235	2,277	10.3%	
2013					2	33	22	15	4	4	12	5		1	98	1,314	7.5%	
2014							131	71	79	44	30	10	9	5	379	4,222	9.0%	
2015							1	68	60	61	36	28	21	4	279	4,231	6.6%	
2016								1	103	76	73	49	32	11	345	5,625	6.1%	
2017									3	162	141	87	42	20	455	5,597	8.1%	
2018											211	101	71	32	415	5,640	7.4%	
2019											3	137	122	46	308	4,966	6.2%	
2020												0	0	0	-	30	0.0%	
2021													3	72	75	2,784	2.7%	
2022														4	4	4,937	0.1%	0.90%

Table A4 Continued.

Coastal DE-VA

Release Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Recaptures	Total Releases	Annual Recapture %	Average Recapture %
2009	2	87	45	18	32	18	10	8	2		1				223	4,721	4.7%	3.60%
2010			105	15	25	17	6	9	10	1	6				194	5,413	3.6%	
2011			3	88	86	36	26	24	9	6	3	1	1		283	6,844	4.1%	
2012				9	235	82	38	17	16	12	8	1	4	1	423	9,873	4.3%	
2013						53	40	23	16	14	16	5	6	4	177	6,813	2.6%	
2014							69	18	17	5	8	1	8	2	128	4,237	3.0%	
2015							4	27	14	12	13	5	4	7	86	3,574	2.4%	
2016								2	49	17	13	11	5	2	99	4,170	2.4%	
2017									1	103	48	31	19	19	221	5,193	4.3%	
2018										7	113	43	41	14	218	5,018	4.3%	
2019											6	98	57	37	198	5,897	3.4%	
2020													33	23	56	4,042	1.4%	1.20%
2021													7	118	125	6,166	2.0%	
2022														9	9	7,382	0.1%	

Southeast Region

Release Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Recaptures	Total Releases	Annual Recapture %	Average Recapture %
2009	1	1	5	2	3										12	325	3.7%	2.00%
2010		1	77	45	10	11	3								147	2,588	5.7%	
2011				20	5	11		1	1						38	957	4.0%	
2012						2									2	442	0.5%	
2013					2	11		3					1		17	412	4.1%	
2014						1	8	3	2	1					15	1,757	0.9%	
2015							1	10	7	2	3			1	24	2,015	1.2%	
2016								1	6	2	7				16	1,865	0.9%	
2017										1				1	2	418	0.5%	
2018										1		1	2		4	502	0.8%	
2019												1			1	608	0.2%	
2020															-	65	0.0%	0.20%
2021														6	6	1,206	0.5%	
2022														1	1	773	0.1%	

Table A5. Total mature (newly mature plus mature) horseshoe crab population estimates in millions by sex and estimation method (catch multiple survey model or Virginia Tech Trawl Survey), 2003-2022.

Biomedical Data:	Females (in millions)			Males (in millions)		
	Zero	Coastwide	N/A	Zero	Coastwide	N/A
Estimation Method:	CMSA		VT Trawl	CMSA		VT Trawl
2003	6.1	6.1	6.5	15.1	15.2	12.1
2004	5.3	5.3	4.2	11	11	8.1
2005	4.2	4.2	3.1	8.9	8.9	5.9
2006	3.7	3.7	3.6	7.3	7.3	6.4
2007	5	5	8.7	10.4	10.5	18.9
2008	5.1	5.1	10.1	10.7	10.7	18.9
2009	4.9	4.9	8.9	8.5	8.5	15.4
2010	4.4	4.4	3.9	7	7	7
2011	4.9	4.9	6.5	7.2	7.3	15.4
2012	4.3	4.3	6.1	5.9	5.9	15.8
2013	10.7	10.7		11.9	11.9	
2014	8.4	8.5		21.1	21.2	
2015	6.5	6.6		15.4	15.4	
2016	11.2	11.2		39.7	39.9	
2017	10.2	10.2	7.6	33.7	33.8	24.5
2018	9.1	9.1	8.7	26.4	26.4	22.2
2019	8.2	8.2	9.1	23.7	23.8	19.1
2020	10.6	10.7	5.4	18.8	18.8	10.2
2021	11.2	11.2	10.9	17.2	17.2	34
2022	16.1	16.2	15.5	40.3	40.3	44.9

b. Appendix Figures

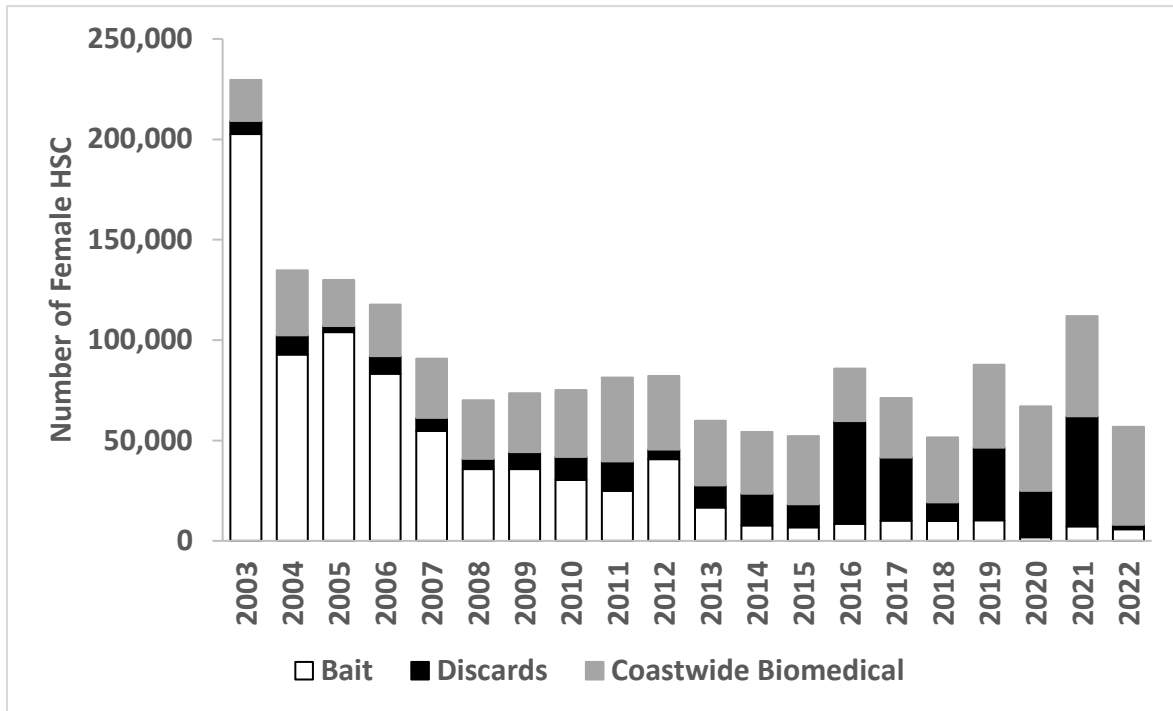


Figure A1. Total female horseshoe crab harvest by source in the Delaware Bay, 2003-2022, for use in the CMSA.

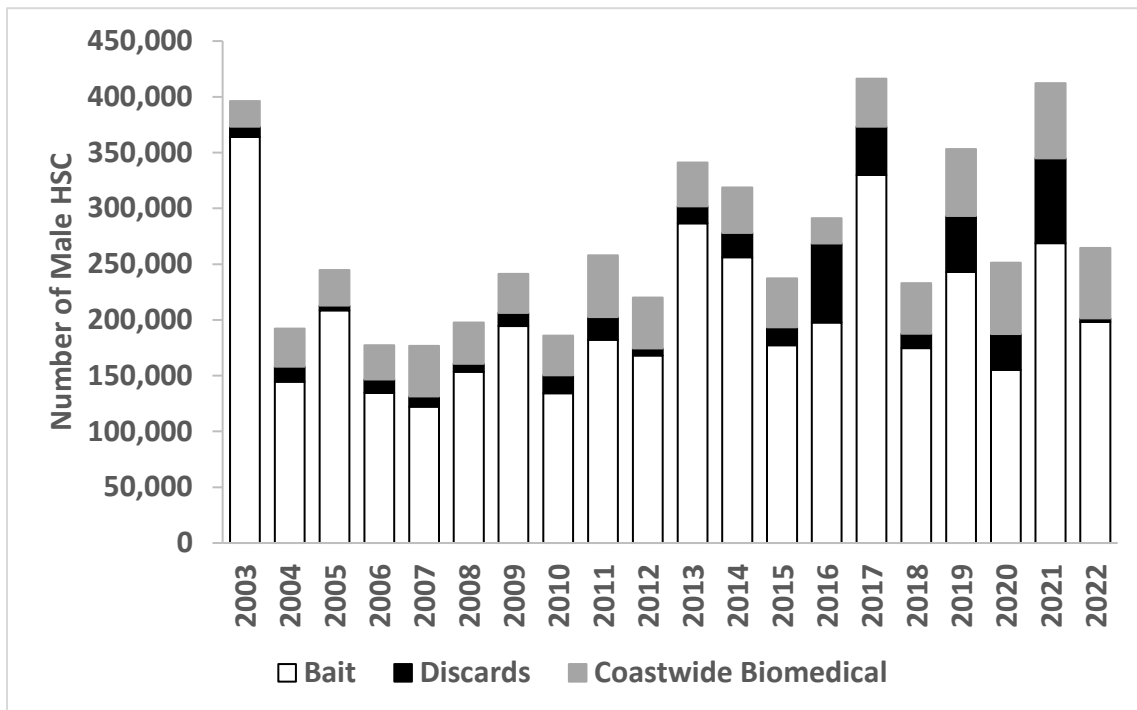


Figure A2. Total male horseshoe crab harvest by source in the Delaware Bay, 2003-2022, for use in the CSMA.

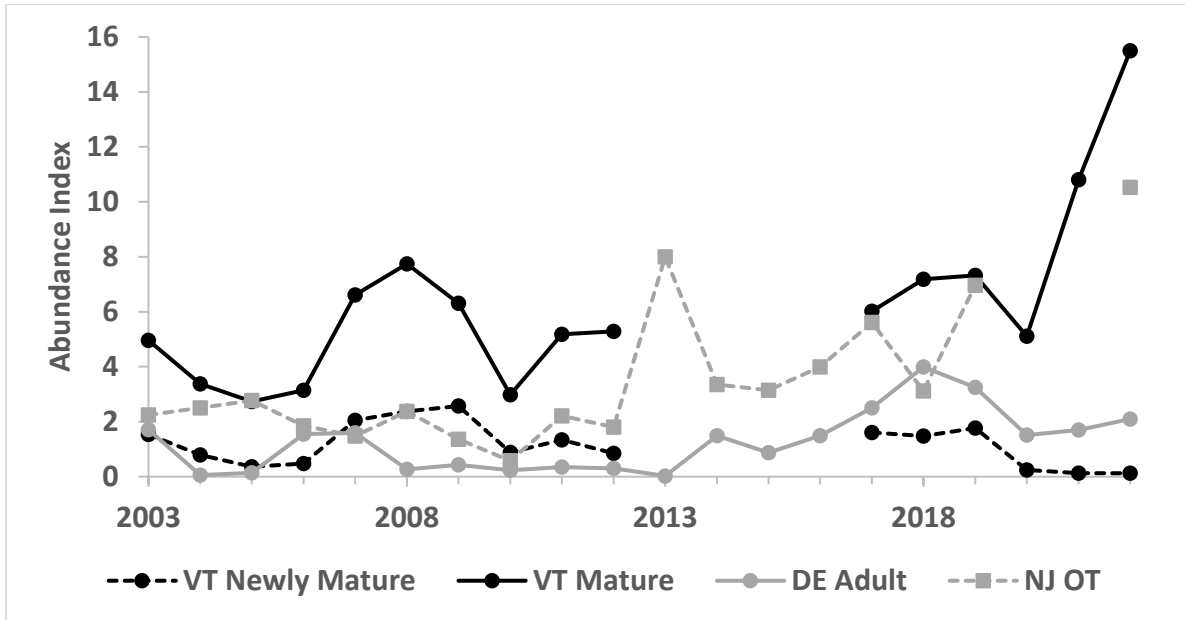


Figure A3. Female horseshoe crab abundance indices used in the CMSA. The Virginia Tech (VT) indices are in millions of newly mature and mature crabs while the Delaware Adult (DE Adult) and New Jersey Ocean Trawl (NJ OT) are in catch-per-tow.

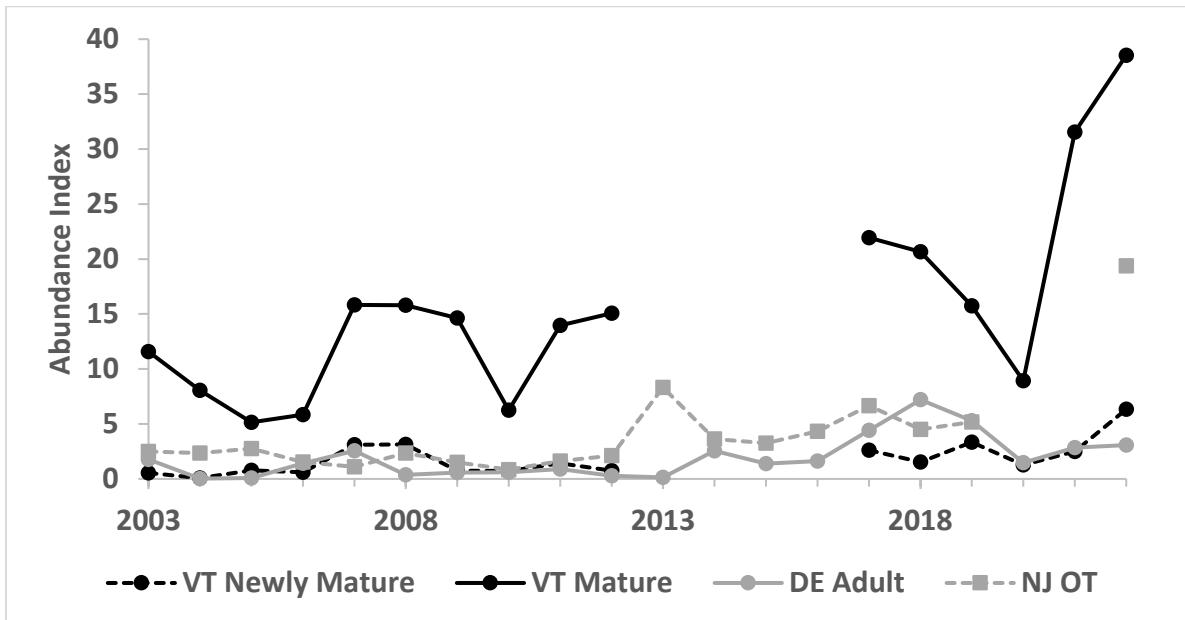


Figure A4. Male horseshoe crab abundance indices used in the CMSA. The Virginia Tech (VT) indices are in millions of newly mature and mature crabs while the Delaware Adult (DE Adult) and New Jersey Ocean Trawl (NJ OT) are in catch-per-tow.

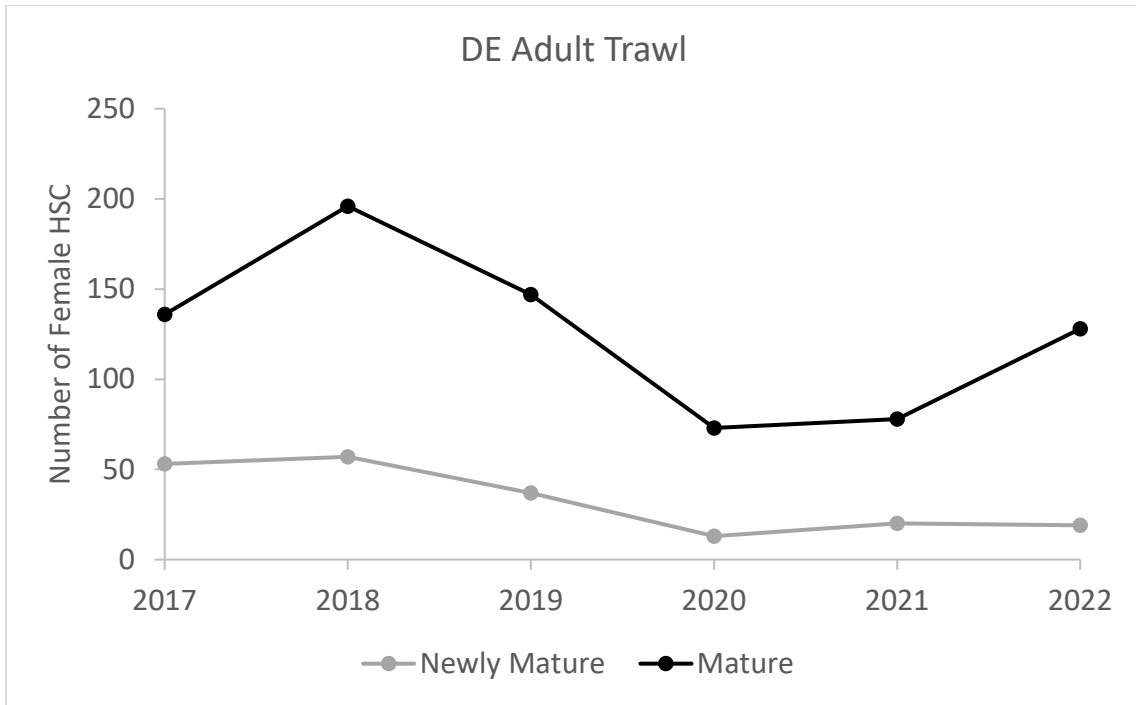


Figure A5. Mature and newly mature female horseshoe crabs caught in the Delaware Adult (30 foot) Trawl, 2017-2022.

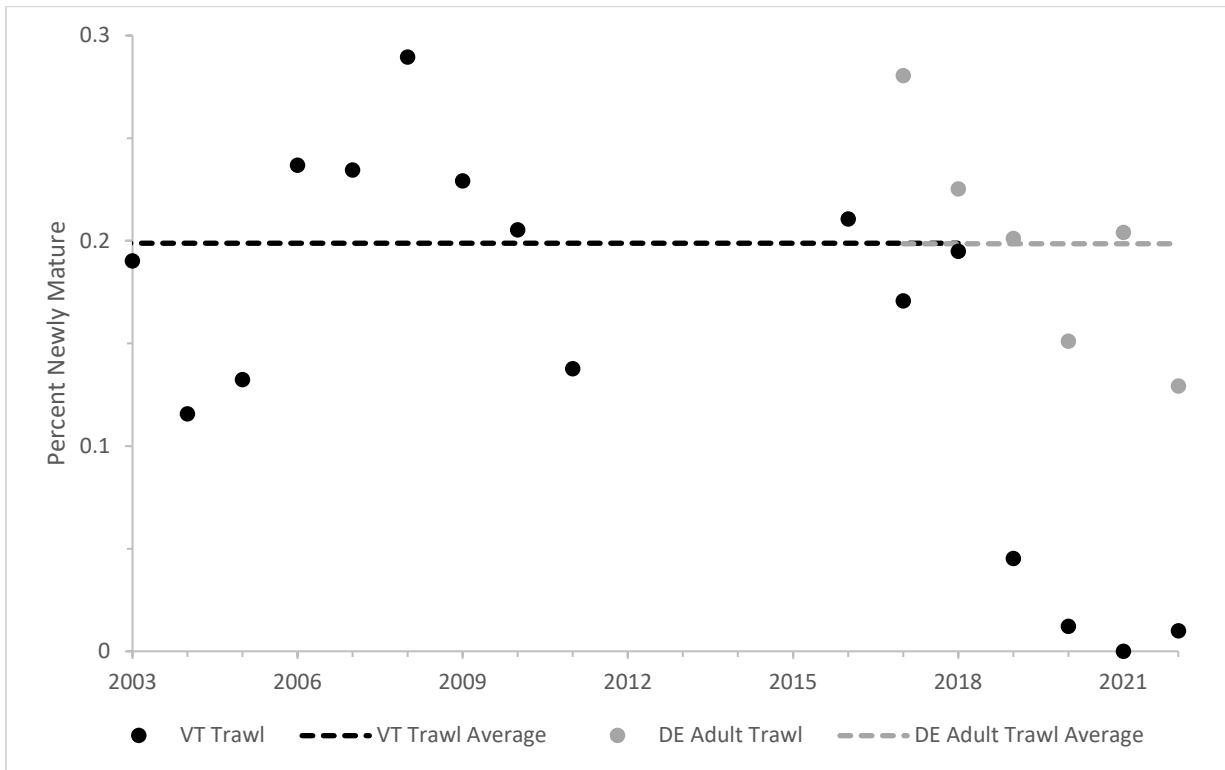


Figure A6. Percent of newly mature female horseshoe crabs in the Virginia Tech and Delaware Adult Trawls. The low years of newly mature female horseshoe crabs (2019-2022) were not included in the average for the Virginia Tech Trawl.

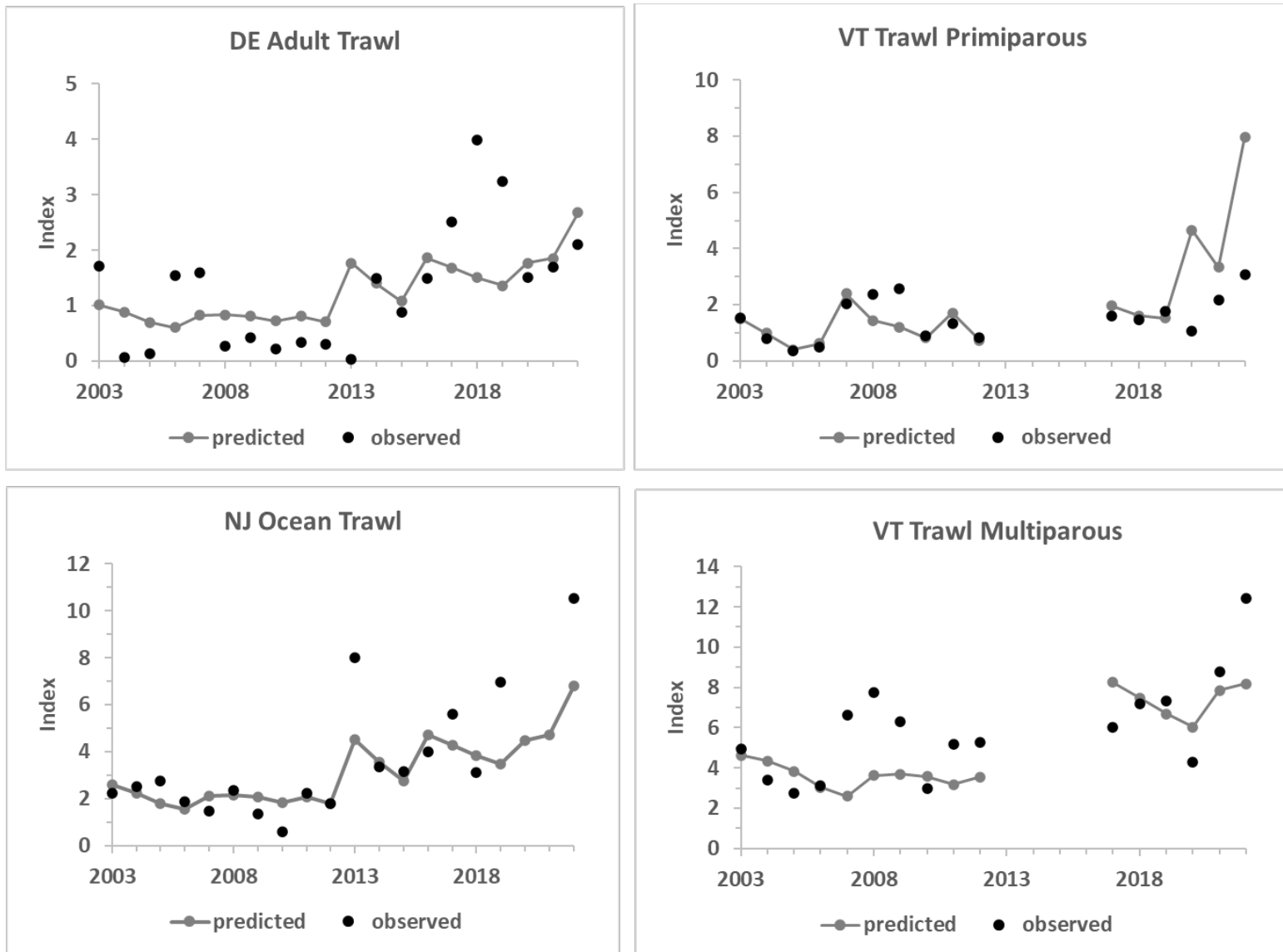


Figure A7. CMSA model fit to the indices of female horseshoe crab abundance.

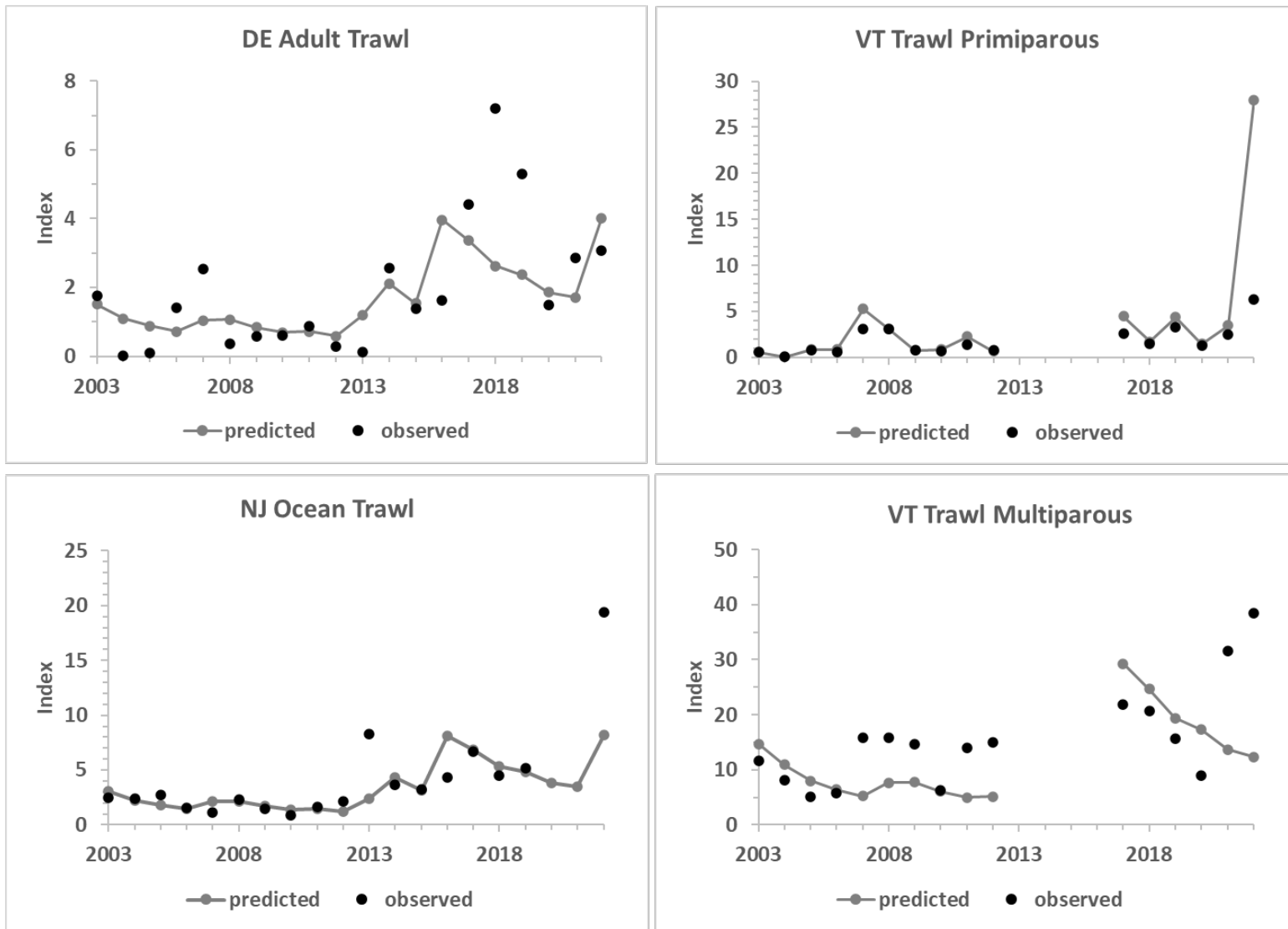


Figure A8. CMSA model fit to the indices of male horseshoe crab abundance.

c. 2019 Benchmark Research Recommendations

The following is the complete list of research recommendations from the benchmark assessment (ASMFC 2019). Comments have been added in italics to list initiated research or published papers since ASMFC 2019. Research recommendations which have been addressed or partially addressed are also described in TOR 7.

Research recommendations have been categorized as future research, data collection, and assessment methodology and listed in order of priority. The SAS and TC recommend that during the years between this assessment and the next, members remain proactive about maintaining surveys and research programs and continuing to initiate or participate in activities that accomplish some of the research recommendations listed below.

Future Research

- Determine relationship between age, stage, and size for horseshoe crabs.
- Compare densities of horseshoe crabs nearshore, offshore, and in bays, compare different stages (i.e., primiparous and multiparous), and look at movements among embayments within regions (i.e., around Cape Cod, Long Island).
 - *Bopp et al. (2019) describes survival and movement between regions of Long Island, New York.*
- Characterize the proportion of states' landings that comprise crabs of Delaware Bay origin. This can be done through a directed tag/release study, genetics/microchemistry study, or both.
- Collect more life history information, particularly for juveniles, on growth, molt timing, and distribution.
 - *Several papers have been published on juvenile ecology, trophic niches across stages and location, and spawning in salt marshes (Cheng et al. 2021; Kendrick et al. 2021; Colon et al. 2022; Bopp et al. 2023; Sasson et al. 2024).*
- Evaluate the effect of warming temperatures on distribution and timing of spawning for horseshoe crabs.
 - *Cheng et al. 2022 evaluated the temperature and salinity preferences of horseshoe crabs in New Hampshire and the effects of warmer water on their heart rates.*
- Address the issue of gear saturation for spawning beach surveys and/or explore analyses that would be less sensitive to gear saturation. Explore the methodology and data collection of spawning beach surveys and the ability of these surveys to track spawning abundance.
- Determine if there is illegal take-and-use at sea, transfer at sea, and poaching from spawning areas for horseshoe crabs and estimate the amount if possible.

Data Collection

- Continue to fund and operate the full Virginia Tech Trawl Survey annually.
 - *The Virginia Tech Trawl Survey has continued to be funded annually since ASMFC 2019 and is currently funded through 2024.*
- Conduct a gear efficiency study of the Virginia Tech Trawl Survey given the importance of using swept-area estimates of abundance in modeling the Delaware population.
- Better characterize the discards, landings, and discard mortality by gear.
 - *The discard estimates were revised and peer reviewed in ASMFC 2022 as part of the revision to the ARM Framework. While there are still large confidence intervals associated with the discard estimates, the ASMFC 2022 estimates are an improvement over the ASMFC 2019 estimates and have been used in this report.*
- Increase the priority of maintaining and managing horseshoe crab data in and among states, both fishery-dependent and –independent, and improve communication between data providers.
- Continue current biosampling for sex and weight and expand where possible.
- Develop a standardized biosampling protocol to cover different seasons and obtain weights, ages, stages, and widths of horseshoe crabs using a random sampling design.
- Expand or implement fishery-independent surveys (e.g., spawning, benthic trawl, tagging) to target horseshoe crabs throughout their full range including estuaries. Highest priority should be given to implementing directed surveys in the Northeast and New York regions.
- Collect sex and stage data in fishery-independent surveys. Surveys should consider using similar methods as the Virginia Tech Trawl Survey and collect biological data by sex and stage, particularly by primiparous and multiparous.
 - *Delaware, New Jersey, and South Carolina have all begun to collect stage information from their trawl surveys following the methods from Virginia Tech Trawl Survey.*
- Continue to evaluate biomedically bled crabs' mortality rates. Consider a tagging study of biomedically bled horseshoe crabs to obtain relative survival and collaborations between researchers and biomedical facilities that would result in peer-reviewed mortality estimates.
 - *Several studies on biomedical mortality have been published since ASMFC 2019 (Owings et al. 2019, 2020; Smith et al. 2020; Tinker-Kulberg et al. 2020a, 2020b, 2020c; Watson et al. 2022; Litzenberg 2023).*

- Maintain consistent data collection and survey designs for spawning beach surveys each year and encourage spawning beach surveys to conduct the data collection for the survey and tagging resights separately.

Assessment Methodology

- The ARM working group should consider using the population estimates from the CMSA model as an input to the ARM model as well as estimated mortality from discards and the biomedical industry.
 - *The CMSA was incorporated into the revised ARM Framework and peer reviewed as part of ASMFC 2022. Additionally, the CMSA was peer reviewed and published (Anstead et al. 2023).*
- Further develop the catch survey analysis and apply assessment modeling beyond the Delaware Bay region, which would require more stage-based data collection.
- Develop a stage-based or length-based model specific for horseshoe crabs that addresses their life history characteristics.
- Estimate the survival of early life stages (e.g., age-zero, juveniles) and growth rates.
- Explore the possibility of using a delay-difference model for future assessments. Because of the life history of horseshoe crab, this would require 20-30 years of data before it could be developed.
- Continue to evaluate tagging data by fitting capture-recapture models that include a short-term (1 year) bleeding effect, account for spatial distribution of harvest pressure, account for capture methodology, and account for disposition of recaptured tagged individuals. Potential methodological approaches include use of time-varying individual covariates to indicate which crabs are 1 year from bleeding and use of hierarchical models to estimate interannual variation in survival within time periods defined by major regulatory changes.

Atlantic States Marine Fisheries Commission

Technical Response to External Review of the 2022 ARM Framework Revision

Prepared by the

Adaptive Resource Management Subcommittee

John Sweka (Chair), US Fish and Wildlife Service
James Lyons (Vice Chair), USGS Patuxent Wildlife Research Center
Kristen Anstead, Atlantic States Marine Fisheries Commission
Linda Barry, New Jersey Division of Fish and Wildlife
Jason Boucher, National Marine Fisheries Service
Margaret Conroy, Delaware Division of Fish and Wildlife
Steve Doctor, Maryland Department of Natural Resources
Conor McGowan, USGS Alabama Cooperative Fish and Wildlife Research Unit
Clint Moore, USGS Georgia Cooperative Fish and Wildlife Research Unit
Bryan Nuse, University of Georgia
Caitlin Starks, Atlantic States Marine Fisheries Commission
Wendy Walsh, US Fish and Wildlife Service

In Collaboration with

Anna Tucker, USGS Iowa Cooperative Fish and Wildlife Research Unit

EXECUTIVE SUMMARY

The Adaptive Resource Management (ARM) Framework was developed in 2009 and implemented through Addendum VII in 2012 to set horseshoe crab harvest in the Delaware Bay at a level that does not limit the red knot stopover populations. In the decade since its implementation, more data on red knots and horseshoe crabs have been collected in the region, programming software advanced, and better population models were developed for the two species. Therefore, the ARM Framework was revised in 2022 by the ARM Subcommittee, a group that includes shorebird and horseshoe crab biologists and modelers. The ARM Revision was evaluated and endorsed by an independent panel of scientific experts through the Atlantic States Marine Fisheries Commission's (ASMFC) external peer review process.

While the ARM Revision represents significant advances in modeling and data use, the conversation around the revised ARM Framework quickly focused on the allowance of female horseshoe crab harvest when horseshoe crab population estimates are sufficiently high as to not limit red knot populations. The original ARM Framework had a technical flaw where it recommended 0 female horseshoe crab harvest when the adult female population was estimated to be less than 11.2 million, as it did from 2013-2022, or maximum female harvest (210,000 female horseshoe crabs) when the population was estimated to be greater than 11.2 million females, as it did in 2023. Rarely were the intermediate harvest levels selected by the model, as was shown through a simulation study. To correct this, the ARM Revision allowed a *gradual* increase of female harvest from 0-210,000 females as population estimates of female horseshoe crabs increased. The nuance of this change was lost in the discourse as stakeholders greatly opposed female harvest at any level, despite the original ARM Framework also recommending female harvest in recent years. In response to the concern over possible female harvest, Earthjustice, a non-profit public interest organization, hired experts to do their own technical review of the ARM Revision in 2022 and again in 2023 before the annual meeting of the Horseshoe Crab Management Board (Board) to set harvest specifications for the Delaware Bay region. During the October 2023 meeting, the Board tasked the ARM Subcommittee with responding to the 2023 technical review from Earthjustice.

The ARM Subcommittee seeks to always use the best scientific information available and welcomes scientific review and critique. As such, the Subcommittee has considered the comments provided by Earthjustice thoroughly. The following report outlines the ARM Subcommittee's responses to the six major criticisms listed by Dr. Kevin Shoemaker, a population ecologist at the University of Nevada, Reno, hired by Earthjustice as an external peer reviewer. Briefly, the ARM Subcommittee maintains that the red knot and horseshoe crab population models used in the ARM Framework currently represent the best use of the available data. Red knot survival rates and horseshoe crab population trends from the ARM Revision are consistent with other published values or data sources in the Delaware Bay region. This includes horseshoe crab egg density data, which were not provided to the ARM Subcommittee, but were subsequently published in the literature and show a similar trend to the horseshoe crab relative abundance indices. Additionally, the ARM Subcommittee responds to the comments in Dr. Shoemaker's report regarding the overparameterization or goodness of fit for the integrated population model for red knots and assert that this criticism misrepresents the work in the ARM Revision.

The ARM Subcommittee reiterates that an important benefit of the adaptive management process is the ability to make decisions even with imperfect knowledge of an ecological system. The overall goal of the ARM was to produce a decision-making framework informed by science and stakeholder values, given the available knowledge about the Delaware Bay ecosystem and horseshoe and red knot populations. At the time of the original ARM Framework, this knowledge was limited. However, the re-evaluation of the data, values, and knowledge on a regular basis is essential to the adaptive management process and is built into the ARM Framework. The 2022 ARM Revision represented a learning event where population models were re-designed to accommodate the advancement of data and knowledge since 2009. The peer reviews from Earthjustice fail to provide any real recommendations for improvement to the ARM Framework or provide other means for helping managers make an informed harvest decision beyond a mandate for zero female harvest at any population level. If the values of all stakeholders have changed (i.e., no female harvest under any circumstances), that change could be considered in a new approach in the future by the ARM Subcommittee. As it stands, the current ARM Framework represents the objectives previously established through stakeholder engagement: to 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.

Table of Contents

Executive Summary.....	2
Introduction	5
Criticism 1: Estimates of red knot survival used in the ARM appear to be artificially inflated, resulting in falsely optimistic estimates of population resilience.	6
Criticism 2: Trawl-based indices of horseshoe crab abundance are inadequate for modeling the biotic interaction between red knots and horseshoe crabs.	8
Criticism 3: Red knot survival is strongly sensitive to horseshoe crab egg density, indicating that persistent degradation of the horseshoe crab egg resource could have dire consequences for the red knot population.	11
Criticism 4: The ARM exaggerates the evidence for an increasing trend in the number of female horseshoe crabs in the Delaware Bay.	14
Criticism 5: The integrated population model used for estimating red knot population parameters is overparameterized and likely to yield spurious results.	18
Criticism 6: The integrated population model exhibits poor fit to the available data.	20
Conclusions	21
Supplemental Responses to the 2022 External Peer Reviews	23
Criticism 7: The estimate of mean horseshoe crab recruitment and propagation of error within the horseshoe crab population dynamics model is inappropriate.	23
Criticism 8: That the ARM model would not predict a decline in red knots under a total collapse of the horseshoe crab population is evidence that the model is fatally flawed. ..	25
Criticism 9: Demographic data indicate a declining horseshoe crab population.	26
Criticism 10: There is an incorrect specification of “pi” parameter in the red knot integrated population model.....	27
Criticism 11: There is an over-representation of Mispillion Harbor in red knot resighting data. 28	
References	30

INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) has been managing the harvest of horseshoe crabs in the Delaware Bay region using an Adaptive Resource Management (ARM) Framework since 2012. The ARM Framework uses linked population dynamics models between horseshoe crabs and red knots to determine a harvest level of male and female horseshoe crabs such that the fishery has the opportunity to benefit from the harvest of horseshoe crabs and the population growth of red knots is not limited by that harvest. The original ARM Framework recommended an annual harvest of 500,000 male and 0 female horseshoe crabs from 2013 – 2022. These harvest recommendations have likely contributed to an increase of both male and female horseshoe crab abundance over the last decade.

The original ARM Framework was theoretical in nature because the underlying population dynamics models for both species were based heavily on literature values of life history parameters and not specific to Delaware Bay. Since its inception, more Delaware Bay-specific data have been collected and the ARM Framework was revised in 2021 and adopted for management use in 2022 (ASMFC 2022). ASMFC 2022, henceforth referred to as “the ARM Revision,” documents the many advantages of the revised ARM Framework including the use of more Delaware Bay-specific data, modern modeling software, and more advanced models for horseshoe crabs and red knots. Although shorebird advocates supported the original ARM Framework for managing horseshoe crab harvest, they have expressed strong disagreement with the use of the ARM Revision for making horseshoe crab harvest recommendations primarily because of the female horseshoe crab harvest strategy. This disagreement spurred intense review and scrutiny of the ARM Revision by Earthjustice and the outside experts they hired to critique the data and modeling. The first public comment by Earthjustice was submitted to ASMFC in September 2022 and contained critiques by Dr. Kevin Shoemaker (University of Nevada, Reno) and Dr. Romuald Lipcius (Virginia Institute of Marine Science). The second public comment was submitted in September 2023 and contained additional critique by Dr. Shoemaker. During the October 2023 meeting, the Board tasked the ARM Subcommittee, which includes red knot and horseshoe crab biologists and modelers, with responding to the 2023 critique by Dr. Shoemaker.

The ARM Revision (ASMFC 2022) did modify the female horseshoe crab harvest strategy from that of the original ARM Framework (ASMFC 2009a, 2012). The original ARM Framework had some technical flaws in the algorithm that optimized horseshoe crab harvest which resulted in an “all or nothing” harvest strategy for female horseshoe crabs. A simulation study showed that the original ARM Framework would recommend either 0 female harvest, or the maximum female harvest (210,000) if the female horseshoe crab population reached a threshold of 11.2 million individuals. Intermediate harvest levels would rarely, if ever, be recommended. The “all or nothing” harvest flaw in the original ARM Framework was observed when 0 female harvest was recommended from 2013 – 2022 and then in 2023, it recommended maximum harvest (210,000 female horseshoe crabs) because female horseshoe crab population estimates exceeded the threshold of 11.2 million. Conversely, the ARM Revision allows female harvest to gradually increase with increasing female horseshoe crab abundance. Despite detailed explanation for this difference between the two ARM Framework versions, shorebird advocates

have strongly objected to the possibility of any female harvest, regardless of the population level of female horseshoe crabs and despite the fact that the original ARM Framework also allowed for female harvest.

With the publication of the ARM Revision and the discourse around the change in female harvest recommendations, Earthjustice solicited an external peer review of the technical work. The following represents the ARM Subcommittee's response to six major criticisms outlined by Dr. Shoemaker in his 2023 peer review. Each criticism is followed by a few bulleted summary points of the response and then a more detailed technical response to the criticism. While the ARM Subcommittee was not tasked with responding to the 2022 critiques, some responses to the major criticisms not included in the 2023 report have been provided in an appendix as supplemental information.

Criticism 1: Estimates of red knot survival used in the ARM appear to be artificially inflated, resulting in falsely optimistic estimates of population resilience.

- High survival and long lifespans are common for red knots and other shorebirds of similar size and life histories.
- Survival rates used in the ARM are calculated from the tagging data for red knots in the Delaware Bay region and are comparable with other published survival values.
- The tagging data were critically analyzed by the ARM Subcommittee to represent the best available data and caveats to the survival estimates were provided in the ARM Revision. The analysis of the tagging data and its use in the modeling was commended by the peer review panel.

Technical Response: Dr. Shoemaker asserts that red knot annual survival probability is more likely closer to 0.8 than the 0.9 used in the revised ARM Framework, corresponding to an expected lifespan of about 5 years. There is not strong evidence for this lower annual survival probability for *rufa* red knot. In fact, previous studies of *rufa* red knot in Delaware Bay (McGowan et al. 2011) and Florida (Schwarzer et al. 2012) also estimated annual survival probability at approximately 0.9. In a separate published analysis, only using data collected by the state of Delaware, Tucker et al. (2022) estimated red knot annual survival probability at 0.89, and at 0.91 for ruddy turnstones, a species with similar body size and a similar annual life cycle. Additionally, observations of birds more than 5 years old are common in the mark-recapture data set (approximately 20% of birds), with a maximum of 17 years between physical recaptures. These observations are a conservative minimum estimate of lifespan. Further, it is worth noting that almost all vertebrate species with delayed maturation life cycles, like red knots, that do not recruit to the breeding population until their third year, exhibit high adult survival rates. This is especially true when annual reproductive output is low, as it is with red knots, which lay only four eggs in a single nest per year.

Outside of the Delaware Bay system, high survival and long lifespans are also reported for red knots and other shorebirds of similar size and annual cycle. For example, Piersma et al. (2016) report that annual apparent survival for red knots in Western Australia were well above 90% in most years of their study. In another example, Boyd and Piersma (2001) reported that they

recaptured 155 birds in their sample >14 years after initial capture and 2 over 24 years after initial capture. There are published studies that report survival rates at 80% or lower, but to assert that the estimated survival rates used in the ARM based on the mark-recapture data are outliers or excessively high is erroneous.

In his report, Dr. Shoemaker claims that the survival estimates in the ARM are biased by individual misidentification, or flag misreads. Before analyzing the data, the ARM Subcommittee conducted a thorough QA/QC, including filtering records to only lime and dark green flags that were first deployed by New Jersey or Delaware, removing records of 5 duplicate flags ($n = 36$), flags apparently resighted before they were deployed ($n = 711$), and flags that were never deployed ($n = 1$). Removal of these records represents only 0.35% of the total resightings. Members of the ARM Subcommittee have worked extensively on the issue of flag misreads, including conducting a thorough simulation study investigating the situations in which misreads might bias survival estimates and the implications of that bias (Tucker et al. 2019). The key points from that work are: 1) misreads disproportionately affect survival estimates from the first years of the study, causing apparent negative trends in survival over time, and 2) there is an important tradeoff to consider between potential bias due to misreads and loss of precision if data filtering is applied. In that paper, the authors suggest a data filtering step of removing all observations of flags that were only seen once in a year as a way to potentially mitigate misidentification errors. However, there are nuances to consider when determining whether this is necessary, because this data filtering will inevitably remove some number of valid observations, and the authors identify thresholds that depend on study length and error rate. For a 10-year study, removing single observations becomes beneficial if the error rate is >5%; below that rate the bias is minimal relative to the detrimental effects of removing valid observations. In the Delaware Bay mark-recapture dataset, the misread error rate is between 0.38% (712 impossible observations/187,587 total) and 4.5% (8,448 single observations). Additionally, the characteristic apparent negative trend in survival over time that would indicate bias due to misreads is not observed. To examine this further, the distribution of the number of resightings in a year for every flag (Figure 1) was plotted, with and without removing single observations. The shape of the resulting histogram indicates that removing these records results in fewer flags being seen once in a year than would be expected, i.e., that the data filtering removes a large number of valid records (> 3,000). The integrated population model uses the mark-recapture data to estimate survival as well as parameters related to stopover site use within each year. There were concerns that removing single observations would bias estimation of within-year parameters, and because the error was below the thresholds identified by Tucker et al. (2019) and the characteristic negative trend in survival was not observed, single observations were kept in the data set for the analysis.

The ARM Revision (ASMFC 2022) contains a thorough discussion of this topic on pages 63-64, in which several hypotheses for the disagreement in annual survival probability estimates from the older studies was described. Dr. Shoemaker points to lower estimates of survival from studies from the early 2000s, when red knot annual survival probability was estimated to be close to 0.8. It is likely that older estimates were negatively biased to some extent due to short study periods, low detection probability, and unmodeled temporary emigration from the system. It is also possible that during that time, when horseshoe crab populations were lower, red knot

survival probability was truly lower. Alternatively, because permanent emigration from the system cannot be distinguished from mortality in older mark-recapture studies, a higher rate of permanent emigration (i.e., birds abandoning Delaware Bay for other spring stopover sites) would appear as lower survival probability. It is possible that there is a threshold of horseshoe crab abundance below which red knot survival probability might be expected to drop dramatically. If such a threshold exists, it was not observed over the time series included in the model (2005-2018).

It has also been proposed that southern-wintering birds (with longer migrations) have lower annual survival probabilities than northern-wintering birds. Declines in the number of red knots overwintering in Argentina (Niles et al. 2009) suggest a decline in the southern-wintering subpopulation and therefore it is possible that in more recent years a greater proportion of the Delaware Bay stopover population are northern-wintering birds. As discussed in the report, this is a key area for future research.

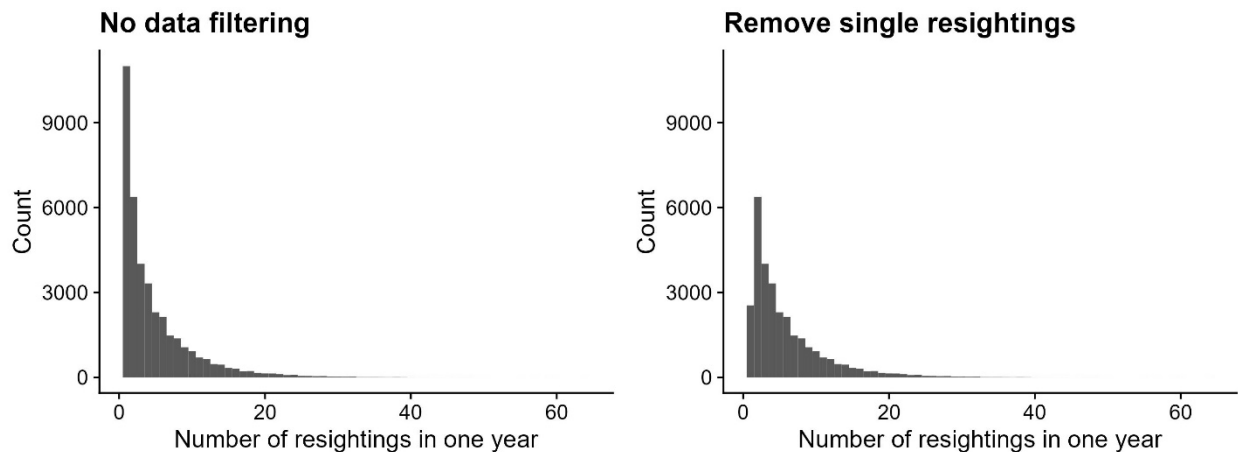


Figure 1. Histogram of the number of resightings per year for all lime and dark green flags deployed by New Jersey or Delaware from 2005 – 2018. The left panel is plotted without any data filtering. In the right panel, all flags that were seen only once (and not physically captured) were removed.

Criticism 2: Trawl-based indices of horseshoe crab abundance are inadequate for modeling the biotic interaction between red knots and horseshoe crabs.

- The inclusion of trawl surveys as indices of horseshoe crab abundance may be imperfect but it is the best available science and its use has been approved by several independent peer reviews.
- Most of the criticisms and caveats relevant to trawl surveys would also apply to egg density and red knot abundance estimates.
- There is consensus among the trawl surveys for an increasing trend in horseshoe crab abundance since 2010.

- Trawl surveys are the standard for bottom dwelling organisms and for evaluating the abundance of many species.

Technical Response: Dr. Shoemaker argues that the trawl surveys used to monitor horseshoe crab abundance and serve as the basis of the catch multiple survey analysis (CMSA) are “...imperfect snapshots of the abundance of horseshoe crabs occupying Delaware Bay, obscured by differing survey methodologies and poorly understood aspects of horseshoe crab ecology, including seasonal and daily activities, habitat preferences, and degree of clustering on the seafloor.” The ARM Subcommittee agrees that the trawl surveys are imperfect; catchability differs in each survey and possibly differs both within and between years. Such is the nature of fishery-independent surveys, and these same arguments also apply to indices of abundance for red knots and horseshoe crab egg density estimates. However, the use of the trawl surveys to index horseshoe crab abundance has gone through multiple peer reviews (e.g., ASMFC 2009b, ASMFC 2019, ASMFC 2022, Anstead et al. 2023) and found to be a scientifically sound measure of horseshoe crab abundance.

Dr. Shoemaker faults the trawl-based indices of abundance used by the ARM Subcommittee for not considering environmental covariates that could influence the catch of horseshoe crabs, and he obtained the raw data to recalculate the indices using generalized linear models (GLM) and generalized additive models (GAM). The ARM Subcommittee does not disagree with this approach to standardizing abundance indices based on environmental covariates, and this sort of analysis was conducted as part of the 2019 stock assessment (ASMFC 2019) but it did not improve the indices of abundance (e.g., decrease errors, reduce large annual fluctuations). The peer review panel for the ARM Revision (2022 ASMFC) recommended using a model-based index for the Delaware Trawl Survey because it is a fixed station survey; consequently, the ARM Subcommittee applied this approach prior to using this survey in the CMSA. The Virginia Tech Trawl Survey has a well-designed sampling scheme that stratifies sampling based on habitat; thus, habitat features that could influence catchability are already incorporated into the abundance estimates from this survey. Finally, and as stated earlier, a GLM did not improve the precision of the New Jersey Ocean Trawl Survey (ASMFC 2019) and the ARM Subcommittee continued using a simpler calculation of the abundance estimate (the delta-mean catch-per-unit-effort).

Like trawl surveys for any aquatic species, there is considerable variation in the catches of horseshoe crabs among individual trawl samples resulting in high inter-annual variation in abundance indices. Dr. Shoemaker concludes there is a lack of statistically significant correlation coefficients among the trawl surveys, and there is a fatal flaw in using those data to infer abundance. The ARM Subcommittee disagrees with this analysis and can demonstrate that there is in fact a significant correlation between trawl surveys and with the CMSA estimates of abundance (see response to Criticism 3). There is observation error associated with each survey (e.g., being in the right place at the right time) and it is not uncommon for a relatively high catch in one survey to correspond with a relatively low catch in another for the same survey year, so it is not surprising that there could be some “non-significant” correlations or correlation coefficients that one may consider low. However, each trawl survey could very well show a statistically significant trend. It is the consensus among surveys about the trend

that is important, not how closely individual observations from the respective surveys track one another. The ARM Subcommittee acknowledges that each survey does not perfectly track the population, which is why the CMSA uses multiple surveys. In addition, it is very possible, from a statistical sense, that two time series of abundance data could not show a statistically significant correlation, but could still both show a statistically significant trend (Figure 2).

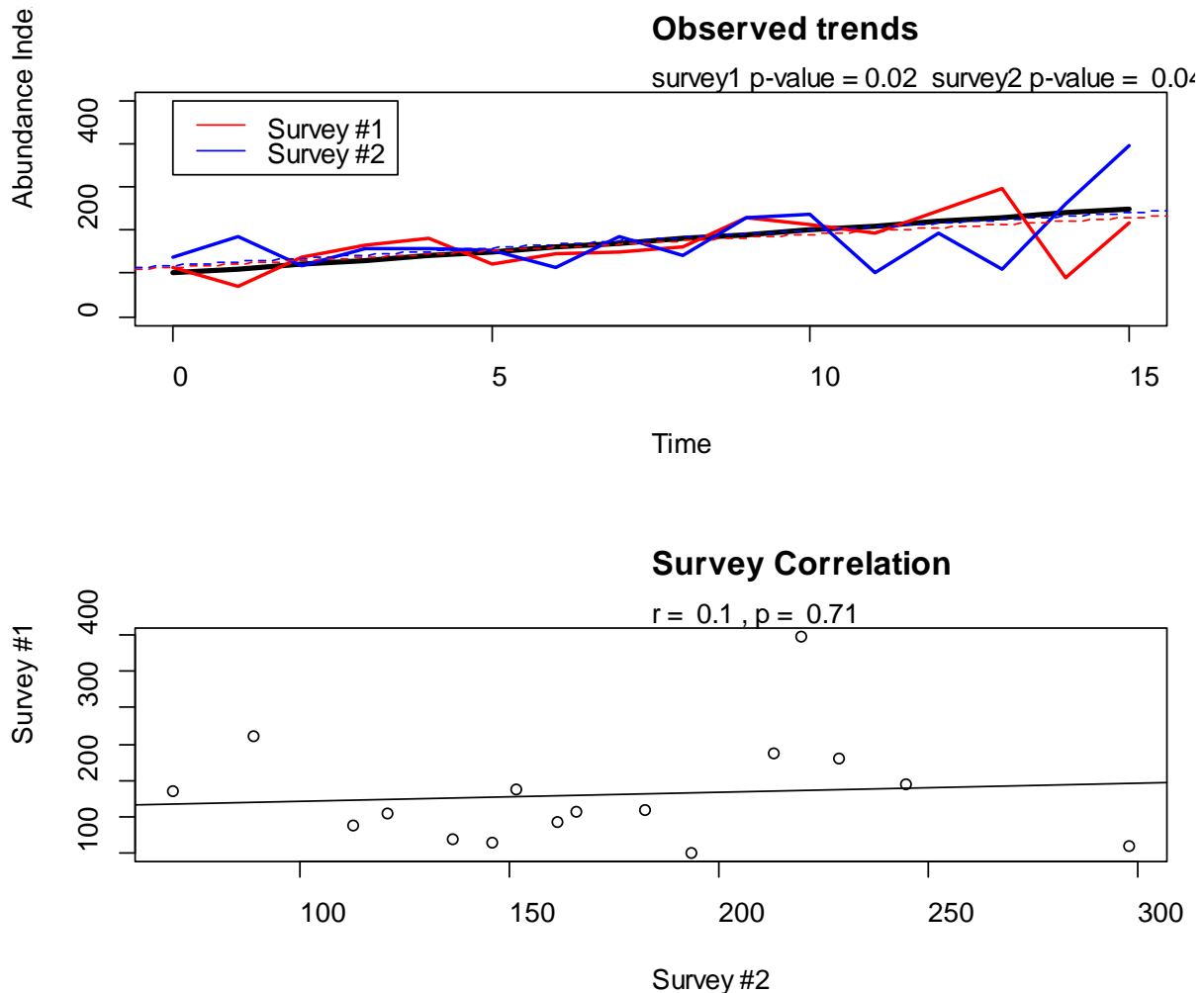


Figure 2. An example of simulated data to show that two surveys can both show an increasing trend but to be statistically uncorrelated with each other. The top graph shows the true change in hypothetical abundance (black line) and two randomly generated independent surveys of abundance each with a CV = 0.3. Dashed red and blue lines indicate linear regression lines for the two surveys. Both of these randomly generated surveys show statistically significantly increasing trends (p -values < 0.05), yet the correlation between the two is low ($r = 0.10$) and non-significant ($p = 0.71$).

Dr. Shoemaker also conducted his own capture-recapture analysis to determine the relationship between trawl-based indices of horseshoe crab abundance, horseshoe crab egg density, and red knot survival. Contrary to the results of the ARM Subcommittee, Dr. Shoemaker did not find any positive relationships between horseshoe crab abundance and red

knot survival. Although additional analysis of these data is welcome, the ARM Subcommittee questions the value of such a comparison due to the many differences in how the data were analyzed. Dr. Shoemaker's analysis only used information about whether a bird was seen at least once in a year in a standalone Cormack-Jolly-Seber model, whereas the ARM Revision uses both within-year and among-year observations in an open robust design model that is embedded within an integrated population model. These differences in modeling approaches make it difficult to draw meaningful conclusions regarding differences in results. The analysis done by the ARM Subcommittee did find a positive relationship between horseshoe crab abundance and red knot survival, providing the demographic link between population models used in the ARM Framework.

Criticism 3: Red knot survival is strongly sensitive to horseshoe crab egg density, indicating that persistent degradation of the horseshoe crab egg resource could have dire consequences for the red knot population.

- During the development of the ARM Revision, horseshoe crab egg density data were requested, but were not provided to the modeling team. Therefore, these data could not be considered as an input to the models.
- Trends in horseshoe crab egg density (extracted from Smith et al. 2022 following the publication of the ARM Revision) are correlated with other data inputs for the years included in the ARM models and thus the inclusion of egg density data in the models is unlikely to result in any meaningful difference from the current ARM Framework in terms of harvest recommendations.
- Smith et al. (2022) showed a general increasing trend in horseshoe crab egg density in recent years similar to that of horseshoe crab abundance, consistent with findings from the ARM Revision.

Technical Response: The debate over the inclusion or exclusion of egg density data has been ongoing since the ARM Framework was initiated in 2007. The ARM Subcommittee does not deny that eggs are the true link between horseshoe crabs and red knots. However, the reasons for excluding egg density data from the ARM model, which range from sampling design to data availability, have been extensively discussed since the inception of the original ARM Framework, in both published versions of the ARM Framework (ASMFC 2009a, 2022) and in response to a minority report on the ARM Revision (ASMFC 2022). Ultimately, egg density data could not be considered in the ARM Revision because they were not provided to the ARM Subcommittee when requested. When egg density data were published (Smith et al. 2022), the trends appeared to be increasing during the years modeled, consistent with trends of the trawl-based indices used in the model.

Egg density data are highly variable, both spatially and temporally within a spawning season, and discrepancies in egg density results have been noted depending on who processed samples and how they were processed. To incorporate egg density data into the ARM would require development of two linked models, in which the relationship between horseshoe crab abundance and observed egg density is quantified in one, and the relationship between egg

density and red knot survival/recruitment is quantified in the other. Such analysis and data exploration were not conducted during the ARM Revision primarily because the egg density data were not provided. The ARM Subcommittee is not opposed to using the egg density data as another index of horseshoe crab abundance once a reliably quantifiable relationship can be established. However, the first time the ARM Subcommittee saw the recent egg density results was in 2021 in the form of a draft manuscript (later published as Smith et al. 2022) as part of a minority report by Dr. Larry Niles. If the owners of the egg density data had been willing to provide the raw data, those data would have been considered in the revision of the ARM Framework. Instead, the ARM Subcommittee accounted for egg availability to shorebirds by including the timing of horseshoe crab spawning in the red knot integrated population model and made a research recommendation to examine the relationship between egg density estimates and horseshoe crab abundance estimates.

In Dr. Shoemaker's report, he finds that surface egg densities are uncorrelated or negatively correlated with the CMSA results and other indices of abundance used in the ARM Framework. In this analysis, he uses data from 1990-2022 although the CMSA and ARM Framework use data beginning in 2003. The CMSA model starts in the early 2000s to coincide with the start of many of required data sets used in the analysis (e.g., Virginia Tech Trawl, biomedical harvest, estimated dead discards from other fisheries). If the correlation analysis is abbreviated to include only the years used in CMSA modeling, all time series are positively correlated (Figure 3) for female horseshoe crabs (Dr. Shoemaker's analysis does not specify if his correlation analysis is for males, females, or both). In fact, the egg density time series from Smith et al. (2022) is positively and significantly correlated with the CMSA estimates of female horseshoe crabs. Therefore, it is likely that if the egg density time series were included in the ARM Framework as another index of horseshoe crab abundance, the CMSA results would not be much different from the current results.

Additionally, Dr. Shoemaker analyzed the egg density data from Smith et al. (2022) and accounted for differences in survey methodology through time. The results of his reanalysis showed no trend in egg density although Smith et al. (2022) showed a general increasing trend in recent years similar to that of horseshoe crab abundance from the CMSA (Figure 4). Dr. Shoemaker also conducted an analysis that shows the effect of egg density on red knot survival. However, this survival analysis is not documented in great detail and only includes data from the New Jersey side of the Delaware Bay. Thus, it is questionable whether this analysis is representative of the red knot population as a whole. If these analyses by Dr. Shoemaker are correct, it still begs the question of how to incorporate this into the ARM Framework. In Dr. Shoemaker's report, red knot survival is positively correlated with egg density but egg density has not changed over time; however, female horseshoe crab abundance has increased. Therefore, while egg density and female horseshoe crab abundance must ultimately be linked, this relationship is not evident in the data. The lack of an empirical relationship ultimately complicates any effort to quantify a model linking horseshoe crab abundance to red knot survival through egg density. Dr. Shoemaker falls short of proposing a way to do this. Regardless, for the time series of the CMSA model, egg density is positively correlated with the other time series of horseshoe crab abundance used. Because egg density data are not readily available to the ARM Subcommittee (either for the model development in 2021 or possibly on

an annual basis that would be required for their inclusion), the data only cover New Jersey beaches, and their use and sampling design have been questioned over the years, the trawl surveys remain the best available data for horseshoe crab abundance in the ARM Framework.

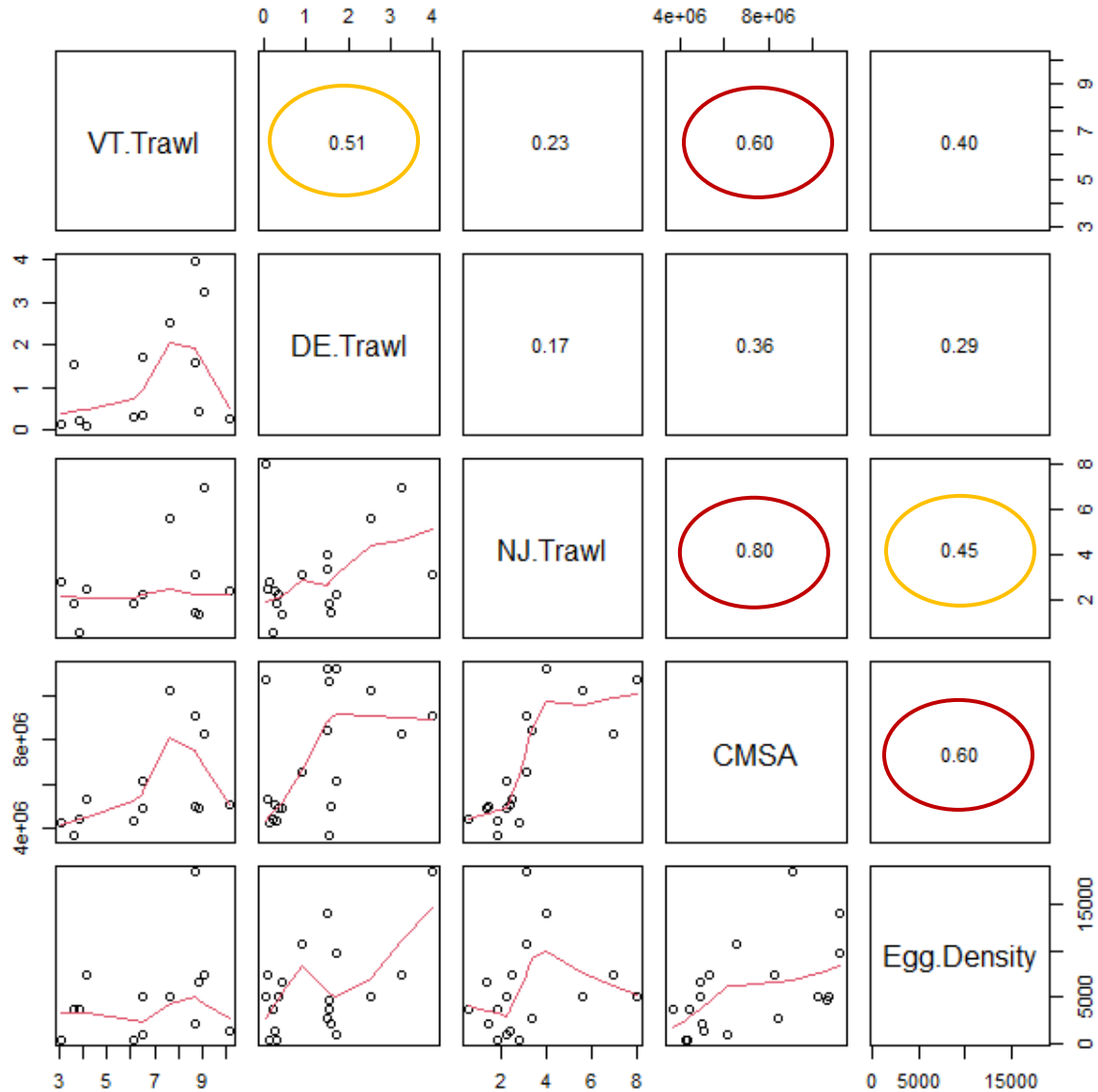


Figure 3. Scatterplot matrices (lower diagonals) and spearman correlation tests (upper diagonals) for female horseshoe crab abundance indices derived from the CMSA model (used as an estimate of horseshoe crab abundance in the ARM Framework), three trawl-based surveys conducted in the Delaware Bay area from 2003 to 2021 (female indices), and New Jersey surface egg densities from Smith et al. (2022). All time series are positively correlated and those correlation coefficients circled in red are significantly correlated at the $P < 0.05$ level. Correlation coefficients circled in yellow are significant at the $P < 0.10$ level.

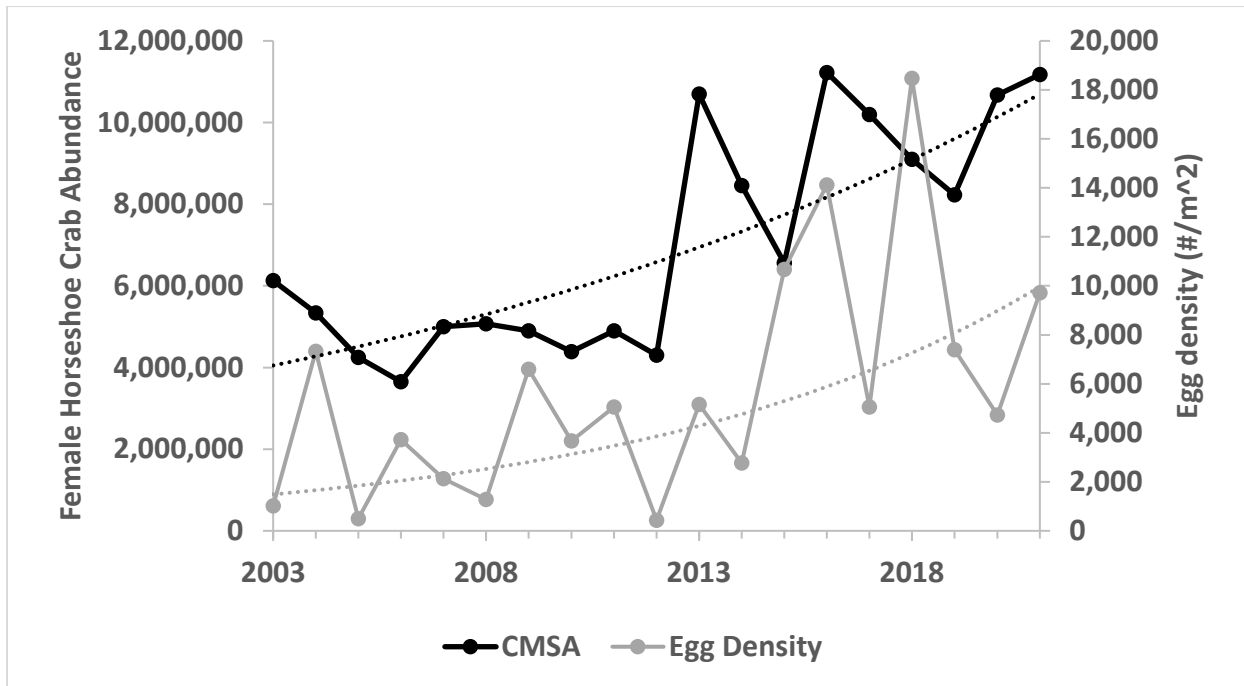


Figure 4. Increasing trends of female horseshoe crab abundance from the catch survey model and egg density time series, 2003-2021. Egg density data were digitized from Figure 2 in Smith et al. (2022).

Criticism 4: The ARM exaggerates the evidence for an increasing trend in the number of female horseshoe crabs in the Delaware Bay.

- The analysis provided in Dr. Shoemaker’s report contains errors, including the use of incorrect data subsetting for the indices and application of an analysis that was inappropriate for the data.
- The trawl-based indices were thoroughly considered by the ARM modelers and represent the best available data for tracking horseshoe crab abundance.
- The goal of the ARM modelers was not to find an increasing trend, but to develop the data in the most statistically sound way possible regardless of the answer.

Technical Response: Dr. Shoemaker suggests the ARM Subcommittee exaggerates the evidence for an increasing trend in horseshoe crab abundance through time. A long time to maturity for horseshoe crabs (9-10 years) suggests that recovery from overfishing would take some time to become evident in fishery-independent surveys. With reductions in harvest in the Delaware Bay region in the early 2000s, it makes sense that any increase in abundance would not be seen until approximately 10 years later (~2010). This is what was observed in the three trawl surveys used to index abundance. When a simple linear regression model is fit to each one of the trawl surveys beginning in 2010, all of them show statistically significant increasing trends (Figure 5). Dr. Shoemaker argues that “...trawl-based indices of horseshoe crab abundance are a noisy and unreliable indicator of annual fluctuations in the horseshoe crab population, and are likely an

inadequate metric for quantifying the biotic interactions between red knots and horseshoe crabs in the Delaware Bay.” The ARM Subcommittee emphatically disagrees with this statement given the life history of horseshoe crabs, the amount of time since bait harvest has been curtailed, and the agreement of the three trawl surveys for an increasing trend in abundance. Harvest management appears to have worked to increase abundance. A rebuttal to this point is also given in Criticism 2.

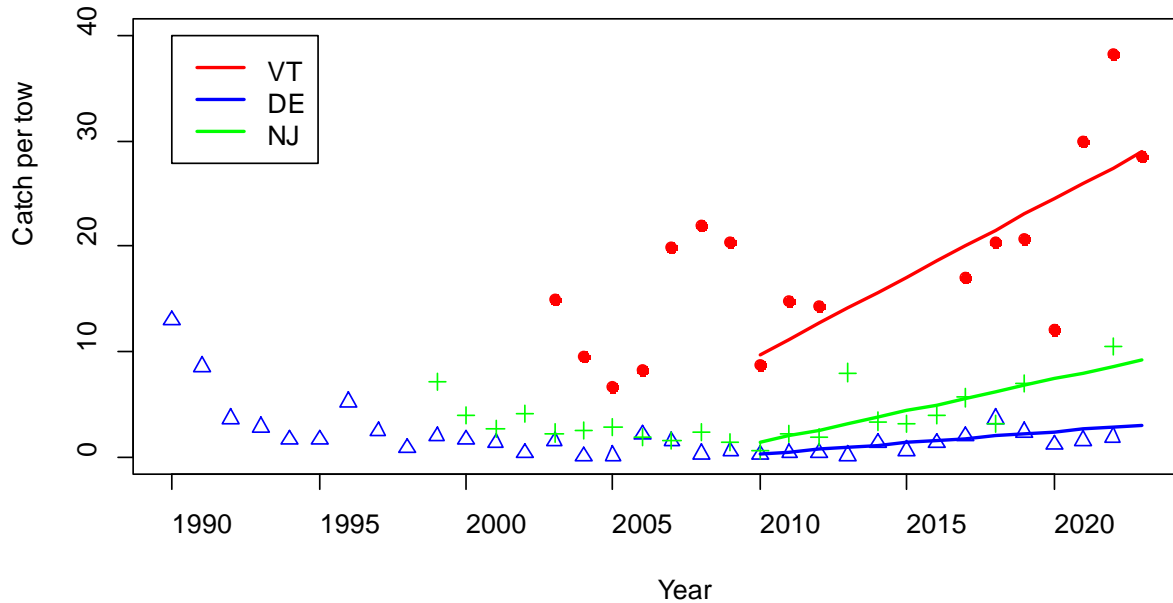


Figure 5. Time series of catch-per-tow of female horseshoe crabs from the three trawl surveys used to index abundance. Simple linear regression models for each survey since 2010 all show statistically significant ($p < 0.05$) increasing trends in abundance.

Dr. Shoemaker again faults the indices of abundance used by the ARM Subcommittee for not being standardized according to environmental covariates in a GLM approach, and he specifically demonstrates his standardization on the New Jersey Ocean Trawl data. However, during an initial review of his report by New Jersey and Delaware staff, it was recognized that he subset the data incorrectly, using the wrong time periods including sample periods when the crabs are not fully available to the survey, resulting in data and an index of abundance that are not used by the ARM Subcommittee. Dr. Shoemaker included the January samples, when the overwintering crabs may remain farther offshore than the survey’s sample area, accounting for the significantly decreased catches during this period. He also included the June samples, when most of the adult crabs have migrated into bays and estuaries to spawn, again making them unavailable to the survey. The inclusion of these two sampling periods has an inappropriately dampening effect on the resulting indices which cannot be corrected through a GLM standardization and will not provide an accurate index of relative abundance. Again, a GLM standardization was attempted with the New Jersey Ocean Trawl data during the 2019 benchmark stock assessment (ASMFC 2019), but it was found to not provide any improvement over a simple delta-mean index. Standardization of the trawl survey catches by a GLM or GAM

is still something worth exploring in future assessments as additional years of data may provide the necessary information to better evaluate the true effects of covariates on catches.

Beyond the issue of the erroneous data standardization of the New Jersey Ocean Trawl Survey data by Dr. Shoemaker, he made a questionable analytical choice leading to the conclusion that female horseshoe crab abundance has not increased. Dr. Shoemaker used both the “raw” and “adjusted” catch-per-tow data from the entire time series of the three trawl surveys in a linear regression analysis to determine if there was a trend in abundance through time (Figure 6). The Delaware Bay crab population is known to have declined to a minimum level by the early 2000s (prompting harvest restrictions), thus, a linear model fit through the entire time series (1990 to present) of all surveys is nonsensical. The near zero slope of the linear model is driven by the high CPUE from the Delaware Trawl Survey at the very beginning of the time series (1990 – 1992). That horseshoe crabs declined in the 1990s and early 2000s is undisputed. All surveys show a low point around 2010, with an increase afterwards. The pattern of the combined surveys looks like a “U” – decreasing and then increasing. A linear model fit to such a pattern will show a non-significant slope (i.e., trend) over the entire time period. It is unclear whether Dr. Shoemaker investigated the resulting residual pattern, as that would have confirmed the inappropriateness of using a simple linear trend model. Perhaps this analysis is indicative of Dr. Shoemaker’s unfamiliarity with the changes in horseshoe crab harvest management through time, but it nevertheless perpetuates the unfounded belief that the horseshoe crab population has not responded positively to harvest restrictions. As previously stated in the rebuttal to Criticism 2, all surveys have shown an increasing trend since 2010 (Figure 5). Alternatively, a segmented regression model could be fit to the time series of data to demonstrate how abundance trends have changed through time. When this is done, both the Delaware and New Jersey Ocean Trawl Surveys show declining abundance followed by an increase after 2010 (Figure 7). Given the lengthy time to maturity of horseshoe crab, it has long been understood that it would take about a decade to begin seeing an increase in abundance following the initiation of harvest restrictions.

Shorebird stakeholders’ views of the trawl surveys have evolved through time. In a 2009 publication questioning if harvest restrictions have worked to increase horseshoe crab abundance in the Delaware Bay region, Niles et al. (2009) included a graph of the Delaware Trawl Survey showing a declining trend in catch-per-effort as evidence that horseshoe crab abundance has declined. In Earthjustice’s September 2022 comments to the Board, they argue that the “...original decision to rely exclusively on the Virginia Tech Trawl Survey reflected explicit stakeholder input,” and that other trawl surveys are “not purpose-designed” and “disfavored” by stakeholders. Finally, in 2023, according to Dr. Shoemaker, “trawl-based indices of horseshoe crab abundance are a noisy and unreliable indicator of annual fluctuations in the horseshoe crab population...”. If the view that the trawl surveys only capture random noise is accepted, and thus the increasing trend in the surveys since 2010 cannot be trusted, one should also question if the horseshoe crab population actually ever declined.

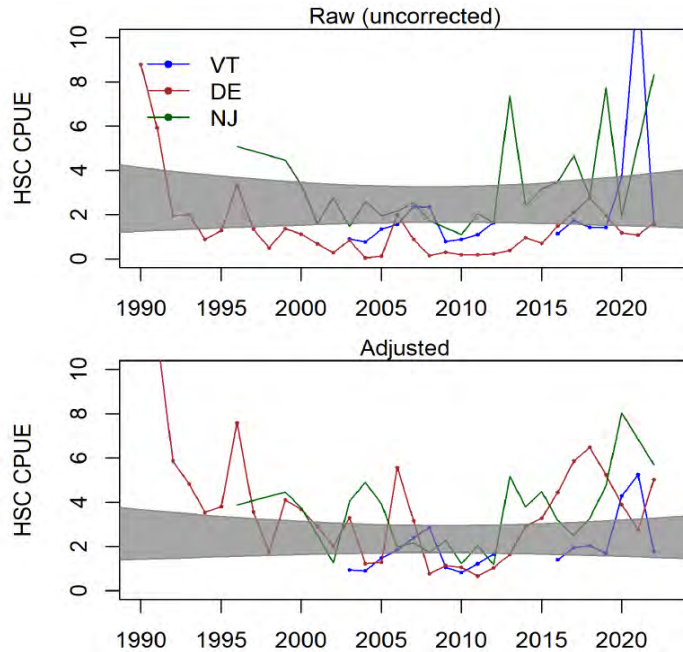


Figure 6. This graphic is taken from the 2023 Dr. Shoemaker report (Figure 12). The intent was to show there is no significant trend in female horseshoe crab abundance through time for the combined trawl surveys using a linear regression model over the entire time series (1990 – 2022). The reason for the lack of a significant trend, either increasing or decreasing (gray shaded area) is because the time series exhibits a “U” shaped pattern – decreasing until around 2010, and increasing afterwards.

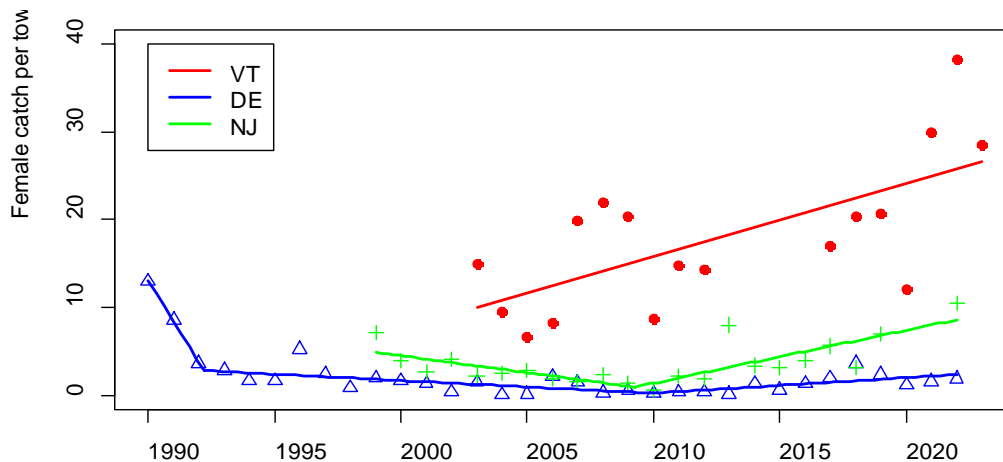


Figure 7. Trends in female horseshoe crab catch-per-tow from the three trawl surveys in the Delaware Bay region. Lines for the Delaware and New Jersey Trawls represent segmented regression models fit to those data. The results of the segmented regression analysis show that the slope of the trend for both the Delaware and New Jersey Trawls changed from being negative to being positive around 2010. The trend line for the Virginia Tech Trawl Survey is simply a linear model over the entire time series because the Virginia Tech Trawl Survey did not extend back in time as far as the other surveys.

Dr. Shoemaker also reanalyzed egg density data from New Jersey to further argue that horseshoe crab abundance has not increased. These data were published by Smith et al. (2022) and showed a variable but increasing trend in egg densities over the last two decades (Figure 4). However, upon reanalysis, Dr. Shoemaker contradicts Smith et al.'s (2022) conclusion for an increasing trend, suggesting that it was an artifact of differing sampling methodologies through time. There is not much the ARM Subcommittee can say concerning trends in egg density data beyond what is published by Smith et al. (2022) because those data were not supplied to the ARM Subcommittee when requested during the ARM Revision. The acknowledgement by Dr. Shoemaker of the changing methodology in egg density data does corroborate one of the reasons the ARM Subcommittee has been reluctant to make use of egg density data since the development of the original ARM Framework in 2007. If the owners of the egg density data would follow the established ASMFC data acquisition processes by sharing the data when requested at the beginning of a stock assessment, the ARM Subcommittee would certainly evaluate the utility and inclusion of such data in the ARM modeling process just like any other data source.

Criticism 5: The integrated population model used for estimating red knot population parameters is overparameterized and likely to yield spurious results.

- Dr. Shoemaker's criticism of the red knot model is unsubstantiated and misrepresents the models used in the ARM Framework.
- Much like the trawl surveys, the red knot data are imperfect but represent the best available data.
- Dr. Shoemaker assumes that too many parameters will produce incorrect results, when the relationship between overparameterization and biased models is more nuanced.

Technical Response: The critique of the state-space model ignores the fact that this model is not analyzed independently, but as a sub-model within an integrated analysis. This viewpoint is apparent in several places in Dr. Shoemaker's critique, as he writes about using the two data sources (i.e., red knot count data and mark-recapture data) to "train" the two sub-model components as if they were separate endeavors where information from one has no influence on the model parameters in the other. Integrated population models combine the likelihoods of two or more sub-models, allowing researchers to estimate demographic parameters from multiple models and data sources simultaneously (Schaub and Abadi 2011). In the ARM Framework, the admittedly limited count data are integrated with 100,000s of mark resight observations from Delaware Bay. A third component, a Markov population model, provides a strong structural prior that links estimates from multiple sub-models based on an understanding of the life history of the species. One key benefit of this approach is the ability to estimate parameters that would not be estimable with any one model or data source alone. In the case of the ARM Framework, the estimation of the red knot recruitment rate is informed by both the analysis of the count data (state-space sub-model) and the mark-recapture data (open robust design sub-model).

By ignoring the structural linkage that shares information between model sub-components, Dr. Shoemaker set up a misleading basis to make unsubstantiated claims about model

overparameterization and to falsely demonstrate spurious results produced by the ARM model. Regarding overparameterization, he referred to the familiar rule-of-thumb of 30 data points per model parameter as sample size guidance for robust estimation. While this guidance is useful in traditional applications where data are used to inform the parameters of a single model, its relevance for integrated modeling – where information is shared across multiple model components – is unclear. His assessment that 18-28 parameters were estimated from 14 data points is a serious mischaracterization of the model and requires overlooking the fact that information from mark-resight data also informs the state-space model. In the ARM Framework, the number of parameters estimated from the count data alone is three: one initial population size and two counting errors. The recruitment parameters (three parameters: mean, variance, and effect of horseshoe crab abundance) are estimated jointly using information from all three components of the integrated population model. The availability parameters are specified with highly informative priors, which were developed externally to the model. In the ARM Subcommittee's view, the availability parameters should be more appropriately thought of as data informing the model, not estimates on which inference was based.

Dr. Shoemaker used a simulation exercise to purportedly demonstrate production of spurious results by the model. By replacing the peak counts with white noise in the simulation runs, he anticipated that the simulated abundance at the end of the time series should match the initial abundance on average. Instead, he was surprised to discover negative trends in simulated abundance and that final abundances produced by the model were most often lower than initial abundance. He did not know the cause of this outcome, and he speculated on a variety of reasons having to do with simulation methods, starting values, etc. The cause is simple to explain, but it requires acknowledgement that the information sources are linked to each other through the Markov population model. By providing a stream of pattern-less peak count data to the model, Dr. Shoemaker effectively contaminated information about recruitment, leaving survival rate as the only reliably informed parameter. Therefore, a population simulated with no recruitment and survival probability <1 will most often decline. Though he failed to understand the cause of the observed simulation behavior, and he cautioned against using his results to infer a systemic bias in the model, he nevertheless concluded that the model is unstable and has a strong tendency to produce spurious results.

The critique of the state-space sub-model also contains an assertion that overparameterized models are necessarily biased. While overparameterization can result in poor generalization to new datasets, it does not guarantee biased results. In fact, bias could also arise if models are under-parameterized and fail to capture system complexity. The relationship between bias and overparameterization is not as straightforward as is portrayed in Dr. Shoemaker's report.

The ARM Subcommittee readily acknowledges that the red knot count data are a much weaker data set than the mark-recapture data, but they were the only count data collected consistently over the all of the years of the monitoring program, so the ARM Subcommittee made the best use of them to better understand the system. As described in ASMFC 2022 (page 80), this model could be greatly improved by including auxiliary information such as survey-specific covariates (e.g., observer ID, tide state, weather conditions), integration of simultaneous ground count data, or future implementation of digital photography or double-observer methods. One of the challenges of working with historical monitoring data is the inability to

influence study design or data collection processes. There were no auxiliary data that were consistently collected (or, at least, made available to the ARM Subcommittee) for aerial surveys that would allow counting error to be better estimated. Similarly, the ARM Subcommittee knows that concurrent ground counts were conducted in at least some years, but those data were not provided. The ARM Subcommittee made the best use of the available data, and conducted these analyses within the management decision context. Sometimes in decision support roles, scientists have to develop the best analysis to support decisions even when data are imperfect (McGowan et al. 2020). All modeling exercises require assumptions and constraints, and those included in this model represent the best understanding of the system at this time; the ARM Subcommittee hopes and intends for this model to be updated as more information and more data become available. It should be noted that all previous attempts to model red knot populations in this system and assess the linkages between knots and horseshoe crabs in this management context required significant assumptions, and the ARM Subcommittee believes that their approach in the ARM Revision alleviates or improves many of those assumptions. Previously, all attempts to model productivity and recruitment in this population relied upon estimates from Europe and basic assumptions about life history (i.e., setting juvenile survival as a percentage of adult survival, see McGowan et al. 2011) and this approach uses data from this flyway in a complex but much improved model to estimate those parameters.

Criticism 6: The integrated population model exhibits poor fit to the available data.

- Dr. Shoemaker provides conflicting arguments for the use of the goodness of fit test for the red knot model.
- Goodness of fit tests applied to the red knot model indicated poor fit in one model component, but the portion of the model including the survival probability of red knots did not fail the test.

Technical Response: There are no unified goodness of fit tests for integrated population models, so the commonly-accepted approach is to assess model fit independently for each sub-model. Posterior predictive checks (PPCs) are the standard type of goodness of fit tests for Bayesian models. The PPC for the state space model indicated adequate fit ($P = 0.44$ where $P = 0.5$ indicates no evidence of either over- or under-dispersion, and P near 0 or 1 suggests poor model fit), but the PPC for some components of the open robust design model indicated lack of fit to the data.

This critique contains shaky logic. First, Dr. Shoemaker asserts that PPCs are a good method for checking model fit and criticizes the lack of fit of the open robust design model. Indeed, Dr. Shoemaker used a PPC in his analysis of banding data to conclude that his model had “reasonable fit.” Next, he states that PPCs are not a reliable indicator of goodness of fit to cast doubt on the ARM Subcommittee’s statement that the state space model “passed” the test. By Dr. Shoemaker’s logic, PPCs are only to be trusted when they indicate lack of fit. Dr. Shoemaker’s inconsistent logic with respect to checking goodness of fit casts doubt on the integrity of the analysis. Putting that aside, the apparent lack of fit for the open robust design model will be discussed. The open robust design model consists of three likelihoods, and PPCs

indicated lack of fit for likelihood L3 ($P = 0.9$), which describes the process of reencountering individuals within years. This lack of fit could arise due to unmodeled heterogeneity in true arrival and persistence probabilities as a result of pooling encounters into three-day sampling periods. If aggregations occur over a time period that is short relative to the expected length of stay, the expected bias is minimal (Lindberg and Rexstad 2002; O'Brien et al. 2005). Average stopover duration for red knot at this site has been estimated to be 12 days (Gillings et al. 2009); 3 days should be a short enough window to avoid biased estimates of arrival and persistence but could introduce heterogeneity and overdispersion. The likelihood that contains the apparent annual survival probability is likelihood L1, which describes the process of encountering marked birds across years. PPCs for this likelihood did not indicate lack of fit ($P = 0.31$).

CONCLUSIONS

Continuous scientific review and critique is welcome as that is how science advances. There will always be room for improvement in any modeling effort in the management of natural resources. This is part of the double-loop learning in an adaptive management effort whereby model design and management are periodically reevaluated (Fabricius and Cundill 2014; Williams and Brown 2018). In this specific case, however, advocacy is infused into the scientific debate. The 2022 ARM Revision represented some great advancements in the understanding of the population dynamics of horseshoe crabs and red knots, and their interactions during the double-loop of the adaptive management process. It is curious that these advancements have stirred so much controversy because the technical criticisms of the ARM Revision could have equally applied to the original ARM Framework. In fact, the original framework merited specific criticism because it relied on life history parameters informed by literature values taken from outside the Delaware Bay or based on expert opinion. The ARM Subcommittee questions if the true problem is not with the process or technical modeling, but rather with the final result and harvest recommendation.

An important benefit of the adaptive management process is the ability to make decisions even under imperfect knowledge of an ecological system (Williams et al. 2002). The overall goal of the ARM Framework was to produce a decision tool informed by science and stakeholder values, given the available knowledge about the Delaware Bay ecosystem and horseshoe and red knot population dynamics. In the original ARM Framework, knowledge about some system components, for instance red knot population dynamics, was quite limited. The ARM Revision represented a double-loop learning event, in adaptive management terms, and population models were re-designed to accommodate 1) the large volumes of high-quality data collected on both species since the original ARM's inception, and 2) changes to both populations over that period. In the view of the ARM Subcommittee, the effect of a change to an ecological model must be judged according to its effect on both the properties of the overall decision framework, and the ability of the ARM Framework to incorporate new monitoring data to improve understanding of the system. One important goal in the development of the ARM Revision was to design population models for horseshoe and red knot that would allow for rapid and efficient learning given the monitoring efforts in place for each species (Williams 2011). This critical feature of the ARM Framework—the ability to learn from monitoring—is not

addressed by Dr. Shoemaker or Earthjustice; and yet it was a major consideration by the ARM Subcommittee. The design of ecological models for use with adaptive management should also be guided by the decision objectives (Fuller et. al. 2020), a point not addressed by Earthjustice.

Much of the 2022 and 2023 criticism by Dr. Shoemaker (as well as the comments by Earthjustice) stem from the belief that there must be a strong relationship between horseshoe crab abundance, horseshoe crab egg density on the beaches, and red knot survival. They claim that because the ARM Subcommittee did not find this “strong” relationship when examining the empirical data from the Delaware Bay region, the ARM Revision must therefore be fraught with error. It is apparent that Dr. Shoemaker reviewed the ARM Subcommittee’s work with an unwillingness to entertain the idea of anything but a “strong” relationship. A specific example of this is his statement in his 2022 report where he postulated that the collection of additional data may show that the relationship between horseshoe crab abundance and red knots survival could disappear or become negative. He states, “This outcome would pose an existential problem for the ARM Framework, decoupling the two-species Framework and rendering the red knot model unusable in the context of management.” Of course, the “no relationship” outcome would be expected if horseshoe crabs become sufficiently abundant to not limit red knot survival, but that knowledge does not challenge the scientific validity and usefulness of an adaptive management framework for decision making. Such comments demonstrate a reluctance to learn within an adaptive management framework and a desire to cling to previous beliefs in spite of scientific advances.

There is no doubt that Dr. Shoemaker is a very knowledgeable quantitative ecologist. However, his critiques are unhelpful in advancing a two-species adaptive management effort. His criticisms focus on specific components of the overall ARM Framework, and why each may be wrong, but nowhere does he provide any recommendations for how to assemble the pieces into a unifying framework to make management decisions. For example, he makes strong arguments for using egg density to predict red knot survival but provides no recommendations for how to link egg density to female horseshoe crab abundance, which is directly affected by harvest management. He also makes a large issue about uncertainty in the horseshoe crab population projections but fails to recognize how uncertainty is handled in the optimization (approximate dynamic programming) or make any recommendations on alternative methods to conduct an optimization given the uncertainty.

The ARM Framework is designed to continuously improve the underlying models through double-loop learning, and the ARM Subcommittee welcomes constructive input on how to do so. Unfortunately, the critiques by Dr. Shoemaker (and Earthjustice) fail to make any real recommendations for improvement or provide any other means for helping managers make an informed harvest decision beyond consideration of the values of a single stakeholder group. If the values of all stakeholders have changed (i.e., no female harvest under any circumstances), that change could be considered in a new approach in the future by the ARM Subcommittee. As it stands, the current ARM Framework represents the values previously established through stakeholder engagement: to 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.

SUPPLEMENTAL RESPONSES TO THE 2022 EXTERNAL PEER REVIEWS

The Management Board specifically tasked the ARM Subcommittee with responding to the 2023 critique by Dr. Shoemaker, and the responses above fulfill that task. However, the ARM Subcommittee felt it appropriate to address a few additional items presented in the 2022 public comment by Earthjustice that included critiques by Dr. Shoemaker and Dr. Romuald Lipcius, as well as the supplemental section to the 2023 critique by Dr. Shoemaker. These items are not in any particular order.

Criticism 7: The estimate of mean horseshoe crab recruitment and propagation of error within the horseshoe crab population dynamics model is inappropriate.

- The estimate of mean horseshoe crab recruitment used by the ARM Subcommittee is the most biologically realistic. If mean recruitment were lower, as Dr. Shoemaker suggests, the current population estimate of horseshoe crabs would be well above a predicted “carrying capacity” of the Delaware Bay region.
- Dr. Shoemaker’s proposed method of error propagation is worth considering in a future revision of the ARM model, but comparison of his population projections to those by the ARM Subcommittee are nearly identical.

Technical Response: The revised ARM Framework uses the same mathematical model to estimate the abundance of horseshoe crabs (the CMSA) and to project the horseshoe crab population into the future while accounting for annual removals of individuals due to bait harvest, dead discards from other fisheries, and mortality associated with biomedical facilities. In his 2022 critique, Dr. Shoemaker expresses his opinion that uncertainty in model parameters was not propagated through time in an appropriate manner. This criticism does have some merit and his proposed methodology is worth the ARM Subcommittee considering in future revisions of the ARM Framework. Dr. Shoemaker contends the current horseshoe crab projection model greatly underestimates uncertainty and its effects on predicted future abundance. Although Dr. Shoemaker’s proposed methodology may be more appropriate, the ARM Subcommittee believes these concerns are overstated as there is still much uncertainty in the projected population – female horseshoe crab abundance can range between 5 – 15 million under a no harvest scenario.

Another parameter Dr. Shoemaker criticized was the estimate of mean horseshoe crab recruitment because of the gap in the Virginia Tech data from 2013 - 2016. The ARM Subcommittee agrees that CMSA estimates of recruitment during these years are poor; therefore, the average of them was used when calculating the overall mean recruitment level. One could argue that recruitment estimates during the Virginia Tech gap years should simply be thrown out. However, doing so ignores the obvious above-average recruitment during those years that must have occurred to increase the multiparous population to the degree that was observed in the following years. The treatment of the missing years of recruitment data balanced the nonsensical estimates of the CMSA with the biological reality that recruitment during these years had to have been relatively high. All other things being equal, changing the mean female horseshoe crab recruitment from 1.67 to 1.26 million, as suggested by Dr.

Shoemaker, would result in an unexploited population size at equilibrium of 6.4 million (95% CI: 3.4 – 14.5 million) compared to 8.5 million (95% CI: 4.5 – 19.2 million) in the current parameterization of mean recruitment. If Dr. Shoemaker were correct in his estimate of mean recruitment, the latest population estimates from the Virginia Tech Trawl Survey swept area estimate and CMSA are well above this equilibrium level and the population will likely decline even in the absence of any harvest. It is also interesting to note that Smith et al. (2006) estimated the female population size via a mark-recapture study at 6.25 million in 2003, shortly after the period of high horseshoe crab harvest. This is another line of evidence that the mean recruitment parameter used in the ARM Framework (1.67 million) is more appropriate than the one proposed by Dr. Shoemaker (1.26 million) given the observed increases in female abundance since the population was estimated by Smith et al. (2006).

Dr. Shoemaker shows his female horseshoe crab population projection from his reformulated Bayesian CMSA model that includes his parameterization for recruitment and method for propagating uncertainty. It is interesting that given all his criticism of the ARM model, his model produces nearly identical results with respect to an equilibrium number of primiparous and multiparous females (Figure 8) and associated uncertainty. If anything, his equilibrium population size may be slightly higher than what the revised ARM Framework predicts and the uncertainty on each seems equivalent.

Dr. Shoemaker did not comment on the harvest policy functions, which are the mathematical equations that actually tell the ARM Subcommittee how many horseshoe crabs to harvest given the abundance of horseshoe crabs and red knots. He also did not comment on the Approximate Dynamic Programming (ADP) process by which the harvest policy functions were derived. When solving for the optimal harvest policy functions, ADP incorporated the full range of uncertainty in population projections for both horseshoe crabs and red knots, and within the ADP process, the optimal harvest policy functions would be more conservative with greater uncertainty. Thus, any recommendation of harvest coming from the revised ARM Framework explicitly incorporates uncertainty in population projections.

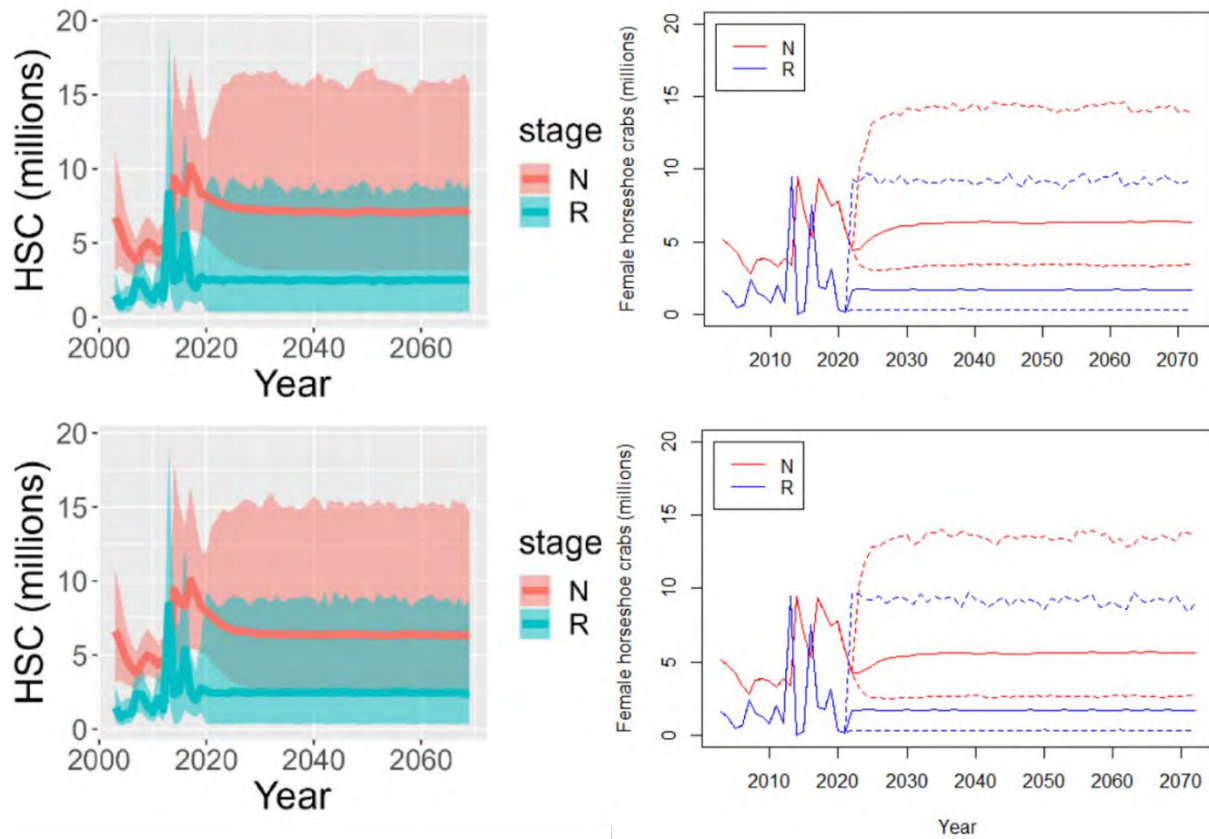


Figure 8. Comparison of the projection model of female horseshoe crabs by Dr. Shoemaker in Earthjustice’s September 2022 comments (left graphs) with that from the revised ARM Framework (right graphs). The early part of the projected time series (2021 and prior) represent population estimates from the CMSA – both the version in the revised ARM Framework and Dr. Shoemaker’s Bayesian version in Earthjustice’s September 2022 comments.

Criticism 8: That the ARM model would not predict a decline in red knots under a total collapse of the horseshoe crab population is evidence that the model is fatally flawed.

- Dr. Shoemaker is incorrect that the ARM model would not predict a decline in red knots if the horseshoe crab population collapsed. The assertion that red knots would continue to increase in the absence of horseshoe crabs is mathematically impossible in the model.

Technical Response: In his 2022 critique, Dr. Shoemaker states, “...the apparent inability of the ARM model to predict a decline in red knot abundance under a total horseshoe crab population collapse...undermines the apparent purpose of the model.” This judgment can be seen echoed throughout the materials submitted by Earthjustice in 2022 and 2023, where the narrative is peppered with claims of predicted red knot population increases even at complete depletion of horseshoe crabs from Delaware Bay. The critics’ implication is this: if the model is unreliable at

the population level of zero horseshoe crabs, how can it be trusted for harvest management at any population level of crab? This is an unfortunate and prejudicial coloring of the model because Dr. Shoemaker was wrong in his 2022 judgment. He not only failed to correct the false assertion in his analysis, but he also amplified it (p. 22) in his later critique.

In Dr. Shoemaker's 2022 critique, he acknowledged that he relied on a "back of the envelope" calculation to arrive at his conclusion because he lacked access to the model data and code at the time. Were he to obtain access to the materials, he fairly asked, "[w]hat would happen to the red knot population projections if female horseshoe crab abundance were set to zero?" For his 2023 evaluation, Dr. Shoemaker was provided access to the data and code, yet he failed to address his own question. He would have observed that the data used to establish the relationship between female horseshoe crab abundance and red knot survival was the logarithm of female horseshoe crab abundance (ASMFC 2022) and not female abundance as it comes straight from the CMSA estimates. Consequently, the model predicts that red knot survival declines to 0 as female horseshoe crab abundance decreases, and a population increase in red knots under this condition is mathematically impossible.

Misunderstanding and mischaracterization of the model aside, prediction by any model for a scenario well outside of the data bounds of model development is a dangerous exercise. A complete loss of horseshoe crabs through harvest is an extreme and unlikely hypothetical scenario that was not considered by the ARM Subcommittee. Such a collapse would require a harvest level greatly exceeding any previously observed harvest level, let alone any harvest level that is within the range of possible values given the current fishery management plan stipulations. The critics should give the ARM Subcommittee and Board some benefit of the doubt: if the horseshoe crab population should fall below any historically observed levels, and outside the bounds of model development, the ARM Subcommittee is sure all would agree that horseshoe crab harvest should be drastically reduced or ceased. This demonstrates an attempt to sensationalize an extremely rare possibility and paint scientific management of the species as reckless.

Criticism 9: Demographic data indicate a declining horseshoe crab population.

- Declining individual size of horseshoe crabs began after harvest was greatly curtailed in the Delaware Bay region and is not indicative of overfishing.
- Assuming natural mortality has not changed, abundance of horseshoe crabs could not have increased if egg deposition and hatch had also not increased.
- Recent low estimates of female primiparous crabs do not necessarily represent recruitment failure. Male primiparous crabs did not decrease over the same time period.

Technical Response: In 2022, Dr. Lipcius argues demographic data are inconsistent with an increase in the horseshoe crab population such as the apparent decline in mean size of individual horseshoe crabs. It is true that mean size has decreased and the ARM Subcommittee agrees that in a typical finfish fishery a declining trend in mean size-at-age is indicative of overfishing (i.e., faster growing fish recruit to the fishing gear at younger ages and a fishery

then selects against fast growing fish). However, horseshoe crabs are not finfish, they have a terminal molt, and stop growing after maturity is reached. One cannot apply the general rule-of-thumb that average size decreases with excessive exploitation to a species like horseshoe crabs, which stop growing once mature and are targeted by a commercial fishery at the mature stage. Fishing pressure for males, and especially females, greatly declined since the 1990s, yet it appears from the Virginia Tech Trawl Survey data on prosomal widths that the decrease in size occurred after 2008 (Wong et al. 2023), and after the fishery was curtailed in the mid-2000s. Alternative hypotheses for the reduction in size is density-dependent growth as the population rebuilt, or an ecosystem wide loss of productivity over the last 20 years resulting in fewer resources available for horseshoe crab growth. The ARM Subcommittee agrees that additional research is needed to explain the declining size of horseshoe crabs, but it is doubtful that it is tied to fishing mortality given how limited the harvest has been relative to the size of the population.

Dr. Lipcius makes an argument that with the decrease in mean size of mature female horseshoe crabs, individual fecundity would also decrease and total reproductive output has not increased. This hypothesis seems unlikely because horseshoe crab abundance would not have increased if natural mortality has not changed and there had there not been an increase in total egg deposition and hatch. Smith et al. (2022) shows a general increase in egg density in recent years, which also refutes this hypothesis.

Dr. Lipcius also argues that the recent low numbers of newly mature (primiparous) females in the Virginia Tech Trawl Survey indicate recent harvest is problematic. Intuitively, one would expect an increase in recruitment following the prohibition of female harvest. However, many factors influence year class strength of horseshoe crabs and there is a 9 to 10-year delay between when new crabs are spawned and when primiparous crabs are assessed. There could be density-dependent effects (nest disturbance by subsequently spawning females) at play, and inter-annual variation in survival over the 9 to 10-year period between the egg and primiparous stage could mask any differences in year class strength. Some very high years of newly mature males also occurred prior to the prohibition of female harvest (Wong et al. 2023). The observed variation in newly mature animals suggests year class strength is influenced by much more than female spawner abundance alone. Also, harvest pressure targets mature individuals and Virginia Tech Trawl Survey data shows a significant increase in mature individuals through time, especially in the last three years. There could not have been an increase in multiparous individuals without a preceding increase in primiparous individuals. Finally, we do not observe the same decline in primiparous males as observed in primiparous females. If harvest pressure caused a decline in female recruitment, as suggested by Dr. Lipcius, why would it not also cause the same decline in male recruitment? The recent years of low primiparous female abundance observations is something the ARM Subcommittee and Delaware Bay Ecosystem Technical Committee are discussing.

Criticism 10: There is an incorrect specification of “pi” parameter in the red knot integrated population model.

- This is a criticism that does warrant further consideration by the ARM Subcommittee.

Technical Response: Dr. Shoemaker asserts that there is a missing parameter that should be included in the derivation of π_{jt} (the probability of being present in Delaware Bay in occasion t of year j) to represent the fraction of the population using Delaware Bay in the previous year. This seems to be a valid criticism, but requires further scrutiny to understand whether this parameter is derived incorrectly and, if so, what the implications might be. The ARM Subcommittee is exploring solutions.

Criticism 11: There is an over-representation of Mispillion Harbor in red knot resighting data.

- Use of data from Mispillion Harbor does not result in biased inferences.

Technical Response: More resighting data is collected in Mispillion Harbor than any other site in Delaware Bay. However, red knots move around the Bay during the stopover period and are often resighted in more than one location within a year. The open robust design sub-model makes use of those repeated observations instead of collapsing all information about each bird into a single 0 or 1, as Dr. Shoemaker did to fit his Cormack-Jolly-Seber model. Given this, it is unclear how Dr. Shoemaker decided that a given bird belonged to the “Mispillion” or “Not Mispillion” group, given that many birds are seen both within and outside of Mispillion Harbor in a given year. The proportion of birds seen only in Mispillion ranges from 0.12 to 0.54 (0). The proportion of birds never seen in Mispillion ranges from 0.17 to 0.69. Given this variation and lack of systematic bias towards birds only being resighted in Mispillion Harbor, we do not believe there is reason to think that the large number of observations from this site result in biased inference.

Table 1. The proportion of individual birds resighted at Mispillion Harbor only, at other sites only, or at both Mispillion and other sites in each year.

Year	Resighted in Mispillion Harbor only	Resighted at non-Mispillion sites only	Resighted at both Mispillion and other sites
2005	0.26	0.45	0.30
2006	0.28	0.40	0.32
2007	0.48	0.17	0.35
2008	0.48	0.30	0.23
2009	0.46	0.28	0.26
2010	0.12	0.69	0.20
2011	0.46	0.30	0.25
2012	0.30	0.46	0.24
2013	0.29	0.53	0.18
2014	0.36	0.43	0.20
2015	0.54	0.24	0.22
2016	0.25	0.62	0.14
2017	0.53	0.27	0.21
2018	0.48	0.29	0.23

REFERENCES

- Anstead, K.A., J.A. Sweka, L. Barry, E.M. Hallerman, D.R. Smith, N. Ameal, M. Schmidtke, and R.A. Wong. 2023. Application of a catch multiple survey analysis for Atlantic horseshoe crab *Limulus polyphemus* in the Delaware Bay. *Marine and Coastal Fisheries* 15(5): e10250.
- Atlantic States Marine Fisheries Commission (ASMFC). 2009a. A Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Constrained by Red Knot Conservation. Washington, D.C.
- _____. 2009b. Horseshoe Crab Benchmark Stock Assessment and Peer Review Report. Washington, D.C.
- _____. 2012. Addendum VII to the Fishery Management Plan for Horseshoe Crab. Arlington, VA.
- _____. 2019. Horseshoe Crab Benchmark Stock Assessment and Peer Review Report. Arlington, VA.
- _____. 2022. Revision to the Adaptive Resource Management Framework and Peer Review Report. Arlington, VA.
- Boyd, H., and T. Piersma. 2001. Changing balance between survival and recruitment explains population trends in Red Knots *Calidris canutus islandica* wintering in Britain, 1969-1995. *Ardea* 89:301–317.
- Fabricius, C., and G. Cundill. 2014. Learning in adaptive management: insights from published practice. *Ecology and Society* 19: 29 <http://dx.doi.org/10.5751/ES-06263-190129>
- Fuller, A.K., D.J. Decker, M.V. Schiavone, and A.B. Forstchen. 2020. Ratcheting up Rigor in Wildlife Management Decision Making. *Wildlife Society Bulletin* 44:29-41. DOI: 10.1002/wsb.1064
- Gillings, S., P.W. Atkinson, A.J. Baker, K.A. Bennett, N.A. Clark, K.B. Cole, P.M. González, K.S. Kalasz, C.D.T. Minton, L.J. Niles, R.C. Porter, I.D.L. Serrano, H.P. Sitters, and J.L. Woods. 2009. Staging behavior in Red Knot (*Calidris canutus*) in Delaware Bay: Implications for monitoring mass and population size. *The Auk* 126:54–63.
- Lindberg, M., and E. Rexstad. 2002. Capture-Recapture Sampling Designs. Pages 251–262 in A.H. El-Shaarawi and W.W. Piegorsch, editors. *Encyclopedia of Environmetrics*. John Wiley & Sons, Chichester, UK.
- McGowan, C. P., J.E. Hines, J.D. Nichols, J.E. Lyons, D.R. Smith, K.S. Kalasz, L.J. Niles, A.D. Dey, N.A. Clark, P.W. Atkinson, C.D.T. Minton, and W. Kendall. 2011. Demographic consequences of migratory stopover: linking red knot survival to horseshoe crab spawning abundance. *Ecosphere* 2:1–22.
- _____, J.E. Lyons, and D.R. Smith. 2020. Decision Implementation and the Double-Loop Process in Adaptive Management of Horseshoe Crab Harvest in Delaware Bay. In *Structured Decision Making: Case Studies in Natural Resource Management*. Johns Hopkins University Press, Baltimore, MD.

- Niles, L.J., J. Bart, H.P. Sitters, A.D. Dey, K.E. Clark, P.W. Atkinson, A.J. Baker, K.A. Bennet, K. Kalasz, N.A. Clark, J. Clark, S. Gillings, A.S. Gates, P.M. González, D.E. Hernandez, C.D.T. Minton, R.I.G. Morrison, R.R. Porter, R.K. Ross, and C.R. Veitch. 2009. Effect of horseshoe crab harvest in Delaware Bay on red knots: are harvest restrictions working? *BioScience* 59:153-164.
- O'Brien, S., B. Robert, and H. Tiandry. 2005. Consequences of violating the recapture duration assumption of mark-recapture models: A test using simulated and empirical data from an endangered tortoise population. *Journal of Applied Ecology* 42:1096–1104.
- Piersma, T., T. Lok, Y. Chen, C.J. Hassell, H.-Y. Yang, A. Boyle, M. Slaymaker, Y.-C. Chan, D.S. Melville, Z.-W. Zhang, and Z. Ma. 2016. Simultaneous declines in summer survival of three shorebird species signals a flyway at risk. *Journal of Applied Ecology* 53:479–490.
- Schaub, M., and F. Abadi. 2011. Integrated population models: a novel analysis framework for deeper insights into population dynamics. *Journal of Ornithology* 152:1–11.
- Schwarzer, A.C., J.A. Collazo, L.J. Niles, J.M. Brush, N.J. Douglass, and H.F. Percival. 2012. Annual survival of Red Knots (*Calidris canutus rufa*) wintering in Florida. *The Auk* 129:725–733.
- Smith, D.R., M.J. Millard, and S. Eyler. 2006. Abundance of adult horseshoe crabs (*Limulus polyphemus*) in Delaware Bay estimated from a bay-wide mark-recapture study. *Fisheries Bulletin* 104:456-464.
- Smith, J.A.M., A. Dey, K. Williams, T. Diehl, S. Feigin, and L.J. Niles. 2022. 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*. 2022:1-13. DOI: 10.1002/aqc.3887.
- Tucker, A.M., C.P. McGowan, J.E. Lyons, A. DeRose-Wilson, and N.A. Clark. 2022. Species-specific demographic and behavioral responses to food availability during migratory stopover. *Population Ecology* 64:1–16.
- _____, C.P. McGowan, R.A. Robinson, J.A. Clark, J.E. Lyons, A. Derose-Wilson, R. Feu, G.E. Austin, P.W. Atkinson, and N.A. Clark. 2019. Effects of individual misidentification on estimates of survival in long-term mark-resight studies. *The Condor: Ornithological Applications* 121:1–13.
- Williams, B.K. 2011. Adaptive management of natural resources--framework and issues. *Journal of Environmental Management* 92(5):1346--1353.
- _____, and E.D. Brown. 2018. Double-loop learning in adaptive management: the need, the challenge, and the opportunity. *Environmental Management* 62:995-1006.
- _____, J.D. Nichols and M.J. Conroy. 2002. *Analysis and Management of Animal Populations*. Academic Press.

Wong, C., Y. Jiao, and E. Hallerman. 2023. Results of the 2022 Horseshoe Crab Trawl Survey: Report to the Atlantic States Marine Fisheries Commission Horseshoe Crab and Delaware Bay Ecology Technical Committees. Virginia Tech, Blacksburg, VA. pp. 28.

Atlantic States Marine Fisheries Commission

Executive Committee

*May 1, 2024
8:00 – 10:00 a.m.*

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.

A portion of this meeting may be a closed for Committee members and Commissioners only.

1. Welcome/Call to Order (*J. Cimino*)
2. Board Consent
 - Approval of Agenda
 - Approval of Meeting Summary from January 2024
3. Public Comment
4. Review FY25 Budget
5. Legislative Update
6. Future Annual Meetings Update
7. Executive Director Performance Review (Closed Session)
8. Other Business/Adjourn

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details.

Atlantic States Marine Fisheries Commission

Coastal Pelagics Management Board

May 1, 2024
10:15 – 11:45 a.m.

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>S. Woodward</i>) | 10:15 a.m. |
| 2. Board Consent | 10:15 a.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from January 2024 | |
| 3. Public Comment | 10:20 a.m. |
| 4. Consider Approval of Atlantic Cobia Draft Addendum II on Recreational Allocation, Harvest Target Evaluation, and Measures Setting for Public Comment (<i>E. Franke</i>) Action | 10:30 a.m. |
| 5. Presentation of Spanish Mackerel White Paper (<i>E. Franke</i>) | 11:20 a.m. |
| 6. Update from South Atlantic Fishery Management Council on Mackerel Port Meetings (<i>J. Carmichael</i>) | 11:40 a.m. |
| 7. Other Business/Adjourn | 11:45 a.m. |

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details

MEETING OVERVIEW

Coastal Pelagics Management Board

May 1, 2024

10:15 – 11:45 a.m.

Hybrid

Chair: Spud Woodward (GA) Assumed Chairmanship: 1/24	Technical Committee Chair: Cobia: Angela Giuliano (MD) Spanish Mackerel: Vacant	Law Enforcement Committee Rep: Capt. Scott Pearce (FL)
Vice Chair: Lynn Fegley (MD)	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: January 24, 2024
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 January 2024

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. Cobia Draft Addendum II on Recreational Allocation, Harvest Target Evaluation, and Measures Setting (10:30-11:20 a.m.) Action

Background

- In October 2023, the Board initiated an addendum to address reallocation of recreational cobia quota based on more recent harvest data.
- In January 2024, the Board provided additional guidance to the Plan Development Team (PDT) to consider alternatives to the current state-by-state allocation system, the process for updating allocations in the future, and uncertainty around harvest estimates.
- The PDT met three times in March and April 2024 to develop the draft addendum for Board review (**Briefing Materials**).
- The PDT documented additional discussion and PDT recommendations regarding the scope of some options for the Board's consideration (**Briefing Materials**).

Presentations

- Overview of Draft Addendum II for public comment by E. Franke

Board actions for consideration at this meeting

- Approve Draft Addendum II for public comment

5. Presentation of Spanish Mackerel White Paper (11:20-11:40 a.m.)

Background

- In August 2023, the Board tasked the newly formed Spanish Mackerel Technical Committee (TC) to develop a paper characterizing Spanish mackerel fisheries along the coast to help inform the Board ahead of any future management action.
- In October 2023, each state submitted a fishery profile questionnaire to provide details on its commercial and recreational fisheries.
- The TC reviewed the state fishery profiles and met in April 2024 to develop the paper summarizing key details about state commercial and recreational fisheries (**Supplemental Materials**).

Presentations

- Overview of Spanish Mackerel white paper by E. Franke

6. Update on South Atlantic Fishery Management Council Mackerel Port Meetings (11:40-11:45 a.m.)

Background

- The South Atlantic Fishery Management Council (SAFMC) is conducting a series of [port meetings](#) for king and Spanish mackerel throughout 2024 to gain a comprehensive understanding of those fisheries from stakeholders to inform management efforts.
- SAFMC's Mackerel Cobia Committee met in March 2024 to finalize the port meetings plan (**Briefing Materials**).
- The first set of port meetings took place in North Carolina from April 1 through April 4.

Presentations

- Update on SAFMC Mackerel Port Meetings by J. Carmichael

7. Other Business/Adjourn (11:45 a.m.)

Coastal Pelagics Board

Activity level: Moderate

Committee Overlap Score: Moderate

Committee Task List

- Cobia TC – Most TC members participate in the SEDAR 95 benchmark stock assessment process
- Cobia PDT – Develop Draft Addendum II for Board review (recreational reallocation, harvest target evaluation, measures setting)
- Spanish Mackerel TC – Develop a paper characterizing the recreational and commercial Spanish mackerel fisheries along the Atlantic Coast
- Spanish Mackerel TC/PRT – October 1: Compliance Reports Due
- Cobia TC/PRT – July 1: Compliance Reports Due

Technical Committee Members:

Cobia TC: Angela Giuliano (MD, Chair), Nichole Ares (RI), Zachary Schuller (NY), Jamie Darrow (NJ), Somers Smott (VA), Melinda Lambert (NC), Justin Yost (SC), Chris Kalinowsky (GA), Christina Wiegand (SAFMC), Michael Larkin (SERO)

Spanish Mackerel TC: Reuben Macfarlan (RI), Zachary Schuller (NY), Jamie Darrow (NJ), Devon Scott (DE), Harry Rickabaugh (MD), Ingrid Braun (PRFC), Joshua McGilly (VA), McLean Seward (NC), Pearse Webster (SC), Jeff Renchen (FL), Christina Wiegand (SAFMC)

Plan Review Team Members:

Cobia PRT: Angela Giuliano (MD), Somers Smott (VA), Chris McDonough (SC), Emilie Franke (ASMFC)

Spanish Mackerel PRT: McLean Seward (NC), Pearse Webster (SC), BJ Hilton (GA), Christina Wiegand (SAFMC), John Hadley (SAFMC), Emilie Franke (ASMFC)

Plan Development Team Members:

Cobia Draft Addendum II PDT: Nichole Ares (RI), Zachary Schuller (NY), Brian Neilan (NJ), Angela Giuliano (MD), Somers Smott (VA), Kathy Knowlton (GA), Emilie Franke (ASMFC), Chelsea

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

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 24, 2024

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

TABLE OF CONTENTS

Call to Order, Chair Spud Woodward1

Approval of Agenda1

Approval of Proceedings from October 17, 20231

Public Comment1

Consider Approval of Terms of Reference for the SouthEast Data, Assessment and Review of Atlantic Migratory Group (AMG) Cobia Stock Assessment1

Update from Cobia Plan Development Team on Recreational Reallocation Addendum Scoping.....4

Consider Approval of Spanish Mackerel Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year 14

Update from the South Atlantic Fishery Management Council on Mackerel Port Meetings and Coastal Migratory Pelagics Framework Amendment 13 16

Elect Vice-Chair..... 18

Adjournment 18

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 18, 2023** by consent (Page 1).
3. **Move to approve the Terms of Reference for the SouthEast Data, Assessment, and Review Atlantic Cobia Benchmark Stock Assessment (SEDAR 95)** (Page 3). Motion by Lynn Fegley; second by Erica Burgess. Motion carries by unanimous consent (Page 3).
4. **Move to approve the Spanish Mackerel Fishery Management Plan Review for the 2022 fishing year, state compliance reports, and de minimis requests from Rhode Island, New Jersey, Delaware, and Georgia** (Page 16). Motion by Doug Haymans; second by Erica Burgess. Motion carries by consent (Page 16).
5. **Move to elect Ms. Lynn Fegley from Maryland as Vice Chair of the Coastal Pelagics Management Board** (Page 18). Motion by Shanna Madsen; second by Malcolm Rhodes. Motion passes by consent (Page 18).
6. **Move to adjourn** by consent (Page 18).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

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, via hybrid meeting, in-person and webinar; Wednesday, January 24, 2024, and was called to order at 10:30 a.m. by Chair Spud Woodward.

CALL TO ORDER

CHAIR SPUD WOODWARD: Good morning, everybody. I want to call the meeting of the Coastal Pelagics Management Board to order. For those that are online, I am Spud Woodward; Governor's appointee commissioner from the state of Georgia. I am Chair for this meeting, made a quick move from Vice-Chair to Chair, thanks to the election of Joe Cimino as Commission Chair. I want to welcome everybody to this meeting.

APPROVAL OF AGENDA

CHAIR WOODWARD: Our first item of business is Approval of the Agenda. Is there any recommended changes or modifications to the agenda from members of the Board? I don't see any hands, I assume there is nothing online, nobody on line's hand raised. Any opposition to accepting the agenda as presented? Seeing none; we'll consider the agenda adopted by unanimous consent.

APPROVAL OF PROCEEDINGS

CHAIR WOODWARD: You also have the proceedings from the October, 2023 meeting of the Coastal Pelagics Board in the briefing materials. Are there any edits, corrections, modifications to the proceedings? Seeing none in the room, I assume none online. Any opposition to accepting the proceedings as presented? Seeing none; we'll consider that adopted by unanimous consent.

PUBLIC COMMENT

CHAIR WOODWARD: At this point we have an opportunity for Public Comment. Is there anyone, I don't see anyone in the room, anyone online that wishes to make public comment to the Coastal Pelagics Board for items that are not on the agenda? Again, don't see anything, so we'll move along.

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

We've got quite a few items, some of these may require some pretty in-depth discussion.

CONSIDER APPROVAL OF TERMS OF REFERENCE FOR THE SOUTHEAST DATA, ASSESSMENT AND REVIEW OF ATLANTIC MIGRATORY GROUP (AMG) COBIA STOCK ASSESSMENT

CHAIR WOODWARD: But I'm going to move into our first agenda item, and that is Consider Approval of the Terms of Reference for the Southeast Data, Assessment, and Review of Atlantic Migratory Group Cobia Stock Assessment, and Chelsea and Angela are going to share duty on this one. I'll turn it over to you all.

MS. ANGELA GIULIANO: Since the last meeting, there has been population of the Data and Assessment Workshop groups, so this first slide just reviews who is currently on the group, and will be providing data. As a review of the current assessment timeline, this has not been finalized yet, but it's the most up-to-date at this point. Currently we're in January, 2024, we're meeting today to finalize the TORs, and after that there will be a call for data. The data scoping webinar is currently scheduled for March, with a series of data workshop webinars occurring from June through August of this year. Data will be finalized early in 2025, and the Assessment Workshops are currently scheduled for April through August, with the final assessment report due to SEDAR in September of 2025.

Since the last meeting, they have decided to schedule a review of this assessment. The Review Workshop has been scheduled for October of 2025, with the final reports due in November. That means that the Board will see the results of that assessment in early of 2026. The Technical Committee met in early January, to discuss the terms of reference for the upcoming stock assessment.

These were based on the standard Southeast Data Assessment and Review TORs, and with that it is split up into three different sections, with separate TORs for the Data Workshop, the Assessment Workshop and the Review Workshop. For the Data Workshop,

it includes the usual review of all the available data for the assessment.

This includes life history information, including data on age, length, growth, natural mortality, maturity and other items. In that vein, a review of discard mortality rates, any fishery dependent or independent surveys and sampling data that is available for cobia, a review of the catch statistics, both commercial and recreational, as well as going through the research recommendations for in the future.

The one Technical Committee addition that we had for the first four was regarding the stock structure and unit stock definition. In red on the slide, you can see the part that we added to consider genetic and/or tagging data that may be available since the last assessment. The Assessment Workshop TORs include a review of any changes in data or data sources since the last assessment.

The development of assessment models and estimates of stock population parameters characterizing the uncertainty in the assessment. Providing estimates of population benchmarks for management criteria that are consistent with data that are available, as well as the fisheries management plan.

Providing a stock status determination, as well as again, reviewing research recommendations for the future. The Technical Committee's goal when reviewing a lot of this portion of the terms of reference, was basically to provide flexibility to the Data and Assessment Workshop teams. At this time, due to changes in index availability, it is unclear if the continuity model will be able to be run.

It's possible that we will be exploring new modeling frameworks that might have different reference points, depending on what data is available. Lastly, there are the terms of reference for the Review Workshop, which is basically to evaluate the data use in the assessment, the methods used to assess the stock, as well as any stock projections provided. Reviewing the uncertainties in the assessment, as well as again, reviewing the research

recommendations, and whether the assessment is the best scientific information available. As part of this, there is also a consideration of when to schedule the next assessment. With that I can take any questions, if the Board has them.

CHAIR WOODWARD: Thank you, Angela. Questions about the TORs for the upcoming assessment. Erika Burgess.

MS. ERIKA BURGESS: I have questions about the TORs related to the stock ID and stock boundary issue. There are two stocks of cobia that are currently managed in the U.S. One, the Atlantic stock, which is managed by the Atlantic States Marine Fisheries Commission, and then the Gulf stock, which is managed by the South Atlantic Council and the Gulf of Mexico Fishery Management Council jointly, but state management in state waters for those states.

I wonder whether it's appropriate at this time for this assessment to evaluate the stock boundary. This is the more data poor stock of the two cobia stocks. The assessment for Gulf cobia is set for tentative as, I think 2026. I know there is research ongoing related to movement. But I think genetic analysis for snips might be more appropriate to identify whether there are different stocks. It may be the case here that this is something like blueline tilefish, which is managed.

Even though it is genetically one population from the Gulf of Mexico through the Mid-Atlantic, there are management boundaries set based upon different jurisdictions for the Mid-Atlantic Council, South Atlantic Council and the Gulf of Mexico, which those bodies have deemed to be more important for assessing the stock, and managing the stock at those levels. I don't know whether the Commission managed stock in that assessment is the appropriate vehicle for assessing stock boundaries.

MS. GIULIANO: We did discuss that on the Technical Committee call. The plan at this point is not to do a larger Stock ID Workshop, as was done in the past assessment, but at least to review the data. From the discussions of the Southeast Fisheries Science

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

Center, it seems that we would need a preponderance of evidence to make any changes at this point. But at least to look at the data and see what the new data look like.

CHAIR WOODWARD: Basically, it's more of an investigation into the current situation, and not really going to be the basis for changing any analytical processes, because it's only going to be Georgia's data northward that is going to be using this assessment anyway. I guess the question is, is it a distraction or an unnecessary obligation of time and effort that might detract from the subsequent for the assessment. I guess maybe that's a question maybe Angela can answer, or Chelsea. I saw Lynn's hand.

MS. LYNN FEGLEY: Thank you, Angela, for that. I also had a question about the stock structure, but in this case it's to the north. Because of what appears to be some evidence that there are distinct genetic groupings within the northern population, including around the Chesapeake Bay.

I think a review of the data, I think that TOR is important to remain, but I also wonder if there would be any utility, depending what that review shows, helping us understand the ramifications for the assessment. If we really do have distinct genetic groupings, you know north of Georgia, you know in that Chesapeake Bay region. How does that impact how we have assessed the stock, and also how we develop those regions for potential allocation?

CHAIR WOODWARD: Erika, did you have a follow up to my comment a while ago? I saw you look kind of quizzical.

MS. BURGESS: I did, and I have more to add on to Lynn's questions. I think cobia there is just so much unknown in general. The Gulf Council and the Gulf states, including the east coast of Florida, have new regulations in place, to address what they see as declining stock. But as far as we've got observations of changing movement patterns throughout the cobia's distribution that are affecting abundance.

We've questioned the utility of the traditional data

streams, to inform an assessment of whether we're capturing the right information. I believe there has long been this question. South Carolina has identified that they have a unique genetic component in their stock, one that stays inshore and offshore, and we see this movement throughout cobia's distribution. Off northeast Florida there is a year-round presence of cobia that move inshore and offshore, they don't migrate north and south.

But we also have a component that goes north and south. Is there a genetic difference between them, we don't know. We don't have the data to inform that. It's kind of this big black box. I don't want to dissuade exploring this concept further, but I was appreciative to hear from you, Spud, that the intent would still be to conduct the assessment on Georgia north within the management unit.

CHAIR WOODWARD: Angela, anything? All right, I think hopefully it's pretty clear what the context for that stock ID work is in the overall SEDAR process. It won't be a distraction, and there are not going to be any surprises, you know in terms of Stock ID boundaries and that kind of thing. But as we all know; this is just like several other species that are pelagics.

It's doing things different, and we're kind of chasing it around, trying to figure out what's going on. Any other questions on the terms of reference as proposed? If not, then I would entertain a motion to approve them. I've got a motion from Lynn, and a second from Dr. Rhodes. We have a motion, I guess, on the board. Lynn, would you read those into the record for me, please?

MS. FEGLEY: Absolutely, Mr. Chair. **I would move to approve the Terms of Reference for the Southeast Data, Assessment, and Review Atlantic Cobia Benchmark Stock Assessment (SEDAR 95).**

CHAIR WOODWARD: Thank you, and we have a second from Dr. Rhodes. Any discussion on the motion? **Any opposition to the motion? Anybody online? Nobody, seeing no opposition then the motion carries unanimously.**

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

**UPDATE FROM COBIA PLAN DEVELOPMENT TEAM
ON RECREATIONAL REALLOCATION ADDENDUM
SCOPING**

CHAIR WOODWARD: We will move on in our agenda to the next item, which is Update from the Cobia Plan Development Team on the Recreational Reallocation Addendum Scoping.

MS. CHELSEA TUOHY: Today, I'll be reviewing the Cobia Plan Development Team's progress on the Recreational Reallocation Addendum that was initiated at the Commission's annual meeting in October. I'll start off with a brief overview of the current allocation system, and the Board motion from October 2023, followed by an overview of the Plan Development Team's progress, and a timeline for this action.

As outlined in the memo that was sent out to the Board, as part of the supplemental meeting materials, the PDT is seeking clarification and feedback on a number of topics, before continuing the development of this action. Starting off with the current allocation system. Addendum I to the cobia FMP allocates 96 percent of the total harvest quota to the recreational sector, and 4 percent of the total harvest quota to the commercial sector.

After this, the recreational quota is further divided down into state-specific soft targets for non-de minimis states, where allocations are calculated using 50 percent of the 10-year average from 2006 to 2015, and 50 percent of the 5-year average from 2011 to 2015. In October of 2023, the Board recognized that there has been a shift in cobia landings in recent years, and initiated an addendum to address recreational quota reallocation.

The Board recommended that the Plan Development Team explore options outside of the current state-by-state quota allocation system. Specifically, the Board was interested in exploring the idea of a coastwide target that would include regional measures that consider the need for fishing opportunity, based on the seasonality of the species in various regions.

The Plan Development Team met on January 8, 2024, to begin scoping this Addendum. The Plan Development Team during this meeting proposed three potential alternatives for consideration. Those three alternatives include continued state-by-state allocations, regional allocations, and a coastwide allocation option.

I'll go into more detail on each of these topics shortly, but to touch on some themes from the PDT memo, the PDT is seeking Board guidance and thoughts on those three proposed alternatives, in addition to the incorporation of management uncertainty and to allocations, the date range used to determine allocations and the timeline for setting recreational measures.

The first alternative that the PDT is planning to explore is the continued use of state-by-state allocations, using an updated date range to set those allocation percentages. Under this alternative, the PDT discussed exploring the idea of an automatic allocation trigger, which would allow those state-by-state allocations to be updated without the need for an addendum.

The PDTs thought behind this allocation trigger was that we're dealing with a host rare event species that has seen a distribution change over the past several years, and given recent trends it's likely that cobia will continue to shift, and more states will be at risk of losing de minimis status. Those states will eventually need to be factored into the allocation if they lose that de minimis status. They could be factored in without the need for an addendum.

The PDT is specifically seeking Board feedback on if the idea of an automatic allocation trigger should be further explored, and if there are any scenarios outside of a state losing de minimis status that would constitute an allocation update. The next alternative that the PDT discussed was the idea of regional recreational allocations. Regional allocations would mean that each region would implement the same bag and size limit, and seasons would be determined by cobia availability along the coast.

The PDT discussed two potential regional

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

breakdowns. The first proposal considers a two-region breakdowns, where the northern region represents states north of North Carolina, or North Carolina and the states north. The southern region includes South Carolina and Georgia. The second regional proposal considers a three-region split where the northern region includes states north of Maryland.

The Mid-Atlantic region includes states from North Carolina through Maryland, and the southern region includes South Carolina and Georgia again. The PDT discussed the Cobia Technical Committee's October 2023 report that explored trends in landings and available tagging data when proposing these regions.

Then the final alternative discussed by the PDT, was that coastwide allocation option. Both the regional and coastwide allocation alternatives propose the idea of what the PDT is calling rolling seasons, where state or regional open seasons will be determined by cobia availability up and down the coast, with bag and size limits, again remaining uniform, either for the whole coast or my region.

The PDT will further explore how these different seasons should be determined. One idea was to try to define seasons based on when an agreed upon percentage of cobia harvest occurs in each state or region throughout the year. The PDT did have some concerns regarding the regional and coastwide approaches, and you know the idea of rolling seasons.

The first concern was that quota may be used up before cobia migrate to certain regions throughout the year. Then the PDT was also looking for Board feedback on the feasibility of up-front regulatory changes that may be associated with this regional or coastal allocation process, where states would potentially need to make changes to their recreational fishing seasons for cobia, and may need to make bag and size limit changes as well.

Up on the screen behind me, these are the current recreational regulations in each state for cobia, where size limits use a combination of fork length or total length, and bag limits vessel limits and seasons

vary from state to state. We can pull this slide up again during the Board's discussion, if it's helpful when discussing up front regulatory changes that may or may not be needed with a regional or coastwide allocation approach.

For the state by state and regional allocation options, the PDT began discussions regarding the appropriate range of years to use in allocation determinations. As a reminder, the current allocation system uses the years from 2006 to 2015. However, using the most recent ten years of data from 2014 to 2023 to update these allocations provides some challenges, including the recreational closure in 2016, and the inclusion of COVID years in the allocation calculations.

The PDT suggested removing cobia years from these allocation calculations, given the pause in sampling, imputed data and already high state level PSEs for MRIP cobia harvest estimate. In total, the PDT suggested removing 2016 for the closure, and then 2020 and 2021 for COVID. That would leave seven years of data for allocation calculations.

The PDT is seeking Board feedback on if COVID years should be included in those allocation calculations. Other considerations discussed by the PDT include management uncertainty and timelines for setting recreational management measures. The PDT is considering exploring multiple options related to management uncertainty, you know given the uncertainty in the MRIP harvest estimates for a pulse rare event species, especially at the state level.

These ideas included potentially adding an up-front uncertainty buffer to the recreational harvest target, or adding a buffer around state level soft targets that indicate when management action is needed, so we don't fall into a situation, you know where a state is a couple hundred fish over, and have to change management measures to account for a couple hundred fish, when our estimates may not be that accurate.

Then the final option discussed by the PDT is the potential for a quota borrowing system, where if a state or region's overage is balanced by a state or

These minutes are draft and subject to approval by the Coastal Pelagics Management Board.

The Board will review the minutes during its next meeting

region's underage, management action may not be needed. Then that last bullet there is talking about recreational measure setting timelines. The PDT is seeking guidance from the Board on the preferred timelines for setting recreational management measures.

Currently those measures are set on a three-year timeline, and the PDT was interested to know if there were other preferred timelines. To wrap up my presentation, I'm going to briefly go over the proposed timeline for this action. The PDT is aiming to have a draft addendum with alternatives available for the Commission's spring or summer meeting in 2024.

At this time the Board will approve the document for public comment, and the states begin their public hearing process. Then depending on when that document is approved for public comment, the Board is looking at final approval of the Addendum in August or October of 2024, for implementation beginning in 2025. If implemented in 2025, the total harvest quota for the coast would remain the same, but those new allocations and recreational management measures would be implemented.

Then as we just heard from Angela, in 2026 the Board will receive the results from the cobia stock assessment, and consider setting a new Total Harvest Quota for the 2027 to 2029 fishing years. That's everything that I have for the Board today, I'm happy to take any questions. If there are no questions, I have a slide that summarizes all of the discussion topics that may help, because I know there is quite a few of them.

CHAIR WOODWARD: Thank you, Chelsea. Any questions about here overview of the Draft Addendum? If not, then we'll be able to launch into going sort of item by item, to respond to the PDT. Chris, are you good for that?

MR. CHRIS BATSAVAGE: Yes, Mr. Chair, yes. I'll just ask my question then.

CHAIR WOODWARD: All right, seeing no questions, as she described, there are several aspects of this

Draft Addendum that we need to provide feedback on. This will be our opportunity to sort of green light, red light, caution light these things as we move forward. I have been asked to bring up that vexing topic, and that is the FES Pilot Study, and the cloud of uncertainty that it has sort of put over things that we're having to deal with here.

As we'll learn later, when John Carmichael is updating us on Council action on Spanish mackerel, we've struggled with it at the Council level of the timing of whether to move forward, not move forward. I think we did good for the Board, for us to sort of get out in the open here, any concerns we've got, because this MRIP data is the foundation of everything we're talking about here.

If you've got concerns about us moving forward, now is the time to get them on the record, and let's clear the air and talk about it, because we've already got, in most situations, MRIP estimates that have very high PSEs. Now we have an FES Pilot Study that has called to question the accuracy of those estimates, the potential bias. I'll just open it up. If anybody has anything they would like to say and get on the record, here is the time to do it. I've got Joe Cimino and then Chris Batsavage and then Lynn.

MR. JOE CIMINO: I think it has been made clear by MRIP staff that this isn't just a recreational/commercial issue from the Pilot Study, although there may be a consistent trend in bias. There is a state-by-state potential difference, and so I think it will fully affect every aspect of this. I think it is something that we have to be concerned with.

CHAIR WOODWARD: All right, Chris Batsavage, and then I'll go to Lynn.

MR. BATSAVAGE: Yes, that was the question I had for the PDT, specific to the proposed region options, that it seemed like those could be impacted more by the future FES calibrations, because we don't know what the new MRIP estimates are going to look like at the state or regional level.

I guess I'll ask Chelsea, was there any discussion about that at the PDT level, and then I guess just raise the question of maybe not a full stop on this

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

Addendum, but should we consider maybe not doing the regional options, knowing that we're going to be working with different MRIP harvest estimates, probably a year or two after this addendum is scheduled to be completed.

MS. TUOHY: Yes, so there was some discussion about the MRIP FES conundrum at the PDT level. I think that was part of the idea behind something like the allocation trigger for the state-by-state allocations. That way, when we do get those updated results, we wouldn't need a full-blown addendum to update the allocations, we could just take those new numbers theoretically and factor them in.

The PDT also discussed that currently the recreational management measures are just status quo for 2024, so at the end of 2024 no management measures will need to change, based on the way that we usually change recreational management measures for cobia, where those landings averages are compared to state harvest targets, and the PDT knew that there was motivation to potentially get this new system in before those recreational management measures needed to be changed. They are going to push forward until they get other direction or clarification.

CHAIR WOODWARD: Okay, Lynn.

MS. FEGLEY: I actually had a question and a comment related to this, specifically about the allocation trigger. I guess I'm trying to understand what that would look like. If you could provide a hard example, because given all of the uncertainty, I find the concept terrifying, because we're not talking about having more fish available.

If we're just going to have a trigger where allocation is suddenly redone. That means somebody is losing fish and somebody is gaining fish. It is no small thing, and how does that relate to all this uncertainty with FES? It gives me great unease, and maybe you can help me feel better, or maybe validate my unease.

MS. TUOHY: With that allocation trigger, the PDT discussed a lot of these topics very briefly. They

didn't get into extreme detail on many of them, because they were looking for Board feedback specifically, and their question was, is this something that we should be pursuing? It's an idea that we have.

But we don't know if it's something that the Board would be interested in, because it wasn't discussed at the last meeting. I think the PDT would be looking to the Board for guidance on something like, would you like us to come back with a better idea of what something like this would look at, or do we want to scrap this, and we won't explore it further?

CHAIR WOODWARD: Any follow up on that, Lynn?

MS. FEGLEY: No, well I guess I would say that in order to know whether to scrap it, we would have to see some specifics. But I would just raise a flag that, again, the concept is frightening to me at this point.

CHAIR WOODWARD: We're going to use an artificial and fill in this algorithm that we're going to educate, and then we're going to turn all the allocation decisions over to it, and that way we won't have to struggle with them anymore. You'll just have to live with the consequences. That is partly, I'm afraid of, and partly fiction. But you never know these days. Doug, and then I'll go to Shanna.

MR. DOUG HAYMANS: You both have stated what has been mulling around in my mind, artificial intelligence, mainly, because that is what it sounds like. It scares me the same as it scares Lynn, and I would much rather have a discussion on the record about reallocations. I guess my question would be though. Is there something critical in this amendment that absolutely has to go through before we know the results of MRIP study? Can this be paused for now?

CHAIR WOODWARD: Well, I think that is a question that every decision-making body has been struggling with is, where is it prudent to wait, and where is it prudent to move forward? You know as I've alluded to the South Atlantic Council has made decisions to hit the pause button on some things. You know we have an interesting situation that will have

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

assessment results, probably about the same time they project to have the more broader FES study completed, as I understand it. I think that is what the projected timing is. Whether that actually comes to pass or not, I guess remains to be seen.

But I think that it's really confounding, just because the FES bias at the stock status determination is different than the FES bias at the allocation situation. I mean we're dealing with small numbers of fish, and you could see a significant change. What I'm concerned about is we don't know if there is a uniform bias across all states and times, and so how an individual state's catch estimates are going to be affected.

We don't know that yet. I mean we already see high variability. I mean if you look at the ten-year time series of the state of Georgia, we've got two years where we had zero, zero harvest of cobia. Then this past year it jumped up to 11,000 fish. But all of them had PSEs that are with red on them. It's a predicament.

I mean we want to be responsive, we want to move forward, but at the same time we have been faced with something now that is, I think we need to decide. Is it prudent to move forward, to make decisions, in an environment of heightened uncertainty, knowing that we may have to go back and change those decisions in ways that we can't forecast? That is just kind of my perspective on it, but it's the will of the Board is what we're here to decide. How do we want to deal with this? I've got Shanna.

MS. SHANNA MADSEN: I think I'm going to combine, actually, the top topic along with this topic. When I read this memo, I too like Lynn, was a little bit confused as to what, first of all what were the PDT asking for, like was this the sort of thing where we would just kind of roll and reallocate without having to have a discussion?

But I think you did a really good job, Chelsea, of explaining what the intent was here, in that if there was an allocation trigger that could be built into this document that said, once we get the changes from the FES, we can update just according to those new

numbers, instead of having to start a whole new addendum process.

Whatever we structurally decide upon, can inherently carry forward once we have those numbers. But we don't have to go through an entire document. That actually for me gives me a little bit of peace of mind, as far as moving forward with this document. I think, you know this is a question that has plagued us, and we talked about this actually at several meetings, should we move forward with this action or not?

I still am strongly in favor of moving forward with this action, due to the fact that we don't know how to handle anything at all right now. How are we supposed to continue to manage this species, based off of soft targets that we are recognizing are no longer usable or correct for a lot of states and regions? I think that in my mind we need to move forward with deciding what the actual structure of reallocation looks like. I don't think that looks like state-by-state allocations like we're doing now, and then utilizing this approach that the PDT had brought forward to us in using those numbers to at least update the structure, without having to go through the whole process again.

CHAIR WOODWARD: Any other comments? Chris Batsavage.

MR. BATSAVAGE: Currently the process we're working with now, it might be convenient for some of the states but in reality, it's not working. But at the same time, I know it's hard to move forward with all of these potential options, with the uncertainty with MRIP estimates in the next few years.

It seems to me like out of this, the only options that, well the option that will be, I guess less impacted by the new MRIP estimates is the coastwide allocation, you know where we could look at different seasons for different regions, based on the seasonality of the fish, but ended up having a more uniform set of size and bag limits.

Compared to what we're doing now, I'm sure we'll get quite a bit of public comment on that, and

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

probably discussion around the table on it. But converting this Board with anything to try to keep from creating more problems from the new MRIP numbers we'll be dealing with. That might be one way to do it. But again, I would look to see what others think about that idea, or just not moving forward with this.

CHAIR WOODWARD: All right, maybe just to make this clear, and then make sure we all agree on a sense of direction. We've had the last two speakers opine that we should move forward. We recognize we're operating in an environment of uncertainty, but we're looking more about how to improve a process and how to improve procedures for a species that is very challenging, knowing that we may have some outcomes that aren't particularly desirable and palatable. I'm going to call for a vote of affirmation that we're going to move forward. All those that are in, John, go ahead.

MR. JOHN MANISCALCO: Just need a moment to caucus.

CHAIR WOODWARD: Yes, sorry, I'll give you a couple of minutes to caucus. All right, our two minutes are up, we need a little more time? Is everybody okay? Are we ready? Is everybody clear on what we're voting on here? Basically, it's green light, red light on moving forward. Then we will deal with the specific topics one by one that you see up here.

Really, the purpose of this is not to bog us down, but just to make sure everybody agrees that we need to move forward, recognizing the uncertainties that we are all dealing with. Those in favor of moving forward with this proposed addendum, signify by raising your hand. All right, those opposed, null votes, abstentions.

All right, so I had one no and one abstention. Okay, we have affirmation of moving forward, so now let's deal with these various items here. The allocation trigger obviously is creating some consternation, because I'm not sure we still all understand quite what that means. I think you know, at the Council level, basically we have like what we call the allocation review trigger, so that is different than I

think we're talking about here, which is an automated process by which allocations would change as a result of a change in the source data. Now do we want the PDT to continue to explore that and come back to us, and explain to us how that would actually work, so that we would have a better understanding of what trigger means in the context of this Addendum? Shanna.

MS. MADSEN: Also, I just want to acknowledge that I was remiss in not saying thank you to the PDT. This is an incredibly complicated species and document that we're asking them to go through. I think that they came up with some really excellent out of the box ideas, and are asking us some really tough questions. I just wanted to say thank you for all of their time on that. Specifically, in regards to this allocation trigger.

I think now I'm kind of envisioning it as two things. Like Lynn, at first I thought this was like, okay we just reallocate on some sort of five-year basis, and we don't have an addendum. But now, the way that you framed it, Spud, as it being an actual trigger for review. I think that makes a lot of sense, so I would like to see some options from the PDT, as far as triggers to have us review allocation.

But then, the other thing I think I would like to see is, is there an option that we can create that says, once we decide the framework, whether it's regions, whether it's coastwide. Can we just update the numbers with the new FES without having to do an entire document? I would like to see, I think two sorts of allocation triggers, is what I'm envisioning.

CHAIR WOODWARD: All right, any further comments on that? John?

MR. MANISCALCO: Just a suggestion that, given FES aside, but if we weren't going to review allocation, this could maybe be done on a stock assessment cycle, so that we're working from new catch advice.

CHAIR WOODWARD: Yes, if you'll repeat that.

MR. MANISCALCO: I'm sorry, so I totally agree with the FES, as kind of a separate reason to consider or

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

review allocations. But otherwise, an allocation trigger for review should maybe be based upon new assessment catch advice, so put it on that site.

CHAIR WOODWARD: Malcolm.

DR. MALCOLM RHODES: Also looking at the years that are included in these allocations, and I saw obviously where 2016 is being left out. But 2017 is the year that effects Georgia and South Carolina immeasurably. I mean it's a six-year series, and we both had zero harvest in 2017, and it's being included. I'm just trying to understand why we're removing 2016 but not the 2017 numbers, because it skews our numbers remarkably.

MS. TUOHY: Yes, so we can, Angela and I were just discussing that 2017 closure as well. We can bring that back to the PDT. Based on their reasons for removing 2016, they will likely also, I don't want to speak for the PDT, but I would assume that they would like to remove 2017 as well, because of that federal water's closure.

CHAIR WOODWARD: Is everybody comfortable and understanding of what we're asking the PDT to do, with regard to allocation trigger, sort of a two-element ask of them. Again, these are draft, they are not binding at any point. This is all more investigating options and novel approaches to dealing with a difficult management situation here.

If you're okay with that, then we'll move on to be clear on the allocation trigger. Our next one is the Proposed Region Approach. Maybe it would be good if we can bring back up your overview presentation. All right, what is your feelings about these as scenarios for them to further investigate in this Addendum?

Any concerns? Not seeing any. Is everybody comfortable with these going forward? I see some thumbs up and some head nodding. Okay, we'll move those forward. Our next one is feasibility of up front, this was going to be the easy one, up front regulation changes for coastwide or regional allocation.

Basically, this is a fisheries management gambling, I guess. You just change your regulations or hope things are going to turn out good. But anyway. Do we understand enough about what that means to actually opine as to whether we want to go forward with that? Maybe, Chelsea, you can just refresh us on what that really means in the context of this Addendum.

MS. TUOHY: Yes, so I think there were some questions from PDT members about if we move to a regional or coastwide approach, where states are looking at potentially changing size, bag limits and/or seasons, based on cobia availability up and down the coast is that, does that provide any challenges for states?

Are there limiting factors for the cobia fishery like spawning season that cobia availability seasons may propose challenges to. I think that was the extent of the PDTs discussions. They were just looking at, is there anything up front that would be an issue for states if we're looking at changing seasons, cobia seasons as a whole.

CHAIR WOODWARD: Shanna.

MS. MADSEN: Thanks for that explanation, Chelsea. I think it helps a lot, because I was a little confused as to what the thought process was here. I think at least from my standpoint, when I was thinking of rolling seasons, I was thinking of it being more established than what I think the PDT might be thinking of.

Like I wasn't thinking of this changing yearly, but maybe something that we would review on like a three-year basis to the seasons still make more sense, et cetera. I don't really know that that would pose a lot of problems, as long as you gave us a long enough length of time to make it make sense. But it is definitely not something that I would like to see yearly, because I feel like that would create a lot of uncertainty and confusion in all of our recreational fisheries.

CHAIR WOODWARD: Doug.

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

MR. HAYMANS: I'll agree, I mean our state rulemaking process isn't as reactionary as being able to change with this season, or would I want to go every year to my Board to change seasons. But I want to make sure I understand when we're talking about uniform bag and size limits, we're talking about across the board, all parties having the same size. Does that take conservation equivalency out of play?

MS. TUOHY: For the regional approach the region would have a uniform bag and size limit, so South Carolina, Georgia would be that southern region, and then all the northern states would be the northern region in that two-region approach. Again, those regions would have the same bag and size limit. In the coastwide approach it would be a coastwide bag and size limit, is what the PDT had discussed.

CHAIR WOODWARD: Yes, and that is one of the questions being asked now. Is that a nonstarter? I mean does that seem to be in conflict with the flexibility that we've all enjoyed through things like conservation equivalency. It's like, this is it, everybody has got the same set of rules. Do we want, again, do we want them to continue to explore this? But if this is DOA for some reason, now is the time to say it. Toni.

MS. TONI KERNS: I'm just going to try to more directly answer about the conservation equivalency. In these approaches for the regions to work them at, is the best way to take the direction from either a TC or a PDT. If that is their original intention, then get a best predictability of what the harvest would be as to keep those measures intact.

The Board, to be as clear as possible, should make a statement that conservation equivalency would not be allowed when using this approach or that, you know, whichever approaches you are using, to make it very clear to the public that when they are considering the options in the document that that is the case. Just lastly, Mel Bell has his hand up.

CHAIR WOODWARD: Mel, can you hear me?

MR. MEL BELL: We were just talking about; you

know Doug had mentioned having to deal with the Commission and all. We're probably the most restrictive state, I guess in terms of if we found ourselves needing to make any kind of in-season adjustments or starts or stops, you know since we have to go through a legislative process to create law. That is just something we would be challenged with, because we don't have a Commission or a Board that can do that for us. That is true of all the fisheries we've dealt with, but just pointing that out.

CHAIR WOODWARD: Thank you, Mel. Do we want the PDT to continue exploring this, realizing there may be some challenges of execution of it, but continue to support. Does anybody have any heartburn with just having them move forward and do the analysis? I don't see anybody that seems to have any strong opposition. Then we've got inclusion of the COVID years in the data stream. What are folks' thoughts about that? Shanna?

MS. MADSEN: I do think that this Commission has excluded COVID years from allocation decisions. I know that we did that in menhaden, but I think we only did it for 2020. However, with cobia being such a highly recreational species, I think it makes sense to kind of consider whether or not they would also want to do 2021 as well. I was just wondering, did the PDT talk about, like how imputed 2021 data were to 2020? Obviously, all of 2020 was pretty much imputed, but I think we were mostly up and running in 2021, so it might be safe to use that, but I was just wondering if the PDT kind of talked through why 2021 also.

MS. TUOHY: The PDT had not looked into the imputed data in 2021. It was just a very brief discussion about the inclusion of COVID years, so they can do some further digging into 2021, and see if that should be excluded/included and what the imputed data looks like in that year.

CHAIR WOODWARD: Any other, I've got Chris.

MR. BATSAVAGE: Yes, I would support removing 2020. We know most of the data for all the species were imputed. For North Carolina I think almost all our cobia information was imputed, because our

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

fishery is largely in May and a little bit in June, and our MRIP samplers I don't think were back sampling again until early to mid-June. I don't remember about the 2021. It might have impacted a couple states, but I think definitely we should consider removing 2020.

CHAIR WOODWARD: I'm hearing general concurrence with removing 2020, but letting the PDT take a closer look at 2021, as to whether or not there is an imputation bias there that might be a problem. Is everybody good with that? Okay, seeing some heads nodding. Now, the timeline for setting measures. There is our proposed timeline, any concerns, comments about that? I think we sort of dealt with this when we had our first vote, just move ahead. Shanna.

MS. MADSEN: Now are we talking about the timeline for recreational measures, because I was just following along in the document. If we are, I had some thoughts on that. I think, you know we're doing this spec setting usually on like a three-year timeline.

I would like to explore seeing maybe what a five-year timeline would look like, so that we can have a little bit more management certainty for the species. If we're going to talk about options that might potentially go into the document, I would like to hear what the PDTs thoughts are on having three and five years as an option, and kind of seeing what might work best, and what we have the most amount of data for.

CHAIR WOODWARD: All right, management uncertainty. Make sure those are back up there where everybody can see them. Thoughts on this. Shanna.

MS. MADSEN: Sorry, I listened to this meeting so I have a lot of thought. I think these are really good ideas. I like that you guys discussed this. I think the thought of management uncertainty, and thinking about this in terms of what kinds of buffers we can kind of build into this process, so we're not in the state of constant management whiplash by just being a couple of hundred fish over.

I think this kind of rolls in a little bit to like thinking about potentially what does make a state non-de minimis anymore, and what doesn't, and maybe building some of those buffers into that will make it make a little bit more sense, because if you're typically de minimis, and maybe you have a year or two that you're not de minimis. Does it actually make sense for you all to slide back out of de minimis status? I think that this management uncertainty is a great idea, and working with some sort of buffers, like I appreciate that you guys walked through this, so please continue.

CHAIR WOODWARD: All right, Chris, and then I'll go to you, John.

MR. BATSAVAGE: I would like to see the PDT continue considering up front uncertainty buffers applied to the harvest target. As these fish move north, they are becoming more rare event, and as I think I've mentioned in previous meetings, MRIP is probably not getting a good representation of the fish being caught north of Maryland.

Social media has probably intercepted more of those fish. On the quota borrowing system, I think that is also worth considering for now. We do that with commercial state allocations at the ASMFC level, where if the overall quota isn't exceeded. But if a state goes over it's kind of a no harm, no foul situation.

I think that's worth considering for now. We may find out later if there are distinct populations of cobia in the management unit, it could be determined later that's not appropriate, meaning a Chesapeake Bay fish isn't equal to a Georgia fish. But I think for now I would support the PDT fleshing that out more for this Addendum.

CHAIR WOODWARD: How about the buffer around the state level soft target, is everybody okay with that? John, and then Adam.

MR. MANISCALCO: Unless I'm missing something, we also have the ability to consider multiple years of data and catch, right, when we're determining when changes are necessary. That all gives us kind of

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

additional thought for around what is otherwise a very volatile catch fishery. Okay, thanks.

CHAIR WOODWARD: Adam.

MR. ADAM NOWALSKY: I just have to offer a word of caution from experience with the concept of uncertainty buffers, because we're only talking about applying them in one direction. When you look at recreational catch estimate, there is uncertainty around those estimates that is in both directions.

We look at the point estimate, we use it, we make a lot of management decisions. But there is uncertainty that the catch is both higher and that it's both lower. When we're talking about applying this uncertainty buffer here, we're only talking about essentially reducing a target that we're then going to derive regulations from.

The level of impact this has had on other recreational fisheries that this Commission manages, cannot be understated. The Summer Flounder, Scup and Black Sea Bas Board, in working with the Bluefish Board, I believe has finally come up with something that has done a better job in the past two years of providing more stability than what there was, by considering the uncertainty around the recreational catch estimate in both directions, as well as considering what the condition of the resource is. If you're going to introduce a discussion about management uncertainty here, I would like to see the PDT also look at some alternative management that is in place. One example is the Summer Flounder, Scup and Black Sea Bass changes. But are there other ways that we can go about to do measure setting in the process, that is simply comparing recent catch, taking those allocations to some new quotas that come out of the assessment, because our process has failed miserably.

When this Board was the South Atlantic Board in considering cobia, when we went through a lot of the management consideration changes there. I brought forward a lot of those concerns. I think a lot of it was heard. But I remain very concerned that cobia management is going to go the way that other

recreational management was, and we should just be better than that.

My request would be, if you are going to pursue the management uncertainty in this manner with upfront buffers, that the PDT also engage in looking at other recreational management that's in place, to do something other than simply comparing a target to recent catch and making decisions based totally on that comparison.

CHAIR WOODWARD: Thank you, Adam, good point. Jay.

DR. JASON McNAMEE: Kind of similar to what Adam was talking about. Maybe I'll characterize it a little bit differently. You know I recognize the need to accommodate management uncertainty. I support what Adam said, and I think, at least in part what he was getting at.

Not only should we look at buffering the target we're trying to achieve, whether you should or you shouldn't. But also, recognizing the uncertainty around the estimate that we're producing. Having the kind of two envelopes of uncertainty as a part of how you are kind of measuring that metric. I think it would help the document a lot to add an option like that in.

CHAIR WOODWARD: Yes, I think that is one of the things we struggle the most with is that we put in these multi-year approaches to try to create these soft targets, which still are kind of undefined exactly what that means. But if you've got three years of estimates that all have 50 to 90 percent PSE estimates on them.

You can only mitigate that uncertainty so much by lumping it together. We still end up with imprecise data. You know you've got to look for something different, because as Adam said, that is on both sides. I mean there are confidence intervals on both sides of it. You know you can be higher or you can be lower.

I think our tendency as an institution is well founded, but perhaps misleading and that is, the precautionary principal says, in the face of the

These minutes are draft and subject to approval by the Coastal Pelagics Management Board.

The Board will review the minutes during its next meeting

uncertainty you always just, you go down. You never go up. I think that is one of the things we certainly continue to struggle with, is how to find that balance in there.

Chelsea is getting all this down, and it will be communicated to the PDT, and hopefully we'll see something come out that will help us explore some novel approaches that are maybe different than what we've been doing. Any other thoughts on the management uncertainty topic? Okay, Chelsea have you got what you need? Any final thoughts on the Draft Addendum? You'll see it again pretty soon. If not then we'll move on.

CONSIDER APPROVAL OF SPANISH MACKEREL FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE REPORTS FOR THE 2022 FISHING YEAR

CHAIR WOODWARD: We've got Emilie Franke online, Consider Approval of the Spanish Mackerel Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year. Emilie, are you ready to go?

MS. EMILIE FRANKE: Yes, thank you, Mr. Chair. I will provide an overview of the FMP review for the 2022 fishing year. On the next slide, starting with the status of the FMP, Spanish mackerel is managed cooperatively with the South Atlantic Fishery Management Council. For the Interstate FMP for state waters, Spanish mackerel is managed through the Omnibus Amendment approved back in 2011. The fishery is managed with size limits for both sectors, a creel limit for the recreational fishery, daily trip limits for the commercial fishery, and then there are a few gear restrictions for both sectors. The most recent stock assessment for Spanish mackerel is SEDAR 78. That was completed in 2022, and had data through 2020.

This most recent assessment indicated the same stock status as the previous assessment, and that is that the stock is not overfished and not experiencing overfishing based on a three-year average fishing mortality. However, in the terminal year of the assessment, the fishing mortality rate was above the

threshold.

That indicates that if that high fishing mortality rate continues, then the stock may fall into an overfishing status in the future. On the next slide for the status of the Spanish mackerel fishery, just a couple reminders for the FMP review. All the landings in the FMP review for Spanish mackerel are calendar year landings.

Florida landings are for the Atlantic coast only, and then also this year's FMP review and last year's FMP review do use current MRIP estimates based on the fishing effort survey. Previous FMP Reviews had used the coastal household telephone survey estimates, but the PRT wanted to update the estimates in the FMP review based on current MRIP. In fishing year 2022 for the calendar year, total landings of Spanish mackerel along the Atlantic coast were estimated at about 6.5 million pounds.

The commercial fishery harvested about 38 percent of that total, and the recreational fishery harvested about 62 percent of that total. For the commercial sector, 2022 landings were about 2.4 million pounds, and this was about a 49 percent decrease from 2021 levels, primarily driven by a decrease in Florida's commercial landings. Then on the recreational side landings were about 4 million pounds in 2022, and this was again about a 54 percent decrease from 2021.

Again, we did see a large decrease in Florida landings, but it is also important to note that 2021 recreational landings were pretty high to start with. For recreational releases of Spanish mackerel, those releases have generally increased over the last several years, and in 2022 about 4.3 million fish were released alive, which is about 52 percent of the total recreational catch. On the next slide you can see a figure showing the commercial landings in blue and the recreational landings in gray. You can see 2020 and 2021 were the highest recreational landings in the time series, and that commercial landings over the past few years have been relatively stable. Then we have this most recent year at the end of the time series there, 2022. We saw that decrease in both commercial and recreational landings. But that total

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

in 2022 is still well within the range of landings that we've seen over the past few decades.

The most recent ten-year average was about 7.8 million pounds, so that 2022 total of 6.5 million pounds is not too far below that ten-year average. Next slide, regarding that 2022 decrease in landings that we saw in Florida. Florida does typically account for a majority of both commercial and recreational landings.

But there was a marked decrease in their landings in 2022, relative to 2021, and in their compliance report, Florida noted that areas off their central east coast are increasingly closed to vessels by the U.S. Coast Guard, in order to create safety zones associated with space launches. This has prevented fishermen from accessing areas where they would traditionally fish for Spanish mackerel, and so that has contributed to a decline in Spanish mackerel landings efforts.

Florida has also noted that they have brought this topic to the South Atlantic Council, and it is currently being investigated further. As far as compliance and 2022 implementation, the Plan Review Team found no inconsistencies among any state management measures. As far as de minimis, on the next slide, a state qualifies for de minimis if its previous three-year average of combined landings is less than 1 percent of the coastwide total.

For 2022, Rhode Island, New Jersey, Delaware and Georgia all requested de minimis. All of those states do meet the requirements, except for Georgia. Georgia just barely exceeded that 1 percent de minimis threshold at 1.04 percent. Georgia noted that they are still requesting de minimis, and they noted that in most years they have no Spanish mackerel commercial harvest, so their calculation is really dependent on recreational harvest.

With the exception of just a few years, their recreational harvest has been below 75,000 pounds each year, and they have had de minimis status for several of the past nine years. The state also notes that they have very high PSEs for their MRIP data.

Then finally on the next slide, the Plan Review Team emphasized two recommendations this year.

The first is the need to understand dynamics of the fishery across regions, and the PRT noted that some of this regional analysis could be included in the upcoming work by the Spanish Mackerel Technical Committee, as they work to put together the paper requested by the Board. Then the PRT also noted the importance of continuing coordination between the Commission and the South Atlantic Council on future management actions that could address the differences between the interstate and federal FMPs. That's all I have, Mr. Chair, I am happy to take any questions.

CHAIR WOODWARD: Any questions for Emilie on her presentation?

MR. BATSAVAGE: Might be more of a question for Erika or the Florida delegation. With the closures around the Canaveral area for space launches. Does that affect both the recreational and commercial fisheries equally, or are the variable landings that we saw in 2022 and looks like 2015 as well. Is that more of a different availability of Spanish mackerel in the waters? A follow up question I would ask now is, it looks like 2023 recreational harvest through Wave 5 in Florida has gone back up again, kind of not the highest levels, but higher than last year. I didn't know if that was different space closures, or just higher availability. Just any insight, to kind of get a sense of what is going on down there is helpful, thanks.

MS. BURGESS: Chris, thank you for those questions. For the commercial component, well for the space closures, it's closure to all vessels. They are both affected. That may be part of what we're seeing in the recreational landings, but I think it's also part of the inherent variability in FES, and how that survey's interpretation of effort in a given year can cause wide swings in total landings.

I don't know that there is a clearcut answer to continue the recreational fishery. But we have seen that in not just Spanish mackerel, landings for other

species have declined in this area, because of reduced ability to access that fishery.

CHAIR WOODWARD: All right, any questions for Emilie? Erika.

MS. BURGESS: Emilie, thank you for including those notes about the impact of space launches in the Cape Canaveral area on our Spanish mackerel landings. I was wondering if you might be willing and able to modify a part of the FMP review on Page 4 to start, specifically referencing, in this document it's called the Entanglement Net Ban in Florida. We prefer it be called the Net Limitation Amendment, because it has to do with more than just entangling nets.

MS. FRANKE: Yes, absolutely, I am happy to make that change, and I will confirm with you to make sure we have the right language.

MS. BURGESS: Thank you.

CHAIR WOODWARD: Any other questions for Emilie? If not, we need Board approval of the FMP review. Do we have a motion, or do we need to read off the bottom of that slide there? We have a motion prepared, looking up there, if someone is willing to make it once it's up there. Okay, Doug.

MR. HAYMANS: Mr. Chairman, I would **move to approve the Spanish mackerel fishery management plan review for 2022 fishing year, state compliance reports and de minimis request for Rhode Island, New Jersey, Delaware and Georgia.**

CHAIR WOODWARD: All right, we have a motion by Doug Haymans and a second by Erika Burgess. Any discussion on the motion? Erika.

MS. BURGESS: I just wanted to state for the record our support for Georgia receiving de minimis, the fishery landings being just 0.04 percent above, and noting that the variability in MRIP from year to year can affect that. We support giving Georgia de minimis.

CHAIR WOODWARD: Thank you. **Any opposition to the motion? Anybody online raise their hand?**

Okay, with no opposition we will consider the motion accepted by consent.

UPDATE FROM THE SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL ON MACKEREL PORT MEETINGS AND COASTAL MIGRATORY PELAGICS FRAMEWORK AMENDMENT 13

CHAIR WOODWARD: At this point we've got John Carmichael, Executive Director of the South Atlantic Fishery Management Council online to do our next agenda item, which is an update on mackerel port meetings and the Coastal Migratory Pelagics Framework Amendment 13. John, you ready to go?

MR. JOHN CARMICHAEL: I'm here. Thank you, Spud, and thanks everybody for letting me weigh in here on this brief meeting remotely. Sorry not to see all you guys in lovely Virginia today, but let me get into this first of all on the Amendment. If you'll recall, the Council was working on an amendment to apply the new ABC and ACL in Spanish mackerel that came out of the last assessment.

The intent was to do this as a framework and do it relatively quickly, just to bring in the higher catch levels that were recommended through the assessment. To get into any other issues after going through the Port Meeting process. What has happened is, you know the Council is going down that path, but frustrated with some of the things that have come up here today, such as a terminal year of this assessment that falls in 2020 with the COVID impacts.

Concerns that have since arisen since they got the results, with this potential FES bias, and recognizing that Spanish is a stock that could really suffer a lot from that, particularly with the issues we've seen with shore mode in the FES, and seeing significantly increased shore mode landings in recent years under FES.

But despite those concerns, the Council is trying to go ahead, because the potential was there for giving the fishermen some more fish back in this situation. At the December meeting, we saw some new items being added to the Amendment, coming up from

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

NMFS and the Regional Office, looking at the Optimal Yield, potentially updating that, and also getting into potential changes in accountability measures.

In the report that you guys saw from the Committee, the Committee supported doing those things, and adding those to the Amendment. But any time you get into stuff like that, as you guys well know, there is more work involved and it's going to take more time. When later in the Council meeting the Council goes through the overall work plan, and looks at what is on the docket for the next few meetings, and balancing out the various demands the Council has.

A concern arose with getting the work done on Spanish mackerel, while also supporting the Port Meetings, which are considered very important to get that input from the fishermen, and also some confusion. If the Amendment were to drag out longer and began to overlap with Port Meetings, the fishermen might not understand why they are coming to Port Meetings to give input, when the Council is potentially doing public hearings on an amendment.

At the end of the December meeting, the Council decided it was best to pause on this Amendment, and to pursue the Port Meetings and then go back and do a more involved, and addressing more issues amendment after the Port Meetings. You know that was always the case, to do a full plan amendment after the Port Meetings.

But we had just hoped at the time back say, you know last spring and summer, to be able to get a quick amendment through to update the catch levels. That hasn't happened, FES fell in our laps, and the Council has decided now to pause on the amendment. Not seeing progress on it that's why. Any questions on that? I'll be glad to take them, before I get into the Port Meeting updates.

CHAIR WOODWARD: Any questions for John on the status of Framework Amendment 13? All right, seeing none; John, go ahead.

MR. CARMICHAEL: The Port Meetings, we are proceeding on with those and our plans are coming

together on that. We have staff from our staff lined up to help and assist, Christina Wiegand leading it for our behalf. We've got the locations pretty well settled; you'll see those in the report that came from the Committee.

You know those of you in the states that are going to be impacted by this, and we're hoping to reach, you will be hearing from us to help find out where to go, help spread the word, get fishermen and others engaged. There remains a lot of excitement by this, our AP is really excited about this opportunity.

They've been asking for it for years, and I think with what we're seeing, at least on the federal front, in dealing with shifting stocks, and demands of dealing with climate change, the Scenario Planning Process we did on the Atlantic Coast. It seems very timely to be getting out there and hearing from the fishermen and understanding better what is happening with this Spanish mackerel stock.

I'll just say particularly that we have an assessment, which was a terminal year of 2020, and we're dealing with what we all know is a very short-lived fish, and we're going into 2024. What we hear from fishermen, what they are seeing on the water, I think is going to be really important to the next steps that the Council takes and the Commission as well. Are there any specific questions about the Port Meeting process, I would be glad to take those.

CHAIR WOODWARD: Thank you, John, any questions for John about the Port Meetings? I want to reemphasize this is a collaborative effort between the Commission and the Council, to make sure that they are being sited in the best locations to get the most diverse and effective input we can get.

It's a pretty monumental task to do this kind of thing up and down the eastern seaboard, hopefully, it will be well attended. There will be effective participation and it will help us sort of see a future for these fisheries that is better informed than it is right now. Shanna.

MS. MADSEN: Thank you for those comments. That kind of brings up the comment that I wanted to

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

make, less of a question than a comment. In reading through this document, John, I did note that there were some suggestions from some of the folks that there be a Chesapeake Bay specific meeting.

We are seeing a lot of Spanish mackerel landings on the middle peninsula, Matthews, Quinn Island area. I might like to see, maybe we can talk offline, but I think we would like to see potentially another Port Meeting inside of the Bay, not just at the Virginia Beach area.

MR. CARMICHAEL: Yes, I think that sounds good. I mean it would be very informative to find out just how far up in the Bay people are readily seeing these things now. Yes, I'll pass that on to Christina, for sure.

CHAIR WOODWARD: All right, if there are not any other questions for John, John, thank you for the update. We appreciate it, and we'll move on.

ELECT VICE-CHAIR

CHAIR WOODWARD: Our next agenda item is probably the most important one in the entire process here, and that is to elect a Vice-Chair. I'll ask the Board for any nominations for Vice-Chair of the Coastal Pelagics Management Board. Shanna.

MS. MADSEN: I would like to **move to elect Lynn Fegley from Maryland as the Vice-Chair of the Coastal Pelagics Management Board.**

CHAIR WOODWARD: Very good, we have a nomination from Shanna and a second from Dr. Rhodes. Any other nominations? Seeing none; **any opposition to the election of Lynn Fegley as Vice-Chair? I guess you didn't spread your money around well enough, did you? No opposition.**

We'll consider her elected as Vice-Chair, thank you very much, Lynn, for stepping up to do that.

ADJOURNMENT

CHAIR WOODWARD: Any other business to come before the Coastal Pelagics Board? Seeing none; any opposition to adjourning, because it is 12:00 noon or

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

close to it. No opposition, we will stand adjourned.
Thank you, everybody.

(Whereupon the meeting adjourned at 11:55a.m. on
Wednesday, January 24, 2024)

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM II TO AMENDMENT 1
TO THE INTERSTATE FISHERY MANAGEMENT PLAN
FOR ATLANTIC MIGRATORY GROUP COBIA**

***Recreational Allocation, Recreational Harvest Target Evaluations, and Measures
Setting Timeline***



This draft document was developed for Management Board review and discussion. This document is not intended to solicit public comment as part of the Commission/State formal public input process. Comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. If approved, a public comment period will be established to solicit input on the issues contained in the document.

**Draft for Board Review
April 2024**



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Draft Document for Board Review. Not for Public Comment.

Public Comment Process and Proposed Timeline

In October 2023, the Coastal Pelagics Management Board initiated the development of Draft Addendum II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Migratory Group Cobia to consider reallocation of the recreational harvest quota and consider changes to the overall allocation framework. In January 2024, the Board provided additional guidance expanding the scope of the Draft Addendum to address the process for future allocation updates, addressing uncertainty around harvest estimates, and the timeline for setting specifications. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission’s management of the Atlantic cobia recreational fisheries; the addendum process and timeline; and a statement of the problem. This document also provides management options 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 public comment period. The final date comments will be accepted is **Month, Day, 2024 at 11:59 p.m. (EST)**. Comments may be submitted at state public hearings or by mail or email. If you have any questions or would like to submit comment, please use the contact information below. Organizations planning to release an action alert in response to this Draft Addendum should contact Emilie Franke, Fishery Management Plan Coordinator, at efranke@asmfc.org or 703.842.0740.

Mail: Emilie Franke
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington VA. 22201

Email: comments@asmfc.org
(Subject: Cobia Draft Addendum II)

Date	Action
October 2023	Board initiated the Draft Addendum
January 2024	Board provided additional guidance on Draft Addendum scope
February – April 2024	Plan Development Team developed Draft Addendum document
May 2024	Board reviewed and approved Draft Addendum II for public comment
May – June 2024	Public comment period, including public hearings; written comments accepted through Month, Day, 2024
August 2024	Board reviews public comment, selects management measures, final approval of Addendum II

Table of Contents

1.0	Introduction.....	4
2.0	Overview	4
2.1	Statement of the Problem.....	4
2.2	Background.....	6
2.2.1	Status of the Stock	6
2.2.2	Status of Management.....	8
2.2.3	Status of the Fishery.....	9
3.0	Proposed Management Program.....	17
3.1	Recreational Allocation Framework.....	17
3.2	Updates to State/Regional Recreational Allocations.....	23
3.3	Data and Uncertainty in Recreational Landings Evaluations	24
3.4	Overage Response for Recreational Landings Evaluations with Rolling Averages	26
3.5	Timeline for Setting Commercial and Recreational Measures	26
4.0	Compliance Schedule	27
5.0	References.....	28
	Appendix. 2023 State Management Measures for Atlantic Migratory Group Cobia	29

1.0 Introduction

The Atlantic States Marine Fisheries Commission (Commission) is responsible for managing Atlantic cobia (*Rachycentron canadum*) from Rhode Island through Georgia in state waters (0-3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through the Interstate Fishery Management Plan for Atlantic Migratory Group Cobia (FMP) since 2017. Atlantic cobia are currently managed under Amendment 1 (2019) to the FMP and Addendum I to Amendment 1 (2020). The states of Rhode Island through Florida, except Connecticut, have a declared interest in the fishery and are responsible for implementing management measures consistent with the Interstate FMP as members of the Coastal Pelagics Management Board. Although Florida has a declared interest in the fishery, their cobia fisheries are managed as part of the Gulf of Mexico Migratory Group Cobia, which is not managed by the Commission, due to the cobia stock boundary at the Georgia-Florida border.

In October 2023, the Board initiated this addendum to address reallocation of recreational cobia quota based on more recent harvest data, recognizing that the distribution of Atlantic cobia harvest has changed since the terminal year in current allocation calculations (2015). In addition, the Board expressed interest in considering alternatives to the current state-by-state allocation system as noted in the approved Board motion from October 2023:

Move to initiate an addendum addressing recreational Atlantic cobia quota reallocation. The Board recommends that the Plan Development Team explore options outside of the current state-by-state quota allocation system, specifically a coastwide soft target with regional management measures designed to meet the coastwide soft target while considering the need for fishing opportunity based on the seasonality of the species in various regions.

In January 2024, the Board provided additional guidance on the scope of the addendum. The Board supported adding options to consider the process for updating allocations in the future, and adding options to consider accounting for uncertainty around harvest estimates. For allocation data timeframes, the Board supported considering 2018-2023 as an option with the exclusion of 2020 due to COVID-19 impacts on data collection. The Board also requested an option to consider a timeline of five years when setting recreational measures.

2.0 Overview

2.1 Statement of the Problem

Amendment 1 to the FMP established state-by-state allocations of the coastwide recreational harvest quota based on harvest data from 2006-2015. At the time of Amendment 1's approval in 2019, these were the most recent data available to inform allocations. The Amendment 1 allocation timeframe did not extend beyond 2015 due to cobia fishery closures in federal waters in 2016-2017 which impacted states' recreational harvests.

It has been five years since state-by-state allocations were updated in Amendment 1. Furthermore, the distribution of cobia landings has changed in recent years and is markedly different from the distribution of state landings observed during the Amendment 1 allocation data timeframe of 2006-2015. Over the last several years, recreational landings have increased in some Mid-Atlantic states while remaining relatively stable in southern states, indicating a possible range expansion as opposed to a stock shift. Additionally, two states have recently declared into the Atlantic cobia fishery (Rhode Island and New York) due to increasing presence of cobia in state waters. Updating the allocation data timeframe would account for these recent changes in landings and the extent of the fishery. If reallocation is not considered, it is likely that some Mid-Atlantic and *de minimis* states at the northern end of the range will continue to exceed their soft targets resulting in restrictive cobia measures that may not reflect the status of the stock.

In addition to concerns about the outdated allocation data timeframe, there are concerns about continuing to use a state-by-state allocation framework. The Interstate FMP originally implemented the state-by-state allocation framework to provide states with flexibility to adjust management to ensure state access when cobia were available and to suit their specific state needs, while still adhering to the federal catch limits at the time. Due to the high level of uncertainty associated with state-level recreational harvest estimates, there are concerns about continuing to use the state-by-state allocation framework (i.e., performance and management changes based on comparing state harvest estimates to state targets). Cobia harvest estimates from the Marine Recreational Information Program (MRIP) tend to have high percent standard errors (PSEs), which indicates lower precision and higher uncertainty. This is common for species like cobia which is a pulse/rare event fishery with highly variable landings year-to-year resulting from inconsistent interactions with cobia anglers. One way to reduce uncertainty is to increase the sample size, which could be accomplished by considering a regional allocation framework or coastwide allocation framework.

Uncertainty could also be addressed by considering the number of data years included in a rolling average, whether the use of point estimates is appropriate, and/or whether a state or region's performance should be considered on its own or considered relative to other state or region performance (i.e., if one region exceeds their target, and another region is below their target, consider whether that result informs the need for management action).

If cobia harvest continues to increase at the northern end of their range, states that currently have *de minimis* status may exceed that *de minimis* threshold over the next several years. When a state loses its *de minimis* status, it must be factored into the allocation calculations to have its own harvest target. The allocation percentage calculations may also need to change if the allocation source data are updated as part of MRIP's effort to evaluate potential bias in the Fishing Effort Survey (FES) estimates. If these changes to the allocation percentages must be done through the addendum process, that process could take several months. Those changes could be accomplished more quickly if the Board had the ability to make those specific updates to the allocations via Board action, which could be specified in this addendum.

Finally, there is concern about changing management measures too frequently under Amendment 1's specification process which limits specification setting to up to three years at a time. To avoid management 'whiplash', specifications could be set for a longer period of time.

2.2 Background

2.2.1 Status of the Stock

In 2020, the Board approved the SEDAR 58 Atlantic Cobia benchmark assessment for management use. This assessment 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, with a terminal year of 2017, provided new reference points (F40% and 75% of SSBF40%). These reference points were selected as they represent the fishing rate and spawning stock biomass (SSB) that allows the population to reach 40% of the maximum spawning potential. These reference points also serve as proxies for maximum sustainable yield-derived relationships due to insufficient data for cobia. Based on those reference points, the stock is not overfished and overfishing is not occurring.

The stock assessment primarily used fishery-dependent data (i.e., data from the recreational and commercial fisheries) as well as information on Atlantic cobia biology, life history, and movement to determine stock condition. The largest changes in SEDAR 58 since the previous assessment included updating data sources with new years of data, updating the natural mortality information, and using newly recalibrated recreational catch and effort data from MRIP.

SEDAR 58 estimated the last strong cobia year class entered the fishery in 2010 (age 1 in 2011) with the four most recent year classes at low levels of recruitment (age 1 in 2014-2017) (SEDAR, 2020). While the SSB remains above the overfished threshold, below-average recruitment led to a decreasing trend in SSB since 2014 (Figure 1). The fishing mortality rate has increased since the late 2000s but has not exceeded the overfishing threshold (Figure 2).

The next stock assessment for Atlantic Migratory Group Cobia (SEDAR 95) is a benchmark assessment currently underway with an estimated completion date of late 2025 or early 2026. The frequency of future stock assessments for Atlantic cobia is uncertain, and the assessment model and methods may change significantly as part of the current assessment, SEDAR 95. The time between completion of the previous stock assessment and the current assessment will be approximately 5-6 years.

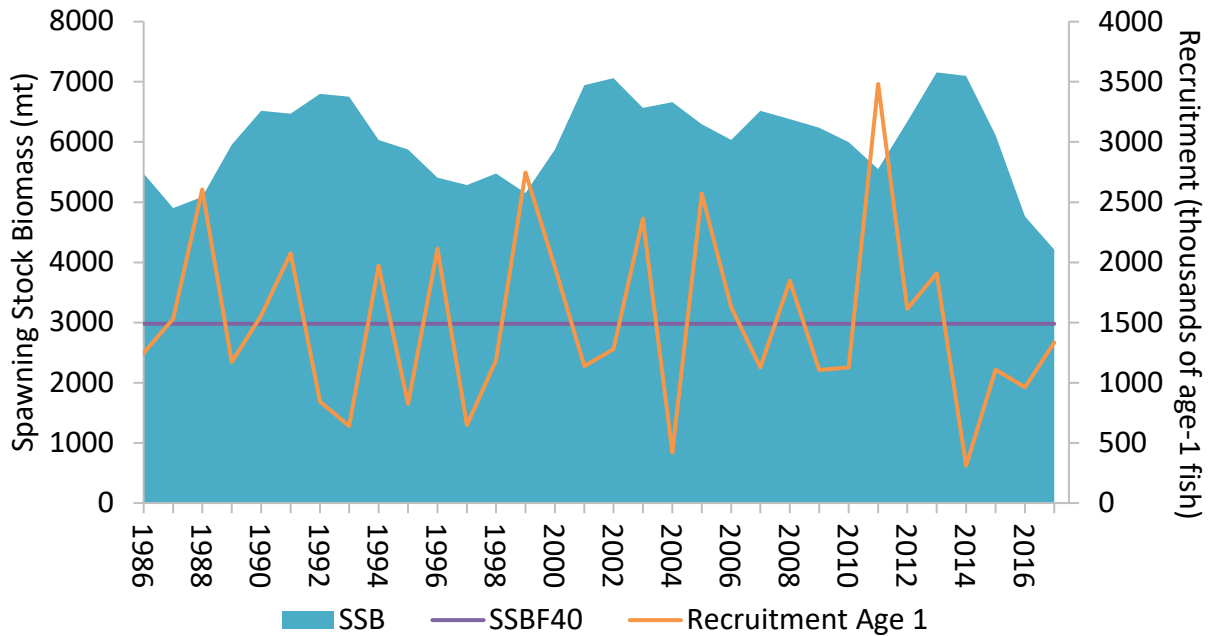


Figure 1. Atlantic Cobia spawning stock biomass (SSB) and recruitment of year 1 fish. (SEDAR, 2020)

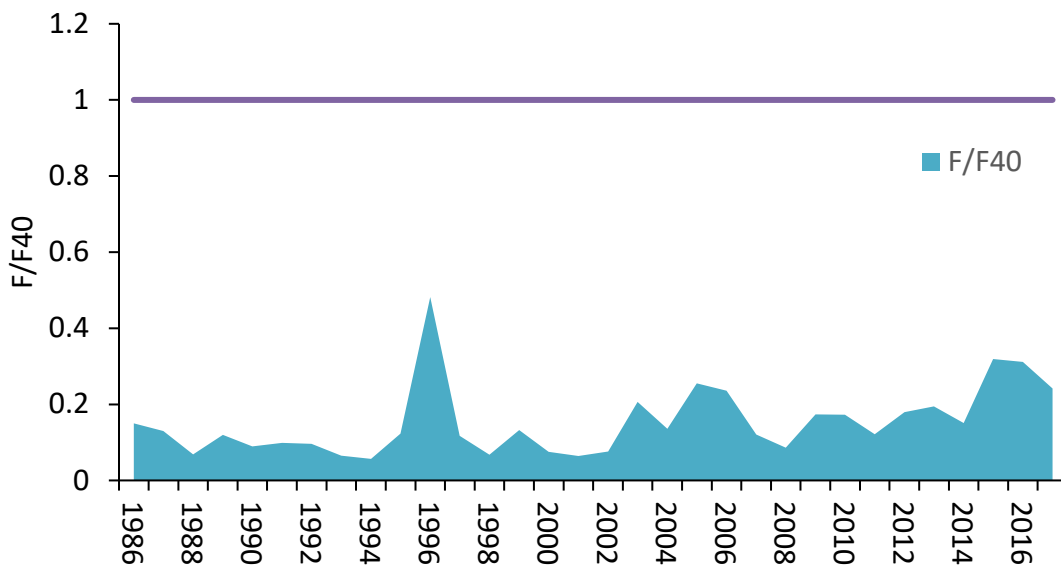


Figure 2. Atlantic Cobia fishing mortality (F) relative to the F40 reference point from 1986-2017. (SEDAR, 2020)

2.2.2 Status of Management

In 2019, Amendment 1 to the Interstate FMP transitioned management of Atlantic cobia from complementary management with the South Atlantic Fishery Management Council to sole management by the Commission. Amendment 1 allows the Board to specify a limited set of management measures for up to three years. This harvest specification process allows managers to specify regulations controlling future harvest through a Board vote, allowing managers to respond quickly to changes in the fishery or react following a stock assessment. Through the harvest specification process, the Board may set the coastwide total harvest quota (combined commercial and recreational harvest), vessel limits, possession or bag limits, minimum size limits, and the commercial closure triggering mechanism for up to three years.

In October 2020, the Board approved Addendum I to Amendment 1, which included modification of the allocation between the commercial and recreational sectors. Addendum I allocates 96% of the coastwide total harvest quota to the recreational sector and 4% of the quota to the commercial sector.

The recreational portion of the total harvest quota is further allocated to non-*de minimis* states as soft harvest targets with a 1% set aside for harvest in *de minimis* states. Amendment 1 defines the process by which the recreational quota is allocated to non-*de minimis* states where allocations are based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of the 10-year average landings from 2006-2015 and 50% of the 5-year average landings from 2011-2015. A 'soft' harvest target means that management measures are adjusted to reduce harvest to the target, but any overage does not need to be paid back. 'Hard' harvest targets (which would have required overage payback) were considered as part of the original Interstate FMP, but soft targets were selected as the management approach.

For the 2024-2026 fishing seasons, the total harvest quota for both sectors combined is 80,112 fish, which is the same harvest quota that has been in place since 2020. The coastwide recreational harvest quota (96% of the total harvest quota) is 76,908 fish. The current management program manages the recreational fishery with a 1 fish bag limit and a minimum size limit of 36 inches fork length (FL) or 40 inches total length (TL) for non-*de minimis* states. Season restrictions and vessel limits are determined by individual states, but may not exceed 6 fish per vessel. Recreational regulations for each state are provided in the Appendix.

Within the coastwide recreational harvest quota, Georgia, South Carolina, North Carolina, and Virginia have the following state recreational harvest targets based on the state-by-state-allocations defined in Amendment 1 to the FMP:

- Georgia - 7,229 fish
- South Carolina - 9,306 fish
- North Carolina - 29,302 fish
- Virginia - 30,302 fish

Recreational harvest of state-specific allocations are evaluated over three-year time periods (or when the total harvest quota changes). Each non-*de minimis* state evaluates recent harvest as an average of years with the same recreational management measures against the state-specific soft targets. If a state's averaged recreational harvest exceeds its harvest target, the state must adjust its management measures to reduce harvest to achieve the target, unless otherwise specified by the Board. If a state's harvest is below their target for at least two consecutive years, the state may liberalize management measures, if desired, to achieve its target. Changes to management measures for states with overages or states that wish to liberalize must be reviewed by the Cobia Technical Committee and approved by the Board prior to implementation.

De minimis states collectively have a 1% set aside of the coastwide recreational quota (769 fish) and are exempt from completing harvest target evaluations. The FMP allows states to request recreational *de minimis* status if their recreational landings in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period. A recreational *de minimis* state may 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 its recreational fishery to 1 fish per vessel per trip with a minimum size of 33 inches FL (or 37 inches TL).

The commercial fishery has an annual coastwide commercial quota of 73,116 pounds (4% of total harvest quota) for the 2024-2026 fishing seasons, which is the same quota that has been in place since 2020. The current management measures for the commercial fishery include a 33 inches FL (or 37 inches TL) minimum size limit and 2 fish per person limit, with a 6 fish maximum vessel limit. Non-*de minimis* states are required to monitor commercial cobia landings in-season and submit regular landings updates to the Commission. The commercial Atlantic cobia fishery will close once the commercial quota is projected to be reached as determined by the updated Addendum I methodology to calculate the commercial trigger for in-season closures. Commercial regulations for each state are listed in the Appendix.

2.2.3 Status of the Fishery

Note: Since this addendum primarily considers management of the recreational fishery, the following information focuses on Atlantic cobia recreational fisheries. For information on the commercial fishery, see the Review of the FMP for Atlantic Cobia: 2022 Fishing Year (ASMFC 2023).

[Note for May 2024 Board meeting: This section includes preliminary 2023 MRIP data. Before being released for public comment, this will be updated to reflect final 2023 MRIP data.]

Recreational harvest has fluctuated throughout the time series, often in rapid increases or declines. Average recreational harvest over the entire time series (1981-2023) is 1.1 million pounds, or about 40,500 fish (Figure 3). More recently, recreational harvest has increased to the series high of 113,939 fish coastwide in 2018, before decreasing to an average of 86,286 fish from 2018-2023.

Recreational releases of live fish have generally increased throughout the time series (Figure 3). In 2023, 246,204 recreationally-caught fish were released, a 22% increase from 2022. This coincides with the increase in recreational landings in 2023 from 2022. From 2018-2023, an average 76% of cobia caught recreationally were released alive each year. This is higher than the average 65% released alive during the previous five-year period of 2013-2017.

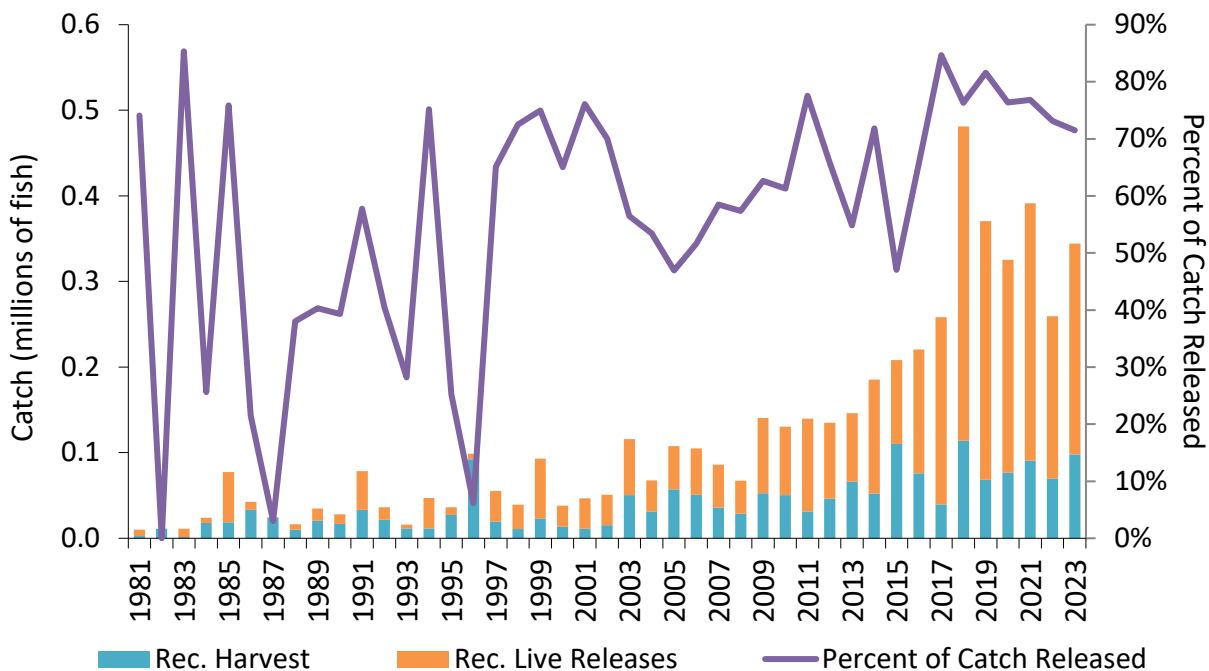


Figure 3. Recreational catch (harvest and live releases) of Atlantic cobia (numbers) and the proportion of catch that is released. *2023 data are preliminary.

From 2018-2023, Virginia has harvested the majority of the coastwide recreational cobia, with an average of 70% of the total fish by count (average of 60,863 fish/year) (Table 1, Figure 4). North Carolina has the second highest recreational harvest with an average of 14% of the total fish by count (average of 12,393 fish) for the same timeframe. South Carolina and Georgia have averaged 7% and 5% of the total coastwide harvest annually for the same timeframe (6,058 and 4,838 fish respectively), and the *de minimis* states made up the remainder (3% on average annually, 2,134 fish). Over the last several years, recreational landings have increased in some Mid-Atlantic states while remaining relatively stable in southern states, indicating a possible range expansion as opposed to a stock shift (Figure 4).

Virginia has harvested above its state recreational target each year since the current state-by-state targets were implemented in 2020 (Table 1). Georgia harvested above their state target in 2021 and 2023. South Carolina has been harvesting just at or under their target each year, while North Carolina has been under their harvest target each year.

From 2018-2023 the *de minimis* states (currently north of Virginia) have exceeded their 1% set aside in 4 of the 6 years. The highest harvest by the *de minimis* states for the time period occurred in 2021, with a total of 5,334 fish or 694% of the *de minimis* allocation. This equates to 6% of coastwide landings that year. States north of Virginia currently have recreational *de minimis* status as each of those states' recreational harvest in two of the previous three years was less than 1% of annual coastwide landings. Florida also has recreational *de minimis* status since its fishery targets Gulf of Mexico Migratory Group Cobia (not Atlantic Migratory Group Cobia).

The percent standard errors (PSEs) associated with recreational cobia harvest estimates from MRIP can be quite high due to the pulse/rare event nature of the cobia fishery. Table 2 summarizes the PSEs for each state's recreational cobia harvest estimates over the last six years.

Table 1. Cobia recreational harvest by state in number of fish from 2018-2023 . Data Source: MRIP. *2023 data are preliminary.

Year	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	Total Rec. Harvest
2018		569			581	206	80,679	25,331	6,340	233	113,939
2019							55,770	10,090	2,381	72	68,313
2020		219				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
2022			3,462	711			39,668	12,330	6,988	6,641	69,800
2023*	361						81,641	572 ⁺	4,129	11,368	98,071
Soft Target for 2020-2024	769 <i>de minimis</i> set-aside						30,302	29,302	9,306	7,229	76,908

⁺Note: North Carolina Division of Marine Fisheries (NCDMF) staff looked into the very low harvest estimate for 2023 and found that windy weather limited the number of fishable days, and cobia were available for about a week. Data showed that MRIP intercepts in North Carolina were considerably lower in 2023 (38) compared to 2019 (85), 2021 (60), and 2022 (78). NCDMF staff noted that the low harvest estimate is also likely influenced by high percent standard error (PSE) because cobia is a rare event species and a pulse fishery.

Table 2. Percent standard error (PSE) for each state’s recreational cobia harvest estimate in number of fish from 2018-2023. Red indicates a PSE greater than 50 (MRIP does not support use of the estimate). Yellow indicates a PSE between 30 and 50 (MRIP cautions use of the estimate in fisheries management). Source: MRIP. *2023 data are preliminary.

Year	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA
2018		100.4			98.1	66.7	35.8	33.2	42.2	53.9
2019							22.6	38.6	70.6	56.9
2020		102.7				69.5	25	37.9	39.1	92.4
2021				92.4		43.8	22.9	39.1	41.9	41.4
2022			82.3	102.2			25.1	47	55.9	72.4
2023*	71.9						34.2	57.3	61.9	56

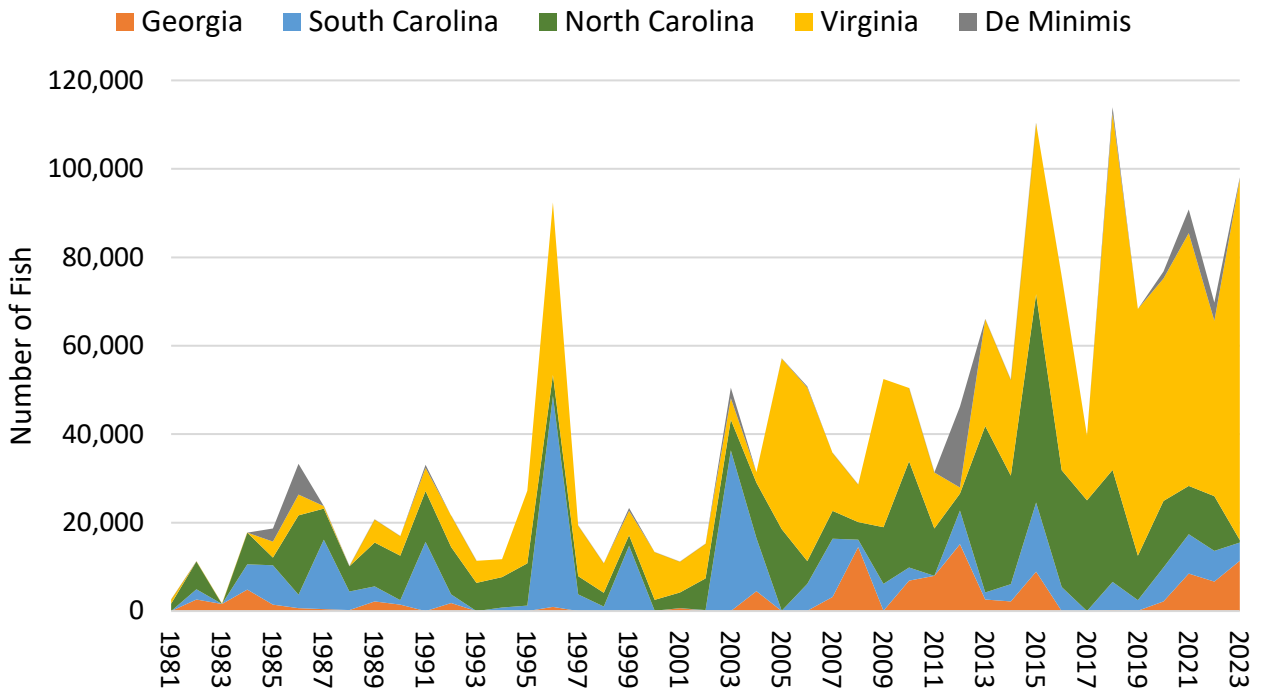


Figure 4. Cobia recreational harvest by state in number of fish. *De minimis* states are states north of Virginia. *2023 data are preliminary.

The availability of cobia, and therefore harvest timing, differs along the coast. From 2018-2023 (excluding 2020), the percent of recreational harvest peaked in wave 3 for Georgia, South Carolina, and North Carolina at approximately 70% of their total recreational harvest (Figure 5). Total recreational harvest peaked in wave 4 for Virginia (~60% of its recreational harvest). For states north of Virginia, all of which are *de minimis* states, harvest has not been observed every year. When harvest has been observed during this time period, most of Maryland’s recreational harvest and all recreational harvest in Delaware, New York, Connecticut, and Rhode Island occurred during Wave 4, while all recreational harvest has occurred during wave 5 for New Jersey during the same time period.

The distribution of total catch throughout the year is slightly different than the distribution of harvest for some states. For Georgia, South Carolina, and North Carolina, total catch in 2018-2023 (excluding 2020) was more spread out among Waves 3, 4, and 5, as compared to consistent peaks in Wave 3 for harvest (Figure 6). Virginia’s total catch is more evenly spread between Waves 3 and 4, as compared to a sharper harvest peak in Wave 4. For states north of Virginia, most catch has been observed during Wave 4, with New Jersey seeing catch only in Wave 5 in the most recent years.

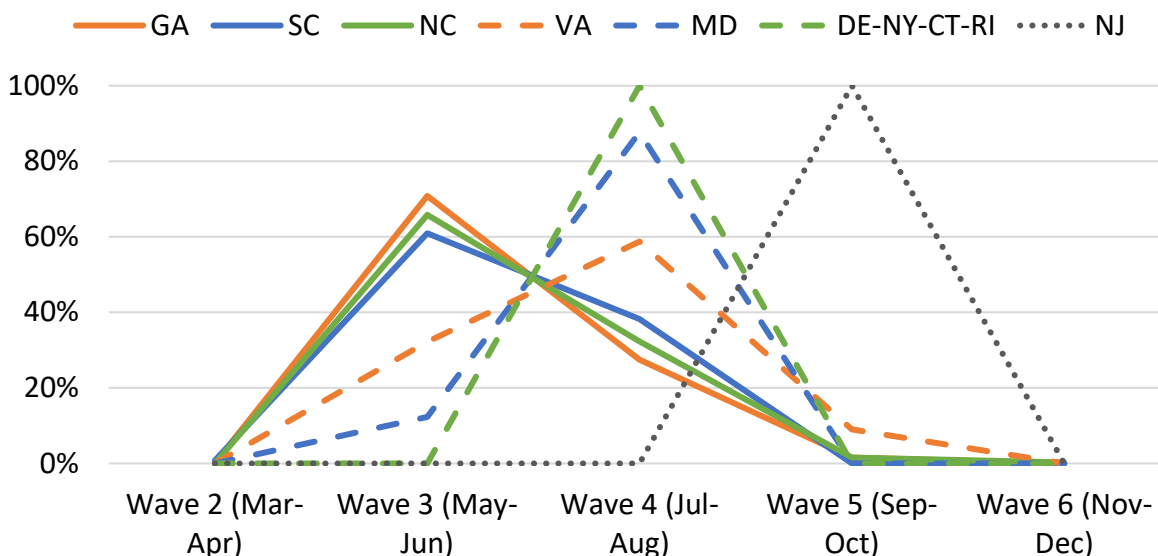


Figure 5. Percent of harvest of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). *2023 data are preliminary. Note: MRIP sampling does not occur in any state during Wave 1 (Jan-Feb) except for North Carolina. North Carolina’s estimated cobia harvest during Wave 1 for this time period was 0 fish.

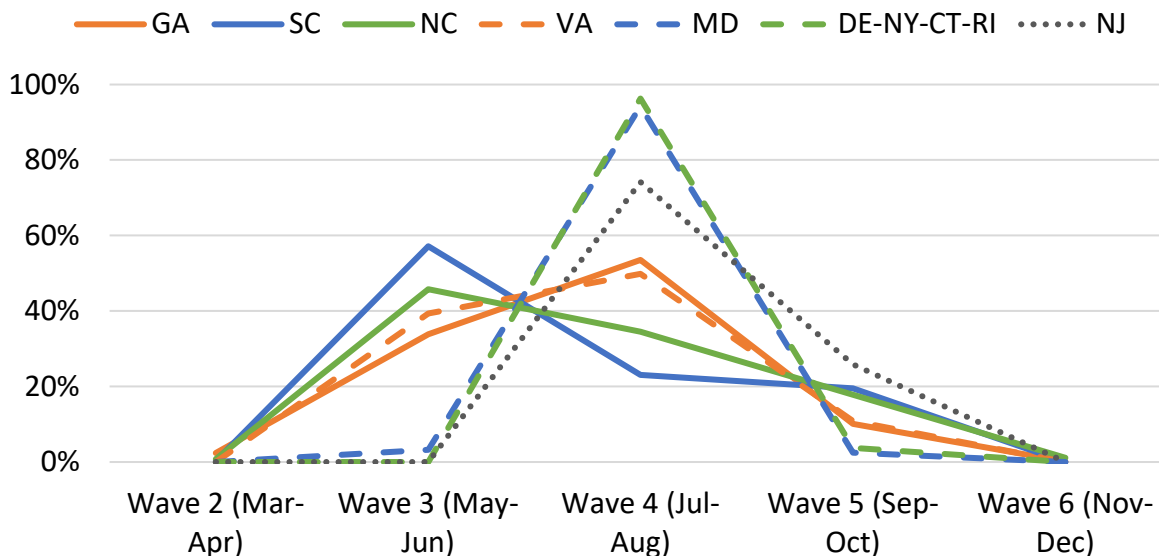


Figure 6. Percent of catch of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). *2023 data are preliminary. Note: MRIP sampling does not occur in any state during Wave 1 (Jan-Feb) except for North Carolina. North Carolina’s estimated cobia harvest during Wave 1 for this time period was 0 fish.

2.2.3.1 MRIP Study of Fishing Effort Survey Bias

In August 2023, NOAA Fisheries released findings of a pilot study it conducted to evaluate potential sources of bias in the recreational Fishing Effort Survey (FES) questionnaire design. This study found switching the sequence of questions in the survey resulted in fewer reporting errors and fishing effort estimates that were generally 30 to 40% lower for shore and private boat modes compared to estimates produced from the current design. However, results varied by state and fishing mode, and impacts on a pulse fishery such as cobia are unknown. These results are based on a pilot study that had a limited time frame (six months) and geographic scope (only four states included). Additional extensive work needs to be done to determine the true impacts of the survey design. NOAA Fisheries is conducting a larger-scale follow-up study over the course of the next few years. At this time, the potential impacts to recreational catch estimates and stock assessments are unknown.

Recent landings information suggests that Atlantic cobia are extending their range northward. Specifically, *de minimis* states have exceeded the 1% *de minimis* set-aside every year between 2020 and 2022, and landings in Mid-Atlantic states have increased over the timeseries. Given these trends in landings, unknown impacts of the FES follow-up study, and lack of updated cobia stock assessment projections, this Draft Addendum is being considered *prior to* potential updates to MRIP catch estimates. A new benchmark stock assessment for Atlantic cobia will be completed by 2026 and could explore how a possible overestimation of recreational catch may impact cobia biomass. Additionally, this Draft Addendum presents an option that would allow

allocations to be quickly updated under certain circumstances, such as potential updated MRIP catch estimates from this study.

2.2.3.2 Summary of Non-De Minimis State Fisheries

Virginia: Virginia's recreational cobia fishery has grown substantially since 2016. Two of the main fishing methods are sight-casting and pier fishing. Sight-casting from custom towers on the top of boats has become more popular than the traditional method of bottom fishing. This shift could be tied to an increase in effectiveness of targeting cobia via sight-casting because of their feeding habits and tendency to swim in schools on the surface of the water. There is also a shore-specific fishery for cobia from the four large piers found within coastal Virginia. While cobia are available, effort will increase on piers as the fish are moving through different parts of the Chesapeake Bay and oceanfront. Anglers will target cobia when they are accessible from the piers, but effort will decrease to almost zero once the fish have migrated to other areas.

While other states may experience pulses of abundance in cobia as they migrate up and down the Atlantic coast, cobia can be found in Virginia waters from mid-May through mid-October. This continuous season in Virginia attracts anglers traveling from out of state to target cobia, contributing to the already large yearly catches from residents. Even with the continuous season, catch peaks from May-June when the fish enter the Bay, and again in August-September as they leave the Bay.

From 2016-2022, Virginia operated the Recreational Cobia Mandatory Reporting Program (RCMRP), a monitoring program to survey recreational cobia anglers. The RCMRP required a free cobia permit for all captains or operators of vessels, as well as those who fished without a vessel (i.e. from a shore, pier, etc.). All permittees were responsible for reporting their cobia activity during the recreational season. Recreational reporting for cobia harvest and releases was mandatory, but revocation of permits was not enforced during the beginning stages of development. Due to low reporting rates, in 2019, reporting became mandatory with revocation to increase reporting rate. That is, permittees who did not report their participation in the recreational cobia fishery within 21 days after the close of the season were ineligible for the following year's recreational cobia permit. At the peak of the program in 2020, there were 8,256 permit holders submitting 12,307 trips total, with a catch of 24,020 cobia (includes kept and released fish). Ultimately the RCMRP was ended in 2022 due to unnecessary burden on recreational anglers. Since the data were not statistically sound enough for any stock assessment use, the program changed to voluntary reporting to try to fill the gap for recreational release data.

North Carolina: In North Carolina, the recreational cobia fishery is seasonal, with cobia primarily available in state waters from late spring through early fall. Cobia are landed mostly in the spring and summer months corresponding with their spring spawning migration (Smith, 1995). Peak landings occur during the latter part of May into June and quickly diminish thereafter. However, recreational landings of cobia can occur through October. Historically, recreational fisherman targeted cobia from a vessel by anchoring and fishing with dead, live, or

a mixture of both bait types near inlets and deep water sloughs inshore (Manooch, 1984). In the early 2000s, fishermen began outfitting their vessels with towers to gain a higher vantage point to spot and target free-swimming cobia along tidelines and around bait aggregations. This method of fishing actively targets cobia in the nearshore coastal zone and has become the primary mode of fishing in most parts of the state.

Despite increased fishing pressure due to a growing number of charter and recreational boats, North Carolina recreational cobia landings have been lower the last couple years relative to previous years. Weather conditions, including persistent winds, have hindered fishing efforts by reducing the number of fishable days. The North Carolina cobia fishery is a pulse fishery, with the primary wave of fish historically arriving in early June and being available for about 6 weeks. In recent years, anecdotal observations suggest the cobia are migrating to Chesapeake Bay much earlier, in April and May, and are residing in North Carolina for a shorter period of time, possibly influenced by temperatures and/or currents.

South Carolina: South Carolina's recreational cobia fishery occurs in both nearshore waters and around natural and artificial reefs offshore. Historically, the majority of cobia landings have occurred in state waters in and around spawning aggregations from April through May. However, due to intense fishing pressure in the inshore zone, annual landings of cobia have fallen drastically since 2009, such that the majority of recreationally caught cobia in South Carolina now come from offshore (federal) waters. Legislative action was taken in 2016 to help protect the inshore fishery by putting a no take of cobia during the month of May, their peak spawning period inshore, within state waters south of Edisto Island. This has also helped shift fishing effort offshore. Due to the size increase from 33 inches FL to 36 inches FL in 2018, most of the captured cobia are under the size limit and are released. Anglers begin targeting cobia in late April-early May with the peak of the season typically occurring May into early June. Late season catches can occur on nearshore reefs through October depending on water temperatures. Additionally, anglers have seen an increase in shark predation over the past few years.

Georgia: A large recreational fishery exists for cobia in Georgia. Most of this fishery occurs in nearshore waters around natural and artificial reefs. While there are some instances of cobia being caught inshore and on beach front piers in Georgia, most landings come from federal waters. Georgia anglers generally begin targeting cobia in late April with peak harvest occurring in May/June. Anglers continue to catch cobia off Georgia through August, and data from MRIP shows that catch of cobia off Georgia peaks during Wave 4 (July-August). There are anecdotal reports of late season (October-December) catch that sometimes occurs on nearshore reefs depending on water temperatures. These are likely migratory fish that are moving back through waters off Georgia as they head south from areas north of Georgia. However, these fall runs are sporadic and may not be observed in MRIP data.

Some evidence suggests there may be two distinct groups of cobia that occur in waters off Georgia. One, a north/south migrating group of fish that appears in early spring as part of their northward migration. This group of fish may account for the peak in landings that occurs in

May/June in Georgia's cobia fishery. And the second, a group of east/west migrating fish that are present off Georgia through the summer months that then retreat to deeper offshore waters to overwinter along the edge of the continental shelf. This theory is supported by the persistence of fish off Georgia well into the summer months (July/August) and after the northward migrating group of cobia has moved out of Georgia waters and into regions north of Georgia.

3.0 Proposed Management Program

Draft Addendum II proposes options regarding:

- recreational allocation framework (Section 3.1);
- updates to allocations (Section 3.2);
- data and uncertainty in recreational landings evaluation (Section 3.3);
- overage response for recreational landings evaluation (Section 3.4); and,
- timeline for setting specifications (Section 3.5).

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.

3.1 Recreational Allocation Framework

The following options would determine how recreational quota is allocated among states (Options A-B), regions (Option C), or coastwide (Option D).

The options consider three different data timeframes as the basis for allocation. One timeframe considers only the most recent five years of harvest data, while the other two timeframes consider a weighted combination of the most recent three or five years plus the last ten years of harvest data. Including the ten-year component gives some consideration to previous harvest distribution before the majority of harvest shifted north.

For all timeframe options, 2016, 2017, and 2020 recreational catch data were excluded from the calculations. Cobia closures in federal waters and some states' waters during 2016 and 2017 resulted in those years being excluded from allocation calculations. Similarly, 2020 was excluded due to COVID-19 impacts on MRIP sampling and use of imputed data for 2020 recreational harvest estimates.

For state-by-state allocation frameworks (Options A-B), *de minimis* states do not have an allocation based on landings, but rather have a set-aside to account for landings across all *de minimis* states. *De minimis* states are exempt from completing harvest target evaluations and have a separate set of standard recreational measures from which to choose. *De minimis* states must request *de minimis* status each year through the compliance report process. The FMP allows states to request recreational *de minimis* status if their recreational landings in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period.

For a regional (Option C) or coastwide (Option D) allocation framework, states could still request *de minimis* status for the recreational fishery, however, *de minimis* states would be part of a larger region subject to regional or coastwide harvest target evaluations. *De minimis* states would be subject to the management measures determined for that region or the coast. So, the current default *de minimis* measures would become irrelevant.

For all allocation framework options, conservation equivalency (CE) is not allowed. The state-by-state allocation framework already affords each state the flexibility to decide how to adjust their management measures to meet their target. The objective of a regional or coastwide allocation framework is to achieve consistent measures within a region or coastwide if a future reduction or liberalization is needed. Seasons could vary within a region or along the coast based on cobia availability, but the size limit and vessel limit would need to be consistent among all states in a region or coastwide. Currently, size limits are mostly consistent among states, with the exception of *de minimis* states. Preliminary vessel limit analysis indicates anglers in states with higher vessel limits are not harvesting their full limit, so reducing vessel limits in those states to be consistent with others in the region or coastwide would not significantly reduce harvest.

It is important to note that upcoming changes to the MRIP Fishing Effort Survey (FES) estimates may affect the state-by-state and regional allocation percentages presented in the below options. If MRIP FES estimates for cobia are changed in the future, associated updates to the selected allocations would need to be considered.

[Note for May 2024 Board meeting: The allocation percentage options listed below include preliminary 2023 MRIP data. Before being released for public comment, the allocation percentages in all options will be updated to reflect final 2023 MRIP data.]

Option A. Status Quo State-By-State Harvest Allocations

Under this option, the recreational quota for Atlantic cobia would continue to be allocated on a state-by-state basis as outlined in Amendment 1. Percentage allocations are based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of the 10-year average landings from 2006-2015 and 50% of the 5-year average landings from 2011-2015. To account for harvests in *de minimis* states, 1% of the recreational quota is set aside.

The recreational landings evaluation process and resulting required changes to state measures would proceed as outlined in Amendment 1.

Option B. Updated State-By-State Harvest Allocations

Under this option, recreational quota would continue to be allocated on a state-by-state basis, including a set aside for *de minimis* states. The allocations in this option include recent data and thereby reflect changes seen in harvest distribution, and the *de minimis* set aside is increased to 5% to account for increased harvest in *de minimis* states in recent years. This option considers three allocation timeframes outlined in options B1, B2, and B3.

If this option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until a state needs to take a reduction based on evaluation of the state's landings against its harvest target, whichever comes first. States would not be able to liberalize measures before completion of SEDAR 95.

If a state needs to change management measures, the state would work with the Cobia Technical Committee to propose a set of management measures to meet the reduction or, after completion of SEDAR 95, the liberalization. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation. Options B1, B2, and B3 all include a 5% set-aside of the recreational quota to account for harvests in *de minimis* states.

Option B1. Five-Year Average Allocation Timeline

Recreational quota allocated state-by-state based on states' percentages of the coastwide historical landings in numbers of fish, derived as 100% of 5-year average landings from 2018-2023 (excluding 2020).

Option B2. Weighted Ten-Year and Five-Year Average Allocation Timeline

Recreational quota allocated state-by-state based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 5-year average landings from 2018-2023 (excluding 2020).

Option B3. Weighted Ten-Year and Three-Year Average Allocation Timeline

Recreational quota allocated state-by-state based on states' percentages of the coastwide historical landings in numbers of fish, derived as 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 3-year average landings from 2021-2023.

Table 3. State-by-state recreational allocation options.

State	Option A Status Quo	Option B1 5 Year Average	Option B2 Weighted 10 Year & 5 Year Average	Option B3 Weighted 10 Year & 3 Year Average
	50% 2006-2015 + 50% 2011-2015	100% 2018- 2023	50% 2014-2023 + 50% 2018-2023	50% 2014-2023 + 50% 2021-2023
<i>De minimis</i> Set Aside	1%	5%	5%	5%
Virginia	39.4%	69.2%	64.5%	63.3%
North Carolina	38.1%	13.2%	17.4%	15.9%
South Carolina	12.1%	6.5%	7.1%	7.8%
Georgia	9.4%	6.1%	6.1%	8.0%
Total	100%	100%	100%	100%

Option C. Regional allocations

Under this option, recreational quota would be allocated among regions. Recreational management measures in a region would eventually need to consist of the same size limit and vessel limit for all states in the region. Seasons may differ among states in a region.

Currently, vessel limits and seasons vary by state along the coast. Size limits are mostly uniform with the exception of *de minimis* states that have adopted the default *de minimis* measures specified in the FMP. If this regional allocation option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until a region needs to take a reduction based on evaluation of the region’s landings against the harvest target, whichever comes first. At that time, the states in the region would work with the Cobia Technical Committee to determine a set of management measures for all states in the region to meet the reduction (i.e., uniform size limit and vessel limit; seasons may differ). Regions would not be able to liberalize measures before the completion of SEDAR 95. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

Option C considers different regional definitions based on:

- whether the coast is divided into two or three regions,
- which states are in each region, and
- three different allocation timeframes based on historical landings in numbers of fish:

- 5-Year Average. 100% of 5-year average landings from 2018-2023 (excluding 2020);
- Weighted 10-year/5-year Average. 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 5-year average landings from 2018-2023 (excluding 2020);
- Weighted 10-year/3-year Average. 50% of 10-year average landings from 2014-2023 (excluding 2016, 2017, 2020) and 50% of the 3-year average landings from 2021-2023.

This results in a total of twelve options as outlined in Table 4. Options C1-C6 consider a southern region of South Carolina and Georgia, while Options C7-C12 consider a southern region of North Carolina, South Carolina, and Georgia.

Options C1, C2, C3. Two Region Allocation – Northern Region (RI-NC) and Southern Region (SC-GA)

Options C1, C2, and C3 consider two regions where the northern region consists of the states from Rhode Island through North Carolina, and the southern region consists of South Carolina and Georgia with the above noted allocation timeframes and detailed in Table 4.

Option C4, C5, C6. Three Region Allocation – Northern Region (RI-DE), Mid-Atlantic Region (MD-NC), Southern Region (SC-GA)

Options C4, C5, and C6 consider three regions where the northern region consists of the states from Rhode Island through Delaware, the Mid-Atlantic region consists of states from Maryland through North Carolina, and the southern region consists of South Carolina and Georgia with the above noted allocation timeframes and detailed in Table 4.

Option C7, C8, C9. Two Region Allocation – Northern Region (RI-VA) and Southern Region (NC-GA)

Options C7, C8, and C9 consider two regions where the northern region consists of the states from Rhode Island through Virginia and the southern region consists of the states from North Carolina through Georgia with the above noted allocation timeframes and detailed in Table 4.

Options C10, C11, C12. Three Region Allocation – Northern Region (RI-DE), Mid-Atlantic Region (MD-VA), Southern Region (NC-GA)

Options C10, C11, and C12 consider three regions where the northern region consists of the states from Rhode Island through Delaware, the Mid-Atlantic region consists of states from Maryland through Virginia, and the southern region consists of states from North Carolina through Georgia with the above noted allocation timeframes and detailed in Table 4.

Table 4. Regional recreational allocation options.

Data Timeframe	100% 2018-2023	50% 2014-2023 + 50% 2018-2023	50% 2014-2023 + 50% 2021-2023
	Option C1	Option C2	Option C3
Northern Region RI-CT-NY-NJ-DE-MD-VA-NC	87.24%	86.65%	83.95%
Southern Region Two State SC-GA	12.76%	13.35%	16.05%
Total	100%	100%	100%
	Option C4	Option C5	Option C6
Northern Region RI-CT-NY-NJ-DE	1.53%	1.31%	1.65%
Mid-Atlantic Region MD-VA-NC	85.71%	85.34%	82.30%
Southern Region Two State SC-GA	12.76%	13.35%	16.05%
Total	100%	100%	100%
	Option C7	Option C8	Option C9
Northern Region RI-CT-NY-NJ-DE-MD-VA	73.77%	68.69%	67.67%
Southern Region Three State NC-SC-GA	26.23%	31.31%	32.33%
Total	100%	100%	100%
	Option C10	Option C11	Option C12
Northern Region RI-CT-NY-NJ-DE	1.53%	1.31%	1.65%
Mid-Atlantic Region MD-VA	72.25%	67.38%	66.02%
Southern Region Three State NC-SC-GA	26.23%	31.31%	32.33%
Total	100%	100%	100%

Option D. Coastwide Target

Under this option, there would be no state-specific or regional harvest targets, but rather only the coastwide recreational harvest quota. A coastwide size limit and vessel limit would eventually be established for all states, but the season may be different for each state or group of states based on cobia availability in each state. 'Coastwide' for Atlantic cobia refers to states north of the Georgia-Florida border.

Currently, vessel limits and seasons vary by state along the coast. Size limits are mostly uniform with the exception of *de minimis* states that have adopted the default *de minimis* measures specified in the FMP. If this coastwide allocation option is selected, recreational management measures would remain status quo in each state until completion of the next stock assessment (SEDAR 95), or until the coast needs to take a reduction based on evaluation of the coastwide landings against the coastwide harvest quota, whichever comes first. At that time, all states would work with the Cobia Technical Committee to determine a set of management measures for all states along the coast to meet the reduction (i.e., uniform size limit and vessel limit; seasons may differ). The coast would not be able to liberalize measures before the completion of SEDAR 95. Changes to management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

3.2 Updates to State/Regional Recreational Allocations

Option A. Status Quo.

Under this option, recreational allocations can only be changed through the ASMFC addendum process.

Option B. Allocation Changes via Board Action

Under this option, the Board may change recreational allocations via Board action (i.e., voting at a Board meeting; no addendum needed) in the following scenarios:

- A state loses *de minimis* status and therefore needs to be allocated a state-specific harvest target (only applicable under a state-by-state allocation framework).
- Harvest estimates for the allocation source data years are revised (i.e., if MRIP estimates are updated).

If the Board is considering changing allocation via Board action under one of the above scenarios, the Cobia Technical Committee would re-calculate allocations based on the associated scenario and bring the new allocations to the Board for consideration. In the case of a state losing *de minimis* status, the Technical Committee will calculate the new allocations to be presented to the Board at the Commission's Summer Meeting. Following the Summer Meeting when the Board considers state *de minimis* requests for that year, the Board could approve new allocations at the Commission's Annual Meeting in the fall. This faster process of Board action, as compared to the longer addendum process, would be more efficient to address the above scenarios, which could occur multiple times over the next several years.

If the Board would like to consider allocation changes outside the scenarios listed above, an addendum is needed to change state/regional recreational allocations.

3.3 Data and Uncertainty in Recreational Landings Evaluations

Option A. Status Quo.

Under this option, MRIP harvest point estimates and up to a three-year rolling average would continue to be used for comparing recreational harvest to harvest targets.

Recreational landings for each non-*de minimis* state (or each region or the coast depending on allocation framework selected in Section 3.1) will be evaluated against that state's/region's/coastwide target as an average of annual landings. The timeframe for this average will only include years with the same management measures (i.e., measures have not changed from year to year). If the same management measures have been in place for at least three years, the timeframe will include the three most recent years under these regulations (a rolling 3-year average). If the same management measures have been in place for less than three years, the timeframe will include all years under the same regulations.

If a regional or coastwide framework is selected, states in each region or coastwide will have different management measures from each other until the measures are changed to a uniform set of measures (same size and vessel limit; seasons may differ) when a reduction or liberalization occurs. This does not affect the evaluation. This does not affect the evaluation; the evaluation timeframe only depends on if measures have changed from year to year, not if they differ between states.

Option B. Extend Rolling Average to Five Years

Under this option, MRIP harvest point estimates would continue to be used for comparing recreational harvest to harvest targets, but the rolling average timeframe would extend to five years. This allows for inclusion of additional data years, which can be more informative given the variability in and sometimes imprecision of cobia landings from year to year.

Recreational landings for each non-*de minimis* state/region/coastwide would be evaluated against that state's/region's/coastwide target as an average of annual landings. The timeframe for this average will only include years with the same management measures (i.e., measures have not changed from year to year). If the same management measures have been in place for at least five years, the timeframe will include the five most recent years under these regulations (a rolling 5-year average). If the same management measures have been in place for less than five years, the timeframe will include all years under the same regulations.

If a regional or coastwide framework is selected, states in each region or coastwide will have different management measures from each other until the measures are changed to a uniform set of measures (same size and vessel limit; seasons may differ) when a reduction or liberalization occurs. This does not affect the evaluation; the evaluation timeframe only depends on if measures have changed from year to year, not if they differ between states.

Provision on the Use of Confidence Intervals

If a regional or coastwide allocation framework is selected, the Board could decide in the future (via Board vote) to switch from a rolling average approach to a confidence interval approach for harvest target evaluation. Using confidence intervals instead of a rolling average for evaluation would more directly account for the uncertainty around the MRIP harvest point estimates.

The confidence interval approach would require PSEs and confidence interval values for the regional or coastwide sum total harvest estimates, which are currently only available via MRIP's custom data request process. The confidence interval approach cannot be used for a state-by-state allocation framework due to larger confidence intervals around some state-specific estimates.

For this approach, when regional or coastwide harvest is evaluated against the harvest target to determine if a change is needed, the Cobia Technical Committee would consider the 95% confidence intervals associated with MRIP harvest point estimates for the evaluation timeframe. If the same management measures have been in place for at least three or five years (depending on whether the Board selects a three- or five-year approach above), the timeframe will include the most recent three or five years under these regulations. If the same management measures have been in place for less than three or five years, the timeframe will include all years under these regulations.

If the harvest estimate's lower bound confidence interval is above the harvest target for a majority of the years within the evaluation timeframe, this indicates harvest has been above the target, and the region/coast must adjust its management measures to reduce harvest to achieve the target. If the harvest target falls within the harvest estimate's confidence interval for a majority of the years within the evaluation timeframe, status quo measures may be maintained. If the harvest estimate's upper bound confidence interval is below the harvest target for a majority of the years within the evaluation timeframe, this indicates harvest has been below the target, and the region/coast may adjust its management measures to liberalize harvest such that the target level of harvest is achieved, but not exceeded. To calculate the reduction or liberalization needed, the average landings over the evaluation time period will be used relative to the target.

A majority of years within the evaluation timeframe means three out of five years or two out of three years. In the event of one out of two years or two out of four years, the Technical Committee will make a recommendation for Board consideration of a reduction or maintaining status quo measures.

To address years with particularly large confidence intervals (i.e., high uncertainty), years that have harvest estimates with a PSE greater than 50 would not be included in the evaluation. Years that have harvest estimates with PSEs between 30 and 50 would be subject to review by the Cobia Technical Committee to recommend whether they are appropriate to include in the evaluation. This aligns with MRIP's guidance to use caution for estimates with a PSE greater than 30, and not support the use of estimates with a PSE greater than 50.

3.4 Overage Response for Recreational Landings Evaluations with Rolling Averages

Option A. Status Quo.

Under this option, the need for changes to recreational management measures is determined at the individual state level by comparing state harvest to that state's harvest target over the evaluation period.

If a state's (or region's or coastwide if selected in Section 3.1) averaged recreational landings exceed its annual recreational harvest target, that state/region/coast must adjust its recreational vessel limit or season to reduce harvest, such that future annual landings would be expected to achieve the state/regional/coastwide recreational harvest target.

States/regions/coast reporting a consistent (i.e., consecutive) under-harvest during an evaluation time period for a minimum of 2 years may present a plan to extend seasons or increase vessel limits, if desired, to allow increased harvests that will not exceed the harvest target.

Changes to management measures for states with overages or states that wish to liberalize management measures must be reviewed by the Technical Committee and approved by the Board prior to implementation.

Option B. Performance Comparisons

Under this option, if a state/region's averaged recreational landings exceed its annual recreational harvest target, management action to reduce harvest in that state/region would not be required if the following conditions are met:

- another state/region's averaged recreational landings is under their target by at least the same amount, and that state has chosen not to liberalize their measures (if applicable); AND
- the average coastwide harvest has not exceeded the coastwide quota for the same timeframe.

Otherwise, the process remains the same as in Option A.

This performance comparison approach cannot be used in conjunction with the confidence interval approach outlined in section 3.3. If the confidence interval approach is implemented in the future, this performance comparison approach can no longer be used at that time.

3.5 Timeline for Setting Commercial and Recreational Measures

Option A. Status Quo.

Under this option, the coastwide total harvest quota, vessel limits, possession or bag limits, minimum size limits, and a commercial closure triggering mechanism may be specified through Board action **for up to three years.**

New specified recreational management measures may be implemented after the expiration of previously specified measures or following a completed stock assessment. In years when harvest specifications are made, they will occur no later than the Fall Board meeting, and resulting measures will be implemented in the following year. Recreational landings will be evaluated against state recreational harvest targets at the same time (i.e., at the same meeting) as the specification process.

Option B. Five-Year Specifications

Under this option, the coastwide total harvest quota, vessel limits, possession or bag limits, minimum size limits, and a commercial closure triggering mechanism may be specified through Board action **for up to five years**. The rest of the specification process would remain the same as Option A.

A longer five-year timeline would potentially reduce the frequency of management changes (management ‘whiplash’) and better aligns with when new stock assessment information is likely to be available for Atlantic cobia. The time between completion of the previous stock assessment and the current assessment will be approximately 5-6 years. Setting new specifications between assessments can be difficult due to the lack of new information on stock status. For example, the 2020-2023 specifications were informed by the SEDAR 58 stock assessment (2020). When those specifications expired, the Board considered specifications for 2024-2026. Since neither a new stock assessment nor stock projections beyond 2024 were available, the Technical Committee and Board had limited information to consider for the 2024-2026 specifications.

4.0 Compliance Schedule

TBD upon approval of Addendum II.

5.0 References

Atlantic States Marine Fisheries Commission (ASMFC). 2023. Review of the Interstate Fishery Management Plan For Atlantic Cobia (*Rachycentron canadum*): 2022 Fishing Year. Arlington, Virginia. 21 pp. Available online at:

http://www.asmfc.org/uploads/file/64da73a8CobiaFMPReview_FY2022.pdf

Manooch, Charles S. 1984. Fisherman's guide to fishes of the Southeastern United States. North Carolina Museum of Natural History. Raleigh, North Carolina. 362 pp.

SouthEast Data, Assessment, and Review (SEDAR). 2013. SEDAR 28 – South Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 420 pp. available online at:

<https://sedarweb.org/assessments/sedar-28/>

SEDAR. 2020. SEDAR 58 – Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 500 pp. available online at: <http://sedarweb.org/sedar-58>

Smith, Joseph W. 1995. Life history of cobia *Rachycentron canadum* (Osteichthyes: Rachycentridae), in North Carolina Waters. *Brimleyana* 23:1-23

Appendix. 2023 State Management Measures for Atlantic Migratory Group Cobia

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
NY	<i>Declared into the fishery in 2023; could qualify for de minimis</i> Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	If commercial fishing in state waters is closed, commercial fishing in federal waters will be recommended to mirror state closures
NJ	<i>De minimis</i> Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	<u>Deviations</u> -Rhode Island and New York possession limit is 2 fish per vessel -Virginia possession limit is per licensee rather than per person -North Carolina has 36 minimum fork length
DE	<i>De minimis</i> Minimum Size: 37 in total length Bag Limit: 1 fish per vessel Vessel Limit: 1 fish per vessel	-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
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	

Draft Document for Board Review. Not for Public Comment.

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>		



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

TO: Coastal Pelagics Management Board
FROM: Cobia Plan Development Team
DATE: April 15, 2024
SUBJECT: Cobia Draft Addendum II Discussion Points

In October 2023, the Coastal Pelagics Management Board (Board) initiated an addendum to address reallocation of recreational cobia quota based on more recent harvest data. In January 2024, the Board provided additional guidance to the Plan Development Team (PDT) for the draft addendum to consider alternatives to the current state-by-state allocation system, the process for updating allocations in the future, and uncertainty around harvest estimates.

The PDT developed those options which are included in Draft Addendum II in the Board's meeting materials for the 2024 Spring Meeting.

This memorandum highlights PDT discussion and additional context on some topics for the Board's consideration, including a PDT recommendation to narrow the scope of regional allocation options.

Allocation Frameworks and Cobia Management Challenges

Each type of allocation framework considered in the draft addendum (state-by-state, regional, or coastwide) has both benefits and challenges. While a regional or coastwide allocation framework could address some of the uncertainty concerns by pooling data into larger sample sizes, these approaches would require coordination between states to determine a uniform set of management measures (uniform size limit and vessel limit; seasons may vary) across regions or the coast. Underlying all types of allocation frameworks are imprecise recreational harvest estimates due to the pulse/rare event nature of the cobia fishery, as well as cobia seasonal migration dictating when fish are available along the coast. Additionally, the Interstate Fishery Management Plan (FMP) for Atlantic Migratory Group Cobia is relatively new, with the FMP originally approved in 2017 and the transition to sole Commission management approved in 2019. The Board only has a few years of sole Commission management to inform potential changes to the allocation framework.

COVID-19 Data Years

At the January 2024 Board meeting, the Board decided to exclude 2020 from allocation calculations due to the lapse in MRIP sampling and use of imputed data. The Board directed the PDT to consider whether 2021 should be excluded as well. The PDT considered that the Access Point Angler Intercept Survey (APAIS) resumed in all states prior to 2021, but the return to at-

M24-xx

sea head boat sampling was delayed into 2021. However, catch by head boats represents less than 0.1% of cobia catch over the last decade, so the PDT was not concerned about this. Additionally, while a high percentage of imputed data was used for 2020 catch estimates, only a very small percentage of data was imputed for 2021 catch estimates for one state (Virginia's 2021 catch estimate includes two imputed data points accounting for 0.02% of the harvest that year).

Since most sampling resumed prior to 2021 and only a very small portion of 2021 catch data was imputed for cobia, the PDT decided to include 2021 in the allocation timeframes.

State-By-State Allocations based on Recent Data

As shown in Table 2 of the draft addendum, the options for updated state-by-state allocations would result in significant changes to state allocation percentages. Virginia's allocation could increase from 39% to 69%; North Carolina's allocation could decrease from 38% to 13%; South Carolina's allocation could decrease from 12% to 6.5%; and Georgia's allocation could decrease from 9% to 6%. The PDT acknowledges the magnitude of these changes, which are primarily driven by Virginia's increased proportion and North Carolina's decreased proportion of the total harvest in recent years. The PDT discussed whether a phase-in approach to these potential allocation changes would be appropriate (i.e., incrementally change the allocations each year until the new allocation is reached). However, the PDT does not recommend a phase-in approach because this would result in constantly changing state harvest targets and associated state measures. This would lead to management 'whiplash' and a lack of consistency in recreational measures from year to year, which is what the Board noted it is trying to avoid.

Regional Allocation Options

The draft addendum includes options for four different regional definitions, including options for a two-region or three-region approach and options for whether to include North Carolina in the northern or southern region.

A three-region approach would result in a northern region comprised of states from Rhode Island through Delaware with a regional allocation of less than 2% of the total recreational quota. All of these states are currently *de minimis* states with variable, sporadic landings from year to year and associated percent standard errors (PSEs) typically greater than 80. The PDT noted concern about having a region comprised of only *de minimis* states with such a small percentage of the quota and high PSEs, and therefore **the PDT recommends the Board remove the three-region allocation options from the draft addendum and only consider a two-region approach.**

The draft addendum includes two alternatives for a southern region. The first is a southern region comprised only of South Carolina and Georgia, which would result in North Carolina being grouped with Virginia (and other northern states). This grouping was used by the Cobia

Technical Committee in their September 2023 report¹ based on tagging data and observations on the water suggesting cobia in North Carolina and Virginia represent the same group of fish. However, the PDT noted that when considering the timing of cobia harvest throughout the year, North Carolina's peak harvest occurs in May/June similar to South Carolina and Georgia's peak harvest (Figure 1). Based on this, the PDT added the second southern region alternative to the draft addendum with North Carolina grouped with South Carolina and Georgia.

Virginia's peak harvest occurs in July/August, at least in part due to their season not opening until June. When considering the timing of cobia catch (harvest and releases) throughout the year, the differences between North Carolina and Virginia are less significant with catch in both states more evenly distributed from May through August (Figure 2).

The PDT recommends the Board consider whether it has a preferred grouping for North Carolina. If so, the non-preferred grouping can be removed from the draft addendum.

The PDT discussed potential considerations for the different regional groupings. If North Carolina is grouped in the southern region with South Carolina and Georgia, then the northern region would be comprised of Virginia plus states with *de minimis* status. This grouping may not necessarily improve PSEs relative to Virginia's current PSEs because the *de minimis* states have such high PSEs and sporadic landings. However, Virginia's PSEs are the lowest of all cobia state harvest estimates with most recent PSEs below 30.

In general, the concern about high PSEs and high uncertainty will not be completely solved by moving to a regional allocation, though there may be some improvement.

Rolling Seasons

The Board's original motion initiating this addendum noted the options should "*consider the need for fishing opportunity based on the seasonality of the species in various regions*". This concept was referred to as 'rolling seasons' meaning the fishery would open and close sequentially along the coast following the cobia seasonal migration. The PDT considered whether the addendum should specifically prescribe season dates to address this concept. After discussion and development of the regional and coastwide allocation framework options, the PDT determined there is no need to prescribe season dates at this time since active fishing seasons are already dictated by cobia availability in a rolling fashion (e.g., peak harvest at the southern end of the range is during May/June and peak harvest at the northern end is during July/August). For the regional and coastwide framework options, the addendum affords flexibility for seasons to differ between states in the same region or along the coast based on cobia availability, with the potential for season changes, if needed, to accomplish either reductions or liberalizations in the future.

¹ Sep 2023 Cobia Technical Committee report:
http://www.asmf.org/uploads/file/65baa5f1CobiaTC_Report_2024MgmtMeasures_Sept2023.pdf

Uncertainty and Confidence Intervals

At the January 2024 Board meeting, Board members noted the need to account for the uncertainty of MRIP harvest estimates and alluded to approaches used for other species (e.g., percent change approach for summer flounder, scup, black sea bass, and bluefish). The percent change approach² for those other species takes into account both the confidence intervals associated with the harvest estimate and the status of the stock to determine how to change measures. The PDT developed a provision for the draft addendum based on the confidence intervals of cobia harvest estimates to account for the uncertainty of point estimates (i.e., harvest could be above or below the point estimate). However, the PDT did not include a biological status of the stock component to the approach. The species for which the percent change approach is applied typically have stock assessments conducted every two years, so there is a regularly updated data stream for biological indicators of stock status. At this point, cobia stock assessments are conducted roughly every five years, and currently it is unclear what (if any) abundance index can be developed for cobia. Given these uncertainties surrounding the timing of cobia stock assessments, the PDT did not consider adding a biological stock status component to the recreational harvest target evaluation process.

² Explanation of Percent Change Approach for Summer Flounder, Scup, Black Sea Bass, and Bluefish: <https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/62a790313537284dee967d85/1655148593447/HCR-Percent-Change-Table.pdf>

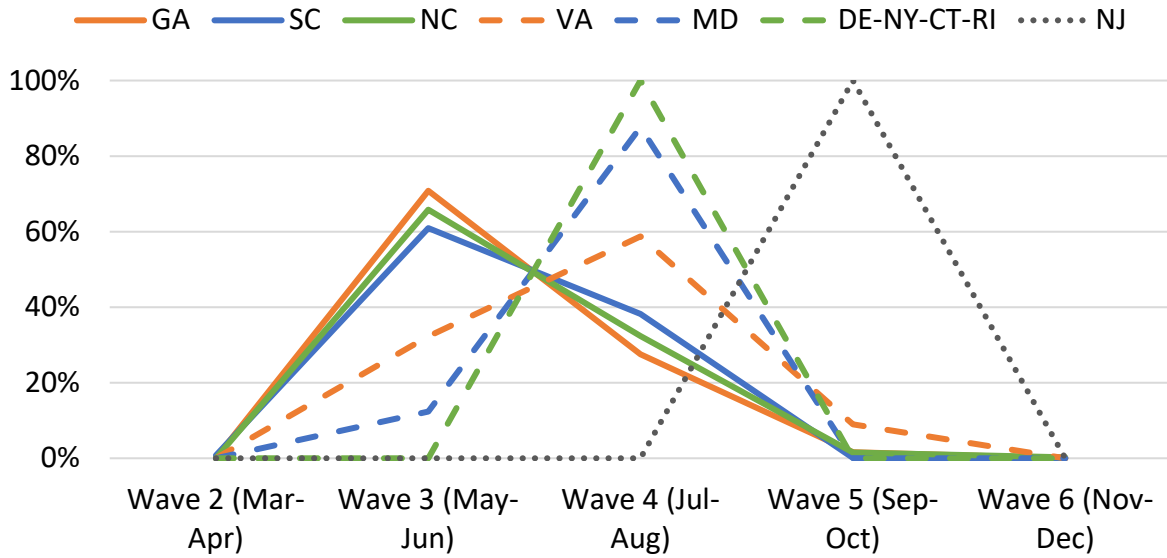


Figure 1. Percent of harvest of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). *2023 data are preliminary. Note: MRIP sampling does not occur during Wave 1 (Jan-Feb) except for in North Carolina. North Carolina’s estimated cobia harvest during Wave 1 for this time period was 0 fish.

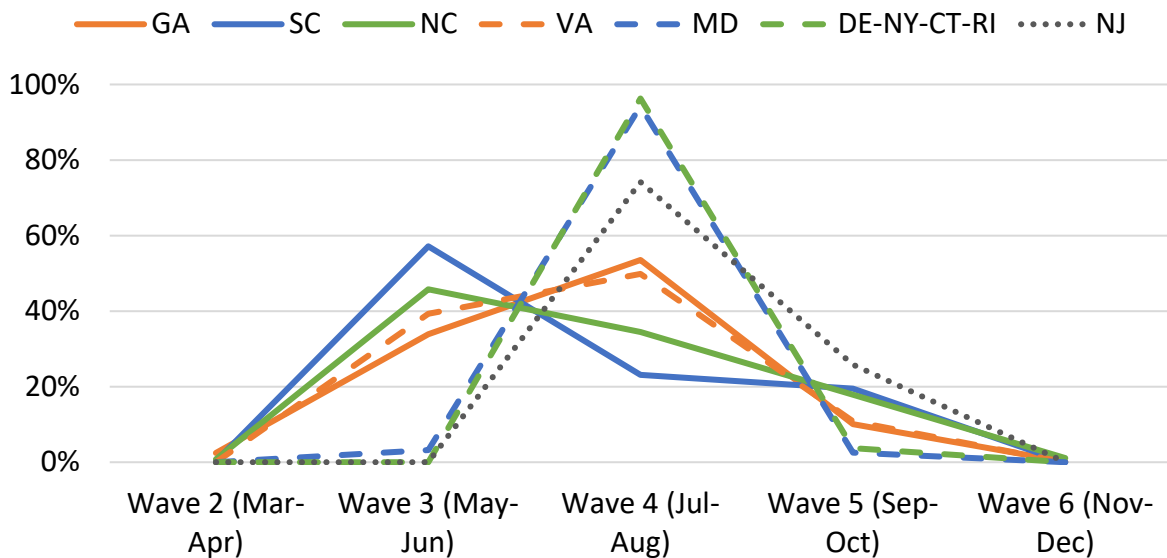


Figure 2. Percent of catch of Atlantic cobia in numbers per wave from 2018-2023 (excluding 2020). *2023 data are preliminary. Note: MRIP sampling does not occur during Wave 1 (Jan-Feb) except for in North Carolina. North Carolina’s estimated cobia harvest during Wave 1 for this time period was 0 fish.

FINAL
SUMMARY REPORT
MACKEREL COBIA COMMITTEE
SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL
Jekyll Island, Georgia
March 5, 2024

The Committee approved the minutes from the December 2023 meeting and the agenda.

Law Enforcement Advisory Panel Report

The Law Enforcement Advisory Panel met on January 29 and 30, 2024 in Charleston, South Carolina. The AP Chair, Captain Scott Pearce, provided a summary of Advisory Panel discussion and recommendations related to king and Spanish mackerel tournament sales. The Committee expressed their appreciation of the advisory panels' in-depth discussions and recommendations.

Mackerel Port Meetings

Based on recommendations from the Mackerel Cobia Advisory Panel, the Council directed staff to begin work on a plan to conduct port meetings for king and Spanish mackerel to gain an in-depth understanding of the fisheries to improve management efforts. The Committee reviewed the goals and objectives and discussion topics for port meetings. Staff presented the Committee with the final meeting structure and locations.

The Committee provided the following input:

- Based on comments from the Atlantic States Marine Fisheries Commission (ASMFC), move the Connecticut, Rhode Island, and Massachusetts port meetings to a virtual format. Hold the virtual meetings during the month of May, as originally planned.
- Consider holding the New York port meeting in conjunction with the Mid-Atlantic Fishery Management Council's June 2024 Council meeting in Riverhead, New York.
- Work with ASMFC and state agency staff to identify a location along the inside of Chesapeake Bay to hold a port meeting.

MOTION 1: APPROVE THE KING AND SPANISH MACKEREL PORT MEETINGS PLAN FOR IMPLEMENTATION.

APPROVED BY COMMITTEE

APPROVED BY COUNCIL

Other Business

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 2: ADOPT THE FOLLOWING TIMING AND TASKS:

1. Begin conducting port meetings for king and Spanish mackerel. Update the Council on North Carolina and New England port meetings at the June 2024 Council meeting.

APPROVED BY COUNCIL

Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

May 1, 2024
1:15 – 2:45 p.m.

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 (*M. Ware*) 1:15 p.m.
2. Board Consent 1:15 p.m.
 - Approval of Agenda
 - Approval of Proceedings from March 2024
3. Public Comment 1:20 p.m.
4. Consider Revised Addendum II State Implementation Plans **Final Action** 1:30 p.m.
 - Overview of Pennsylvania, Maryland, and Potomac River Fisheries Commission Plan Revisions (*K. Kuhn, M. Luisi, I. Braun-Ricks*)
 - Consider Approval of State Implementation Plans
5. Presentation of Massachusetts Division of Marine Fisheries Release Mortality Study (*M. Armstrong*) 1:50 p.m.
6. Discuss Recreational Release Mortality Workgroup Task **Potential Action** 2:15 p.m.
 - Overview of Past Board Discussion (*E. Franke*)
 - Consider Tasking for Recreational Release Mortality Workgroup
7. Review and Populate Advisory Panel Membership (*T. Berger*) **Action** 2:35 p.m.
8. Elect Vice-Chair **Action** 2:40 p.m.
9. Other Business/Adjourn 2:45 p.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details.

MEETING OVERVIEW

Atlantic Striped Bass Management Board

May 1, 2024

1:15 – 2:45 p.m.

Hybrid

Chair: Megan Ware (ME) Assumed Chairmanship: 1/24	Technical Committee Chair: Tyler Grabowski (PA)	Law Enforcement Committee Rep: Sgt. Jeff Mercer (RI)
Vice Chair: Vacant	Advisory Panel Chair: Louis Bassano (NJ)	Previous Board Meeting: March 26, 2024
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 March 2024

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. Revised Addendum II State Implementation Plans (1:30-1:50 p.m.) Final Action

Background

- In March 2024, the Board approved Addendum II state implementation plans with the following exceptions: Pennsylvania’s timeline for implementing its new spring slot limit; Maryland and the Potomac River Fisheries Commission’s (PRFC) timeline for paying back any potential 2024 commercial quota overage.
- Pennsylvania, Maryland, and PRFC submitted revised state implementation plans by April 12, 2024 (**Briefing Materials**).
- States are required to implement Addendum II measures by May 1, 2024.

Presentations

- Overview of Pennsylvania, Maryland, and PRFC Implementation Plan Revisions by K. Kuhn, M. Luisi, and I. Braun-Ricks

Board actions for consideration at this meeting

- Approve revised state implementation plans

5. Massachusetts Division of Marine Fisheries Release Mortality Study (1:50-2:15 p.m.)

Background

- The Massachusetts Division of Marine Fisheries (MADMF) has been conducting a study to better characterize release mortality in striped bass, including consideration of different hook types, handling time, and air and water temperatures. The study includes participation from many volunteer anglers.

Presentations

- Overview of MADMF release mortality study by M. Armstrong

6. Recreational Release Mortality Workgroup Task (2:15-2:35 p.m.) Potential Action

Background

- At the January 2024 Board meeting, an item was requested under Other Business regarding continued concerns about the difficulty of addressing striped bass recreational release mortality. Due to the length of the Board meeting, this item was moved to the Interstate Fisheries Management Program (ISFMP) Policy Board for discussion.
- The ISFMP Policy Board agreed a Board Work Group should review past discussions on striped bass recreational release mortality and consider how the Atlantic Striped Bass Management Board could address the issue moving forward.
- The Commission's [Work Group Meeting Standard Operating Practices and Procedures](#) notes there should be a clear directive of tasks, deliverables and timeline for the Work Group.
- After the Board identifies task(s) for the Work Group, membership can be established and the Work Group can move forward (**Briefing Materials**).

Presentations

- Overview of past Board discussion on recreational release mortality by E. Franke

Board Actions for Consideration

- Approve task for Recreational Release Mortality Board Workgroup

7. Advisory Panel Membership (2:35-2:40 p.m.) Action

Background

- Peter Jenkins, a recreational angler from Rhode Island, has been nominated to the Atlantic Striped Bass Advisory Panel.

Presentations

- Nominations by T. Berger

Board actions for consideration at this meeting

- Approve Advisory Panel nomination

8. Elect Vice Chair (2:40-2:45 p.m.) Action

Background

- The vice chair seat is empty since Megan Ware (Maine) has become the new chair.

Board actions for consideration at this meeting

- Elect Vice Chair

9. Other Business/Adjourn (2:45 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

- TC – June 15th: Annual compliance reports due
- TC-SAS – Conduct 2024 stock assessment update

TC Members: Tyler Grabowski (PA, Chair), Michael Brown (ME), Kevin Sullivan (NH), Gary Nelson (MA), Nicole Lengyel Costa (RI), Kurt Gottschall (CT), Caitlin Craig (NY), Brendan Harrison (NJ), 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), John Ellis (USFWS), Katie Drew (ASMFC)

SAS Members: Michael Celestino (NJ, Chair), Gary Nelson (MA), Alexei Sharov (MD), Brooke Lowman (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**

Webinar

March 26, 2024

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.

TABLE OF CONTENTS

Call to Order, Chair Megan Ware1

Approval of Agenda.....1

Approval of Proceedings from January 23, 20241

Public Comment1

Consider Addendum II State Implementation Plans1

 Technical Committee Report1

 Plan Review Team Report.....2

 Consider Approval of State Implementation Plans..... 13

Adjournment 22

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of January 23, 2024** by consent (Page 1).
3. **Move to approve Addendum II state implementation plans as discussed today** (Page 13). Motion by Mike Luisi; second by Steve Train. Motion substituted.

Motion to Substitute

Move to substitute to approve Addendum II state implementation plans as discussed today with the following exceptions:

- **CT, MD, VA, NC, PA: not planning to adopt the two-fillet per legal fish possession limit rule for recreational filleting allowances;**
- **PA: not planning to adhere to the May 1 implementation deadline; and**
- **MD, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year.**

These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board will review and consider approval of the revised state implementation plans at its May 1, 2024 meeting (Page 14). Motion by Mike Armstrong; second by Emerson Hasbrouck.

Motion to Amend

Move to amend the substitute to remove the first bullet point on recreational filleting rules. Motion made by Dr. Davis and seconded by Mr. Kuhn (Page 15). Motion by Justin Davis; second by Kris Kuhn. Motion passes (Roll Call: In favor – RI, CT, NH, DE, ME, VA, DC, MA, PA, NC; Opposed – PRFC, NY, MD; Abstention – NOAA; Null – NJ) (Page 17).

Motion to Substitute as Amended

Move to substitute to approve Addendum II state implementation plans as discussed today with the following exceptions:

- **PA: not planning to adhere to the May 1 implementation deadline; and**
- **MD, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year.**

These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board will review and consider approval of the revised state implementation plans at its May 1, 2024 meeting.

Motion to Amend

Move to amend the substitute to remove the first bullet regarding PA adhering to May 1 deadline (Page 17). Motion by Kris Kuhn; second by Marty Gary. Motion fails (Roll Call: In favor – DE, ME, NY, DC, PA; Opposed – RI, NH, PRFC, VA, NJ, MA, NC; Abstention – NOAA; Null – CT, MD) (Page 18).

Motion to Substitute as Amended

Move to Substitute as Amended Move to substitute to approve Addendum II state implementation plans as discussed today with the following exceptions:

- **PA: not planning to adhere to the May 1 implementation deadline;**
- **MD, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year.**

These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board

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

will review and consider approval of the revised state implementation plans at its May 1, 2024 meeting (Page 20). Motion passes (Roll Call: In Favor – RI, CT, NH, NY, NJ, DC, MA, NC; Opposed – ME, PRFC, MD, VA, PA; Abstention – NOAA; Null – DE) (Page 20).

Main Motion as Substituted

Move to approve Addendum II state implementation plans as discussed today with the following exceptions:

- **PA: not planning to adhere to the May 1 implementation deadline; and**
- **MD, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year.**

These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board will review and consider approval of the revised state implementation plans at its May 1, 2024 Meeting (Page 20). Motion passes (Roll Call: In favor – RI, CT, NH, DE, ME, NY, VA, NJ, DC, MA, NC; Opposed – PRFC, MD, PA; Abstention – NOAA; Null – None) (Page 20).

4. **Move to adjourn** by consent (Page 22).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened via webinar; Tuesday, March 26, 2024, and was called to order at 1:00 p.m. by Chair Megan Ware.

CALL TO ORDER

CHAIR MEGAN WARE: This is Megan Ware; I'm going to call to order the Striped Bass Board Meeting today. I do just want to start out with a moment of silence for those who were impacted by the Baltimore Bridge tragedy this morning. Particularly thinking about those who were injured or are still missing. A moment of silence for them, please. Thank you.

APPROVAL OF AGENDA

CHAIR WARE: We're going to move on to Approval of our Agenda for today's meeting. Are there any additions or modifications to the agenda? I am not seeing any hands raised, so I'm going to have the agenda approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR WARE: We'll move on to the approval of proceedings from January 2024. We did have one edit to the proceedings from a Board member correcting a date reference.

The proceedings incorrectly stated that Addendum VI was approved in 2009, when it should have been 2019, so we will make that edit. Are there any other edits to the proceedings from our January meeting? Seeing no hands raised, the proceedings with that correction are approved by consent.

PUBLIC COMMENT

CHAIR WARE: We'll move on to Public Comment. This is for items that are not on the agenda today, and I'll be looking for raised hands on the webinar to indicate a desire to make a public comment. Is there anyone from the public wishing to make a comment for an item not on the agenda this morning? I am not seeing any hands raised, and just confirming that with Toni and Emilie.

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

MS. TONI KERNS: I also don't see any hands.

CHAIR WARE: Okay.

CONSIDER ADDENDUM II STATE IMPLEMENTATION PLANS

CHAIR WARE: We will move on to Agenda Item Number 4 then. This is Considering the Addendum II State Implementation Plans. It is a final action. We're going to have a Technical Committee Report from Tyler Grabowski and then a Plan Review Team Report from Emilie. Then we'll move into questions and discussions.

TECHNICAL COMMITTEE REPORT

CHAIR WARE: I'll turn it over to the TC Report.

MR. TYLER GRABOWSKI: Thank you. Yes, I'm going to present on the Addendum II area specific measures for New York, Pennsylvania and Delaware that was reviewed by the TC. The TC met via webinar on March 4, 2024, and reviewed these three analyses for Addendum II area specific recreational measures for the Hudson River fishery in New York, the spring slot fishery in the lower Delaware River and estuary for Pennsylvania, and Delaware's summer slot fishery in the Delaware River and Bay. All three states did submit measures estimated to achieve at least a 14.1 percent reduction for these fisheries. The methods followed by each of these three states, all are typical methodologies to estimate reductions for these proposed striped bass measures. Each state did use available fishery dependent and/or fishery independent data to characterize the size of available striped bass within these given fisheries.

Each state then calculated a percent change in removals based on change in harvest, and release mortality, and Pennsylvania also accounted for a bag limit reduction in their analysis. The TC during this meeting did note that there were significant data limitations, particularly for the Pennsylvania and Delaware fisheries.

The Pennsylvania fishery is small compared to coastwide removals, and there is no fishery dependent data associated with this fishery. MRIP

does not cover Pennsylvania waters, and Pennsylvania currently does not have a logbook program enacted within their waters. For Delaware, there is a low number of MRIP intercepts, especially when looking at one wave within their fisheries.

However, the TC did note that all three states did use the best available data given these data limitations. Moving first up to the New York Hudson River fishery. The TC did not have any concerns with the analysis used by New York. Following the TC meeting on March 4, it would confirm that a noncompliance measure had not been applied for this analysis, nor for the PA or Delaware analysis in the past.

That was just one minor thing that was brought up during the TC meeting that was confirmed following that meeting. Currently, New York's Hudson River fishery operates between April and November, and the current measures is 1 fish from 18 to 28 inches. New York is proposing to reduce that to 1 fish from 23 to 28 inches, achieving an estimated reduction of 14.9 percent.

Pennsylvania conducted an analysis on their spring slot fishery, and the TC in the initial feedback during that meeting recommended revisions to the initial analysis. First, it was recommended that a 25 percent estimated savings when reducing the bag from 2 fish to 1 fish be applied, and then also to apply a multiplicative reduction equation to account for a simultaneous change to the slot and the bag limit.

Following the resubmission of this CE proposal, the TC had no concerns with the revised analysis. The fishery in Pennsylvania is a spring slot fishery from April and May. The current measures are 2 fish from 21 inches to less than 24 inches. Pennsylvania is proposing to change that to 1 fish at 22 inches to less than 26 inches, achieving an estimated reduction of approximately 19.3 percent.

Then finally, Delaware is proposing to change their summer slot fishery. There were no concerns with the Delaware's summer slot fishery, and this fishery occurs during the month of July and August in the Delaware River and Bay. The current measures are 1 fish from 20 inches to 25 inches, and their proposed

measures are proposed to be 1 fish at 20 inches to 24 inches, achieving an estimated reduction of 15.4 percent. That concludes the TC summary. I believe Emilie said to hold the questions following the review of the Addendum II implementation plans.

PLAN REVIEW TEAM REPORT

MS. EMILIE FRANKE: Thanks, Tyler. This is Emilie, as the Chair mentioned. We'll go through both of these presentations. As the Chair of the Plan Review Team, I will provide an overview of the PRTs review of the Addendum II state implementation plans. These implementation plans for Addendum II were due on March 1st, and then states are required to implement measures by May 1st. The PRT met via webinar on March 12, to review these plans.

This table outlines the requirements of Addendum II. For the ocean recreational fishery, the required measures are 1 fish at 28 to 31 inches with 2022 seasons, and then as the TC Chair just mentioned, for specific recreational fisheries in New York, Pennsylvania, and Delaware, Addendum II requires measures designed to achieve a 14.1 percent reduction in those areas.

Then for the Chesapeake Bay recreational fishery, the measures are 1 fish at 19 to 24 inches, with 2022 seasons. Then if a state allows recreational filleting of striped bass, Addendum II has two requirements. First is that racks must be retained and possession be limited to 2 fillets per legal fish.

Then for the commercial fisheries, both the ocean and the Chesapeake Bay, the Addendum II measures are a 7 percent commercial quota reduction from the 2022 quota levels, with the 2022 size limits. With that I will review the PRT report on the plans for each of those categories. For the recreational size limits, bag limits and seasons the PRT found no inconsistencies.

The PRT did note that four states implemented a less than 31 inch upper bound in the ocean recreational fishery, which is slightly more conservative than the required inclusive 31 inch upper bound. Then the PRT also noted that Maryland and the Potomac River

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

Fisheries Commission are eliminating their striped bass spring trophy fisheries as of May 1st.

This is more conservative than the Addendum II requirements, which are to maintain 2022 seasons. Then Maryland is also eliminating its late May Susquehanna Flats Fishery. Regarding the implementation timeline for the recreational size and bag limits, Pennsylvania is proposing a delayed implementation until 2025 for their April/May new slot limits and bag limits.

Pennsylvania noted that changing the slot size in the middle of their two-month April to May season this year would be procedurally burdensome, and they noted that it may lead to angler confusion and noncompliance and enforcement issues. Then Pennsylvania also noted that the current measures are already published in their 2024 fishing summary.

Moving on to the recreational filleting requirements. The specific requirement that would limit possession to 2 fillets per legal fish is missing from some of the state implementation plans. The PRT also noted that some of the state regulations around filleting are not entirely clear. First, Maryland and Virginia do specifically allow filleting, and they require racks to be retained.

But they did not specify in their implementation plan that 2-fillet limit requirement. Then there are some states with sort of regulations that generally say the striped bass length must not be altered, the striped bass should be measurable, and/or have the head and tail attached. For Connecticut and North Carolina, those two states allow filleting under their regulations, but they are missing that 2-filletted per legal fish requirement. Then Delaware, D.C. and PRFC interpret their regulations as filleting is not allowed, and therefore that 2-fillet limit is not applicable. The PRT noted here that that interpretation was not entirely clear, given the current regulatory language. Then again, regarding the implementation timeline for the filleting requirements, Pennsylvania is proposing a delayed implementation until 2025 for the possession requirement of 2 fillets per legal fish.

Pennsylvania noted that their existing regulations do cover the first requirement to retain the racks, and then to add the second requirement they are proposing to go through their full Pennsylvania Fish and Boat Commission rulemaking process, which would require more time. Then moving on to the commercial fisheries, the Plan Review Team noted that Maryland, Virginia and PRFC have not implemented the 7 percent commercial quota reduction for their 2024 Chesapeake Bay commercial fisheries.

Then Maryland also has not implemented that reduction for their 2024 ocean commercial fishery. These three jurisdictions noted in their implementation plans that their commercial fisheries started prior to Addendum II approval, and so the commercial tags had already been distributed for this fishing year.

The three jurisdictions noted that if there is an overage in 2024 above the new Addendum II reduced quota level, then these three jurisdictions would pay back that overage. PRFC and Virginia also noted that their commercial landings in recent years have been below the new Addendum II quota levels, so they are not anticipating any overage in 2024.

Then regarding the payback of those potential overages above the Addendum II quota levels. Maryland and PRFC noted that if an overage occurs in 2024, then that overage would be deducted from their 2026 quota. Those two jurisdictions noted that the 2025 quota will have already been distributed to permit holders before the end of this year, so the deduction could not happen until 2026.

The PRT noted that this is inconsistent with Addendum II, which requires that any overage be deducted from the state's quota in the following year. In this case that deduction would be in 2025. Then finally, the PRT didn't find any inconsistencies regarding the commercial size limits, which are the same as the 2022 size limits. That is all we have. We are happy to take any questions.

CHAIR WARE: Great, thank you, Tyler and Emilie for those presentations. How I would like to structure

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

our discussion this afternoon is just start with any clarifying questions that Board members may have for Emilie and Tyler on the PRT report and the TC report. Next, what I'm proposing is we'll move into a Board discussion where we can talk about the commercial measures, the rec measures, rec filleting.

That would be an opportunity for states to want to respond to the PRT report. If your state was mentioned, that is an opportunity for you to comment. It would also be an opportunity for states to ask questions of other states. Once we're done with the Board discussion, then we will move into motions. That is how I am hoping to structure our webinar today. We'll start with any clarifying questions for the TC or the PRT on their report. I am not seeing any hands, Toni or Emilie. I just want to confirm that with you.

MS. KERNS: I am not either; you just got a member of the public raise their hand. Do you see that one?

CHAIR WARE: I do not see that. I see it now, thank you. I'm going to stick to the Board for now, but once we get to motions, we can consider any comments from the public. Are there any questions from the Board? Okay, seeing none, I'm going to move us then into Board discussion, and I'll start with the commercial measures.

Then I'll go to the recreational bag and size limit, and then recreational filleting. Starting with the commercial measures. If your state would like to make a comment in response to the PRT report, this would be an opportunity to do so, or if you have a question for another state about their commercial measures in their implementation plan, this would be an opportunity to ask that question. Roy Miller, I see your hand up, so go for it.

MR. ROY W. MILLER: I would like to just ask if Mike Luisi is on, or whoever from Maryland. I know that in Virginia's proposals that they notified their commercial ocean gillnetter about the new quota. Shall we assume that it was too late for Maryland to do that, or they considered that not worthwhile to do this this spring?

CHAIR WARE: I see Mike Luisi has his hand up, so Mike, go ahead and respond.

MR. MICHAEL LUISI: Thanks for the question, Roy. I think my answer to this will hopefully help address other concerns or questions related to the handling of the commercial quota, both on the coast, in the ocean and in the Chesapeake Bay for Maryland. Both our coastal ocean fishery and our Chesapeake Bay fishery are managed through an individual transferrable quota system.

The seasons, while there are closed periods for both the coastal and the Chesapeake Bay throughout the year. The seasons are managed based on an annual allocation of Florida that starts on January 1st and doesn't end until December 31st of that same year. I guess to Roy's point, once we sent out the permits and the tags associated with the 2024 fishing year to our coastal fishermen, that season began on January 1st.

Because Addendum II's action in the end of January, the season had already started. We were not able to make adjustments to the quota that was already distributed. We don't distribute the quota based on any type of gear type. The quota is an individual quota to each permit holder, and they can use whatever means that are legal throughout that course of the year to harvest those fish.

This goes along with the Chesapeake Bay as well. Once a permit holder starts the year, they may be able to harvest their actual quota within a day or two if the quota is small enough. Specifically, along the coast, the individual quotas could be quite small, given that we have 50-ish people that we permit and the quota is only about 85,000 pounds, give or take. They can harvest that very quickly. We didn't feel that once that within the season it was fair to take quota away from individuals who didn't have the opportunity to harvest those fish prior to Addendum II's implementation. Since we're still discussing implementation, and the implementation isn't due until May 1st, we were allowing for the harvest of fish that we distributed to each of our permit holders beginning on January 1st.

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

But I will say that the Addendum II quota, both in the Chesapeake Bay and on the coast are what we are using for management purposes. That gets us into the potential for overages, which I can address if others have questions on that. But I hope that helps answer your question, Roy, and I added the Chesapeake Bay part of it in there as well, because we're handling both similarly, or the same.

CHAIR WARE: Roy, I'm going to go back to you. Did that answer your question?

MS. KERNS: Megan, I muted him, I just have to find him again, because he left his microphone open, sorry. Hold on, here we go. All right, go ahead, Roy, and then Roy, when you're done talking, if you can make sure to re-mute yourself, I won't. Sorry.

MR. MILLER: That took care of my concerns, thank you, Madam Chair.

CHAIR WARE: Pat Geer, I see your hand up, so I'll go to you next, and then on deck is Dennis Abbott.

MR. PAT GEER: I'm happy to say that our Board today approved all the recreational measures, as well as the reduction in the ocean quota. That will be effective before May 1. We did not do the Bay quota, because similar reasons that Mike talked about. Our season is an ITQ, like it is in Maryland. The season opened on January 16.

We have over 300 folks with Bay quota and about 75 percent of them had already picked up their tags. It was impossible for us to get those tags back. We were able to do it in the ocean, because we only have 29 individuals and only one of them had picked up the tags prior to Addendum II being approved. We were able to adjust that and get that in on time.

Our quota over the last five years, we're only catching about 77 percent of our quota. We're confident that we are going to be below that 7 percent reduction this year. If it appears that we're getting close towards the end of the year, and we're monitoring it, we have electronic reporting. We may be able to do the emergency closure if we had to,

probably in early November. I mean early December.

CHAIR WARE: Dennis Abbott.

MR. DENNIS ABBOTT: Two questions for Mike Luisi, if I may. Mike, did you not consider last fall as we were preparing Addendum II that they would probably be some cut, and could that not have influenced your decision on how many tags you distributed? That is the first question. The second question is, would you have the ability later in the year if your catch reporting shows you reaching your quota, to close the season in order to eliminate the possibility of exceeding the quota? Is that a possibility for you? Again, I realize that you have not been catching the quota for the past few years, and we probably have more of a paper problem than we do have a real-life problem on the water. But I think we're also bound to keep up with the requirements of the Addendum. I'll leave it at that, and ask if you can answer both of those questions, Mike.

CHAIR WARE: Mike, I see your hand up, so feel free to go for it.

MR. LUISI: Yes, I am happy to try to address that. To the first question about whether or not we considered taking action prior to the decisions made during Addendum II during the final meeting in January. I will say that we discussed it. However, not knowing where the Board was going to ultimately lie, given that the commercial fishery is a much smaller piece of the puzzle when we're talking about mortality in the striped bass, and the fact that commercial quota reductions was not even part of the initial intent of Addendum II.

We didn't feel back in October/November that we were in any position to try to hold quota back, to guess about what the Board was planning to do come later that year, I guess early probably of next year, early 2024. The other complication to that is that some of our permit holders receive very small amounts of quota.

For instance, if we held back 5 percent of the quota, we might be in a situation where fishermen have

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

already harvested their allotted allocation for 2024. But we still have on the books for that person a 5-pound permit that he could harvest one more fish. The administrative burden of distributing that, sending one tag in the mail to someone was more than what we wanted to do for upwards to between 8 and 900 individuals.

We decided that without the understanding of where the Board was ultimately going to fall on this, that we would manage 2024 as it was. I will use this opportunity to state again, that this was all part of the Addendum development, and that in August and in October I was very clear on the record that any further delay of this action was going to lead to this type of situation possibly. Hopefully that helps with the first question. The second question, Madam Chair, can you remind we what that second question was?

CHAIR WARE: Sure, I think it was, could you monitor reporting in season, and then close the commercial fishery early if it looks like you guys are approaching your new quota.

MR. LUISI: Yes, I mean we have harvest records that come in within some type of timely information. However, given that we have the individual quota system, and our fishery is open all the way through the remainder of 2024, we would not close the season in the middle of the season, even if it were close to the end.

Fishermen are of the understanding that they have a full year to harvest their allocation that is granted to them by our agency. By considering the closure, you could create more of a frenzied approach that we were trying to get away from in our old management system into the new ITQ system. The answer directly to that is no, we would not consider a closure.

CHAIR WARE: Next, I see Emerson Hasbrouck.

MR. EMERSON C. HASBROUCK: I had several questions, two of them were the same questions that Dennis just asked. But even with the answer to those questions, right now I cannot support approving the implementation plans for Maryland

and Potomac River Fisheries Commission, particularly the component that says that they are going to delay any possible overages to be subtracted in 2026.

I haven't heard anything from Maryland. We haven't heard anything from PRFC yet. But I haven't heard any good reason for Maryland, as to why as we get close to 2025, they can't issue a reduced number of ITQ allocation, and wait to see what the 2024 landings actually are, and then make a final adjustment of the ITQ allocation sometime in 2025. It seems to me that there is an opportunity here for Maryland to take action in 2025, if need be, they are just not willing to do it. Unless I hear something else, I can't support approval of that implementation plan.

CHAIR WARE: I'm going to turn that into a question, maybe for Maryland or PRFC to respond to. Mike, I see your hand up. Do you want to just take this opportunity to talk about the overage payback?

MR. LUISI: Sure, I'm just going to leave my hand up from now on, given that your only issue that everyone seems to have regarding this Addendum and the implementation is with Maryland. I'll just leave my hand up and answer questions as they come at me. I just wanted to be clear that we could have done something completely different.

Had the Board taken into consideration the administrative burden that finalizing Addendum II was going to have on our state, and having implementation of the commercial quota management fall within the middle of a quota year for our state. I guess I can probably speak on behalf as well of the Potomac River Fisheries, because they are in the same boat.

It's not that we're not managing the new Addendum II quota. I just want that to be clear. The 2022 quota for the state of Maryland was 1,445,394 pounds. That was what was distributed this year in 2024. That was what was distributed. We are managing at a minus 7 percent, so we are managing a quota of 1,344,216 pounds.

If you look at those number it's about 100,000

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

pounds, just give or take, we'll round it off. We've over extended by about 100,000 pounds. Now, there have been years in the past where we have been within 10 percent of the quota. We had a year just a few years ago where we were short by 15 percent.

It comes and goes with the market. We can't know, you know what is going to happen by the end of the year. We're only in March at this time. But we are managing to the 1.344 million pounds. Now, we are just now gathering all of the information, so in March of 2024, we are just now getting our information together from the harvest report from 2023.

Collecting of tags, getting harvest reports, and we'll know within a matter of maybe a month what the final catch was for 2023. It will be of April of 2024 when we know that. We have to begin the process of getting our quotas distributed to our fisheries, which begin on January 1st. Usually, we start in October, and November is kind of the time when we start sending the mailings out, we get the tags distributed, we get our permits sent. In October of this upcoming year, we may have some idea of where the catch lies, as it compared to previous years, but we're not going to have any way to predict what the overall catch is going to be. The fact that we have to start preparing as early as we do in this upcoming year, our intent is to send out the 1.344 million pounds, which is the Addendum II quota with a 7 percent reduction.

Then by April of 2025, we'll have a much better handle on any overage if an overage even occurs. There is no way to predict whether or not an overage is going to occur. I know Virginia and Potomac River have stated in their implementation plan that they don't believe it will. I could say the same thing. I don't think it's going to happen, but it could.

We could go over, and then that will be accounted for in the following year. Now, I started all of this by saying that we're talking about 100,000 pounds. That would be if all 7 percent was harvested, and we actually caught the full amount of quota that we've distributed this year, 7 percent. In comparison to all the other mortality along the coast that we're trying

to address, and the uncertainties around addressing through the mechanisms that we've put in place.

I really hope that this Board is not going to sit back and decide that the state of Maryland, who we're doing everything we possibly can to get ourselves in a position to best manage this population and this stock. You're going to find us out of compliance because of an administrative burden that didn't have to be part of this discussion, had we made decisions a little differently back in January.

We're not going to jump through hurdles and hoops to the point of exhaustion with the resources and the staff that we have, to address what might be a 20,000-pound overage in a particular year's catch. But we have no idea what that overage is going to be. I really hope that you all can see that we are doing our best to try to get in front of the issues at hand.

But we are not in a position to, with the resources that we've had and the amount of fishermen that we are dealing with, to do this overnight. I hope that within a year's time we will find ourselves at the point for which we aren't over harvesting the resource, and we'll be able to make the necessary changes within a year's time, and address overages in a much more expedited and more prepared way.

CHAIR WARE: I'm just going to do some hand clean up here. Dennis Abbott, I see your hand raised. I don't know if that is a new or an old hand, so if that is an old hand. Great, thank you. The only other hand I see raised is David Borden, so David, I'll go to you for a question on the commercial measures, and then we'll move on to recreational measures, so David.

MR. DAVID V. BORDEN: The question is, this has been a little bit of a reoccurring problem for the Board, in terms of the timing of the Chesapeake action. I guess my question is, has the PDT at any point looked at and developed options that that the Board could consider in the future to avoid this type of situation? Has that type of discussion ever taken place? That I think is a question of staff or the Chair, and then if the answer is no, then the second

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

question. Is it possible to have the PDT do that and report at a subsequent meeting?

CHAIR WARE: Emilie, I'm going to pass that question to you.

MS. FRANKE: Sure. No, the PDT has not had specific discussions about timing of measures for different fisheries. Those discussions have really occurred, I think at the Board level, in terms of, you know based on the timeline of a particular addendum, what that means for potential implementation.

I'm not sure, I'll turn to Toni, if the PDT, if that would be a discussion the PDT could have soon, without another management action coming up. I'm not sure if we would have that discussion now, or if that discussion should be included in whatever the next round of management action ends up being.

MS. KERNS: Emilie, I think that maybe the PRT could discuss it when you review compliance reports this summer, as to the best timing of things, or to provide some recommendations to the Board. Perhaps at least that would be a group that would be getting together in a more timely fashion, perhaps. Does that sound good?

MS. FRANKE: I could put it on the PRTs agenda for this summer.

CHAIR WARE: All right, thank you, David, for that question. We did get a flurry of hands raised. What I'm going to do is I'm going to focus on folks who have not had an opportunity to speak yet. David, I saw your hand go back up. Did you want to respond, or you're all set?

MR. BORDEN: I'm all set. Thank you very much, that answers my question.

CHAIR WARE: Okay, excellent. I'm going to focus on folks who have not had an opportunity to speak yet. First, I'm going to start with Ingrid, and then Doug Grout, you are on deck.

MS. INGRID BRAUN-RICKS: Ultimately, I would just like to echo some of the comments made by both

Maryland and Virginia, in that we're in a very similar boat. Pretty much in a very similar situation with Maryland in that our fishermen, these seasons are set, and they take advantage of different portions of the season.

For PRFC, our tags are distributed by gear type, so ultimately certain gears I wouldn't know and have final numbers until the following spring, to know how to take a reduction. That again is past the time that we have issued. We have about 320 licensees in the Potomac River, and about 65 percent of that is already issued and in hand, and fishing actively by the January meeting. We didn't have the capability of holding tags back. Additionally, PRFC is not an ITQ in the sense that Maryland and Virginia are.

Where we don't have the ability to send letters, posts, distribution of tags to amend the quota, their individual quota, so that is really not an option for us. That is why we put in the payback in the 2026 season, where we can enumerate and properly reduce quota. But then we're also similar in the Virginia situation, in that from year to year we only utilize 60 to 70 percent of a quota. It is very unlikely that we would surpass that in this year. I just want to say that for the Board consideration.

CHAIR WARE: Doug.

MR. DOUGLAS E. GROUT: One thought I had regarding the two-year payback of any potential 2024 overage. Would it be possible for Maryland and PRFC to, in the fall of 2024, issue a portion of their ITQ tags, say 80 percent, and then once you get your final harvest tallies for 2024, you would then apply any overage or non-overage and then issue another amount of tags to make up for what the final quota is. That way we could have the 2025 payback, which all of the other states have been able to accommodate here for many years, as a matter of fact.

It seems like there is a mechanism. It seems like there are ways that you could do it. That is my question, that is my first question. The second question is, in the future, you know the way the proposal is stated, it sounded like every year into the future it would be the same two-year payback, or I

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

think the wording used the next applicable year. Does that mean that it may, if you go over in future years, say if 2025 that you wouldn't pay back until 2027 and so on?

CHAIR WARE: Mike, I see your hand raised, do you want to respond to this question?

MR. LUISI: Yes, sure. What I'll say is that there is a way to do anything. But whether or not it's worth the challenges, both administratively and worth the challenges to our resources is another question. What I would say, and while I understand what everyone is discussing about this payback.

The challenges that we would face in doing two permit issues along with our transferability of quota, with tags coming from the distribution center, not from a state agency, but through the company that we order our tags from. That is an individual number per person. The administrative burden is going to be too great.

I want to follow this up with a question. Last year we did an emergency action, the first emergency action I've ever been a part of during my 10 to 15 or so years of working with this Board. Everyone is so concerned right now about the payback from what could be an insignificant, biologically insignificant amount of fish in a future year.

What is the accountability for all of those that you just keep pressing and pressing and pressing on this commercial fishery? What is the accountability on the recreational fishery? We have no idea what the recreational fishery is going to catch this year. We're not going to know until well into 2025 what the estimates are going to be for recreational catch.

Does that mean that once we find out that those recreational fishermen are going to have to take reduction immediately upon the understanding that they may have over achieved what it was that we set out to do by changing the rules? Is that realistic to think that you are going to get the recreational community to make an adjustment in real time? No, it's not realistic.

Neither is it realistic to expect an agency, in charge of an enormous number of people who rely on this resource commercially, and the administrative burden, to deal with all of these suggestions of how to do something. One doesn't work with the other. If it's too burdensome, the word burdensome was used earlier today. Pennsylvania said it was too burdensome for them to do their necessary reductions for 2025, I'm sorry, 2024, so they are going to move things to 2026. But that is not being challenged. We might be talking about 10,000 pounds. We might be talking about such an insignificant number of fish and a payback that at the end of the day we're still achieving the desired result of managing a much-reduced quota from the previous quota, and we're going to do our best to do that.

I feel like I keep repeating myself over and over again. But in all due respect, the questions are the same. We are not going to jump over hoops and we cannot do it. We don't have the resources to do it. Just like certain states said they don't have the ability or the resources to put in season closures in this coming year, because it was going to be too much for them to try to take on in too quick time.

We don't have the resources to do what people suggested here, and I hope that folks can understand that. It has nothing to do with what we would like to be able to do, it's about what we have the resources for. I appreciate taking that into consideration. Megan, I think I answered the question, I hope I did. If there was another one out there that might be lingering, I'll try to be more quick in my answer for anything for the future.

CHAIR WARE: I think Doug, to your second question. It sounds like the PRT may have opportunity to review this, just like the general overage payback provisions later this year. Doug, did those answer your two questions? I still see your hand up. Okay, excellent. We've had a pretty robust discussion on the commercial measures. I am going to move us on to the recreational measures and the implementation plan.

I'm going to start just with recreational bag and size limit. As a reminder, I believe the only note from the Plan Review Team was Pennsylvania's request for a delayed implementation on their April and May fishery. I'll turn to Pennsylvania to see if they would like to comment on that, and then it's an opportunity for folks to ask questions. I'm going to separate out recreational filleting. We will do that next. Kris, I see your hand up, feel free to make a comment.

MR. KRIS KUHN: I appreciate the opportunity here to comment. Just some general rationale for the Board consideration for the delayed implementation that Pennsylvania is suggesting. The Pennsylvania recreational fishery is extremely small compared to; I think overall coastwide removals, that to use the words that I just heard from Mike Luisi, are biologically insignificant.

If the seasonal prohibitions for only, they are not available I'll say to have those in PA waters during a large portion of the year. I would also just reiterate that we use the best available data. If we had to come up with the reduction that was determined, because there is no fishery dependent data (poor audio) doesn't sample below.

Before we vote, I will add that anecdotally and based on best professional judgment observation from our law enforcement involved in the area, anglers largely practice cast. That being said, a more specific rationale for delayed implementation of the spring slot limit specifically. The spring slot as was mentioned runs from April to May, it's a two-month period. Changing the legal harvestable slot in the middle of a two-month season, it would certainly be procedurally burdensome. It would mostly lead to angler confusion and noncompliance enforcement. The current regulation as Tyler provided in his presentation is 2 fish from 21 to less than 24, and that is published in our (missed some) both of the regulations (?) purse seine fishing. That will certainly lead to some confusion and some noncompliance, and we're talking about a one-month period. States have been required to hope to achieve the 14.1 percent reduction, with the proposal estimates based on the analysis, Pennsylvania overshot that. We estimate it to be 19.3 percent.

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

The ocean slot, I will note, and I believe it might have been noted in the briefing materials or through the presentations with the slot reflecting for the lifespan, 31 inches was certainly more conservative, as a name required. This is why we're proposing to implement the 1 fish from 22 to 26 slot, less than 26-inch slot limit beginning the next spring slot from April 1st, 2025.

Through the normal rulemaking process in Pennsylvania, which we do. We confirm this through our Board of Commissions in July, our Commission meeting. Assume that it does ask them to send it out for public comment and then come back with it in October for final rulemaking for implementation in the 2025 fishing. I hope that answers some questions. Save any comments from the rational to delay implementation, with the recreational filleting allowance with the Commission before I address that.

CHAIR WARE: Thanks, Kris, yes, I'll have you hold your comments on the recreational filleting until our next topic, so thank you for that. Dennis Abbott, I see your hand raised.

MR. ABBOTT: Yes, thank you, Megan. I was going back. Mike Luisi, you know he posed in his last comments he actually had a question, and I was going to respond somewhat to his question about, you know this not being a large number of fish and so on and so forth. But I would like to just comment that you know there is a keen awareness of what's been going on in the striped bass fishery for some years now.

Everyone is aware and concerned with what may happen. I don't think that we can say there isn't a lot of effect. It goes back through the years of always making these minor changes. As I said years ago, it's like death by a thousand cuts. I think it's imperative that when we implement a management plan that we stick to the management plan, and the states fortunately or unfortunately have to do whatever it takes to be in compliance.

CHAIR WARE: I'm looking for any hands on the recreational bag and size limit. I think this is really an

opportunity for folks who have questions of Pennsylvania, if you have any. Emerson, I see your hand raised.

MR. HASBROUCK: On my end at least, the audio was not so good during Pennsylvania's presentation. My question is then, is Pennsylvania taking any reduction in 2024, or are they not taking any reduction at all, and are proposing they are not taking reduction until 2025?

CHAIR WARE: Kris, you are welcome to respond to that.

MR. KUHN: Thanks for the question, Emerson. Yes, Pennsylvania is taking this overall reduction by reducing the slot year-round in the nontidal portion of the Delaware, west branch Delaware River to the 28 to less than 31-inch slot limit, and also in the Delaware River and estuary tidal portion outside of the spring slot period that we were discussing. We enacted that back in January of this year.

MR. HASBROUCK: Follow up, please.

CHAIR WARE: Go ahead, Emerson.

MR. HASBROUCK: What is that reduction? What is the reduction amount by taking that action?

MR. KUHN: That is the 14.1 percent that the ocean slot limit was required for recreational fisheries.

CHAIR WARE: Any other questions on the recreational size and bag limit? Seeing no more hands raised, I'm going to move us to recreational filleting. Again, this is an opportunity for any states who want to comment or respond to the Plan Review Team report on recreational filleting, or if you have a question for a state on their recreational filleting measures. John Clark.

MR. JOHN CLARK: I just would like to respectfully disagree with the findings in the PRT that our regulation in Delaware doesn't clearly disallow or prohibit filleting at sea. I don't understand how you can, even though our regulation, which says you cannot keep a striped bass that you cannot alter the

total length of a striped bass in any way was not specifically written about filleting at sea.

It was more about just altering the length of a striped bass to get it under the size limit. In looking at it, I just don't understand how you could fillet a fish at sea and not alter its length. I figured that was good enough to prevent us from allowing filleting at sea, and thus we are compliant with the plan.

CHAIR WARE: Next, I have Justin Davis, and then on deck is Chris Batsavage.

DR. JUSTIN DAVIS: Similar to John's comment. I feel like our regulation in Connecticut clearly prohibits the possession of more than 2 fillets per legal fish. Our regulation states that any striped bass landed or possessed cannot be altered in such a way that the fish cannot be measured.

The way our law enforcement has interpreted that rule and enforced it to date is that anglers can fillet a striped bass at sea, they just need to bring back the rack with the fillets, so that the rack can be measured to determine that the fish was of legal length. From my standpoint, if you're in possession of three or more fillets, then you also need to be in possession of the rack that those fillets came from.

Otherwise, you are in possession of a striped bass that has been rendered unable to be measured. I can't see a way under our current rules, where someone could legally be in possession of more than two fillets per legal fish. I could see an argument that well, somebody could come back to shore with a rack and several chunks of what used to be a striped bass fillet. Say you know, weren't very good at filleting the fish or had a dull knife, and then could sort of claim, oh all this came from one fish, but it's several pieces of fish. I think there we're getting into an issue where we don't have a clear definition of what is and isn't a fillet.

I think it's something where if we all looked at a fillet, we would sort of say, yes, that is a fillet from a fish. But if you're in possession of more than two pieces of fish from a single fish, absent any definition of a fillet, I think then you're in possession of more than

two fillets. I feel like our rules clearly preclude a situation where somebody could come back to shore with more than one striped bass legally landed. You know I think about all the other species we manage.

We don't have rules for any of the other species explicitly stating that you can only have two fillets per legal fish. I've never run into a situation where our law enforcement has told us, you know we ran across somebody with 40 black sea fillets, but unfortunately, since there is not a rule saying you can only have two fillets per legal fish, we weren't able to make a case on it. Just from my standpoint, I think the rules we have in place clearly already preclude the possession of more than two fillets per legal fish.

CHAIR WARE: I have Chris Batsavage, and on deck is Ingrid.

MR. CHRIS BATSAVAGE: Yes, similar to what Justin explained for Connecticut, in North Carolina the way our mutilated finfish rule is enforced is if somebody had three fillets of a fish at either size or bag limit, and there was only one intact fish carcass, then our marine patrol would write a ticket for not having that second fish carcass, would be how that would work. However, if need be, we could add that specific requirement for possessing the fillets to our ocean striped bass confirmation to remain in compliance. It wouldn't apply to the other species that are enforced under our mutilated finfish rule, but we do have the administrative ability to make that change by May 1st if necessary.

CHAIR WARE: Ingrid and on deck is Pat Geer.

MS. BRAUN-RICKS: I just wanted to echo John Clark's comments, same language with PRFC, that you cannot alter the species in any way that it cannot be measured, and when it comes to our enforcement it is understood that there is no at-sea or shoreside filleting. We just feel that our language is sufficient for that. That's my comment, thanks.

CHAIR WARE: Pat Geer, and on deck I have Kris Kuhn.

MR. GEER: We actually have a whole regulation 580, which is alteration of finfish, which said, you know

we've asked it be identifiable, and the length that should be available as well. We also have similar information in our striped bass regulations. We kind of feel that we have what we need to make this work. You have to bring the rack back with you like other states have said as well. We feel it's in two different places in two different regulations. I think we're covered.

CHAIR WARE: Kris, and on deck is Mike Luisi.

MR. KUHN: The rationale for Pennsylvania is similar to what you heard from Justin Davis and Chris Batsavage in that I believe our current regulations cover those requirements in Addendum II. However, our plan is to clarify those to look to normal rulemaking process as they described with recreational slots.

Currently, it is unlawful to possess fish in any form other than whole or had the entrail removed while on shore, along the waters of Pennsylvania, on more than public docks, so peer launch area or parking area adjacent thereto. Fish may only be processed only if they are getting prepared for immediate consumption, or we had the provision in there that a charterboat operator or fishing guide may process the fish at any time.

However, the racks must be retained and a certificate of transfer to the customer has to be made when the fillets are given to the customer onshore. We think we have it covered, and our implementation plan seeks to address that a little bit better, beginning effective January 1, 2025.

CHAIR WARE: Mike Luisi.

MR. LUISI: This is to the filleting rule. We were holding off, waiting for the PRT to provide us some feedback on the language that we already have in place regarding limitations for striped bass filleting onboard chartered vessels. But given the feedback that we got, we are in the process now of implementing additional language to the rules that were provided in our implementation plan, which will state that an individual may not possess more than two fillets per legal fish onboard a vessel. We

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

started that process and it will likely come to fruition in a couple months. I just wanted to give the Board a heads up on that.

CHAIR WARE: Great, thank you for the update, Mike.

MR. LUISI: I'm sorry, Chair. When you get to it, if you want to come back to me, I would be happy to make a motion for the approval of the plan, state plan if you want to come back.

CHAIR WARE: Okay, thank you, Mike, I'm going to finish up our discussion and then we'll move to motions. Are there any other questions or comments on the recreational filleting portion of the implementation plan? Okay, not seeing any more hands.

CONSIDER APPROVAL OF STATE IMPLEMENTATION PLANS

CHAIR WARE: I am going to move us into the motion part of our agenda today. Mike Luisi, you mentioned that you have a motion ready to go.

MR. LUISI: Well, I was hoping that you or staff may have had a quick motion that I would be prepared to provide for the purpose of discussion. Yes, I think I can make that motion and speak to it if I get a second. The motion would be, **move to approve Addendum II state implementation plan as discussed today.**

CHAIR WARE: Steve Train, I see your hand raised, is that a second?

MR. STEPHEN TRAIN: Yes.

CHAIR WARE: Thank you, Steve. Mike Luisi, I will let you speak to the motion.

MR. LUISI: There were some questions that were raised today, all good questions. I think that no matter where we find ourselves in situations like this, because we are a group of individual states, there is always going to be some issue with process. There is going to be some issues with the administrative

workload that accompanies any type of actions like this.

Especially for a species that has esteemed a high-profile position as striped bass. With all of that said, I think that from what I've read in the implementation plans by the states, all the states are making a fair attempt to try to get the implementation of Addendum II done as quickly as possible. There are hurdles, there are some uphill battles to still face.

I think down the road we can, as was suggested, perhaps take on management action to try to find ways to help states plan for changes with striped bass through management actions to be on a cycle that would allow for the implementation of those necessary changes, with a timeline that is more readily handled by the administrations that have to put this together and the agencies that have to do the work. I'm comfortable with where we are, and I hope others can see it that way. That's all I have.

CHAIR WARE: I just want to note for the record, Mike you did mention that Maryland is implementing regulations for the 2-fillet language, so I'm viewing that as under the umbrella of, as discussed today in this motion. Just so that is clear on the record. Steve Train, as a seconder, do you want to make any comment?

MR. TRAIN: I'll try to do it really quickly. I don't think that what we have is perfect. I think Mike did a very good job reflecting the situation, the problems people have in administration. I know I've heard that from Maine before in the past, that we just don't have the capacity to do some of the things.

Years ago, with logbooks it took us a while to catch up, and I think it reflects that we are the ASMFC, we are not National Marine Fisheries. We do not come down heavy handed and expect everything to be followed according to what we put out. We give states a chance to adapt or make small changes and meet the requirements, and I think that this Addendum implementation plan will do that. Like I said, it's not perfect. There will be a chance to

correct things, I hope. But it looks like we've moved in the right direction.

CHAIR WARE: We'll move to the Board's discussion. Mike Armstrong, I see your hand raised.

DR. MIKE ARMSTRONG: I would like to move to substitute a motion.

CHAIR WARE: Okay, I think you had sent staff that language, so just give them a second to put that up.

DR. ARMSTRONG: I did.

CHAIR WARE: If you could, read that into the record, Mike.

DR. ARMSTRONG: Move to substitute to add with the following exceptions, Connecticut, Maryland, Virginia, North Carolina not planning to adopt the two-fillet per legal fish possession limit rule for recreational filleting allowances; Pennsylvania, not planning to adhere to the May 1 Implementation deadline; Maryland, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year. These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board will review and consider approval of the revised state implementation plans at its May 1, 2024 meeting.

CHAIR WARE: Just before I get a second, Mike, I think with the motion to substitute we would need to add into the first part of the phrase there, move to approve the Addendum II state implementation plans with the following exception. Just looking at Emilie or Toni to confirm that.

MS. KERNS: Megan, it could just be a motion to amend to add. I think that would be our easiest fix.

CHAIR WARE: Okay, sounds good. We'll do a motion to amend, Mike Armstrong, if you're okay with that.

DR. ARMSTRONG: Hold on just a second.

CHAIR WARE: I think if it's a substitute we would just keep the first part of the underlying motion.

DR. ARMSTRONG: I think I would rather have it a substitute, and it becomes easier to discuss.

CHAIR WARE: Okay, so this is a motion to substitute, and it would be motion to substitute to approve, et cetera, et cetera, and we'll just give folks a chance to make that change. We have a motion by Mike Armstrong, we're looking for a second. Emerson, are you seconding this motion?

MR. HASBROUCK: Yes, I will.

CHAIR WARE: Mike Armstrong, would you like to provide some rationale as the maker?

DR. ARMSTRONG: I apologize, this much complicates things, but as Steve Train just said, this isn't perfect, and his opinion is it should go forward. My opinion is it's imperfect enough that we should be looking at items individually and voting on them. For the fillet rule, you know the states have made a good case. I expect an amendment perhaps on that.

What is not included is the lack of reducing the quota in the Bay states. I'm not terribly concerned with that, because they will get in it for next year. What I am concerned is the lack of payback for next year. It is a biological concern, and it's been in effect since 1995 from Amendment V that payback is in the following year. AT some point we need to follow the rules that we have made. I would like to see a vote up and down on some of these things and further discussion.

CHAIR WARE: Emerson, as the seconder of the motion, would you like to make a comment?

MR. HASBROUCK: I agree with what Mike just said, particularly in reference to the FMP that requires payback in the following year. You know I understand what Mr. Luisi has been talking about. I understand that there are some administrative hurdles. I have some sympathy for those administrative hurdles.

But what I heard was, from Maryland is, not that they cannot do it, but that they won't do it or don't want to do it right now, meaning come up with a process to have any particular payback occur in 2025. I'm also going to just add that if the implementing of reduced commercial quota was such an issue with Maryland and Potomac River Fisheries Commission, I don't know why they didn't vote for status quo on the commercial quota, back when we had this vote in our winter meeting. That's a rhetorical question.

CHAIR WARE: As was alluded to, you can make motions to amend on substitute motions. What I would like to do is focus on perfecting both of the motions we have via amendments if there are any, and then we will vote on the two motions to substitute. I'm going to start with the underlying motion.

Toni or Emilie, if I am doing this incorrectly let me know. I think we'll start with the underlying motion and check in to see if there are any motions to amend the underlying motion, so that is the motion by Mr. Luisi, seconded by Mr. Train. Going down the list here. Justin Davis, do you have a motion to amend?

DR. DAVIS: I do, but I think it's probably a motion to amend the substitute motion, so I'll wait, if that is appropriate at this point.

CHAIR WARE: Yes, let's do that. Let's just make sure there are no motions to amend the underlying motion. Thanks, Justin. I'll write your name down and come back to you. Mike Luisi, do you have a motion to amend your motion? You're all set, okay. Dennis Abbott, you have a motion to amend the underlying motion?

MR. ABBOTT: No, but I'm confused at the moment. How can we vote on the underlying motion, which would approve the state implementations as discussed today. I don't know that all of us or any of us are prepared to approve the implementation plan as discussed today. Seemed to me, I thought we would be dealing with the substitute motion first.

CHAIR WARE: Thanks, Dennis, my understanding is on the motion to substitute we perfect both sides of

the motion. I suspect all of the motions to amend will be on the motion to substitute. I'm just trying to doublecheck that. Kris, is your hand up for a motion to amend the substitute motion?

MR. KUHN: No, it is not, Madam Chair, I had a qualifying question.

CHAIR WARE: Okay, go for it.

MR. KUHN: I'm trying to understand the Pennsylvania portion from the substitute motion. Is that to apply only to the spring slot fishery, or is that also the recreational filleting law? Because it doesn't say here, and I heard the maker of the motion didn't think that the rationale provided for the filleting was sufficient.

CHAIR WARE: Thanks, Kris, great question. Mike Armstrong, I'll go to you as the maker of the substitute. Do you want to clarify the Pennsylvania bullet point?

DR. ARMSTRONG: Yes, my mistake. Pennsylvania should have been in that.

CHAIR WARE: Pennsylvania should be both in the first bullet point, as well as the second one? I think Kris's question, or if I'm interpreting Kris's question, is the May implementation deadline applying both to recreational filleting and the April/May recreational size limit for their slot fishery?

DR. ARMSTRONG: I think it would apply to both. I think the cleanest would be to keep Pennsylvania where it is, and also add it to the first line.

CHAIR WARE: Okay. Emerson, are you okay with that as a friendly?

MR. HASBROUCK: Yes, I am.

CHAIR WARE: Kris, does that clarify for you how Pennsylvania fits into this motion?

MR. KUHN: Yes, it does.

CHAIR WARE: Okay, excellent, thank you for the question. We're now going to work on perfecting the substitute motion, and Justin, I know you had mentioned that you had a motion to amend the substitute.

DR. DAVIS: Yes, thank you Madam Chair. I **move to amend the substitute motion by removing the first bullet referencing the filleting rules.** Hopefully that is clear enough.

CHAIR WARE: Okay, if you could read that into the record, Justin, what staff has written on the board, and then we'll see if there is a second.

DR. DAVIS: Sure. Move to amend the substitute to remove the first bullet point on recreational filleting rules.

CHAIR WARE: Thank you, so we have a motion from Justin, is there a second? I am not seeing any other hands raised, so I'll just ask one more time. Is there a second? Kris Kuhn, are you seconding the motion?

MR. KUHN: Yes, I'll second the motion for discussion.

CHAIR WARE: Justin, would you like to provide some rationale?

DR. DAVIS: I can understand the intent here, but it's clear to me from Connecticut standpoint and the arguments that were made by other states when we were discussing this issue that the states referenced here have rules in place that clearly prevent someone from legally landing more than two fillets per legal fish, just based on a logical interpretation of the rules. I don't really think this is necessary to meet the intent of the Addendum, so that is why I'm moving to amend to remove this bullet point.

CHAIR WARE: Okay, thank you, Justin. Kris, as seconder, would you like to make a comment?

MR. KUHN: No, I don't have any further comments, Dr. Davis said it well.

CHAIR WARE: We've had a lot of discussion on the rec fillet measures so far. I'm looking for any new

comments on the motion to amend the substitute. Justin, if I could just have you lower your hand when you get a chance. Okay, I am not seeing any hands, so I'm going to give a two-minute caucus period, since I know we're on webinar and caucusing can be challenging.

Two minutes to caucus. If a state needs more time after two minutes, if you could just raise your hand that would be helpful. Okay, so those are two minutes. I don't see any other states with their hands raised. I am assuming folks are ready to vote on this. If we could just move the timer to the side or up a little bit, I'll just remind folks what we're voting on.

This is a motion to amend the substitute, to remove the first bullet on recreational filleting. A yes is voting in favor of amending the substitute to remove the first fillet. We are going to vote by a raise of hands, so if each state's administrative commissioner, or one commissioner from each state should be raising the hand. **All those in favor of the motion to amend the substitute, please raise your hand.**

MS. KERNS: I have Rhode Island, Connecticut, New Hampshire, Delaware, Maine, Virginia, District of Colombia, Massachusetts, Pennsylvania, and North Carolina. John, I did say Delaware, right?

MS. FRANKE: You did.

MS. KERNS: Thank you, Emilie.

CHAIR WARE: All those opposed to the motion to amend the substitute, please raise your hand.

MS. KERNS: I'm just waiting for the hands to settle. I have New Hampshire, Potomac River Fisheries Commission, New York, Maryland, Virginia, and Massachusetts. I thought they voted before, but maybe I'm misremembering.

MS. CHERI PATTERSON: Yes, New Hampshire already voted yes to amend.

MS. KERNS: Okay, you have your hand up, so I am

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

going to take it down for you. Is it just Potomac River Fisheries Commission, New York and Maryland?

MR. GEER: Yes, that's right. I was going to say, initially you said Virginia, but we voted yes.

MS. KERNS: Okay, your hand hadn't been raised, so we'll remove Virginia, it is just those three entities. I will put the hands down for everybody.

CHAIR WARE: Are there any abstentions?

MS. KERNS: NOAA Fisheries.

CHAIR WARE: Any null votes?

MS. KERNS: New Jersey.

CHAIR WARE: Emilie or Toni, I will look to you for a vote count. I'm not sure I got all of the yesses.

MS. KERNS: Emilie, can you just make sure we had everybody that was here. I'm sorry that was a little confusing with the hands going up and down.

MS. FRANKE: I've got it. We have 15 voting members here today, so we had 10 in favor, 3 opposed, 1 abstention and 1 null.

CHAIR WARE: The motion to amend the substitute passes. We'll give staff a moment to amend the substitute, and then we will see if there are any other perfections to the substitute. This is now our amended substitute. Are there any other motions to amend the substitute? Kris, go ahead.

MR. KUHN: I move to amend the motion to remove the first bullet on Pennsylvania planning to adhere to May 1 implementation deadline. If I get a second, I will give additional rationale.

CHAIR WARE: John Clark, are you seconding the motion? Maybe not. Marty, are you seconding this motion?

MR. MARTIN GARY: Yes, Madam Chair, I'll second it.

CHAIR WARE: Okay, thank you, Marty. Kris, I'll go to

you as the maker of the motion if you would like to make a comment.

MR. KUHN: Yes, I appreciate that, thank you, Madam Chair. I was trying not to be too redundant in my comments, but maybe clarify what I previously said a bit better. Pennsylvania implemented the 28-to-31-inch slot limit in January that was required in the fishery. That was for the entire river, river estuary and its branch (not clear). We met that part of Addendum II. We have the spring fishery, which is a very small fishery, not a lot of fish available.

It's the only opportunity in Pennsylvania really for anglers to have some type of opportunity to harvest. We worked through the analysis to come up with a reduction of 19.3 percent, you were only required to get to the target of 14.1 percent. We may or may not be able to implement this by May 1st.

We may go through a large amount of administrative burden and hoops to jump through, to try and get this done for a two-week period. I'm asking, we're making a good faith effort at making this change for 2025, but I'm asking for consideration to alleviate some of this administrative burden that would come with a change that is not biologically going to be significant.

CHAIR WARE: Marty Gary, as the seconder, would you like to make a comment?

MR. GARY: I think Mr. Kuhn said it well, Madam Chair, nothing to add.

CHAIR WARE: We're looking for discussion on the motion to amend the substitute. Again, we've had a lot of discussion so far. Looking for new types of comments. Mike Armstrong, would you like to comment?

DR. ARMSTONG: Yes, I would. I guess, you know burdensome is not a reason not to put in regulations, or try your darnedest to. You know we have one of the biggest fisheries on the east coast, and we change things midstream all the time. We've changed rules after our sportfish guide has gone out.

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

We don't like it, but that is the way fisheries management works. You know if they come back May 1st and say, we're close but we don't have it yet. Sure, we can vote and say, that is all right, we'll give you another couple of weeks. But they've got to keep going with a good faith effort for this year.

CHAIR WARE: Any other comments on the motion to amend the substitute? Mike Armstrong, if I could just get you to lower your hand when you get a chance. Thank you. I'm not seeing any other hands, so again, we'll do a two-minute caucus. If a state needs extra time to caucus on this, please just raise your hand and we will allow that.

I think admittedly, Maine may need a little extra time to caucus, so I'm going to ask for another minute on behalf of Maine. I appreciate everyone's patience. I think folks are ready. As a reminder, this is a motion to amend the substitute to remove the first bullet regarding the Pennsylvania May 1 deadline. **All those in favor of a motion to amend the substitute, please raise your hand.**

MS. KERNS: Okay, Delaware, Maine, New York, District of Colombia and Pennsylvania.

CHAIR WARE: Opposed.

MS. KERNS: Hold on Megan, let me just put the hands down. I'm going to put everybody's hands down, and those opposed are going to have to reraise their hands. Ready.

CHAIR WARE: My apologies. Okay, all those opposed.

MS. KERNS: Rhode Island, New Hampshire, Potomac River Fisheries Commission, Virginia, New Jersey, Massachusetts, and North Carolina.

CHAIR WARE: Okay, any abstentions?

MS. KERNS: NOAA Fisheries.

CHAIR WARE: Any null votes?

MS. KERNS: Connecticut and Maryland.

MS. FRANKE: By my count there were 5 in favor, 7 opposed, 1 abstention, and 2 nulls.

CHAIR WARE: Yes, I have the same numbers, Emilie. **The motion to amend the substitute fails.** We are now back to our motion to substitute. Are there any other motions to perfect the substitute? Seeing no hands raised, I think this now would bring us to the point where we are voting on the substitute motion that has been perfected. Mike Luisi, do you have a motion to perfect the substitute?

MS. KERNS: Mike, if you are talking, you are muted.

MR. LUISI: I'm sorry. Madam Chair, I don't have a motion to perfect the language, but I would hope that there would be an opportunity to speak to the motion and address some of the things that were brought up by the maker and seconder, in opposition to this motion. I don't know if you are planning to allow for discussion or not.

CHAIR WARE: I am, yes. Let me just set the stage here and then I'll go to you, Mike. We are now to our perfected motion to substitute, so this is a discussion on the motion to substitute. If there is any discussion, I know we've had a lot, but any new ideas, or it sounds like reactions to previous comments, now would be the opportunity to say it. Mike Luisi, I see your hand raised.

MR. LUISI: I'll try to be quick in my comments. I've already had a few opportunities to address some of the concerns related to Maryland's fishery as its highlighted here. I think the focal point, based on the previous vote has to do with Pennsylvania, then Maryland and Potomac River plan for the commercial quota overage payback.

I want to make the statement. In all due respect to the folks around the table, the hard work that they all put in to managing fisheries on the east coast. We have lost our way. If we are at the point in time right now, where within a matter of a years' time we have not only gone through the process of establishing emergency regulations within our state. Addressing an addendum that was finalized just a few months ago, that has the impacts that it does, not only to 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

fishermen, but the positive impacts to the resource and the complete lack of caring on behalf of this Board in regards to the burden that this puts on the agencies that have to go through the process of making sure that all of these provisions get done.

My original motion was, as Mr. Train said very eloquently, the first step. I tried to take action in the positive, to help this resource come back around. By continuing to press the issue on things that just aren't biologically significant. At the end of the day this Board is missing the bigger purpose. There are intended consequences to delaying action in October, and take final action on an addendum in January. There are unintended consequences.

One of them is one of the things that we're addressing here today regarding administering Maryland and Potomac River Fisheries commercial fishery. There was a comment made earlier by Mr. Hasbrouck, about the state of Maryland doesn't want to do it. It's not that we don't want to do it, it's that we can't.

We don't have the resources to juggle the amount of needed administrative detail to handle something like this, within the season that it's currently operating. We need to be able to address the concern that has been raised by this Board over time, and address any commercial overages during an upcoming year, when we can actually make the change and do it in an effective and an efficient way.

The other point that was made was, why didn't we support status quo on the commercial fishing reductions, if we knew this was going to be a problem? It's because we didn't think that that was the right thing to do. We felt that the commercial industry was part of the overall picture for Maryland for striped bass management on the coast, and we felt that it was responsible on our part to support some form of a reduction.

This in my opinion, the Board just seems lost in this detail, and I really, really hope that we don't find ourselves having to go back to the drawing board, put together an implementation plan, which I'll tell you now will likely not address the concerns that

have been brought up here today by the state of Maryland, to allow for the approval of our plan.

If our plan isn't approved as is, there is nothing we can do. We're not going to be able to accomplish that task, and that is a whole other question. I like Steve's comment about possibly down the road we can take some additional issues like this into consideration, kind of improve what we currently have.

We also have an assessment report that is going to come out in a matter of months, where we might be doing this all over again. I sure hope that this Board will vote no on the substitute, and approve the state implementation plans as we discussed today, with all the best intent by all the states to accomplish the tasks at hand.

CHAIR WARE: Are there any other comments on the motion to substitute before we go into caucus? Seeing no hands raised, we're going to go into a two-minute caucus, and then we will vote on the motion to substitute. Okay, that was two minutes. I'm not seeing any hands raised requesting additional caucus time. Just a reminder of voting on the motion to substitute. A yes vote is in favor of the substitute, and a no vote is opposed to the substitute. **All those in favor of the motion to substitute, please raise your hand.**

MS. KERNS: Rhode Island, Connecticut, New Hampshire, New York, New Jersey, District of Columbia, Massachusetts and North Carolina. **I'll put the hands down for everybody. Okay, we're ready.**

CHAIR WARE: All opposed.

MS. KERNS: Maine, Potomac River Fisheries Commission, Maryland, Virginia, and Pennsylvania.

CHAIR WARE: Any abstentions?

MS. KERNS: NOAA Fisheries.

CHAIR WARE: Any null votes?

MS. KERNS: Delaware.

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

MS. FRANKE: My count was 8 in favor, 5 opposed, 1 abstention and 1 null.

CHAIR WARE: Yes, I have the same count, Emilie. **The motion to substitute passed.** We'll give folks a moment to get that back up on the screen. This is now our main motion, are there any other changes that folks want to propose to this main motion? If not, we will take a two-minute caucus and then vote on the main motion.

MS. KERNS: Megan, not a change, but Emilie, it's now a property of the Board so the makers and seconders go away, since it was substituted. Perfect, thank you.

CHAIR WARE: I'm not seeing any hands raised for amendments and substitutes, so we'll do again, a two-minute caucus and then we'll vote. Okay, that was two minutes. I don't see any hands raised, so I think we're ready to vote. **All those in favor of the motion, please raise your hand.**

MS. KERNS: Rhode Island, Connecticut, New Hampshire, Delaware, Maine, New York, Virginia, New Jersey, District of Columbia, Massachusetts and North Carolina. I'll put the hands down for you all. Okay, Megan.

CHAIR WARE: Thanks, Toni. All those opposed. I'll just flag, I think Virginia's hand.

MS. KERNS: Yes, I'm going to take it away. Potomac River Fisheries Commission, Maryland and Pennsylvania.

CHAIR WARE: Okay, any abstentions?

MS. KERNS: NOAA Fisheries.

CHAIR WARE: Any null votes?

MS. KERNS: No hands.

MS. FRANKE: I had 11 in favor, 3 opposed, 1 abstention and 0 null.

CHAIR WARE: Yes, I had the same count, Emilie. **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

motion to approve the Addendum II state implementation plans with the following two exceptions passes. I believe that concludes the business we needed to complete today. Emilie, I'll check in with you. Is there anything else on the implementation plans the Board needs to discuss?

MS. KERNS: Megan, I just want to advise you that Mike Luisi has his hand up, and now Marty Gary.

CHAIR WARE: Okay, let me just check in with Emilie, and then I will go to you, Mike and then Marty.

MS. FRANKE: No, nothing else, just reiterating what is in the motion. Based on this motion, these three jurisdictions will be submitting revised implementation plans by April 12, and then this will be on the Board's agenda for the spring meeting, to consider approval of the revised plans.

CHAIR WARE: Okay, thank you, Emilie. Mike Luisi, I see your hand up.

MR. LUISI: I hope this is the proper venue to at least ask this of staff, and I was hoping not to have this conversation here today. But I am now sitting here thinking about the comments that have been made on the part of Maryland, and looking at a revised implementation plan. I don't know that we're going to be able to meet what this Board has put forth, as far as our ability to make the adjustments necessary.

Would it be appropriate to ask staff to provide for the Board a detailed summary in a memo style regarding noncompliance, and when a state in this situation would be found out of compliance? Would it be upon the implementation date of the Addendum, or would it be on having to follow the regulatory process of a reduction payback in 2025?

The reason I ask is that all of this may not even be necessary if the 2024 Addendum II quota is not overharvested. When, if we left things the way they are, would Maryland be considered out of compliance? I guess that is my overall question, and maybe I'm asking it for Potomac River as well, but those are things that I'm definitely going to have to answer to after this meeting.

CHAIR WARE: Mike, I see Bob Beal with his hand up, so I will pass that question to him.

EXECUTIVE DIRECTOR ROBERET E. BEAL: Can you hear me, okay? I'm in a hotel lobby.

CHAIR WARE: Yes, we can.

EXECUTIVE DIRECTOR BEAL: Okay, great, I like hanging out in these places. Mike, we can easily put together a sort of step-by-step process for noncompliance and what that means. However, it's up to the Board when they decide they would like to suggest to the Secretary of Commerce and Interior that a state is out of compliance. In other words, Maryland is given the opportunity to bring something back at the May meeting, and then some of these conversations that we had today will be reviewed, and see what is included in the proposal for Maryland.

I think part of that conversation at that meeting would be, you know what you just said, that in reality the likelihood of an overage from Maryland is going to be an important part of those discussions relative to noncompliance findings by the Commission, which would be forwarded off to the Secretary.

You know we can do step-by-step process, but timing wise is solely up to the Board, and ultimately up to the Commission, rather than just the Board itself. I'm not trying to duck your question; I'm just saying there are more conversations to be had before we go down the road of noncompliance. Happy to answer any questions if you have them, Mike.

CHAIR WARE: Mike, did that help?

MR. LUISI: Yes, thanks, Madam Chair. That helped, Bob. I've just been trying to field questions during this meeting about when Maryland could be found out of compliance. Whether it be at the next meeting in May or upon not being able to comply with Addendum II for taking the reduction in the follow up year. I guess for now, next step would be for May, to figure out where we might be by then. That is what I took from your conversation. I think that is what I'll pass along.

EXECUTIVE DIRECTOR BEAL: Yes, that is correct, Mike.

CHAIR WARE: Marty Gary, I see your hand up.

MR. GARY: I thought I had a simple question, but hopefully I'll state this correctly. We come back in May with we see revised implementation plan, and let's say we approve them. Do we know what the implementation date would be for those revised plans? Could they be different for Pennsylvania versus Maryland?

CHAIR WARE: Emilie, I may pass that question to you, or we can try and work it out together.

MS. KERNS: Do you want help, Emilie?

MS. FRANKE: Yes, go for it, Toni.

MS. KERNS: Marty, I think it will be sort of at the pleasure of the Board. Again, the Board will review the implementation plans. It is right now we're stating that they need to adhere to these implementation dates of May 1st. That state may ask for help.

I heard Mike Armstrong say earlier today that his intention is for these states to do their best of their ability to try to get these measures in place by May 1. If these states cannot do so, then they should come forward and say why they couldn't do it, but they tried to do it, and then the Board will take that into consideration when they are reviewing the implementation plans at our May 1st meeting. Does that answer your question, Marty?

MR. GARY: It does, thank you, Toni, appreciate it. Thank you, Madam Chair.

CHAIR WARE: Good question, Marty. Any other questions on the implementation plans and what has happened today, before we look to adjourn the meeting? I'm not seeing any.

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

ADJOURNMENT

CHAIR WARE: We did not have any Other Business at the beginning of the meeting, so I think at this point we're just looking for a motion to adjourn. Doug Grout, I see your hand raised and a second by Steve Train. Thanks everyone. I appreciate everyone's patience today.

(Whereupon the meeting adjourned at 3:00 p.m. on March 26, 2024)

Atlantic Striped Bass Addendum II to Amendment 7 Implementation Plan Pennsylvania

Ocean Recreational Fishery

Requirement: 1 fish at 28" to 31" with 2022 seasons (all modes).

Summary of Proposed Measures

The Pennsylvania Fish and Boat Commission (PFBC), acting under the authority of 58 Pa. Code § 65.25 (relating to temporary changes to fishing regulations), amended 58 Pa. Code § 61.2 (relating to Delaware River, West Branch Delaware River and River Estuary) to implement the 1 fish at 28" to less than 31" slot limit requirement on January 6, 2024. This regulation applies to the portion of the Delaware River, West Branch Delaware River, and River Estuary from the Commonwealth line upstream to Calhoun Street Bridge (Delaware Estuary) from January 1 through March 31 and June 1 through December 31 and from the Calhoun Street Bridge upstream (Delaware River) year-round. This temporary regulation will expire December 31, 2024; however, the PFBC will seek to extend this regulation indefinitely through Pennsylvania's established rulemaking process described later in this plan.

NY/PA/DE Additional Requirement: The following states are required to submit area-specific measures to achieve the same percent reduction in recreational removals as the selected 28-31" ocean option (14.1% reduction) as part of their state implementation plans:

- *New York: the Hudson River management area.*
- *Pennsylvania: the state's April-May slot fishery in the lower Delaware River/Estuary.*
- *Delaware: the state's July–August slot fishery in Delaware River/Bay.*

- NY/PA/DE Area-Specific Proposed Measures: Pennsylvania's Atlantic Striped Bass Addendum II Spring Slot

Summary of Proposed Measures

1 fish at 22" to less than 26" (April 1 through May 31) for the Delaware River and Estuary.

The current spring slot regulation is 2 fish at 21" to less than 24" (April 1 through May 31).

Data Sources

The PFBC's annual Delaware River Estuary spring spawning stock survey from 2020-2023. Pennsylvania is not covered by MRIP, so those data are not available for analysis.

Inch Group	Number	Percent
5	2	0.2%
6	6	0.7%
7	9	1.0%
8	13	1.4%
9	18	2.0%
10	40	4.4%
11	43	4.7%
12	45	5.0%
13	54	6.0%
14	58	6.4%
15	48	5.3%
16	59	6.5%
17	50	5.5%
18	61	6.7%
19	51	5.6%
20	47	5.2%
21	42	4.6%
22	32	3.5%
23	26	2.9%
24	30	3.3%
25	26	2.9%
26	18	2.0%
27	10	1.1%
28	17	1.9%
29	9	1.0%
30	8	0.9%
31	5	0.6%
32	4	0.4%
33	4	0.4%
34	5	0.6%
35	4	0.4%
36	10	1.1%
37	11	1.2%
38	10	1.1%
39	5	0.6%
40	6	0.7%
41	5	0.6%
42	5	0.6%
43	4	0.4%
44	2	0.2%
45	2	0.2%
46	2	0.2%

Methods

The number of fish in each inch group was summed (all fish in the 10 to 46-inch groups). Fish greater than or equal to 10 inches recruit to the boat electrofishing gear most effectively and were therefore included in the analysis. The harvest rate of the current regulation (2 fish, 21" to less than 24") was calculated by summing fish in the 21 to 23-inch length groups and applying a 9% dead discard rate to all size bins outside of the current slot (10" to less than 21" and 24" to 46"). The proportion of fish in the proposed slot (22" to less than 26") was assumed available for harvest and that all fish, if caught, would be harvested. A 9% reduction was again applied to all inch groups outside of the proposed slot limit (10" to less than 22" and 26" to 46") to account for delayed hooking mortality. We considered the reduction in bag limit from two fish to one fish per day to be a 25% reduction in harvest. A sequential reduction equation ($X + [(1+X)*Y]$; where X = the percent change in harvest associated with a bag limit reduction and Y = the percent change in harvest associated with a change in slot limit dimensions) was used to calculate the harvest savings of the proposed regulation.

Table of proposed measures

Current removals (2022 Regulations - 2 fish at 21" to less than 24")	
Status quo harvest	100
Status quo dead releases (9% of all bins greater than 10" excluding 21" to < 24")	68.22
Total status quo removals	168.22
New removals under proposed measures (22" to less than 26")	
New slot harvest (22" to less than 26")	114
New slot dead releases (9% of all bins greater than 10" excluding 22" to < 26")	66.96
Total new removals	180.96
Percent change from status quo (New removals - Status quo removals)/Status quo removals	0.075734
Overall change in harvest	
X (Percent change due to bag limit reduction)	-0.25
Y (Percent change from status quo [current regulation])	0.075734
Change in harvest using Sequential Reduction Equation: $X + [(1+X) * Y]$	-0.1932
Total harvest savings with proposed regulation (1 fish at 22" to less than 26")	19.32%

Based on the included analysis, this proposal achieves a 19.32% reduction in total removals from 2022 measures.

Chesapeake Bay Recreational Fishery

Requirement: 1 fish at 19" to 24" with 2022 seasons (all modes).

- Proposed Measures: NA

Recreational Filleting Allowance

Requirement: For states that authorize at-sea/shore-side filleting of striped bass, establish minimum requirements, including requirements for racks to be retained and possession to be limited to no more than two fillets per legal fish.

Summary of Proposed Measures

The recreational filleting allowance requirements are covered under 58 Pa. Code § 63.15 (Field dressing and disposal of fish). See full regulation at: [58 Pa. Code § 63.15. Field dressing and disposal of fish. \(pacodeandbulletin.gov\)](http://www.pacodeandbulletin.gov). However, the provision for the possession limit of no more than two fillets per legal fish could be clarified. As such, a revision to § 63.15 to account for this requirement will be recommended to PFBC’s Board of Commissioners through proposed and final rulemaking.

Ocean Commercial Fishery

Requirement: 7% reduction from 2022 quotas with 2022 size limits.

State-by-state commercial quotas for the ocean region.

	2022 Quota (pounds)	Addendum II Quota (pounds) 7% Reduction
Maine	154	143
New Hampshire	3,537	3,289
Massachusetts	735,240	683,773
Rhode Island	148,889	138,467
Connecticut	14,607	13,585
New York	640,718	595,868
New Jersey	215,912	200,798
Delaware	142,474	132,501
Maryland	89,094	82,857
Virginia	125,034	116,282
North Carolina	295,495	274,810
Ocean Total	2,411,154	2,242,373

- Proposed Measures: NA

Chesapeake Bay Commercial Fishery

Requirement: 7% reduction from 2022 quotas with 2022 size limits.

Chesapeake Bay region commercial quota, and Bay jurisdiction quotas assuming Maryland, Virginia, and PRFC maintain their same quota allocation.

	2022 Quota (pounds)	Addendum II Quota (pounds) 7% Reduction
Chesapeake Bay	3,001,648	2,791,532
Maryland Chesapeake Bay	1,445,394	1,344,216
Potomac River Fisheries Commission	572,861	532,761
Virginia Chesapeake Bay	983,393	914,555

- Proposed Measures: NA

Timeline for Implementation

Requirement: Implementation of all measures no later than May 1, 2024.

Proposed Implementation Timeline

This timeline describes Pennsylvania’s established rulemaking process to promulgate regulations. Although it does not fully implement all required measures by May 1, 2024, the amendments described below fully or partially satisfy Addendum II requirements by that date.

Proposed Amendments

- Ocean Recreational Fishery – Pennsylvania implemented a temporary regulation to enact the required 1 fish at 28” to less than 31” slot limit on January 6, 2024. This measure will be extended indefinitely beyond 2024 through the rulemaking timeline described below.
- April-May slot fishery in the lower Delaware River/Estuary – Pennsylvania’s spring slot fishery extends from April 1st through May 31st. We proposed to implement the 1 fish at 22” to less than 26” slot limit beginning May 1, 2024 through a temporary regulation. This regulation will extend through May 31, 2024, after which the regulations will revert to the 1 fish at 28” to less than 31” slot limit.

- Recreational Filleting Allowance – Currently it is unlawful to possess a fish in any form or condition other than in the whole or having the entrails removed while on shore, along the waters of Pennsylvania, onboard a boat or on a dock, pier, launch area or a parking lot adjacent thereto. Fish may only be processed fully if they are being prepared for immediate consumption. However, a charter boat operator or fishing guide may fully process the fish at any time provided the charter boat operator or fishing guide retains the carcass until possession of the fish is transferred to the customer on shore. The charter boat operator or fishing guide shall give the customer who receives the processed fish a signed, dated receipt on the form prescribed by the PFBC. As such, the Addendum II requirement is satisfied by this regulation; however, the provision for the possession limit of no more than two fillets per legal fish could be clarified. As such, a revision to § 63.15 to account for this requirement will be recommended to PFBC’s Board of Commissioners through proposed and final rulemaking.

Timeline

- May 1, 2024 – Implement the 1 fish at 22” to less than 26” slot limit in the lower Delaware River/Estuary from May 1, 2024, through May 31, 2024 through a temporary regulation, after which the regulations will revert to the 1 fish at 28” to less than 31” slot limit.
- July 2024 quarterly PFBC meeting – Proposed Rulemaking: Request the board of commissioners approve the publication of notices of proposed rulemakings in the *Pennsylvania Bulletin* containing the amendments in the approved implementation plan. If approved, a link will be established on the PFBC website coincident with posting in the *Pennsylvania Bulletin* to accept public comments for at least 30 days prior to the October Commission meeting where these amendments will be considered for final rulemaking.
- October 2024 quarterly PFBC meeting – Final Rulemaking: Propose these amendments to the Board of Commissioners in October. Staff will recommend that the Commission adopt the amendments as set forth in the notices of proposed rulemakings.
- January 1, 2025 – If adopted on final rulemaking in October 2024, these amendments will go into effect January 1, 2025.



Wes Moore, Governor
Aruna Miller, Lt. Governor
Josh Kurtz, Secretary
David Goshorn, Deputy Secretary

Revised Atlantic Striped Bass Addendum II to Amendment 7 Implementation Plan **Maryland**

The State of Maryland prepared the following revised Implementation Plan to the Atlantic Striped Bass Addendum II to Amendment 7 Fishery Management Plan based on actions taken by the Atlantic Striped Bass Management Board (Board) on March 26, 2024. The following motion was passed by the Board and identifies the sections of the original plan that require revision:

Move to approve Addendum II state implementation plans as discussed today with the following exceptions:

- *PA: not planning to adhere to the May 1 implementation deadline; and*
- *MD, PRFC: not planning to adhere to the commercial quota overage payback provision for deductions to occur in the following year.*

These jurisdictions must submit revised implementation plans by April 12, 2024. The Management Board will review and consider approval of the revised state implementation plans at its May 1, 2024 meeting.

Motion passes (11 in favor, 3 opposed, 1 abstention).

Ocean Recreational Fishery, Chesapeake Bay Recreational Fishery and Recreational Filleting Allowance

*No changes required - Original Implementation Plan approved on March 26, 2024.

Note Regarding Maryland's Filleting Rules:

- Maryland is actively working to incorporate the following language into our regulations on filleting Striped Bass: *An individual may not possess more than 2 fillets per legal fish on board a vessel.*

Ocean and Chesapeake Bay Commercial Fisheries

Requirement: 7% reduction from 2022 quotas with 2022 size limits.

*No changes required - Original Implementation Plan approved on March 26, 2024.

Additional Requirement: The Board noted the FMP requires payback of quota overages to occur the following year after the overage (i.e., 2025 payback for 2024 overage).

Revised Implementation Plan for the Ocean and Chesapeake Bay Commercial Fisheries:

Maryland's reduced Addendum II Ocean quota is **82,857 pounds**.

Maryland's reduced Addendum II Chesapeake Bay quota is **1,344,216 pounds**.

- Maryland's 2024 Ocean/Chesapeake Bay commercial fishing seasons began on January 1, 2024 prior to the approval of Addendum II. The fisheries are open through December 31, 2024.
- When Addendum II was implemented in February of 2024, Maryland had already distributed individual allocations (lbs) and tags for the 2024 fishing season to commercial harvesters based on the pre-Addendum II quota. (Ocean - 89,094 lbs and Chesapeake Bay -1,445,394 lbs).
- Commercial Striped Bass harvest in Maryland is accounted for using a dual reporting system:

- Permittees report trip level landings data on a paper permit card which is returned, along with any leftover tags, after the completion of the calendar year fishery (due March of the year following harvest). Some permittees submit trip level reports in real-time using an electronic reporting system, however, this is voluntary and currently not available to the Ocean permittees.
- All harvested Striped Bass must be verified at a state-approved Check Station. There are 33 Check Stations approved by MDNR to report commercial Striped Bass harvest in 2024. The Check Stations submit reports weekly to MDNR.
- After all of the 2024 reports are received in March of 2025, data from the two sources are compared and discrepancies are corrected before annual harvest numbers are considered final (April - May of the year following harvest).
- Although the Check Station weekly reports are considered preliminary, Maryland will use these reports in early December 2024 to project preliminary 2024 harvest totals, which will be used to determine if an overage is likely to occur.
- If the Addendum II Ocean or Chesapeake Bay quotas are projected to be exceeded in 2024, the projected overages will be deducted from the total allocations distributed to permit holders for the next calendar year (2025). MDNR will need to delay sending ITQs to permit holders as long as possible to ensure that we send the most accurate allocations to each permit holder based on our 2024 harvest projections, which could interrupt business planning for commercial fishermen
- If no overages are projected, the Addendum II Ocean and Chesapeake Bay quotas will be allocated for the next calendar year (2025).
- Final Ocean/Chesapeake Bay commercial harvest numbers will be reported in Maryland's 2024 annual compliance report which is submitted to ASMFC in June of each year. Note that any difference between the projected year-end 2024 harvest that was used to calculate the 2025 quota (e.g. accommodate payback) and the final 2024 harvest reported in Maryland's compliance will be used for adjustments to the Ocean/Chesapeake Bay commercial quota in 2026.
- The Board made it clear that it was a violation of the current Fishery Management Plan to make any adjustments to commercial quotas in any year except the year following the year of harvest. While we understand this provision of the plan, the timing of our fisheries and when allocations must be determined prior to the fishing season do not align. The approach detailed above is our best attempt to make all of the needed adjustments to the annual quota prior to the beginning of the fishing season on January 1st.
- Other Board suggestions were considered (i.e. sending out multiple rounds of tags and ITQs), however, the administrative complexity and workload is more than what we have the staff resources for.
 - Maryland's Permit and Quota Monitoring Program has one full time employee responsible for the preparation and annual distribution of 7 species specific permits (striped bass, summer flounder, black sea bass, horseshoe crab, spiny dogfish, snapping turtles and yellow perch)
 - There are over 1,000 individual permit holders participating in these permitted fisheries
 - ITQ fisheries (i.e. striped bass, summer flounder and black sea bass) allow for quota transfers among permit holders and the documentation of partial, temporary and permanent quota and/or license transfers are processed by this individual. In a given year there could be as many as 400+ transfer documents which need to be verified, processed, notarized and cataloged in our databases.
 - Distributing the quota in multiple rounds during the active season could potentially double this effort and create confusion within the fishery as well as enforcement of the catch spread over various permit cards.
- Over the last decade, Maryland's Chesapeake Bay commercial striped bass quota has been exceeded once. In 2019, the Common Pool fishery exceeded the annual harvest allowance by 3,274 pounds. We

were able to determine this early in the fishing year, and adjustments were made for the 2020 season along with additional reductions needed as a result of Addendum VI to Amendment 6 of the FMP.

- This year (2024) is the last year that the Common Pool fishery will operate in the Chesapeake Bay. All striped bass permit holders will participate in the ITQ system beginning on January 1, 2025.
- Over the last decade, Maryland's Ocean commercial striped bass quota has not been exceeded.
- Recently passed legislation regarding the use of electronic reporting may help Maryland acquire more timely data from commercial harvesters in 2025 and beyond. This could provide the needed flexibility to make adjustments to our commercial striped bass quotas prior to the start of the fishing year.

Timeline for Implementation

Requirement: Implementation of all measures no later than May 1, 2024.

- The 2024 Ocean recreational regulations are already in effect through [public notice](#).
- The 2024 Chesapeake Bay recreational summer/fall regulations are already in effect through [public notice](#)
- The commercial quota adjustments have already been made for 2024 and Maryland is managing the quota under the limitations specified in Addendum II. Quota adjustments resulting from any overages in 2024 will be accounted for as described above in 2025.

Atlantic Striped Bass Addendum II to Amendment 7 Implementation Plan
Potomac River Fisheries Commission
REVISED 4.10.24

Ocean Recreational Fishery

Requirement: 1 fish at 28" to 31" with 2022 seasons (all modes).

- **Proposed Measures:** NA

NY/PA/DE Additional Requirement: The following states are required to submit area-specific measures to achieve the same percent reduction in recreational removals as the selected 28-31" ocean option (14.1% reduction) as part of their state implementation plans:

- *New York: the Hudson River management area.*
- *Pennsylvania: the state's April-May slot fishery in the lower Delaware River/Estuary.*
- *Delaware: the state's July–August slot fishery in Delaware River/Bay.*
- **NY/PA/DE Area-Specific Proposed Measures:** NA
Please include a brief write-up of the data sources used for the analysis, brief methods description, and a table showing that at least a 14.1% reduction is estimated for the proposed measures as compared to the 2022 measures.

NA

Chesapeake Bay Recreational Fishery

Requirement: 1 fish at 19" to 24" with 2022 seasons (all modes).

- **Proposed Measures:** The Potomac River Fisheries Commission Chesapeake Bay recreational striped bass fishery will have a slot limit of 19.0-24.0" and a 1 fish per person bag limit for all modes.
- In 2024, the seasons will be consistent with the 2022 seasons with the exception of removing the May 1 through 15 spring trophy season. The catch & release season is proposed as January 1 through May 15, 2024. The PRFC recreational striped bass fishery will be open from May 16 through July 6, 2024 and August 21 through December 31, 2024 with a 19.0-24.0" slot size and 1 fish per person bag limit. The PRFC recreational striped bass fishery will be closed to direct targeting from July 7 through August 20, 2024.
- The Commission approved Order #2024-01 "Revised" 2024 Recreational and Charter Fisheries Striped Bass Seasons at their March 8, 2024 meeting and was effective March 18, 2024.

Recreational Filleting Allowance

Requirement: For states that authorize at-sea/shore-side filleting of striped bass, establish minimum requirements, including requirements for racks to be retained and possession to be limited to no more than two fillets per legal fish.

- **Proposed Measures:** NA, PRFC Regulation III, Section 11(b) Method of Measurement does not authorize at-sea/shore-side filleting of striped bass.
 - Regulation III, Section 11(b) Method of Measurement: Measurement shall be the greatest distance in a straight line from the tip of the snout to the end of the caudal fin or tail in a natural state, excluding the tail filament of a black sea bass. No person shall alter the natural state of any species of fish listed in (a) above such that its length cannot be measured.

Ocean Commercial Fishery

Requirement: 7% reduction from 2022 quotas with 2022 size limits.

State-by-state commercial quotas for the ocean region.

	2022 Quota (pounds)	Addendum II Quota (pounds) 7% Reduction
Maine	154	143
New Hampshire	3,537	3,289
Massachusetts	735,240	683,773
Rhode Island	148,889	138,467
Connecticut	14,607	13,585
New York	640,718	595,868
New Jersey	215,912	200,798
Delaware	142,474	132,501
Maryland	89,094	82,857
Virginia	125,034	116,282
North Carolina	295,495	274,810
Ocean Total	2,411,154	2,242,373

- **Proposed Measures:** NA

Chesapeake Bay Commercial Fishery

Requirement: 7% reduction from 2022 quotas with 2022 size limits.

Chesapeake Bay region commercial quota, and Bay jurisdiction quotas assuming Maryland, Virginia, and PRFC maintain their same quota allocation.

	2022 Quota (pounds)	Addendum II Quota (pounds) 7% Reduction
Chesapeake Bay	3,001,648	2,791,532
Maryland Chesapeake Bay	1,445,394	1,344,216

Potomac River Fisheries Commission	572,861	532,761
Virginia Chesapeake Bay	983,393	914,555

- Proposed Measures:** The Potomac River Fisheries Commission Chesapeake Bay quota will be 532,761 pounds beginning in the 2024 season. The Commission approved *Order #2024-02 "Revised" 2024 Commercial Striped Bass Catch Limits and Restrictions* at their March 8, 2024 meeting and was effective March 18, 2024.
- In 2024, the seasons and size limits will be consistent with the 2022 season and size limits. The pound net fishery will be open February 15 through March 25 with an 18-36" slot size and from June 1 through December 15 with an 18" minimum size limit. The hook and line fishery will be open January 1 through February 14 with an 18" minimum size, February 15 through March 25 with an 18-36" slot size and from June 1 through December 31 with an 18" minimum size. The haul seine and fyke net fisheries will be open from February 15 through March 25 with an 18-36" slot size and from June 1 through December 15 with an 18" minimum size limit. The gill net fishery was open November 6, 2023 through February 14, 2024 with an 18" minimum size and February 15 through March 25, 2024 with an 18-36" slot size limit. Due to the 2023-24 gill net fishery closing March 25, 2024, the quota will not be updated. The Commission will set the 2024-25 gill net season and quota to be in compliance with the new quota at their September 2024 meeting for the 2025 compliance year*.
- Given the Potomac River Fisheries Commission's commercial fishing season began prior to the approval of Addendum II, the PRFC had already distributed tags for the 2024 fishing season to commercial harvesters based on the pre-Addendum II quota. If the Addendum II quota of 532,761 pounds is exceeded in the 2024 fishing year, the overage will be deducted from the 2025 fishing year. The PRFC will monitor and review the 2024 commercial striped bass landings at each of its quarterly meetings (September and December) and if an overage is projected, take appropriate action to delay issuing 2025 tags to specific gears and/or reduce numbers of tags distributed to each gear type to cover the overage in the 2025 fishing year. Since the gill net fishery makes up 61% of the total PRFC quota and the gill net season ends March 25, 2024, the PRFC will have a greater understanding of whether there will be an overage in the 2024 fishing year by September 2024. If in September, the gill net fishery landings have exceeded its proportion of the 2024 quota, the Commission will decide whether to reduce the number of gill net tags issued to account for the overage for the 2025 season or not. If the overage is relatively small and the other gear types are projected to be under quota, then the Commission could take no action to reduce the gill net tag distribution. However, if the overage is substantial and the other gears are not projected to be under quota, the Commission will reduce the number of tags issued to account for the overage for the 2025 season. The PRFC's commercial fishery is unlikely to surpass the new quota based on the last five years reported total harvest ranging from 21-35% below the quota each year (see chart below).

Compliance Year*	Total PRFC Landings (lbs)	Quota (lbs)	Quota Utilized
2019	457953	583362	79%
2020	377685	572861	66%
2021	400114	572861	70%
2022	440087	572861	77%
2023**	371328	572861	65%

*PRFC's compliance year is different than calendar year due to the gill net fishery beginning in November of the previous year and ending March of the calendar year. Ex. For the 2023 compliance year, the gill net fisheries quota is managed by the season beginning November 7, 2022 and ending March 25, 2023.

**2023 data preliminary

Timeline for Implementation

Requirement: Implementation of all measures no later than May 1, 2024.

- **Proposed Implementation Timeline:** Both recreational and commercial measures were approved at the March 8, 2024 PRFC meeting and became effective March 18, 2024.



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asafc.org

MEMORANDUM

TO: Atlantic Striped Bass Management Board

FROM: Megan Ware, Board Chair and Emilie Franke, FMP Coordinator

DATE: April 15, 2024

SUBJECT: Board Consideration of Work Group on Recreational Release Mortality

At the January 2024 Atlantic Striped Bass Board meeting, an item was requested under Other Business regarding continued concerns about the difficulty of addressing striped bass recreational release mortality. Due to the length of the Atlantic Striped Bass Board meeting, this item was moved to the Interstate Fisheries Management Program (ISFMP) Policy Board for discussion. The ISFMP Policy Board agreed a Work Group should review past discussions on striped bass recreational release mortality and consider how the Atlantic Striped Bass Management Board could address the issue moving forward.

The Commission's [Work Group Meeting Standard Operating Practices and Procedures](#) (WG SOPPs) notes the following:

The Board should fully describe the task or issue the work group is to address. There should be a clear directive of deliverables and established timeline to bring issues back for Board for review.

Development of a specific directive and task for the Work Group (WG) to address recreational release mortality will be considered at the Atlantic Striped Bass Management Board meeting on May 1, 2024.

Regarding the WG timeline, the Board Chair recommends the WG complete their task and report back to the Board by the fall Annual meeting, where the 2024 stock assessment will also be presented. This could include a progress report from the WG at the 2024 Summer meeting.

The Board Chair identified the following potential WG tasks for the Board's consideration. The Board can consider these tasks and/or any modifications and additional tasks during the May 2024 Board discussion:

- Review existing non-targeting closures for striped bass, including any information on impacts to striped bass catch and effort as well as their enforceability.
- Review the MA DMF discard mortality study and other relevant reports to evaluate the efficacy of potential gear modifications.

M24-xx

- Identify assessment sensitivity runs which may inform Board discussion around release mortality (e.g., how low would you have to reduce the release mortality rate in order to see a viable reduction in removals with the same level of effort?).

As background to inform the Board and potential WG, Commission staff compiled a summary of recent Board discussion and action to address striped bass recreational release mortality. The summary is enclosed in the following pages.

Recent Consideration of Recreational Release Mortality by the Atlantic Striped Bass Management Board

April 2024

Background

Since 1990, roughly 90% of all striped bass caught recreationally were released alive either due to angler preferences (i.e., fishing with the intent to catch and release striped bass) or regulation (e.g., the fish is not of legal size, was caught out of season, or the angler already caught the bag limit). A proportion of releases die as a result of that fishing interaction, which is referred to as release mortality (or dead releases). The number of striped bass that die after being caught and released is estimated by multiplying the total number of live releases by an estimated rate of release mortality. The stock assessment currently applies a 9% release mortality rate to all recreationally released striped bass (Diodati and Richards 1996). This does not mean every time a fish is released alive it has a 9% chance of dying. Under some conditions, the released fish has a higher or lower probability of dying, but overall, coastwide, it is assumed that 9% of all striped bass released alive die. Each year from 2017-2021, more fish were estimated to have died from release mortality than were harvested by the recreational fishery.

Recreational release mortality could be addressed through implementation of measures to intended increase the chance of survival after a striped bass is released (gear restrictions), or effort controls (seasonal closures) to reduce the number of trips interacting with striped bass and thus the overall number of striped bass released alive.

Gear Restrictions

Addendum VI (2019) implemented the first requirement to specifically address recreational release mortality by requiring the use of non-offset circle hooks when fishing for striped bass recreationally with bait. This measure was later clarified by adding a definition of bait and providing an exemption for artificial lures with bait attached. Amendment 7 (2022) added another gear restriction prohibiting the use of gaffs when fishing recreationally. Amendment 7 also requires that striped bass caught on any unapproved method must be returned to the water immediately without unnecessary injury. This incidental catch provision had initially been discussed following implementation of Addendum VI, and was supported by the Law Enforcement Committee to strengthen the circle hook requirement.

The Draft Amendment 7 Plan Development Team (PDT) had put forward three other potential gear restriction options for the Board's consideration during development of Draft Amendment 7: prohibiting the use of treble hooks, requiring the use of barbless hooks, and prohibiting trolling with wire when fishing recreationally for striped bass. In October 2021, the Board removed these options from Draft Amendment 7 before the document went out for public comment. Board members noted the complexities of managing specific gear requirements when fishing techniques and gear preferences vary greatly along the coast; there is potential for a repeat of the circle hook issue with needing to define terms and consider specific exemptions that may be state-specific. Board members did note that outreach and education

could be used to promote best practices (e.g., use of barbless hooks). Board members also questioned the measurable benefit of these gear restrictions.

The benefit of gear restrictions (i.e., how many additional fish could be saved) is difficult to quantify for several reasons, including: 1) it is unknown how many anglers already use these tactics; 2) possible non-compliance, especially with management measures that can only be observed on the-water and in real-time; and 3) enforcement challenges related to proving angler intent or target species (i.e., gear restrictions are difficult to enforce if the gear is acceptable to use when targeting a different species). It would be difficult to quantify the benefits of gear restrictions in striped bass stock assessments, but gear restrictions would be expected to result in a favorable trend towards a reduction in release mortality (increased chance of survival after a striped bass is released).

Outreach and Education

In addition to hook type, several other factors influence release mortality as well, including environmental conditions (e.g., salinity, air and water temperatures), angler experience, and angler behavior (e.g., how fish are handled). Addendum VI and Amendment 7 encouraged states to continue developing education and outreach campaigns on the benefits of using circle hooks and to promote best handling and release practices.

Draft Amendment 7 considered whether to *require* states to implement education and outreach campaigns, or whether to encourage it. The Board ultimately chose to encourage it, noting that it would be difficult to define what required outreach and education would look like and that states had already been conducting education and outreach campaigns.

Seasonal Closures

Seasonal closures could be no-harvest closures (i.e., catch and release fishing is allowed) or no-targeting closures (i.e. no person may take, attempt to take, target, or have in possession any striped bass).

Although Addendum VI did not consider seasonal closures, two jurisdictions (Maryland and PRFC) implemented no-targeting closures as part of their approved conservation equivalency programs for the recreational fishery. Both jurisdictions implemented the no-targeting closures during the summer when release mortality rates are relatively high due to low dissolved oxygen in the water and higher air and water temperatures. The closures are still in place, now as part of Addendum II to Amendment 7.

Draft Amendment 7 considered seasonal closure options to address recreational release mortality, and primarily considered no-targeting closures. While there are noted concerns about the unenforceability of no-targeting closures (including concerns expressed by the Law Enforcement Committee), it is assumed that the maximum reduction of effort, and thus maximum reduction in number of releases, would be achieved with no-targeting closures. No-targeting closures would address recreational releases from both harvest trips and catch-and-release fishing trips. While no-harvest closures would reduce the number of fish harvested,

angler behavior may shift to catch-and-release fishing, thereby increasing the number of recreational releases which is counter to the objective of reducing release mortality.

Draft Amendment 7 noted several considerations for seasonal closures. Fishing trips targeting other species that incidentally catch and release striped bass would still occur regardless of closure type. Additionally, seasonal closures for striped bass may shift effort to targeting other species, or shift effort to other times of year when the striped bass fishery is open. Regarding no-targeting closures, there is concern about the lack of standardized method to estimate the reduction in removals. Estimating the reduction in removals from a no-targeting closure depends on assumptions about changes in angler behavior, which is highly uncertain. *Note: As part of a task in the Commission's [2024 Action Plan](#) to review striped bass bag-size-season analysis, the Striped Bass Technical Committee may start discussing methods to estimate reductions associated with no-targeting closures.*

Another consideration is whether to coordinate closures on a coastwide, regional, or state level. A coastwide closure would ensure consistency in the timing of closures across all states, but would present an equitability challenge. Recreational fisheries operate very differently along the coast based on timing (availability of fish), among other biological, environmental, and socioeconomic considerations, so coastwide closures would result in different levels of effort reduction across states. State-specific or regional closure options could help account for these differences, but this may result in a patchwork of season closures across the coast.

The Draft Amendment 7 PDT put forward potential options for coastwide, regional, and state closures for Board consideration. In October 2021, the Board removed coastwide and regional closure options before the document went out for public comment. The Board noted support for states having flexibility to select closure dates instead of a prescribed coastwide or regional closure date. There was particular concern about an option for a prescribed coastwide closure in July or August (Wave 4). While water temperatures may be a high in the Chesapeake Bay and Mid-Atlantic states during that time, New England water temperatures are not a concern and their shorter season would be more significantly impacted by a closure during that time. For regional closures, there was concern about how to define regions to ensure states in shared water bodies would have the same closure dates.

Draft Amendment 7 did include options for state-specific, two-week no targeting closures that would occur during a time then the striped bass fishery is active in that state (e.g., during a wave when at least 15% of directed trips occur). Draft Amendment 7 also included options for spawning closures (no-harvest closures in spawning areas and/or no-targeting closures on spawning grounds) to reduce effort and increase protections for pre-spawn and spawning fish. When selecting final measures for Amendment 7 in May 2022, the Board decided not to include any closures in Amendment 7. The primary reason was concern about enforceability of no-targeting closures. Board members noted that further discussion on no-targeting closures was needed in the future. For spawning closures, the Board noted the spawning closures already in place in many states were adequate.

In August 2023, the initial Draft Addendum II document presented to the Board included options combining seasonal closures and size limit changes to achieve the intended reduction. The Board discussed whether to include an option that could designate the closures as no-targeting instead of no-harvest. A motion to that effect passed to add that option for no-targeting closures. However, a subsequent Board vote during the meeting to remove all seasonal closure options from Draft Addendum II removed any new seasonal closures from consideration. The Board noted the draft addendum should focus only on size and bag limit changes.



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: Atlantic Striped Bass Management Board

FROM: Tina Berger, Director of Communications

DATE: April 12, 2024

SUBJECT: Advisory Panel Nomination

Please find attached a nomination to the Atlantic Striped Bass Advisory Panel – Peter Jenkins, a recreational angler from Rhode Island. 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.



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: Conor McManus State: RI
(your name)

Name of Nominee: Peter Jenkins

Address: 36 Third Street

City, State, Zip: Newport, RI 02840

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 508.735.7350 Phone (evening): _____

FAX: _____ Email: peter@saltwateredge.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.

RISSA

American Saltwater Fishing Guide Association

Rhody Flyrodders

Newport County SW Fishing Club

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Striped bass

Bluefin Tuna

Bluefish

Black sea bass

False Albacore

tautog

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

Redfish

Bonefish

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 no _____

If "yes," please explain.

30 years as tackle shop owner; 3 years as Chair of ASGA (volunteer position)

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):

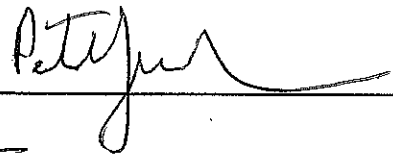
FOR ALL NOMINEES:

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.

The ADDITION OF PETER JENKINS TO THE ASMFC STRIPED BASS ADVISORY PANEL WOULD BE AN ASSET. THIS IS A RARE OPPORTUNITY TO INCLUDE A PANEL MEMBER THAT HAS EXTENSIVE EXPERIENCE IN MULTIPLE MODES OF STRIPED BASS FISHING; SURFCASTING, BOAT FISHING, AND FLY FISHING. PETER ALSO HAS A UNIQUE ECONOMIC PERSPECTIVE AS A PROPRIETOR OF A SUCCESSFUL FISHING RELATED BUSINESS, THE SALTWATER EDGE FISHING TACKLE SHOP, WHICH EXPOSES HIM TO THE VIEWS AND CONCERNS OF ALL RECREATIONAL MODES OF STRIPED BASS FISHERMEN INCLUDING PROFESSIONAL FISHING GUIDES AND CHARTER BOAT CAPTAINS.

RESPECTFULLY SUBMITTED,

DENNIS ZAMBROTTA 
PRESIDENT, NEWPORT COUNTY SALTWATER FISHING CLUB
PAST MEMBER - RHODE ISLAND STRIPED BASS ADVISORY PANEL

Nominee Signature:  _____

Date: 2/21/24

Name: Peter Jenkins
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

State Director

State Legislator

Governor's Appointee

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.

Nominee Signature: _____

Date:

Name: _____
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Jason McNamee

State Director

Eric Reid

State Legislator

David Borden

Governor's Appointee



Reel Solutions
20 Paul James Drive
Tiverton RI 02878

Atlantic States Marine Fisheries Commission
Striped Bass Advisory Panel chairmen

February 20th, 2024

Subj: Letter supporting the nomination of Peter Jenkins to the ASMFC Striped Bass Advisory Panel.

Dear Striped Bass Panel Chairperson,

I would like to submit this letter of recommendation to the ASMFC regarding the Striped Bass Advisory panel. I believe Peter Jenkins would be an exceptionally strong candidate on the panel and would like to see his nomination be given every consideration possible. Peter maintains a strong presence in the New England fishing scene as an angler, tackle shop owner (30 yrs plus) and promoter of better fishing practices. Peter is highly respected for both his angling acumen and well as his vision of healthy fisheries being the best way to achieve a vibrant and sustainable fishery well into the future.

With over 50 years of active fishing under his belt, Peter has a unique set of experiences and skills as it relates to striped bass. Peter has effectively pursued Stripers using fly rods, light tackle and or conventional gear from both shore and boat. Few are more knowledgeable about their history, population trends, recoveries and current stressors all of which I believe would serve the panel well should he be chosen. Likewise, Peter is a long time member of many of New England's premiere clubs and fishing organizations such as Rhody fly Rodders, Newport County Saltwater fishing Club, RI Saltwater Anglers and the American Saltwater Guide Assoc and is a sought out speaker who readily shares his fishing knowledge.

Peter remains a tireless advocate for recreational fishing as whole and has for years both hosted as well as attended events al throughout New England designed to both educate anglers as well as promote the positive aspects of recreational fishing. Very adept at building consensus and finding common ground that can be supported by others, he would be ideal to sit on the advisory panel board. Whether at home, on the water, in his shop or out among stakeholders in the community he is a rarity that can effectively migrate among many segments of the fishing community and the panel would be well served to have Peter join its members in finding best practice solutions that work for the community as a whole.

V/R

Greg Vespe

Greg Vespe, President
401.662.5573
vespgf@yahoo.com

FOR ALL NOMINEES: In the space provided below, please provide the Commission with any additional information which you feel would assist us in choosing new Advisors. You may use as many pages as needed.

Date: February 18, 2024

To: M. Conor McManus, Ph.D., Chief, RI DEM Division of Marine Fisheries

Re: Nomination of Peter Jenkins, Atlantic Striped Bass, ASMFC Advisory Panel

Dear Conor and Selection Committee:

Please consider Peter Jenkins, owner of The Saltwater Edge, Middletown, RI as a nominee for the ASMFC Striped Bass Advisory Panel,

I have known Peter ten years and have watched him grow and admired his skill as a recreational fisher, instructor, recreational fishing industry businessperson, leader and fish advocate.

Peter is perfectly suited to advise about striped bass as he is an expert in a broad range of disciplines in the recreational fishing world.

Science driven. Peter is a strong believer in science driven policy. He has the ability to review, analyze, intrepid and weigh in on the science and how it impacts policy and fishers whether it be a stock assessment, climate impact study, or research on a species.

Striped bass expertise. Cannot think of anyone else in Rhode Island that knows more about what striped bass mean to the recreational fishing industry in Rhode Island and region than Peter. He has firsthand experience focusing on fishing for this species (and others), knows how striped bass impact recreational anglers, and as a recreational fishing industry business person, knows what striped bass mean for his business and those of others.

Communications skills. Peter is an excellent communicator. His interpersonal skills one on one are good, showing respect for others and their point of view. Peter is an excellent communicator with his peers, anglers and the recreational fishing industry overall. He has built an outstanding network of customers, fellow board and association members. In fact, this year he was honored by the RI Saltwater Anglers Association at their Annual Banquet with one of three community outreach awards. Much of his network was built on his ability as an outstanding communicator.

Community engagement. Peter is plugged into the fishing community, his hometown on Aquidneck Island, in the State through his RISAA membership and chairing of their Access Subcommittee, in the region as a noted lecturer on fly fishing and shore surfcasting, and nationally as chair of the American Saltwater Guides Association. I have personally been with Peter at hundreds of meetings with legislators, state and US, NOAA agency meetings, national hearings, state of Rhode Island regulation meetings and local planning board and town council meetings. He is always engaged, taking up the reins to advocate for recreational fishers, the fishery, with particular zeal advocating for striped bass.

Please give Peter every consideration as a member of the Atlantic Striped Bass Advisory Panel as he would be an outstanding panel member.

Best,

David P. Monti

Capt. Dave Monti
No Fluke Fishing LLC
dmontifish@verizon.net
401.480.3444

Dave Monti holds a master captain's license and charter fishing license in Rhode Island. He is past vice chair of the RI Marine Fisheries Council, a past 2nd vice president of RISAA. Presently he serves as vice chair of the Narragansett Bay Estuary Program, board member of the ASGA, active member of RISAA and the RI Party & Charter Boat Association. He is a fishing columnist for thirteen newspapers and blogs and has a recreation fishing advocacy and outreach consulting business.

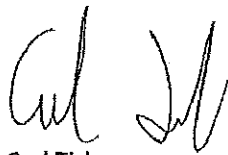
18 February 2023

I hereby nominate Peter Jenkins to serve as a representative of recreational anglers on the Striped Bass Advisory Committee.

Besides being a dedicated recreational angler for decades, Peter is the owner of the Saltwater Edge tackle shop, which gives him a close connection with the local fishing community. He is in constant contact with the folks who are out on the water, both recreational anglers and the charter/for hire captains and crew members. His business clientele isn't just limited to the local community either, he has an extensive mail order business which gives him perspective on the details of the fishing community across the entire Atlantic seaboard. Consequently, he is deeply knowledgeable of the status of the fisheries, the regulatory processes, and the interests and concerns of the community. Peter regularly attends DEM public workshops and hearings to serve as an advocate for sustainable management and regulations of the fish stocks, even when changes to regulations have the potential to have short term negative implications on his business. Peter places the health of the fish stocks over short term financial gain in a way that very few other people across the fishing industry do.

Despite the demands of being a business owner, Peter is also the Chairman of the American Saltwater Guides Association and has led the organization in their efforts to advocate for managing the striped bass population for abundance as well as initiating an innovative research project to gather scientific data on the status of the false albacore stock. In this role, he has educated the public on the regulatory process and encouraged more recreational anglers to get involved in the public hearing process and make their voices heard, me included.

I can think of no better person to serve as a representative of recreational anglers than Peter Jenkins. He has my strongest possible recommendation for selection as a representative of recreational anglers on the Striped Bass Advisory Committee.

A handwritten signature in black ink, appearing to read 'Carl Tiska', written in a cursive style.

Carl Tiska
Captain, United States Navy (retired)



Peter Jenkins <peter@saltwateredge.com>

Recommendation

1 message

Fri, Feb 16, 2024 at 7:29 AM

Rich Hittinger <richhittinger@gmail.com>
To: Peter Jenkins <peter@saltwateredge.com>

ASMFC Advisory Panel Nominating Committee:

As 1st Vice President of Rhode Island Saltwater Anglers Association I give my full support and the support of the RISAA Board of Directors to the appointment of Peter Jenkins for this Advisory Panel position. RISAA represents over 7500 anglers and 30 member clubs in the southern New England area. Peter has been an active RISAA member for many years. He has participated in several recreational fishing symposia which RISAA has sponsored over the years as well as other activities. Peter is an active member of our Legislative Committee which is where we discuss our positions on fishing related matters. Peter always takes time to evaluate issues and provide very useful and insightful comments that help to form RISAA positions. In addition, Peter brings issues to RISAA leadership when he feels that they are important to address, such as striped bass conservation and working toward a better understanding of bonito and false albacore. We are sure that Peter will be an active and helpful member of this advisory panel.

Thank you,

Rich

Rich Hittinger
1st Vice President
Rhode Island Saltwater Anglers Association
Risaa.org
Cell 401-265-7602
richhittinger@gmail.com

Atlantic States Marine Fisheries Commission

American Eel Management Board

May 1, 2024
3:00 – 5:00 p.m.

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 (*K. Kuhn*) 3:00 p.m.
2. Board Consent 3:00 p.m.
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment 3:05 p.m.
4. Consider Addendum VI on Maine Glass Eel Quota for Final Approval 3:15 p.m.
Final Action
 - Review Options and Public Comment Summary (*C. Starks*)
 - Advisory Panel Report (*M. Feigenbaum*)
 - Consider Approval of Addendum VI
5. Consider Addendum VII on Yellow Eel Coastwide Cap and Monitoring for Final Approval **Final Action** 4:00 p.m.
 - Review Options and Public Comment Summary (*C. Starks*)
 - Advisory Panel Report (*M. Feigenbaum*)
 - Consider Approval of Addendum VII
6. Elect Vice-Chair **Action** 4:55 p.m.
7. Other Business/Adjourn 5:00 p.m.

The meeting will be held at The Westin Crystal City, 1800 Richmond Highway, Arlington, VA; 703.486.1111, and via webinar; click [here](#) for details.

MEETING OVERVIEW

American Eel Management Board

May 1, 2024

3:00 – 5:00 p.m.

Chair: Kris Kuhn (PA) Assumed Chairmanship: 10/23	Technical Committee Chair: Danielle Carty (SC)	Law Enforcement Committee Rep: Rob Beal (ME)
Vice Chair: Vacant	Advisory Panel Chair: Grant Moore (MA)	Previous Board Meeting: January 23, 2024
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, PRFC, VA, NC, SC, GA, FL, DC, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from January 2024

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 Addendum VI on Maine Glass Eel Quota for Final Approval (3:15-4:00 p.m.) Final Action

Background

- In August 2023, the Board initiated Draft Addendum VI to address the quota for Maine’s glass eel fishery for the 2025 fishing year and beyond. The current quota expires at the end of 2024.
- Draft Addendum VI for Public Comment was approved in January 2024. A public hearing was held in February (**Supplemental Materials**).
- Draft Addendum VI considers options for Maine’s commercial glass eel quota level and duration (**Briefing Materials**).

Presentations

- Overview of Addendum VI options and public comment summary by C. Starks
- Advisory Panel Report by M. Feigenbaum

Board actions for consideration at this meeting

- Select management options and implementation dates
- Final approval of Addendum VI

5. Consider Addendum VII on Yellow Eel Coastwide Cap and Monitoring for Final Approval (4:00-4:55 p.m.) Final Action

Background

- In August 2023, the Board initiated Draft Addendum VII to consider changes to the coastwide cap for yellow eel harvest in response to the stock assessment findings that the American eel stock is depleted to historically low levels, and recommendation to reduce yellow eel fishing mortality.
- Draft Addendum VII for Public Comment was approved in January 2024. Public hearings were held in February and March (**Supplemental Materials**).
- Draft Addendum VII considers options for the yellow eel coastwide harvest cap, monitoring requirements, and evaluation of *de minimis* status (**Briefing Materials**).

Presentations

- Overview of Addendum VII options and public comment summary by C. Starks
- Advisory Panel Report by M. Feigenbaum

Board actions for consideration at this meeting

- Select management options and implementation dates
- Final approval of Addendum VII

6. Elect Vice Chair (4:55-5:00 p.m.) Action

Background

- The vice chair seat is empty since Kris Kuhn (PA) has assumed the role of chair.

Board actions for consideration at this meeting

- Elect Vice Chair

7. Other Business/Adjourn (5:00 p.m.)

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

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 23, 2024

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

TABLE OF CONTENTS

Call to Order, Chair Kris Kuhn.....1

Approval of Agenda.....1

Approval of Proceedings from1

Public Comment1

Consider Approval of Draft Addendum VI on Maine’s Glass Eel Quota for Public Comment1

Consider Approval of Draft Addendum VII on Yellow Eel Coastwide Cap and Monitoring Requirements for Public Comment7

Consider Approval of Fishery Management Plan Review and State Compliance Reports for the 2022 Fishing Year..... 17

Review and Populate Advisory Panel Membership 18

Adjournment 18

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 19, 2023** by consent (Page 1).
3. **Move to remove in Section 3.1, Option 2: Reduce Maine’s glass eel quota by 21.8%** (Page 5). Motion by Megan Ware; second by Eric Reid. Motion passes (14 in favor, 3 opposed, 2 abstentions) (Page 7).
4. **Move to approve Draft Addendum VI for public comment, as modified today** (Page 7). Motion by Megan Ware; second by Cheri Patterson. Motion passes by consent (Page 7).
5. **Move to remove Sections 3.1 and 3.2 from the draft addendum VII and postpone further action on the coastwide cap options until coastwide landings reach 600,000 lb. in a given year** (Page 14). Motion by John Clark; second by Russel Dize. Motion fails (1 in favor, 18 opposed) (Page 16).
6. **Motion to remove Section 3.1, option 2** (Page 16). Motion by John Clark; second by Megan Ware. Motion fails (8 in favor, 11 opposed) (Page 16).
7. **Move to approve Draft Addendum VII for public comment, as modified today** (Page 16). Motion by Cheri Patterson; second by Shanna Madsen. Motion passes by consent (Page 16).
8. **Move to approve the American Eel FMP Review for the 2022 fishing year, state compliance reports, and *de minimis* status for New Hampshire, Massachusetts, Pennsylvania, D.C., and Georgia** (Page 18). Motion by Ingrid Braun; second by Lynn Fegley. Motion passes by consent (Page 18).
9. **Move to approve Sara Rademaker and Timothy LaRochelle to the American Eel Advisory Panel** (Page 19). Motion by Megan Ware; second by Dan McKiernan. Motion passes by consent (Page 19).
10. **Move to adjourn** by consent (Page 19).

ATTENDANCE TO BE FILLED ON A LATER DATE

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

The American Eel 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, January 23, 2024, and was called to order at 4:30 p.m. by Chair Kristopher M. Kuhn.

CALL TO ORDER

CHAIR KRISTOPHER M. KUHN: Good afternoon, everyone. Welcome to the Atlantic States Marine Fisheries Commission American Eel Board. I would like to call this meeting to order. I'm Kris Kuhn; I'm the Administrative Proxy for Pennsylvania, and today I'm going to begin Chairmanship of the American Eel Management Board, so please bear with me as I transition into this new role.

I want to thank Phil Edwards for his service and leadership in this capacity previously. We currently do not have a Vice-Chair for this Board, but when the time comes to seek a nomination, please let us know if you're interested. Our Technical Committee Chair is Danielle Carty from South Carolina. Advisory Panel Chair is Mari-Beth Delucia with the Nature Conservancy, and our Law Enforcement Representative is Rob Beal from Maine. I am joined at the front table here by Caitlin Starks and Dr. Kristen Anstead.

APPROVAL OF AGENDA

CHAIR KUHN: We'll go ahead and get started with today's meeting, and the first order of business is Approval of the Agenda. Are there any proposed modifications to the agenda? Seeing none in the room, are there any hands online? Okay, seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR KUHN: Next, we'll move on to the approval of the proceedings from the October, 2023 Board meeting. Are there any edits to the proceedings from October, 2023? All right, seeing none again, the proceedings from 2023 are approved by consent.

PUBLIC COMMENT

CHAIR KUHN: Next up is public comment. Are there

any public comments pertaining to items that are not on today's agenda? Again, items not on today's agenda. Yes, Sara Rademaker.

MS. SARA RADEMAKER: Good afternoon. I thank you for the opportunity to speak. I just wanted to quickly introduce myself. My name is Sara Rademaker; I am the owner of American Unagi, the aquaculture farm that is up in Maine. I just wanted to share a couple of quick updates on the farm in Maine.

Ten years ago, I started with this idea to grow eels in Maine, and now we have the largest eel aquaculture farm in North America, and it is being watched globally. I've had a lot of reach out to people around the world who are very encouraged to see what we've doing in the U.S. Much of the success of this business has been because of the aquaculture quota that was approved back in 2018 by the Atlantic States. From that we've been able to build out this operation year over year, and now we can take 500 pounds of glass eels and grow them out to 500,000 pounds of adult yellow eels.

That is only 5 percent of the U.S. market right now, so we're still importing around 11 million pounds of product from China. There is a lot of opportunity up in Maine with our success to build more aquaculture facilities. I just wanted to thank the Atlantic States for the continued support and approval of our aquaculture quota, and also invite any of you who are interested to come see our facility up in Maine, to please reach out. Thank you.

CHAIR KUHN: Thank you, and I'll remind myself, because I didn't have it down when I said thank you, but I'll just remind Commissioners and others when making comments, to move their microphones down so we can hear you.

CONSIDER APPROVAL OF DRAFT ADDENDUM VI ON MAINE'S GLASS EEL QUOTA FOR PUBLIC COMMENT

CHAIR KUHN: Moving on to Item Number 4 on the agenda, which is to Consider the Approval of

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

Addendum VI on Maine’s Glass Eel Quota for Public Comment.

This is an action item, and we have two primary considerations to decide upon today, based on Board motions from 2023, August of 2023, and those are options for Maine’s glass eel quota and then the timeframe for Maine’s glass eel quota. Caitlin Starks is going to start us off with a presentation, and following that we’ll take questions on the presentation. Caitlin.

MS. CAITLIN STARKS: In my presentation I’m going to start off with a timeline for the development of this addendum, the problem statement and background, and then cover the proposed management options and end with next steps. Draft Addendum VI was initiated in August, 2023, when the Board moved to initiate an addendum to address the Maine glass eel quota.

Following that meeting the Plan Development Team or PDT developed the draft addendum document for public comment, and today the Board will consider approving the document for public comment. If it is approved, we would have the public comment period and hearings in February, and the Board would be able to consider this action for final action in May.

That would allow enough time for the implementation of the measures before January, 2025. The statement of the problem and reason for this addendum is that Maine’s commercial glass eel quota needs to be established for 2025 and beyond. That quota was set for 2015 through 2017 at 9,688 pounds by Addendum IV, and then Addendum V maintained that quota, which has been extended via Board action through 2024.

However, fishing beyond 2024 requires an addendum, so Draft Addendum VI is addressing this issue by considering implementation of a Maine glass eel commercial quota for 2025 and beyond. Since 2015, when the quota was implemented, Maine’s annual glass eel landings have remained below that quota.

The fishery is monitored using a swipe card program to track individual fishing quotas daily, and track glass eel catch with associated weights from dealer purchase to export. As a condition of the glass eel fishery, Maine also conducts life-cycle monitoring. They’ve conducted the young of year eel survey since 2001, and the yellow eel/silver eel survey since 2018. In those young of year data there has been a linear increasing trend. For the glass eel elver catch per unit effort for the fishery, that has also been calculated since 2016. For some visuals, this is the annual Maine glass eel landings shown by the columns and the ex-vessel value shown by the black line.

Then on the next slide here it’s the Maine glass eel young of year survey results for each year with catch on the Y axis and the linear trend shown by the dashed line. Then this graph compares the young of year survey results with the harvester CPUE. The top line is the CPUE, and the bottom is the YOY survey catch.

The trend in these two datasets have tracked each other pretty closely for the available time period. I’ll move into the proposed management options. For quota levels the PDT developed two options, and Option 1 is status quo, which would be 9,688 pounds. Then Option 2 is to reduce the Maine quota by 21.8 percent. That 21.8 percent is derived from the yellow eel draft addendum, which we’ll talk about later, and it’s equivalent to the smallest percent reduction that is being considered for yellow eels in their coastwide cap.

Option 2 would result in an annual quota of 7,576 pounds. The rationale for this option was responding to the stock assessment results, which indicate the stock’s depleted status, and they chose to go with the smallest reduction for yellow eel, as this percent reduction for glass eel, given glass eel experience a higher natural mortality rate than yellow eel, and are therefore thought to have a lower relative impact to the coastwide population than yellow eel harvest does.

The second set of options in Section 3.2 are regarding the duration of the quota that is

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

established at final action. Option 1 would be no sunset, meaning the quota would remain the same indefinitely, unless it's changed through another addendum or amendment. Option 2 is a three-year duration, after which the Board would have to initiate a new addendum to establish Maine's glass eel quota for 2028 and beyond.

Then Option 3 is a three-year duration, where after that period the Board could extend the quota indefinitely via Board action. If a change to the quota is desired under Option 3, then a new addendum would be needed. As I mentioned at the outset, after the Board considers this draft addendum for approval for public comment.

If we have approval, the public hearings and comments could occur this February, and the Board would be able to consider those comments and the draft addendum for final approval at the spring Commission meeting, and that Maine would be able to implement the quota for 2025. With that the Board action for consideration today are whether the Board wants to make any modifications to the draft addendum before it goes out for comments, and then to consider approval of the draft addendum for public comment. I can take any questions.

CHAIR KUHN: Any questions for Caitlin? Shanna Madsen.

MS. SHANNA MADSEN: I actually have a couple of questions. I'm going to start off with the quota questions, and then I also have a couple of questions about the timeframe, so just cut me off if I'm going too long. My first question in regards to the quota is, I was a little bit confused in seeing Option 2, a reduction. I think I was confused, because I guess my question is, didn't the assessment say that the abundance of yellow eel is what is driving the depletion of the stock currently?

MS. STARKS: I'm not sure it said what is driving it, but it's where the assessment is noting a decline in relative abundance.

MS. MADSEN: Okay, and then secondarily, I guess I was also surprised, because I was reading some of

the memos, the previous memos from the yellow eel PDT, which actually recommended that like an option essentially, of trying to pursue some sort of switch from yellow eel fishing to glass eel fishing, because of the mortality rates on glass eels are so much higher natural mortality. Was I also correct in that? Was that a recommendation as well of the other PDT?

MS. STARKS: The other PDT did discuss that, and ultimately decided not to put forward any options related to that idea.

MS. MADSEN: Oh, one more. I forgot about my timeframe question. I was a little confused on the timeframe question for Option 3 that you had up there. I think for Option 3 you said that the Board can extend the quota indefinitely. But the way that I read this was that the Board can extend a quota for up to three years at a time.

Then the way that I read this is sort of like a spec-setting process, where after those three years we would come back and determine whether or not we wanted to continue with that quota, based off of some data that the TC would be providing us, I'm guessing. It just seemed like what was on the screen was different than what I was at least interpreting Option 3 in the document to say. I just wanted to kind of get clarification on that.

MS. STARKS: Yes, thanks for that question. It does say in the Addendum draft that this would allow the Board to extend the quota for up to three years at a time, until the provision is modified by another addendum or amendment. I think it would be up to the Board to ask for the Technical Committee to provide some kind of update for them to consider when they are considering extending the quota.

MS. MADSEN: Okay, so Option 3 isn't an indefinite extension of quota, it's just every three years. The other question I had is, I was reading through the PDTs recommendations on these timings, and it seemed like they wanted to go with Option 2, because they felt like it was important for us to review the quota every three years in some time frame.

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

If we would like to make a motion to essentially clarify in Option 3 that we would come back after those three years, and make some considerations before we move forward with extending the quota for another three years, or changing the quota, whatever that ends up looking like. I feel like that would sort of get to their concerns with Option 3, and I would be happy to add something along those lines whenever it is appropriate.

CHAIR KUHN: Okay, we have another question, Lynn Fegley.

MS. LYNN FEGLEY: I just want to start by saying that I have no problem with this going out for public comment. But I'm really struggling to put all the pieces together with eels, I admit it. I wanted to ask a question about the paper that was brought to our attention by Shiraishi and Kaifu entitled An Early Warning of an Upsurge in International Trade in the American Eel.

That seems to say that they are concerned about the impacts of large amounts of glass eels being sent over, being imported into Asia, potentially having an impact on the range-wide population. The TC is clear that this shouldn't affect our decision on the glass eel quota, but I'm really trying, I understand the point about the mortality being very high on glass eel, so that is where the mortality should be focused.

But then we have people saying that maybe the glass eel fishery, the glass eel catch could be a negative impact on the coastwide or the global range of the animal. Which is it? I mean glass eels become yellow eels, become silver eels, produce baby eels. I'm really trying to understand, just in order to answer cogently to people who ask me, should we worry or not about the increasing harvest of the young eels globally?

DR. KRISTEN ANSTEAD: I'll take that one. The TC did bring this paper up for discussion, and it was mostly just kind of to flag it that there seems to be evidence that there has been a lot of export of glass eels. Now, you might have noticed in the paper the exports being attributed to the U.S. is higher than our current quota, and that is because the way that the exporting

works sometimes, we get exports from like the Caribbean, and then they get attributed to the U.S.

Out of eel moving through the U.S. that then get attributed to us. I just want to be clear that there is no concern that we're exporting like a weekly harvest of U.S. eel. Second, I think that there was a concern that a huge increase in glass eels from the Caribbean could potentially affect the stock range wide.

That is something to consider, because there is always this opportunity on the table to do a range-wide assessment, and events like this would support a movement to considering this on a larger scale. But it's true that the mortality on glass eels isn't as concerning as it is on the yellow eel stage. But certainly, if the data in that paper are true, it's something we should consider when we're talking about the future of eel.

CHAIR KUHN: Thank you for that question and response, appreciate it. Are there any hands online? Okay, if there are no more questions on the presentation, let's open it up to discussion around the table before we move on to any motions. Is there any discussion? Megan Ware.

MS. MEGAN WARE: I had two suggested modifications to the intro of the document. I don't think those would require a motion, and then I had sent a motion to staff. But I'll start with the two suggestions. The first is on Page 5, Section 2.4, status of the stock. That first paragraph talks about the assessment and the recommendation for the reduction in the yellow eel fishery.

Given this addendum is on the glass eel fishery, I think a pretty logical question from the public will be, what was the recommendation coming out of the assessment for glass eels. My understanding is there no recommendation for reduction in F, so I would ask that that be added to that paragraph. Then on that same page, the next paragraph, it talks about the MARS models that were used. I'll just use the YOY sentence as an example. But the Addendum said a declining trend in coastwide YOY abundance was observed. I think when I went back to the

assessment report, the assessment is, I'll say a little more nuanced in this statement that it reads.

It says, there is a slightly declining trend, but that the confidence intervals overlap 0, which would indicate a stable population. I think there are kind of two different things you could take away from the Addendum versus the assessment. I would just ask that those get federal lined, maybe just take the sentence from the assessment and put that in there.

CHAIR KUHN: This change is acceptable?

MS. STARKS: Yes, I'm clear on those changes, so as long as that is the will of the Board, I can do that.

CHAIR KUHN: Yes, Shanna Madsen.

MS. MADSEN: I think I'm going to try and do the same thing that Megan did, not make a motion but just a recommendation. I think that if in Option 3 we clarified that we would come back to the table after those three years. Essentially, I think the types of information that I was anticipating the Board receiving, before deciding on either extending the quota or going into an addendum process, with essentially the information that you presented today, and was presented in this addendum.

I don't think I need to see an addendum in order to make that consideration. I think that the Board can look at this sort of information that they are doing now, and make that consideration then, without having to go through the whole addendum process for something as simple as dealing with quota.

CHAIR KUHN: Are there any objections to that change? Yes, we have a hand online, Eric Reid.

MR. ERIC REID: I have a question. Honestly, I'm not all that thrilled about the 20 something percent reduction in Option 2. But my question would be, what would be the impact on that to the Unagi set-aside. Let's call it the Unagi set-aside, because that is what happened. Will their 500 pounds become 400 pounds, or how does that work, or how would that work?

MS. STARKS: I'm not sure I have an answer to that question, Eric. But it looks like Bob or Toni does.

MS. TONI KERNS: Eric, if you're referring to the 200 pounds that we set aside for aquaculture, that would not be impacted. Are you referring to a different set-aside?

MR. REID: No, no, I thought Ms. Unagi herself said it was 500 pounds turned into something else. But if it was only 200, maybe I didn't hear her correctly. But I just was wondering if the overall quota goes down, does it affect the RSA? You're saying no. Thank you. MS. STARKS: I have a clarification to that point, I believe. American Unagi gets their 200-pound allocation from Maine through the aquaculture program in our FMP. Then they are also able to buy glass eels from the industry.

MR. REID: Okay, great, thank you.

CHAIR KUHN: Any other comments, questions around the table? Anyone at the point where there is time for a motion? Megan Ware.

MS. WARE: I am pretty concerned that there is an option in the document for a 21.8 percent reduction when there is no recommendation coming out of the assessment for a reduction in F. I don't see the statement problem in the addendum acknowledging a need for a reduction in F, and the economic impacts of this are pretty severe. I had sent a motion to staff. I'll read it into the record. I would appreciate a second for an opportunity on rationale. **Move to remove in Section 3.1, Option 2: Reduce Maine's glass eel quota by 21.8 percent.**

CHAIR KUHN: Thanks for that, do we have a second? Eric Reid seconds.

MS. WARE: I was able to listen in to both of the PDT meetings on this. I heard many PDTs members struggling to identify and justify a quota reduction. As the PDT memos note, there is no specific recommendation coming out of the assessment to reduce F in the glass eel fishery. Maine surveys are actually increasing, and I think this reflects a lot of

the efforts that the state has put into improved connectivity in the state.

The identification of any amount or percent reduction at this point is arbitrary. I understand that our next topic is considering the yellow eel fishery, and they are facing potential reductions in the catch cap. That said, I don't find that a compelling argument or justification for a 21.8 percent reduction in Maine's glass eel quota.

The assessment is very clear that harvesting glass eels has a lower impact on the population, given that high natural mortality rate. To quote the assessment here, "The glass eel fishery could withstand a greater amount of fishing mortality than the yellow eel fishery." The addition of fishing mortality to natural mortality at the glass eel stage has a much lower relative effect on total mortality compared to the addition of fishing mortality, natural mortality at the yellow eel stage. The economic impacts of this cannot be understood, based on 2022 numbers.

I estimate that this is about a four-million-dollar impact in just ex-vessel value to the state. This impacts not only those who are licensed with DMR, but also our tribal nations in Maine. By law they get a portion of our Maine glass eel quota. I am concerned that with this option in the document, Maine, which has no recommendation for a reduction whose surveys are increasing, is really facing the biggest socioeconomic hit here. I would ask that the Board take this option out ahead of public comment, thank you.

CHAIR KUHN: Eric Reid, as seconder, would you like to provide any additional rationale for the motion?

MR. REID: Ms. Ware covered it really well, but the socioeconomic impact is, you know these aren't 90 footers, glass eel fishing these are artisanal fishermen and tribal fishermen, and I think that there is really no basis for it in the problem statement. It's a regulatory housekeeping issue not a biological issue.

I just don't see Option 2 being anywhere near proper for this document. There are other options for

timing and et cetera, et cetera. But Option 2 doesn't belong in this document, it's not fair to the state of Maine, and it's not necessary to the biology of the eels themselves. Thank you.

CHAIR KUHN: Thank you, Eric, Bill Hyatt.

MR. WILLIAM HYATT: This isn't a substantive comment, but I just wonder if somebody from the Commission might speak to the history of sending out addendum with only a single option.

MS. KERNS: I think we've done it before. There is no regulations or information that say you can't. We've done it in the past, in this fishery maybe last time. We did maybe one other option the last time for glass eel. But we have done it in other fisheries.

CHAIR KUHN: We're starting behind schedule, but are there any members of the public that would like to make comment on this motion? Okay, seeing none; discussion on the motion. Adam Nowalsky.

MR. ADAM NOWALSKY: Given that we have an annual quota for Maine's commercial glass eel fishery in place already, without a finite end date for it. What would be the purpose of even continuing this addendum if we removed this option? I understand that there is a section here about the timelines here with the three years. But essentially, by taking this out it would seem that our message is, we intend to keep the Maine commercial glass eel quota status quo, period, and we would just bring forward another addendum. To what purpose does this even serve if we take this out?

MS. STARKS: If it is removed and the action is not approved, then Maine would not have a quota for 2025. That is kind of an alternative option to remaining status quo, if you will, with the quota number that they have now.

CHAIR KUHN: Any additional discussion? John Clark.

MR. JOHN CLARK: While I don't think there would be any reason to put this on Maine, this type of reduction. Keeping it in the addendum, I don't see there is any problem with that. Probably reduced

the cognitive dissonance for people looking at this, especially yellow eel fishermen.

They are seeing some of these caps are like miniscule, and yet the message is that you can catch as many glass eels as you want. That doesn't have any impact on the yellow eel stock, which obviously, a lot of glass eels grow up into yellow eels. I don't see any problem with keeping it in there, I really don't think it's going to be something that will affect Maine. I doubt that will happen. But you know just in the sense of fairness, to have that in there, since yellow eels are possibly facing a cap cut. Then just to show the public that we're looking at the same type of options across the board for eels.

CHAIR KUHN: Shanna.

MS. MADSEN: I think this question is for Megan. Megan, could you maybe enlighten the Board on what a public hearing would look like if you're going out and saying that you are going to potentially reduce Maine's glass eel quota by 21 percent?

MS. WARE: Sure. I would expect a very lively public hearing. I would be requesting marine patrol at this hearing. I'm not trying to make light of the situation. This is not an insignificant option to be bringing out for public comment. I mean this is potentially catastrophic here for the fishery. If the Board is not serious about this option, I would ask that we remove it.

I think if the Board isn't serious, and the only reason to keep it in is to say, oh, we want a range or we want the yellow eel fishery to see that we're considering something else. I don't find that a strong enough justification for people to feel like their livelihoods are threatened.

CHAIR KUHN: Any additional discussion on this motion? Nothing online? Okay, I guess we're ready to call the question. Is there a need for a caucus? We'll go two minutes for caucus. Okay, two minutes is up. We'll go ahead and call the question. **All those in favor, please raise your hands. Okay, you can put your hands down. All opposed. Three opposed.**

Any null votes? Abstentions? (NOAA Fisheries abstains). Motion passes, 14, 3, 0 to 2.

Okay, so we still need to account for the timeframe, correct? The timeframe aspect of this. We'll go back to the table to discuss the options for the timeframe. Are there any modifications for the timeframe motion at this time? Is there anyone willing to make a motion regarding the timeframe options, just for the approval of the addendum, rather. Megan Ware.

MS. WARE: I would think it would be **move to approve Draft Addendum VI for public comment, as modified today.**

CHAIR KUHN: Seconded by Cheri Patterson. Okay, we'll try and do this the easy way. **Is there any opposition to the motion? Seeing none; motion passes by consent.**

**CONSIDER APPROVAL OF DRAFT ADDENDUM VII
ON YELLOW EEL COASTWIDE CAP AND
MONITORING REQUIREMENTS FOR PUBLIC
COMMENT**

CHAIR KUHN: Okay, so we'll go ahead and move on to Item 5 in the agenda, which is to consider the approval of Draft Addendum VII on yellow eel coastwide cap and monitoring requirements for public comment. We have multiple considerations in this draft addendum. Caitlin Starks is again going to lead us into questions and discussion with the presentation, then we'll take questions on the presentation. Caitlin, the floor is yours.

MS. STARKS: At the start I'm just going to note that this is a much longer one, so please hang in there. In this presentation I'm going to start off with the timeline and background information on this addendum, including the problem statement, recent data and monitoring requirements relevant to the option, and then I'll go over the proposed management options, which address the yellow eel coastwide cap and management response to exceeding the cap, the young of year survey requirements and catch and effort reporting requirements. Then we'll talk about the next step. As a reminder, this addendum was also initiated in

August, 2023, after the Board reviewed the 2023 benchmark stock assessment. Then this fall the Plan Development Team drafted management options and put this document together. Now here we are in January, and today the Board will consider Draft Addendum VII for public comment.

Back in August, the Board approved the recent benchmark stock assessment for American eel for management use, and this assessment found that the American eel stock is depleted, and it recommended that yellow eel catch be reduced. In response to the stock assessment findings and recommendation, the Board initiated Draft Addendum VII to address coastwide catch of yellow eel, by using the recommended tool in the assessment called I-TARGET to recommend a range of catch cap.

This addendum addresses the poor stock condition of American eel, and the fact that the assessment has not been able to provide biologically-based reference points upon which to base management of yellow eel, and instead the current coastwide cap that we have is based on historical landings.

While the 2023 assessment still hasn't provided biological reference points, it did identify a trend-based tool that could be used to inform management, which is I-TARGET, and I-TARGET uses only the time series of coastwide landings and the fishery independent abundance indices to provide catch advice.

This graph is showing the yellow eel abundance index, which is the dotted gray line, and the coastwide landings, which is the black line, and this is showing you the decline in both the abundance index and landings over time. The Addendum also considers some options to change some monitoring requirements, based on recommendations from the Stock Assessment Subcommittee and Technical Committee.

The PDT taking these recommendations thought it was worthwhile to group these together with the yellow eel options in this addendum. First, the 2023 assessment indicated that the biological sampling

that is required is part of the state young of year surveys, specifically the individual length and pigment stage, that those could be made optional, because the data have not been able to inform trends in the stock.

Additionally, a note that the catch per unit effort data that are provided by the states have not been used in any of the stock assessments until now, as was intended for those data, because they are not indicative of trends in the stock as a whole. Moving into the review of the options, the proposed options are organized in the document by issue, starting with options on the coastwise yellow eel harvest cap, and the management response to exceeding that.

Then the timeframe for the yellow eel provision, followed by options for the young of year survey and the catch and effort monitoring requirement. Section 3.1, Issue 1, deals with the yellow eel coastwide harvest cap. Our current cap is 916,473 pounds, and that's based on the average landings from 1998 to 2010. This is our status quo option. There are four additional options, which propose a range of alternative harvest caps using the I-TARGET tool with different configurations based on management goals. As a reminder, when using I-TARGET, there are these three variables or knobs that can be adjusted to configure the tool, and these are the reference period, multiplier, and threshold. The reference period is meant to be a time period where the population is stable, or at the desirable abundance level. Then the multiplier determines the level of abundance that the management is aiming to achieve.

If the multiplier is set to one, that means you're aiming to achieve the same abundance from the reference period that's set, and if you use a multiplier of 1.25, that means you are aiming to achieve an abundance level that is 25 percent higher than what it was during the reference period. Then our last one here is the threshold value, and that is a portion of the I-TARGET value that depends on the goals of the fishery.

A threshold of 0.5 is less conservative, and would generally result in higher catch cap, whereas a

These minutes are draft and subject to approval by the American Eel Management Board.

The Board will review the minutes during its next meeting

threshold of 0.8 is a more conservative value, and that was what was recommended by the Northeast Fishery Science Center when they used or evaluated the use of this tool. Just another note. When the Stock Assessment Subcommittee recommended using I-TARGET, they recommended that the Board use the threshold value rather than the other two knobs, to adjust the configuration in setting management.

In the options, okay it's really difficult to see on the screen, so I apologize. But in the options that use I-TARGET to recommend a catch cap, you'll see that there are two different reference periods that are used. These are identified by the orange and blue shaded areas, which are really hard to see. But these two reference periods were based on distinct regimes that were identified in the stock assessment.

The blue area, which is the earlier reference period from 1974 to 1987, in that reference period the abundance index was higher, representing a more desirable abundance level, and then the later reference period, which is in an orange square, is a period of lower abundance, but still above the abundance in our most recent decade.

This table is showing the four proposed options for a coastwide cap, based on I-TARGET. Option 2 and 3 both use the earlier reference period, and they both use a multiplier value of 1.25, meaning they are both aiming to achieve stock abundance that is 25 percent greater than the abundance during that earlier reference period.

They differ in that Option 2 uses a threshold of 28, which is again the more conservative threshold, which would result in a coastwide cap of 202,453 pounds, and then Option 3 uses a threshold of 0.5, which is the less conservative threshold value resulting in a coastwide cap of 518,281 pounds.

Then Options 4 and 5 use the later reference period, which is 1988 to 1999, and they both use a threshold value of 0.5, which is the less conservative threshold. However, Option 4 uses a multiplier of 1.5, and Option 5 uses a multiplier of 1.25. This means these

two options are aiming for two different levels of stock abundance.

Option 4 is aiming for a 50 percent greater abundance than the reference period, and Option 5 is aiming for 25 percent greater than that reference period. To try and better explain how these options compare to each other, this is how they compare in terms of the abundance level they are aiming to achieve. The target abundance increases from the bottom up. Options 2 and 3 both aim for the highest level of relative abundance, and then Option 5 aims for the lowest relative abundance, and Option 4 is between those.

In this graph you can see the coastwide caps that would result from each of these options, compared to the current coastwide cap and the coastwide yellow eel landings since 2015. Our current cap is the black dashed line at the top, and that has not been exceeded since 2016. Then of the alternative options, Option 5 would result in the highest cap, and landings have not exceeded that level since 2018.

Functionally it has the least potential to reduce fishing mortality. The caps under Option 3 and 4 are pretty similar, they are the yellow and green dot/dash lines in the middle, and the landings have not exceeded those levels since 2019. Then Option 2 produces the lowest coastwide cap, and landings have exceeded this cap in all years since 2015. Functionally, it has the most potential to reduce fishing mortality.

As a reminder, that Option 2 is the recommended option that the SAS put forward in the stock assessment document. Now we'll move on to the management response to exceeding the coastwide cap. The status quo option is that if landings exceed the cap by 10 percent for two consecutive years, then the state's whose landings are greater than 1 percent of the coastwide landings in the years when that cap is exceeded, will be responsible for reducing their landings to achieve the coastwide cap in the subsequent year.

Our Option 2 in this document would modify this

These minutes are draft and subject to approval by the American Eel Management Board.

The Board will review the minutes during its next meeting

response, so that the states whose landings are greater than 5 percent of the coastwide landings would be responsible for reducing their landings to achieve the coastwide cap in the subsequent year. This option is responding to the fact that as total landings of yellow eel have declined drastically over the past few years, states with very minimal landings are still winding up contributing more than 1 percent of the total coastwide landings.

Just for a visual, the shaded cells in this table, which apparently do not show up on this projector. Okay, that one shows it. This shows the states whose landings were greater than the 5 percent of the coastwide total in each year since 2014. Now I'll move on to the options on the timeframe for these yellow eel cap provisions.

The PDT developed two proposed options for consideration. Option 1 is that the cap would not have a sunset date, but that it would have to remain in place for three years before being updated. The three-year minimum timeframe is recommended, because less than three years of data with the cap in place would be insufficient for evaluating the performance of that cap.

Then Option 2 is that the cap would again not have a sunset date, but that it would have to remain in place for five years before being updated. Five years is also recommended as more years of data would make a more robust dataset to look at that cap. I want to note here that when it says update the cap, we are talking about adding additional years of catch and index data, and running that through the I-TARGET tool as it is configured by approval of this Addendum, if that's the way it goes. It would not allow for changes to be made to the reference period multiplier and threshold that are set through this action. If changes to those items, or the configuration of I-TARGET is desired, then that would require a new addendum, and that is under either of these options.

That is the end of the provisions related to the cap, and then these are the options related to the young of year survey sampling. Option 1 is status quo, which would mean the states must continue to

collect individual length and pigment stage data during the young of year surveys. Then Option 2 is that the biological sampling of length and pigment stage would become optional.

As I mentioned, this was the recommendation from the Stock Assessment Subcommittee and the Technical Committee in the 2023 assessment, and that would ease the monitoring in some of the states. Next are options related to the fishery dependent catch and effort monitoring. Option 1, status quo, is that the requirements for harvester reporting of trip level CPUE data, which was established by Addendum I, would be maintained.

This means the states would continue to require trip level CPUE data and harvester reports, including soak time, number of units of gear fished and pounds landed. Then Option 2 is that the states would no longer be required to collect trip level CPUE data for yellow eel catch. The states of course would be able to continue to require those data if they choose to do so, and the majority of states, when we ask the Technical Committee, indicated that they would collect these data, even if it were voluntary.

Then as a note, this option is specific to yellow eel, it does not apply to glass eel fisheries, so more to the young of year survey options, this was proposed to ease the monitoring burden on states, since there are no plans to use those catch per unit effort data for the assessment. The Technical Committee has no concerns with making this an optional requirement, optional data.

That was the last of the options that were included in the draft document that you received in the materials. However, I wanted to offer for the Board's consideration the potential to add options to this Addendum that address the Commission's new de minimis policy, which was modified in November, 2022.

In that new policy the standard is that a state can be considered de minimis if the average landings for the last three years is less than 1 percent of the coastwide landings. However, the American eel FMP uses the average landings of the last two years to evaluate the states qualification for de minimis

These minutes are draft and subject to approval by the American Eel Management Board.

The Board will review the minutes during its next meeting

status. The new Commission policy doesn't automatically update the de minimis criteria for any of our species FMPs, so that change has to be made through an addendum or an amendment for each species.

It is also not required that the Board adopt the new standard for American eel, but if the Board wants to keep using two year-average landings rather than three years, then it needs to provide a rationale as to why two years is more appropriate for eel than three years. If the Board does want to add options to address the de minimis policy, then these are two draft options for consideration that could be easily thrown into the Addendum. Status quo would be to continue using the average landings for the preceding two years to evaluate de minimis status, and again, it would need to include a rationale as to why. Then Option 2 would be to update the criteria to apply the Commission policy to eels, meaning that a state would be de minimis if the average landings for the last three years is less than 1 percent of the coastwide landings.

Thanks for hanging in there, that wraps up all the options, and then this is our potential timeline again for next steps. If the Board approves this for public comment today, we would start the public comment period and state hearings in February, and the Board would be able to consider Draft Addendum VII for final approval in May at the spring meeting, and then would determine the implementation dates for the different provisions of the Addendum.

With that, these are the Board actions to consider. First the Board should consider any modifications to the document, including whether or not to add these de minimis policy options. Then consider approving the document Draft Addendum for public comment. With that I can take any questions.

CHAIR KUHN: Questions for Caitlin. Megan Ware.

MS. WARE: I just have two questions. My first is under 3.2 timeframe. You were kind of getting at it with your slide there. Maybe this reflects that I don't totally understand I-TARGET. But if the timeframe, the threshold and the other value are not changing,

does that mean the catch cap is also not changing with new data, or it is?

MS. STARKS: The catch cap would be updated if you add additional years of data from the abundance index and the coastwide landings data into the I-TARGET tool. It would take those two things into account and produce a new catch cap.

MS. WARE: Okay, thank you, and then my second question was on the catch and effort monitoring section. Under Option 2 it says states would no longer be required to mandate that harvesters or dealers report certain things, one of them is pounds landed. I assume that is harvesters or dealers, not both, and if that is the case, then I just want to clarify that.

MS. STARKS: Just to clarify, the requirement to report landings, pounds of landings, would still remain for either harvesters or dealers as was in the Addendum I language. But it wouldn't be per trip or per year type. You wouldn't have to report it separately for each of those different pieces of effort data, if that makes sense.

MS. WARE: As an example, our harvester would still need to report total pounds landed, I'll say monthly, or whatever the reporting timeframe is, but not per trip or gear type.

MS. STARKS: Yes.

MS. WARE: Okay. I think we could better clarify that, maybe, in Option 2, but I'll see what others have to say.

CHAIR KUHN: Thanks, Megan and Caitlin, Erika Burgess.

MS. ERIKA BURGESS: I had a question about 3.2 as well, the timeframe for yellow eel provisions. This was more of a philosophical type question. This Addendum would put in place something that says the cap cannot be updated for either three or five years. Technically, is it possible to hold the Board to something like that? What would prevent a Board from coming in and saying, in Year 2 or Year 4,

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

depending on which option is chosen, that they wanted to make changes. Is that even feasible?

MS. STARKS: Yes, so without a new addendum it would remain in place for three years. But if the Board were to initiate a new addendum to change that management program, it could change the coastwide cap earlier.

CHAIR KUHN: Any additional questions? Lynn Fegley.

MS. FEGLEY: Mr. Chair, I'm not sure if this is a question or a comment, so cut me off if it's inappropriate. But I think for the I-TARGET, it would help people to understand, and I don't have a specific language modification, but if you take that, I'm looking right now at Figure 11 in the Addendum, that shows the different iterations of I-TARGET.

The lowest version, as I understand, the options for the 200 something thousand catch cap is the last time, it's the terminal year of that time series. But that catch cap was calculated across the time series, and starts at a level that is higher, maybe close to 500,000, if I'm making sense. I think it would help the public to understand that it is the index and the landings that are driving the changes in that I-TARGET. We're going to choose to set a cap somewhere, but that cap would be changing if we were to run it, based on what the index and the landings show.

I only say that, because I think it will help people understand, and if we can see that there is some sort of change in a positive direction, you know maybe that would provide some motivation for the Board to initiate that addendum. I don't know. It's really hard to wrap your head around the fact that you are sort of watching this time series of a cap, and we're setting it at a terminal year. Somehow, I think there is some language to help clarify that a little bit.

MS. STARKS: Thanks, Lynn, I think I can work on kind of clarification of that in this document.

CHAIR KUHN: Shanna Madsen.

MS. MADSEN: I think we might be getting into comment zone. First of all, I want to say, I completely agree with Lynn. I think that would really, really help this document to shine a little bit more. I think the public is going to have a hard time understanding what I-TARGET is, and its actually kind of simple in its essence, so it just needs some more wording to kind of help that along, in my opinion.

The other thing that I didn't notice in the document, and if I'm wrong, Caitlin, please feel free to kick me. But I think it's kind of important to give that back recommendation that was, if we were going to vary anything we should be varying the threshold, yes, the threshold, but not the reference period for the multipliers. I think it would be really useful in 3.1, and I think we should also say it in Option 3. I think you guys do a good job in Option 2 of laying out what the SAS recommendation was, and the SAS said to us, you know please keep these two things, but if you want to modify, this would be a really good way to do it. I think it's important for us to note that in this document.

CHAIR KUHN: Lynn Fegley.

MS. FEGLEY: I do have a question now, based on what Shanna just said. When this decision is made, does the Board have the opportunity to pick a cap within the range of what is presented, or will the Board be restricted to picking a cap based on particular knobs, if you get my question?

MS. STARKS: I believe the Board would be able to pick a cap that falls within the range of cap values, so that 916,000 that we have now, and the lowest one is 202 thousand something. I think if it were in that range, even though it's not produced by I-TARGET, it would still be on the table, because our current cap is not based on I-TARGET.

CHAIR KUHN: Any additional discussion here? John Maniscalco.

MR. JOHN MANISCALCO: Caitlin's response kind of confused me. I mean I thought we were trying to be driven by the I-TARGET, and by setting those knobs into the future, just responding to how landings and

index values changed over time, and choosing some other cap and ignoring the I-TARGET advice doesn't make a lot of sense.

I thought we were trying to kind of set a base for what we're doing. I understand the Board usually has the discretion to kind of set a cap, given the spread of options that we put out for public comment, but I guess I would discourage that and it sounds counterproductive. I don't know if there is a way to kind of force the Board to use the knobs that we set, rather than give us that discretion to use a little bit too much discretion.

CHAIR KUHN: Thanks, John, I'm not sure I know the answer to that one. I mean you could pick between the range right now. But I understand where you're coming from with that sticking to the set values that come out of the black box, so to speak. Is there any additional discussion? Do you have some comments on that, Caitlin?

MS. STARKS: Yes, I can just add that that ability for the Board to pick a cap between those two values is just an artifact of the way all of our Commission documents work. It is possible for the Board to choose any option that falls within the range that goes out for public comment, and that also includes combining things across options, or issue.

CHAIR KUHN: We'll move this along a little bit. Are there any additions that the Board would like to see for de minimis or other modifications to the Addendum? Shanna.

MS. MADSEN: I just think that Lynn and John have pointed out something that maybe should be in the document, to let the public know that that is, and I realize this is something that we can do for all of our species. If we can just pop something in there that does exactly that. Then my other comment is, I think that what you guys have prepared for another set of options for de minimis is sufficient. I was happy with those, and I'm okay adding those to the document.

MS. STARKS: That language is already in the document about being able to combine and pick between the range.

CHAIR KUHN: Seeing no other discussion around this, is there any motions that we could entertain here at this time? Erika Burgess.

MS. BURGESS: I'm assuming we need a motion to add the change for de minimis requirement.

MS. STARKS: I believe we could do it without a motion if there is agreement among all of the Board.

CHAIR KUHN: Is there any disagreement to Erika's comments there, any addition? Okay, we'll just go ahead and add that. Okay, Shanna.

MS. MADSEN: Caitlin, I did find that section under 3.0. I think what John is getting at is still something maybe important for us to say, like yes, you can choose from the range of options. However, they may not be supported by some configuration of I-TARGET. Because I think that is an important distinction to make.

CHAIR KUHN: Toni.

MS. KERNS: That is the status quo option, so that is pulling from the range of options. We can try to add some language in there. But the status quo option is just an arbitrary value that the Board chose the last round. You're taking the arbitrary value and then using a reduction, if it were a reduction. It could be anywhere between what the current value is and the lowest value in the options, because you are combining those two. You're using the rationale of status quo with the reductions of I-TARGET.

CHAIR KUHN: It seems like what we're discussing here are modifications to the addenda for clarification, say not necessarily in my interpretation the options. Is there any additional discussion on clarification? Shanna.

MS. MADSEN: Sorry, just a question to Toni's point. Toni, what does that mean if we selected something outside of the I-TARGET values for the other sections of the document that discuss timing of when we would look at the cap in relation to I-TARGET?

MS. STARKS: I believe it would mean that whatever level is set, if it is not set using I-TARGET then it would just remain in place indefinitely, because it is saying in those two options that it has to remain in place for three years if you're using I-TARGET.

CHAIR KUHN: Are there any motions to modify the options? Okay, seeing none, we need a motion to approve the document. Is someone willing to make that motion? John Clark, seconded by Shanna Madsen.

MR. CLARK: No, I'm not willing to do that. I was going to propose something different.

CHAIR KUHN: Oh, okay. My apologies.

MR. CLARK: Sorry about that for the confusion. I wanted to **move to postpone further action on the coastwide cap options until coastwide landings reach 600,000 pounds in a given year**. If I get a second, I can speak to that.

CHAIR KUHN: Do we have a second? Sorry, Russ Dize second. Do you want to speak to your motion?

MR. CLARK: Yes, I find this whole process has been very upsetting to a lot of people that have been, obviously to a lot of yellow eelers, but in addition, I just think it's very unnecessary at this time. This is a market driven fishery. We've seen landings, as pointed out in the presentation, we were above the coastwide cap as recently as 2016, and the last few years we've been well below 500,000 pounds.

If we look at the catch in the fisheries, we would see that the catch per unit effort, especially in the Chesapeake, which Maryland is the bulk of the landings, has actually been going up. As it has been pointed out, over the decades that we've been looking at eels, we actually have, it almost looks like two different populations of eels, the estuarine eels, which is where all the fisheries are prosecuted, and then eels in fresh water.

Their fates do seem to be differing, where the freshwater eels are in much bigger trouble than estuarine eels. I think, as was just pointed out with

the glass eels, the fact that we're talking about the recommended option in here from this I-TARGET method is an enormous cut in the coastwide cap.

I know this is just a proposal at this point, but it's bringing a lot of consternation to those who do fish for eels. As I said, based on the fact that this is a fishery that is market dependent, and it doesn't look like the market is coming back anytime soon. I would just say, our current system is not broken, and this is not the fix that we need, and I would just leave it alone at this point.

CHAIR KUHN: Russ Dize, as the seconder, would you like to add any comments to that?

MR. RUSSEL DIZE: I think if you look at the graph, and what John was talking about is that our line of catch is down. But the reason is, because there is no market. In their area, I'm a fisherman, in our area of the Chesapeake Bay we've got so many eels, yellow eels that someone handlining or still fishing for perch, have a hard time catching the perch., because we've got so many eels.

You can throw an eel trap over and you're going to fill in a matter of hours. The problem is, we can't sell it. All of our commercial guys that were selling eels have quit, again selling, they had to do something else. I agree with John that the problem isn't here, and I think you'll find out where they are taking their samples, in the Hudson River, in Maryland in the upper Bay, we have an abundance of blue cats and snakeheads. You're not going to get a very good sample in those areas. I understand you have to have ten years of sampling before you can have that to be what you're going to go by. I think it's time you moved the sampling to another part of another area on the coast, because we may never have any more eels in the Hudson River, and in the Sassafras River in Maryland. But down our way, we've got Bou coups of eels.

CHAIR DIZE: Erika.

MS. BURGESS: I had a question for clarification, but I see that staff has modified the motion, although the motion has already been seconded, so it belongs to

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

the Board. I don't know if that is in order to do that. My question was, whether the actions in the Draft Addendum under consideration regarding monitoring would still move forward. John, is that your intent?

MR. CLARK: Yes, Erika, I just wanted to postpone action on the cap. Thanks.

CHAIR KUHN: Any other discussion on the motion? John.

MR. CLARK: Toni said that I needed to say that into the record, so yes, my intention is that all other parts of the Addendum would move forward, and just postpone action on the cap part of the options.

CHAIR KUHN: Do we have any public comments on the motion? Dan McKiernan.

MR. DANIEL MCKIERNAN: My question is, you know John's proposal is an interesting one. But couldn't he bring up that same motion after this goes to public hearing? I mean I guess I would like to have a chance to talk to my TC members. I'm kind of intrigued by it, but couldn't you make that same motion at the next meeting?

CHAIR KUHN: John Clark, response.

MR. CLARK: Yes, Dan, if I can channel my inner Tom Fote. I've been on eels for such a long time that I remember back in 2008, I was on the Technical Committee, and we had come up with a life table method for trying to reduce yellow eel mortality by coming up with a slot that could be harvested, so you would have to let go eels that were smaller than the slot eels that were larger, to get more escapement.

It did go out to the public that way, and then the Board just rejected going with the life table type of reductions that would have been required there, and just approved the other parts of the addendum. It could be done that way, I just wanted to put on the record I'm just very skeptical of some of these cap numbers that are coming up.

CHAIR KUHN: Shanna Madsen.

MS. MADSEN: As much as I love John, and as much as I love the first state, I have to say I'm going to oppose this motion. In going through the stock assessment, I think one of the things that really hit home for me is this one sentence that says, the SAS thinks the continued fishing pressure on a depleted stock is likely contributing to the continued decline in abundance seen over several assessments, being the 2012 one, the 2017 one and the 2013 one. I think that we're being incredibly irresponsible by not taking this out to public comment. At least having the discussion on what these I-TARGET limits look like, and what could potentially be feasible. We're at the point where we have been asked several times by our SAS, by our TC, to reduce fishing pressure on this specific life stage of eels. Every single time we have declined and/or have raised the cap. I can't support this motion.

CHAIR KUHN: Joe Cimino.

MR. JOE CIMINO: I echo Shanna's comments on both trying to be supportive, but also, you know there has to be some need for concern here. This is a species that's life history is very complicated. Our understanding of its population is very complicated. It's one that's been discussed for listing at times. To just push this off for a future date on a poundage that isn't even something that would hurt our commercial fisheries at this point. I would much rather see this go to public comment as is. I think there are darn good reasons for it, so thank you.

CHAIR KUHN: Rick Jacobson.

MR. RICK JACOBSON: I agree with some of the comments that have been offered that I do not support this motion. Given the status of the stock, and the declining status over the years. I do believe that we need to go out for public comment with these sorts of options. We've given due diligence into analyzing what may be drivers to the abundance issue.

This is the best science we have available to us at this time. Add to that, if we were ultimately to conclude that this is the right time to lower the coastwide cap, no better time to do it than during a period when the

actual harvest is decreased, and it's easier to accept that change. I can't support the motion at this time.

CHAIR KUHN: Okay, we've had considerable discussion on this item. I think we're ready to call the question. Assuming there is going to be a need to caucus, so we'll go with two minutes for caucus. Okay, we had two minutes. Let's go ahead and wrap this up. Before I call the question, I'm going to read this motion back into the record. Move to approve Sections 3.1 and 3.2 from the Draft Addendum, and postpone further action on coastwide cap options until coastwide landings, did I say, I'm sorry.

It looks like I read that wrong., so I'll start over. Apologies. **Move to remove Sections 3.1 and 3.2 from the Draft Addendum, and postpone further action on the coastwide cap options until coastwide landings reach 600,000 pounds in a given year.** Motion made by Mr. Clark and seconded by Mr. Dize. **All those in favor, raise your hand. All those opposed. Any null votes, abstentions? The motion fails, 1 to 18 to 0 to 0.** John Clark.

MR. CLARK: I'll take another crack at this. How about, I would like to make a **motion to remove Section 3.1 Option 2**, that is the lowest cap value in the document.

CHAIR KUHN: Thank you, John, do we have a second? Megan Ware. John, would you like to provide some additional rationale?

MR. CLARK: Obviously the Board has made it clear that they would like the coastwide cap options to go out to the public. I just think this one would have zero possibility of ever passing the Board, and is probably the one that would be most concerning to the eel fishermen. Sort of the similar reasoning that was used for the glass eel addendum. It's why would you take something out that really is just going to cause a lot of concern and worry, when it's not something that we probably want to consider as a Board?

CHAIR KUHN: Megan Ware, any additional comments?

MS. WARE: Seconded for discussion, so John could provide his rationale.

CHAIR KUHN: We're running behind, obviously. Let's go ahead and take any comments in support of John's motion. Lynn Fegley.

MS. FEGLEY: I would go ahead and support this. I recognize that this is what was recommended by scientists. But I will say that while I do, I have concern about the potential recruitment overfishing of yellow eels. But I also have concern that we really have very little understanding for analysis of the levels of fishing mortality that are happening on glass eels, and glass eels become yellow eels.

We also have an issue in Maryland, where we have the highest catch per unit effort in the history of our time series, and I understand that's a local view. It's a concentration. But a 200,000-pound catch cap is essentially a moratorium. I mean you might as well go there if you're going to go to 200,000 pounds. While I am in the camp of making a move on this fishery and not ignoring the problem, I could support moving this lowest option.

CHAIR KUHN: I'll take one more comment in support if there are any, that differs from the rationale Lynn provided. Okay seeing none; is there any comments in opposition to that before we call the question? Okay, assuming again there is going to be a need for caucus. Need for caucus? Okay, I'm not seeing any, yes. We'll take one minute. I'm going to read the motion back into the record before we call the question. Motion to remove Section 3.1, Option 2. Motion by John Clark, second by Ms. Ware.

All those in favor, raise their hands. Okay, you may lower your hands. All those opposed, okay lower your hands. Null votes, abstentions. Okay, the motion fails 8 to 11, 0, 0. Okay, are there any additional modifications to the Draft Addendum for public comment? Seeing none; do we have a motion to approve the Draft Addendum for public comment? Cheri Patterson, seconded by Shanna Madsen.

MS. CHERI PATTERSON: I'm just going to read it. **Move to approve Draft Addendum VII for public comment, as modified today.**

CHAIR KUHN: Shanna, any additional comments? Okay, we'll try this the easy way, maybe. **Is there any opposition to this motion? Okay, seeing none; the motion passes by consent.**

CONSIDER APPROVAL OF FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE REPORTS FOR THE 2022 FISHING YEAR

CHAIR KUHN: Okay, we have two items remaining on the agenda, so let's move on to Item 6 on the agenda, which is to Consider the Approval of the Fisheries Management Plan Review and State Compliance Reports for 2022 Fishing Year. Caitlin.

MS. STARKS: I'm going to make this briefer than it was supposed to be. But I'll quickly go over the status of the fishery and then the PRT Review, the State Compliance and their recommendations. I'm going to skip through these first couple slides just showing on the screen. These are the glass eel fishery regulations in place under the FMP, and there haven't been any changes in recent years.

These are the yellow eel fishery regulations, and then these are the silver eel fishery regulations. Then in addition, there are other management measures in place, including the catch in effort reporting, sustainable fishery management plans, and then there have not been changes in those as well. Just an update, Maine has used the aquaculture plan provision. They've submitted a continuation of the aquaculture plan for 2023. That was approved by the Board in August, 2022, and 200 pounds were harvested by America Unagi in 2022.

For commercial landings, the state reported landings of yellow and silver eels were around 334,653 pounds in 2022, and that is a 2 percent increase from 2021. States that contribute 91 percent of the coastwide harvest are Maryland, Virginia, New Jersey and New York. Maine's glass eel harvest in 2022 was 9,459 pounds.

South Carolina also has minimal glass eel harvest, but

it's confidential. I'm not going to continue reporting on recreational eel fisheries, because as we discussed, the design of MRIP is not geared to inland fisheries, so we don't have any estimates. Unless this changes, I will no longer report on that.

This is the PRT Review of the compliance reports. They found no issue with the glass eel fishery. Then with regard to the yellow eel provision, the PRT noted one issue, which is that New York's regulations for a minimum mesh size are not consistent with the requirements of the FMP. Addendum III requires states and jurisdictions to implement a 1/ 2 inch by 1/ 2 inch minimum on the mesh size that is used in the commercial yellow eel pots.

Addendum III allows states to use an escape panel constructed of that mesh size for three years, in order to reduce the financial burden on this fishery for those gear changes. However, that provision for the three-year escape panel thing has expired. Now all the yellow eel pots should be required to use the minimum mesh size, regardless of the presence of an escape panel.

New York's regulations still allowed the pots to have the escape panel instead of using the minimum mesh size, so therefore New York should update those regulations to require the minimum mesh size for all yellow eel pots to meet that FMP requirement. For silver eel the PRT noted two small issues, which are that Delaware and Florida have not implemented regulations that prevent harvest of eels from pound nets from September 1 through December 31.

However, Delaware has not had any reported pound net landings for 50 years, and they will be able to address this issue the next time they have to make a change to their eel regulations. Florida is also unaware of any active pound net fishery in the past 10 to 15 years. As discussed earlier, the de minimis threshold for eel is that average landings for the two preceding years must be under 1 percent of the coastwide landings for a particular life stage. For this year, New Hampshire, Massachusetts, Pennsylvania, D.C., Georgia and Florida all requested de minimis status for yellow eels. While the rest of the states qualify, Florida's average landings for 2021 and 2022

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

are greater than 1 percent of the coastwide landings, and it is 2.25 percent of the coastwide.

The PRT recommends that the Board consider those compliance issues that they noted, and then they also recommend that New York separate the yellow and silver eel landings in their reporting. The PRT maintained the recommendation for the states to quantify upstream and downstream passage, and provide information to the TC for evaluation regularly.

To address this, they suggested making a section in the compliance report, so that the states are reporting on this annually. The PRT also recommends the Board engage the Committee on Economic and Social Sciences to conduct an analysis of market demand specific to the food versus state markets and international market demand, and also recommends working with U.S. Fish and Wildlife to compare the U.S. landings and the exports. With that I can take any questions.

CHAIR KUHN: Any questions for Caitlin? Okay, if there are no more questions, Doug Grout.

MR. DOUGLAS E. GROUT: I just wanted to ask, Mr. Chairman, has there been any reason that New York has not passed those changes to the minimum mesh size, and if not, are there plans to change those in the near future?

CHAIR KUHN: Would you like to address that, John?

MR. MANISCALCO: Yes, thank you, just an oversight, and we will address it as quickly as possible to our regulatory.

CHAIR KUHN: Are there any modifications to the FMP as presented? Is someone willing to make a motion to accept the FMP Review? Ingrid Braun.

MS. INGRID BRAUN: **Move to approve the American Eel FMP Review for the 2022 fishing year, state compliance reports, and de minimis status for New Hampshire, Massachusetts, Pennsylvania, D.C., and Georgia.**

CHAIR KUHN: We have a second by Megan Ware, sorry, Lynn Fegley. They are sitting somewhat close together. Any comments on that? Okay, it's getting late, my apologies. **Is there any opposition to the motion? Seeing none; the motion passes by consent.**

MS. STARKS: I just wanted to clarify that if, unless I hear any objections, I will add a section to the compliance reports for the states to report on their upstream and downstream passage.

CHAIR KUHN: Thanks for that clarification, Caitlin.

REVIEW AND POPULATE ADVISORY PANEL MEMBERSHIP

CHAIR KUHN: Moving on to the last item on the agenda. It is to Review and Populate the Advisory Panel membership, and for this I am going to turn it over to Tina Berger.

MS. TINA L. BERGER: Thank you, Mr. Chair, I offer for your consideration and approval two nominations to the American Eel Advisory Panel, Sara Rademaker, sorry, Sara, an eel aqua culturist, and Timothy LaRochelle, a commercial net fisherman. Both are from Maine, and they replace two previous advisors on the panel who are no longer active in the fishery. Thank you.

CHAIR KUHN: Thank you, Tina, do we have a motion regarding the nomination? Megan Ware. Second, Dan McKiernan.

MS. WARE: **Move to approve Sara Rademaker and Timothy LaRochelle to the Eel Advisory Panel.**

CHAIR KUHN: Would anyone around the table like to make a comment? Okay, seeing none; **is there any opposition to the motion? Seeing none; the motion passes by consent.**

ADJOURNMENT

CHAIR KUHN: At this point is there any other business to come before the American Eel Management Board today? Seeing none; do we have

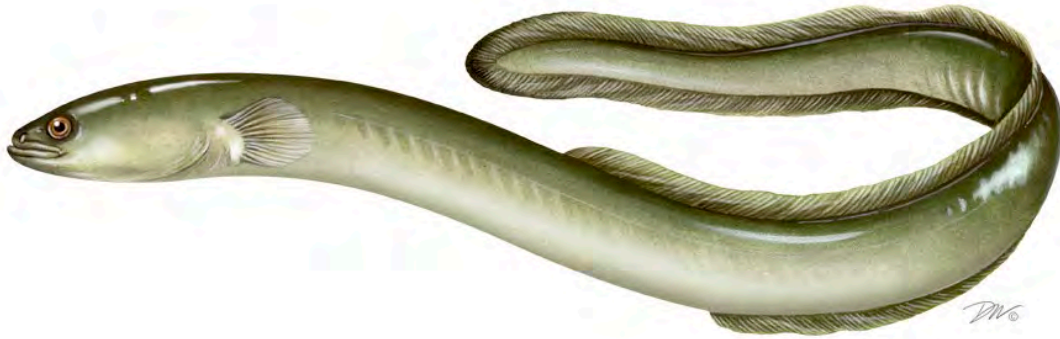
a motion to adjourn? Justin Davis, second Cheri Patterson. Thank you, this meeting is adjourned.

(Whereupon the meeting adjourned at 5:54 p.m. on Tuesday, January 23, 2024)

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM VI TO THE INTERSTATE FISHERY
MANAGEMENT PLAN FOR AMERICAN EEL**

Commercial Glass/Elver Eel Management



January 2024



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In August 2023, the American Eel Management Board initiated the development of an addendum to the Interstate Fishery Management Plan (FMP) to address the Maine commercial quota for glass eel starting in the 2025 fishing season. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of American eel, the addendum process and timeline, and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding this document at any time during the public comment period. The final date comments will be accepted is **March 4, 2024 at 11:59 p.m.** Comments may be submitted at state public hearings or by mail or email. If you have any questions or would like to submit comment, please use the contact information below.

Mail: Caitlin Starks, Senior FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Draft Addendum VI)
Phone: 703.842.0740

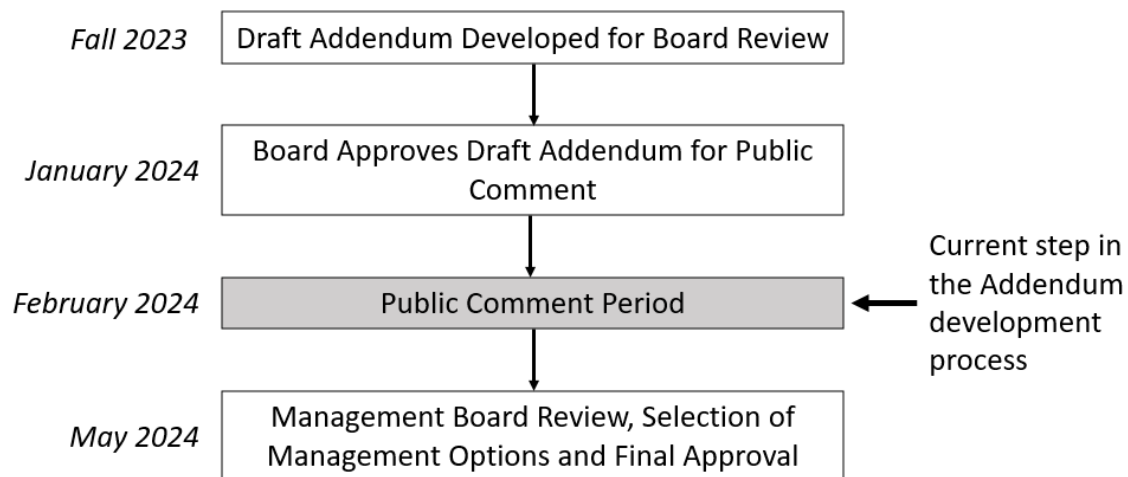


Table of Contents

1.0 Introduction 2

2.0 Overview 2

 2.1 Statement of Problem..... 2

 2.2 Background 2

 2.3 Description of the Fishery..... 3

 2.3.1 Glass Eel/Elver Fishery 3

 2.4 Status of the Stock 5

3.0 Proposed Management Options..... 8

 3.1 Maine Glass Eel Quota 9

 3.2 Timeframe for Maine Glass Eel Quota..... 9

4.0 Compliance 9

5.0 References 9

1.0 Introduction

The Atlantic States Marine Fisheries Commission (Commission) has coordinated interstate management of American eels (*Anguilla rostrata*) from 0-3 miles offshore since 2000. American eel is currently managed under the Interstate Fishery Management Plan (FMP) and Addenda I-V to the FMP. Management authority in the exclusive economic zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries. The management unit is defined as the portion of the American eel population occurring in the territorial seas and inland waters along the Atlantic coast from Maine to Florida.

The Commission's American Eel Management Board (Board) approved the following motion on August 1, 2023:

Move to initiate an addendum to address the Maine glass eel quota.

This Draft Addendum proposes options for commercial quota provisions for Maine's glass eel fishery including quota level and duration.

2.0 Overview

2.1 Statement of Problem

Addendum V, approved in August 2018, examined Maine's glass/elver eel quota based on updated information but made no changes to the state's quota of 9,688 pounds. The Addendum specified Maine's 9,688 pound glass eel quota be set for three years (starting in 2019; from 2019-2021), and could be revisited before year four (2022). At that point, the quota of 9,688 pounds could be extended for an additional three years (2022-2024) without requiring a new addendum. Fishing beyond 2024 would need to be addressed through a new addendum.

Therefore, Maine's current glass eel quota of 9,688 pounds expires after 2024, and a new addendum is required to establish a quota for the 2025 fishing season and beyond.

2.2 Background

American eels inhabit fresh, brackish, and coastal waters along the Atlantic, from the southern tip of Greenland to Brazil. American eel eggs are spawned and hatch in the Sargasso Sea. After hatching, leptocephali (the larval stage) are transported to the coasts of North America and the upper portions of South America by ocean currents. Leptocephali then transform into glass eels via metamorphosis. In most areas, glass eels enter nearshore waters and begin to migrate up-river, although there have been reports of leptocephali found in freshwater in Florida. Glass eels settle in fresh, brackish, and marine waters, where they undergo pigmentation, reaching the elver life stage. Elvers subsequently mature into the yellow eel phase, most by the age of two years.

The Commission's American Eel Board first convened in November 1995 and finalized the FMP for American Eel in November 1999. The goal of the FMP is to conserve and protect the

American eel resource to ensure its continued role in its ecosystems while providing the opportunity for commercial, recreational, scientific, and educational uses. The FMP requires a minimum recreational size and possession limit and a state license for recreational harvesters to sell eels. The FMP requires that states and jurisdictions maintain existing or more conservative American eel commercial fishery regulations for all life stages, including minimum size limits. Each state is responsible for implementing management measures within its jurisdiction to ensure the sustainability of its American eel population.

Since the FMP was approved in 1999, it has been modified four times. Addendum IV (2014) specified an annual glass eel commercial quota for Maine of 9,688 pounds for the 2015-2017 fishing seasons, and that it be re-evaluated after 3 years (prior to the start of the 2018 fishing season). In October 2017, the Board specified a glass eel commercial quota for Maine of 9,688 pounds for the 2018 fishing season. Addendum V (2018) examined Maine's glass/elver eel quota based on updated information but made no changes to the state's quota. In 2021 the Board extended the quota of 9,688 pounds through 2024.

Addendum V also maintained other provisions of Addendum IV relevant to the glass eel/elver fishery. Overages of any state's commercial glass/elver eel quota would require that state or jurisdiction to deduct their entire overage from their quota the following year, on a pound for pound basis. Any state or jurisdiction with a commercial glass eel fishery harvesting at least 750 pounds is required to implement daily trip-level reporting with daily electronic accounting to the state for both harvesters and dealers. Additionally, any state or jurisdiction with a commercial glass eel fishery harvesting at least 750 pounds must implement a fishery-independent life cycle survey covering glass/elver, yellow, and silver eels within at least one river system. Any state or jurisdiction can request an allowance for commercial harvest of glass eels based on stock enhancement programs implemented after January 1, 2011, subject to TC review and Board approval. To qualify for the allowance the state must demonstrate that the stock enhancement program has resulted in a measurable increase in glass eel passage and/or survival.

2.3 Description of the Fishery

2.3.1 Glass Eel/Elver Fishery

Life stage glass and elver eel harvest along the Atlantic coast is prohibited in all states except Maine and South Carolina. Prior to the implementation of the FMP, Maine was the only state compiling glass eel and elver fishery catch statistics. Under the FMP, all states are now required to submit fishery-dependent information. In recent years, Maine was the only state reporting substantial glass eel or elver harvest.

Maine Glass Eel/Elver Fishery

Since the implementation of the 9,688 pound Maine glass eel quota in 2015, landings have tracked closely with the quota. Since 2016, landings have remained above 94% of the quota, but have not exceeded it.

Table 1. Maine's Glass/Elver Eel Landings in pounds 2007-2022 (Source: Maine DMR)

Year	Landings	Value	Year	Landings	Value
2007	3,714	\$1,287,479	2015	5,259	\$11,422,831
2008	6,951	\$1,486,353	2016	9,400	\$13,446,828
2009	5,199	\$519,569	2017	9,343	\$12,166,417
2010	3,158	\$584,851	2018	9,194	\$21,753,350
2011	8,585	\$7,653,332	2019	9,620	\$20,119,194
2012	21,611	\$40,384,618	2020	9,652	\$5,067,521
2013	18,080	\$32,931,077	2021	9,106	\$16,681,103
2014	9,690	\$8,474,302	2022*	9,429	\$20,163,965

*Preliminary landings

In 2012, Maine’s glass eel landings hit an all-time high of 21,610 pounds with a landed value of over \$38 million. This huge spike in price per pound created a gold rush mentality that brought with it poaching problems that most thought Maine could not overcome, and there was a call to close the fishery all together. Over the next two years, the Maine Department of Marine Resources (ME DMR) responded by instituting a voluntary reduction in harvest of 35% from the 18,076 pounds that was landed in 2013. This established the first glass eel quota for Maine at 11,749 pounds. With the implementation of Addendum IV, the elver quota was cut another 11%, reducing Maine’s glass eel quota to 9,688 pounds. Since the implementation of the 9,688 pound glass eel quota, landings have tracked closely with the quota with the exception of 2015 where a late spring with ice and high water contributed to a drop in landings down to 5,260 pounds.

In 2013, Maine instituted individual fishing quotas, and penalties were moved from civil to criminal and included a “two-strike” provision where a harvester license would be permanently revoked. Also in 2013, ME DMR developed a swipe card program that allows dealers to enter daily landings data and allows ME DMR to analyze that data within 24 hours of receipt; it also serves as a fishery management tool to implement an individual fishing quota (IFQ) for harvesters. The program was expanded in 2015 to include dealer-to-dealer transactions. Using the swipe card program, ME DMR has effectively tracked the overall quota by closely monitoring the IFQs of over 1,000 harvesters, which includes quota for the four indigenous tribes and non-tribal quota. In 2022 and 2023 over 5,500 daily landings reports did not need to be key-entered as a result of the swipe card program, which has reduced the burden on ME DMR staff. The swipe card program has also shown to be reliable with no card failures reported in the last 3 years (2020 to 2023).

In addition, the number of fishery-related infractions reported by the ME Marine Patrol dropped from over 200 in 2013 to under 20 in 2014 through 2016. Elver related violations have continued to remain low in 2016 through 2023. The addition of the dealer-to-dealer swipe card program allows the ME DMR to track the glass eels from initial purchase to export out of the state. For a dealer to export out of Maine, they are required to have a separate “export” license and ME Marine Patrol must be present to weigh the shipment. ME Marine Patrol will also weigh

the glass eels at the dealer facilities and report that verified amount along with the amount the swipe card program indicates should be at the facility. ME Marine Patrol can also remove any dead loss to reconcile the dealer's inventory.

Given the high market value, poaching of glass eels and elvers remains a serious concern in several states. Enforcement of the regulations is challenging due to the nature of the fishery (very mobile, nighttime operation, and high value for product). Cooperation between the State's enforcement agencies and the U.S. Fish and Wildlife Service remains a high priority. This cooperation resulted in several convictions for violation of the Lacey Act in 2013 through 2016. From 2016 through 2023, the number of federal investigations and violations followed the same decreasing trend as fishery-related infractions.

Aquaculture

Addendum IV to the FMP also allows approved Aquaculture Plans from states and jurisdictions to harvest up to 200 pounds of glass/elver eel annually from within their state waters for use in domestic aquaculture activities. Aquaculture Plans have been approved each year for Maine starting in 2018 for the 2019 fishing season.

2.4 Status of the Stock

The last peer reviewed and accepted benchmark stock assessment was approved for management use in 2023. The Assessment and Peer Review Reports indicate the American eel stock is depleted and has likely been experiencing overfishing in the last few decades. The stock assessment recommended a drastic reduction to the yellow eel coastwide cap to between 21% and 33% of the current cap. The stock assessment did not provide recommendations regarding glass eel harvest.

The abundance indices developed and used in the 2023 assessment are more robust and better defined than previous assessments. State-mandated young-of-year (YOY) surveys have been in operation for twenty years or more in some cases. From Maine to Florida, 25 surveys were developed into individual indices of relative abundance and then combined into a coastwide YOY index using a multivariate auto-regressive state-space (MARSS) model. A slightly declining trend in coastwide YOY abundance was observed from 1987-2020 but the 95% confidence intervals on population growth rate estimates overlapped 0 suggesting a stable population. Ten elver indices were developed from multiple surveys from Maine to Virginia that were combined into a coastwide index using the MARSS model. The coastwide index indicated no trend in elvers from 1999-2020. There were also 14 yellow eel indices developed from multiple surveys from New Hampshire to South Carolina that were combined into a coastwide index using the MARSS model. There was a declining trend in coastwide yellow eel abundance from 1974-2020.

Additional analyses provide convergent results indicating the stock has decreased over the monitored time series. The Mann-Kendall test detected significant trends in 6 of the 26 YOY indices; of these two (33%) were increasing (Maine and New York) and four (67%) decreasing. For elver, two of nine indices had significant Mann-Kendall detected trends with one increasing and one decreasing (both in Virginia). For the yellow eel indices, the Mann-Kendall test

detected significant trends in 7 of the 15 Yellow Eel indices; of these two (29%) were increasing and five (71%) decreasing. The Traffic Light method also showed similar results for both YOY and yellow eel indices, indicating green values for the 1980s, changing to orange, then to red by the end of the time series.

2.4.1 Maine Eel Lifecycle Monitoring

In 2011, the glass eel life stage was identified as a unique opportunity to assess the annual recruitment of each year's cohort, because glass eels result from the previous year's spawning activity and are all the same age. In order to assess the annual variation in recruitment of American eel, Addendum III (2011) required that each member state conduct an annual survey of YOY abundance. In 2018, Addendum V further required: *“Any state or jurisdiction with a commercial glass eel fishery must implement a fishery-independent life cycle survey covering glass/elver, yellow, and silver eels within at least one river system. If possible and appropriate, the survey should be implemented in the river system where the glass eel survey (as required under Addendum III) is being conducted to take advantage of the long-term glass eel survey data collection.”* Maine's YOY survey has been running since 2001 and the yellow and silver eel surveys since 2018. Each year ME DMR staff summarize the results of the YOY, yellow, and silver eel lifecycle surveys into a compliance report. The methods and a summary of results are described below.

Methods

Fishery-independent monitoring for young-of-year eels at West Harbor Pond in Maine has been carried out continuously since 2001. Each year eel ramps with collection traps are installed at the site in early spring, typically in March, and are checked daily throughout the run, which typically ends in late June. Glass eels and elvers are separated and enumerated before being released into the pond.

Monitoring of yellow and silver eels was initiated in 2018. The survey was initially on Cobbosseecontee Stream, but ME DMR moved the surveys to West Harbor Pond in 2019. Monitoring for yellow eels includes sampling with baited eel pots beginning in July and continuing through September of each year. Each time the pots are checked all eels are removed, measured for length and weight, tagged with a PIT tag if they are not already tagged, and released. Monitoring for silver eels includes daily checking of a fyke net set at the outlet of West Harbor Pond. The fyke net is set starting in September and continues until December. All eels are removed from the fyke net each day, scanned for a PIT tag, a subsample is measured for length and weight, and released downstream.

Results

A total of 942,327 glass eels were captured during 2022. The catch of glass eels in 2022 far exceeded any previous catches and was more than seven times the average of 127,591 since 2001. Preliminary data from 2023 indicate a total of 307,216 glass eels were captured in 2023, more than double the average, which continues a trend five of the last seven years significantly exceeding average annual catch since 2001 (Figure 1). A total of 4,356 elvers were also captured in the trap boxes during 2022, which was the second largest catch of elvers from 2001

through 2022. Preliminary data from 2023 report a total of 6,344 elvers were captured in trap boxes, which is the highest amount to date.

A total of 459 yellow eels were caught in baited pots in West Harbor Pond at least once in 2022, with many being caught multiple times (up to 4 recaptures). Of the yellow eels caught in 2022, 51 were tagged in 2018, 77 were tagged in 2019, 92 were tagged in 2020, 123 were tagged in 2021, and 116 eels were untagged when captured in 2022 and received a PIT tag before release. 1,019 yellow eels have been caught, tagged, and released into West Harbor Pond as of December 2022.

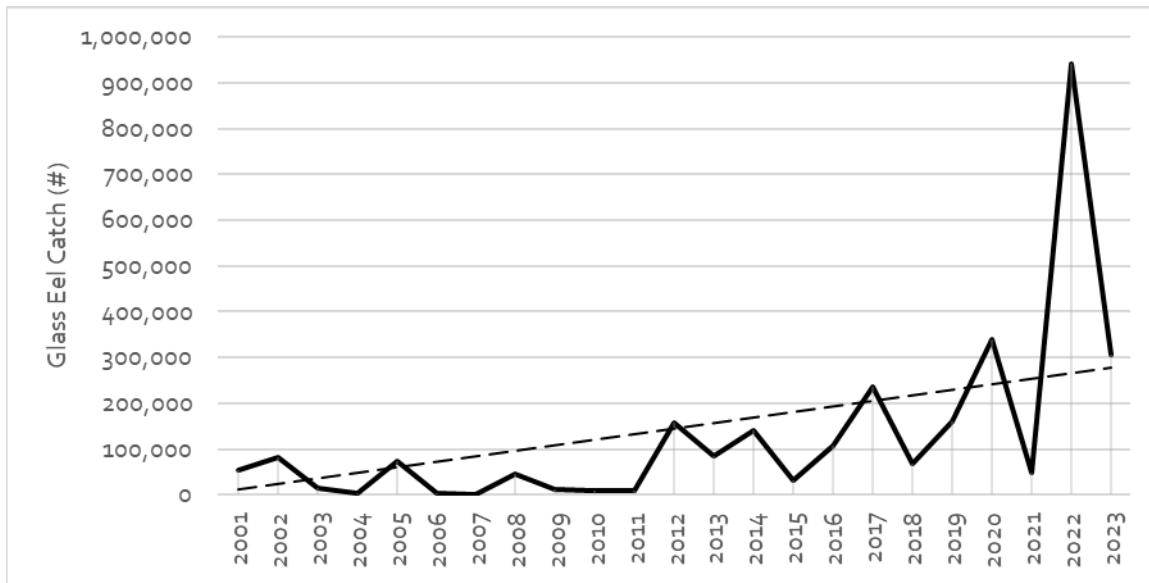


Figure 1. Glass eel capture at West Harbor Pond Maine as part of the ME DMR Eel Lifecycle study (solid line). The linear trendline, with the intercept set to zero and an R^2 value of 0.5009, shows an increase over time (dashed line).

In 2022, a total of 269 eels were caught in the fyke net set at the outlet of West Harbor Pond, all of which were silver phase. Including the 2022 season, 5,888 silver eels have been captured and released at the site since 2018 and the annual average catch is 1,178. In 2022, length ranged from 24.8 cm to 102.6 cm TL, with an average of 34.6 cm TL, and weight ranged from 25.7 g to 2600 g, with an average of 119.7g. These lengths and weights did not differ significantly from previous years.

2.4.2 Maine Glass/Elver Eel Index

In addition to the in-season reporting of landings that allows for the close management of the Glass/Elver eel fishery in Maine, ME DMR also requires each harvester to report gear type, location, and set time for each gear type. These data were analyzed to produce a catch-per-unit-effort (CPUE) index for the Glass/Elver Eel fishery, which adds additional context to the proposed management options. Data from 2016-2022 were reviewed and a subset of that data was included in this analysis. Due to the difference between fyke nets and dip nets, in terms of the method for fishing each and the impact on set times, dip nets were excluded from the

analysis to standardize the results. In addition, harvesters had the option to report set times in minutes, hours, days, and weeks. However, only those harvesters that reported in hours were included in the analysis due to irregularities in reporting in other units of time (e.g., reporting of: ‘0 days’; ‘1300 days’). With the exclusions described above, the remaining data accounted for the majority of harvesters in all years. For example, harvesters that reported both the use of fyke nets and set times in hours accounted for 75.5% of harvesters in 2022.

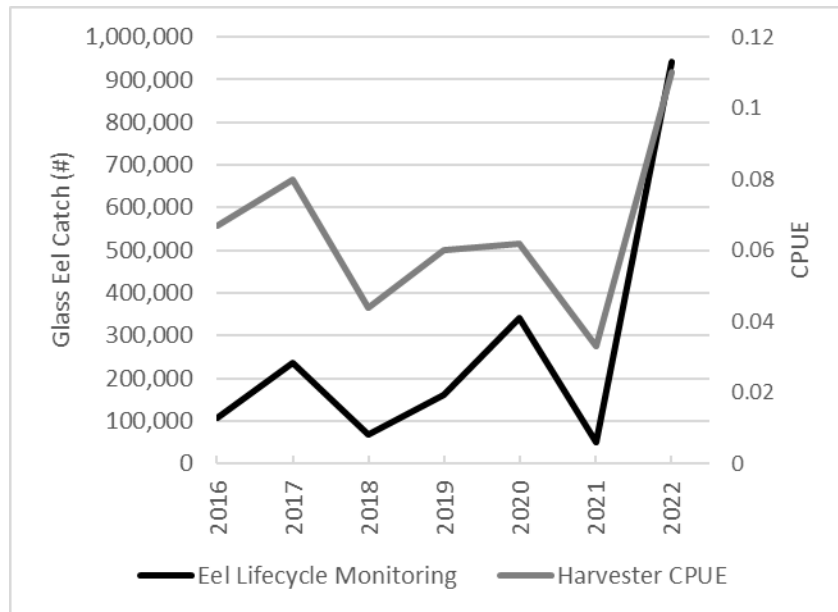


Figure 2. Glass eel capture at West Harbor Pond Maine as part of the ME DMR Eel Lifecycle Study (black line) and CPUE of Harvesters from 2016-2022 (gray line).

The CPUE for catches in fyke nets in the glass/elver fishery, expressed as pounds caught per one hour unit, ranged from 0.033 to 0.110 from 2016 to 2022 with an average of 0.065. CPUE was greatest in 2022, at nearly double the average, but otherwise CPUE decreased slightly from 2016-2021. In addition, CPUE for harvesters is closely correlated to the glass eel capture at West Harbor Pond as part of the Maine Eel Lifecycle Monitoring Program (Figure 2).

3.0 Proposed Management Options

The following options were developed from the Board motion from August 2023.

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.

3.1 Maine Glass Eel Quota

Selection of one of the following options would determine the annual quota level for the Maine commercial glass eel fishery, starting in the 2025 fishing year. If no action is taken on this draft addendum, the Maine commercial glass eel fishery would not be managed with a quota under the American Eel FMP.

Option 1. Status quo

Under this option, the annual quota for Maine's commercial glass eel fishery would remain at 9,688 pounds.

3.2 Timeframe for Maine Glass Eel Quota

Selection of one of the following options would determine the number of years the Maine quota would remain in place once it is implemented, and whether or not an addendum would be required to maintain the same quota for subsequent years.

Option 1: No sunset

Under this option, the commercial quota selected for Maine's glass eel fishery in Section 3.1 will remain in place until modified through an addendum or amendment to the FMP.

Option 2: Three years

Under this option, the quota selected for Maine's glass eel fishery in Section 3.1 may remain in place for up to three years (2025-2027). Prior to the 2028 fishing year, the Board must initiate an action to establish Maine's glass eel commercial quota for 2028 and beyond. If a change to the quota is desired before 2028, the Board must initiate an addendum or amendment to modify the FMP.

Option 3: Three years, with the ability to extend via Board action

Under this option, the quota selected for Maine's glass eel fishery in Section 3.1 may remain in place for three years (2025-2027). If no change to Maine's quota is desired, the Board may extend the selected quota for up to three years at a time via Board action, until this provision is modified by an addendum or amendment to the FMP. If a change to the quota is desired for 2028 or earlier, the Board must initiate an addendum or amendment to establish Maine's glass eel commercial quota.

4.0 Compliance

If the existing American Eel FMP is revised by approval of this Draft Addendum, the Board will designate implementation deadlines for the addendum provisions.

5.0 References

Atlantic States Marine Fisheries Commission (ASMFC). 2000. [Interstate Fishery Management Plan for American Eel \(*Anquilla rostrata*\)](#). Washington D.C.

ASMFC. 2014. [Addendum IV to the Interstate Management Plan for American Eel](#). Arlington, VA.

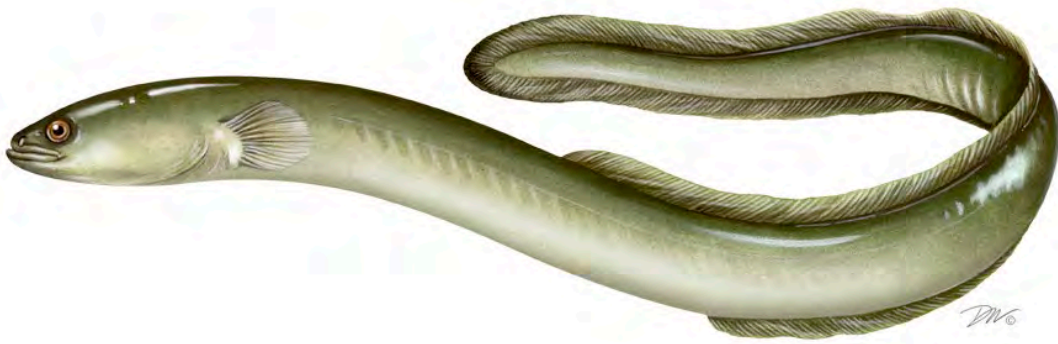
ASMFC. 2018. [Addendum V to the Interstate Management Plan for American Eel](#). Arlington, VA.

ASMFC. 2023. [American Eel Benchmark Stock Assessment and Peer Review Reports](#). Arlington, VA.

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM VII TO THE AMERICAN EEL INTERSTATE
FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT**

Commercial Yellow Eel Management and Monitoring Requirements



February 2024



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In August 2023, the American Eel Management Board initiated the development of an addendum to the Interstate Fishery Management Plan (FMP) to consider changes to the coastwide yellow eel harvest cap. The results of the recent benchmark stock assessment indicate the stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, and toxins, contaminants, and disease. The benchmark assessment proposed a new tool for setting the coastwide cap based on abundance indices and catch. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of American eel, the addendum process and timeline, and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding this document at any time during the public comment period. The final date comments will be accepted is **March 24, 2024 at 11:59 p.m.** Comments may be submitted at state public hearings or by mail or email. If you have any questions or would like to submit comments, please use the contact information below.

Mail: Caitlin Starks, Senior FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Yellow Eel Harvest Cap Draft Addendum)
Phone: (703) 842-0740

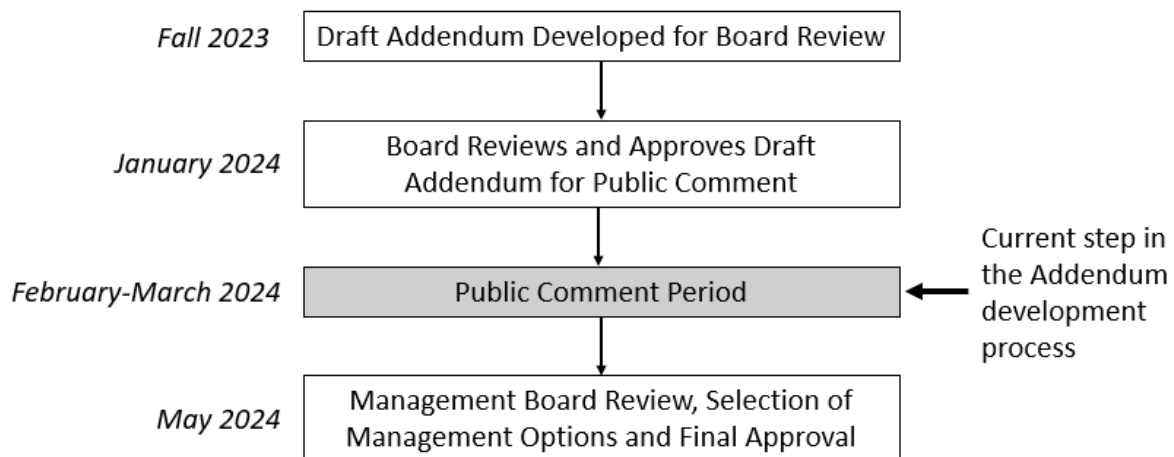


Table of Contents

1.0 Introduction	2
2.0 Overview	2
2.1 Statement of Problem.....	2
2.2 Background	3
2.3 Status of the Stock	4
2.4 Description of the Yellow Eel Fishery	4
2.4.1 Coastwide Description	4
2.4.2 State-by-state Descriptions.....	7
2.4.3 Catch per Unit Effort	9
3.0 Proposed Management Program	13
3.1 Yellow Eel Coastwide Cap and Management Response to Exceeding the Coastwide Cap	13
Issue 1: Coastwide Cap	13
Issue 2: Management Response to Exceeding the Coastwide Cap	17
3.2 Timeframe for Yellow Eel Provisions	19
3.3 Annual Young-of-Year Abundance Survey.....	20
3.4 Catch and Effort Monitoring Program	20
3.5 <i>De Minimis</i> Status	21
4.0 Compliance	22
Appendix	23

1.0 Introduction

The Atlantic States Marine Fisheries Commission (Commission) has coordinated interstate management of American eel (*Anguilla rostrata*) from 0-3 miles offshore since 2000. American eel is currently managed under the Interstate Fishery Management Plan (FMP) and Addenda I-V to the FMP. Management authority in the exclusive economic zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries. The management unit is defined as the portion of the American eel population occurring in the territorial seas and inland waters along the Atlantic coast from Maine to Florida.

The Commission's American Eel Management Board (Board) approved the following motions on August 1, 2023:

Move to draft an addendum to consider using I_{TARGET} to recommend various catch caps, but not use I_{TARGET} to set biological reference points or stock status.

This Draft Addendum proposes options for coastwide commercial landings caps for yellow eel, and alternative management responses if the coastwide cap is exceeded. The objective of Addendum VII is to recommend a coastwide cap using the I_{TARGET} tool from the stock assessment based on abundance indices and catch to reduce coastwide landings of yellow eel. The Draft Addendum also considers options to modify the biological sampling requirements of the annual young-of-the-year (YOY) survey, the harvester catch per unit effort (CPUE) reporting requirements, and the *de minimis* policy.

2.0 Overview

2.1 Statement of Problem

The Commission established the FMP for American Eel in November 1999, which has since been modified through five addenda. The FMP goal and objectives highlight the conservation, protection, and enhancement of American eel abundance in its current range as priorities for management. In response to the 2012 American Eel Benchmark Stock Assessment recommendation to reduce mortality on all life stages, the Board adopted Addendum IV. Addendum IV (2014) established a coastwide harvest cap of 907,671 pounds of yellow eel, reduced Maine's glass eel quota to 9,688 pounds, and allowed for the continuation of New York's silver eel weir fishery in the Delaware River. Addendum V was approved in 2018, which increased the yellow eel coastwide cap to 916,473 pounds starting in 2019 to reflect a correction in the historical harvest data. It also adjusted the process for reducing total landings to the coastwide cap when the cap has been exceeded.

The coastwide cap was intended to control fishing mortality on the coastwide population of eel at the yellow eel life stage. Because the assessment could not establish biological reference points for American eel, historical harvest was used as the basis for setting the coastwide cap. The cap was set at a level equivalent to the average annual harvest between 1998 and 2010. The selected cap was greater than the Technical Committee's recommendation at the time, which was to establish a cap equivalent to a 12% reduction from the 1998-2010 average landings.

Despite these management changes, the 2023 benchmark stock assessment found that the yellow eel population remains depleted, and was at lower levels than the previous assessment. The assessment and peer review recommend reducing fishing mortality on the yellow eel life stage, while also recognizing that stock status is affected by other factors including historical overfishing, habitat loss due to damming mainstems and tributaries of rivers, mortality from passing through hydroelectric turbines, pollution, possibly parasites and disease, climate change, and other unexplained factors at sea. Similar to previous assessments, a statistical model could not be developed for the species to determine stock status or give management advice. However, the assessment explored several index-based methods and recommended a new tool called I_{TARGET} for management use to provide advice on coastwide catch. I_{TARGET} is an index-based method that needs only catch and abundance data to provide management advice on coastwide landings.

2.2 Background

Since its implementation in 2000, the Commission's FMP for American Eel has aimed to conserve and protect the American eel resource to ensure its continued role in its ecosystems while providing the opportunity for commercial, recreational, scientific, and educational uses. The FMP requires all states and jurisdictions to implement an annual young-of-year (YOY) abundance survey to monitor annual recruitment of each year's cohort. In addition, the FMP requires a minimum recreational size and possession limit and a state license for recreational harvesters to sell eels. The FMP requires that states and jurisdictions maintain existing or more conservative American eel commercial fishery regulations for all life stages, including minimum size limits. Each state is responsible for implementing management measures within its jurisdiction to ensure the sustainability of its American eel population.

Because of the unique life history of American eel, separate management measures have been developed to address fisheries targeting each life state (i.e., glass eel, yellow eel, and silver eel). Management measures for yellow eel, which is the primary life stage harvested by commercial and recreational fishermen, have been modified through Addendum I (2006), Addendum III (2013), Addendum IV (2013), and Addendum V (2018). Addendum I established a mandatory catch and effort monitoring program for American eel, requiring trip-level landing and effort data by state. Addendum III made changes to the commercial yellow eel fishery, specifically increasing the yellow eel size limit from 6 to 9 inches, and requiring a $\frac{1}{2}$ -by- $\frac{1}{2}$ minimum mesh size in commercial yellow eel pots. Responding to the 2012 Benchmark American Eel Stock Assessment, which found the American eel population in U.S. waters to be depleted, Addendum IV set goals of reducing overall mortality and maximizing the conservation benefit for American eel stocks (ASMFC 2014). The Addendum established a coastwide commercial harvest cap for yellow eel of 907,671 pounds to limit fishing mortality. The coastwide cap was implemented starting in the 2015 fishing year and established two management triggers: (1) if the coastwide cap is exceeded by more than 10% in a given year, or (2) the coastwide cap is exceeded for two consecutive years regardless of the percent overage. If either trigger were met, states would implement state-specific allocations based on average landings from 1998-2010 with allocation percentages derived from 2011-2013.

Following the implementation of Addendum IV states expressed some concerns about the management program, including 1) the lack of information available to determine what changes in landings would be necessary to affect fishing mortality rates and spawning stock status, 2) the administrative burden on the states associated with moving to state-specific quotas, and 3) the difficulty of achieving an equitable allocation of this resource given the variation in availability and market demand for eels along the Atlantic coast. To address concerns about state allocations the Board approved Addendum V, which established a new commercial coastwide landings cap for the yellow eel fishery based on corrected landings data, developed new management triggers, and modified the allocation process that would occur if the coastwide cap were exceeded by more than 10% of the coastwide cap for two consecutive years (ASMFC 2018).

2.3 Status of the Stock

The 2023 Benchmark Stock Assessment and Peer Review indicates the American eel stock remains depleted at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, toxins and contaminants, and disease (ASMFC 2023), consistent with the results of the 2012 and 2017 stock assessments. Despite the large number of surveys and studies available for use, the American eel stock is still considered data-poor. Additionally, eels have an extremely complex life history that is difficult to describe using traditional stock assessment models. The 2023 assessment explored additional approaches for assessing American eel that were suggested in past stock assessments including a delay-difference model, traffic light analysis and surplus production models, and developing an egg-per-recruit model, but overfished and overfishing determinations still could not be made due to data limitations. However, the 2023 stock assessment found that the yellow eel population has declined since the previous assessment (2017), and recommended reducing yellow eel harvest. Unlike previous assessments, the 2023 assessment and peer review identified an index-based tool to provide management advice without requiring an assessment model, which is being considered for management use through this draft addendum.

The Commission's assessments only consider the portion of the stock residing in US coastal waters, but there have been efforts to characterize the stock in other regions. In 2003, declarations from the International Eel Symposium (AFS 2003, Quebec City, Quebec, Canada) and the Great Lakes Fisheries Commission (GLFC) highlighted concerns regarding the health of eel stocks worldwide. In 2010, Fisheries and Oceans Canada (DFO) conducted a stock assessment on American eels in Canadian waters and found that region-specific status indices showed abundance is very low in comparison to levels in the 1980s for the Lake Ontario and upper St. Lawrence River stock, and is either unchanged or increasing in the Atlantic Provinces.

2.4 Description of the Yellow Eel Fishery

2.4.1 Coastwide Description

Yellow eel fisheries exist in all Atlantic Coast states and jurisdictions with the exception of Pennsylvania and the District of Columbia. American eels are harvested for food, bait, and export markets. Yellow eel landings have varied considerably over the years due to a

combination of market trends and availability. These fluctuations are evident both within states and jurisdictions, as well as at a regional level. American eel landings ranged from over 3 million pounds in the 1970s to early 1980s to around 1 million pounds or less since the late 1990s (Figure 1). Since 2014, when the coastwide cap for yellow eel was adopted under Addendum IV, total coastwide landings have generally experienced a steady decline to a time series low of 263,892 pounds in 2020. Landings in 2021 and 2022 increased slightly, but still remain near all-time low levels.

Fishery participants have noted that recent declines in landings have primarily been related to market demand; demand for wild-caught American eel from the US for European food markets has decreased in recent years due to increased aquaculture in Europe. Additionally, demand for domestic bait in 2020 was negatively impacted by COVID-19 restrictions. A smaller proportion of US yellow eel landings typically goes to the domestic bait market, and landings are not expected to increase significantly from current levels in the near future.

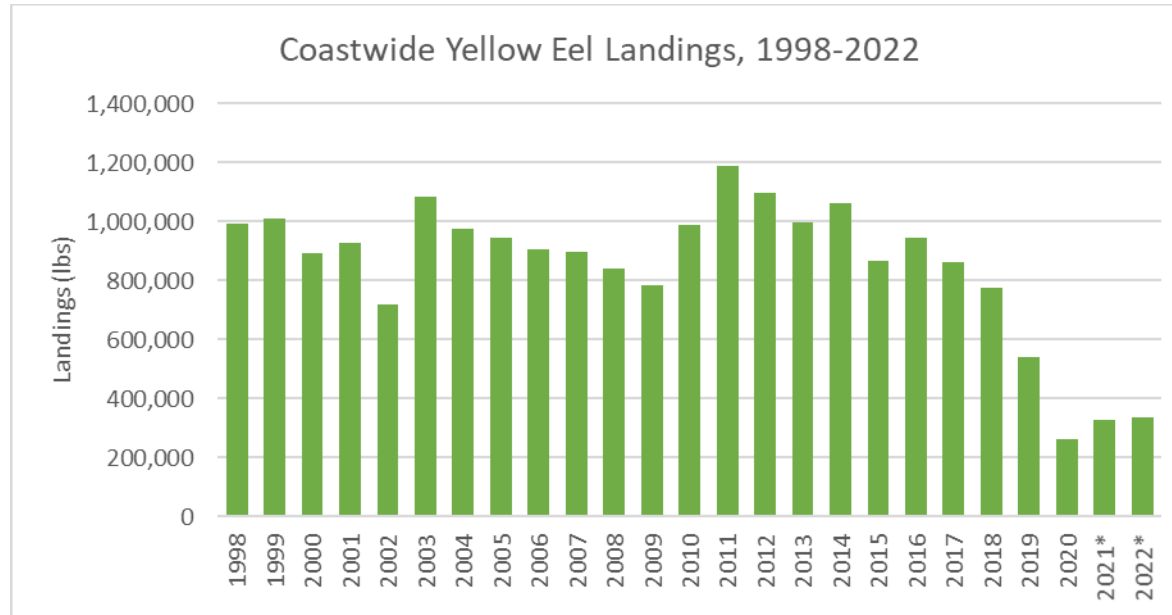


Figure 1. Yellow Eel Coastwide Landings 1998-2022. *2021 and 2022 data are considered preliminary.

Table 1. State-by-state Yellow Eel Landings: 2014-2023. Source: Atlantic Coastal Cooperative Statistics Program, 2023, and state compliance reports. *2021 and 2022 data are considered preliminary.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
2014	7,578	Time series average < 400 pounds	3,903	2,353	1,390	38,143	91,225	62,388	619,935	49,293	109,537	60,755	Time series average < 400 pounds	Time series average < 400 pounds	14,092	1,060,725
2015	4,142		2,213	1,538	2,271	50,194	88,828	44,708	493,043	31,588	86,715	57,791			5,632	868,663
2016	6,811		1,705	2,651	2,445	36,371	67,422	44,558	583,578	58,223	96,336	39,911			6,034	946,045
2017	6,358		592	2,968	905	41,732	77,499	29,945	541,270	33,555	97,328	24,752			7,456	864,360
2018	2,832		375	3,988	3,268	39,218	69,679	31,378	514,226	31,151	57,281	18,058			4,659	776,112
2019	2,567		1,577	4,056	5,275	33,039	76,241	13,628	331,878	27,111	34,247	8,140			1,542	539,301
2020	7,012		84	1,425	2,783	16,411	23,742	1,942	159,816	24,971	21,916	3,291			499	263,892
2021*	457		C	1,863	3,255	16,097	26,273	4,433	204,701	10,439	46,345	5,705			9,050	328,618
2022*	877		0	605	3,755	16,570	52,585	2,967	187,810	12,814	36,525	4,202			6,073	317,456

2.4.2 State-by-state Descriptions

All states are subject to the FMP requirements for a yellow eel minimum size limit of 9 inches and a ½-by-½ inch minimum mesh size in commercial yellow eel pots. The yellow eel fishery in Maine occurs in both inland and tidal waters. Yellow eel fisheries in southern Maine are primarily coastal pot fisheries managed under a license requirement, minimum size limit, and gear and mesh size restrictions. Yellow eels are taken by a very small number of harvesters (four to five annually) for use as bait. Reported landings have been under 10,000 pounds annually since 2013, and were below 1,000 pounds in 2022.

The New Hampshire fishery has diminished significantly since the early 2000s. Commercial harvest of yellow eel in Massachusetts occurs only in coastal waters; commercial permitting for inland harvest was eliminated in 2013. Massachusetts allows eel harvest by nets, pots, spears, or angling. The commercial fishery is now mainly conducted using baited pots with over 200 permits issued and reported harvest under 2,000 pounds since 2015. Reporting of activity under commercial permits is mandatory, however, underreporting of eels harvested for commercial striped bass fishing bait is expected.

Small-scale, commercial eel fisheries occur in Rhode Island and are mainly conducted in coastal rivers and embayments with pots during May through November. Connecticut has a similar small-scale, seasonal pot fishery for yellow eel in the tidal portions of the Connecticut and Housatonic rivers. All New England states presently require commercial fishing licenses to harvest eels and maintain trip-level reporting.

Licensed eel fishing in New York occurs primarily in the Hudson River, the upper Delaware River (Blake 1982), and in the coastal marine district. A slot limit (greater than 9 inches and less than 14 inches to limit PCB exposure) exists for eels fished in the tidal Hudson River, strictly for use as bait or for sale as bait only. Due to PCB contamination of the main stem, commercial fisheries have been closed on the freshwater portions of the Hudson River and its tributaries since 1976. The fishery in the New York portion of the Delaware River consists primarily of silver eels collected in a weir fishery. New Jersey fishery regulations require a commercial license when using more than two pots or selling catch. Mandatory trip level reporting is required for every month of the year a license is possessed, even if no fishing occurs. Eel pot diameter may not exceed 16 inches if cylindrical or 201 square inches in cross section if any other configuration.

The Delaware eel commercial fishery exclusively uses baited pots equipped with ½-by-½ inch mesh. Delaware mandated catch reporting in 1999 and more detailed effort reporting in 2007. The fishery occurs primarily in the tidal tributaries of Delaware Bay although a small proportion of annual harvest may occur in the Atlantic coastal or “Inland Bays” in some years. American eels are sold for both food and bait, dependent upon market demand. Historically, total annual landings in Delaware were consistently greater than 100,000 pounds and ranked in the top three in value for the State among all Delaware commercial fisheries. A suite of variables (bait supply, market demand, aging out of the most knowledgeable eel fishers) has contributed to recent low annual landings for Delaware.

Maryland, Virginia, and Potomac River Fisheries Commission primarily have pot fisheries for American eels in the Chesapeake Bay. Maryland required eel fisherman to be licensed in 1981 and effort reporting began in 1990. Over 99% of all eel harvest in Maryland occurs with the use of eel pots, and all harvest occurs in tidal waters. Average annual landings and effort have declined 50% and 60%, respectively, from 2018 levels. However, catch per unit effort (CPUE, pounds per pot) in recent years is at the highest levels since effort reporting began in 1990.

Large eels are generally exported whereas small eels are used for bait in the crab trotline fishery, except in Virginia. Almost all of the eel harvest in Virginia is done using eel pots as the main gear. Virginia formerly had a voluntary buyer reporting system that was replaced by a mandatory harvester reporting system for all species in 1993. Most of Virginia's American eel are sold locally for bait with no harvest being exported for sale in recent years. Eel harvesters can sell their eels directly to consumers or to businesses with a VMRC issued eel self-market permit. Some eel harvesters also buy and sell eels from other harvesters and are required to have a seafood buyer permit and an eel buyer permit; monthly reporting of the weights of any purchased eels is required. The Potomac River Fisheries Commission has had harvester reporting since 1964, and has collected eel pot effort since 1988.

North Carolina has a coastal pot fishery with fluctuating effort depending on market demands. While a standard commercial fishing license is required for participation in the commercial eel pot fishery, a permit is not, but a notification letter must be provided as part of the mandatory reporting system. Most commercial yellow eel landings in North Carolina occur in October and November, but there is also a small fishery in the spring. Most landings come from the Albemarle Sound area, with additional landings reported from the Pamlico Sound and southern waterbodies under the jurisdiction of North Carolina Division of Marine Fisheries. No catch records are maintained for freshwater inland waters, and the sale of eels harvested from these waters is prohibited. Trip-level commercial landings are required to document all transfers of fish sold from coastal waters from the fishermen to the dealer. Data reported on these forms include transaction date, area fished, gear used, species landed, and fishermen and dealer information. In 2007, to comply with Addendum I, an eel pot logbook program was implemented at the individual commercial fisherman level to collect additional information not reported on trip tickets including pot soak time, the number of pots fished, and landings (pounds) per pot. Annual yellow eel landings in North Carolina historically were greater than 100,000 pounds; however, market demand and attrition of the most knowledgeable eel fishers has contributed to recent low annual landings.

South Carolina instituted a permitting system in 1998 to document total eel gear and commercial landings. Traps or pots used to capture yellow or silver eels must be permitted by water area fished. Restrictions include specific water designations, possession and size limits. Permit conditions outline fishing closure from September 1 through December 31 and immediate bycatch release. Mandatory reporting of effort and catch is required by the 10th of each month. Since 1999, a total of 583.80 pounds of eels were reported.

American eel fishing in Georgia was restricted to coastal waters prior to 1980 but has since expanded to approved inland waters, including portions of the following rivers: Savannah River, Ogeechee River, Altamaha River, Oconee River, Ocmulgee River, Satilla River, and St. Marys River. Landings data are available for Georgia, and as of April 1, 2018, effort data are available due to commercial eel fishermen being required to possess an eel endorsement stamp in addition to a commercial fishing license. Florida's commercial eel pot fishery is operated under a permit system; the recreational fishery has a 25 fish/angler/day bag limit.

2.4.3 Catch per Unit Effort

CPUE can be used as an index to estimate relative abundance for a population. These indices are often used in stock assessments to inform decisions for how to manage a fishery using options such as quotas, catch limitations, or gear restrictions. For American eel, fishery-dependent CPUE data are available for some states prior to the Addendum I requirement for mandatory catch and effort reporting, but CPUE data were not considered indicative of trends in the stock as a whole in the 2023 stock assessment (ASMFC 2023). Fishery-dependent CPUE is almost exclusively composed of positive trips only; trip reports with zero eels caught are rare because most agencies do not require reports of zero catches. While the CPUE indices provided by individual states do not tend to agree and are not useful for assessing trends in the coastwide stock, they may be useful for understanding fishery trends within each state.

The Connecticut commercial CPUE index was calculated for yellow eels from the pot fishery (Figure 2). The index has fluctuated up and down with no clear trend.

The New York commercial CPUE is an arithmetic mean of pounds per pot per hour fished, based on data from VTR monthly harvester reports (Figure 3). With only five years of data, there is no clear trend in the index.

The New Jersey index generally declined until 2015 then exhibited an upward trend (Figure 4), though it is possible it overestimates CPUE since there were very few trips reported with zero catch.

Delaware considers its American eel catch and effort records since 1999 fairly accurate, and the CPUE in the Delaware fishery has remained fairly stable since 2003 (Figure 5).

Maryland has calculated a commercial CPUE index for the pot fishery since 1992 (Figure 6). The CPUE index was relatively flat from 1992–2002 and then generally increased until hitting the time series high CPUE in the terminal year.

Virginia's commercial eel pot fishery CPUE has shown a general decline since the beginning of the time series (Figure 7). Only data associated with positive effort are included in the calculations as commercial harvesters only report positive catches to the VMRC.

North Carolina logbook data (which began in 2007) was used for calculating a fishery-dependent index of abundance, which has been fairly stable over time (Figure 8).

South Carolina Department of Natural Resources has calculated CPUE for the commercial fishery using monthly dealer reports but the data are confidential.

Commercial catch and effort data collection for American eel in Florida began in 2006, and the CPUE index is available for 2007-2019 but shows no clear trend (Figure 9).

The state CPUE data have not been used in the stock assessment as originally intended when the reporting requirement was established under Addendum I. In the 2012 and 2023 benchmark stock assessments, these data were considered but the assessment team decided against their inclusion because they were not considered indicative of trends in the stock as a whole, and differences in baiting practices and bait preference vary geographically which can confound the accuracy and analysis of fishery-dependent CPUE data. The 2023 stock assessment peer review panel also noted that given the variety of fishing gears and fishing areas, the analysis of fishing effort would not be straightforward. The 2023 stock assessment and peer review reports indicate that there is no plan to use the fishery-dependent CPUE data moving forward. As such, this Draft Addendum includes options to make it voluntary for states to collect these CPUE data for American eel.

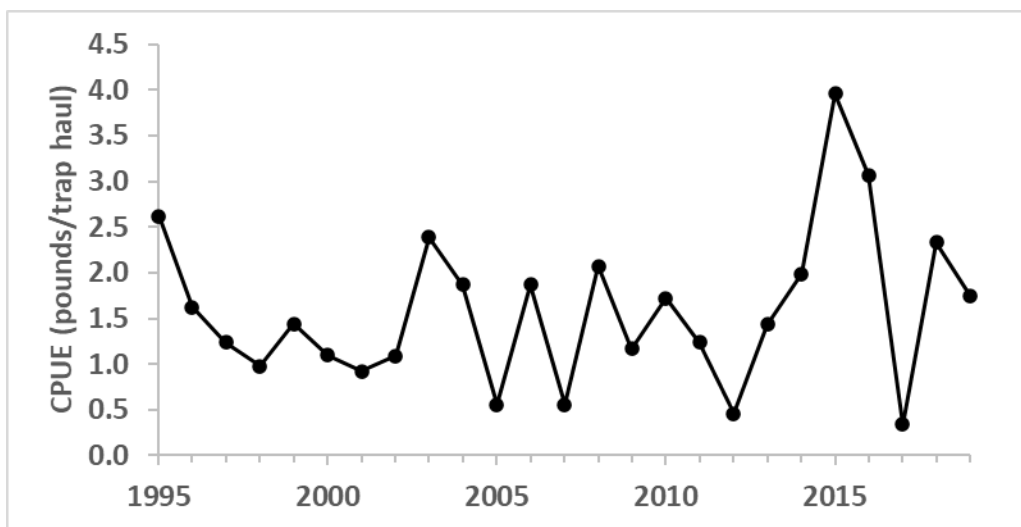


Figure 2. Fishery-dependent catch-per-unit-effort for Connecticut's yellow eel pot fishery. Estimated errors associated with the index were not provided.

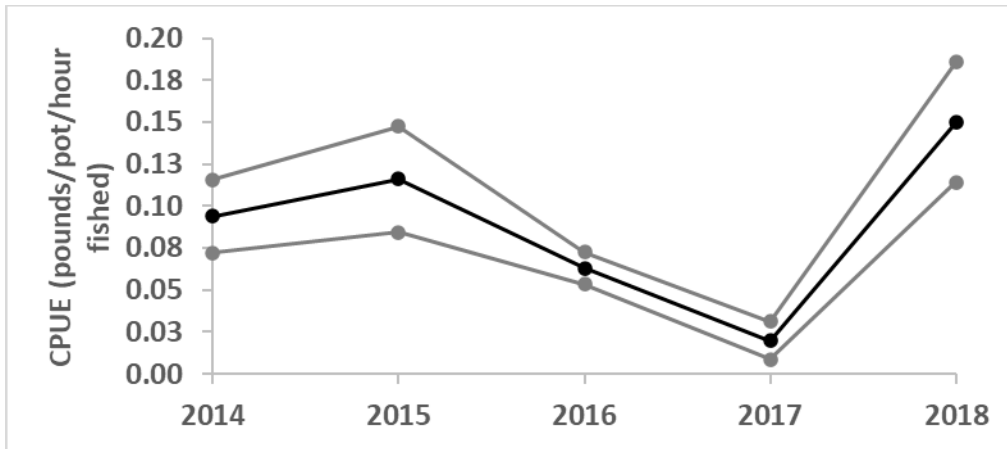


Figure 3. Fishery-dependent catch-per-unit-effort for New York's yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

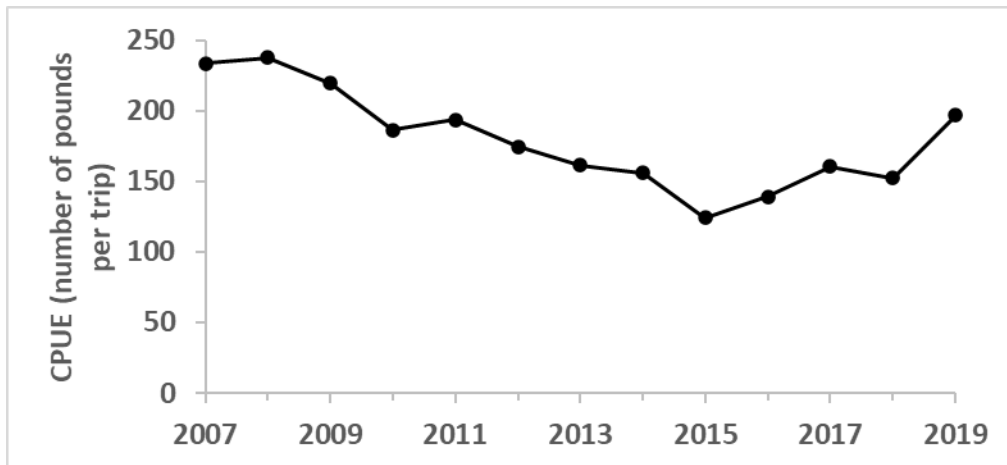


Figure 4. Fishery-dependent catch-per-unit-effort for New Jersey's yellow eel fyke net fishery. Estimated errors associated with the index were not provided.

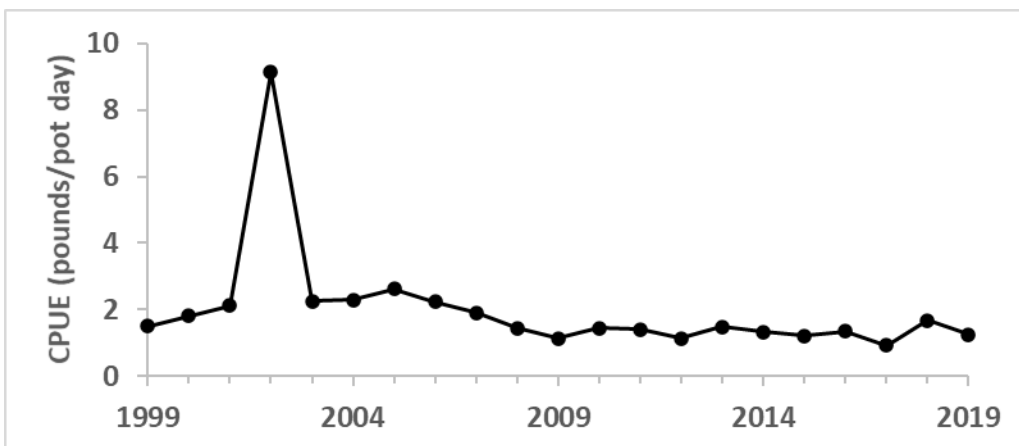


Figure 5. Fishery-dependent catch-per-unit-effort for Delaware's yellow eel pot fishery. Estimated errors associated with the index were not provided.

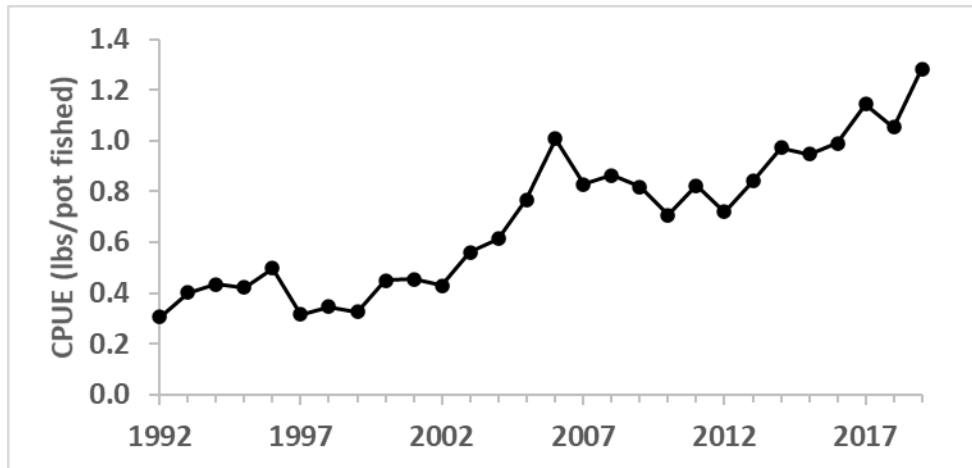


Figure 6. Fishery-dependent catch-per-unit-effort for Maryland's yellow eel pot fishery. Estimated errors associated with the index were not provided.

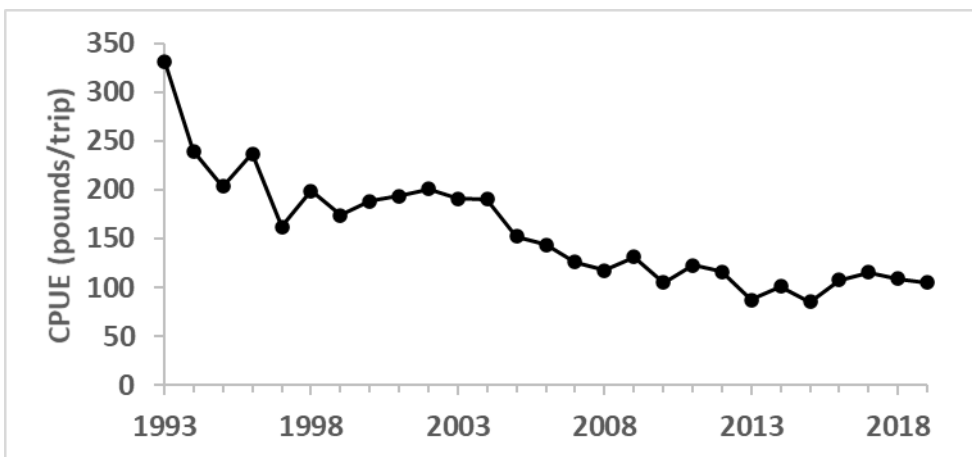


Figure 7. Fishery-dependent catch-per-unit-effort for Virginia's yellow eel pot fishery. Estimated errors associated with the index were not provided.

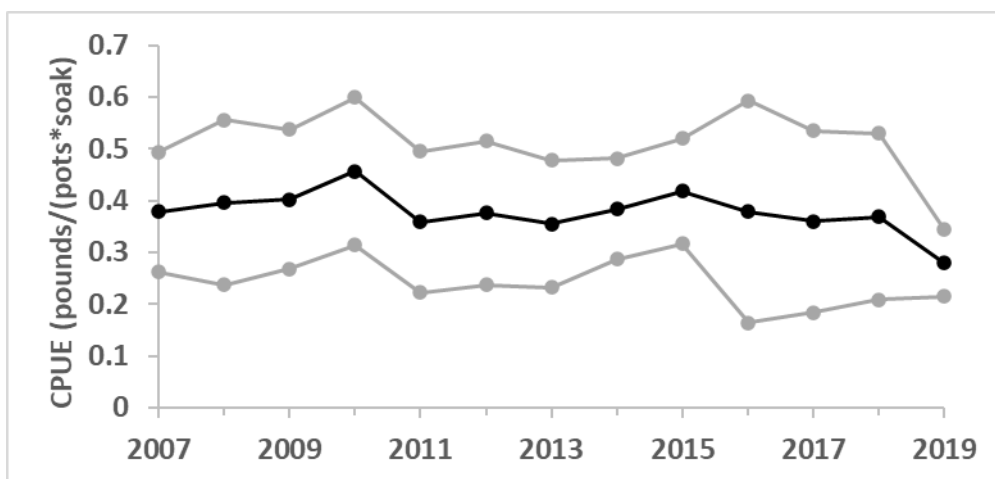


Figure 8. Fishery-dependent catch-per-unit-effort for North Carolina's yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

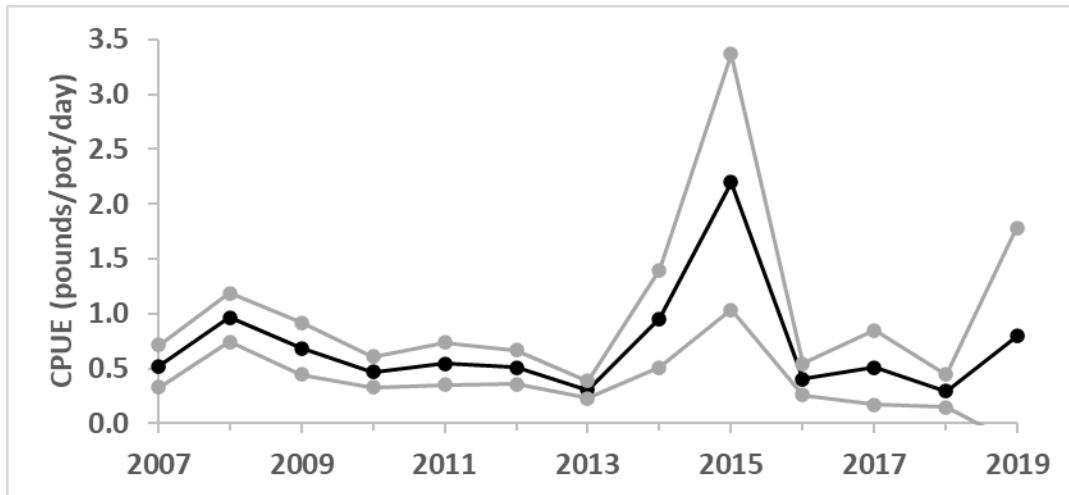


Figure 9. Fishery-dependent catch-per-unit-effort for Florida’s yellow eel pot fishery. The black line indicates the CPUE and the grey lines indicate 95% confidence intervals.

3.0 Proposed Management Program

The following options were developed in response to the Board motion from August 2023¹. The options are organized by issue item.

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. This means when selecting final management measures, the Board may select a coastwide cap that falls within the range of options, i.e., between 202,453 and 916,473 pounds.

3.1 Yellow Eel Coastwide Cap and Management Response to Exceeding the Coastwide Cap

Issue 1: Coastwide Cap

Addendum V established a coastwide cap of 916,473 pounds, which is the coastwide average landings during the years of 1998 through 2010 (based on revised landings information through 2016 as of January 2018). This timeframe was also the period covered by the 2012 benchmark stock assessment.

Alternative options for coastwide caps were developed using I_{TARGET} , an index-based method that provides management advice based on abundance indices and catch information, as well as management goals specified by the Board.

When using I_{TARGET} to recommend a catch cap, there are three parameters that must be specified: the reference period, multiplier, and threshold. The reference period should be a time period where the population is stable or at a desirable abundance level. The multiplier

¹ Move to draft an addendum to consider using I_{TARGET} to recommend various catch caps, but not use I_{TARGET} to set biological reference points or stock status.

represents the target level of abundance that management is aiming to achieve, and can range from 1 to 1.5. A multiplier of 1 indicates that the target abundance level is equal to the abundance over the reference period, and a multiplier equal to 1.5 indicates that the target is 1.5 times the average index value over the reference period. The threshold value reflects goals of the fishery. If landings exceed the threshold, then future landings are reduced. A threshold of 0.5 is less conservative, whereas a threshold of 0.8 is more conservative. Adjusting these three parameters affects the resulting coastwide catch cap recommendation.

The stock assessment included analyses that identified regimes in the American eel abundance index data. Regimes are time periods where the abundance index data are more similar compared to other time periods. There were three regimes detected in the yellow eel index: a high yellow eel abundance regime in 1974-1987, a low regime in 1988-1999, and an even lower regime in 2000-2020. The first two regimes are included as reference period options in this addendum. A stable period of relative high abundance (1974-1987) was recommended in the stock assessment as an appropriate reference period. The Management Board requested a reference period when more surveys were available (1988-1999) also be evaluated. This reference period reflects lower relative abundance levels, but relative abundance during this period was higher than in recent years (2000-2020).

Figure 10 shows the relative abundance index and catch time series, with the two reference periods considered in this document identified by the shaded areas.

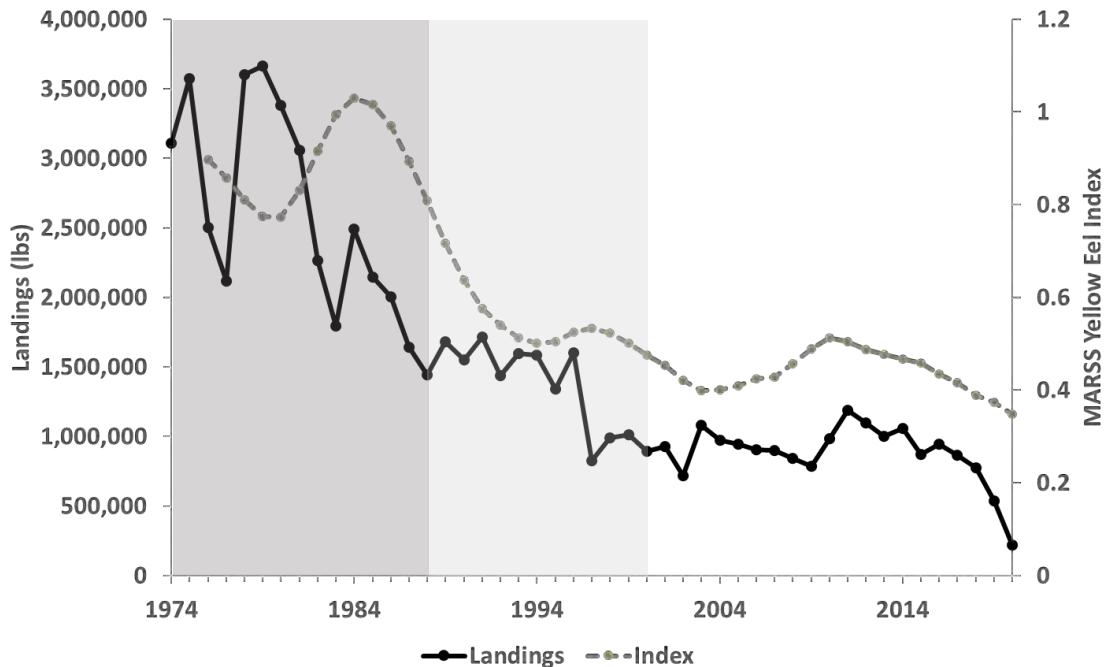


Figure 10. Yellow eel landings and abundance index, 1974-2020. The high abundance regime (1974-1987) is represented by the dark gray shaded area. The lower abundance regime (1988-1999) is represented by the light gray shaded area.

The assessment recommended using I_{TARGET} with a reference period of 1974-1987, which represents a stable period of relative high abundance of yellow eel. The stock assessment used a multiplier of 1.25 rather than 1.5, because it recognizes that more factors beyond fishing have influenced the stock and may have changed the maximum population size for American eel that can be supported by the environment, therefore higher abundance levels (e.g., 1.5 times the abundance during the higher abundance regime) might not be achievable under current conditions. The Stock Assessment Subcommittee (SAS) recommended that if the Board elects to use the I_{TARGET} tool to establish the yellow eel coastwide cap, it should use the recommended reference period (1974-1987) and multiplier (1.25) and adjust the tool by choosing the threshold value.

Option 1: Status Quo

Under this option, the coastwide cap for yellow eel of 916,473 pounds would be maintained. Based on the 2023 stock assessment advice, this option is not recommended by the Plan Development Team.

Option 2: Coastwide Cap set at 202,453 pounds using I_{TARGET} configuration recommended in the 2023 benchmark stock assessment

The coastwide cap for yellow eel would be set at 202,453 pounds, using the following configuration of I_{TARGET} , which was recommended in the 2023 Benchmark Assessment and Peer Review Report with catch and abundance index data through 2020:

Reference Period: 1974-1987
Multiplier: 1.25
Threshold: 0.8

This option aims to achieve a relative abundance level that is 1.25 times the average index value from 1974-1987, meaning a 25% larger population than the average population during that time period.

The assessment used a threshold value of 0.8 because it reflects a more conservative approach, and was recommended in the recent research track assessment conducted by the Northeast Fisheries Science Center (NEFSC) that examined methods for providing catch advice in data-limited fisheries.

Option 3: Coastwide Cap set at 518,281 pounds using I_{TARGET}

Under this option, the catch cap is set at 518,281 pounds, which is based on the following configuration of I_{TARGET} with catch and abundance index data through 2020:

Reference Period: 1974-1987
Multiplier: 1.25
Threshold: 0.5

This option uses a reference period of 1974-1987 and multiplier of 1.25, as recommended in the stock assessment. It aims to achieve a relative abundance level that is 1.25 times the average index value from 1974-1987, which is the same target abundance in Option 2. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance than the previous option. This would likely increase the amount of time needed to achieve the target index compared to Option 2.

Option 4: Coastwide Cap set at 509,780 pounds using I_{TARGET}

Under this option, the catch cap is set at 509,780 pounds, which is based on the following configuration of I_{TARGET} with catch and abundance index data through 2020:

Reference Period: 1988-1999

Multiplier: 1.5

Threshold: 0.5

This option uses a reference period of 1988-1999, which represents a period of lower abundance, and a multiplier of 1.5. Thus, this option aims to achieve a relative abundance level that is 1.5 times the average index value from 1988-1999, meaning a 50% larger population than the average population during that time period. The abundance target in this option is slightly lower than the abundance target in Options 2 and 3. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance.

Option 5: Coastwide Cap set at 716,497 pounds using I_{TARGET}

Under this option, the catch cap is set at 716,497 pounds, which is based on the following configuration of I_{TARGET} with catch and abundance index data through 2020:

Reference Period: 1988-1999

Multiplier: 1.25

Threshold: 0.5

This option uses a reference period of 1988-1999, which represents a period of lower abundance, and a multiplier of 1.25. Thus, this option aims to achieve a relative abundance level that is 1.25 times the average index value from 1988-1999, meaning a 25% larger population than the average population during that time period. The abundance target for this option is 39% lower than the target recommended in the stock assessment. The threshold value of 0.5 reflects a less conservative approach to managing the fishery to achieve the target abundance.

The PDT does not recommend consideration of this option. The catch cap recommended when using this configuration is more than three times the catch cap that was recommended in the stock assessment (Option 2).

Figure 11 illustrates the difference in the catch caps produced by each of the above configurations of I_{TARGET} , where each colored line consists of annual data points representing the catch cap that would have been produced with each year as the terminal year of data. This demonstrates that coastwide caps recommended using I_{TARGET} change based on the time series of catch and abundance data that are used in the model. The assessment used 2020 as the terminal year; therefore, the catch caps considered in this draft addendum are based on landings and index data through 2020. If the Board selects any of the options that base the coastwide cap on I_{TARGET} , additional years of catch and abundance index data could be used to update the recommended catch level in the future based on changes in yellow eel catch and abundance (see Section 3.2).

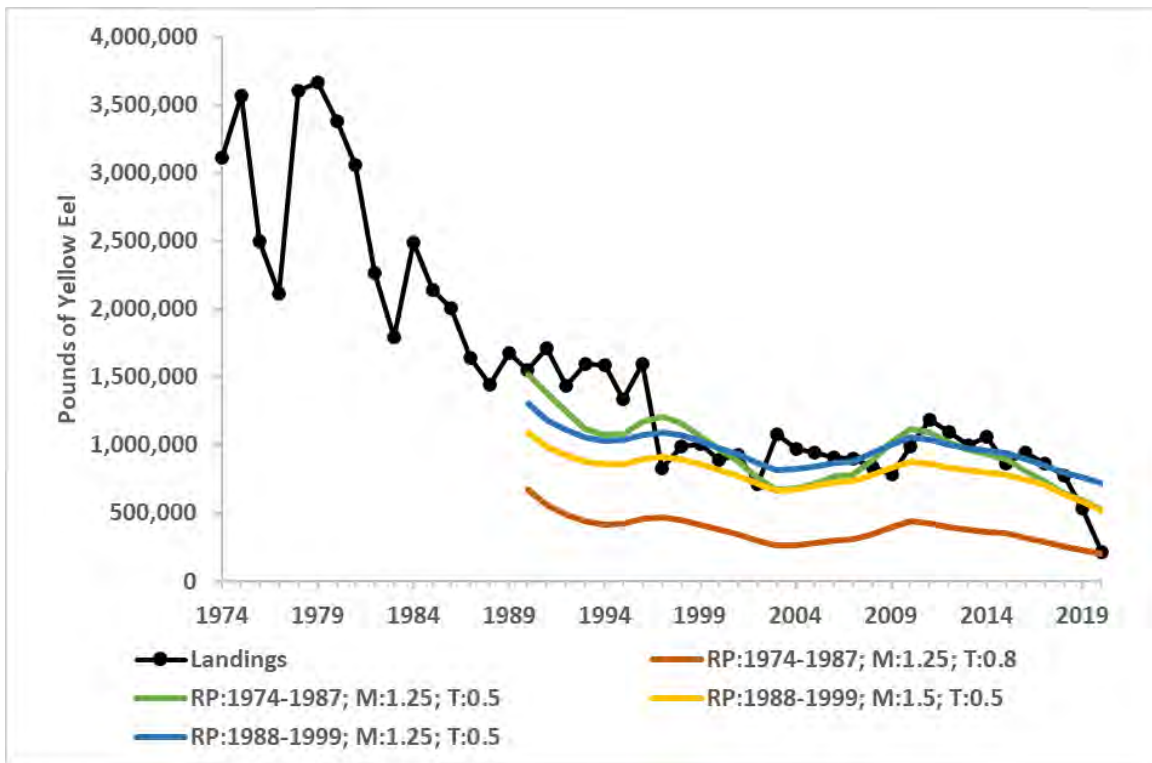


Figure 11. Comparison of catch advice produced by each of the proposed configurations of I_{TARGET} relative to annual coastwide catch. RP=reference period; M=multiplier; T=threshold value. The orange line represents Option 2, the green line represents Option 3, the yellow line represents Option 4, and the blue line represents Option 5. Each year represents the terminal year of data used in the model.

Issue 2: Management Response to Exceeding the Coastwide Cap

Addendum V established that the coastwide landings are annually evaluated against a two-year management trigger. If the coastwide cap is exceeded by 10% (10% of the coastwide cap = 91,647 pounds; coastwide cap + 10% = 1,008,120 pounds) for two consecutive years, then only states with landings greater than 1% of the coastwide landings, in the year(s) when the management trigger is tripped, will be responsible for reducing their landings to achieve the coastwide cap in the subsequent year. States with landings greater than 1% of the coastwide landings will work collectively to achieve an equitable reduction to the coastwide cap. For

states with landings less than 1% of the coastwide landings, if in subsequent years a state’s landings exceeds 1% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the subsequent year to return to the less than 1% level. More details on the process the Management Board will undertake to respond to overages of the coastwide cap are outlined in the Appendix.

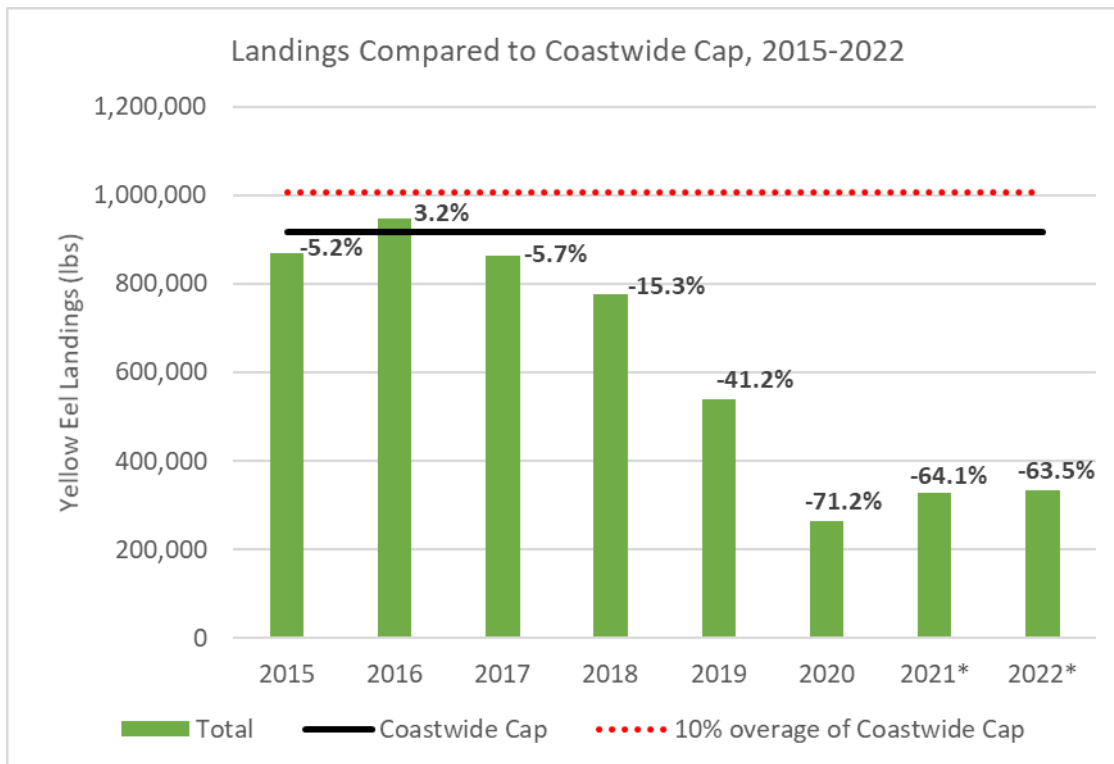


Figure 12. Coastwide yellow eel landings from 2015-2022 compared to the Addendum V coastwide cap and a 10% overage of the cap (the Management Trigger). Percentages above each bar indicate percent above or below the coastwide cap.

Option 1: Status Quo

The management trigger, landings evaluation process, and management response established in Addendum V would remain in place (see Appendix).

Option 2: States with 5% or greater of coastwide landings

This option would modify the management response that would take place if the coastwide cap is exceeded by 10% under the addendum V guidelines. Under this option, only states with landings greater than 5% of the coastwide landings in the year(s) when the management trigger is tripped will be responsible for reducing their landings to achieve the Coastwide Cap in the subsequent year. Those states with landings greater than 5% of the coastwide landings will work collectively to achieve an equitable reduction to the Coastwide Cap. For those states with landings less than 5% of the coastwide landings, if in subsequent years a state’s landings exceeds 5% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the subsequent year to return to the <5% level.

For reference, Table 2 shows the percent of the coastwide landings contributed by each state in recent years.

Table 2. Percent of total coastwide yellow eel landings contributed by each state. Shaded cells represent > 5% of the annual coastwide landings.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL
2014	0.7%	Time series average < 0.1%	0.4%	0.2%	0.1%	3.6%	8.6%	5.9%	58.4%	4.6%	10.3%	5.7%	Time series average < 0.1%	Time series average < 0.1%	1.3%
2015	0.5%		0.3%	0.2%	0.3%	5.8%	10.2%	5.1%	56.8%	3.6%	10.0%	6.7%			0.6%
2016	0.7%		0.2%	0.3%	0.3%	3.8%	7.1%	4.7%	61.7%	6.2%	10.2%	4.2%			0.6%
2017	0.7%		0.1%	0.3%	0.1%	4.8%	9.0%	3.5%	62.6%	3.9%	11.3%	2.9%			0.9%
2018	0.4%		0.0%	0.5%	0.4%	5.1%	9.0%	4.0%	66.3%	4.0%	7.4%	2.3%			0.6%
2019	0.5%		0.3%	0.8%	1.0%	6.1%	14.1%	2.5%	61.5%	5.0%	6.4%	1.5%			0.3%
2020	2.7%		0.0%	0.5%	1.1%	6.2%	9.0%	0.7%	60.6%	9.5%	8.3%	1.2%			0.2%
2021*	0.1%		C	0.6%	1.0%	4.9%	8.0%	1.3%	62.3%	3.2%	14.1%	1.7%			2.8%
2022*	0.3%		C	0.2%	1.1%	8.1%	15.7%	0.9%	56.4%	3.8%	10.6%	1.1%			1.8%

3.2 Timeframe for Yellow Eel Provisions

The following options would determine how long the selected coastwide cap would remain in place before any changes are considered.

Option 1: No sunset date, cap can be updated after three years

Under this option there would be no sunset date for this Addendum. The selected coastwide landings cap for yellow eel would remain in place for three years (2025-2027). After three years, the Board may choose whether to update the coastwide cap with additional years of catch and abundance data, or maintain the same coastwide cap. If the Board chooses to update the cap using the selected I_{TARGET} configuration established in this addendum, this could be done via Board action and a new addendum would not be required. The additional years of data available at that time would be included in the I_{TARGET} model to provide an updated coastwide cap.

The PDT recommends three years as the minimum amount of time that the cap should remain static before being updated. This is because less than three years of additional data from the yellow eel abundance index and the coastwide landings would not be sufficient to evaluate the performance of the cap and provide an updated catch limit.

If a new or different management program is desired than what is specified in the prior sections (e.g., a different configuration of I_{TARGET}), a new addendum would be required.

Option 2: No sunset date, cap can be updated after five years

Under this option there would be no sunset date for this Addendum. The selected coastwide landings cap for yellow eel would remain in place for five years (2025-2029). After five years, the Board may choose whether to update the coastwide cap with additional years of data, or

maintain the same coastwide cap. If the Board chooses to update the cap using the selected I_{TARGET} configuration established in this addendum, this could be done via Board action and a new addendum would not be required. The additional years of data available at that time would be included in the I_{TARGET} model to provide an updated coastwide cap.

A time period of five years is provided as an alternative to three years. Five years of additional data from the yellow eel abundance index and the coastwide landings would be more robust for providing an updated catch limit.

If a new or different management program is desired than what is specified in the prior sections (e.g., a different configuration of I_{TARGET}), a new addendum would be required.

3.3 Annual Young-of-Year Abundance Survey

The following options consider modifying the biological sampling requirements of the annual YOY abundance survey established in the FMP.

Option 1: Status Quo

Under this option all requirements for the annual YOY abundance survey established in Section 3.1.1 of the FMP would remain in place. This means states must continue to collect individual lengths and pigment stage of the entire survey catch, or a statistical subsample where the catch of young-of-year is too large.

Option 2: Voluntary biological sampling in the YOY survey

Under this option the requirements of the annual YOY abundance survey established in Section 3.1.1 of the FMP would be modified such that the states would no longer be required to collect individual lengths and pigment stage of the YOY catch. All other survey requirements would remain in place. States may continue to collect biological data voluntarily.

This option is proposed in response to a recommendation from the SAS and Technical Committee (TC). The SAS and TC recommend that the biological sampling requirement for YOY surveys be made optional, given the lack of trends in pigment, length, and weight within and among sampling sites (ASMFC 2023).

3.4 Catch and Effort Monitoring Program

Addendum I established fishery-dependent monitoring requirements for commercial eel fisheries. Specifically, since 2007 states have been required to implement mandatory reporting of eel catch and effort by either harvesters or dealers as a condition of their permit. The following options consider changing the Addendum I fishery-dependent monitoring requirements.

Option 1: Status Quo

Under this option there would be no change to the current fishery-dependent reporting requirements. Harvesters or dealers would still be required to report trip-level data including soak time, number of units of gear fished, and pounds landed by life stage.

Option 2: Voluntary collection of fishery-dependent catch-per-unit-effort (CPUE) for yellow eel harvest

Under this option states would no longer be required to mandate that harvesters or dealers report trip-level CPUE data (i.e., soak time, number of units of gear fished, and pounds landed per unit) for yellow eel harvest. If a state wishes to maintain this reporting requirement it may do so voluntarily. All states would continue to be required to collect estimates of directed harvest by month, life stage, and gear type, to be provided in the annual compliance report. This option would not modify any fishery-dependent reporting requirements for the glass eel life stage.

3.5 De Minimis Status

The Commission defines *de minimis* as "a situation in which, under existing condition of the stock and scope of the fishery, conservation, and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coast-wide conservation program required by a Fishery Management Plan or amendment." Under the American Eel FMP, *de minimis* status exempts a state from having to adopt the commercial and recreational fishery regulations for a particular life stage, and any fishery-dependent monitoring elements for that life-stage listed in Section 3.4.1. of the FMP. States may apply for *de minimis* status for each life stage if (given the availability of data), for the preceding two years, their average commercial landings (by weight) of that life stage constitute less than one percent of coast wide commercial landings for that life stage for the same two-year period.

The Commission updated its *De minimis* Policy in November 2022. The Policy outlines *de minimis* standards for FMPs. A species management board may deviate from these standards to address unique characteristics of a fishery. If a board deviates from the Policy's standards, a rationale must be provided within the FMP. This Policy does not automatically change the provisions of current FMPs. In order to change *de minimis* standards, an addendum or amendment process must be completed, unless the FMP specifies a different process. Therefore, this Draft Addendum considers options to modify the American Eel *de minimis* criteria to align with the updated Commission Policy.

Option 1: Status Quo

If this option is selected, the *de minimis* threshold for American eel will continue to be based on the average landings from the previous two years of landings. A state can be considered *de minimis* if the average landings for the last two years are less than 1% of the coastwide landings for the same two years.

Option 2: Modify de minimis policy for eel to apply the Commission policy

If this option is selected, the *de minimis* threshold for American eel will be based on the average landings from the previous three years of landings. The averaging of multiple years of data prevents a state from taking action as a result of a rare event. A state can be considered *de minimis* if the average landings for the last three years are less than 1% of the coastwide landings for the last three years.

4.0 Compliance

If the existing American Eel FMP is revised by approval of this draft addendum, the American Eel Management Board will establish dates by which states will be required to implement the addendum provisions.

5.0 References

Atlantic States Marine Fisheries Commission (ASMFC). 2000. [Interstate Fishery Management Plan for American Eel \(*Anquilla rostrata*\)](#). Washington D.C. NOAA Oceanic and Atmospheric Administration Award No. NA97 FGO 0034 and NA07 FGO 024.

ASMFC. 2012. [American Eel Benchmark Stock Assessment](#). Arlington, VA.

ASMFC. 2014. [Addendum IV to the Interstate Management Plan for American Eel](#). Arlington, VA.

ASMFC. 2017. [American Eel Stock Assessment Update](#). Arlington, VA.

ASMFC. 2018. [Addendum V to the Interstate Management Plan for American Eel](#). Arlington, VA.

ASMFC. 2023. [American Eel Benchmark Stock Assessment and Peer Review Reports](#). Arlington, VA.

Blake, L. M. 1982. Commercial fishing for eel in New York State. In K. H. Loftus (ed). Proceedings of the 1980 North American eel conference. Ont. Fish. Tech. Rep. Ser. No. 4. 97pp

Appendix

Policy to Address Coastwide Cap Overages for the Yellow Eel Commercial Fishery

This appendix describes the Board response that was established under Addendum V for in the event that the coastwide cap of 916,473 pounds of American eel is exceeded in a given year. Sections 3.3.2 and 3.3.3 of this Addendum state the following regarding the management trigger and the response:

3.3.2 Yellow Eel Coastwide Cap Management Trigger

Starting in 2019, the coastwide landings are annually evaluated against a two-year management trigger. If the coastwide cap is exceeded by 10% (10% of the coastwide cap = 91,647 pounds; coastwide cap + 10% = 1,008,120 pounds) for two consecutive years, the Board is required to alter the management program as specified below to ensure the objectives of the management program are achieved.

3.3.3 Allocation

The yellow eel fishery is managed without state-specific quotas through adaptive management. If the management trigger is tripped. Only states with landings greater than 1% of the coastwide landings, in the year(s) when the management trigger is tripped, will be responsible for reducing their landings to achieve the coastwide cap in the subsequent year. States with landings greater than 1% of the coastwide landings will work collectively to achieve an equitable reduction to the coastwide cap. For states with landings less than 1% of the coastwide landings, if in subsequent years a state's landings exceeds 1% of the coastwide landings after reductions have been applied, that state must reduce their individual state landings in the following year to return to the less than 1% level².

A management objective under this Addendum is to manage landings to the coastwide cap (cap). Annual landings are not finalized until the spring of the following fishing year. Therefore, if an overage occurs, a year lag time will likely occur before full action is taken to reduce harvest to the cap. For example, a cap overage in 2019 would not be determined until 2020, and action would likely be delayed until 2021 since some states do not have authority to act within the same fishing year when the overage is determined.

One way to proactively manage the yellow eel fishery is to closely monitor landings and encourage states to take voluntary action when it is clear an overage has occurred in the previous year. By engaging with states before the management trigger is tripped, but after landings have exceeded the cap, a lengthy addendum process can be avoided and more immediate action can be taken to ensure the fishery is managed to the cap. This proactive approach encourages vigilance and voluntary action in the first year of an overage, and provides opportunity for collaborative, rapid action to prevent an overage in the second

² To clarify, reduction measures apply when the management trigger is tripped. States are not held to a landings level until coastwide landings have exceeded the coastwide cap.

consecutive year, thereby preventing the triggering of mandatory management action through an addendum.

Thus, to improve the expediency in reacting to an overage, it is recommended that preliminary commercial yellow eel landings from the ACCSP Data Warehouse be made available for the Board's consideration prior to the ASMFC Spring Meeting, annually. Based on the preliminary data review, if it's determined the cap has likely been exceeded in one year the Board will convene a work group (WG) consisting (at a minimum) of one representative from each state/jurisdiction that harvested more than 1% of the coastwide landings in the year of the overage. The charge of the WG is to consider the overage relative to the decision trees (Figure 1) and determine if and how the Board should recommend voluntary action by those states that harvested more than 1% of the coastwide landings (1% states).

Response Strategy When Cap is exceeded in One Year

Once convened by the Board, the WG will review the magnitude and the pattern of the overage relative to the decision trees (Figures 1-3) to determine the need for voluntary action. "Pattern" refers to whether landings of American eel increased in all states or in some states while harvest decreased in others. "Magnitude" refers to the extent of the overage and, for individual states, the amount of harvest increase relative to the previous year. It will be important for the WG to examine potential reasons for increasing harvest, such as increased effort, increased availability of eels, improved market conditions, etc. Once the Board recommends states decrease landings it will be up to the states to take action.

States may utilize (but are not restricted to) the following voluntary methods to reduce eel harvest as considered by the Board in Draft Addendum II (2007):

- Seasonal restrictions,
- Gear limits, and
- Size limits.

Note: Harvest reductions were not approved by the Board and were not included in Addendum II (2008).

Seasonal restrictions are the simplest method of reducing harvest, but there was strong opposition to the seasonal restrictions from the Advisory Panel when proposed in Draft Addendum II. However, those seasonal closures were designed to increase escapement of silver eels and occurred in the fall during times of maximal fishing effort, so it is conceivable that a seasonal closure could be designed that would reduce harvest without imposing a severe hardship on the fishery. The Board considered a maximum size limit as a method to allow more escapement of silver eels and increase eggs-per-recruit (EPR). A range of size limits were presented in the Draft Addendum ranging from a 19" maximum size limit, which was estimated to increase EPR by 138%, but at a reduction of 40% to the harvest, to a 23" maximum size, which only increased EPR by 3.8% and reduced harvest by less than 10%. A larger minimum size also will reduce harvest if harvest reduction is the sole goal. Size limits could either be enforced by gear modifications or by grading the eels on the water. Gear modifications can impose a

large financial burden on harvesters, depending on the number of pots fished and length limit. If a minimum length is used, eel pots can be modified by installing an escape panel of a mesh size that would only retain eels above the minimum length. If a maximum eel length is used, the funnel(s) on the eel pots can be modified by restricting the circumference. A grader can also be used to comply with length limits at a lower cost to the harvesters than gear modification. Grader bars can be set to pass all eels below a minimum length or to hold all eels above a maximum length. Although the Advisory Panel favored grading for complying with a maximum length limit during the Draft Addendum II deliberations, the Law Enforcement Committee thought on-water enforcement of the length limit by grading would be difficult.

Response Strategy if the Two-Year Management Trigger is Tripped

If a review of landings at the Commission's Spring Meeting indicates the two-year management trigger has been met, the Board will initiate an addendum to reduce landings to or below the cap. A Plan Development Team (PDT) will be convened to draft the addendum (Table 1). The PDT will consider a variety of actions to reduce harvest back to the cap, including but not limited to: (1) an equal percent reduction taken only from the 1% states whose harvest increased in the overage year(s); (2) an equal percent reduction taken from all 1% states regardless of whether their harvest increased or decreased; (3) each 1% state takes a base reduction that is less than the total reduction needed, and the remainder of the reduction is taken only by those 1% states who had substantially increased harvest leading up to the overage year. The PDT should consider the impacts of calculating a reduction in harvest from a single overage year, the 2 years over which the trigger was reached or from a baseline within the last 5 years using a maximum of 3 years that ensures equitable reductions.

Once action is taken to reduce harvest to the cap (either voluntary after the first year of an overage or required after the management trigger is tripped), actions will remain in place until the coastwide harvest returns to a level that is at or below the cap. At this point, states may propose adjustments to the Board recognizing the process will begin again if another year's overage occurs or a management action is enacted.

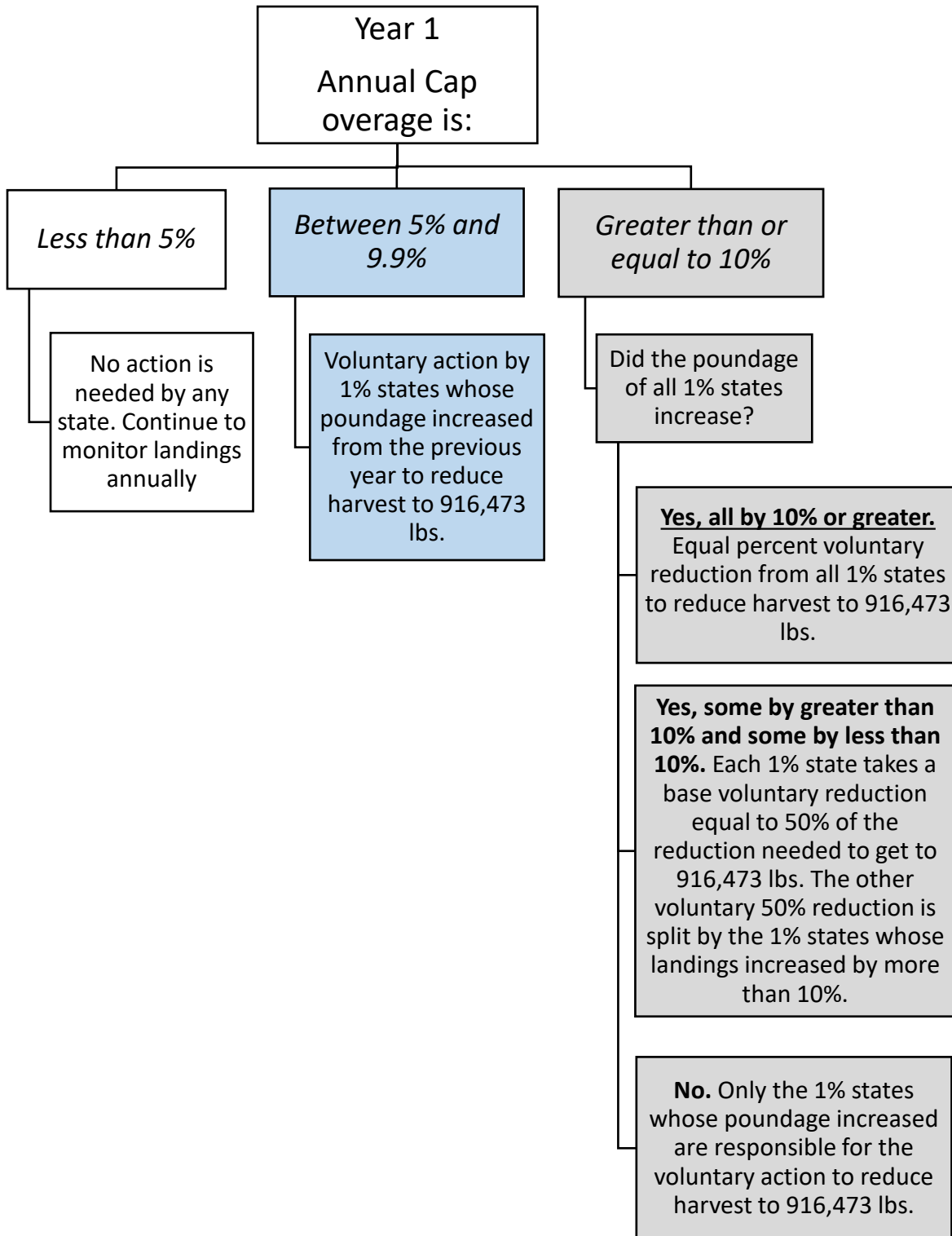


Figure A1. Decision tree for management response to cap overage in Year 1.

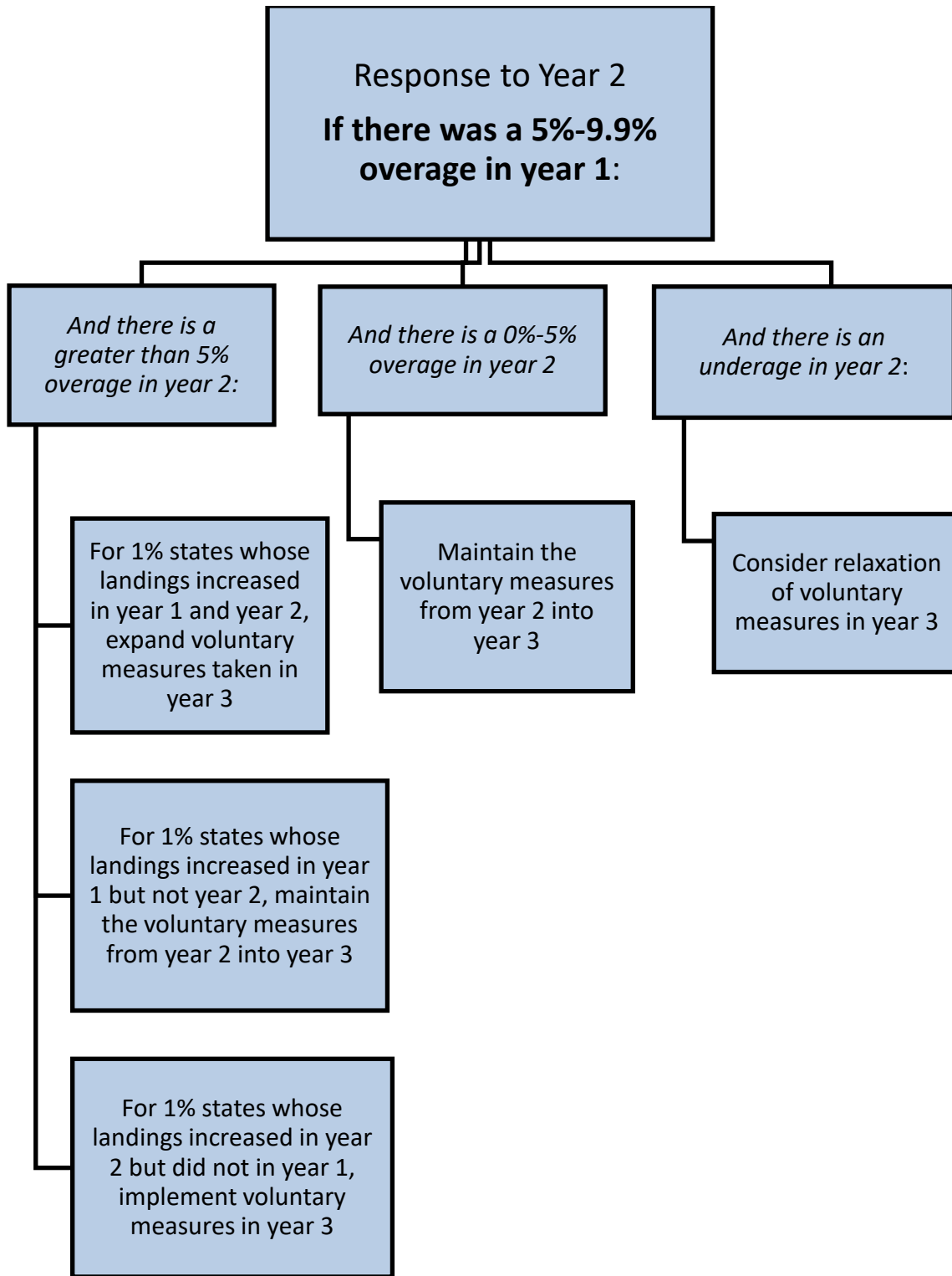


Figure A2. Decision tree for management response in Year 3 if overage is less than 10% in Year 1.

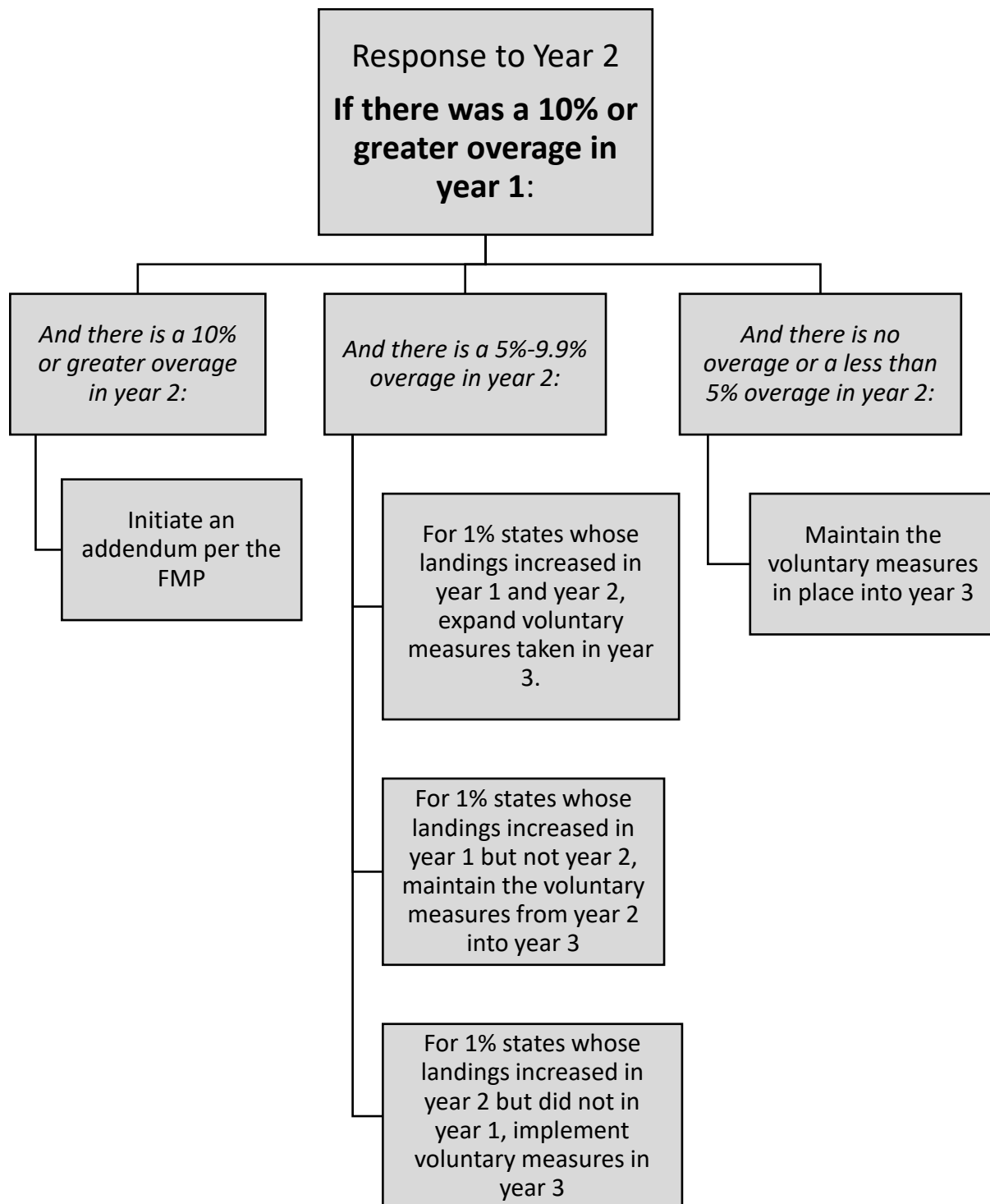


Figure A3. Decision tree for management response in Year 3 if overage is more than 10% in Year 1.



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • www.asafc.org

MEMORANDUM

TO: American Eel Management Board
FROM: American Eel Advisory Panel
DATE: April 16, 2024
SUBJECT: Advisory Panel Report

The Advisory Panel (AP) met virtually April 2, 2024 to review Draft Addenda VI and VII, as well as a summary of public input received during the comment period, and to elect a new AP Chair. Five AP members were in attendance on the call (see below). Staff continues to recommend states revisit their current AP membership in order to improve attendance and participation.

Participating AP Members: Mari-Beth DeLucia (TNC, Chair), Mitch Feigenbaum (PA), Richard Stoughton (SC), Timothy LaRochelle (ME), Sara Rademaker (ME)

Additional Attendees: Megan Ware (ME), Corrin Flora, Barry Kratchman, Jesse Hornstein (NYDEC), Kristen Anstead (ASMFC)

Caitlin Starks provided an overview of the two Draft Addenda currently under development. Draft Addendum VI addresses Maine's glass eel quota, and Draft Addendum VII considers changes to the yellow eel coastwide catch limit and monitoring requirements. The advisors' input on the proposed options in the Addenda and the public comments is summarized below.

Draft Addendum VI

On the Maine glass eel quota, Tim LaRochelle and Sara Rademaker, both advisors representing Maine, support the status quo option. Tim noted that in the last few years they have seen phenomenal amounts of glass eels in Maine, and have had large catches that had to be released to prevent exceeding the quota.

Tim and Sara also supported Option 1 for the quota timeframe, so that Board action is not required to keep the same quota in place. Mitch Feigenbaum and Richard Staunton agreed with the Maine advisors. They think Maine is doing a good job managing the fishery and they see no reason to disagree with the public comments in support of status quo.

Draft Addendum VII

Regarding the coastwide harvest cap for yellow eel (Section 3.1), three of the five AP members on the meeting favored status quo. This was the overwhelming position of adult eel harvesters that attended the state meetings in New Jersey, Maryland, Delaware.

Although Mitch was in favor of status quo, he acknowledged that of the other cap options, Option 5 would cause little short-term disruption to the fishery while, at the same time, expressing that Option 2 is so draconian that it would likely put the yellow eel industry out of business and could lead to the end of the commercial fishery altogether. If currently-depressed market conditions were to improve, Option 5 would allow for some growth in the fishery only up to a point that would still be restricted to the low end of historical volumes.

Mitch did not express a preference for either of the option under Issue 2 (management response to exceeding the quota) but he did comment that the current process if the cap is exceeded seems very complicated it seems that quota management for yellow eel might be simpler.

Mari-Beth DeLucia supported Option 3 for the coastwide cap (518,281 pounds) because there is enough data to support taking a more precautionary approach with the species. This is especially true because we only have information on a portion of the range, and there are more drastic declines in other parts of the range.

AP member Sara Rademaker expressed no position about the coastwide cap options.

Regarding Section 3.2 (timeframe for yellow eel cap) Mitch and Sara spoke in support of Option 1, meaning the cap could be updated after 3 years. As there is better data and modeling, the cap should be able to be updated sooner. The other AP members did not comment on this issue.

On Section 3.3 (young-of-year [YOY] biosampling), all of the AP members present were in favor of Option 2, to make the collection of individual lengths and pigment stages during YOY surveys optional. They did clarify that the surveys should always distinguish the age class they are sampling (i.e., glass eel or elvers, year 0 or year 1).

On Section 3.4 (Catch-per-unit-effort [CPUE] reporting), Mitch, Sara, and Richard supported Option 1, status quo. They said it is important to keep the CPUE requirement since this is a data poor species and the public comments support it. Mitch added that the Technical Committee has said previously that without effort the fishery catch information cannot be used as an index.

Mari-Beth was in favor of Option 2 to make the CPUE reporting requirement optional; she noted that with limited resources, the states may be able to improve data collection in other areas without the burden of this requirement.

Regarding Section 3.5 (*de minimis* status) the AP members said they do not have a strong preference and can support Option 2 if that is the recommendation from the Commission.

Mitch provided some additional thoughts related to Draft Addendum VII, including concerns about the accuracy of the fishery independent indices that are used for I_{TARGET} and that the

surveys are only capturing areas where the fishery occurs, not the vast majority of the US range. He noted that the stock assessment faces challenges with eel being a data poor species with a very unique life cycle. The last four assessments have been searching for a model that will get us closer to biological reference points, but he does not think *I_{TARGET}* is necessarily better than previous models.

AP Chair

The AP held an election for the AP Chair position. Mitch Feigenbaum was nominated, and was elected with the support of all the AP members present. Mitch noted that he will serve as the AP Chair for an appropriate term, based on the feedback and preferences of the Eel Board Chair and other Pennsylvania delegates. Thereafter, he expects to step down from the AP, after almost twenty years of proud participation at ASMFC on the Panel and as a (proxy) Commissioner for Pennsylvania.

Atlantic States Marine Fisheries Commission

Coastal Sharks Management Board

May 2, 2024
8:00 – 8:45 a.m.

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. Luisi</i>) | 8:00 a.m. |
| 2. Board Consent | 8:00 a.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from October 2023 | |
| 3. Public Comment | 8:05 a.m. |
| 4. Progress Update on Ongoing Highly Migratory Species Fishery Management Plan Actions (<i>K. Brewster-Geisz</i>) | 8:15 a.m. |
| 5. Consider Implementing Complementary State Waters Measures to Prohibit Retention of Oceanic Whitetip Sharks (<i>C. Starks</i>) Action | 8:30 a.m. |
| 6. Other Business/Adjourn | 8:45 a.m. |

The meeting will be held at The Westin Crystal City, 1800 Richmond Highway, Arlington, VA; 703.486.1111, and via webinar; click [here](#) for details.

MEETING OVERVIEW

Coastal Sharks Management Board

May 2, 2024

8:00 – 8:45 a.m.

Chair: Erika Burgess (FL) Assumed Chairmanship: 05/23	Technical Committee Chair: Angel Willey (MD)	Law Enforcement Committee Rep: Greg Garner (SC)
Vice Chair: Mike Luisi (MD)	Advisory Panel Chair: VACANT	Previous Board Meeting: October 17, 2023
Voting Members: MA, RI, CT, NY, NJ, PA, DE, MD, VA, NC, SC, GA, FL, NMFS (13 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 2023

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. Progress Update on Ongoing Highly Migratory Species Fishery Management Plan Actions (8:15-8:30 a.m.)

Background

- NOAA Fisheries is working on several actions for the Highly Migratory Species (HMS) FMP relevant to coastal sharks.
- Amendment 15 addresses modification, data collection, and assessment of four commercial longline spatial management areas, and administration and funding of the HMS pelagic longline electronic monitoring program.
- Amendment 16 could result in large changes to the entire commercial and recreational shark fishery including changes to commercial and recreational shark quotas, shark management groups, shark retention or bag limits, and shark minimum size limits.

Presentations

- Update on Ongoing Highly Migratory Species Fishery Management Plan Actions by K. Brewster-Geisz

5. Consider Implementing Complementary State Waters Measures to Prohibit Retention of Oceanic Whitetip Sharks (8:30-8:45 a.m.) Action

Background

- A [final rule](#) was issued in January prohibiting the retention and possession of oceanic whitetip sharks in U.S. waters of the Atlantic Ocean, effective February 2, 2024.
- As a result, the federal regulations and the Commission’s Coastal Sharks FMP are no longer consistent.

Presentations

- Options for Implementing Complementary State Waters Measures to Prohibit Retention of Oceanic Whitetip Sharks by C. Starks

Board actions for consideration at this meeting

- Consider Implementing Complementary State Waters Measures to Prohibit Retention of Oceanic Whitetip Sharks

6. Other Business/Adjourn

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

**Beaufort Hotel
Beaufort, North Carolina
Hybrid Meeting**

October 17, 2023

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

TABLE OF CONTENTS

Call to Order, Chair Erica Burgess.....1

Approval of Agenda.....1

Approval of Proceedings from August 1, 20231

Public Comment1

Set Specifications for 2024 Fishing Year.....1

Adjournment2

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of August 1, 2023** by consent (Page 1).
3. **Move to approve the 2024 coastal sharks specifications via an email vote after NOAA Fisheries publishes the final rule for the 2024 Atlantic Shark Commercial Fishing season** (Page 2). Motion by John Clark; second by Mike Luisi. Motion carries by unanimous consent (Page 2).
4. **Move to nominate Mike Luisi as Vice-Chair of the Coastal Sharks Board** (Page 2). Motion by John Clark; second by Nichola Meserve. Motion passes by unanimous consent (Page 2).
5. **Move to adjourn** by consent (Page ____).

ATTENDANCE TO BE FILLED ON A LATER DATE

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 Rachel Carson Ballroom via hybrid meeting, in-person and webinar; Tuesday, October 17, 2023, and was called to order at 5:00 p.m. by Chair Erika Burgess.

CALL TO ORDER

CHAIR ERIKA BURGESS: At this time, I'll call to order the Coastal Sharks Management Board.

APPROVAL OF AGENDA

CHAIR BURGESS: The first item on our agenda is the approval of the agenda. Is there any opposition to the agenda or any additions to the agenda? Seeing none.

APPROVAL OF PROCEEDINGS

CHAIR BURGESS: Next up is the approval of the proceedings from August, 2023. Is there any objection to approving the proceedings? Seeing none.

PUBLIC COMMENT

CHAIR BURGESS: We'll now open the floor to public comment. I see a few people in the audience. Is there anyone in the room who wishes to give public comment to the Coastal Sharks Management Board? Seeing none; I'll look online. None online, all right.

SET SPECIFICATIONS FOR 2024 FISHING YEAR

CHAIR BURGESS: That brings us to our fourth agenda item, which is to set specifications for the 2024 fishing year, and I will ask Caitlin to give a presentation.

MS. CAITLIN STARKS: Thank you, Madam Chair. This should be pretty quick and painless. The NOAA Highly Migratory Species Division published their Proposed Rule for the 2024 coastal shark specifications on August 2nd this year, and the Final Rule is expected to publish later this fall. In that proposed rule, the quota for the shark's species relevant to this Board remain status quo from last

year, and the proposed opening date is January 1, 2024.

In addition to the specifications, the Proposed Rule considers options for the 2024 fishing years and beyond to automatically open the commercial fishing season on January 1st of each year, under base quotas and default retention limits. It also considers increasing the default commercial retention limit for the large coastal shark fisheries.

These are the 2024 proposed quotas for aggregated large coastal shark; hammerhead shark, non-blacknose, small coastal shark, blacknose shark, and smoothhound shark. For the LCS group and the blacknose group, the proposed retention limits are status quo from 2023 at 55 large coastal sharks other than sandbar sharks and 8 blacknose sharks per vessel per trip.

Next, so the proposed 2024 quotas for the non-sandbar LCS research group, sandbar shark research group, blue shark, porbeagle sharks and other pelagic sharks. These are also status quo from 2023. Regarding the proposed default measures in a proposed rule. The proposed option or preferred option is to automatically open the fisheries on January 1st of each year, with base quotas and default retention limits. This option would increase the default possession limit for the large coastal sharks' group to 55 sharks per vessel per trip, rather than the current default of 45. The default possession limit for blacknose would stay at eight, and in this option, NOAA could still adjust the start date quotas and retention limits as needed, either before or during the season. Similar to last year, the Board can consider whether to approve the 2024 coastal sharks' specifications via an e-mail vote after NOAA Fisheries publishes the final rule for the 2024 Atlantic coastal sharks commercial fishing season later this year. I can take any questions.

CHAIR BURGESS: Any questions for Caitlin regarding her presentation or the proposed specifications? Mr. Clark.

MR. JOHN CLARK: Thank you, Madam Chair. If there are no questions, I think there is a prepared motion

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

that I would be glad to make. Okay, **move to approve the 2024 Coastal Sharks Specifications via an e-mail vote after NOAA Fisheries publishes the Final Rule for the 2024 Atlantic shark commercial fishing season.**

CHAIR BURGESS: I saw a second from Mike Luisi. Is there any discussion on the motion? One thing I want to bring forward, to make sure everyone on the Board is aware. Caitlin and I have discussed this. The ASMFC Interstate Fishery Management Plan for coastal sharks requires us to set a fishing season start date each year.

Although NOAAs Proposed Rule would set it at January 1st, for each year, this Board would still have to go through the formal process of voting on a season each year. We can leave that in place, if that's all right. If we want to change it that would require an addendum. An addendum is not necessary, but if everyone is comfortable with that.

I just want to make sure that the Board is aware that that would be the practice moving forward. **Any opposition to this motion? Seeing none; this motion is approved,** and be on the lookout for an e-mail from Caitlin to vote for that. The next to last action is to elect a Vice-Chair. John, is your arm, okay?

MR. CLARK: Thanks to all the candy I have regained my strength, Madam Chair. At this time, it is my honor to **nominate my neighbor, the multitalented Mike Luisi as Vice-Chair of the Coastal Sharks Board.**

CHAIR BURGESS: I see a second from Nichola Meserve. **Any opposition to this motion?** Mike, you can't put your hand up. **Seeing none; I'll consider that motion approved.**

ADJOURNMENT

CHAIR BURGESS: Is there any other business to come before this Board? Seeing none, I'll ask for a motion to adjourn. So moved, thank you.

(Whereupon the meeting adjourned at 5:06 p.m. on October 17, 2023)

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

Atlantic States Marine Fisheries Commission

Spiny Dogfish Management Board

May 2, 2024
9:00 – 9:45 a.m.

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 (*P. Geer*) 9:00 a.m.
2. Board Consent 9:00 a.m.
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Public Comment 9:05 a.m.
4. Review Action by the Mid-Atlantic and New England Fishery Management Councils (MAFMC and NEFMC) to Reduce Sturgeon Bycatch and Consider Complementary Action **Possible Action** 9:15 a.m.
 - Review MAFMC and NEFMC Final Action (*K. Cisneros*)
 - Review Consistency of Federal and State Management of Spiny Dogfish (*J. Boyle*)
5. Other Business/Adjourn 9:45 a.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details

MEETING OVERVIEW

Spiny Dogfish Management Board

May 2, 2024

9:00 a.m. – 9:45 a.m.

Chair: Pat Geer (VA) Assumed Chairmanship: 1/24	Technical Committee Chair: Scott Newlin (DE)	Law Enforcement Committee Rep: Chris Baker (MA)
Vice Chair: Joe Cimino (NJ)	Advisory Panel Chair: Vacant	Previous Board Meeting: January 23, 2024
Voting Members: ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, NC, NMFS (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from January 2024

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. Review Action by the Mid-Atlantic and New England Fishery Management Councils (MAFMC and NEFMC) to Reduce Sturgeon Bycatch and Consider Complementary Action (9:15-9:45 a.m.)

Possible Action

Background

- In response to the 2021 Biological Opinion and 2022 Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries, a joint FMAT/PDT of the New England and Mid-Atlantic Fisheries Management Councils formed to develop a range of alternatives to reduce sturgeon bycatch in the Monkfish and Spiny Dogfish Fisheries.
- In April 2024, the MAFMC and NEFMC each met to select their Final Actions (**Briefing Materials**).

Presentations

- Review MAFMC and NEFMC Final Action by K. Cisneros.
- Review Consistency of Federal and State Management of Spiny Dogfish by J. Boyle

5. Other Business/Adjourn

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

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 23, 2024

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

TABLE OF CONTENTS

Call to Order, Chair Pat Geer1

Approval of Agenda1

Approval of Proceedings from October 18, 20231

Public Comment1

Review 2023 Management Track Assessment.....1

Set Specifications for Up to the Next Three Fishing Years5

 Review Monitoring Committee and Mid-Atlantic Fishery Management Council Recommendations for 2024-2026 Fishing Years5

Elect Vice-Chair.....9

Adjournment 10

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 18, 2023** by consent (Page 1).
3. **Move to approve FY2024-2026 spiny dogfish specifications: commercial quota 2024-2025 be set at 10,699,021 pounds; 2025-2026 be set at 10,972,394 pounds; 2026-2027 be set at 11,223,720 pounds consistent with those adopted by the Mid-Atlantic Fishery Management Council pending their approval by NOAA Fisheries** (Page 5). Motion by Nichola Meserve; second by Jeff Kaelin. Motion carries (11 in favor, 1 abstention from NOAA fisheries) (Page 8).
4. **Move to approve the spiny dogfish northern region trip limit for fishing years 2024/25, 2025/26, and 2026/27 at 7,500 lb** (Page 8). Motion by Jeff Kaelin; second by Doug Grout. Motion carries with 1 abstention from NOAA Fisheries (Page 9).
5. **Move to nominate Joe Cimino as Vice-Chair of the Spiny Dogfish Board** (Page 9). Motion by Chris Batsavage; second by Mike Luisi. Motion passes by unanimous consent (Page 9).
6. **Move to adjourn** by consent (Page 10).

ATTENDANCE TO BE FILLED ON A LATER DATE

The Spiny Dogfish 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, January 23, 2024, and was called to order at 3:20 p.m. by Chair Pat Geer.

CALL TO ORDER

CHAIR PAT GEER: Welcome to the Spiny Dogfish Management Board. My name is Pat Geer; I am the Administrative Proxy for the Commonwealth of Virginia, and I'll be your Chair today. We're going to be joined by James Boyle, who is the FMP Coordinator and Jason Didden, who is a fisheries management specialist at Mid-Atlantic Fisheries Management Council.

APPROVAL OF AGENDA

CHAIR GEER: The first order of business for today is Approval of the Agenda. Are there any changes or modifications to the agenda? Hearing none; the agenda is approved by Board consent.

APPROVAL OF PROCEEDINGS

CHAIR GEER: Moving on to the Proceedings from the October meeting in Beaufort, North Carolina on October 18. Any modifications, changes, or comments to the proceedings? Hearing none; the proceedings are approved by Board consent.

PUBLIC COMMENT

CHAIR GEER: Moving on to Public Comment. Is there anybody in the audience that would like to speak on items that are not on the agenda today? Do we have anybody listed? Seeing none; is there anybody online, the same, interested in speaking on items not on the agenda.

REVIEW 2023 MANAGEMENT TRACK ASSESSMENT

CHAIR GEER: Hearing no comments at all, we're going to move on to Item 4, which is Review of the 2023 Management Track Assessment. That will be done by Jason Didden. Jason, you're online, can you hear us, okay?

MR. JASON DIDDEN: Yes, and my presentation is kind of a combination of that and the Council actions, if that is okay.

CHAIR GEER: Yes.

MR. DIDDEN: A quick overview, going to hit a bit of history, some science and policy, and then at the management measures. These acronyms come up a lot. I'll just note that last one, going back and forth between metric tons and pounds can be a bit tricky. But that 450 metric tons, being about a million pounds, I think is a good quick conversion.

The main thing here from federal summaries, to highlight the federal trip limit at 7,500 pounds, and that federal waters close to possession when the federal quota is reached. Also, it is a joint plan with New England. The Mid took action in December, and New England considers next week. Just an overview of the specifications, where we are now. Key components include the discard set-aside, the management uncertainty buffer, which is zero currently, and that gets us to the current commercial quota of 12 million pounds, based on what our SSC had set previously, and then those various deductions.

Just history of catch. Mostly commercial landings and discards, starting from left to right with the bottom red bars. You can see that expansion of the directed domestic fishery in the 90s, the low landings in the early 2000s, as a rebuilding effort then expanded landings as the stock and quotas grew, and then finally erosion of those landings in most recent years.

The question has come up a few times in different venues of, you know we're looking at these quota cuts, but we haven't been catching the past quotas. What is going on? As a bit of context for that, before we talk about a few of the assessment details. In terms of the scale of recent inaccuracy, if you applied the current fishing target rate to what we think the biomass was in 2016, it looks like the 2016 quota was set about four times too high.

That we're going to relate to, well it relates to questions that have come up of how can we have been having these issues now, when we generally haven't been hitting our quotas or catch limits? This is biomass as spawning output. The Y vertical axis here is millions of pups produced annually. That is the biomass measure for this assessment.

This is the exploitation rate. You can see if you look about two-quarters of the way to the right, around 2000. You can see that reduction in fishing mortality. After 2000 was that initial rebuilding effort, but then some overfishing again. But we do look like we're right at the biomass target, basically, and not overfishing in that terminal year of the management track stock assessment that considered data up through 2022.

From here I just want to note, and can you hit next one more time? Just two things to note here. One that the green that I kind of hand colored in along the year's X axis are times where we don't think we're overfishing. Then to that green horizontal dash is where the research thought the biomass target was, so a good bit higher than we now think our biomass target is.

We have a bit of a double-edged sword of the assessment thinking that there is lower productivity. The assessment thinks we're at our target, but then requires lower catches to stay there, because of that lower productivity. You can see in 2022 our ABC was around 17.5 thousand metric tons.

Then 2023 just a bit under 8,000 metric tons, with the 12-million-pound quota, and then potentially lower again now. That is a super quick overview of the recent management track assessment. Let's review a little recent performance. Here are those highlights. You can see the landings track, the initial quota, the increasing quota initially in the late 2000s, as our biomass was increasing, but then overall declined in the last decade

Bear with me, I'm at the end of a cold, but my voice is deteriorating here. We'll try to make it through. Next, this is just prices for the fishery over time. You can see inflation adjusted to 2022 dollars. Prices are

relatively stable in recent years. This is just fishery performance. The last full fishing year in orange, and the current in blue. Week 0 here all the way to the left is May 1. You can see 2023 fishing year landings, May through April, 2023 fishing year is a bit behind 2022. That was just refreshed last week, so the far right of the blue are late December and just early January landings.

Just summary of landings by state. Virginia landings have been the strongest the last couple years, and that you look at by a season, kind of not surprising, kind of correlates to more landings toward the latter half of the fishing year in recent years. Since recent vessel participation, this is a vessel with any federal permit, and there are some landings categories.

Started work with the AP a number of years ago, just to get a general sense of vessel activity. You can see that kind of follows the general landings trend. It ramps up in the late 2000s, with that quota, and then erosion the last decade. We get a fishery performance report from our Advisory Panel.

They note that a lot of things affects participation and landings in this fishery, its relatively low price, some of them get other opportunities, it could be oysters or just any other opportunity can draw effort away. In fact, they don't really see the big change in abundance trend that the assessment sees, and the survey doesn't match the biomass trends that they see, which is they report basically seasonal variabilities and annual variability, but not a lot of trends.

But they do really note that with the fishery they really feel like, I thought I would just take this quote from the Fishery Performance Report that they report that they are kind of at a threshold where interest and then fishermen and infrastructure will evaporate. They've noted that the artificially-low quota broke the supply chain from the south, Virginia, that processor in Virginia, the packer that most of the dogfish are shipped for process in Massachusetts.

But the dealer who was landing exited the fishery that's been replaced to some degree, but it has

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

definitely created some instability in flux there. Other replacement of panelists that feel they are subject to kind of roller coaster style management that is just going to result in shoreside gentrification.

A lot of concern about the Bigelow performance issues, whether it doesn't run, doesn't run on time, performance of the gear. We also reviewed the Council's research priorities and they did provide some input on potential research and that is in the AP report. I'll skip any more details for now.

The Council's Scientific and Statistical Committee, they take the assessment. The Council's Risk Policy, and consider how uncertain the assessment is to calculate an ABC. We've got an analytical estimate that has passed peer review. The Council's Risk Policy says that for a stock where we think dogfish is, just above its target, the Council's Risk Policy wants a 54 percent chance of not overfishing.

Then the SSC also considers, is this a low uncertainty assessment, a high uncertainty assessment that affects how much you have to back off the overfishing level to achieve that slightly higher chance of overfishing. They kind of assess this to be kind of a moderately uncertain stock assessment. When you apply the Council's Risk Policy, to get that 4 percent better than coin flip chance of not overfishing, that results in cutting back about 8 or 9 percent from the overfishing catch, so it's about 663 metric tons in this case. The SSC makes those calculations and you get those ABCs, about 7,100 for 2024, 7,200 for 2025, and 7,500 metric tons for 2026. Those are the SSC recommendations that the Council cannot exceed.

There is an SSC Report, I think was included in your briefing materials. I have more details and some backup slides, but that is kind of where the ABC arrives from. The Monitoring Committee takes those ABCs and then provides management recommendations to the Council, so that I said jointly manage, we've got some Council staffers, federal staff, state staff, and then this Monitoring Committee also has two nonvoting ex-officio industry representatives on the Monitoring Committee also.

The charge in the regulations to the Monitoring Committee is to make recommendations to ensure that the ACLs are not exceeded. It's really this tradeoff between trying to maximize this limited quota that we have available, and then also because this plan has pound for pound paybacks for ACL overages, we try to not exceed that ACL, so you don't well, potentially overfish. But also, not get paybacks that could be disruptive to future fishing years.

The Monitoring Committee has discussed over the years that at these relatively low ABCs, you can't really ensure these gear risks that you don't have like a big discard estimate that causes a big ACL overage, and really causes future year disruptions because of those potential paybacks. Kind of try to do a good faith effort to avoid substantial overages in a typical year.

Canadian and recreational landings are pretty simple, some small deductions for those. The discards, the management uncertainty, commercial total discards and management uncertainty buffer is really kind of where it is more complicated, and we typically spend more of our time. This is the spiny dogfish dead discards, total dead discards that we kind of have to try to plan for and set aside.

You can see just above 2,000 metric tons in the terminal year of the assessment, and overall downward trend the last ten years, but a lot of that trend is from '13 and '14 being a good bit higher. We tried to get a bit of a sense of early 2023 discards, because that is one thing. It looks like trawl discards were up a little bit the first half of the year, CAMS good output midyear discard estimates for us on the commercial side.

Gillnet discards maybe down a little bit, did a midseason query from MRIP, recreational discards the first half of the year were up a little bit, two more months were available. I took a look at '23 looks very similar year to date through Wave 5 of 2022. They look quite comparable when you added in another two months of data.

The Monitoring Committee kind of discussion really ended up hinging on kind of two perspectives. One,

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

our industry members really recommended that using that 2022 terminal discard estimate without any management uncertainty buffer, they noted the downward trend, 2022 was pretty close to what we set for 2023. They noted the state landings allocations can't quite probably use all the landings, because of the regional allocation. That creates a big of an implicit buffer. They noted the ABC is increasing. That could soak up any small overages, and really flagged the kind of critical negative impact from sequestering, setting aside any potential quota, and the fishery is kind of on a knife edge of viability. The industry members of the Monitoring Committee thought that the options suggested by the rest of the Monitoring Committee were not reasonable that we'll talk about next.

The rest of the Monitoring Committee decided that just that 2022 discard estimate with no management uncertainty buffer seemed rather risky. The assessment suggests increase in biomass, which should increase discards. Some really low small-mesh trawl estimates in the last couple years, so if that slips what could happen?

Noting that a lot of the discards in other fishery trawl, who's behavior may be variable. There is just tradeoff, again higher buffers, less quota now but lower risk of overages and paybacks and future disruptions and vice versa, with lower buffers now. We noted that the three-year average, about 3,100 metric tons captures some of the use and discard variability.

Probably if you were spending that high you wouldn't need a management uncertainty buffer to avoid substantial overages in most years. You could still get an overage, but at least it accounts for some of that recent variability. But you get a low quota then, even without any additional buffering.

We noted the assessment model also generates expected discards, and thought that seemed like an objective way to set discards. Although it then showed that the Monitoring Committee recommended to the joint Spiny Dogfish Committee some may want to consider some management uncertainty buffers, given there is still, by the nature

of how the discard estimates are calculated in the model, a 50/50 chance that they are higher or lower than projected.

Depending on the discard set-aside, you get somewhere in between about 8.5 to 10.7 million pounds for a quota, and there are tables in the Monitoring Committee Summary. Then the discard set-aside, potentially lower yet again if a management uncertainty buffer is used. We had some additional public comment at the Monitoring Committee summary, just really concerned about the uncertainty in this and the impacts to industry.

Really flagging that they need as much quota as they can to survive another year. They flagged what they sense is really low sampling and the potential impacts of that on the assessment. East Coast provided a letter that should be in the briefing materials. Next, I'll just kind of note is some of the input on, in fact, and this is kind of across a number of fisheries.

While the fish assessment, it also uses some observer data for length information. That kind of drives the assessment. We really have had very few portside samples of trips for spiny dogfish in recent years, kind of largely hinging on, part of it is fishery activity, but also had a lot of reduction in funding of portside sampling in the last couple years.

The Committee took all that input and they moved to use the most recent estimate of Canadian landings, no management uncertainty buffer, those model-predicted-projected year specific discards, three-year average for recreational landings, and that resulted in those commercial quotas at that bottom bullet, a little over 10 million pounds going up to about 10.5 million pounds over the course of your three-year specs, and that is Table 3 of the Monitoring Committee Summary. The Council started with that and a motion along those lines, but the Mid-Atlantic Council decided to adopt for 2024 specifications, recommend the 2022 discard amount, to start off with. That is the most recent year available, about 4.7 million pounds.

Then slightly more discards in 2025 and 2026. You

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

can see what the commercial quota that results there is. Starting about 10.7 then 11, then 11.2 million pounds. I said the full motion is in the briefing books. The motion might not be, but the Council summary I'm pretty sure was. The Mid-Atlantic Council noted the downward trend in discards over the last ten years, concluding that made it a reasonable proxy for near future discards.

But does kind of follow along the assessment's prediction of slightly increasing biomass for '25 and '26 that same kind of trend, and then increases discards slightly for '25 and '26 from that first 4.7 million pounds number. That is all I have, I'll be able to take any questions, and then turn it back over to you all, thank you.

CHAIR GEER: Thank you, very much, Jason. Does anybody have any questions for Jason at this time? I'm not seeing any. Do we have to have a motion on this. I don't think we need a motion on this assessment. There are no questions.

SET SPECIFICATIONS FOR UP TO THE NEXT THREE FISHING YEARS

CHAIR GEER: We can move on to set the specifications for the next three years.

CHAIR GEER: Jason will review the Monitoring Committee and the Mid-Atlantic Council's recommendations for the 2024 through 2026 fishing seasons.

REVIEW MONITORING COMMITTEE AND MID-ATLANTIC FISHERY MANAGEMENT COUNCIL RECOMMENDATIONS FOR 2024-2026 FISHING YEARS

MR. DIDDEN: Sure, and that was kind of integrated into those last few slides. I think we've had some issues with, in the last couple years in like the Council Summary down to like a tenth of a million pounds, but provided the exact poundage translation to Commission staff.

CHAIR GEER: James has a couple of slides to show at

this point.

MR. JAMES BOYLE IV: Just a couple of quick slides as you consider the specifications for the next one to three fishing years. Last year the Commission maintained the trip limit for the northern region at 7,500 pounds for the 2023-2024 fishing year, which is consistent with the federal trip limit.

But because this Commission specified that it was just for the '23-'24 fishing years, the Commission would need to respecify the trip limit for the 2024-2025 fishing year or any beyond that. Lastly, if the Commission were to adopt the recommended quotas from the Mid-Atlantic Council, it would result in these regional and state quotas, as shown in the table on the slide. I'm happy to leave these up for reference, and can take any questions or hand it over to the discussion.

CHAIR GEER: Okay, is there any other discussions or questions? Some people looking. Hey, we're looking for a motion at some point, if we have no other questions. Nichola's hand is up.

MS. NICHOLA MESERVE: I'll move to a motion if there are no questions, if staff could bring it up to help me, make sure I've got the right numbers in that it will be consistent. **I move to approve FY2024-2026 spiny dogfish specifications: commercial quota 2024-2025 to be set at 10,699,021 pounds; 2025-2026 to be set at 10,972,394 pounds; 2026-2027 to be set at 11,223,720 pounds consistent with those adopted by the Mid-Atlantic Fishery Management Council pending their approval by NOAA Fisheries.** If I have a second to the motion I will speak to it as well, Mr. Chair.

CHAIR GEER: Do we have a second to that motion? Yes, I see Jeff's hand come up. Nichola, do you have anything you want to add to that?

MS. MESERVE: Yes, thank you, Mr. Chair. I took the time last night to relisten to the Mid-Atlantic Council discussion on this item, and that really helped me to support the outcome that the Council arrived at in December. It was reached after a thorough Council discussion of a range of options that included several

beyond what the Committee had evaluated.

That discussion highlighted for me a widespread desire to support the continuation of the dogfish fishery with the highest quotas as justifiable. However, it was also apparent that NOAA Fisheries was unlikely to approve specifications that use the 2022 discard estimate as was also considered as the discard deduction for the coming three years.

That doing so would be too similar to cherry picking the discard estimate to get the quota we want, rather than a scientifically valid approach. But sufficient rationale was, I think, provided for these numbers that use the ten-year declining trend of discard estimates to support the application of the 2022 discard estimates for 2024, and then use the stock assessment's projections to follow a gradual increasing trend of discards.

I'm aware that the New England Council is meeting next week, and it's possible that a different outcome could be arrived at, and that the final decision would rest with NOAA Fisheries, hence that additional language about, pending NOAA Fisheries approval within the motion. I don't favor postponing our action to wait for those decisions, that would essentially be giving up this Board's opportunity to influence the outcome. Therein lies the rationale for my making this motion.

CHAIR GEER: Thank you, Nichola, Jeff, do you have anything to add to that?

MR. JEFF KAELIN: My only question is, should this motion include the possession limits for '24 and '25 also, or do you want that as a separate motion?

CHAIR GEER: We could do it separately, or we can include it in this motion if you want.

MR. KAELIN: It may as well go in this motion, it seems to me, maybe, if it's not too late.

CHAIR GEER: Nichola, do you want to modify the motion and include the trip limits?

MS. MESERVE: I don't know, Mr. Chair, I had

considered that myself. I wasn't sure if there was going to be a different opinion on the quotas in this meeting. These specifications are also for three years, whereas I think I feel more comfortable setting the trip limit for just one year at this time. For those reasons I had not included it.

MR. KAELIN: That's fine with me.

CHAIR GEER: I would recommend we do it as a separate motion. Are there any questions or any discussion on this motion? Mike Luisi.

MR. MICHAEL LUISI: I supported this as a member of the Mid-Atlantic Council, and there was a lot of discussion at the time about what NOAA Fisheries, what the Regional Office was going to do, based on the recommendations from the Mid. Nichola also mentioned that the New England Council is going to be meeting on this same topic, and they may come up with something entirely different from what we did.

I guess my question is, if we were to support this and this moved forward, and the New England Council comes up with something different, or even the same as the Mid-Atlantic Council, yet NOAA Fisheries decides to implement something different. Does that put the states and the federal waters, does it make the quotas different?

I know it says at the end of this motion, pending NOAAs approval, but what approval is it pending? They are going to make a decision at some point, it's what decision they make that then affects whether or not our state and federal waters have the same limits or not. Because I think maintaining those quotas the same in both federal and state waters is extremely important. We don't want to start to go in two different paths here. I'm just looking for some clarification.

CHAIR GEER: Bob may have some clarification on that.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, I'll give it a shot. I think Nichola can speak for herself, obviously as the maker of the motion. But my interpretation of this is that if the Board were to

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

approve this, our measures are essentially what is on the screen, and if NOAA ultimately approves something different, based on guidance to the Mid-Atlantic Council or just action on their own.

This Board would have to get back together and revisit the state quotas to make them consistent with the federal government, and that would take a two-thirds vote to do that. But I think, Mike, to your last point that is probably the most important, which is having the states and the federal government on the same page, as far as quotas go is pretty important. We've shown, in dogfish a couple times actually, that if there are different quotas at the state and federal level, it gets really messy really quickly.

CHAIR GEER: Mike, follow up?

MR. LUISI: Bob, you're not the right person to answer this question, but as far as timing goes for NOAA. What is the intended timeline for the establishment of making this decision, publishing that rule? Do you know, Alli?

MS. ALLISON MURPHY: If I may, Mr. Chair.

CHAIR GEER: Go ahead.

MS. MURPHY: It is a little hard for me to say at this point, because as was noted earlier, the New England Council hasn't taken action yet. I imagine Mid-Atlantic Council staff, if different action were taken next week would have to write that up. I think that would be dependent on when the document is submitted to us for us to start our rulemaking decisional process there. Unfortunately, I can't speak specifically to that.

MR. DIDDEN: This is Jason. With some of the assessment delays we're backed up a bit, compared to sometimes though. It's going to be tight to get things in before the start of the fishing year. That's going to be our goal. But from the federal side there is rollover, so if things aren't quite ready exactly by May 1, existing measures roll over until superseded.

CHAIR GEER: Nichola Meserve has her hand up.

MS. MESERVE: I don't want to disagree with Bob, but when I was thinking about this motion and the language of pending their approval by NOAA Fisheries, my intent was that essentially, if NOAA Fisheries adopted something else, the Commission, this Board, you know this motion would be kind of invalidated and the Commission wouldn't have any quotas, like on the books.

It would just be a simple majority vote at that time to adopt specifications, which I would hope could be done by probably a Board e-mail ballot, given the late nature that that may be at that time. I would look to Bob to see if that is an okay interpretation as well.

CHAIR GEER: Any other comments on this motion? Bob.

EXECUTIVE DIRECTOR BEAL: Just to follow up on Nichola's question. You know if that is her intent is that should NOAA Fisheries implement something different, then the Commission does not have any measures for these years on the books at all, and then the Board can get back together and approve something through simple majority, you know that is fine.

The record just needs to reflect, and as I said, it's Nichola's motion. If that is her interpretation or her intent of the motion is, if NOAA does something different than the numbers that are included on the screen now, then there are no state measures and the Commission will have to get back together, this Board will have to get back together and take action to do that. That is absolutely fine, it is just good to have it clear on the record.

CHAIR GEER: Mike Luisi.

MR. LUISI: I think that is a really important point, the intent of the motion. If you would like, if you want to make sure it's clear, I agree with Nichola. I think that unless NOAA Fisheries approves the same quotas that are listed above, if they don't then we need to revisit, but if they do, then we can move forward. I would be happy to either offer advice, as to a friendly, or I could make a motion to amend, and add a little language at the end that would hopefully

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

clarify that for everyone. It's up to you.

CHAIR GEER: Mike, the record shows, so it shouldn't be necessary. Is there any other discussion on this motion? Not hearing any; I guess it's time for a vote. Before we take the vote, I would like to have public comment, if there is anybody who would like to speak to this motion. We have one online. Please, state your name.

MR. JOHN WHITESIDE, JR ESQ: Attorney John Whiteside, I'm on the AP and Monitoring Committee. I was at the Mid-Atlantic meeting on December 13, and I would just urge the Commission to follow the same vote for what the motion is that is on the board now. Thank you.

CHAIR GEER: Thank you. All right, since this is a final motion, I would like to see a list of hands in favor of this motion. **Please raise your hand if you are in favor. Raise your hand if you're opposed. Seeing none; null votes, abstentions; 1 from NOAA Fisheries. I believe the final vote on that is 11 to 0 to 0 to 1.**

I did not read the motion in. Do you want me to read it? Are you sure? Okay. **All right that passes.** Now we need to address the trip limits, and I'll look for, Mike Luisi has his hand up, and I think Jeff you're playing volleyball back and forth with each other right now.

MR. KAELIN: **I move to approve 2024-2025 spiny dogfish trip limits at 7,500 pounds.** I think that is the right number.

CHAIR GEER: Do I have a second for that? Doug Grout. Jeff, do you want to comment on that at all?

MR. KAELIN: I'm glad I don't have to pull them all in, I tell you. I've done 6,000, and 7,500 is a lot of fish. No, I don't have any other comment, thank you, Mr. Chairman.

CHAIR GEER: Mr. Grout, no. We have that up there, so the motion was by Jeff Kaelin, seconded by Doug Grout. Do we need to do the same for the southern region? No, okay.

MS. TONI KERNS: The southern states set their own trip limits to match. They can set their measures however they deem necessary, as long as they don't exceed their quotas.

CHAIR GEER: Jeff Kaelin was the motioner and Doug Grout was second.

MR. KAELIN: Thank you for clarifying the motion, Toni.

CHAIR GEER: Okay, we have that up there. Is there any other discussion on this? Nichola, do you have a comment?

MS. MESERVE: A question for the motion, Mr. Chair. I just wanted to check if this is setting the trip limit for one year or two. I see fishing seasons and seeing FY2024-2025. You know it is a little bit unclear to me if this is one year or two. Just the one year was meant, hopefully the proper interpretation.

CHAIR GEER: Mr. Kaelin, you want to clarify that?

MR. KAELIN: I wanted it to be for two years, so **it should be 2024-2026.** The intent was for two years, not one year.

MS. KERNS: Then we need to say fishing year, so move to approve 2024-2025; and 2025-2026.

CHAIR GEER: Mr. Kaelin, does that meet with what you intend for the motion?

MR. KAELIN: It is, Mr. Chair, thank you.

CHAIR GEER: Mr. Grout are you okay with that. Are there any other comments or discussion? Nichola's hand is up again. Nichola.

MS. MESERVE: I apologize, that was left over.

CHAIR GEER: Chris Batsavage.

MR. CHRIS BATSAVAGE: Just a question for the motion maker and seconder. You are okay with just setting the specification with trip limits for two years, but we just had specifications for three years. Just

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

wondering if that was your intent, because you have two years for the trip limits, even though we just did three years for the specifications, just trying to understand.

MR. KAELIN: I was just trying to follow along with the presentation, and I thought we could only do it for two years. Is that a misunderstanding, or should we add the third year?

CHAIR GEER: I believe we can do it for all three if we want. I think we can.

MR. KAELIN: Then we should do that. I thought we could only do it for two. I thought that was what I read earlier. But we'll add a third year if that is okay, to match the specification period. That is a good point, Chris. If we can do three, let's do three.

CHAIR GEER: You're the maker of this motion, if you want to change it.

MR. KAELIN: I do want to change it if we can.

CHAIR GEER: Do we have to have an alternative motion, since it's already 7,500 pounds.

MR. KAELIN: That looks good.

CHAIR GEER: That meets with your approval. Is that okay? James just let me know, we could have gone up to five years. Mr. Grout, you're okay with this as well? Okay, Jeff, we've changed it so much, I'm going to ask you to read it out again.

MR. KAELIN: Of course, Mr. Chairman. I **move to approve the northern region trip limit for spiny dogfish fishing years 2024-2025; 2025-2026; and 2026-2027 at 7,500 pounds.** I think we need to add spiny dogfish, so what's written there. Move to approve the spiny dogfish northern region trip limit, that looks good to me.

CHAIR GEER: You've got it. Mr. Grout, you're okay with this? All right, thumbs up. **Is there any opposition to this motion? Yes.**

MS. MURPHY: If NOAA Fisheries could please

abstain.

CHAIR GEER: All right, thank you very much. Hearing no objection, this motion is passed by the Board by unanimous consent with one abstention from NOAA Fisheries. I apologize, Jeff, probably what I should have done was asked up front, I should have asked you if you wanted to do one, two or three years, and we could have saved ourselves 15 minutes of our doing this.

MR. KAELIN: I should have let Luisi go with it.

ELECT VICE-CHAIR

CHAIR GEER: Moving on to the next item is election of a Vice-Chair. I'm looking for a motion, Mr. Batsavage

MR. BATSAVAGE: I **move to nominate Joe Cimino as Vice-Chair of the Spiny Dogfish Management Board.**

CHAIR GEER: Do I have a second to that motion? Mr. Luisi. **Hearing any discussion on the motion. Having none; the motion passes unanimously.** Joe, congratulations, and thank you for your service. I have Nichola's hand is back up again, so Nichola.

MS. MESERVE: Congratulations, Joe. I wanted to check in with staff as to the status of quota rollovers. Now that the stock is above its biomass target, Addendum III authorizes 5 percent of unused state or regional quotas to be rolled over. Is it implicit in the prior motions that the state and regional quotas may be adjusted for FY2024 based on that quota rollover? Thank you.

CHAIR GEER: James.

MR. BOYLE: Yes, so with the stock status the way it is, the 5 percent rollover is allowed for the next fishing year. Given in the past it looked like this was done kind of automatically, with a preliminary quota memo being sent out in May. Given the kind of fine margin between those potential landings and the potential quotas, given the way they are.

It would be more prudent to send out a preliminary quota memo with rollovers in October, when

landings from the previous fishing year have a bit more time to be closer to finalized. That seems to be the process that would work best for us, and for states to let us know ahead of time that they want to do it, so we can do it on a state by state or region basis, instead of doing it for the whole coast, or every state is possible automatically.

CHAIR GEER: Toni.

MS. KERNS: Just to point out that because we are at such close margins with this quota, one thing that the Board should take into consideration is that states will have a different quota than that of NOAA Fisheries. Our quota will be higher than theirs. If the full coastwide quota is projected to be reached, NOAA will close, and it could close before a state has harvested all of its quota. That would potentially disadvantage a person that is a federal permit holder, if our quotas are higher than the feds.

CHAIR GEER: Any other discussion on that item? Nichola.

MS. MESERVE: What Toni has just pointed out, that potential mismatch. It occurs to me that there was a similar concern recently regarding black sea bass commercial quotas, and how a state's potential overage of a state-specific quota could have the same impact, in terms of impacting another state.

That their fishery is later in the season, and the federal closure occurring to curtail our fishery before the state quota is reached, and that there is a soon to be approved, I believe, change to the rules there that would have the federal in-season closure trigger for black sea bass occurring when landings are at 105 percent of the coastwide quota.

That may, just food for thought for now, but I think that may be a tool that we might want to think about using for spiny dogfish, or trying to pursue for spiny dogfish in the future. If we maintain a biomass above a target, that will continue to provide for different coastwide quotas between the ASMFC and the federal perspective of that. That's all for now, thank you.

CHAIR GEER: Any comments or discussion with what

Nichola just spoke about? Something to consider for the future.

ADJOURNMENT

CHAIR GEER: Is there anything else to come before this Board today? Any other business? All right, hearing none; this meeting is adjourned.

(Whereupon the meeting adjourned at 4:05 p.m. on Tuesday, January 23, 2024)

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



Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 26, 2024
To: Council
From: Karson Cisneros and Jason Didden, MAFMC Staff; Jennifer Couture and Robin Frede, NEFMC Staff
Subject: Joint Sturgeon Bycatch Framework: Final Action

On Wednesday, April 10, the Council will take up the Spiny Dogfish and Monkfish Committees' motions for final action on the Sturgeon Bycatch Framework. Final action for the New England Fishery Management Council (NEFMC) is scheduled for April 16-18, 2024. Please see the following supporting materials:

- 1) Joint Monkfish and Spiny Dogfish Committee meeting summary from March 13, 2024 with Committees' motions for preferred alternatives.
- 2) Joint Monkfish and Spiny Dogfish Advisory Panel meeting summary and recommendations from March 5, 2024
- 3) Fishery Management Action Team/Plan Development Team (FMAT/PDT) meeting summary and recommendations from February 22, 2024 and staff supplemental memo dated March 12, 2024
- 4) [Draft Framework Environmental Assessment](#) dated March 26, 2024 which includes the alternatives under consideration, affected environment, and impacts analyses*

*This document is provided electronically via the above link due to its size



MEETING SUMMARY

Joint Monkfish and Dogfish Committee

Webinar

March 13, 2024, 9am – 3 pm

The Monkfish and Dogfish Committee (Committee) met jointly on March 13, 2024, via webinar to: 1) review the Sturgeon Framework alternatives, 2) review the preliminary impact analyses; 3) review the recommendations from the Fishery Management Action Team/Plan Development Team (FMAT/PDT) and Joint Monkfish and Dogfish Advisory Panel (AP); 4) make recommendations on any preferred alternatives for the Mid-Atlantic and New England Fishery Management Councils to consider during their April meetings; and 5) Other business.

MEETING ATTENDANCE:

Dogfish Committee: Sonny Gwin (Dogfish Chair), Chris Batsavage, Richard Wong, Dan Farnham, Skip Feller, Joseph Grist, Adam Nowalsky, Nichola Meserve (Dogfish Vice Chair), Mark Alexander, Rick Bellavance, Dan Salerno, Alan Tracy*, Toni Kerns (ASMFC), Jay Hermsen (GARFO).

Monkfish Committee: Matt Gates (Monkfish Chair), Eric Hansen, Kelly Whitmore, Jackie Odell, Scott Olszewski, John Pappalardo, Alan Tracy*, Pete Christopher (GARFO), Dan Farnham* (MAFMC), Robert Ruhle (MAFMC).

*Committee member is on both Committees

Council Staff: Jason Didden (MAFMC), Jenny Couture (NEFMC), Robin Frede (NEFMC), and Karson Cisneros (MAFMC)

Others in attendance: Sturgeon FMAT/PDT: James Boyle, Jason Boucher, Lynn Lankshear, Spencer Talmage; Additional Council staff: David McCarron and Emily Bodell; NEFMC and MAFMC: Eric Reid (NEFMC Chair), Wes Townsend (MAFMC Chair), Mike Luisi (MAFMC Vice Chair), Michelle Duval (MAFMC), Megan Ware (NEFMC); Mitch MacDonald (NOAA GC); GARFO: Allison Murphy; Monkfish and Dogfish Advisory Panel: James Dopkin, Chris Rainone, Patrick Duckworth, Ted Platz, Kevin Wark, Mark Sanford; Public: Albert Didden, Aubrey Church, Conor Davis, Emerson Hasbrouck, Francisco Perez-Gonzalez, Jesse Hornstein, Joe Cimino, Raymond Kane, Richard Tyler Guterres, Sefatia Romeo Theken, and Tara Dolan.

SUPPORTING DOCUMENTATION: Discussions were aided by the following documents and presentations: **(1)** Meeting overview memo; **(2)** Agenda; **(3)** Presentation, Council Staff; **(4)** Draft Framework Adjustment; **(5)** Sturgeon Bycatch Fishery Management Action Team/Plan Development Team DRAFT meeting summary, February 22, 2024; **(6)** Joint Monkfish and

Dogfish Advisory Panel Meeting Summary, 20240305 – DRAFT; (7) Sturgeon Risk Assessment (Closures) Final Report, February 20, 2024; (8) BREP proposal narrative for low-profile gear; (9) correspondence; and (10) FMAT/PDT supplemental memo, March 12, 2024. Meeting materials are available on the NEFMC website: <https://www.nefmc.org/calendar/mar-13-2023-joint-monkfish-and-dogfish-committee-webinar>

KEY RECOMMENDATIONS:

- Monkfish:
 - For Southern New England, the Monkfish Committee did not recommend any measures for the Councils to adopt.
 - For New Jersey, the Monkfish Committee recommended the Councils adopt a year-round low-profile gear requirement in the NJ bycatch hotspot polygon as the preferred alternative (Alternative 5).
- Spiny Dogfish:
 - For New Jersey, the Dogfish Committee recommended the Councils adopt an overnight soak prohibition (8pm until 5am) for vessels targeting spiny dogfish in the NJ bycatch hotspot polygon with an exemption for mesh < 5.25” year-round; vessels using mesh ≥ 5.25” could not do overnight soaks in May and November.
 - For DE/MD/VA, the Dogfish Committee recommended the Councils adopt an overnight soak prohibition (8pm until 5am) for vessels targeting spiny dogfish in DE/MD/VA bycatch hotspot polygons with an exemption for mesh < 5.25” year-round; vessels using mesh ≥ 5.25” could not do overnight soaks from November through March.
- Other:
 - The Joint Monkfish and Dogfish Committee recommend the New England and Mid-Atlantic Councils write a letter to the NEFSC observer program to develop and implement a carcass tagging program for dead sturgeon discards (similar to what is done for sea turtles and marine mammals) and a tagging program for live sturgeon discards. This would apply to any fishery where sturgeon are caught, regardless of gear type, area, etc.

Questions:

Committee members asked several questions about the staff presentation. More specifically, one member asked if and how offshore wind was being taken into account in evaluating the impact of time/area closures in Southern New England for the monkfish fishery. He mentioned this should be considered a de facto closure and that fishing practices and behavior are likely to change, which would inherently benefit sturgeon. Staff noted that the regulations do not prohibit fishing within wind farms so cannot be considered a closure; this type of impact will be addressed in the cumulative effects section of the environmental assessment.

Another member asked whether the Council action alternatives meet the necessary sturgeon bycatch target reduction levels. Council and GARFO staff noted that after many iterative discussions, there are no target reduction levels for this action. The Council action is designed to reduce sturgeon interactions in both the monkfish and spiny dogfish fisheries, which is the only

mandate from the 2021 Biological Opinion, where measures must be in place by 2024. There is a possibility that the new Biological Opinion (expected in early 2025) may require additional sturgeon reduction measures, though this is uncertain given the sturgeon stock assessment is not yet complete.

One Monkfish Committee member asked if the delayed implementation for low-profile gear would impact achieving sturgeon reduction by 2024. Council and GARFO staff noted that as long as regulations are in place by 2024, the delayed implementation should not matter with respect to meeting the 2021 Biological Opinion requirements. It is unclear how this impacts the baseline analysis of the new Biological Opinion, however.

Regarding the upcoming sturgeon stock assessment, there were a few questions on whether the individual sturgeon distinct population segments (DPS) would be evaluated and if the assessment would evaluate any potential change in status from endangered to threatened. Atlantic States Marine Fisheries Commission staff explained that the assessment is just an update with additional years of data, so very similar to what was included in the 2017 assessment. Another member later asked if a substantial change in stock status is anticipated from the assessment and if the Committees should include a contingency for this Council action. Staff reiterated that the Councils should take final action in April to reduce sturgeon interactions in both the monkfish and spiny dogfish fisheries in order to meet the 2021 Biological Opinion requirements. Thus, a contingency based on the stock assessment results is likely not feasible. We do not know what the updated trends for sturgeon will be – positive or negative or large or small.

Another Committee member asked about the monthly spiny dogfish observed takes in the Delmarva region and if the months with highest sturgeon interactions were due to higher fishing effort. Staff explained that the rate of sturgeon takes are from only observed trips, so not necessarily a reflection of overall fishing effort. The Committee member asked whether the next Incidental Take Statement (ITS) would be informed by the sturgeon assessment, meaning the allowed ITS could be higher if there is a positive trend in the upcoming assessment. Staff explained this is hard to predict but the next BiOp and ITS will be informed by all available information.

A Dogfish Committee member asked about the partial exemption for the overnight soak prohibition for vessels using mesh < 5.25” and the reason for the low observer coverage for New Jersey. Staff answered that the observer program does have binning rules in order to meet certain standards based on the standard bycatch reporting methodology, which allocates observer coverage among fleets. There has not been a substantial amount of 5” mesh gear being used off NJ for spiny dogfish recently (<10% of NJ gillnet spiny dogfish landings). Another member asked whether the observer data by mesh size in Delmarva could be used as a proxy for the lower observer coverage in NJ. Increasing observer coverage for smaller mesh gear would be helpful for future management. Staff commented that during the AP meeting on March 5, a member of the public who used larger mesh (5.75”) stated an overnight soak prohibition would be most problematic from May through September.

A couple of Committee members asked about the time/area closures and the need to balance the socioeconomic impacts to the fisheries with reducing sturgeon interactions. One member expressed concern about the results of the decision support tool analysis and needing to potentially consider closures in the future as needed once the new Biological Opinion is published.

Regarding the low-profile gear requirement and the twine size conflict with the Harbor Porpoise Take Reduction Team requirements, this is a lengthy process (around one year). The meetings (not yet scheduled) are just getting underway to evaluate a potential exemption for using low-profile gear.

Regarding the Atlantic Large Whale Take Reduction Team timing, the proposed rule for gillnet and other trap/pot fisheries is expected by 2025 and implementation by 2026, so the current sturgeon Council action will be implemented before then. Staff noted that NMFS has not determined whether the South Island Restricted Area will be included in the proposed rule.

Public Comment:

- **Chris Rainone, NJ monkfish fishermen, monkfish advisor:** Asked if Alternative 5 includes time/area closures in May and November and if the measures would only apply to the polygon areas. He wanted to address the latent permit issue in the monkfish fishery. Staff clarified that Alternative 5 only includes gear modifications and does not include any time/area closures.

There was a brief discussion on the voting protocols for motions, namely that only the Dogfish Committee can vote on Dogfish motions and likewise with monkfish. Only one member of GARFO and one member from the state of Massachusetts can vote given there are two members of each on the Joint Committee membership.

1. **Dogfish Motion (Grist/Gwin):** The Spiny Dogfish Committee recommends the Councils adopt Alternative 5 with an exemption for both NJ and DE/MD/VA bycatch polygons for the use of gill net mesh less than 5.25-inches (e.g., In Delmarva, mesh < 5.25” mesh could do overnight soaks year-round; mesh ≥ 5.25” could not do overnight soaks from November through March; In NJ, mesh < 5.25” mesh could do overnight soaks year-round; mesh ≥ 5.25” could not do overnight soaks in May and November).

Alternative 5: Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters - Overnight soak time prohibition from 8pm until 5am in the New Jersey bycatch hotspot polygon during May 1 – May 31 and November 1 – November 30. - Overnight soak time prohibition from 8pm until 5am in the Delaware/Maryland/Virginia bycatch hotspot polygons during November 1 – March 31.

Sub-alternative 5a: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the New Jersey polygon overnight soak time prohibition.

Sub-alternative 5b: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the Delaware/Maryland/Virginia polygon overnight soak time prohibition.

Rationale: Based on observer data, input from AP and other industry members, appears that gillnet meshes <5.25” have fewer sturgeon interactions; a closure and lack of overnight soak which is necessary in Delmarva is problematic; economic impact should be balanced with

protected species impacts. Applicable to NJ as well because observer data from Delmarva can serve as a proxy for NJ.

Discussion on the motion: There was support for this motion, however, one Dogfish Committee member was concerned that no overnight soaks would not be workable in Delmarva area, though may be workable in NJ. He noted this seems to be very region-specific and he's concerned that further action may be needed in the next Biological Opinion. Another member expressed concern about a prohibition of overnight soaks for five months and that it will substantially negatively impact the dogfish fishery. One Committee member asked how this motion differs from the FMAT/PDT recommendation. Staff noted that the FMAT/PDT did not recommend an exemption for overnight soaks for the smaller mesh in NJ due to limited observer data in the area and Council staff (not yet vetted by the FMAT/PDT) recommend the Committee carefully consider no exemption for the Delmarva region for the smaller mesh in December, when sturgeon takes/observed trip was highest. Another Committee member appreciated the exemption for the smaller mesh and thought the benefit to sturgeon would likely extend beyond the polygon boundaries (since fishermen cannot switch gillnet gear mesh easily).

Public Comment:

- **Chris Rainone, NJ monkfish fishermen, monkfish advisor:** Expressed concern that fishermen are going to use smaller mesh as a result of this exemption in order to avoid the overnight soak prohibition. He also asked what happens if the measures from this Council action are not sufficient for the new Biological Opinion.

One Committee member commented that the smaller mesh does benefit sturgeon, however, there are still sturgeon interactions, including juveniles like what is observed in North Carolina. If additional bycatch reduction measures are needed then this could be done through the Councils again or via NMFS.

Motion passed 11/1/2.

Dogfish Committee	Yes	No	Abstain
Sonny Gwin (Chair)	x		
Chris Batsavage		x	
<i>Dan Farnham</i>	x		
Skip Feller	x		
Joseph Grist	x		
Richard Wong	x		
Adam Nowalsky	x		
Jay Hermsen			x
Toni Kerns			x
Nichola Meserve (Vice Chair)	x		
Mark Alexander	x		
Rick Bellavance	x		
Dan Salerno	x		
<i>Alan Tracy</i>	x		

2. Monkfish Motion (Odell/Farnham): Monkfish Committee recommends that the Councils adopt Alternative 5 (year-round low-profile gear requirement in NJ bycatch hotspot polygon) as the preferred alternative.

Rationale: This follows the recommendations of the FMAT/PDT and recommendations of the advisors. Need to think more about the time/area closures and economic impacts to the monkfish fishery and the impacts on sturgeon. Need additional information on the stock assessment and the new Biological Opinion before proceeding with additional measures. Based on the Decision Support Tool analysis and how time/area closures could shift effort into areas important for other protected species (e.g., North Atlantic Right Whales), do not recommend closures at this time.

Discussion on the motion: One member supported the motion as it struck a good balance between minimizing economic impacts to the monkfish fishery and reducing impacts to sturgeon and does not include time/area closures which may push effort into important North Atlantic right whale habitat. Regarding a follow-on action for the states (once the Council action is complete), the Commission representative clarified that any action the Commission undertakes will be for the spiny dogfish fishery and not the monkfish fishery, given monkfish is not a species managed by the Commission.

If a future action is needed based on the new Biological Opinion, the Councils or NOAA could work on this. One member wanted the Councils to be involved in this process should another action be needed and NOAA leads this effort. Once the next Biological Opinion is published, a final determination will be made on sturgeon status and the impact to fisheries. The Reasonable and Prudent Measures from any Biological Opinion are typically less rigid from a non-jeopardy finding compared to Reasonable and Prudent Alternatives.

There was a brief discussion on the terms and references for the upcoming stock assessment. Ms. Kerns sent Council staff the document with this information, after which staff send to the full Committee for their awareness.

Public Comment:

- Jamie Dopkin, NJ monkfish fishermen, monkfish advisor:** Expressed interest in conducting research on alternative gear types, namely different mesh sizes (12” vs 13”) and twine sizes, to understand how monkfish and skate catch change along with sturgeon interactions. He noted that skate possession limits recently increased and that fishing using low-profile gear may be counter-productive if he can’t catch enough skates. He commented that if sturgeon are able to break through the lighter twine size then it’s likely harbor porpoises can as well.

One Committee member asked about the research recommendations the Councils approved in fall 2023. These included additional low-profile gear research as potential management measures, including in Southern New England for the monkfish fishery and the Mid-Atlantic region in the spiny dogfish fishery. This is likely broad enough to encompass research on different mesh sizes.

- Ted Platz, southern area monkfish fishermen, monkfish adviser:** Agreed with Committee members on the need to balance the socioeconomic impacts to the monkfish fishery and the need to reduce sturgeon interactions. He expressed concern that the observer data are not by individual DPS and that this information is needed for future management decisions.

Motion passed 9/0/0.

Monkfish Committee	Yes	No	Abstain
Matt Gates (Chair)			
Eric Hansen	x		
Kelly Whitmore	x		
Jackie Odell	x		
Scott Olszewski	x		
John Pappalardo	x		
Alan Tracy	x		
Pete Christopher	x		
Peter Hughes (Vice-Chair)	absent		
Dan Farnham	x		
Robert Ruhle	x		
Paul Risi	absent		

Other business

One Committee member asked how to address the double counting of dead sturgeon discards by observers.

CONSENSUS STATEMENT

The joint Monkfish and Dogfish Committee recommends to both the New England and Mid-Atlantic Councils to write a letter to NOAA NEFSC observer program to develop and implement a carcass tagging program for dead sturgeon discards similar to sea turtles and marine mammals as well as include a tagging program for live sturgeon discards. This would apply to any fishery where sturgeon are caught regardless of gear type, area, etc.

Rationale: This type of program would help prevent the possibility of double-counting individual observed sturgeon takes.

Discussion on the Consensus Statement: For dead marine mammals and sea turtles, the carcass is usually tagged by observers so if the animal is observed again in the near future that the observer knows this take has already been accounted. Observers can scan for pit tags but cannot implant the tags. Staff noted that the 2021 Biological Opinion included a recommendation to this effect. There was a brief discussion on which fisheries the consensus statement would apply to, noting that the Councils may not necessarily have jurisdiction.

Public Comment:

- **Chris Rainone, NJ monkfish fishermen, monkfish advisor:** Suggested expanding to include both live and dead discard tagging to track the species more. For example, use of spaghetti tags for live sturgeon by observers.
- **Patrick Duckworth, monkfish fishermen, monkfish adviser:** Reiterated that he caught a dead sturgeon and then re-caught the same one a few days later and that this is an urgent issue that needs to be addressed.

Consensus statement with one abstention from NMFS.

The meeting adjourned at approximately 1pm.



MEETING SUMMARY

Joint Monkfish and Dogfish Advisory Panel

Webinar

March 5, 2024, 1 pm – 5 pm

The Monkfish and Dogfish Advisory Panel (AP) met jointly on March 5, 2024, via webinar to:

- 1) review the Sturgeon Framework alternatives, 2) review the preliminary impact analyses; 3) review the recommendations from the Fishery Management Action Team/Plan Development Team (FMAT/PDT); 4) make recommendations on any preferred alternatives for the Joint Committee to consider during their March 13th meeting; and 5) Other business

MEETING ATTENDANCE:

Dogfish Advisory Panel: James Fletcher, Jeremy Hancher, Scott MacDonald, Roger Rulifson, John Whiteside, Mark Sanford, Christopher Rainone*, Samuel Martin, Kevin Wark, Shah Amir

Monkfish Advisory Panel: Ted Platz, Terry Alexander, Bonnie Brady, James Dopkin, Patrick Duckworth, Timothy Froelich, Linda Hunt, Samuel Martin, Randall Hayes Morgan

*Advisor is on both APs

Council Staff: Jason Didden (MAFMC), Jenny Couture (NEFMC), Robin Frede (NEFMC), and Karson Cisneros (MAFMC)

Others in attendance: Lynn Lankshear, Chris Batsavage, Matt Gates, Scott Olszewski, Eric Reid, Tara McClintock, Conor Davis, Janice Plante, James Boyle, Jesse Hornstein, Sefatia Romeo Theken, Aubrey Church, Mark Alexander, Jackie Odell, Joe Grist, Kelly Whitmore, Nichola Meserve, Jason Boucher, Michelle Duval, Tyler Guteres, Wes Townsend, Emerson Hasbrouck, Robert Elsey, and two other members of the public on the phone.

SUPPORTING DOCUMENTATION: Discussions were aided by the following documents and presentations: **(1)** Meeting overview memo; **(2)** Agenda; **(3)** Presentation, Council Staff; **(4)** Draft Framework Adjustment; **(5)** Sturgeon Bycatch Fishery Management Action Team/Plan Development Team DRAFT meeting summary, February 22, 2024; **(6)** Sturgeon Risk Assessment (Closures) Final Report, February 20, 2024; **(7)** BREP proposal narrative for low-profile gear; and **(8)** correspondence. Meeting materials are available on the MAFMC website: <https://www.mafmc.org/council-events/2024/march-5/joint-dogfish-monkfish-ap>.

KEY RECOMMENDATIONS:

Note that the following advisor recommendations are not necessarily consensus statements.

MONKFISH

- For New Jersey, advisors supported Alternative 5 (year-round low-profile gear requirement) if action must be taken.
- For Southern New England, advisors did not support any closure alternatives and felt that there needed to be more options other than closures. If closures are deemed absolutely necessary to reduce sturgeon interactions, the same or better results would be achieved with fewer economic impacts to the monkfish fishery by avoiding the times of the year included in the range of alternatives, specifically April and May, and implementing a closure in November as the most preferable option followed by December (less preferable). It's worth noting that a closure in June would also be economically detrimental to the fishery. Restrictions in the region should be discussed only after low-profile gear is tested in the area.
- Managers should wait for sturgeon stock assessment results before making any other recommendations.
- More research needs to be done related to 1) sturgeon tagging (passive acoustic monitoring) to better reflect accurate number of sturgeon takes (vs. retakes of the same sturgeon) in order to inform the new Biological Opinion and 2) additional gear modifications such as different mesh sizes and lighter twine sizes to reduce sturgeon interactions.

SPINY DOGFISH

- For New Jersey, one advisor felt the overnight soak prohibition would be workable.
- For the Delmarva region, several advisors supported the overnight soak exemption for smaller mesh (<5.25"). In this region, no overnight soaks would end the fishery and any months with overnight soak prohibitions should be considered a closure.
- Overall, advisors were concerned with putting people out of business since there are so few participants left and several advisors did not support any of the alternatives.
- Generally, advisors did not support any closures. One advisor noted that if a closure was needed, it should be done in October or early November south of Long Island.
- Nothing should be done until the results of the 2024 sturgeon stock assessment are available.
- More research needs to be done with lighter twine sizes and ways to enforce longer soak times for spiny dogfish (for example a 23-hour maximum soak time requirement).
- A member of the public who uses 5.75" mesh communicated that October through April would be less problematic for an overnight soak ban in New Jersey related to his fishing including for smooth dogfish.

Questions:

Advisors asked several clarifying questions related to the analysis, process, and values presented in the meeting materials. One advisor asked how observed takes are extrapolated out to become total bycatch estimates to a specific fishery in the 2021 Biological Opinion. Staff provided a

general description of the model used to estimate takes and directed the advisor to the Sturgeon Biological Opinion and Sturgeon Action Plan for additional information and suggested talking offline about this as needed.

One advisor asked whether closing an area for spiny dogfish was considered eliminating the fishery in the southern regions because that is what the implications would be (the processor can not survive reductions in landings). Staff highlighted that the FMAT/PDT also discussed that the alternatives with time/area closures occur during the months that are the most critical for these fisheries and also only achieve a low reduction in sturgeon bycatch. Because of this, the FMAT/PDT recommended gear-only restriction measures for both fisheries (Alternative 5) instead of the time/area closures.

An advisor specifically asked why October and November were not considered for potential closures in the Southern New England (SNE) region. He felt that these months should be considered and that there may be less disruptive ways to achieve the same sturgeon bycatch reduction. The advisor would like to see the bycatch numbers for all months for the SNE region. Staff noted that the months identified for potential closures were generally the months with the highest observed sturgeon takes.

Another advisor asked whether data were reviewed on where male dogfish are located to focus the fishery there, instead of fishing for female dogfish, which he thought is where sturgeon interactions occur. Staff noted previous work on male/female spiny dogfish overlap times/areas could be used to consider measures in the future.

Discussion:

Overall, advisors commented on the need for improved evaluation of sturgeon abundance to understand the size of the sturgeon population. One advisor felt that the sturgeon population is a lot larger than is being reported by states or the surveys. A couple of advisors added that a specific survey targeting sturgeon needs to be conducted. Lastly, they felt that fishermen bear the brunt of the reductions when other threats to sturgeon such as vessel strikes and habitat degradation are contributing to their endangered status. Another advisor agreed that the trawl survey does not catch sturgeon well and did not feel it was a good tool for estimating sturgeon abundance. Staff did not know the sturgeon population estimate and individual survey results, however, provided the AP with a description of the surveys used in the most recent assessment and noted that the updated assessment will be completed summer 2024.

One advisor commented that the way observed takes are documented is problematic. He relayed an instance of catching a sturgeon that was dead, cutting its tail to mark it, then catching the same fish and had it count as taking two sturgeon by the observer. Staff noted that we can look at sturgeon condition and whether they were caught dead or alive, but otherwise are unsure how to address that potential issue. This advisor also raised concerns over the potential for shifting effort to where there are more right whales in the SNE region. This advisor supported no closures in SNE, however if closures must be implemented (given there are no gear modification options for SNE), the advisor would prefer consideration of October and November instead of December for closures. He added that there are very limited options in SNE and the time/area closure polygon is essentially where the fishery operates at any given time.

Multiple advisors recommended that there should be more tagging of sturgeon to generate more accurate population estimates and use the tagging data as validation for take estimates.

One advisor discussed that there are five distinct population segments (DPS) that have a wide range and movement within the range. He noted that observers collect genetic information and asked whether Council staff have this information available, further commenting that more work needs to be done in this area. Protected Resources Staff at GARFO responded that the preliminary genetic results are available from observer data collection, noting that fish from the Hudson River and Delaware River dominate the fish from the Mid-Atlantic Region, however there are fish from all of the DPSs.

One advisor stated that selecting no action is the best choice, especially given the results from the 2024 assessment are not yet available. He added that sturgeon need to be removed from the endangered species list and the stocks are healthy. However, given the legal requirement to reduce sturgeon interactions in the gillnet fisheries to meet the 2021 Biological Opinion requirements, Alternative 5 seems to be the only workable option. The advisor added that when fishermen lose access it is never given back.

Another advisor agreed that Alternative 5 (gear-only modifications) is the only alternative that provides a balance between a reduction in sturgeon bycatch and the successful operations of the monkfish and spiny dogfish fisheries per the Action Plan. For a low-profile gillnet, he added that there needs to be more emphasis on 12-inch mesh with finer twine (versus the 13-inch mesh size) because fishermen still need to catch monkfish/skate. The advisor added that further gear modifications such as a lighter twine size should be researched before any measures are implemented. Other advisors agreed with this recommendation. For soak time restrictions, he felt that a 24-hour maximum should be considered instead of no overnight soaks. Lastly, this advisor reiterated the importance of no closures. Staff noted a 24-hour soak restriction was not feasible for action at this time due to the current alternative range based on input from enforcement regarding enforceability of a 24-hour maximum soak time.

An advisor said that twine size research should be explored for both the dogfish and monkfish fisheries and felt that the dogfish fishery in Virginia using smaller mesh ($\leq 5.5''$) have fewer interactions with sturgeon. He added that a prohibition of overnight sets in this area would end the fishery. He also agreed with previous comments that measures should be decided after the results of the sturgeon stock assessment are available.

One advisor reiterated that a 23-hour soak time restriction for New Jersey would be better than no overnight soaks and felt that this could be enforceable (nets would be out for an hour for enforcement checks, achieving a less than 24-hour soak time in practice). Another advisor said that no overnight soaks in New Jersey for dogfish would be doable for him.

An advisor spoke in favor of gear modifications in general because he is against closures. If closures are necessary, closing October and early November are preferred over closing December in Southern New England. He felt that if a closure is needed, the timing of the closure should be up to the people who fish because they know when the sturgeon interactions occur. The advisor added that when there was a sturgeon fishery, the season was in October or November which is when the sturgeon migrated further offshore.

One advisor commented that a lot of takes in the Virginia area occurred in state waters, specifically at the mouth of Chesapeake Bay, and asked what will be done in state waters to

reduce sturgeon bycatch. Staff responded that the Atlantic States Marine Fisheries Commission plans to consider complementary action following final action from the Councils. This advisor added that the sturgeon takes are from vessels fishing larger mesh sizes (≥ 6 inches) and that fishermen generally avoid areas where there are a lot of sturgeon. He agreed with other advisors that action should be taken only after the stock assessment results are available, and that closures are going to ruin the fishery.

One advisor recommended changing the exemption for smaller mesh sizes to ≤ 5.25 " for Virginia because there is variability in the manufacturing of the webbing which does not consistently measure 5". He added that he didn't want to see any restrictions and said that if the Virginia dogfish fishery closes, a lot of people will be out of work. Staff noted there did not seem to be much gear used at 5.25 inches, and 5.5 inches had more sturgeon catch than 5.0 inches, so the measure was set up as < 5.25 inches rather than less than or equal to 5.25 inches.

Lastly, an advisor stated that he represents the last dogfish processor, and the processor can't take a cut to the quota or a reduction in landings and added that this action is essentially a backdoor way of reducing the quota. The advisor also supported all of the concerns voiced by other advisors and felt that the minimum possible cuts is what should be accepted by the Councils.

Public Comment:

Robert Elsey who fishes for monkfish from Sandy Hook to Cape May commented that there are only about 8 boats left fishing for monkfish in NJ and how could so few boats be impacting the sturgeon population so much. He added that if fishermen move off the beach they will not catch as many sturgeon. From the few sturgeon that are caught, 90% are caught on the shoreline. He said there is a need to leave the nets overnight to catch enough target species and noted that he sleeps with his nets out and guards them in the summer months. His main income comes from sand sharks (e.g., smooth dogfish) in June, which requires a longer soak time (using a 5.75" mesh). Sturgeon migrate in the fall, so he can continue fishing and avoid sturgeon even if the nets are pulled off the beach.

The meeting adjourned at 5pm.



Joint¹ Sturgeon FMAT²/PDT³ Meeting Summary

February 22, 2024 Webinar

The joint Sturgeon FMAT/PDT met on February 22, 2024, via webinar. The purposes of this meeting were to 1) review the additional sub-alternatives added by the MAFMC, 2) review the draft impact analyses, and 3) develop FMAT/PDT recommendations for the Joint AP and Joint Committee to consider. The meeting was open to the public.

FMAT/PDT Attendees: Jason Didden (MAFMC), Jenny Couture (NEFMC), Robin Frede (NEFMC), Jason Boucher (NEFSC), Spencer Talmage (GARFO SFD), Bridget St Amand (NEFSC), Lynn Lankshear (GARFO PRD), Sharon Benjamin (GARFO NEPA), Ashleigh McCord (GARFO NEPA), and James Boyle (ASMFC).

Other Attendees: Invited member from GARFO APSD Daniel Hocking; NEFMC members Eric Reid, Scott Oszewski, Nichola Meserve and Kelly Whitmore; MAFMC member Joe Grist; NEFMC staff David McCarron; GARFO PRD staff Danielle Palmer; and about 10 members of the public.

1. **Gear sub-alternatives:**

The FMAT/PDT discussed the new sub-alternatives added by the MAFMC during their February meeting, which includes exemptions for vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters during the times of the year currently specified in the set of alternatives. More specifically:

Sub-alternative 5a: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the New Jersey polygon overnight soak time prohibition.

Sub-alternative 5b: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the Delaware/Maryland/Virginia (Delmarva) polygon overnight soak time prohibition.

FMAT/PDT members discussed the need for considering additional observer data analyses, but initial review suggests that there are fewer sturgeon interactions with the smaller mesh size (5" mesh) in the Delmarva area. For the New Jersey area, there may be too few small mesh trips with sturgeon takes to say anything meaningful regarding the effect of smaller mesh size on rates of sturgeon interaction. Council staff plan to further evaluate observer data on trips with and without sturgeon interactions by mesh size.

¹ This is a joint action of the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC)

² FMAT = Fishery Management Action Team

³ PDT = Plan Development Team

Staff noted that the MAFMC also discussed adding a requirement to use low-profile gear in the Southern New England polygon, however, after much discussion, this was not added to the alternatives.

2. Review of Draft Impact Analyses

Council staff reviewed the Decision Support Tool (DST) analyses along with the sturgeon risk analysis which are being used to evaluate the impact of time/area closures on gear displacement and removal. Daniel Hocking provided an overview of the risk assessment for the FMAT/PDT noting that the model is spatially implicit and is based on observer data that is used to estimate unobserved VTR trips (by spatially interpolating individual VTR locations and smoothing between these points). This model is the same one used since 2011 to estimate sturgeon takes and Dr. Hocking noted that the model fits observer data fairly well. He also commented that there were observed sturgeon interactions in deeper water, though less common, which likely led to the unexpectedly diffuse sturgeon risk. Dr. Hocking's final report was recently made available and will be included as part of the Council framework and will also be distributed to the AP and Committee.

Public: Chris Rainone asked how the DST works and whether there were any differences in sturgeon takes inshore versus offshore. Dr. Hocking explained that the time/area closures were evaluated using a maximum distance that someone would be willing to move from the current fishing location to a new fishing location outside of the proposed closed area. 20 and 50 miles were used as two scenarios for which gear would be displaced; the DST group heard from a few industry members that 20 miles is likely more representative of the distance fishermen would be willing to travel to continue fishing outside of any closure. Regarding sturgeon interaction differences, Dr. Hocking explained that there were fewer takes offshore in deeper waters but that those interactions still occurred. Most of the reduction in sturgeon interactions is from gear being removed from the water versus being displaced outside a closure.

Staff also shared preliminary DST results for the gear modification alternatives. These results are still being finalized and will be shared with Dr. Hocking to be used in his sturgeon risk assessment analysis. These results are expected by the March Committee meeting.

A few FMAT/PDT members discussed whether these DST and sturgeon risk assessment analyses account for sturgeon seasonal movement where sturgeon are further offshore in the ocean environment in the winter, all within the 50 m contour line with most within the 20 m contour line. The fish then travel further south towards inshore waters and up the coast into estuaries in the spring and summer. There are several references noting these seasonal movements that should be used to help interpret the sturgeon risk assessment results. More specifically, any time/area closures off New Jersey and Delmarva regions that cause effort to move north or south are likely to have a similar level of risk of sturgeon interaction relative to the closed areas. However, if effort shifts in deeper waters during the spring, for example, then the literature would suggest there would be reduced risk of sturgeon interaction because the sturgeon are thought to be more nearshore during this season.

The team also briefly discussed the low-profile gear configuration which includes 0.81 mm twine size, which is at conflict with the Harbor Porpoise Plan Take Reduction Team's (TRT) requirement of 0.90 mm twine size. The TRT received the Councils' letter which requested an exemption of this lighter twine size. The process just began and the TRT will likely only raise this issue during their March meeting. In order for low-profile gear to be included as part of the

proposed rule (if the Councils select this as part of their final action package), the TRT must be far enough along in their process to signal that this lighter twine size would be acceptable. The low-profile gear requirement includes a delay in implementation to allow the TRT process to play out and to allow gear manufacturers to produce the gear.

The new Biological Opinion (BiOp) is expected to be published by January 2025 (absent any extensions), with preliminary versions available before then, though drafts may or may not be publicly available. The new BiOp will include the Council action as the baseline for the assessment and will include the results of the sturgeon stock assessment (expected to be completed summer 2024), and any other new information.

Public: Chris Rainone asked about the data included within the Human Communities Impacts analysis and whether the total number of permits are active permits or include latent permits as well. These are permits where a vessel landed > 0 lb of the target species in the relevant area, thus, active permits in that regard. The member of the public was concerned about the magnitude of latent fishing effort in the skate fisheries and its contribution to protected species issues and fishing regulations, etc.

3. FMAT/PDT Recommendations

Each FMAT/PDT member discussed their input on the range of alternatives and what he/she would recommend to the AP and Committee to consider during their deliberations of selecting a preferred alternative. The group was interested in striking a balance between achieving sufficient sturgeon interaction reduction without having too much of an impact on the fishing industry and other protected species (especially North Atlantic right whales). A few individual comments are detailed below:

- One person was interested in better understanding the smaller mesh exemption sub-alternatives and if there is one month with a higher ratio of sturgeon takes on observed trips; if so, he recommended against potentially allowing the smaller mesh to be exempt from overnight soak prohibition during this month and allowing the exemption in other months where the ratio of sturgeon takes was lower.
- Another member noted that she wanted to see as much sturgeon reduction as possible because if sufficient reduction is not achieved through this Council action, then that would likely be a gamble given the new BiOp will use the Council action as the baseline condition. She noted that the results of the sturgeon assessment are not yet known, however, it has been 12 years since sturgeon was listed under the ESA and large mesh fisheries are responsible for many sturgeon interactions.
- Several members were interested in gear modifications as the potential way forward, noting that there is some uncertainty in impacts on reducing sturgeon interactions. There is ongoing low-profile gear research funded by the Bycatch Reduction Engineering Program that will help inform use of this gear in other areas; the results will not be ready in time for this Council action but could inform future work.
- One member expressed concern over negatively impacting fishermen and the impact to the observer program given she has heard reports that fishermen do not want observers on board if that will lead to additional closures.
- Another member suggested the Councils recommend NEFSC evaluate the impacts on observer coverage of adding Atlantic sturgeon to the Standardized Bycatch Reporting

Methodology (SBRM) to help ensure there is sufficient observer coverage. The prior sturgeon stock assessment noted that there is a need for increased monitoring of this species, however, observer coverage has declined in recent years in some important areas/gears.

The FMAT/PDT made the following recommendation for the AP and Committee to consider during their upcoming March meetings:

Of the options available, Alternative 5, the gear-only package appears to be the most reasonable. A partial exemption from the Delmarva overnight soak prohibition for gear less than 5.25” seems preliminarily supported by observer data. There were insufficient trips available to evaluate any potential exemptions for New Jersey, thus, the FMAT/PDT does not recommend any exemptions for this smaller mesh in this area. The FMAT/PDT is evaluating the monthly ratio of takes to observed trips in the Delmarva area to further inform a potential exemption for the Delmarva overnight soak prohibition for gear less than 5.25”. Most likely this could entail an exemption for months where sturgeon take rates are lower and a recommendation to not exempt the month with the highest rate of sturgeon takes per observed trip in the Delmarva area. Generally, more research needs to be done to understand sturgeon bycatch and how to reduce sturgeon interactions – it is uncertain if the next Biological Opinion will trigger the need for additional measures regardless of the current action. The group also recognized the need to avoid shifting fishing effort from any time/area closures to important North Atlantic Right Whale habitat. The FMAT/PDT discussed potentially revisiting their recommendation following AP input.

Public:

- Chris Rainone appreciated the work of the FMAT/PDT and agreed that Alternative 5 gear-only package is a good first step in reducing sturgeon interaction. He recommended addressing the latent fishing effort issue in the skate fishery.
- James Fletcher asked whether this Council action is focused on reducing sturgeon interactions or mortality and he noted that large sturgeon have the most eggs and are most likely going to survive in the gillnet nets. Council staff answered that the current Council action is focused on reducing sturgeon interactions but have heard that reducing mortality is also important and will likely be included in the new BiOp.

The Councils will hold a joint meeting of their Spiny Dogfish and Monkfish Advisory Panels on March 5, 2024, and will hold a Joint Spiny Dogfish and Monkfish Committee meeting on March 13, 2024, to develop recommendations for the Councils. Final action by both Councils is scheduled for April 2024.

If additional information is needed before the March Advisory Panel (March 5th) and Committee (March 13th) meetings and before the April MAFMC and NEFMC meetings, please call Jason Didden of MAFMC staff (302-526-5254), Jenny Couture of NEFMC staff (978-465-0492 x111), or Robin Frede of NEFMC staff (978-465-0492 x124). The briefing documents for the Council meetings will be available at their websites, <https://www.mafmc.org/>, and <https://www.nefmc.org/>.

The meeting ended at 4pm.

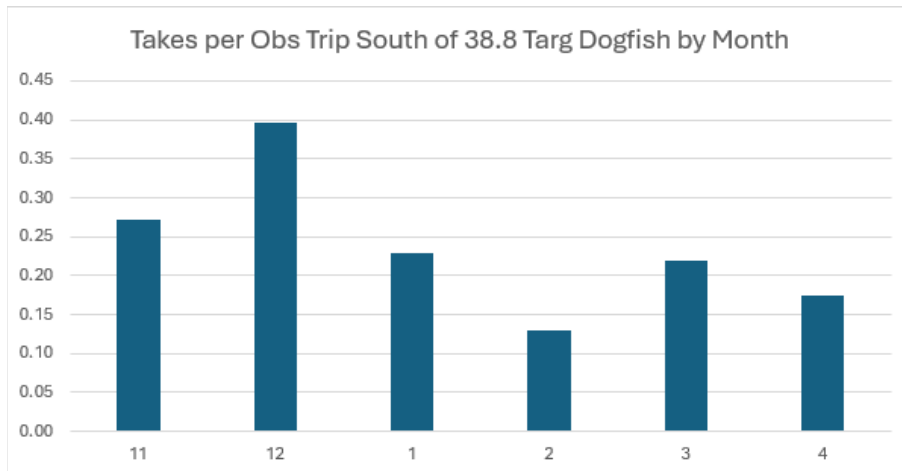


March 12, 2024 Staff Supplement to Joint¹ Sturgeon FMAT²/PDT³ Recommendation

In February 2024, the FMAT/PDT made the following recommendation for the AP and Committee to consider during their March meetings (underline added for this memo):

“Of the options available, Alternative 5, the gear-only package appears to be the most reasonable. A partial exemption from the Delmarva overnight soak prohibition for gear less than 5.25” seems preliminarily supported by observer data. There were insufficient trips available to evaluate any potential exemptions for New Jersey, thus, the FMAT/PDT does not recommend any exemptions for this smaller mesh in this area. The FMAT/PDT is evaluating the monthly ratio of takes to observed trips in the Delmarva area to further inform a potential exemption for the Delmarva overnight soak prohibition for gear less than 5.25”. Most likely this could entail an exemption for months where sturgeon take rates are lower and a recommendation to not exempt the month with the highest rate of sturgeon takes per observed trip in the Delmarva area...”

Subsequent analyses of observer data indicate that December has recently had the most Atlantic sturgeon takes per observed trip when considering trips targeting spiny dogfish south of 38.8 N latitude (i.e. south of Delaware Bay). As will be presented to the Committee, during 2020-2022, December spiny dogfish revenues into MD and VA averaged about \$276,000 (2nd most with January higher) and about 57% of those December revenues came from the Delmarva polygon hotspots. Staff recommend that the Committee carefully consider not exempting December from the Delmarva polygon overnight soak prohibition even if gear less than 5.25” is used (the overnight soak prohibition would not apply in other months if using less than 5.25” gillnet mesh). There was not time to fully confirm FMAT/PDT consensus on this recommendation with the updated data, but it is generally consistent with the initial FMAT/PDT recommendation.



¹ This is a joint action of the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC)

² FMAT = Fishery Management Action Team

³ PDT = Plan Development Team

Joint Framework Action to Reduce Sturgeon Bycatch in Monkfish and Spiny Dogfish Fisheries

Monkfish Framework Adjustment 15 Spiny Dogfish Framework Adjustment 6



Environmental Assessment

Draft (Version 2)

March 29, 2024

Prepared by the
New England Fishery Management Council and the
Mid-Atlantic Fishery Management Council
in consultation with the
National Marine Fisheries Service



Document history

Initial Meetings: April 18, 2023 (NEFMC)
June 7, 2023 (MAFMC)
Final Meetings Planned: April 10, 2024 (MAFMC)
April 17, 2024 (NEFMC)
Preliminary Submission: May X, 2024
Final Submission: X, 2024

Cover image

NOAA image

MONKFISH AND SPINY DOGFISH FISHERY MANAGEMENT PLANS
MONKFISH FRAMEWORK ADJUSTMENT 15
SPINY DOGFISH FRAMEWORK ADJUSTMENT 6

Proposed Action: Propose management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries to ensure compliance with the Endangered Species Act.

Responsible Agencies: New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

For Further Information: Cate O’Keefe, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, Massachusetts 01950
Phone: (978) 465-0492
Fax: (978) 465-3116

Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
Phone: (302) 526-5255
Fax: (302) 674-5399

Abstract:

The New England Fishery Management Council and the Mid-Atlantic Fishery Management Council, in consultation with NOAA Fisheries, have prepared Framework Adjustment 15 to the Monkfish Fishery Management Plan and Framework Adjustment 6 to the Spiny Dogfish Fishery Management Plan. This Environmental Assessment presents the range of alternatives to achieve the purpose and need of the action. The proposed action includes measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish gillnet fisheries. This document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives. This document also addresses other requirements of the National Environmental Policy Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

The New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC) jointly manage the monkfish and spiny dogfish fisheries under the Monkfish and Spiny Dogfish Fishery Management Plans (FMPs), with the NEFMC having the administrative lead on monkfish and MAFMC having the administrative lead on spiny dogfish. The FMPs have been updated over time through a series of amendments, framework adjustments, and fishery specification actions. For amendments and frameworks (other than frameworks that set specifications) both Councils must approve any alternatives.

This action, Monkfish Framework Adjustment 15 (FW15) and Spiny Dogfish Framework Adjustment 6 (FW6), considers alternatives that would set management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish gillnet fisheries (Table 1). These measures are necessary to reduce the incidental take of endangered Atlantic sturgeon and ensure compliance with the Endangered Species Act (ESA).

Under the provisions of the MSA, Councils submit proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce may approve, disapprove, or partially approve the action proposed.

This document describes a range of management alternatives (Section 4), the affected environment, which are defined as valued ecosystem components (VECs; Section 5), and the alternatives' expected impacts on the VECs (Section 6). The expected impacts of the alternatives on the VECs are derived from consideration of both the current conditions of the VECs and expected changes in fishing effort under each alternative.

Table 1. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. Methods and rationale for alternatives can be found in Section 4.0.

<i>Monkfish</i>	Polygon ¹	Measure	Time
Alternative 1	No Action		
Alternative 2	Southern New England	Closure	April 1 – May 31 & Dec. 1 – Dec. 31
	New Jersey	Closure	May 1 – May 31 & Oct. 15 – Dec. 31
		Low-profile gillnet gear	June 1 – Oct. 14 & Jan. 1 – April 30
			May 1 – May 31 & Dec. 1 – Dec. 31
Alternative 3	Southern New England	Closure	Dec. 1 – Dec. 31
	New Jersey	Closure	Dec. 1 – Dec. 31
		Low-profile gillnet gear	Jan. 1 – Nov. 30
Alternative 4	Southern New England	Closure	Dec. 1 – Dec. 31
	New Jersey	Closure	Nov. 1 – Nov. 30
		Low-profile gillnet gear	Dec. 1 – Dec. 31
Alternative 5	New Jersey	Low-profile gillnet gear	Year-round

<i>Spiny Dogfish</i>	Polygon ¹	Measure	Time
Alternative 1	No Action		
Alternative 2	New Jersey	Closure	May 1 – May 31 & Oct. 15 – Dec. 31
	DE / MD / VA	Closure	Nov. 1 – March 31
Alternative 3	New Jersey	Closure	Nov. 1 – Dec. 31
		Overnight soak prohibition	May 1 – May 31
	DE / MD / VA	Closure	Dec. 1 – Feb. 28
Alternative 4	New Jersey	Closure	Nov. 1 – Nov. 30
		Overnight soak prohibition	Dec. 1 – Dec. 31 & May 1 – May 31
	DE / MD / VA	Closure	Dec. 1 – Jan. 31
Alternative 5	New Jersey	Overnight soak prohibition	May 1 – May 31 & Nov. 1 – Nov. 30
	DE / MD / VA	Overnight soak prohibition	Nov. 1 – March 31
Sub-Alt. 5a	New Jersey	Vessels using less than 5 ¼ inch gillnet mesh would be exempted from soak prohibition in Alt. 5	
Sub-Alt. 5b	DE/MD/VA		

¹Hotspot area polygons are mapped in sections 4.2 through 4.4.

2.0 TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY.....	5
2.0	TABLE OF CONTENTS.....	7
2.1	Tables.....	8
2.2	Figures.....	10
2.3	Maps.....	12
2.4	Acronyms and Wording Conventions.....	12
3.0	BACKGROUND AND PURPOSE	14
3.1	Background.....	14
3.2	Purpose and Need	15
4.0	ALTERNATIVES UNDER CONSIDERATION.....	16
4.1	Alternative 1 - No Action.....	21
4.2	Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions).....	22
4.3	Alternative 3 – Intermediate Impact Sturgeon Package.....	29
4.4	Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions).....	34
4.5	Alternative 5 – Gear-Only Sturgeon Package.....	39
4.6	Alternatives Considered but Rejected.....	44
5.0	AFFECTED ENVIRONMENT	45
5.1	Target Species.....	45
	Monkfish.....	45
	Spiny Dogfish	47
5.2	Non-target Species	49
	Monkfish Focus.....	49
	Spiny Dogfish Focus.....	52
5.3	Protected Resources	54
5.4	Physical Environment and Essential Fish Habitat	74
5.5	Human Communities	75
	Monkfish Focus.....	75
	Spiny Dogfish Focus.....	103
6.0	ENVIRONMENTAL IMPACTS OF ALTERNATIVES.....	111
6.1	Introduction.....	111
6.2	Impacts on Target Species	119
6.3	Impacts on Non-target Species	123

6.4	Impacts on Protected Resources	126
6.5	Impacts on Physical Environment and Essential Fish Habitat	141
6.6	Impacts on Human Communities.....	144
7.0	GLOSSARY	153
8.0	REFERENCES	159
9.0	APPENDICES	175
9.1	Appendix A – Additional Decision Support Tool Information.....	175
9.2	Appendix B – Final Report From Dr. Hocking.....	187
9.3	Appendix C – January 2024 Take Estimate Update	193
9.4	Appendix D – Monkfish and Dogfish Landings Relative to Proposed Sturgeon Measure Areas	
	199	

2.1 TABLES

Table 1. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. Methods and rationale for alternatives can be found in Section 4.0.....	5
Table 2. Purpose and need for Monkfish Framework Adjustment 15 and Spiny Dogfish Framework Adjustment 6.	15
Table 3. Spiny Dogfish Observer Coverage Summary.	20
Table 4. Monkfish Observer Coverage Summary.....	21
Table 5. Gillnet configurations used and sturgeon bycatch and target species catch results in Fox et al 2011, 2012, 2013, and 2019.	28
Table 6. Takes by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.	40
Table 7. NEFSC trawl survey multipliers for monkfish from the last three assessments.	47
Table 8. Species protected under the ESA and/or MMPA that may occur in the monkfish fishery affected environment.....	57
Table 9. Large whale occurrence, distribution, and habitat use in the affected environment.	62
Table 10. Small cetacean occurrence and distribution in the monkfish fishery affected environment.....	64
Table 11. Pinniped occurrence and distribution in the monkfish fishery affected environment.....	66
Table 12. Small cetacean and pinniped species incidentally injured and/or killed by Category I sink gillnet fisheries or Category II bottom trawl fisheries operating in the affected environment of the monkfish fishery and/or the spiny dogfish fishery.	73
Table 13. Monkfish permit categories.	76
Table 14. Fishing vessels with federal monkfish permits, with number of vessels landing over 1 lb and 10,000 lb, FY 2012-2021.	76

Table 15. Proportion of monkfish landings by permit category to total monkfish landings in the year, FY 2012-2021.....	77
Table 16. Year-end monkfish annual catch limit (ACL) accounting, FY 2017-2021.	77
Table 17. Recent landings (whole/live weight, mt) in the NFMA and SFMA compared to target TAL....	80
Table 18. Landings by gear type (mt), CY 2012-2021.	81
Table 19. Discards by gear type (mt), CY 2012-2021.	82
Table 20. Total monkfish revenue, CY 2005 – 2021.....	84
Table 21. Monkfish revenue and revenue dependence on trips where over 50% of revenue is from monkfish, CY 2011 – 2021.	84
Table 22. Landings and revenue dependence from monkfish and other fisheries on trips where a Monkfish DAS was used, FY 2021.	85
Table 23. Monkfish DAS usage, combined management areas and all vessels with a limited access monkfish permit, FY 2019 – FY 2021.	86
Table 24. Monkfish landings and total number of vessels and trips by trip declarations (plan code) and DAS used, average across FY 2019 and FY 2021. Orange highlights indicate trips where monkfish was landed without a monkfish DAS.	88
Table 25. NFMA FY 2020-2022 monkfish limited access possession limits while fishing on a monkfish DAS.	90
Table 26. SFMA FY 2020-2022 monkfish limited access possession limits while fishing on at least a monkfish DAS.	90
Table 27. Monkfish incidental possession limits by management area, gear, and permit category. Source: GARFO.	92
Table 28. Monkfish landings (lb, whole weight) under and over incidental trip limits while using and not using a Northeast Multispecies DAS, by permit category, FY 2021.....	94
Table 29. Primary and secondary ports in the monkfish fishery.....	97
Table 30. Fishing revenue (unadjusted for inflation) and vessels in top Monkfish ports by revenue, calendar years 2010 – 2019.	98
Table 31. Changes in monkfish fishery engagement over time for all ports with high engagement during at least one year, 2006 – 2020.	99
Table 32. Monkfish landings by state, CY 2012 – 2021.....	100
Table 33. Social vulnerability and gentrification pressure in monkfish ports, 2019.	102
Table 34. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2020-2022 fishing years.	109
Table 35. Commercial Spiny Dogfish landings (live weight – millions of pounds) by months for 2020-2022 fishing years.	109
Table 36. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2020-2022 fishing years.	109
Table 37. Vessel participation over time in the Spiny Dogfish Fishery based on annual landings (pounds). Note: State-only vessels are not included.....	110
Table 38. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline)...	111

Table 39. Alternative 2 DST results for a 20-mile maximum gear replacement.	115
Table 40. Alternative 2 DST results for a 50-mile maximum gear replacement.	116
Table 41. Alternative 3 DST results for a 20-mile maximum gear replacement.	116
Table 42. Alternative 3 DST results for a 50-mile maximum gear replacement.	117
Table 43. Alternative 4 DST results for a 20-mile maximum gear replacement.	117
Table 44. Alternative 4 DST results for a 50-mile maximum gear replacement.	118
Table 45. Expected percent reduction of Atlantic Sturgeon takes by federally-permitted vessels using gillnet gears under various actions and behavior (max movement distance) scenarios. Action 1 is ‘no action’ and other alternatives not involving closures are also not listed.	119
Table 46. Harbor Porpoise Take Reduction Plan measures in relevant Management Areas.	130
Table 47. Number of sturgeon caught alive and dead based on soak time duration in gillnet gear ≥ 5 - < 7 - inch mesh and < 5 -inch mesh with spiny dogfish as the target species. <i>Data source: observer data pulled Jan. 2024.</i>	137
Table 48. Alternative 2 – max distance 20.	176
Table 49. Alternative 2 - max distance 50.	178
Table 50. Alternative 3 - max distance 20.	180
Table 51. Alternative 3 - max distance 50.	182
Table 52. Alternative 4 - max distance 20.	183
Table 53. Alternative 4 - max distance 50.	184

2.2 FIGURES

Figure 1. Sturgeon bycatch hotspots in the monkfish fishery; shown as quarter degree squares due to data confidentiality.	17
Figure 2. Sturgeon bycatch hotspots in the spiny dogfish fishery; shown as quarter degree squares due to data confidentiality.	18
Figure 3. All sturgeon bycatch hotspot polygons for the monkfish and spiny dogfish fisheries.	19
Figure 4. NMFS Statistical Areas.	21
Figure 5. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.	23
Figure 6. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.	24
Figure 7. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.	25
Figure 8. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.	30
Figure 9. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.	31
Figure 10. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.	32

Figure 11. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.	35
Figure 12. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.	36
Figure 13. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.	37
Figure 14. Sturgeon take rates by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.	40
Figure 15. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.	41
Figure 16. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.	42
Figure 17. Time series of spawning output 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold.	48
Figure 18. Time series of fishing mortality 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold.	49
Figure 19. Total Estimated Gillnet Takes.	56
Figure 20. ABC, TAL, landings, and discards (mt), 2011-2021.	83
Figure 21. Monthly monkfish price (\$2021) per live pounds, 2010 – 2021.	85
Figure 22. Frequency of monkfish DAS use by vessels allocated monkfish DAS, FY 2019 and FY 2021 average.	87
Figure 23. Frequency of trip landings while using both a monkfish and Northeast Multispecies DAS, FY 2021.	91
Figure 24. Frequency of monkfish landings per Northeast Multispecies DAS in the NFMA for permit categories C and D, FY 2021.	93
Figure 25. Frequency of trip discards per NE Multispecies DAS, by permit category, FY 2021.	95
Figure 26. Discards as a function of landings (lb, whole weight), per NE Multispecies DAS in FY 2021.	95
Figure 27. Spiny Dogfish Catches 1924-2022.	104
Figure 28. U.S. Spiny Dogfish Landings and Quotas 2000-2023 fishing years.	105
Figure 29. Spiny Dogfish Ex-Vessel Revenues 1995-2022 fishing years, Nominal Dollars.	105
Figure 30. Ex-Vessel Spiny Dogfish Prices 1995-2022 Adjusted to 2022 Dollars.	106
Figure 31. U.S. Preliminary spiny dogfish landings; 2023 fishing year in dark blue, 2022 in yellow-orange.	107
Figure 32. Survey and VTR Spiny Dogfish Catches 2010-2021 – Assessment – Jones 2022 Working Paper available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php	108
Figure 33. Current gillnet gear density for monkfish and dogfish based on VTR and VMS data from 2017-2020, compiled by DST team.	112
Figure 34. Current gillnet gear density for monkfish based on VTR and VMS data from 2017-2020, compiled by DST team.	113

Figure 35. Current gillnet gear density for dogfish (data do not differentiate between spiny and smooth dogfish), based on VTR and VMS data from 2017-2020, compiled by DST team.....	113
Figure 36. North Atlantic right whale habitat relative to Southern New England bycatch polygon (closest to shore) and the South Island Restricted Area (further offshore).....	128
Figure 37. Harbor Porpoise Take Reduction Plan Areas overlapping and adjacent to the proposed sturgeon bycatch polygons.	129
Figure 38. Atlantic Large Whale Take Reduction Plan Gillnet Management Areas overlapping the proposed Southern New England and New Jersey sturgeon bycatch polygons.	131
Figure 39. Observed Atlantic sturgeon caught in gillnet gear ≥ 5 - < 7 -inch mesh and < 5 -inch mesh with spiny dogfish as the target species (sturgeon condition as alive, dead, or unknown) for 2017-2019 and 2021-2022. <i>Data source: Observer data pulled Jan. 2024.</i>	137
Figure 40. Alternative 2 – max distance 20	175
Figure 41. Alternative 2 - max distance 50	177
Figure 42. Alternative 3 - max distance 20	179
Figure 43. Alternative 3 - max distance 50	181
Figure 44. Alternative 4 - max distance 20	182
Figure 45. Alternative 4 - max distance 50	183

2.3 MAPS

Map 1. Fishery statistical areas used to define the Monkfish NFMA and SFMA.	46
--	----

2.4 ACRONYMS AND WORDING CONVENTIONS

“	inches
ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual catch target
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
BOEM	Bureau of Offshore Energy Management
CFR	Code of Federal Regulations
CV	coefficient of variation
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DAS	Days at Sea
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973

F	Fishing Mortality Rate
FMP	Fishery Management Plan
FR	Federal Register
GB	Georges Bank
GOM	Gulf of Maine
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
MT (or mt)	Metric Tons (1 mt equals about 2,204.62 pounds)
MTA	Management Track Assessment
NE	Northeast
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NFMA	Northern Fishery Management Area
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Level
OY	Optimum Yield
PBR	Potential Biological Removal
RTA	Research Track Assessment
SFMA	Southern Fishery Management Area
SSC	Scientific and Statistical Committee
TAL	Total allowable landings
U.S.	United States
VTR	Vessel Trip Report

3.0 BACKGROUND AND PURPOSE

3.1 BACKGROUND

All five Atlantic sturgeon distinct population segments (DPS) in the United States are listed as endangered or threatened under the Endangered Species Act (ESA). The primary threats to these DPSs are entanglement in fishing gears, habitat degradation, habitat impediments, and vessel strikes.

On May 27, 2021, NOAA's National Marine Fisheries Service (NMFS) issued a Biological Opinion (Opinion) on the authorization of eight federal fishery management plans (FMPs), two Interstate Fishery Management Plans (ISFMPs) and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2. The eight FMPs considered are the: Atlantic Bluefish; Atlantic Deep-sea Red Crab; Mackerel, Squid, and Butterfish; Monkfish; Northeast Multispecies; Northeast Skate Complex; Spiny Dogfish; and Summer Flounder, Scup, and Black Sea Bass FMPs. The Opinion evaluated the effects of the action on ESA-listed species, including all five DPS of Atlantic sturgeon, and designated critical habitat.

Section 9 of the ESA prohibits the take, including the incidental take, of endangered species. Pursuant to section 4(d) of the ESA, NMFS has issued regulations extending the prohibition of take, with exceptions, to certain threatened species. NMFS may grant exceptions to the take prohibitions with an incidental take statement (ITS) or an incidental take permit issued pursuant to ESA section 7 and 10, respectively. Take is defined as "to harass, harm, pursue, hunt, shoot, capture, or collect, or to attempt to engage in any such conduct."

The ESA defines incidental take as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), incidental take is not considered to be prohibited under the ESA provided that it is in compliance with the terms and conditions of an ITS. The 2021 Opinion includes an ITS which specifies the level of incidental take of Atlantic sturgeon anticipated in the federal fisheries and defines reasonable and prudent measures (RPMs) and implementing terms and conditions (T&C), which are necessary or appropriate to minimize impacts of the incidental take. The RPMs and T&Cs are non-discretionary and must be undertaken in order for the exemption to the take prohibitions to apply.

The RPMs/T&Cs of the Opinion included that NMFS convene a working group to review all the available information on Atlantic sturgeon bycatch in the federal large mesh gillnet fisheries and develop an Action Plan by May 27, 2022, to reduce Atlantic sturgeon bycatch in these fisheries by 2024. Additionally, the Opinion requires that this Action Plan include an evaluation of information available on post-release mortality, identification of data needed to better assess impacts, and a plan, including timeframes, for obtaining and using this information to evaluate impacts.

The Opinion did not specify the extent of bycatch reduction that must occur as a result of this Action Plan. However, RPMs are those actions that are necessary or appropriate to minimize impacts (i.e. amount or extent) of incidental takes. As a result, measures must be developed that minimize impacts. However, ESA regulations specify that RPMs involve only a minor change and be consistent with the basic design, location, scope, duration, or timing of the action, which in this case is the typical operation of the relevant fisheries.

The Working Group conducted a review of available information regarding Atlantic sturgeon distribution, bycatch in gillnet gear, bycatch mitigation, and post-release mortality. From this review, the working group produced the Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries, which recommended that the New England and Mid-Atlantic Fishery Management Councils

(Councils), in coordination with the National Marine Fisheries Service and the Atlantic States Marine Fisheries Commission, consider a range of potential measures to reduce Atlantic sturgeon bycatch in federal gillnet fisheries using large mesh gear, defined as greater than or equal to 7 inches. The Councils agreed to focus on spiny dogfish and monkfish because they are jointly managed, and the action plan identified these fisheries as two of the highest contributors to sturgeon bycatch in gillnet fisheries.

The Action Plan does not prescribe the measures that must be used, but provided recommendations based on the information available and considered on Atlantic sturgeon bycatch. These recommendations were: 1) Requirements to use bycatch mitigating low-profile gillnet gear; 2) reductions in soak time for gillnet gear; and 3) implementation of time/area measures, particularly gear restricted areas, in regions where Atlantic sturgeon bycatch is most common.

During the course of developing this action, the Councils were made aware that [new estimates \(Hocking 2023¹\)](#) showed the bycatch of Atlantic sturgeon in gillnet gear exceeded the level exempted in the ITS of the 2021 Opinion. Due to the ITS exceedance, NMFS reinitiated consultation as required by the Endangered Species Act (ESA) on eight Federal Fishery Management Plans (FMPs) on September 13, 2023. It should be noted that the updates also changed the estimates used to develop the exempted take levels in the ITS (all new information will be considered during the next Biological Opinion development). Regardless, the intent is for the resulting bycatch reduction measures in the Councils' action to be considered during the re-initiated consultation process to the extent feasible. [GARFO subsequently provided guidance](#) on bycatch percentage reductions needed to return take levels to those authorized in the ITS (though again, the estimates used to develop the ITS have also changed).²

3.2 PURPOSE AND NEED

The purpose of this action is to implement management measures to reduce the bycatch of Atlantic sturgeon in the monkfish and spiny dogfish gillnet fisheries based on the best scientific information available. This action is needed to reduce incidental takes per the Action Plan developed after the 2021 Biological Opinion to allow for the continued authorization of the fisheries in compliance with the Endangered Species Act (Table 2).

The range of alternatives described in this document is based on the types of alternatives the NEFMC and MAFMC approved during their September/October 2023 meetings, respectively. The FMAT/PDT then provided input on several packages of alternatives that the Councils endorsed at their January/February 2024 meetings for consideration via this document.

Table 2. Purpose and need for Monkfish Framework Adjustment 15 and Spiny Dogfish Framework Adjustment 6.

Need for Monkfish Framework 15, Spiny Dogfish Framework 6	Corresponding Purpose for Monkfish Framework 15, Spiny Dogfish Framework 6
To address the 2021 Biological Opinion reasonable and prudent measures to allow for the continued authorization of the monkfish and spiny dogfish fisheries in compliance with the Endangered Species Act.	Specify measures that would reduce the incidental take of endangered Atlantic sturgeon in the federal monkfish and spiny dogfish fisheries.

¹ Available at: https://mafmc.squarespace.com/s/sturgeon_report_state_fed.pdf

² See “Take Reduction Recommendations for Atlantic Sturgeon in Federal Gillnet Fisheries, GARFO Protected Resources Division to Sturgeon Bycatch FMAT/PDT; transmitted 12/04/2023” available at <https://www.mafmc.org/s/Sturgeon-Update-Dec-2023.pdf>

4.0 ALTERNATIVES UNDER CONSIDERATION

The Councils considered the alternatives in this section. Alternatives considered but rejected are briefly described in Section 4.6. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. These alternatives are designed to represent a robust range of measures:

Alternative 1: No action.

Alternative 2: Higher impacts; time/area closures and gear restriction measures.

Alternative 3: Intermediate impacts; time/area closures and gear restriction measures.

Alternative 4: Lower impacts; time/area closures and gear restriction measures.

Alternative 5: Only gear restriction measures.

The Councils may select any one of these alternatives, modify them, or create a hybrid option leading up to final action (e.g., a combination of multiple alternatives). The alternatives were constructed as packages to allow for meaningful analyses of the impacts of the measures that might be implemented. Considering every possible combination would have resulted in tens of thousands of permutations that would have been impossible to analyze in a meaningful and timely manner. All packages cover multiple sturgeon take hotspots so that benefits to sturgeon and impacts to the fisheries are spread geographically across the various areas of higher sturgeon takes.

The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to consider complementary action to reduce sturgeon interactions by state vessels in state waters.

Methods for determining the sturgeon bycatch polygons where time/area closures and gear restrictions would apply

To map sturgeon take hotspots, sturgeon takes summed across 2017-2019 and 2021-2022 were quantified by 10-minute squares and shaded accordingly. Given these 10-minute squares represent confidential data, only quarter degree squares with shading are included in Figure 1 and Figure 2. The Councils were primarily interested in encompassing the bycatch hotspots with a 1-mile buffer approximately based on straight lines parallel to shore (estimating 6-9 miles offshore).

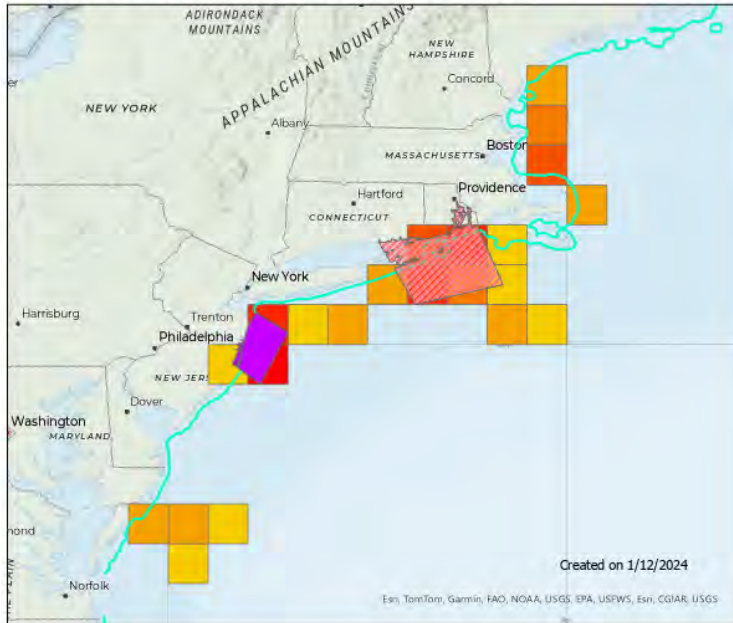
- Orange and red squares represent areas with higher takes, and groupings of these darker squares were considered hotspots. The edges of hotspots often appeared as yellow ten-minute squares.
- Boundaries of the polygons were drawn using the following criteria: If the outer-most edge of a hotspot cluster is an orange or red ten-minute square, the boundary line extends approximately one mile beyond the edge of the square. This allows for some buffer to address the potential for shifting effort. If the outer edge is a yellow ten-minute square, the boundary line is drawn at least approximately one mile out from the point where a take occurred in that yellow square. This was because yellow squares represented fewer takes and were often already on the edge of a hotspot rather than within a hotspot. Note that there are some instances where the boundary line is larger than 1 mile given the initial criteria to draw boundaries from the edges of the red and orange ten-minute squares.
- The western area boundaries were clipped to the shore for all hotspot locations to prevent shifting effort into shallower state waters where there will likely be sturgeon present. Note, this Council action only applies to vessels with a federal fishing permit targeting monkfish and spiny dogfish

in federal and state waters; ASMFC is expected to take complementary action for state only vessels fishing in state waters.

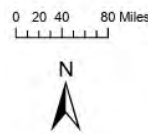
- The offshore portion of the polygon latitude and longitude values were then rounded to either the nearest 0.05 or 0.1 to help improve implementation of measures and enforcement.

Figure 1. Sturgeon bycatch hotspots in the monkfish fishery; shown as quarter degree squares due to data confidentiality.

Sturgeon Bycatch Hotspot Polygons by Quarter Degree Squares for Monkfish Fishery

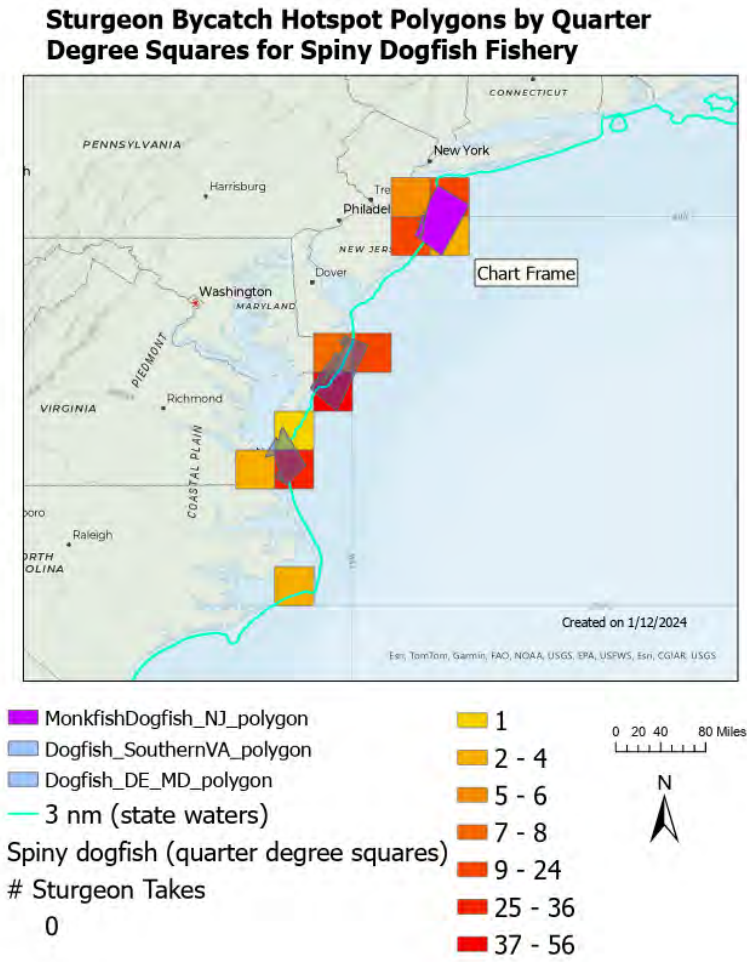


- Monkfish_SNE_polygon
- MonkfishDogfish_NJ_polygon
- 3 nm (state waters)
- Monkfish (quarter degree squares)
- # Sturgeon Takes
- 0
- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 13
- 14 - 21
- 22 - 42



Data source: 2017-2019 and 2021-2022 observer data.

Figure 2. Sturgeon bycatch hotspots in the spiny dogfish fishery; shown as quarter degree squares due to data confidentiality.



Data source: 2017-2019 and 2021-2022 observer data.

Figure 3. All sturgeon bycatch hotspot polygons for the monkfish and spiny dogfish fisheries.



For monkfish gear measures, a January 1, 2026 implementation date is used, based on input from industry about the time needed to procure new gear with the required specifications. This delay would also allow for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).

Note: observed sturgeon interactions were based on:

- Hauls where monkfish and spiny dogfish are caught and recorded by the observer as either TARG1 or TARG2 species for gillnet trips. Monkfish and skate are caught on the same trip so it is important to include records where monkfish is not listed as the TARG1 species, for example. This is consistent with what was done in the Sturgeon Action Plan.
- Only records that denote ‘spiny dogfish’ as target species and exclude records for ‘smooth dogfish’ and ‘unknown’ records. Spiny dogfish is the only dogfish species managed by the MAFMC.
- Data subset by mesh size groups: 1) $< 5''$ ('' = inches for measurements hereafter), 2) $\geq 5'' - < 7''$, and 3) $\geq 7''$ based on how the spiny dogfish and monkfish fisheries operate. **Note:** there were no recorded takes in mesh size $< 5''$, so the mesh size groups hereafter are: $\geq 5'' - < 7''$ and $\geq 7''$.
- Data from 2017-2019 and 2021-2022 were included to evaluate the most recent five years of observer data to adequately account for interannual variability, exclude 2020 when observer coverage was very low due to the global pandemic, and to help be consistent with the new Biological Opinion which is likely to use the same set of years.
- Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022.

There were **175** observed sturgeon takes in the **monkfish fishery** and **180** observed sturgeon takes in the **spiny dogfish fishery**, based on the previously described methodology and fishery definitions. In the

alternative rationales below, the percent of observed sturgeon takes in a given month and polygon are based on the number of observed sturgeon takes in just the relevant fishery. For example, there were 6 observed sturgeon takes in the **monkfish** fishery in the SNE polygon in April, which represents 3% of total observed takes in the **monkfish fishery** (6 out of **175** total observed takes in the monkfish fishery).

Note: Low-profile gillnet gear mentioned below is defined based on research by Fox et al. (2012 and 2019) and He and Jones (2013) in New Jersey:

- Mesh size ranging from 12 to 13 inches,
- Net height ranging from 6 to 8 meshes tall,
- Net length of 300 feet,
- Tie-down length of at least 24 inches to 48 inches max³,
- Tie-down spacing of 12 feet,
- Primary hanging ratio of 0.50,
- Twine size 0.81mm, and
- Net is tied at every float to keep float line down.

General Observer Coverage in Relevant Areas

The statistical areas that are most relevant for the polygons include 539, 537, 613, 612, 615, 614, 621, 625, and 631. For each statistical area, the number of commercial trips and the number of observed trips from [2017, 2018, 2019, 2021, 2022 (not 2020)] were tallied and compared. For spiny dogfish, commercial trips were tallied based on if spiny dogfish made up at least 40% of the landed weight. Monkfish commercial trip counts were based on landing monkfish and using $\geq 10''$ mesh. Tallies of observed trips were based on species targeted (target species 1 or 2 indicated as the relevant species). Trip counts and coverage levels for statistical areas near relevant polygons are provided for each fishery in Table 3 and Table 4.

Table 3. Spiny Dogfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Spiny Dogfish Commercial Trips	Spiny Dogfish Observed Trips	Percent Observer Coverage
612	NJ	591	61	10%
615	NJ	369	72	20%
614	NJ	626	105	17%
621	MD/VA	827	102	12%
625	MD/VA	1232	79	6%
631	MD/VA	2633	308	12%

Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024.

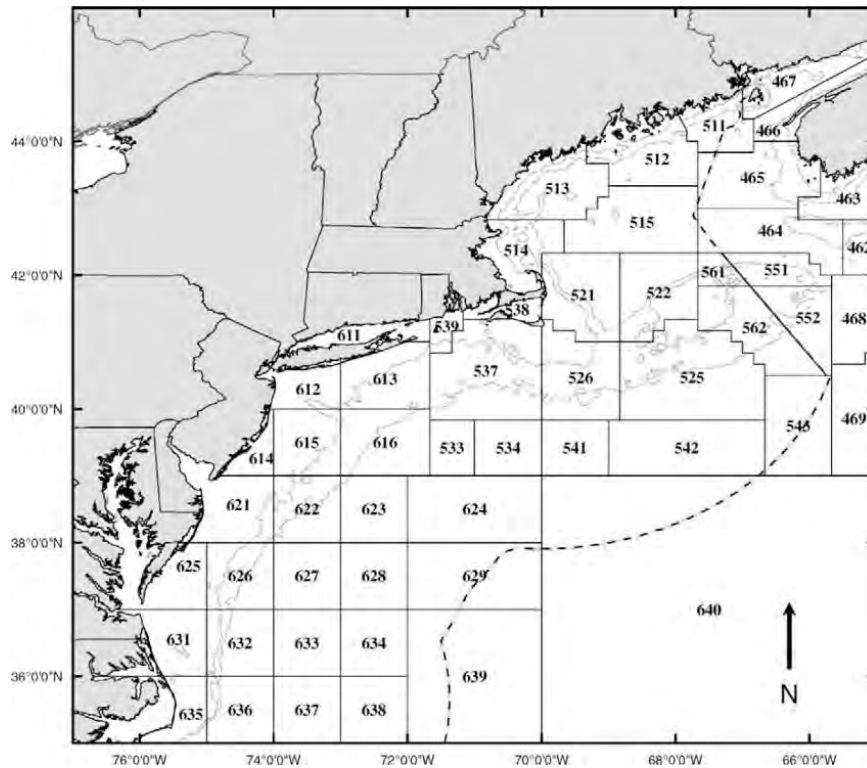
³ The Harbor Porpoise regulations specify a 48" maximum tie-down length during the specified months; the FMAT wanted to accommodate these regulations and also enable ongoing/future research on testing low-profile gear with different tie-down lengths.

Table 4. Monkfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Monkfish Commercial Trips	Monkfish Observed Trips	Percent Observer Coverage
539	SNE	882	92	10%
537	SNE	3439	441	13%
613	SNE	2316	260	11%
612	NJ	772	86	11%
615	NJ	1229	136	11%

Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024.

Figure 4. NMFS Statistical Areas.



4.1 ALTERNATIVE 1 - NO ACTION

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action. This alternative would not follow the sturgeon action plan’s recommendation for developing measures to reduce sturgeon bycatch. The action plan laid out two possible paths to achieve a reduction in sturgeon bycatch by 2024. The recommended path was through action by the MAFMC and

the NEFMC. Selection of Alternative 1 (No Action) by the Councils may mean that NMFS takes action via a second path, under ESA rule-making processes.

4.2 ALTERNATIVE 2 – HIGH IMPACT STURGEON PACKAGE (MOST TIME/AREA CLOSURES AND GEAR RESTRICTIONS)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7).

The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $<10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026.

The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 2 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 5) during **April 1 – May 31**, and **December 1 – December 31**.
- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31**, and **October 15 – December 31**.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 6) in the rest of year when above polygon closure is not in effect (**June 1 – October 14 and January 1 – April 30**).

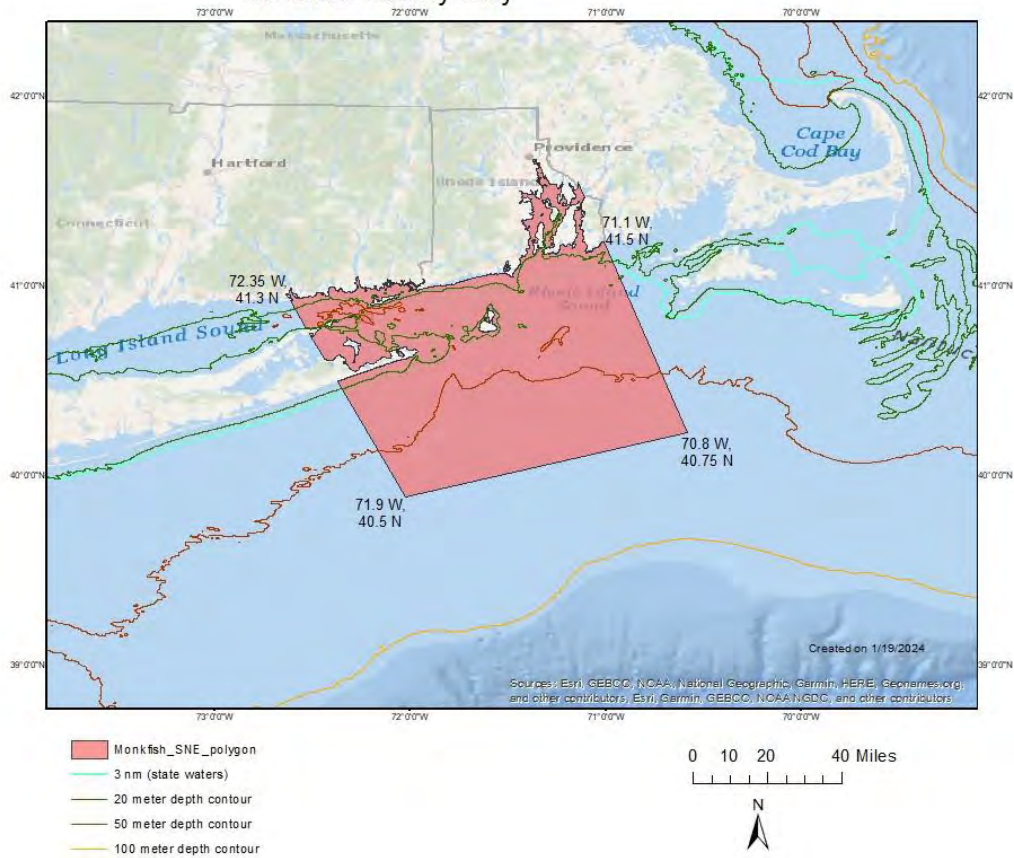
Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31** and **October 15 – December 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 7) during **November 1 – March 31**.

These time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 5. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

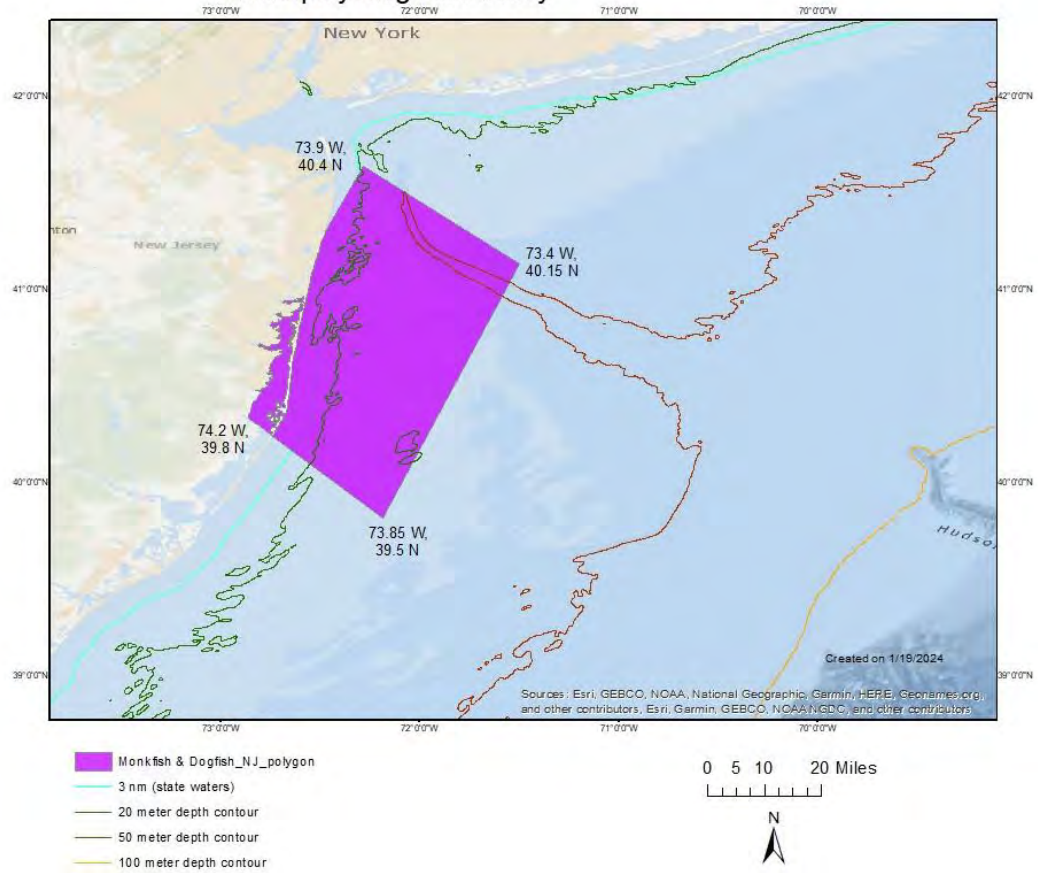
**Southern New England Bycatch Hotspot Polygon -
Monkfish Fishery Only**



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 5, Figure 8, and Figure 11 are identical.

Figure 6. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

New Jersey Bycatch Hotspot Polygon - Monkfish Fishery and Spiny Dogfish Fishery



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 6, Figure 9, and Figure 12 are identical.

Figure 7. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would reduce both number of sturgeon takes and sturgeon mortality. This high impact Alternative would have the most beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o April had 6 observed sturgeon takes in the SNE polygon, representing ~3% of total observed gillnet takes on trips targeting monkfish from 2017-2019 and 2021-2022. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 2.
 - o May had 31 observed sturgeon takes in the SNE polygon, representing ~18% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
 - o December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
 - o May had 23 observed takes in the NJ polygon, representing ~13% of total observed takes on trips targeting monkfish from 2017-2019 and 2021-2022. Note that there is a closure from the Harbor Porpoise Take Reduction Plan⁴; April 1 – 20 is closed to large mesh 7” + gillnet closure in the Waters off New Jersey management area which overlaps the NJ polygon. Initial feedback from OLE is this 10-day opening between closures does not pose an enforcement issue.
 - o October 15 – December 31 had 29 observed sturgeon takes in the New Jersey polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
 - This time period is conservative for the monkfish fishery given all of the observed takes occurred in December, however, there was a desire to have the time period for the New Jersey polygon to be the same for the monkfish and spiny dogfish fisheries.
- New Jersey spiny dogfish fishery
 - o May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - o October 15 – December 31 had 33 observed takes in the New Jersey polygon, representing ~18% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - o Across both Mid-Atlantic polygons, November through March had 107 observed takes, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing off New Jersey had no significant difference in monkfish catch rates,

⁴ Harbor Porpoise Take Reduction Plan information and a map of the New Jersey April 1-20 large mesh closure can be found here: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/harbor-porpoise-take-reduction-plan>.

however, vessels fishing off New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

- In the Fox et al., 2011 study, the researchers tested the influence of tie-downs on sturgeon bycatch using gillnets of standard height (12 meshes high) and found no significant differences in sturgeon bycatch but did find significantly lower target species catches in the gear configuration without tie downs. In the follow-up 2012 study, the researchers tested a low-profile gear configuration with the same tie-down configuration and net height 6 meshes high and found significantly lower sturgeon bycatch in the low-profile nets and lower (though not significant) target species landings (monkfish and winter skate). In their subsequent 2013 study where net height increased from 6 to 8 meshes, the researchers found lower (but not significant) sturgeon bycatch in the low-profile net and similar (not significant) rates of target species landings. Lastly, in the 2019 Fox et al study where mesh size was increased from 12 to 13 inches and twine size decreased from 0.90 to 0.81mm, the researchers found the low-profile net reduced sturgeon bycatch by a ratio of 4.2 to 1. The lighter twine is intended to reduce retention of larger sturgeon while the larger mesh size allows smaller sturgeon to escape. Results for target species catches were mixed, with the vessel fishing off New York catching significantly fewer monkfish with the low-profile net, while there was no significant difference between monkfish catch by the vessel fishing off New Jersey. The New York based vessel overall had higher monkfish catch rates and longer soak durations, both of which may have contributed to the difference in monkfish catch rates between the experimental low-profile net and the control net. The vessel fishing off New Jersey had more modest monkfish catch rates overall and shorter soak durations (mean soak time of 32.1 hours vs 48 hours for the New York vessel), which may have better optimized the effectiveness of the experimental low-profile net and thus the difference in monkfish catch between the experimental and standard nets was not significant. Catches of winter skate were not significantly different for either vessel. In the He and Jones (2013) study, researchers tested the low-profile net design from the Fox et al 2013 study off Virginia and Maryland and found sturgeon bycatch was significantly reduced with the low-profile net, though only seven sturgeon were caught in total. Results for target species catches were mixed, with one vessel having no significant difference in monkfish catch while the other vessel had significantly lower monkfish catch with the low-profile net particularly when catch rates are high. There were no significant differences in winter skate catch. All studies had relatively low sample sizes and results are considered uncertain. Table 5 summarizes the gear studies described above.
- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).

Table 5. Gillnet configurations used and sturgeon bycatch and target species catch results in Fox et al 2011, 2012, 2013, and 2019.

Fox et al 2011

	Mesh Size (in.)	Net Height (# Mesh)	Tie Down Length (ft)	Tie Down Spacing (ft)	Hanging Ratio	Net Length (ft)	Twine Diameter (mm)	Sturgeon Catch (# individuals)		Target Species Landings (kg)		
Control	12	12	4	24	0.5	300	0.90	18	Not significantly different	Monkfish 7,306.3	Winter skate 10,048.5	Experimental nets (no tie-downs) significantly reduced catch rates
Experimental	12	12	N/A	N/A	0.5	300	0.90	5		Monkfish 3,737.9	Winter skate 1,782.3	
Fox et al 2012												
Control	12	12	4	24	0.5	300	0.90	28	Significantly lower in low-profile nets	Monkfish 4,345	Winter skate 11,921	No significant differences, though overall catch rates lower with low-profile nets
Experimental	12	6	2	12	0.5	300	0.90	9		Monkfish 3,341	Winter skate 9,734	
Fox et al 2013												
Control	12	12	4	24	0.5	300	0.90	21	Not significantly different	Monkfish 2,615.5	Winter skate 2,417.6	Similar catch rates, not significantly different
Experimental	12	8	2	12	0.5	300	0.90	14		Monkfish 2,388.7	Winter skate 2,103.2	
Fox et al 2019												
Control	12	12	4	24	0.5	300	0.90	25	Significantly lower in low-profile nets	Monkfish * 32,333	Winter skate* 35,010	Monkfish catch significantly lower with low-profile nets for NY, no sig. differences for NJ; no sig. differences in winter skate catch for either
Experimental	13	8	2	12	0.5	300	0.81	6				

* Monkfish and winter skate landings were not differentiated between the control and experimental gillnet configurations so only total is included.

4.3 ALTERNATIVE 3 – INTERMEDIATE IMPACT STURGEON PACKAGE

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 3 (Intermediate Package) includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 8) during **May 1 – May 31** and **December 1 – December 31**, two months with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 9) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 9) in the rest of year when above polygon closure not in effect (**January 1 – November 30**).

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in the New Jersey bycatch hotspot polygon (Figure 9) during **November 1 – December 31**, two months with the highest observed sturgeon takes.
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon (Figure 9) during **May 1 – May 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 10) during **December 1 – February 28**, three consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 8. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

Southern New England Bycatch Hotspot Polygon -
Monkfish Fishery Only

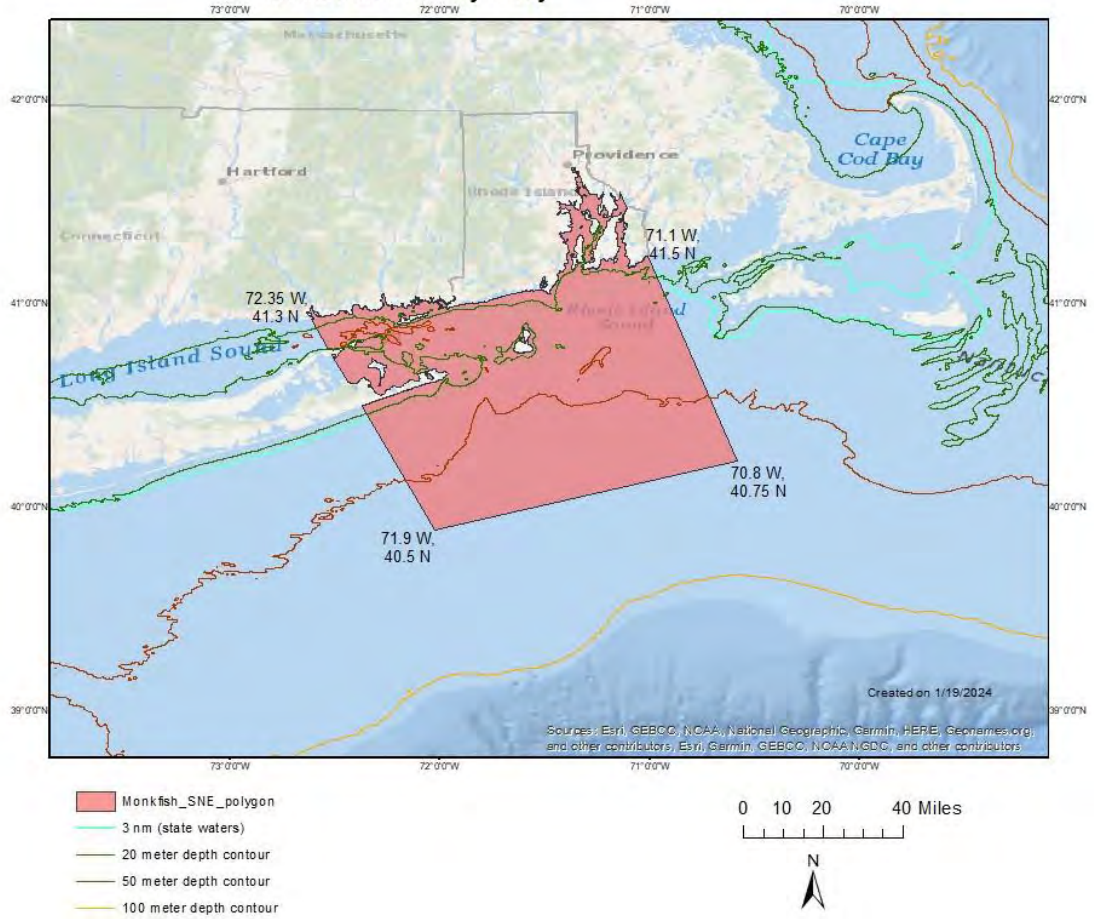


Figure 9. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

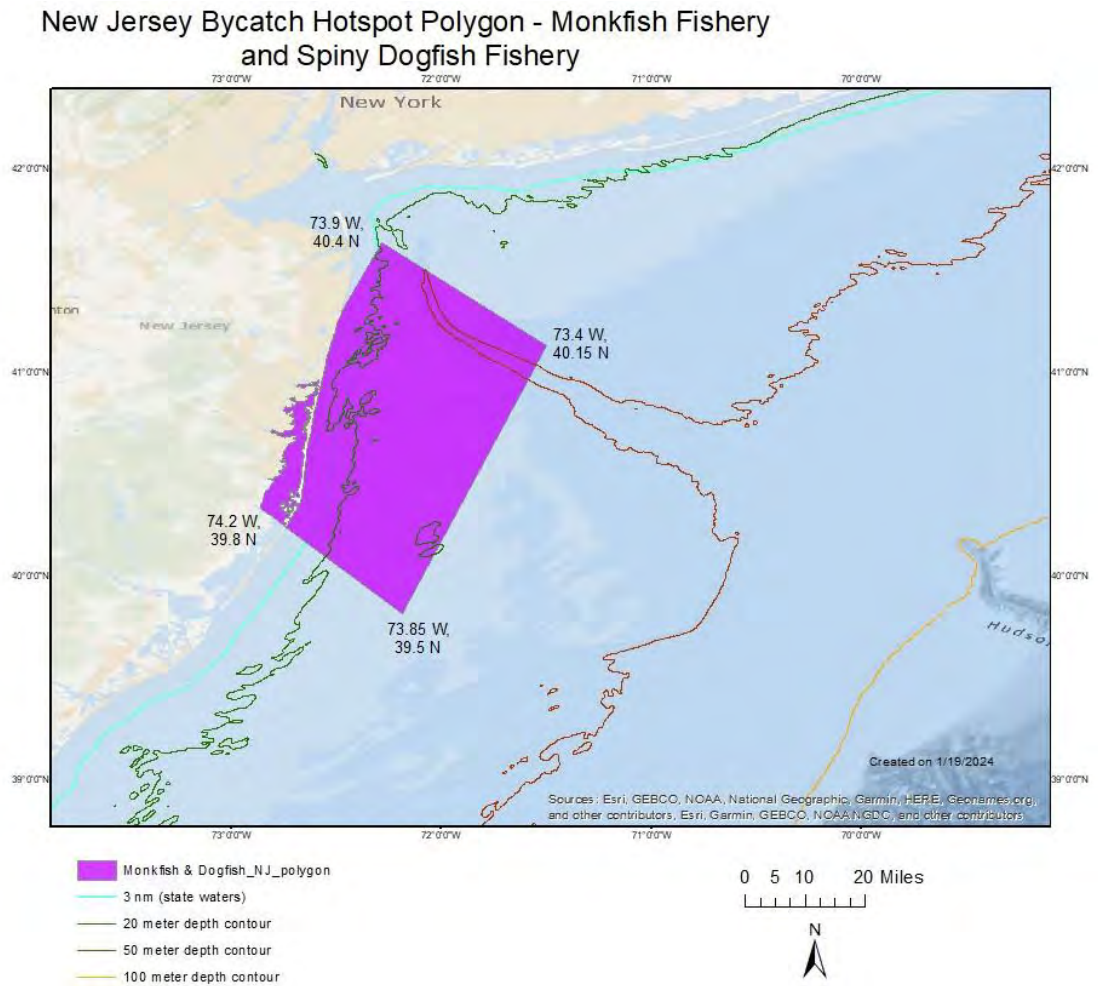
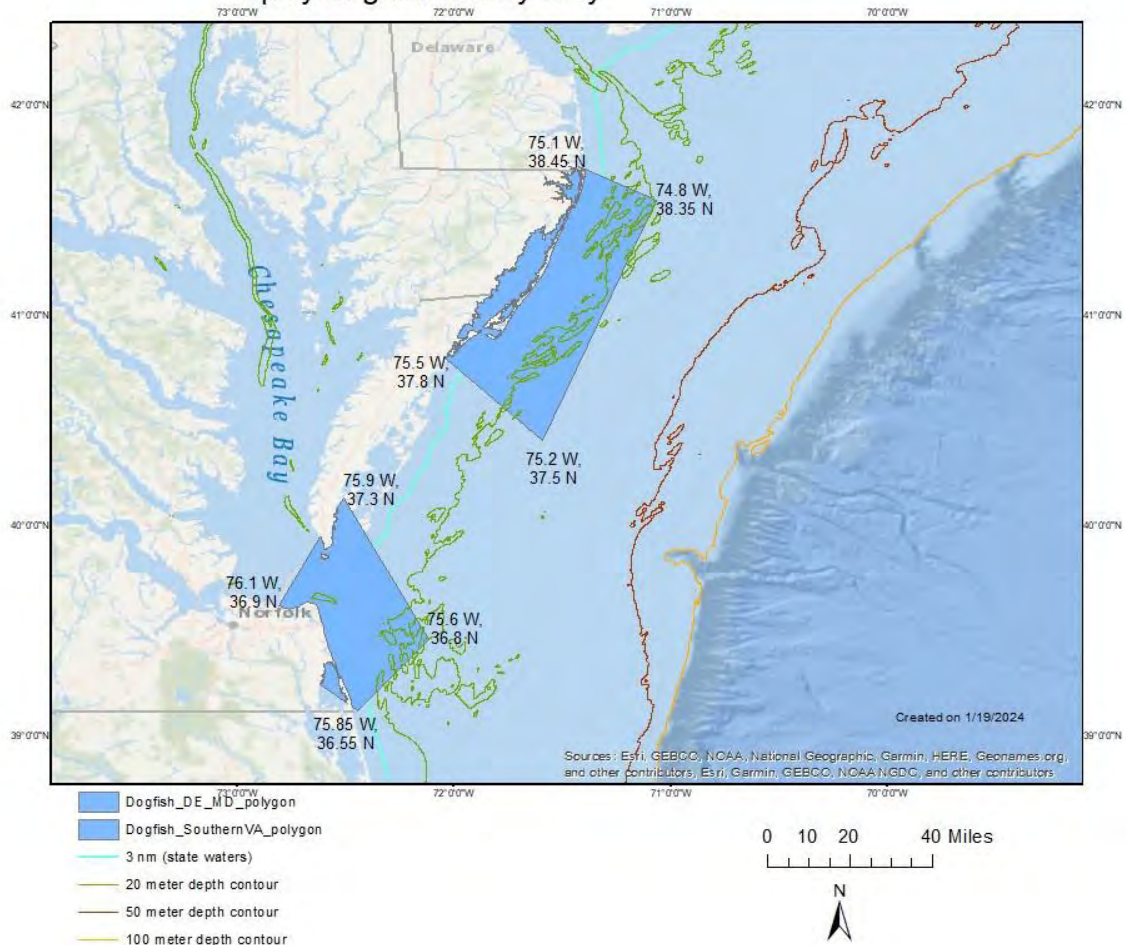


Figure 10. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.

**Delaware, Maryland, Virginia Bycatch Hotspot Polygons -
Spiny Dogfish Fishery Only**



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce takes/mortality. This intermediate impact Alternative would have intermediate beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o May had 31 sturgeon takes in the SNE polygon, representing ~18% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.

- December had 33 sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
 - December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
 - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - Across both polygons, December through February has 79 observed takes, representing 44% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025 at which time the minimum mesh size is increased to 12''): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions are during times of documented high sturgeon bycatch as described above for

closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.4 ALTERNATIVE 4 – LOW IMPACT STURGEON PACKAGE (LEAST TIME/AREA CLOSURES AND GEAR RESTRICTIONS)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 4 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 11) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30**.
 - o Note, if the Councils do not select the option to require low-profile gillnet gear in the New Jersey hotspot in the month of December (month with the highest observed takes), then this closure should be in December instead of November.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31**.

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30**.
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31** and **May 1 – May 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 13) during **December 1 – January 31**, two consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine

Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 11. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

Southern New England Bycatch Hotspot Polygon -
Monkfish Fishery Only

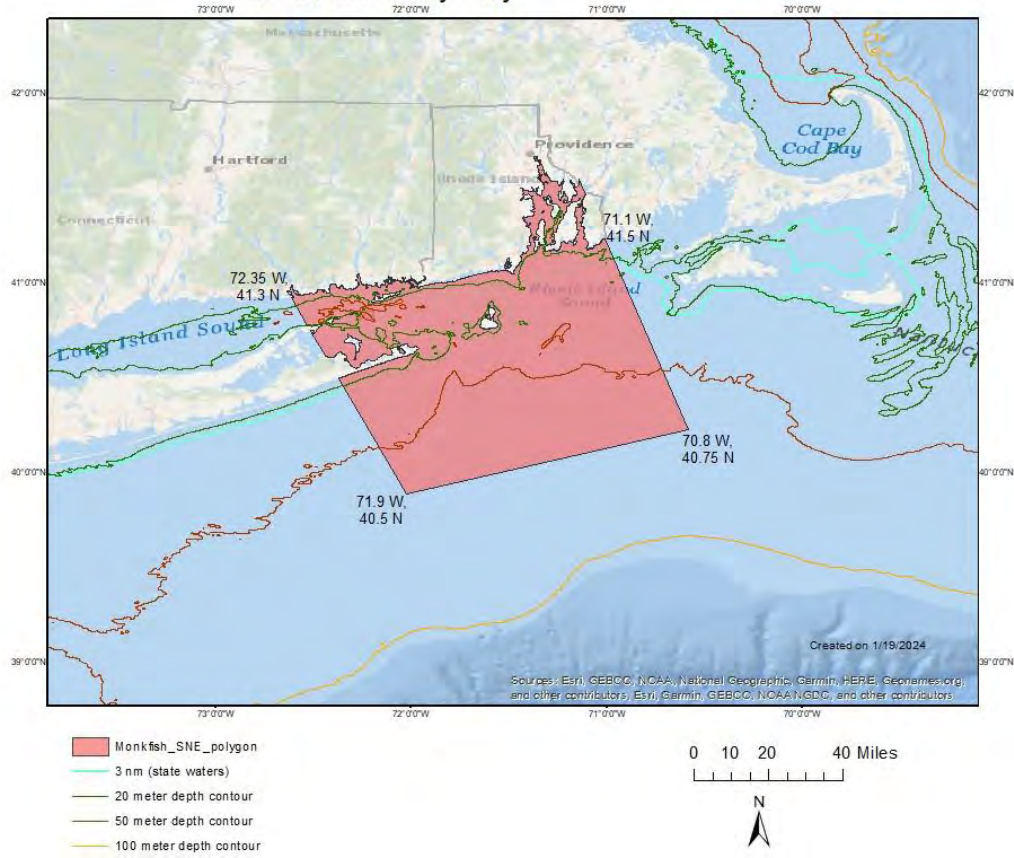


Figure 12. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

New Jersey Bycatch Hotspot Polygon - Monkfish Fishery and Spiny Dogfish Fishery

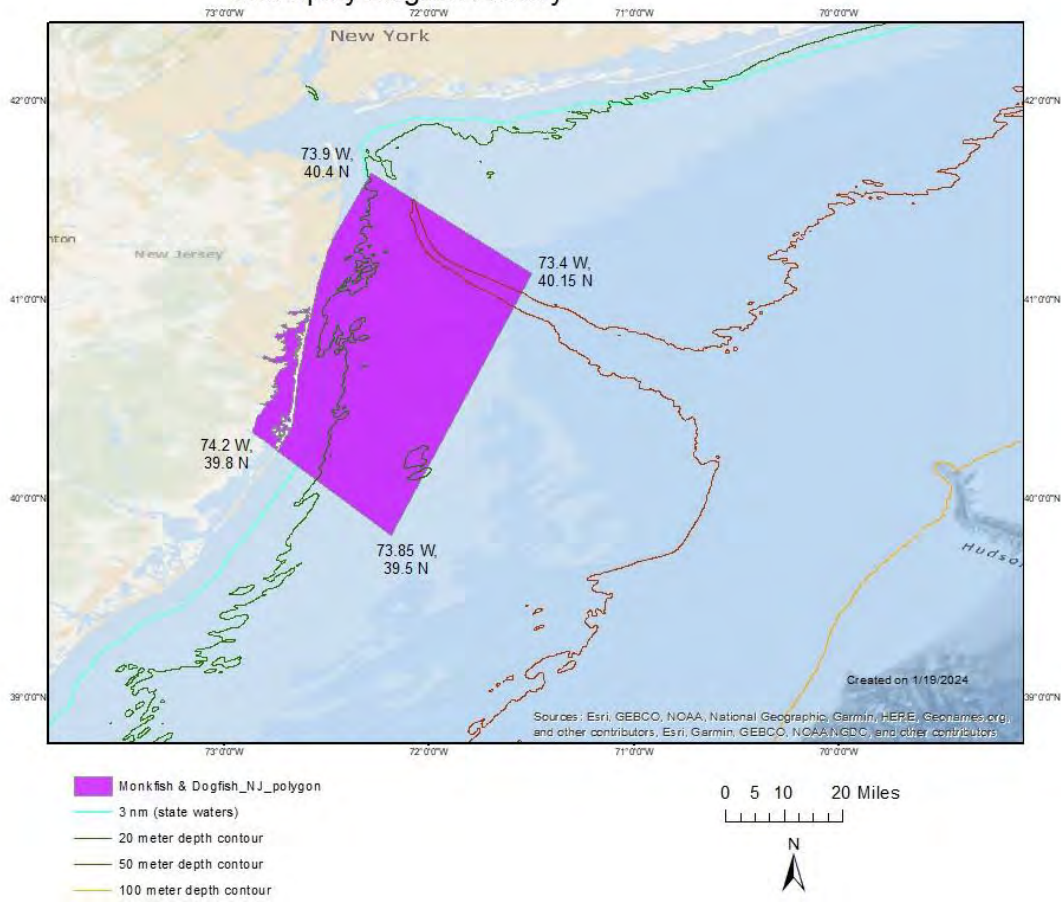


Figure 13. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce both sturgeon takes and mortality. This low impact Alternative would have the least beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.

- New Jersey monkfish fishery
 - o November did not have any sturgeon takes in the NJ polygon in the monkfish fishery, however, there were substantial observed sturgeon takes in the spiny dogfish fishery in this area during the same time period so there was interest in aligning these time/area measures for both fisheries.
 - o December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
 - o May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single haul in the NJ polygon was 5.
 - o November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2. The number of sturgeon takes for each of these months cannot be shared due to data confidentiality reasons, though it is worth noting that December represents <1% of total observed gillnet takes on trips targeting spiny dogfish.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - o Across both polygons, December through January had 69 sturgeon, representing ~38% of observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025 at which time the minimum mesh size is increased to 12''): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight

is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions are during times of documented high sturgeon bycatch as described above for closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.5 ALTERNATIVE 5 – GEAR-ONLY STURGEON PACKAGE

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in several Atlantic sturgeon bycatch hotspot areas (Figure 15 and Figure 16). The gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40 am) is included for federal vessels targeting spiny dogfish in the New Jersey and the two more southern Mid-Atlantic polygons. The polygons where the gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same gear restriction measures would be the same across both polygons.

More specifically, Alternative 5 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 15), **Year-round.**

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Overnight soak time prohibition from 8pm until 5am in the New Jersey bycatch hotspot polygon (Figure 15) during **May 1 – May 31** and **November 1 – November 30.**
- Overnight soak time prohibition from 8pm until 5am in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 16) during **November 1 – March 31.**

These gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Sub-alternative 5a: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the New Jersey polygon overnight soak time prohibition.

Sub-alternative 5b: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the Delaware/Maryland/Virginia polygon overnight soak time prohibition.

FMAT/PDT Recommendation:

Sub-alternative 5a: There were insufficient trips available to evaluate any potential exemptions for New Jersey, thus, the FMAT/PDT does not recommend any exemptions for

this smaller mesh in this area. Observer data by mesh size in the NJ area for vessels targeting dogfish cannot be provided due to data confidentiality issues.

Sub-alternative 5b: The FMAT/PDT did not have time to develop a specific recommendation but generally concluded some exemption seemed reasonable but maybe not for the month with the highest bycatch rates. Subsequent analyses showed this month to be December, and staff recommended careful consideration of not exempting December from the Delmarva polygon overnight soak prohibition even if gear less than 5.25” is used.

Rationale: Analyses of observer data indicate that fishing for spiny dogfish south of 38.8 N latitude (approximate latitude of Lewes/Cape Henlopen, DE) with mesh of 5” has lower sturgeon take rates based on observer data (Table 6, Figure 14). Most of the VTR landings for the 5” to <5.5” mesh bin appear to have been with mesh of 5”, supporting a measure that exempted mesh less than 5.25 inches (note the higher rate on the next larger mesh bin). Monthly analyses indicated for these same trips, December had the highest overall sturgeon catch rate (https://d23h0vhsm26o6d.cloudfront.net/10.-FMAT-PDT-Supplemental_20240312.pdf)

Table 6. Takes by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.

Mesh Category (inches)	Sturgeon catches	Observed Trips	Sturgeon catch per observed trip
5 to <5.5	25	278	0.09
5.5 to <6	41	143	0.29
6 to <6.5	58	170	0.34

Figure 14. Sturgeon take rates by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.

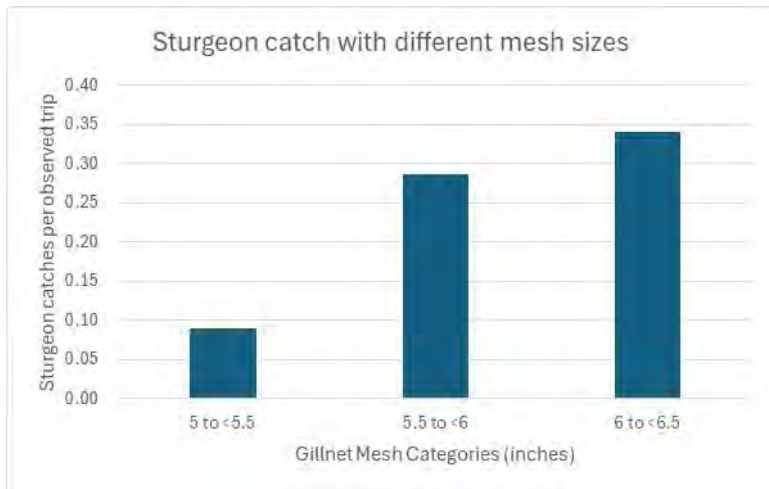


Figure 15. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

New Jersey Bycatch Hotspot Polygon - Monkfish Fishery and Spiny Dogfish Fishery

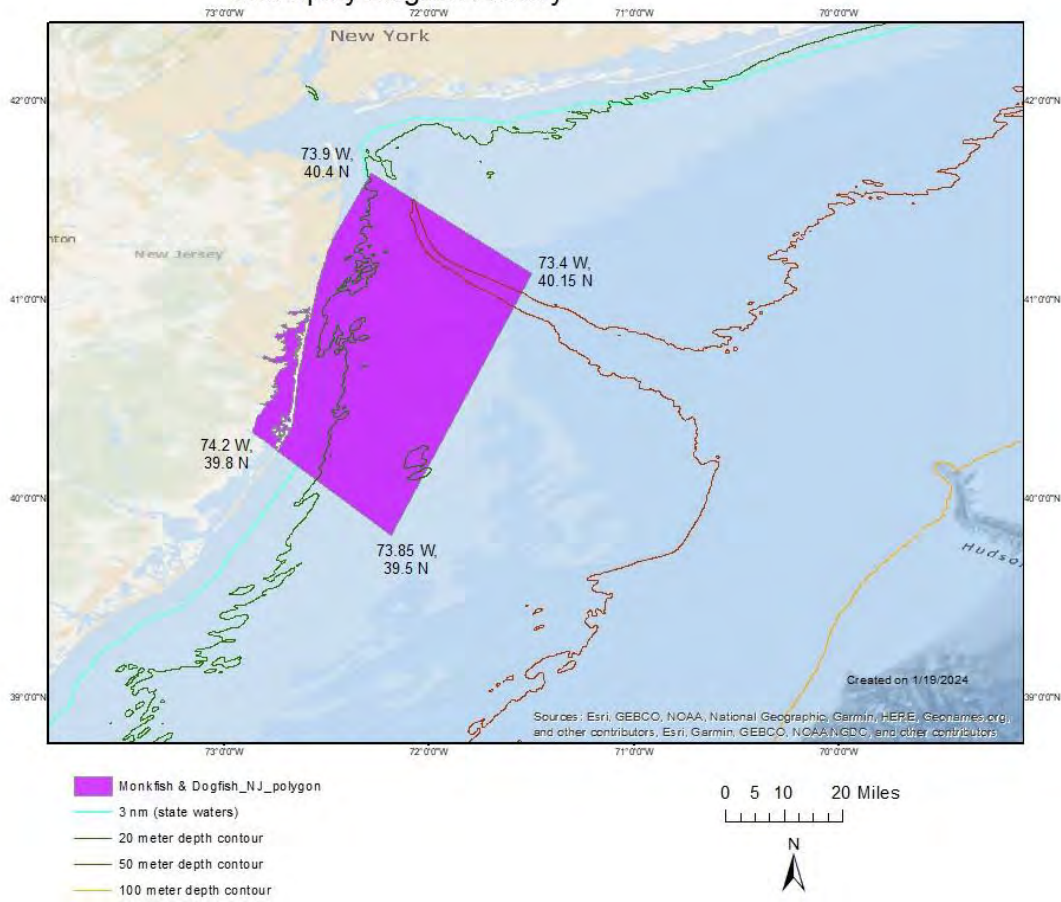


Figure 16. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time periods: The time periods in which gear restrictions would apply are based on reducing interactions with Atlantic sturgeon by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters in the bycatch hotspot areas. These hotspot area polygons and times in which measures would apply were based on observer data including when and where observed sturgeon takes for federal gillnet vessels targeting monkfish and spiny dogfish occurred from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- New Jersey spiny dogfish fishery
 - o May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - o November had 28 observed sturgeon takes in the NJ polygon, representing ~16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - o Across both polygons, November through March had 107, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025 at which time the minimum mesh size is increased to 12''): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Forcing vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.6 ALTERNATIVES CONSIDERED BUT REJECTED

4.6.1 Adding an option to use Vessel Monitoring System (VMS)

The Councils considered using VMS as an enforcement / management tool as part of the range of the monkfish and spiny dogfish alternatives to make soak time restrictions and area closures more enforceable. Currently, VMS is not a requirement in the monkfish and spiny dogfish fisheries, however, this was discussed during Framework 13 development for the monkfish fishery in 2022. During the Joint Monkfish and Dogfish Committee meeting, invited enforcement representatives clarified that VMS is not required to enforce time/area closures, though is still helpful to identify the fishery declaration and vessel location. The Coast Guard uses routine patrols in aircraft and cutters and can do targeted boardings if there are known restrictions in the area regardless of whether a vessel has VMS or not. There was general concern for the impacts of any VMS requirement for these fisheries given the added cost, quota reductions, processor limitations, etc. As part of its priority list for work to be potentially done in 2024, the NEFMC decided instead to add “review of the utility of VMS and how it is used for enforcement in coordination with the MAFMC” given the broader implications for requiring VMS in other fisheries beyond monkfish and spiny dogfish.

4.6.2 Soak time restrictions of 24 hours or greater in the monkfish and spiny dogfish fisheries

The Councils considered restricting soak time limits of 24 hours or greater for the monkfish and spiny dogfish fisheries, however, the options were removed from further consideration given these restrictions do not necessarily reduce sturgeon interactions/bycatch and there are enforcement concerns.

4.6.3 Soak time and low-profile gear restrictions and closures by entire statistical area approach

The Councils considered applying gear restrictions (soak time limits and low-profile gillnet gear) and closures by entire statistical area, however, these are broad areas that are well outside of sturgeon bycatch hotspots and are likely to cause substantial impacts to fishermen.

4.6.4 Shorter increments of time/area closures and additional partial-year gear restriction time periods

Shorter, weekly increments of time/area closures and additional partial-year gear restriction time periods were considered to allow for various combinations of shorter time periods across areas and fisheries, but after initial analysis, these measures were ultimately removed from further consideration. This is because these shorter temporal measures were not likely to achieve the sturgeon bycatch reduction targets identified by GARFO’s Protected Resource Division in a December 4, 2023 memo addressed to the Sturgeon Bycatch FMAT/PDT. Furthermore, the available data did not support an analysis to that level of temporal and spatial resolution without confidentiality issues. The refined range of alternatives in Section 4.0 is a more simplified version that captures the full range of possible time/area closures and gear restriction measures.

5.0 AFFECTED ENVIRONMENT

The Affected Environment is described in this action based on valued ecosystem components (VECs), including target species, non-target species, physical environment and Essential Fish Habitat (EFH), protected resources, and human communities. VECs represent the resources, areas and human communities that may be affected by the alternatives under consideration in this amendment. VECs are the focus since they are the “place” where the impacts of management actions occur.

5.1 TARGET SPECIES

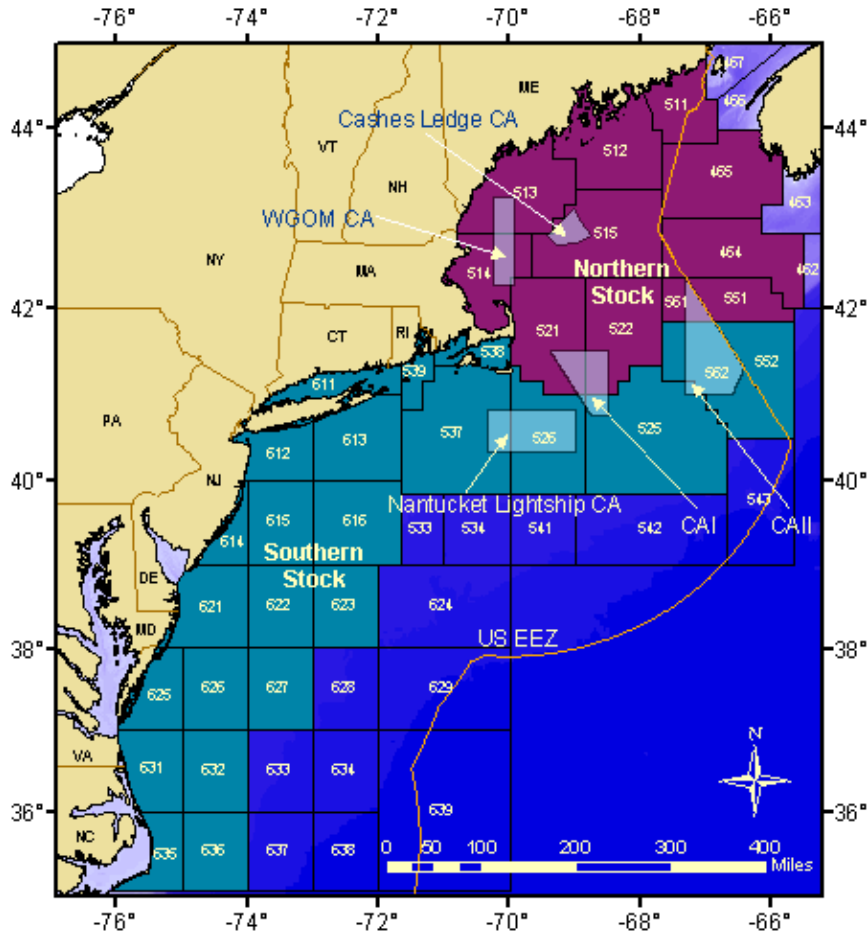
MONKFISH

Monkfish Management: The monkfish fishery in U.S. waters is jointly managed under the Monkfish Fishery Management Plan (FMP) by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental shelf margin. The fishery is assessed and managed in two areas, northern and southern (Map 1). The Northern Fishery Management Area (NFMA) covers the Gulf of Maine (GOM) and northern part of Georges Bank (GB), and the Southern Fishery Management Area (SFMA) extends from the southern flank of GB through the Mid-Atlantic Bight to North Carolina. The directed monkfish fishery is primarily managed with a yearly allocation of monkfish Days-at-Sea (DAS) and possession limits, though incidental landings are allowed in other fisheries.

Monkfish Distribution and Life History. Monkfish (*Lophius americanus*), also called goosefish, occur in the Northwest Atlantic Ocean from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina (Collette & Klein-MacPhee 2002). Data from resource surveys spanning the period 1948-2007 suggest that seasonal onshore-offshore migrations occur (from inshore areas in autumn to depths of at least 900 m in mid-spring) and appear to be related to spawning and possibly food availability (Richards *et al.* 2008). Stock structure is not well understood, but two assessment and management areas for monkfish, northern and southern, were defined in 1999 through the original Fishery Management Plan based on patterns of recruitment and growth and differences in how the fisheries are prosecuted (NEFSC 2020b).

Map 1. Fishery statistical areas used to define the Monkfish NFMA and SFMA.

Source: NEFSC (2020b).



Monkfish Stock Status. The status of the monkfish stocks changed in 2023 to unknown from not subject to overfishing and not overfished, based on the 2022 monkfish stock assessment. These changes were made because the 2013 assessment that supported the prior stock status determinations were rejected during the 2016 assessment due to an invalid ageing method. Analytical assessments have not been used for monkfish since 2013, and index-based approaches have been used since to determine catch advice. A brief history of recent assessments is provided.

The monkfish stock assessment in 2010 (SARC 50) was an analytical assessment that used the SCALE model (had been in use since 2007), concluding that monkfish was not overfished and overfishing was not occurring but recognized significant uncertainty in this determination. The 2013 operational assessment also used the SCALE model and reached the same conclusion.

The 2016 operational assessment, that informed FY 2017-2019 specifications, did not update the SCALE model because its use was invalidated by age validation research (Richards 2016). This assessment concluded that many of the biological reference points were no longer relevant due to invalidation of the growth model (e.g., no estimation of absolute biomass, F_{max} could not be recalculated), and thus were not updated. Stock status was concluded to be unknown. A strong 2015-year class was identified in both the survey and the discard data. The assessment review panel concluded that using a survey index-based method for developing catch advice was appropriate. A method now called the “Ismooth” approach was used that set catch advice based on the recent trend in NEFSC trawl survey indices. This method

calculates the proportional rate of change in a smoothed average of the fall and spring NEFSC surveys over the most recent three years. This rate is the slope of the regression trend from the last three years, which is then multiplied by the most recent three years average of fishery catch to determine catch advice. The multipliers were 1.02 in the NFMA and 0.87 in the SFMA (Table 7):

$$\text{Equation 1: } \text{catch advice} = \text{Trawl survey multiplier} * \text{latest 3-year average catch} = \text{ABC}$$

The 2019 assessment continued use of the Ismooth method due to ongoing uncertainties. The assessment continued to see a strong recruitment event from 2015 that led to an increase in biomass in 2016-2018, though abundance declined in 2019 as recruitment returned to average levels (NEFSC 2020b). The Ismooth multipliers were 1.2 in the NFMA and 1.0 in the SFMA.

Table 7. NEFSC trawl survey multipliers for monkfish from the last three assessments.

Assessment year	NEFSC trawl survey multiplier	
	NFMA	SFMA
2016	1.02	0.87
2019	1.2	1.0
2022	0.829	0.646
<i>Source: Richards (2016); NEFSC (2020b); Deroba (2022).</i>		

The 2022 management track assessment again used the Ismooth method to develop catch advice. Like the 2016 and 2019 assessments, this assessment concluded that the status of monkfish remains unknown. The multipliers were 0.829 for NFMA and 0.646 for SFMA, tracking the decline in monkfish biomass in the NEFSC trawl surveys. The fishery catch time series was updated, including a new discard mortality rate for scallop dredges (reduced to 64% from 100%) and various data corrections (Deroba 2022).

The October 19, 2022 [Monkfish PDT memo](#) to the SSC on OFLs and ABCs details how these prior assessments were used in setting specifications.

SPINY DOGFISH

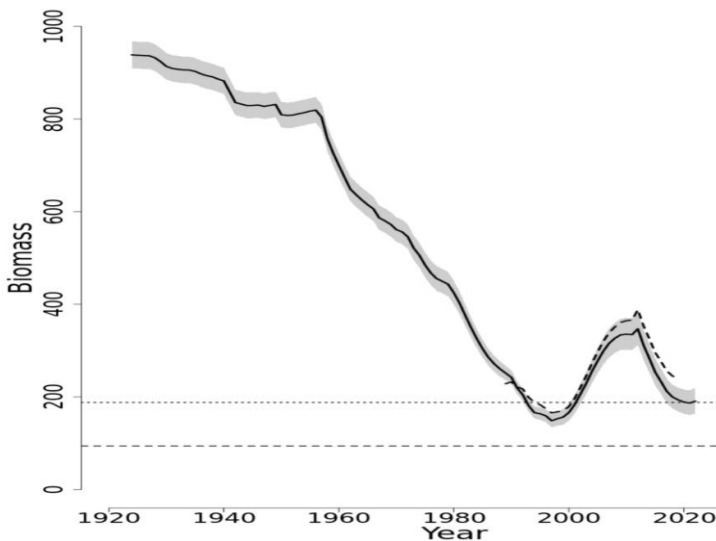
Spiny dogfish Management: The spiny dogfish fishery in U.S. waters is jointly managed under the Spiny dogfish Fishery Management Plan (FMP) by the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC), with the MAFMC having the administrative lead. The management unit area includes all U.S. east coast water. Canadian landings are also accounted for as part of setting annual specifications (the assessment integrates Canadian catch data).

Life History: Spiny dogfish (*Squalus acanthias*) is a long-lived (up to 50 years) schooling shark that is widely distributed across both sides of the North Atlantic. The Northwest Atlantic population is treated as one stock – substantial migration is not believed to occur across the two sides of the Atlantic (though tagging studies do find occasional long-distance migrators (e.g. Hjertenes 1980, Templeman 1954)). Spiny dogfish are considered one of the most migratory shark species in the northwest Atlantic (Compagno 1984). In the northwest Atlantic, spiny dogfish occur from Florida to Canada, with highest concentrations from Cape Hatteras to Nova Scotia. In the winter and spring, they are found primarily in Mid-Atlantic waters, and tend to migrate north in the summer and fall, with concentrations in southern New England, Georges Bank, and the Gulf of Maine (though a recent study has created some uncertainty regarding the established migration paradigm, Carlson 2014). Spiny dogfish have a wide-ranging diet consisting of fish, such as herring, mackerel and sand lance, as well as invertebrates including ctenophores, squid, crustaceans and bivalves. Spiny dogfish are live bearers with a very long gestation period (18-24 months), and are slow growing with late maturation. These reproductive characteristics generally make a stock more vulnerable to overfishing (<https://www.fisheries.noaa.gov/international->

[affairs/shark-conservation](#), NOAA 2001). Females grow larger than males and as a result, the fishery primarily targets females.

Spiny Dogfish Stock Status: Based on the 2023 Spiny Dogfish MTA, which used the Stock Synthesis 3 (SS3) assessment model and passed peer review in 2023, the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022⁵. Biomass (spawning output) in 2022 was estimated to be at 101% of the reference point/target, despite being relatively near its all-time low. Fishing mortality in 2022 was 81% of the overfishing threshold (the first time in the last decade without overfishing). Biomass and fishing mortality figures are immediately below. Due to the stock's reduced productivity, the SS3 model projections predict that relatively low future catches are needed to stay at the target (NEFSC 2023).

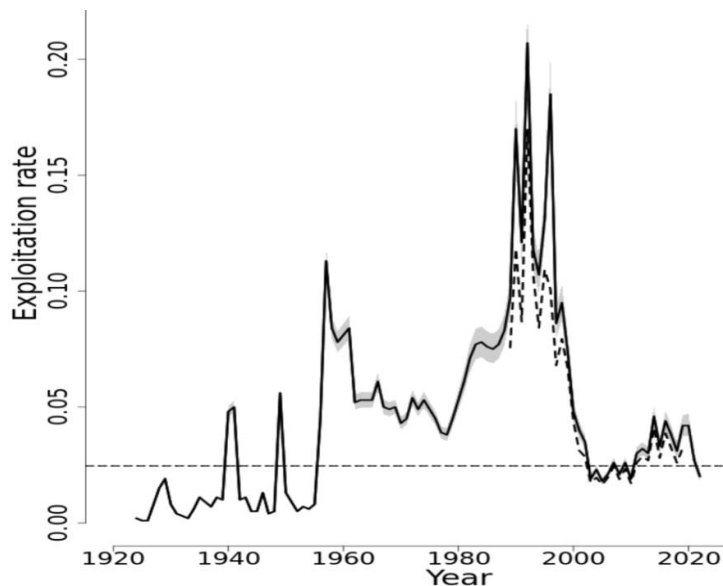
Figure 17. Time series of spawning output 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold).



Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://www.mafmc.org/ssc-meetings/october-30-2023>

⁵ The assessment and its peer review summary are available at <https://www.mafmc.org/ssc-meetings/october-30-2023>.

Figure 18. Time series of fishing mortality 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold).



Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://www.mafmc.org/ssc-meetings/october-30-2023>

5.2 NON-TARGET SPECIES

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with Non-Target species, so Section 5.2 (monkfish focus) and 5.3 (spiny dogfish focus) differ somewhat in formatting.

MONKFISH FOCUS

The monkfish fishery is closely associated with several fisheries managed by other FMPs, specifically the groundfish, skate, spiny dogfish, and scallop fisheries. Particularly in the NFMA, monkfish can be targeted or caught as incidental bycatch during trips in which groundfish are also caught, depending on the focus of a trip. Monkfish are caught as bycatch in the scallop fishery, particularly in the SFMA. Further, skates and spiny dogfish are often caught when targeting monkfish in both areas, but particularly in the SFMA.

5.2.1 Northeast Multispecies

Life History and Population. The Northeast Multispecies FMP manages 20 groundfish stocks and stock status varies by stock (NEFMC 2022a).

In U.S. waters, cod are currently managed as two stocks: Gulf of Maine (GOM) and Georges Bank (GB). Based on the updated assessment, the GOM cod stock is overfished and overfishing is occurring for the M=0.2 model and overfished and overfishing is not occurring for the M-ramp model. Georges Bank cod, *Gadus morhua*, is the most southerly cod stock in the world. Based on the 2021 assessment, overfishing

status is considered unknown and stock status remains overfished based on a qualitative evaluation of poor stock condition (NEFSC 2022). Recent work by the [Atlantic Cod Stock Structure Working Group](#) proposes a new stock structure with five biological stocks in U.S. waters: Georges Bank, Southern New England, Western Gulf of Maine and Cape Cod winter spawners, Western Gulf of Maine spring spawners, and Eastern Gulf of Maine (McBride & Smedbol 2022). The Western Gulf of Maine spring spawners overlaps spatially with the Western Gulf of Maine and Cape Cod winter spawner stock. The Council is working on a transition plan for management of the current two stocks to up to five stocks and the research track working group is currently working to determine how these stocks will be assessed, tentatively scheduled for 2023.

Six distinct haddock stocks have been identified, and the two which occur in U.S. waters are associated with Georges Bank and the Gulf of Maine. As of its 2022 assessment, GOM haddock is not overfished but overfishing is occurring; the 2021 SSB was estimated to be at 16,528 mt, which is 270% of the biomass target (NEFSC 2022 in prep). GB haddock is not overfished and overfishing is not occurring; the 2021 SSB was estimated to be 79,513 mt, which is 66% of the biomass target (NEFSC 2020b).

Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine and Georges Bank regions. In the Gulf of Maine and Georges Bank, the American plaice is not overfished and overfishing is not occurring. The stock was in a rebuilding plan, but based on the 2019 assessment, the stock is now considered rebuilt (NEFSC 2020b).

Witch flounder is managed as a unit stock. Because a stock assessment model framework is lacking, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. NMFS determined that the stock status for witch flounder will remain overfished, with overfishing unknown, consistent with the 2016 benchmark assessment for this stock.

Winter flounder is managed and assessed in U.S. waters as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Based on the recommendation of the 2020 Peer Review Panel, overfishing is not occurring for GOM winter flounder, but the overfished status is unknown; GB winter flounder is overfished and overfishing is not occurring; SNE/MA winter flounder is overfished, but overfishing is not occurring (NEFSC 2020).

NMFS manages three yellowtail stocks off the U.S. coast including the CC/GOM, GB, and SNE/MA stocks. Based on the 2019 operational assessment, the CC/GOM yellowtail flounder stock is not overfished and overfishing is not occurring. GB yellowtail flounder status determination relative to reference points is not possible because reference points cannot be defined; 2020 stock assessment results continue to indicate low stock biomass and poor productivity. Based on the 2019 operational assessment, the SNE/MA yellowtail flounder stock is overfished and overfishing is not occurring (NEFSC 2020b).

NMFS manages Acadian redfish inhabiting the U.S. waters of the Gulf of Maine and deeper portions of Georges Bank and the Great South Channel as a unit stock. Based on the recommendation of the 2020 Peer Review Panel, redfish is not overfished and overfishing is not occurring. Redfish is rebuilt.

Pollock are assessed as a single unit, though there is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Based on the 2019 operational assessment, the pollock stock is not overfished and overfishing is not occurring.

White hake is common on muddy bottom throughout the Gulf of Maine. Based on the 2019 operational assessment, the white hake stock is overfished and overfishing is not occurring.

Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB or northern) and Southern New England-Mid-Atlantic Bight (SNE/MA or southern) due to differences in growth rates, size at maturity, and relative abundance trends. Based on the recommendations of the 2020 Peer Review Panel, northern windowpane flounder stock status is unknown; Southern windowpane

flounder is not overfished and overfishing is not occurring (status has not changed from the 2018 assessment) (NEFSC 2020b).

In US waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. Based on the 2020 assessment, ocean pout is overfished but overfishing is not occurring. The stock is not rebuilding as expected, despite low catch. Discards comprise most of the catch since the no possession regulation was implemented in May 2010.

Atlantic halibut is the largest species of flatfish and is distributed from Labrador to southern New England. Halibut is assessed using a data-poor method (First Second Derivative model), and projections are not possible using this method. Biological reference points are unknown for halibut, but the stock is considered overfished. Halibut is currently in a rebuilding plan with an end date of 2056.

Atlantic wolffish is a benthic fish distributed off Greenland to Cape Cod and sometimes in southern New England and New Jersey waters. Based on the recommendations of the 2020 Peer Review Panel, wolffish is overfished but overfishing is not occurring. Wolffish is in a rebuilding plan, but the end date is not defined.

Management and Fishery. Northeast multispecies are managed under a dual management system which breaks the fishery into two components: sectors and the common pool. For stocks that permit fishing, each sector is allotted a share of each stock's ACL that consists of the sum of individual sector member's potential sector contribution based on their annual catch entitlements. Sector allocations are strictly controlled as hard total allowable catch limits and retention is required for all stocks managed under an ACL. Overages are subject to accountability measures including payback from the sector's allocation for the following year. Common pool vessels are allocated days at sea (DAS) and their effort further is controlled by a variety of measures including trip limits, closed areas, minimum fish size and gear restrictions varying between stocks. Only a very small portion of the ACL is allotted to the common pool. Framework Adjustment 63 to the NE Multispecies FMP has more detail on the stock status and control of fishing effort (NEFMC 2022a).

5.2.2 Skates

Life History and Population. The Northeast Skate Complex Fishery Management Plan (Skate FMP) specifies the management measures for seven skate species (barndoor, clearnose, little, rosette, smooth, thorny, and winter skate) off the New England and Mid-Atlantic coasts. Specifications are set for skates as a complex (e.g., one ACL) every two years, which include possession limits for the skate wing and bait fisheries. These fisheries have different seasonal management structures and are subject to effort controls and accountability measures. Overfishing is not occurring on any of these species, and only one species, thorny skate, is overfished.

Management and Fishery. A detailed description of the commercial skate fishery and fishing communities may be found in Framework Adjustment 8 (NEFMC 2020b). The bait fishery is primarily whole little and small-winter skates, and the wing fishery is primarily large-winter and barndoor skates. There are three primary skate ports: Chatham and New Bedford, Massachusetts and Point Judith, Rhode Island; and 11 secondary ports from Massachusetts to New Jersey. The number of vessels landing skate has declined since FY 2011 (567) to 322 in FY 2020. Skate revenue has fluctuated between \$5.2-\$9.4M annually from FY 2010 to 2020, largely due to changes in wing revenue. Within the directed monkfish gillnet fishery, there is also a seasonal gillnet incidental skate fishery, in which mostly winter skates are sold for lobster bait and as cut wings for processing.

5.2.3 Atlantic Sea Scallops

Life History and Population. Sea scallops, *Placopecten magellanicus*, are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20° C (68° F). North of Cape Cod, concentrations generally occur in shallow water <40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths of 25 - 200 m (14 - 110 fathoms), with commercial concentrations generally 35 - 100 m (19 - 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart & Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 - 80% in shell height and quadruple their meat weight. Sea scallops can live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. Larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three-year-olds were often exploited. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality (NEFSC 2011).

Management and Fishery. The commercial fishery for sea scallops is conducted year-round, primarily using New Bedford style and turtle deflector scallop dredges. A small percentage of the fishery uses otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. The NEFMC established the Scallop FMP in 1982. The scallop resource was last assessed in 2020, and it was not overfished, and overfishing was not occurring (NEFSC 2020a). Vessels targeting scallops catch monkfish and land them if the price is high enough.

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with non-Target species, so Section 5.2 (monkfish focus) and 5.3 (spiny dogfish focus) differ somewhat in formatting.

Non-Target Species

A) Other Species Caught in Directed Spiny Dogfish Fishing

Due to reduced observer coverage in 2020 and 2021 due to Covid-19, observer data from 2017-2019 still best describe incidental catch in the spiny dogfish fishery. The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. A flexible criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal but is impracticable.

From 2017-2019, gill net gear accounted for 66%-74% of annual landings. Bottom long line gear accounted for 18-27% of annual landings. All other gears, including bottom trawl, accounted for only 7-8% of annual landings and are not expected to have involved substantial targeting of spiny dogfish given current trip limits (substantial trawling for spiny dogfish would only be expected at higher trip limits given the price of spiny dogfish) and very similar intensity of bottom trawling in the region would be expected to occur even with a complete prohibition on spiny dogfish retention.

From 2017-2019 there were on average 235 observed sink gill net trips (gear # = 100) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 2,540 hauls of which 86% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 5% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): winter/big skate (83,000 pounds), little skate (8,000 pounds), unknown skates (7,000 pounds), monkfish (6,000 pounds), smooth dogfish (4,000 pounds), cod (3,000 pounds), lobster (3,000 pounds), pollock (3,000 pounds), menhaden (2,000 pounds), haddock (1,000 pounds), and striped bass (1,000 pounds). Of these, only cod is overfished while the Southern New England lobster stock is “depleted with poor prospects of recovery” (https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf, <http://www.asmfc.org/species/american-lobster>). Information on skates, the most frequent bycatch species, can be found above in the section that focuses on bycatch in the monkfish fishery.

From 2017-2019 there were on average 36 observed bottom longline trips (gear # = 010) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 438 hauls of which 99% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 10% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): golden tilefish (7,000 pounds), barndoor skate (4,000 pounds), smooth dogfish (3,000 pounds), and winter/big skate (2,000 pounds). Of these, none is overfished (https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf).

While not extrapolations, the above amounts appear very small relative to annual catch limits for these species, and management of these species already accounts for both landings and discards. Given the apparent low level of interactions with non-target species and ongoing management of those species, their conditions are affected predominantly by other fisheries/issues and should not be affected by this action or the operation of the spiny dogfish fishery more generally.

B. Other Managed Fisheries with Non-directed Spiny Dogfish Catch

Per NMFS’ 2020 report on Discard Estimation, Precision, and Sample Size Analyses for 14 Federally Managed Species Groups in the Waters off the Northeastern United States (NMFS 2020), a wide variety of gear types discard spiny dogfish beyond the gear types mentioned above that are responsible for most landings. These other gear types catch most of the species that exist in the region, some of which are in good condition and some of which are in an overfished condition. While this indicates that incidental spiny dogfish catch occurs across a wide variety of other managed fisheries, outside of the directed spiny dogfish fishery, spiny dogfish is often seen as a pest species (e.g. see MAFMC 2017 MSB Fishery Performance Report at <http://www.mafmc.org/s/2017-MSB-Fishery-Performance-Report.pdf>), and is often entirely discarded (e.g. longfin squid fishery – see MAFMC 2020). As such, changes in spiny dogfish regulations are not expected to change fishing patterns for other fisheries that catch (and mostly

discard) spiny dogfish, or affect any of those managed species in a meaningful way. Further details about the many other managed species in the region and their current stock statuses can be found in their relevant FMPs.

5.3 PROTECTED RESOURCES

5.3.1 Atlantic Sturgeon

The life history traits of Atlantic sturgeon have been documented in historical and contemporary literature (e.g., Dees 1961; Vladykov and Greeley 1963; ASSRT 2007; Hilton et al. 2016; ASMFC 2017). Key characteristics include that spawning occurs in freshwater of a river that is part of an estuary. The early life stages are dependent on and remain in the natal estuary for months to years until they are suitably developed to enter the Atlantic Ocean, thus beginning their seasonal use of both estuarine and marine waters for the remainder of their life. They return to a freshwater tidal reach of a river estuary when they are ready to spawn. Tagging records and the relatively low rate of gene flow reported in population genetic studies provide evidence that Atlantic sturgeon typically return to their natal river to spawn (ASSRT 2007). Adults are long-lived and spawn multiple times within their lifespan but maturity occurs relatively late, anywhere from several years to more than 20 years (ASSRT 2007; Hilton et al. 2016). The age at which they mature and the time of year when they spawn varies among the river populations.

Atlantic sturgeons travel long distances in marine waters and aggregate in both ocean and estuarine areas at certain times of the year. The marine and estuarine range of all five Atlantic sturgeon DPSs as well as the two Canadian populations overlap and extends from Canada through Cape Canaveral, Florida (ASSRT 2007; Wirgin et al. 2015; Kazyak et al. 2021). Their use of the marine environment is characterized by seasonal differences in distribution with a presence in more nearshore waters in the spring, particularly near coastal estuaries, and movement to more offshore waters in the fall where the fish generally occur throughout the winter (Erickson et al. 2011; Ingram et al. 2019; Rothermel et al. 2020).

The Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries (NOAA 2022) described the movements of Atlantic sturgeon in marine waters and the habitats used in greater detail as follows.

Erickson et al. (2011) provided some of the most detailed information for Atlantic sturgeon in the marine environment based on data from pop-up satellite archival tags of 15 adult Atlantic sturgeon that were captured in the freshwater reach of the Hudson River. Upon leaving the Hudson River, all of the fish used a similar depth range in summer and fall, and 13 of the 15 continued to have a similar depth pattern in the winter through spring. Mean-daily depths typically ranged from 5 to 35 m and never exceeded 40 m. The sturgeons occupied the deepest waters during winter and early spring (December–March) and shallowest waters during late spring to early fall (May–September). Mean-monthly water temperatures ranged from 8.3°C in February to 21.6°C in August for the 13 fish that exhibited similar depth distributions. Of the remaining two fish, during December and January, one sturgeon occurred at shallower depths (5-15 m) and in warmer waters, while the second fish occurred at deeper depths (35-70 m) and in colder waters. Nearly all of the sturgeon stayed within the Mid-Atlantic Bight before their tags were released. However, the sturgeon did not appear to move to a specific marine area where the fish reside throughout the winter. Instead, the sturgeon occurred within different areas of the Mid-Atlantic Bight and at different depths, occupying in deeper and more southern waters in the winter months and more northern and shallow waters in the summer months with spring and fall being transition periods. Three subsequent studies, Breece et al. (2018), Ingram et al. (2019), and Rothermel et al. (2020), using

thousands of detections of acoustically-tagged Atlantic sturgeon within receiver arrays off Long Island, New Jersey, Delaware, and Maryland demonstrated that depth and water temperature are key variables associated with sturgeon presence and distribution in Mid-Atlantic marine waters. All three studies provided further evidence of seasonal inshore and offshore movements with sturgeon occupying shallower waters closer to the coast in the spring and more offshore waters in the late fall-winter. Finally, like Erickson et al., both the Ingram et al. study and the Rothermel et al. study found very low residency time for individual Atlantic sturgeon within the receiver arrays for the respective studies. This suggests that sturgeon aggregation areas in the marine environment are not areas where individual sturgeon reside for extended periods of time but are used by many sturgeon for what they provide in terms of the most suitable environmental conditions as the sturgeon move through the marine environment.

Available information suggests a similar pattern for Atlantic sturgeon distribution and occurrence within the Gulf of Maine. Altenritter et al. (2017), Novak et al. (2017), and Wippelhauser et al. (2017) provide the most recent, published literature describing Atlantic sturgeon movements within and beyond the Gulf of Maine. Each of the studies used telemetry detections of acoustically-tagged Atlantic sturgeon, many of which were initially captured in a Gulf of Maine river, suggesting that they were more likely to belong to the Gulf of Maine DPS. Their results demonstrate that the sturgeon primarily occurred in the Gulf of Maine, use more offshore waters in the fall and winter, and make seasonal coastal movements between estuaries. Some of the estuaries are known aggregation areas where sturgeon forage, and one (i.e., the Kennebec River Estuary) is the only known spawning river for the Gulf of Maine DPS.

A comprehensive analysis of Atlantic sturgeon stock composition coastwide provides further evidence that the sturgeon's natal origin influences the distribution of Atlantic sturgeon in the marine environment. While Atlantic sturgeon that originate from each of the five DPSs and from the Canadian rivers were represented in the 1,704 samples analyzed for the study, there were statistically significant differences in the spatial distribution of each DPS, and individuals were most likely to be assigned to a DPS in the same general region where they were collected (Kazyak et al. 2021). The results support the findings of previous genetic analyses that Atlantic sturgeon of a particular DPS can occur throughout its marine range but are most prevalent in the broad region of marine waters closest to the DPSs natal river(s). In comparison to its total marine range, Atlantic sturgeon belonging to: the Gulf of Maine DPS are most prevalent in the Gulf of Maine; the New York Bight DPS are most prevalent in the Mid-Atlantic Bight and are the most prevalent of all of the DPSs in the Mid-Atlantic Bight; and, the Chesapeake Bay DPS are most prevalent in the Mid-Atlantic Bight, particularly from around Delaware to Cape Hatteras.

The seasonal movements of Atlantic sturgeon are not absolute and exceptions to the general movement pattern occur. For example, two adults were detected in the Appomattox River, Virginia during the winter (C. Hager, Chesapeake Scientific, pers. comm.). Nevertheless, multiple studies using a variety of tracking methods demonstrate that Atlantic sturgeon adults and subadults typically move from coastal estuaries to marine waters in the fall and occur there throughout the winter before moving to more inshore marine waters in the spring.

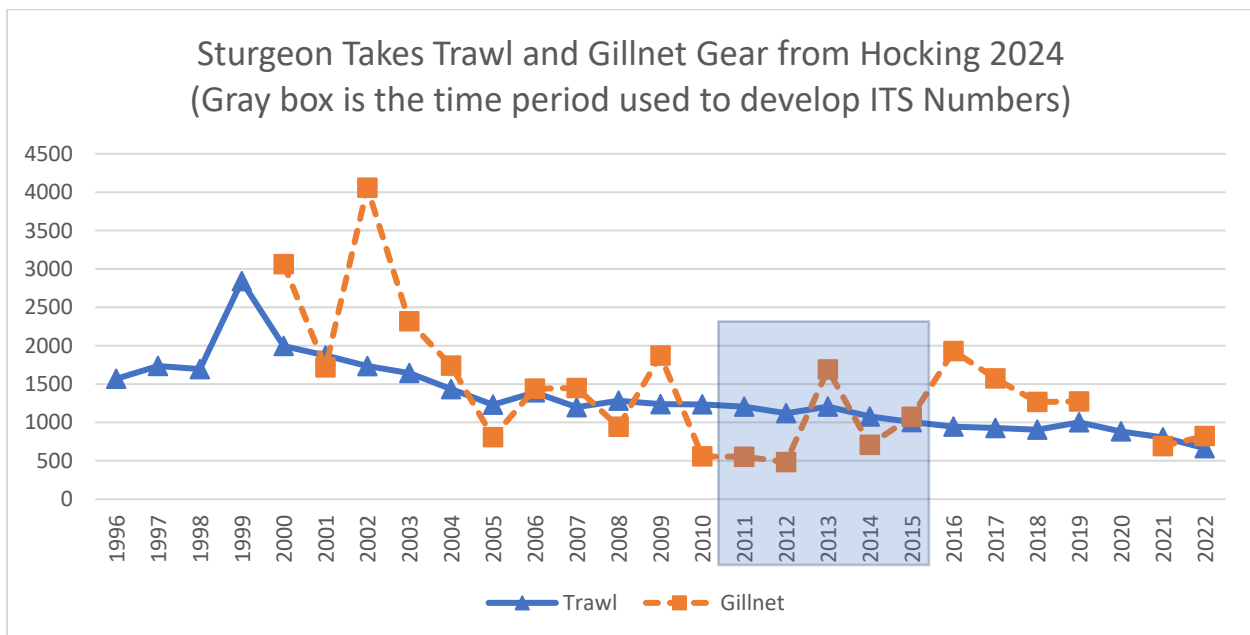
All of the Atlantic sturgeon DPSs are either at risk of extinction (i.e., those DPSs listed as endangered) or at risk of becoming endangered (i.e., the Gulf of Maine DPS) due to multiple threats that include the loss and alteration of habitat, and anthropogenic mortality. In particular, based on estimates of Atlantic sturgeon bycatch (Stein et al. 2004b; ASMFC 2007), NOAA Fisheries concluded that bycatch of Atlantic sturgeon in commercial gillnet and bottom trawl fisheries was a threat (77 FR 5880 and 77 FR 5914; February 6, 2012). NOAA Fisheries also noted in the listing determinations that there were no estimates of total abundance for any of the five DPSs but that abundance was likely orders of magnitude lower than historical abundance given the available information for adult spawning abundance and natal juvenile

abundance for some DPSs and given the reduced number of known spawning populations compared to historical records.

The ASMFC’s most recent stock assessment for Atlantic sturgeon concluded that some of the DPSs have likely increased in abundance since closure of the Atlantic sturgeon fisheries in state and federal waters (ASMFC 2017). However, a lack of data hampered their efforts to assess the status of Atlantic sturgeon and there was considerable uncertainty given the data available. For example, the Stock Assessment describes that there is a relatively low probability (37 percent) that abundance of the Chesapeake Bay DPS has increased since the implementation of the 1998 fishing moratorium but, adds further clarification that it was not clear if the percent probability for the trend in abundance was a reflection of the actual trend in abundance or of the underlying data quality for the DPS. Similarly, the Stock Assessment concludes that there is a 51-percent probability that abundance of the Gulf of Maine DPS has increased since implementation of the 1998 fishing moratorium but also a relatively high likelihood (74-percent probability) that mortality for the Gulf of Maine DPS exceeds the mortality threshold used for the Stock Assessment. By comparison, more data is available for the New York Bight DPS and the Stock Assessment concludes that there is a relatively high probability (75 percent) that the New York Bight DPS abundance has increased since the implementation of the 1998 fishing moratorium, and a 69-percent probability that mortality for the New York Bight DPS does not exceed the mortality threshold used for the assessment. However, the Stock Assessment also describes that the DPS-level estimates of mortality from the tagging model had wide credible intervals, so one cannot conclude with statistical certainty whether any of the DPS-level mortality estimates are above or below its respective thresholds. New information available since the ESA-listing of the five DPSs was provided in the Stock Assessment as well as in the NOAA Fisheries [5-year reviews](#) for each DPS. Based on the new and existing information, NOAA Fisheries concluded that the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs should remain listed as endangered, and the Gulf of Maine DPS should remain listed as threatened.

The ASMFC is updating its Atlantic sturgeon assessment in 2024 and that information will be considered in the reinitiated Biological Opinion.

Figure 19. Total Estimated Gillnet Takes.



Source: Hocking 2024, available via Tables 3/4 at <https://www.mafmc.org/actions/sturgeon-bycatch-framework> . Years used for ITS highlighted (2011-2015)

5.3.2 Protected Species Present in the Area

The Monkfish FMP describes management of the monkfish fishery from Maine to North Carolina. The Spiny Dogfish FMP describes management of the spiny dogfish fishery coastwide. Although spiny dogfish are most abundant from Nova Scotia to Cape Hatteras, North Carolina, we consider here the protected species that occur throughout the coastwide management area of the spiny dogfish fishery.

Numerous protected species occur in the combined affected environment of the Monkfish FMP and of the Spiny Dogfish FMP (Table 8) and have the potential to be impacted by the proposed action (i.e., there have been observed/documented interactions in the fisheries or with gear types like those used in the fisheries (bottom trawl, gillnet gear)). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Cusk are a NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. If a species is proposed for listing the conference provisions under Section 7 of the ESA apply (50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, cusk will not be discussed further in this and the following sections; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. More information on cusk is at: <https://www.fisheries.noaa.gov/species/cusk>.

Table 8. Species protected under the ESA and/or MMPA that may occur in the monkfish fishery affected environment.

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (<i>Eubalaena glacialis</i>)	Endangered	Yes
Humpback whale, West Indies DPS (<i>Megaptera novaeangliae</i>)	Protected (MMPA)	Yes
Fin whale (<i>Balaenoptera physalus</i>)	Endangered	Yes
Sei whale (<i>Balaenoptera borealis</i>)	Endangered	Yes
Blue whale (<i>Balaenoptera musculus</i>)	Endangered	No
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered	Yes
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected (MMPA)	Yes
Pilot whale (<i>Globicephala</i> spp.) ²	Protected (MMPA)	Yes
Pygmy sperm whale (<i>Kogia breviceps</i>)	Protected (MMPA)	No
Dwarf sperm whale (<i>Kogia sima</i>)	Protected (MMPA)	No
Risso's dolphin (<i>Grampus griseus</i>)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected (MMPA)	Yes
Short Beaked Common dolphin (<i>Delphinus delphis</i>)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (<i>Stenella frontalis</i>)	Protected (MMPA)	No
Striped dolphin (<i>Stenella coeruleoalba</i>)	Protected (MMPA)	No
Bottlenose dolphin (<i>Tursiops truncatus</i>)³	Protected (MMPA)	Yes
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected (MMPA)	Yes

Species	Status	Potentially impacted by this action?
Sea Turtles		
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered	Yes
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	Endangered	Yes
Green sea turtle, North Atlantic DPS (<i>Chelonia mydas</i>)	Threatened	Yes
Loggerhead sea turtle (<i>Caretta caretta</i>), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (<i>Eretmochelys imbricate</i>)	Endangered	No
Fish		
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered	No
Giant manta ray (<i>Manta birostris</i>)	Threatened	Yes
Oceanic whitetip shark (<i>Carcharhinus longimanus</i>)	Threatened	No
Atlantic salmon (<i>Salmo salar</i>)	Endangered	Yes
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)		
<i>Gulf of Maine DPS</i>	Threatened	Yes
<i>New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS</i>	Endangered	Yes
Cusk (<i>Brosme brosme</i>)	Candidate	Yes
Pinnipeds		
Harbor seal (<i>Phoca vitulina</i>)	Protected (MMPA)	Yes
Gray seal (<i>Halichoerus grypus</i>)	Protected (MMPA)	Yes
Harp seal (<i>Phoca groenlandicus</i>)	Protected (MMPA)	Yes
Hooded seal (<i>Cystophora cristata</i>)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale	ESA Designated	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Designated	No
Johnson's Sea Grass	ESA Designated	No
Elkhorn and Staghorn corals	ESA Designated	No
Smalltooth Sawfish (U.S. DPS)	ESA Designated	No
<p><i>Note:</i> Marine mammal species italicized and in bold are considered MMPA strategic stocks, a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Sect. 3, MMPA of 1972).</p> <p>² There are 2 species of pilot whales: short finned (<i>G. melas melas</i>) and long finned (<i>G. macrorhynchus</i>). Due to the difficulties in identifying the species at sea, they are often just referred to as <i>Globicephala spp.</i></p> <p>³ This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See NMFS Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region for further details.</p>		

5.3.3 Species and Critical Habitat Unlikely to be Impacted by the Proposed Action

Based on available information, it has been determined that this action is unlikely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 8). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent ten years of observer, stranding, and/or marine mammal serious injury and mortality reports, there have been no observed or documented interactions between the species and the primary gear type (i.e., bottom trawl and gillnet) used to prosecute the

monkfish fishery or the spiny dogfish fishery (Greater Atlantic Region (GAR) Marine Animal Incident Database, unpublished data; NMFS [Marine Mammal Stock Assessment Reports \(SARs\) for the Atlantic Region](#); NMFS NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality [Reference Documents, Publications](#), or [Technical Memoranda](#); [MMPA List of Fisheries \(LOF\)](#); NMFS 2021a).⁶ In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 8 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

The protected species and critical habitat that occur only within the extended range of the spiny dogfish management area (e.g., Hawksbill sea turtle and critical habitat for Johnson's sea grass, Smalltooth sawfish, Elkhorn and Staghorn corals) are unlikely to be impacted by this action (Table 7). Therefore, for this action, the combined affected environment is the same even though the management areas for the monkfish fishery and the spiny dogfish fishery are not the same.

5.3.4 Species Potentially Impacted by the Proposed Action

Table 8 lists protected species of sea turtle, marine mammal, and fish species present in the affected environment of the monkfish and spiny dogfish fisheries, and that may also be impacted by the operation of these fisheries; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fisheries. To aid in the identification of MMPA protected species potentially impacted by the action, NMFS [Marine Mammal SARs for the Atlantic Region](#), [MMPA List of Fisheries \(LOF\)](#), NMFS (2021b), NMFS NEFSC observer/sea sampling database (unpublished data), and NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality [Reference Documents, Publications](#), or [Technical Memoranda](#) were referenced.

To help identify ESA listed species potentially impacted by the action, we queried the NMFS NEFSC observer/sea sampling (2010-2019), Sea Turtle Disentanglement Network (2010-2019), and the GAR Marine Animal Incident (2010-2019) databases for interactions, and reviewed the May 27, 2021, Biological Opinion (Opinion)⁷ issued by NMFS. The 2021 Opinion considered the effects of the NMFS' authorization of ten fishery management plans (FMP),⁸ including the Monkfish FMP and the Spiny Dogfish FMP on ESA-listed species and designated critical habitat. The Opinion determined that the authorization of ten FMPs may adversely affect, but is unlikely to jeopardize, the continued existence of North Atlantic right, fin, sei, or sperm whales; the Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, leatherback, Kemp's ridley, or North Atlantic DPS of green sea turtles; any of the five DPSs of Atlantic sturgeon; GOM DPS Atlantic salmon; or giant manta rays. The Opinion also concluded that the proposed action is unlikely to adversely affect designated critical habitat for North Atlantic right whales, the Northwest Atlantic Ocean DPS of loggerhead sea turtles, U.S. DPS of smalltooth sawfish, Johnson's seagrass, or elkhorn and staghorn corals. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

⁶ For marine mammals protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2010-2019. For ESA listed species, information on observer or documented interactions with fishing gear is from 2010-2019.

⁷ NMFS' May 27, 2021, Biological Opinion on the 10 FMPs is at:

<https://www.fisheries.noaa.gov/resource/document/biological-opinion-10-fishery-management-plans>

⁸ The ten FMPs considered in the May 27, 2021, Biological Opinion include: American Lobster, Atlantic Bluefish, Atlantic Deep-Sea Red Crab, Mackerel/Squid/Butterfish, Monkfish, Northeast Multispecies, Northeast Skate Complex, Spiny Dogfish, Summer Flounder/Scup/Black Sea Bass, and Jonah Crab.

As the primary concern for both MMPA protected and ESA listed species is the potential for the monkfish fishery and the spiny dogfish fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider (1) species occurrence in the affected environment of each of these fisheries and how the fisheries will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the monkfish and spiny dogfish fisheries and on protected species interactions with specific fishery gear is provided below.

5.3.4.1 Sea Turtles

Below is a summary of the status and trends, and the occurrence and distribution of sea turtles in the affected environment of the monkfish fishery and spiny dogfish fishery. More information on the range-wide status of affected sea turtles species, and their life history is in several published documents, including NMFS (2021a); sea turtle status reviews and biological reports (Conant *et al.* 2009; Hirth 1997; NMFS & USFWS 1995; 2007a; b; 2013; TEWG 1998; 2000; 2007; 2009), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992; 1998b; 2020), Kemp's ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (NMFS & USFWS 1991; 1998a).

Status and Trends.

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 8). Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

For the Northwest Atlantic Ocean DPS of loggerhead sea turtles, there are five unique recovery units that comprise the DPS. Nesting trends for each of these recovery units are variable; however, Florida index nesting beaches comprise most of the nesting in the DPS (<https://myfwc.com/research/wildlife/sea-turtles/nesting/beach-survey-totals/>). Overall, short-term trends for loggerhead sea turtles (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021a).

For Kemp's ridley sea turtles, from 1980-2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15% annually (Heppell *et al.* 2005a); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and therefore, the overall trend is unclear (Caillouet *et al.* 2018; NMFS & USFWS 2015). In 2019, there were 11,090 nests, a 37.61% decrease from 2018 and a 54.89% decrease from 2017, which had the highest number (24,587) of nests; the reason for this recent decline is uncertain (NMFS 2021a). Given this and continued anthropogenic threats to the species, according to NMFS (2021a), the species resilience to future perturbation is low.

The North Atlantic DPS of green sea turtle, overall, is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff *et al.* 2015). While anthropogenic threats to this species continue, considering the best available information on the species, NMFS (2021a), concluded that the North Atlantic DPS seems somewhat resilient to future perturbations.

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (Northwest Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS & USFWS 2020). Given

continued anthropogenic threats to the species, according to NMFS (2021a), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

Occurrence and Distribution.

Hard-shelled sea turtles. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill *et al.* 2008; Braun & Epperly 1996; Epperly *et al.* 1995a; Epperly *et al.* 1995b). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2002; Epperly *et al.* 1995a; Epperly *et al.* 1995b; Epperly *et al.* 1995c; Griffin *et al.* 2013; Morreale & Standora 2005; NMFS & USFWS 2020), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly *et al.* 1995a; Griffin *et al.* 2013; Hawkes *et al.* 2011; Shoop & Kenney 1992).

Leatherback sea turtles. Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (Dodge *et al.* 2014; Eckert *et al.* 2006; James *et al.* 2005; Murphy *et al.* 2006; NMFS & USFWS 2013). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006; NMFS & USFWS 1992). They are found in more northern waters (i.e., GOM) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006).

5.3.4.2 Large Whales

Status and Trends.

Six large whale species have the potential to be impacted by the proposed action: humpback, North Atlantic right, fin, sei, sperm, and minke whales (Table 9). Large whale stock assessment reports covering the period of 2010-2019, indicate a decreasing trend for the North Atlantic right whale population; however, for fin, humpback, minke, sperm, and sei whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. The NMFS [Marine Mammal SARs for the Atlantic Region](#) has more information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales.

Occurrence and Distribution.

As in Table 9, North Atlantic right, humpback, fin, sei, sperm, and minke whales occur in the Northwest Atlantic Ocean. As large whales may be present in these waters throughout the year, the monkfish fishery and spiny dogfish fishery are likely to co-occur with large whales in the affected area for at least some part of each year. To further help understand how the monkfish fishery and the spiny dogfish fishery overlap in time and space with large whales, Table 8 has an overview of species occurrence and distribution in the affected environment. More information on North Atlantic right, humpback, fin, sei, sperm, and minke whales is in: NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 9. Large whale occurrence, distribution, and habitat use in the affected environment.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
<p>North Atlantic Right Whale</p>	<ul style="list-style-type: none"> ● Predominantly occupy waters of the continental shelf, but based on passive acoustic and telemetry data, are also known to make lengthy excursions into deep waters off the shelf. ● Visual and acoustic data demonstrate broad scale, year-round presence along the U.S. eastern seaboard (e.g., GOM, New Jersey, and Virginia). ● Surveys have demonstrated the existence of several areas where North Atlantic right whales congregate seasonally, including Cape Cod Bay; Massachusetts Bay; and the continental shelf south of New England. Although whales can be found consistently in certain locations throughout their range, there is high inter-annual variability in right whale use of some habitats. Since 2010, acoustic and visual surveys indicate a shift in habitat use patterns, including: <ul style="list-style-type: none"> > Fewer individuals are detected in the Great South Channel; > increase in the number of individuals using Cape Cod Bay (i.e., during the expected late winter and early spring foraging period and during the ‘off season’ period of summer and fall); > apparent abandonment of central GOM in the winter; and, > Large increase in the numbers of whales detected in a region south of Martha’s Vineyard and Nantucket Islands (i.e., during the expected late winter and early spring foraging period and during the ‘off season’ period of summer and fall). > Passive acoustic monitoring suggests a shift to a year-round presence in the Mid-Atlantic, including year-round detections in the New York Bight with the highest presence between late February and mid-May in the shelf zone and nearshore habitat).
<p>Humpback</p>	<ul style="list-style-type: none"> ● Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. ● New England waters (GOM and GB) = Foraging Grounds (~March- November); however, acoustic detections of humpbacks indicate year-round presence in New England waters, including the waters of Stellwagen Bank. ● Mid-Atlantic waters: Increasing evidence that mid-Atlantic areas are becoming an important habitat for juvenile humpback whales. ● Since 2011, increased sightings of humpback whales in the New York-New Jersey Harbor Estuary, in waters off Long Island, and along the shelf break east of New York and New Jersey. ● Increasing visual and acoustic evidence of whales remaining in mid- and high-latitudes throughout the winter (e.g., Mid- Atlantic: waters near Chesapeake and Delaware Bays, peak presence about January through March; Massachusetts Bay: peak presence about March-May and September-December).
<p>Fin</p>	<ul style="list-style-type: none"> ● Distributed throughout all continental shelf waters of the GOM to Mid-Atlantic; ● Recent sighting data show evidence that, while densities vary seasonally, fin whales are present in every season throughout most of the EEZ north of 30°N. ● New England waters (GOM and GB) = Major Foraging Ground
<p>Sei</p>	<ul style="list-style-type: none"> ● Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks.; however incursions into shallower, shelf waters do occur (e.g., Stellwagen Bank, Great South Channel, waters south of Nantucket, Georges Bank). ● Spring through summer, sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of Georges Bank, and south of Nantucket, MA. ● Recent acoustic detections peaked in northern latitudes in the summer, indicating feeding grounds ranging from Southern New England through the Scotian Shelf. ● Persistent year-round detections in Southern New England and the New York Bight indicate this area to be an important region for sei whales.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
	<ul style="list-style-type: none"> The wintering habitat remains largely unknown. Passive acoustic monitoring conducted in 2015-2016 off Georges Bank detected sei whales calls from late fall through the winter along the southern Georges Bank region (off Heezen and Oceanographer Canyons).
Sperm	<ul style="list-style-type: none"> Distributed on the continental shelf edge, continental slope, and into mid-ocean regions. Seasonal Occurrence in the U.S. EEZ: <ul style="list-style-type: none"> >Winter: concentrated east and northeast of Cape Hatteras; >Spring: center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank; >Summer: similar distribution to spring, but also includes the area east and north of Georges Bank and into the Northeast Channel region, and the continental shelf (inshore of the 100-m isobath) south of New England; and, >Fall: occur in high levels south of New England, on the continental shelf. Also occur along continental shelf edge in the mid-Atlantic bight.
Minke	<ul style="list-style-type: none"> Widely distributed within the U.S. EEZ. Spring to Fall: widespread (acoustic) occurrence on the continental shelf; most abundant in New England waters during this period of time. September to April: high (acoustic) occurrence in deep-ocean waters.
<p><i>Note:</i> SNE=Southern New England; GOM=Gulf of Maine; GB=Georges Bank <i>Sources:</i> Baumgartner et al. (2011; 2007); Baumgartner and Mate (2005); Bort et al. (2015); Brown et al. (Brown et al. 2018; 2002); CETAP (1982); Charif et al. (2020); Cholewiak et al. (2018); Clapham et al. (1993); Clark and Clapham (2004); Cole et al. (2013); Davis et al. (2017; 2020); Ganley et al. (2019); Good (2008); Hain et al. (1992); Hamilton and Mayo (1990); Hayes et al. (2017; 2018; 2019; 2020; 2021; 2022); Kenney et al. (1986; 1995); Khan et al. (2010; 2011; 2012; 2009); Kraus et al. (2016); Leiter et al. (2017); Mate et al. (1997); Mayo et al. (2018); McLellan et al. (2004); Moore et al. (2021); Morano et al. (2012); Muirhead et al. (2018); Murray et al. (2013); NMFS (1991; 2005; 2010; 2011; 2021a; b) 2012; 2015; NOAA (2008); Pace and Merrick (2008); Palka et al. (2017); Palka (2020)2020; Payne et al. (1984; 1990); Pendleton et al. (2009); Record et al. (2019); Risch et al. (2013); Robbins (2007); Roberts et al. (2016); Salisbury et al. (2016); Schevill et al. (1986); Stanistreet et al. (2018); Stone et al. (2017); Swingle et al. (1993); Vu et al. (2012); Watkins and Schevill (1982); Whitt et al. (2013); Winn et al. (1986); 81 FR 4837 (January 27, 2016); 86 FR 51970 (September 17, 2021).</p>	

5.3.4.3 Small Cetaceans

Status and Trends. Risso’s, white-sided, short beaked common, and bottlenose dolphins (Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal stocks); long and short – finned pilot whales; and harbor porpoise are identified as having the potential to be impacted by the proposed action (Table 10). The latest stock assessment (Hayes *et al.* 2021) indicates that as a trend analysis has not been conducted for Risso’s, white-sided, short-beaked common dolphins; long-finned pilot whales; or harbor porpoise, the population trajectory for these species is unknown. For short-finned pilot whales a generalized linear model indicated no significant trend in the abundance estimates (Hayes *et al.* 2022). For the Western North Atlantic Offshore stock, review of the most recent information on the stock shows no statistically significant trend in population size for this species; however, the high level of uncertainty in the estimates limits the ability to detect a statistically significant trend. Regarding the Northern and Southern Migratory Coastal stocks (both considered a strategic stock under the MMPA), the most recent analysis of trends in abundance suggests a probable decline in stock size between 2010–2011 and 2016, concurrent with a large unusual mortality event (UME) in the area; however, there is limited power to evaluate trends given uncertainty in stock distribution, lack of precision in abundance estimates, and a limited number of surveys (Hayes *et al.* 2021).

Occurrence and Distribution. Atlantic white sided dolphins, short and long finned pilot whales, Risso’s dolphins, short beaked common dolphins, harbor porpoise, and several stocks of bottlenose dolphins are

found throughout the year in the Northwest Atlantic Ocean (see NMFS [Marine Mammal SARs for the Atlantic Region](#)). Within this range, however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how the monkfish fishery and the spiny dogfish fishery overlap in time and space with the occurrence of small cetaceans, Table 10 gives an overview of species occurrence and distribution in the affected environment of the monkfish and spiny dogfish fisheries for this action. More information on small cetacean occurrence and distribution in the Northwest Atlantic is in the NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 10. Small cetacean occurrence and distribution in the monkfish fishery affected environment.

Species	Occurrence and Distribution in the Affected Environment
<p>Atlantic White Sided Dolphin</p>	<ul style="list-style-type: none"> • Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM; however, most common in continental shelf waters from Hudson Canyon (~39°N) to GB, and into the GOM. • January-May: low densities found from GB to Jeffreys Ledge. • June-September: Large densities found from GB, through the GOM. • October-December: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic), particularly around Hudson Canyon, low densities found year-round, • Virginia (VA) and North Carolina (NC) waters represent southern extent of species range during winter months.
<p>Short Beaked Common Dolphin</p>	<ul style="list-style-type: none"> • Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 m isobaths) of the Mid-Atlantic, SNE, and GB (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia/South Carolina border. • January-May: occur from waters off Cape Hatteras, NC, to GB (35° to 42°N). • Mid-summer-autumn: Occur in the GOM and on GB; <i>Peak abundance</i> found on GB in the autumn.
<p>Risso's Dolphin</p>	<ul style="list-style-type: none"> • Spring through fall: Distributed along the continental shelf edge from Cape Hatteras, NC, to GB. • Winter: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the GOM; primarily a Mid-Atlantic continental shelf edge species (can be found year-round).
<p>Harbor Porpoise</p>	<ul style="list-style-type: none"> • Distributed throughout the continental shelf of the Mid-Atlantic, SNE, GB, and GOM. • July-September: Concentrated in the northern GOM (waters <150 m); low numbers can be found on GB. • October-December: widely dispersed in waters from New Jersey (NJ) to Maine (ME); seen from the coastline to deep waters (>1,800 m). • January-March: intermediate densities in waters off NJ to NC; low densities found in waters off New York (NY) to GOM. • April-June: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 m). • Passive acoustic monitoring indicates regular presence from January through May offshore of Maryland.
<p>Bottlenose Dolphin</p>	<p><u>Western North Atlantic Offshore Stock</u></p> <ul style="list-style-type: none"> • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from GB to Florida (FL). • Depths of occurrence: ≥40 m <p><u>Western North Atlantic Northern Migratory Coastal Stock</u></p> <ul style="list-style-type: none"> • Most common in coastal waters <20 m deep.

Species	Occurrence and Distribution in the Affected Environment
	<ul style="list-style-type: none"> • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to about 25-m isobaths between the mouth of the Chesapeake Bay and Long Island, NY. • Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. <p><u>Western North Atlantic Southern Migratory Coastal Stock</u></p> <ul style="list-style-type: none"> • Most common in coastal waters <20 m deep. • October-December: appears stock occupies waters of southern NC (south of Cape Lookout) • January-March: appears stock moves as far south as northern FL. • April-June: stock moves north to waters of NC. • July-August: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA (as far north as Assateague).
<p>Pilot Whales: <i>Short- and Long-Finned</i></p>	<p><u>Short-Finned Pilot Whales</u></p> <ul style="list-style-type: none"> • Except for area of overlap (see below), primarily occur south of 40°N (Mid-Atlantic and SNE waters); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily near the continental shelf break of the Mid-Atlantic and SNE (i.e., off Nantucket Shoals). <p><u>Long-Finned Pilot Whales</u></p> <ul style="list-style-type: none"> • Except for area of overlap (see below), primarily occur north of 42°N. • Winter to early spring: distributed principally along the continental shelf edge off the northeastern U.S. coast. • Late spring through fall: movements and distribution shift onto GB and into the GOM and more northern waters. • Species tends to occupy areas of high relief or submerged banks. <p><u>Area of Species Overlap:</u> along the mid-Atlantic shelf break between Delaware and the southern flank of GB.</p>
<p><i>Notes:</i> Information is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to 2,000 m depth. <i>Sources:</i> Hayes et al. (2017; 2018; 2019; 2020; 2022); Payne and Heinemann (1993); Payne et al. (1984); Jefferson et al. (2009).</p>	

5.3.4.4 Pinnipeds

Status and Trends. Harbor, gray, harp and hooded seals are identified as having the potential to be impacted by the proposed action (Table 11). Based on Hayes et al. (2019; 2022), the status of the:

- Western North Atlantic harbor seal and hooded seal, relative to Optimum Sustainable Population (OSP), in the U.S. Atlantic EEZ is unknown;
- Gray seal population relative to OSP in U.S. Atlantic EEZ waters is unknown, but the stock's abundance appears to be increasing in Canadian and U.S. waters; and,
- Harp seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown, but the stock's abundance appears to have stabilized.

Occurrence and Distribution. Harbor, gray, harp, and hooded seals are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. Depending on species, they may be present year-round or seasonally in some portion of the affected environment of the monkfish fishery. Table 11 gives an overview of pinniped occurrence and distribution in the affected environment of the monkfish and spiny dogfish fisheries for this action. More information on pinniped occurrence and distribution in the Northwest Atlantic is in the NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 11. Pinniped occurrence and distribution in the monkfish fishery affected environment.

Species	Occurrence and Distribution in the Affected Environment
Harbor Seal	<ul style="list-style-type: none"> • Year-round inhabitants of Maine; • September through late May: occur seasonally along the coasts from southern New England to Virginia.
Gray Seal	<ul style="list-style-type: none"> • Ranges from New Jersey to Labrador, Canada.
Harp Seal	<ul style="list-style-type: none"> • Winter-Spring (approx. January-May): Can occur in the U.S. Atlantic Exclusive Economic Zone. • Sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey.
Hooded Seal	<ul style="list-style-type: none"> • Highly migratory and can occur in waters from Maine to Florida. These appearances usually occur between January and May in New England waters, and in summer and autumn off the southeast U.S. coast and in the Caribbean.
<p><i>Sources:</i> Hayes et al. (2019, for hooded seals; 2022).</p>	

5.3.4.5 Atlantic sturgeon

Status and Trends. As in Table 8, Atlantic sturgeon (all five DPSs) have the potential to be impacted by the proposed action. Population trends for Atlantic sturgeon are difficult to discern; however, the most recent stock assessment report concludes that Atlantic sturgeon, at both coastwide and DPS level, are depleted relative to historical levels (ASMFC 2017a; ASSRT 2007; NMFS 2021a).

Occurrence and Distribution. The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (Altenritter *et al.* 2017; ASMFC 2017b; ASSRT 2007; Breece *et al.* 2016; Breece *et al.* 2017; Dadswell 2006; Dadswell *et al.* 1984; Dovel & Berggren 1983; Dunton *et al.* 2015; Dunton *et al.* 2010; Erickson *et al.* 2011; Hilton *et al.* 2016; Ingram *et al.* 2019; Kynard *et al.* 2000; Laney *et al.* 2007; Novak *et al.* 2017; O’Leary *et al.* 2014; Rothermel *et al.* 2020; Stein *et al.* 2004a; Waldman *et al.* 2013; Wippelhauser *et al.* 2017; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b).

Based on fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour; however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Altenritter *et al.* 2017; Breece *et al.* 2016; Breece *et al.* 2018; Collins & Smith 1997; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Stein *et al.* 2004a; b; Wippelhauser *et al.* 2017). Data from fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies also indicate that Atlantic sturgeon make seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall; however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year (Altenritter *et al.* 2017; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Wippelhauser 2012; Wippelhauser *et al.* 2017).

More information on the biology and range wide distribution of each DPS of Atlantic sturgeon is in 77 FR 5880 and 77 FR 5914 (February 6, 2012); the Atlantic Sturgeon Status Review Team’s (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007); the ASMFC 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017a); NMFS (2021a); and, the [5-year review](#) for each Atlantic sturgeon DPS.

5.3.4.6 Atlantic salmon

Status and Trends. As in Table 10, Atlantic salmon (GOM DPS) have the potential to be impacted by the proposed action. There is no population growth rate available for GOM DPS Atlantic salmon; however, the consensus is that the DPS exhibits a continuing declining trend (NMFS 2021a; NMFS & USFWS 2018; NOAA 2016).

Occurrence and Distribution. The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily the northern portion) to the coast of Greenland (Fay *et al.* 2006; NMFS & USFWS 2005; 2016). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al.* 2006; Hyvärinen *et al.* 2006; Lacroix & Knox 2005; Lacroix & McCurdy 1996; Lacroix *et al.* 2004; NMFS & USFWS 2005; 2016; Reddin 1985; Reddin & Friedland 1993; Reddin & Short 1991; Sheehan *et al.* 2012; USASAC 2004). More information on the on the biology and range wide distribution of the GOM DPS of Atlantic salmon is in NMFS and USFWS (2005; 2016); Fay *et al.* (2006); and NMFS (2021a).

5.3.4.7 Giant Manta Ray

Status and Trends. Giant manta rays have the potential to be impacted by the proposed action (Table 8). While there is considerable uncertainty regarding the giant manta ray's current abundance throughout its range, the best available information indicates that in areas where the species is not subject to fishing, populations may be stable (NMFS 2021a). However, in regions where giant manta rays are (or were) actively targeted or caught as bycatch populations appear to be decreasing (Miller & Klimovich 2017).

Occurrence and Distribution. Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast, usually found in water temperatures between 19 and 22°C and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller & Klimovich 2017).

5.3.5 Gear Interactions and Protected Species

Protected species are at risk of interacting with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For marine mammals protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2011-2020 (GAR Marine Animal Incident Database, unpublished data; Cole *et al.* 2013; Hayes *et al.* 2017; 2018; 2019; 2020; Hayes *et al.* 2021; Hayes *et al.* 2022; Hayes *et al.* 2023; Henry *et al.* 2017; Henry *et al.* 2016; Henry *et al.* 2019; Henry *et al.* 2020; Henry *et al.* 2021; Henry *et al.* 2022; Henry *et al.* 2023; Waring *et al.* 2016). For ESA listed species, the most recent ten years of data on observed or documented interactions is available from 2013-2022 (ASMFC 2017a; Kocik *et al.* 2014; unpublished data: GAR Marine Animal Incident Database, NMFS NEFSC observer/sea sampling database, GAR Sea Turtle and Disentanglement Network, NMFS Sea Turtle Stranding and Salvage Network; NMFS 2021a)

(NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality [Reference Documents](#), [Publications](#), or [Technical Memoranda](#)). Available information on gear interactions with a given species (or species group) is in the sections below. This is not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is on the main gear types used to prosecute the monkfish and spiny dogfish fisheries (i.e., sink gillnet and bottom trawl gear).

5.3.5.1 Sea Turtles

Bottom Trawl Gear. Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso & Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2008; 2015; 2020; NMFS 2021a; Warden 2011a; NMFS NEFSC observer/sea sampling database, unpublished data; 2011b). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents. Most recently, Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate (0.43 turtles/day fished) was in waters south of 37° N during November to June in waters over 50 m deep. The most estimated interactions occurred in the Mid-Atlantic region north of 39° N, during July to October in waters under 50 m deep. In each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)⁹, from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI=0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. At Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

Gillnet Gear. Interactions between sink gillnet gear and green, Kemp's ridley, loggerhead, and leatherback sea turtles have been observed in the GAR since 1989 (NMFS NEFSC observer/sea sampling database, unpublished data). Specifically, sea turtle interactions with gillnet gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2009a; b; 2013; 2018; NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea

⁹ Murray (2020) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2008; 2015; Warden 2011a; b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be like those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013; Orphanides 2010).

turtle interactions with sink gillnet gear in this region. As a result, the bycatch estimates and discussion below are for sink gillnet gear in the Mid-Atlantic and Georges Bank.

From 2012-2016, Murray (2018) estimated that sink gillnet fisheries in the Mid-Atlantic and Georges Bank¹⁰ bycaught 705 loggerheads (CV=0.29, 95% CI over all years: 335-1116), 145 Kemp's ridleys (CV =0.43, 95% CI over all years: 44-292), 27 leatherbacks (CV =0.71, 95% CI over all years 0-68), and 112 unidentified hard-shelled turtles (CV=0.37, 95% CI over all years: 64-321).¹¹ Of these, mortalities were estimated at 557 loggerheads, 115 Kemp's ridley, 21 leatherbacks, and 88 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 19 adults. The highest bycatch rate of loggerheads occurred in the southern Mid-Atlantic stratum ($\leq 37^{\circ}\text{N}$ to 34°N) in large mesh (≥ 7 inches) gear during November to June. Though only one sea turtle was observed in this stratum, observed effort was low, leading to a high bycatch rate. Bycatch rates of all other species were lower relative to loggerheads. Highest estimated loggerhead bycatch occurred in the northern mid-Atlantic ($>37^{\circ}\text{N}$ to the Georges Bank boundary) from July to October in large mesh gears due to the higher levels of commercial effort in the stratum. Mean loggerhead bycatch rates were ten times those of Kemp's ridley bycatch rates in large mesh gear in the northern Mid-Atlantic from July to October (Murray 2018). Although interactions between sink gillnet gear and green sea turtles have been observed (NEFSC observer/sea sampling database, unpublished data); green sea turtles were excluded from the bycatch rate calculations in Murray (2018) because the observed interaction occurred in waters of North Carolina, and therefore, outside the study region.

Updates to Murray (2018) were recently issued by Murray (2023). From 2017-2021¹², Murray (2023) estimated that sink gillnet fisheries operating from Maine to North Carolina¹³ bycaught 142 loggerheads (CV=0.89, 95% CI over all years: 15-376), 91 Kemp's ridleys (CV =0.62, 95% CI over all years: 0-218), 49 greens (CV=1.01, 95% CI over all years: 0-177), 26 leatherbacks (CV=0.98, 95% CI over all years: 0-79), and 32 unidentified hard-shelled turtles (CV=0.59, 95% CI over all years: 0-75). Of these interactions, mortalities were estimated at 88 loggerheads, 56 Kemp's ridley, 30 greens, 16 leatherbacks, and 20 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 2.5 adults. The highest interaction rate of loggerhead sea turtles occurred in the northern Mid-Atlantic ($>37^{\circ}\text{N}$ to the Georges Bank boundary) from July to October in large mesh gears (≥ 7 inches); relative to loggerheads, interaction rates were lower for all other sea turtle species.

5.3.5.2 Atlantic Sturgeon

Sink gillnet and bottom trawl gear. The ASMFC (2017a), Miller and Shepard (2011), NMFS (2021a), Boucher and Curti (2023) and the most recent ten years of NMFS observer data (i.e., 2013-2022; NMFS

¹⁰ The boundaries of the Mid-Atlantic and Georges Bank were defined by Ecological Production Units (Murray 2018).

¹¹ Murray (2018) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches Murray (2009a); (2013), where rates were estimated using GAMs. Ratio estimator results may be like to those using GAM or GLM if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013; Orphanides 2010).

¹² Due to the COVID 19 pandemic, observer coverage rates were greatly reduced in 2020 and 2021. Murray (2023) determined that estimated interactions derived from a 3-year time series (2017-2019) did not differ significantly from those derived from the 5-year time series (2017-2021), suggesting that reduced and uneven observer monitoring in 2020 and 2021 did not bias the results using the longer time series. As a result, observer data from 2017-2019 was used to estimate sea turtle interaction rates, confidence intervals, and CVs for the 2017-2021 time series.

¹³ Murray (2023) defined this range as the boundaries of the Gulf of Maine, Georges Bank, and Mid-Atlantic Ecological Production Units.

NEFSC observer/sea sampling database, unpublished data) describe the observed or documented interactions between Atlantic sturgeon and bottom trawl and gillnet gear in the GAR. For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths under 40 m, mesh sizes over ten inches, and the months of April and May ASMFC (2007). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch has been associated with depths under 30 m. More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic sturgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017a).

Boucher and Curti (2023) updated the estimate of Atlantic sturgeon bycatch that was presented in the ASMFC (2017a) Atlantic sturgeon benchmark stock assessment for the annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The assessment analyzed fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2021 (excluding 2020 due to COVID-related impacts on data collection). The total bycatch of Atlantic sturgeon from bottom otter trawls was between 638-836 fish over 2016-2021 (excluding 2020 due to COVID-related impacts on data collection), while the total bycatch of Atlantic sturgeon from gillnets ranged from 1,031-1,268 fish. The estimated average annual bycatch during 2016-2021 of Atlantic sturgeon in bottom otter trawl gear is 718.4 individuals and in gillnet gear is 1,125.4 individuals. However, the estimate of Atlantic sturgeon bycatch in Boucher and Curti (2023) for 2016-2021 includes take of all Atlantic sturgeon, including non-listed fish that originate in Canadian waters but occur within the affected environment of this action. Partitioning out the fish that were likely of Canadian origin, NOAA fisheries concluded that the total bycatch of ESA-listed Atlantic sturgeon, only, during 2016-2021 in bottom otter trawl gear is 712 individuals and in gillnet gear is 1,115 individuals.

5.3.5.3 Atlantic Salmon

Sink gillnet and bottom trawl gear. Atlantic salmon are at risk of interacting with bottom trawl or gillnet gear (Kocik *et al.* 2014; NMFS 2021a; NEFSC observer/sea sampling database, unpublished data). Northeast Fisheries Observer Program (NEFOP) data from 1989-2022 show records of incidental bycatch of Atlantic salmon in seven of the 31 years, with a total of 15 individuals caught, nearly half of which (seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data).¹⁴ Of the observed incidentally caught Atlantic salmon, ten were listed as “discarded,” which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Five of the 15 were documented as lethal interactions. The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Observed captures occurred in March (2), April (2), May (1), June (3), August (1), and November (6). Given the very low number of observed Atlantic salmon interactions in gillnet and bottom trawl gear, interactions with these gear types are believed to be rare in the GAR.

5.3.5.4 Giant Manta Ray

Sink gillnet and bottom trawl gear. Giant manta rays are potentially susceptible to capture by bottom trawl and gillnet gear based on records of their capture in fisheries using these gear types (NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). The most recent 10 years of NEFOP data show that between 2013-2022, one giant manta ray and five unidentified *Mobulidae* were observed in bottom trawl gear and two were observed in gillnet gear (NMFS NEFSC observer/sea sampling database, unpublished data). Also, all the giant manta ray interactions in gillnet or trawl gear recorded in

¹⁴ There is no information available on the genetics of these bycaught Atlantic salmon, so it is not known how many of them were part of the GOM DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the GOM DPS.

the NEFOP database (13 in 2001-2022) indicate the animals were encountered alive and released alive. However, details about specific conditions such as injuries, damage, time out of water, how the animal was moved or released, or behavior on release is not always recorded. While there is no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0-16 giant manta rays captured per year between 1998 and 2015 and estimated that approximately 89% survived the interaction and release (NMFS reports: <http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm>).

5.3.5.5 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or sink gillnet gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2023 LOF (88 FR 16899, March 21, 2023) categorizes commercial sink gillnet fisheries (Northeast and Mid-Atlantic) as a Category I fishery; and bottom trawl fisheries (Northeast or Mid-Atlantic) as a Category II fishery. No changes for how these fisheries are categorized were proposed for the 2024 LOF (88 FR 62748; September 13, 2023).

5.3.5.5.1 Large Whales

Bottom Trawl Gear. The most recent 10 years of observer, stranding, and/or baleen whale serious injury and mortality determinations from 2012-2021, and the GAR Marine Animal Incident database shows that there has been one observed or confirmed documented interactions with large whales and bottom trawl gear. In 2020, a humpback whale was anchored/entangled in fishing gear, later identified by NMFS as trawl net. The animal was disentangled by responders from the Atlantic Large Whale Disentanglement Network. The gear was removed and recovered from the animal, and the whale was released alive with non-serious injuries. Additional information on this incident can be found in the 2020 Atlantic Large Whale Entanglement Report and in Henry et al. (2023).

Sink Gillnet Gear. Large whale interactions (entanglements) with fishing gear have been observed and documented in the waters of the Northwest Atlantic.¹⁵ Information available on all interactions (e.g., entanglement, vessel strike, unknown cause) with large whales comes from reports documented in the GARFO Marine Animal Incident Database (unpublished data). The level of information collected for each case varies, but may include details on the animal, gear, and any other information about the interaction (e.g., location, description, etc.). Each case is evaluated using defined criteria to assign the case to an injury/information category using all available information and scientific judgement. In this way, the injury severity and cause of injury/death for the event is evaluated, with serious injury and mortality determinations issued by the NEFSC.¹⁶

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Hartley et al. 2003; Johnson et al. 2005; Whittingham et al. 2005a,b; Knowlton et al. 2012; NMFS 2021a,b; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Sharp et al. 2019; Pace et al. 2021; NMFS [Marine Mammal SARs for the Atlantic Region](#)).

¹⁵ [NMFS Atlantic Large Whale Entanglement Reports](#): For years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; GAR Marine Animal Incident Database (unpublished data); [NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region](#); NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations [Reference Documents, Publications](#), or [Technical Memoranda](#); [MMPA List of Fisheries](#); NMFS 2021a,b.

¹⁶ NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations [Reference Documents, Publications](#), or [Technical Memoranda](#).

Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Cole and Henry 2013; Hamilton and Kraus 2019; Hartley et al. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Johnson et al. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001; Knowlton et al. 2012; NMFS 2021a,b; Whittingham et al. 2005a,b; see NMFS [Marine Mammal SARs for the Atlantic Region](#)).¹⁷ Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear often result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; NMFS 2021a,b; Pettis et al. 2021; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). In fact, review of Atlantic coast-wide causes of large whale human interaction incidents between 2010 and 2019 shows that entanglement is the highest cause of mortality and serious injury for North Atlantic right, humpback, fin, and minke whales in those instances when cause of death could be determined (NMFS 2021b). As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton et al. 2012; NMFS 2021a,b; Pace et al. 2017; Robbins 2009).

As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the Northwest Atlantic Ocean. As fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA. Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.¹⁸ In 1997, the ALWTRP was implemented; however, since 1997, it has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In 2021, adjustments to Plan were implemented and are summarized [online](#).

[The ALWTRP](#) consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area- and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries. The ALWTRP recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S. and identifies gear modification requirements

¹⁷ Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear. ALWTRP regulations currently in effect are summarized [online](#).

¹⁸ The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.¹⁹ Further details of the Plan are at: [the ALWTRP](#).

5.3.5.5.2 Small Cetaceans and Pinnipeds

Sink Gillnet and Bottom Trawl Gear. Small cetaceans and pinnipeds are vulnerable to interactions with sink gillnet and bottom trawl gear.²⁰ Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years data (i.e., 2011-2020), and the MMPA LOF's covering this time frame (i.e., issued between 2017 and 2023), Table 12 has a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category I (frequent interactions) gillnet and/or Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the monkfish and spiny dogfish fisheries for this action. Of the species in Table 12, gray seals, followed by harbor seals, harbor porpoises, short beaked common dolphins, and harp seals are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the GAR (Hatch & Orphanides 2014; 2015; 2016; Orphanides 2019; 2020; 2021; Orphanides & Hatch 2017; Precoda & Orphanides 2022). In terms of bottom trawl gear, short-beaked common dolphins, Risso's dolphins, Atlantic white-sided dolphins, and gray seals are the most frequently observed bycaught marine mammal species in the GAR, followed by long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Chavez-Rosales *et al.* 2017; Lyssikatos 2015; Lyssikatos & Chavez-Rosales 2022; Lyssikatos *et al.* 2020; 2021).

Table 12. Small cetacean and pinniped species incidentally injured and/or killed by Category I sink gillnet fisheries or Category II bottom trawl fisheries operating in the affected environment of the monkfish fishery and/or the spiny dogfish fishery.

Fishery	Category	Species Incidentally Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore; Northern Migratory Coastal)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Long-finned pilot whales
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet	I	Bottlenose dolphin (offshore, Northern and Southern Migratory coastal)
		Harbor porpoise
		Short-beaked common dolphin
		Harbor seal
		Hooded seal

¹⁹ The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet .

²⁰ For additional information on small cetacean and pinniped interactions, see: NMFS NEFSC marine mammal serious injury and mortality [Reference Documents, Publications,](#) or [Technical Memoranda](#); NMFS [Marine Mammal SARs for the Atlantic Region](#); [MMPA LOF](#).

		Harp seal
		Gray seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Long-finned pilot whales
		Short-beaked common dolphin
		Atlantic white-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal
<i>Source:</i> MMPA 2017-2023 LOFs		

To address the high levels of incidental take of harbor porpoise and bottlenose dolphins in sink gillnet fisheries, pursuant to section MMPA Section 118(f)(1), the Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented for these species.²¹ Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid- Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented. More information on each take reduction plan or strategy is at: [NMFS HPTRP](#), [NMFS BDTRP](#), or [NMFS Atlantic Trawl Gear Take Reduction Strategy](#).

5.4 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem has been described as including the area from the GOM south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman *et al.* 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 m. Four distinct sub-regions comprise the NOAA Fisheries Greater Atlantic Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It

²¹ Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal SARs (Hayes *et al.* 2022) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

Pertinent physical and biological characteristics of each of these sub-regions are described in the Physical and Biological Environment section of Amendment 5 (Section 4.2), along with a short description of the physical features of coastal environments. Monkfish habitats are described in Section 4.4.1 of Amendment 5 and summarized below. Information on the affected physical and biological environments included in Amendment 5 was extracted from Stevenson et al. (2004).

5.4.1 Fishing Effects on EFH

A detailed discussion of fishing impacts on EFH is contained in the Affected Environment Section of Amendment 5 to the Monkfish FMP and in the Affected Environment Section 6 of the 2023 Spiny Dogfish Specifications EA (MAFMC 2023). Since monkfish and spiny dogfish EFH has been determined to not be vulnerable to any fishing gear (Stevenson *et al.* 2004), the discussion focuses on gillnet gear that potentially could impact EFH of other fisheries given that is the focus of this action. Discussion in Monkfish Amendment 5 and the 2023 Spiny Dogfish Specifications EA cites several important peer-reviewed studies in describing the potential biological and physical effects of fishing on various substrates (mud, sand, gravel and rocky substrates). Since gillnets are stationary or static, the gear has been determined to not have an adverse effect on EFH of other species and are, therefore, omitted from further discussion in this section.

5.4.2 Essential Fish Habitat

Section 4.4 of Monkfish Amendment 5 and Section 6 of the 2023 Specifications Environmental Assessment (MAFMC 2023) contain detailed descriptions of monkfish and spiny dogfish EFH, respectively. EFH of other species vulnerable to gillnet, the effect of the monkfish and spiny dogfish fisheries on EFH (monkfish, spiny dogfish, and other species, all life stages), and previous measures to minimize adverse effects of the monkfish and spiny dogfish fisheries on EFH can also be found in those documents.

In summary, monkfish and spiny dogfish EFH have been determined to only be minimally vulnerable to bottom gillnets. Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. There are no species or life stages for which EFH is more than minimally vulnerable to bottom gillnets (Stevenson et al., 2004).

5.5 HUMAN COMMUNITIES

MONKFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so Section 5.6 (monkfish focus) and 5.7 (spiny dogfish focus) differ in formatting.

5.5.1 Permits and Vessels

The Monkfish FMP has [seven types of federal permits](#): six categories of limited access permits (A-D, F, H) and one open access permit (E, Table 13). The number of fishing vessels with limited access monkfish permits has decreased over the past decade, from 670 to 562 (Table 14). Of those vessels, about 35-48% landed over 1 lb of monkfish each year and about 9-20% landed $\geq 10,000$ lb of monkfish. Permit category C and D vessels consistently accounted for the greatest portion of vessels with monkfish permits and landing monkfish (Table 14, Table 15).

Table 13. Monkfish permit categories.

Permit Category		Description
Limited Access	A	DAS permit that <i>does not</i> also have a groundfish or scallop limited access permit (possession limits vary with permit type).
	B	
	C	DAS permit that <i>also</i> has a groundfish or scallop limited access permit (possession limits vary with permit type).
	D	
	F	Seasonal permit for the offshore monkfish fishery .
H	DAS permit for use in the Southern Fishery Management Area <i>only</i> .	
Open Access	E	Open access incidental permit.

Table 14. Fishing vessels with federal monkfish permits, with number of vessels landing over 1 lb and 10,000 lb, FY 2012-2021.

Permit Category	2012			2015			2018			2021		
	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb
A	22	6	4	22	4	*	20	*	*	18	8	6
B	44	9	5	42	4	*	38	6	4	38	19	15
C	295	148	60	267	128	30	268	110	30	255	114	42
D	292	94	28	242	59	10	226	77	18	229	115	50
F	9	6	4	17	9	*	17	14	4	14	13	0
H	8	5	4	8	6	5	7	6	3	8	*	0
Total LA	670	268	105	598	210	51	576	214	60	562	270	113
E	1,743	338	19	1,578	247	8	1,525	247	20	1,485	176	7

Source: GARFO Permit database and DMIS as of April 2022.

Table 15. Proportion of monkfish landings by permit category to total monkfish landings in the year, FY 2012-2021.

Permit Category	2012	2015	2018	2021
A and B	15%	13%	16%	12%
C and D	75%	80%	77%	83%
F	2%	2%	1%	>1%
H	1%	1%	1%	0%
E	7%	5%	5%	4%
All	100%	100%	100%	100%

Source: GARFO Permit database and DMIS as of April 2022.

5.5.2 Catch and Landings

From FY 2017-2021, the ACL was exceeded in the NFMA twice and never in the SFMA (Table 16). Commercial landings made up 77-90% of total catch in the NFMA and 30-59% in the SFMA. State landings, defined as vessels that have never had a federal fishing permit, consistently make up under 0.5% of catch. Recreational catch is consistently under 3% of catch. In the NFMA, discards were 9% of catch in FY 2017 and increased to 28% and lowered to 20% and 19% of catch in FY 2018-2020; discards were similar in FY 2021 (21%). In the SFMA, discards were higher in FY 2017-2019 (41-43%) but lowered to 13% in FY 2020 and increased to 27% in FY 2021.

Table 16. Year-end monkfish annual catch limit (ACL) accounting, FY 2017-2021.

Catch accounting element	Pounds	Metric tons	% of ACL
FY 2017			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	15,003,103	6,805	89.6%
State-permitted only vessel landings	60,031	27	0.4%
Estimated discards	1,567,883	711	9.4%
Recreational catch (MRIP landings and discards)	11,725	5.3	0.1%
Total Northern monkfish catch	16,642,742	7,549	99.4%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,392,979	3,807	30.9%
State-permitted only vessel landings	66,936	30	0.2%
Estimated discards	11,531,614	5,231	42.5%
Recreational catch (MRIP landings and discards)	1,627	1	0.0%
Total Southern monkfish catch	19,993,156	9,068	73.6%
FY 2018			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,237,011	6,004	79.1%

State-permitted only vessel landings	37,468	17	0.2%
Estimated discards	4,666,815	2,117	27.9%
Recreational catch (MRIP landings and discards)	6,977	3	0.0%
Total Northern monkfish catch	17,948,271	8,141	107.2%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	10,133,407	4,596	37.3%
State-permitted only vessel landings	64,841	29	0.2%
Estimated discards	11,505,833	5,219	42.4%
Recreational catch (MRIP landings and discards)	742,988	337	2.7%
Total Southern monkfish catch	22,447,069	10,181	82.7%
FY 2019			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,673,898	6,202	81.7%
State-permitted only vessel landings	16,474	7	0.1%
Estimated discards	3,418,346	1,551	20.4%
Recreational catch (MRIP landings and discards)	164,771	75	1.0%
Total Northern monkfish catch	17,273,489	7,835	103.2%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,236,922	3,736	30.3%
State-permitted only vessel landings	66,673	30	0.2%
Estimated discards	11,174,259	5,069	41.2%
Recreational catch (MRIP landings and discards)	11,410	5	0.0%
Total Southern monkfish catch	19,489,264	8,840	71.7%
FY 2020			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,684,519	5,300	63.5%
State-permitted only vessel landings	13,416	6	0.1%
Estimated discards	3,503,282	1,589	19.0%
Recreational catch (MRIP landings and discards)	23,077	10	0.1%
Total Northern monkfish catch	15,224,294	6,905	82.7%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,944,794	2,243	18.2%
State-permitted only vessel landings	20,749	9	0.1%
Estimated discards	3,078,040	1,396	11.3%
Recreational catch (MRIP landings and discards)	359,987	163	1.3%
Total Southern monkfish catch	8,453,570	3,834	31.1%
FY 2021			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,496,640	5,215	62.4%

State-permitted only vessel landings	18,511	8	0.1%
Estimated discards	3,857,341	1,750	21.0%
Recreational catch (MRIP landings and discards)	7	0	0.0%
Total Northern monkfish catch	15,372,499	6,973	83.5%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,338,159	1,968	16.0%
State-permitted only vessel landings	32,185	15	0.1%
Estimated discards	7,278,106	3,301	26.8%
Recreational catch (MRIP landings and discards)	30,056	14	0.1%
Total Southern monkfish catch	11,678,506	5,298	43.0%
<i>Notes:</i>			
"Commercial landings" includes all monkfish landings by vessels with a permit number over zero, RSA landings, and party/charter landings sold to a federal dealer.			
"State-permitted only vessel landings" are landings from vessels that never had a federal fishing permit (so the permit #=0).			
"Recreational catch" includes landings and discards from party charter vessels and private anglers, not sold to a federal dealer.			
<i>Source:</i> Commercial fisheries dealer and Northeast Fishery Observer Program databases; FY 2017 data accessed 10/2018; FY 2018 accessed 3/2020; FY 2019 accessed 3/2021; FY 2020 accessed 4/22; Marine Recreational Information Program database.			

Landings

Landings since FY 2016 have been higher in the NFMA than in the SFMA. The NFMA has had a higher TAL and higher possession limits relative to the SFMA (Table 17). Landings relative to TAL in the NFMA have been between 80-107% since FY 2016, which could be a combination of revised management measures (possession limits) and the large 2015-year class. The NFMA TAL was increased by 10% for FY 2020-2022 (relative to FY 2017-2019) and the individuals from the 2015-year class have grown large enough to be retained by the fishery and are less likely to be discarded because of minimum size regulations. The landings relative to TAL in the SFMA have been lower than the NFMA, between 39-51% since FY 2016.

Table 17. Recent landings (whole/live weight, mt) in the NFMA and SFMA compared to target TAL.

Fishing Year	Northern Area			Southern Area		
	TAL (mt)	Landings (mt)	Percent of TAL achieved	TAL (mt)	Landings (mt)	Percent of TAL achieved
2014	5,854	3,403	58%	8,925	5,415	61%
2015	5,854	4,080	70%	8,825	4,733	53%
2016	5,854	5,447	93%	8,925	4,345	49%
2017	6,338	6,807	107%	9,011	3,802	42%
2018	6,338	6,168	97%	9,011	4,600	51%
2019	6,338	6,211	98%	9,011	3,785	42%
2020	6,624	5,299	80%	5,882	2,294	39%
2021	6,624	5,228	79%	5,882	1,982	34%
*2022	6,624	3,569	54%	5,882	1,366	23%

*Data as of February 16, 2023.

Landings values are different than the annual catch limit accounting in Table 16 because these are the landings as of April 30 each year. Includes RSA landings.

Source: GARFO quota monitoring [data](#), accessed 3/6/2023.

FY 2021 landings. In FY 2021, 79% of the FY 2021 TAL was landed in the northern area and 34% in the southern area. In the NFMA, monthly landings were lower in May-November 2021 relative to December-March (312-417 mt/month vs. 501-654 mt/month). Otter trawls accounted for 63% of the FY 2021 landings. In the SFMA, monthly landings were highest in May and June 2021 (439-535 mt/month), then dropped to a low in July-November (9-59 mt/month), then were moderate since December (117-227 mt/month). These data and additional information can be found at GARFO’s Quota Monitoring website: <https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/monkfish/mul.htm>.

Landings and discards by gear type. The northern and southern areas have distinctions in terms of gear type. Since at least 1980, monkfish landings in the NFMA have largely been by vessels using trawls (NEFMC 2022b), 84% on average since 2012 (Table 18). In the SFMA, landings were primarily by vessels using dredges and trawls from 1980 to the early 1990s. Through the 1990s and to today, gillnets have been the predominant gear for vessels landing monkfish, 72% on average since 2012.

Discards have traditionally been higher in the SFMA relative to the NFMA, and since 2017, southern essential discards have approximated landings, exceeding landings in 2020 (Table 19). In the NFMA, discards have been primarily with otter trawl gear (64%), followed by scallop dredges (29%), and gillnets (7%) over the last 10 years. In the SFMA, discards have been primarily with scallop dredges (78%), followed by otter trawl (16%), and gillnets (6%).

Table 18. Landings by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total ^a
Northern Fishery Management Area							
2012	359	9%	3,561	87%	135	3%	4,081
2013	424	13%	2,813	84%	114	3%	3,355
2014	424	12%	2,958	86%	36	1%	3,434
2015	678	17%	3,277	80%	100	2%	4,086
2016	629	13%	3,949	84%	111	2%	4,723
2017	984	14%	6,044	85%	44	1%	7,105
2018	870	14%	4,958	83%	153	3%	6,009
2019	1,029	17%	4,950	81%	53	1%	6,084
2020	554	10%	5,020	90%	11	0%	5,587
2021	961	19%	4,122	80%	20	0%	5,121
Annual average	691	14%	4,165	84%	78	2%	4,959
Southern Fishery Management Area							
2012	3,614	64%	1,144	20%	766	14%	5,674
2013	3,394	65%	1,115	21%	627	12%	5,207
2014	3,139	62%	1,029	20%	899	18%	5,099
2015	3,293	72%	674	15%	542	12%	4,550
2016	3,247	75%	577	13%	372	9%	4,331
2017	2,773	73%	547	14%	418	11%	3,796
2018	3,346	76%	497	11%	486	11%	4,388
2019	3,526	81%	357	8%	260	6%	4,373
2020	1,956	75%	387	15%	190	7%	2,593
2021	1,530	76%	300	15%	150	7%	2,005
Annual Average	2,982	72%	663	15%	471	11%	4,202
<p>Source: Deroba (2022).</p> <p>^a The total column includes landings from other minor gear types.</p>							

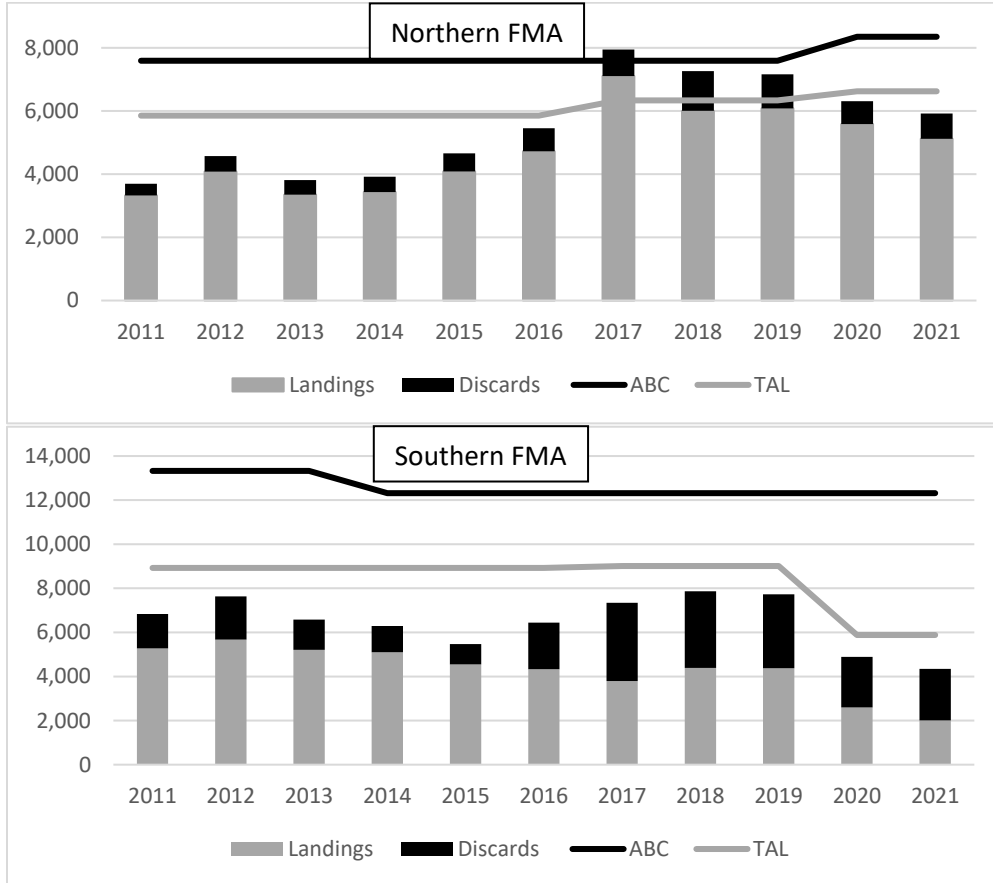
Table 19. Discards by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total
Northern Fishery Management Area							
2012	20	4%	233	47%	240	49%	493
2013	32	7%	300	65%	127	28%	459
2014	27	6%	384	79%	73	15%	484
2015	42	7%	462	81%	68	12%	572
2016	56	8%	483	66%	195	27%	734
2017	31	4%	712	85%	96	11%	840
2018	66	5%	404	32%	783	62%	1,253
2019	54	5%	512	47%	514	48%	1,080
2020	109	15%	528	73%	85	12%	723
2021	62	8%	500	62%	240	30%	802
Annual average	50	7%	452	64%	242	29%	744
Southern Fishery Management Area							
2012	192	10%	187	10%	1,583	81%	1,962
2013	236	17%	106	8%	1,030	75%	1,372
2014	151	13%	143	12%	893	75%	1,188
2015	73	8%	262	29%	583	64%	919
2016	87	4%	552	26%	1,475	70%	2,114
2017	116	3%	581	16%	2,847	80%	3,544
2018	142	4%	398	11%	2,936	84%	3,476
2019	172	5%	456	14%	2,730	81%	3,358
2020	82	4%	722	31%	1,491	65%	2,295
2021	67	3%	127	5%	2,147	92%	2,340
Annual Average	132	6%	353	16%	1,772	78%	2,257
<i>Source: Deroba (2022).</i>							

Fishery performance relative to specifications

Fishery catch has largely been below the ACL and landings below TAL since 2011, except for in 2017-2019 (Figure 20, Table 16).

Figure 20. ABC, TAL, landings, and discards (mt), 2011-2021



Note: Landings and discards are calendar year data from the assessment. ABC and TAL are the FY specifications.

5.5.3 Revenue

Monkfish fishery revenue has generally declined in recent years, from \$42.2M in CY 2005 to \$10.3M in CY 2021 (Table 20, not adjusted for inflation). Since at least CY 2011, about half of this revenue is from trips where monkfish was over 50% of total revenue (Table 21). There is a declining number of vessels that had trips where the monkfish revenue was over 50% of total revenue, from 206 in CY 2011 to 76 in CY 2021. CY 2020 and 2021 were particularly low revenue years. On trips where a monkfish DAS was used in FY 2021 (Table 22), 61% of the revenue was from monkfish, 17% from skate, 13% from groundfish, and minor components of the revenue from other species. Monkfish price per live pound has been on a declining trend since 2010, though prices have been increasing within the last year (Figure 21). Seasonally, prices tend to be lower in spring to summer months and higher in fall to winter.

Table 20. Total monkfish revenue, CY 2005 – 2021.

Calendar Year	Revenue	Calendar Year	Revenue
2005	\$42.2M	2014	\$18.7M
2006	\$38.0M	2015	\$19.1M
2007	\$28.9M	2016	\$20.0M
2008	\$27.2M	2017	\$18.4M
2009	\$19.6M	2018	\$14.8M
2010	\$19.2M	2019	\$14.5M
2011	\$26.6M	2020	\$9.3M
2012	\$27.1M	2021	\$10.3M
2013	\$18.7M		

Source: ACCSP data, accessed April 2022.
 Note: Revenues not adjusted for inflation.

Table 21. Monkfish revenue and revenue dependence on trips where over 50% of revenue is from monkfish, CY 2011 – 2021.

Calendar Year	Vessels	Monkfish Revenue		Non-Monkfish Revenue		Total Revenue	% Monkfish
		Total	Per vessel	Total	Per vessel		
2011	206	\$16,517,143	\$80,180	\$3,354,458	\$16,284	\$19,871,601	83%
2012	196	\$15,138,030	\$77,235	\$3,339,764	\$17,040	\$18,477,794	82%
2013	164	\$8,994,464	\$54,844	\$2,414,798	\$14,724	\$11,409,262	79%
2014	173	\$9,307,800	\$53,802	\$3,042,854	\$17,589	\$12,350,654	75%
2015	140	\$9,319,537	\$66,568	\$2,286,111	\$16,329	\$11,605,648	80%
2016	127	\$9,654,776	\$76,022	\$1,957,503	\$15,413	\$11,612,280	83%
2017	135	\$9,471,858	\$70,162	\$2,545,266	\$18,854	\$12,017,124	79%
2018	108	\$7,001,537	\$64,829	\$1,660,777	\$15,378	\$8,662,314	81%
2019	96	\$7,021,724	\$73,143	\$1,912,752	\$19,924	\$8,934,476	79%
2020	70	\$2,700,687	\$38,581	\$995,332	\$14,219	\$3,696,019	73%
2021	76	\$3,611,791	\$47,524	\$1,057,492	\$13,914	\$4,669,283	77%

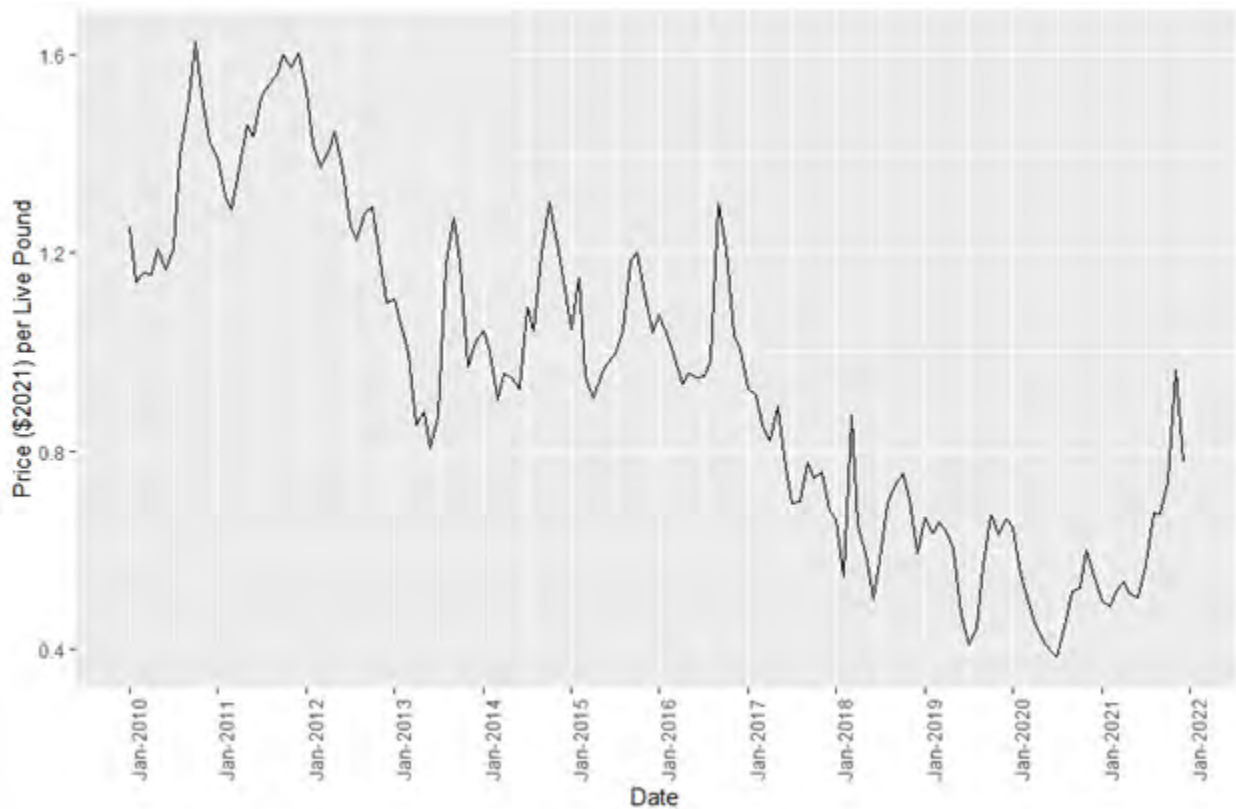
Source: NEFSC SSB. Note: Revenues adjusted to 2021 USD.

Table 22. Landings and revenue dependence from monkfish and other fisheries on trips where a Monkfish DAS was used, FY 2021.

	Live pounds	Revenue	
Monkfish	3,507,169	\$2,464,974	61%
Skate	3,382,423	\$699,805	17%
Groundfish	270,948	\$542,289	13%
Dogfish	75,295	\$21,890	1%
Other	70,806	\$308,774	8%
Total	7,306,641	\$4,037,732	100%

Source: GARFO/APSD, accessed January 2023.
 Note: Includes trips where only a monkfish DAS is used and trips where a monkfish DAS and other DAS are used.

Figure 21. Monthly monkfish price (\$2021) per live pounds, 2010 – 2021.



Source: NEFSC SSB, July 2022. Note: Revenues adjusted to 2021 USD.

5.5.4 Fishing Effort

Effort controls such as Days-at-Sea (DAS) and possession limits help ensure that the fishery landings remain within the TAL. Framework 10 established the possession limits and DAS allocations for FY 2017-2019, and these remain unchanged through FY 2022.

5.5.4.1 Day-at-Sea (DAS)

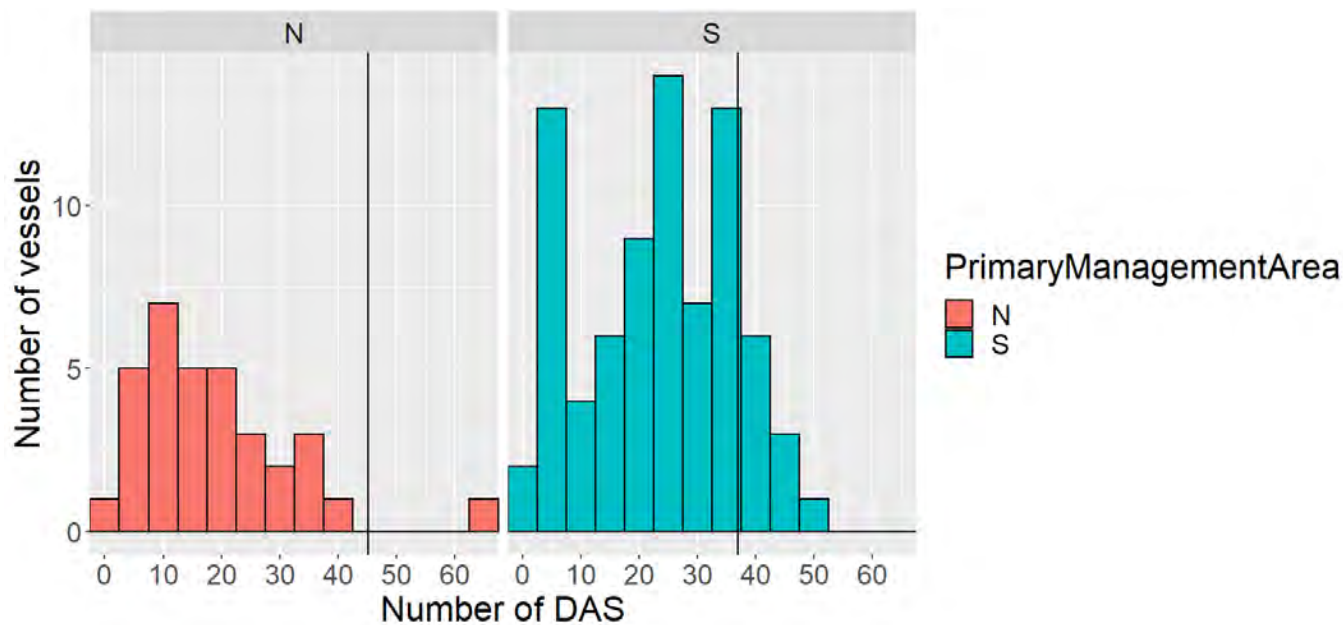
DAS use. DAS allocations have remained the same since FY 2017 ([Framework 10](#)). Limited access vessels are allocated 35 monkfish DAS per fishing year to use in the NFMA and 37 DAS to be used in the SFMA. Additionally, vessels are prohibited from using more than 46 total allocated DAS annually. The number of monkfish DAS used each year is far below what is allocated, suggesting a substantial amount of latent effort in the monkfish fishery. An average of 575 permits were allocated DAS between FY 2019 – 2021, with permit categories C and D accounting for the greatest number of vessels and DAS (Table 23). DAS use varies with permit category. Of the Category A and B permit vessels, 52-64% used at least one DAS in FY 2019-2020, but that decreased to 28-38% in FY 2021. The Category C and D vessels had more stable participation, but was generally lower, 4-18% these past three years.

Table 23. Monkfish DAS usage, combined management areas and all vessels with a limited access monkfish permit, FY 2019 – FY 2021.

Permit Category	All Vessels			Vessels that used ≥ 1 DAS
	Total Vessels	DAS Allocated	DAS Used	
FY 2019				
A	21	909	385	11 (52%)
B	39	1,689	750	25 (64%)
C	273	11,821	583	24 (9%)
D	238	10,305	850	42 (18%)
FY 2020				
A	15	650	193	9 (60%)
B	37	1,602	444	23 (62%)
C	268	11,604	334	17 (6%)
D	229	9,916	490	32 (14%)
FY 2021				
A	18	779	130	5 (28%)
B	37	1,602	280	14 (38%)
C	255	11,042	177	11 (4%)
D	223	9,656	397	24 (11%)
<p><i>Notes:</i> Permit categories F and H account for a minor number of permits, DAS allocated, and DAS used, thus, are not included in table.</p> <p>Data include all vessels with a monkfish limited access permit (i.e., all activity codes).</p> <p><i>Source:</i> NMFS Vessel Permits and Allocation Management System (AMS) databases, accessed March 2022.</p>				

The use of the monkfish DAS allocation varies by vessel and fishing area. In FY 2019 and 2021, vessels that fished primarily in the NFMA used fewer monkfish DAS relative to vessels fishing primarily in the SFMA, despite the 37 DAS use restriction in the SFMA (Figure 22). Some of the vessels fishing primarily in the SFMA vessels exceeded the 37 DAS use restriction, but some of these vessels also took trips in the NFMA, where there is no DAS use restriction. For vessels fishing primarily in the NFMA, one vessel used more than the 45.2 DAS allocated. For primarily SFMA vessels, 12 vessels used more than 37 DAS and 2 used more than 45.2.

Figure 22. Frequency of monkfish DAS use by vessels allocated monkfish DAS, FY 2019 and FY 2021 average.



Notes: Black vertical line represents annual DAS allocations that can be used in the NFMA (45.2) and the SFMA (37). Each vessel was binned into one management area based on where most of its trips occurred.

Source: CAMS database. Accessed October 2022.

FY 2021, 2019 monkfish landings by trip declaration.

Although use of a monkfish DAS is required for landing more than incidental amounts of monkfish, a substantial amount of monkfish landings occur on the incidental trips, particularly in the NFMA. An average of FY 2021 and FY 2019 performance is used to illustrate this. In the NFMA, the most trips and about 86% of the monkfish landings were on trips that did not use a monkfish DAS (Table 24). In the SFMA, vessels using a monkfish DAS accounted for the most trips and 73% of the monkfish landings.

In the NFMA, most of the monkfish landings are on trips using a Northeast (NE) multispecies DAS. Vessels with a Category C and D monkfish permit that also has a limited access NE multispecies DAS permit can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declare the “monkfish option” prior to leaving port at the start of its trip. When these vessels do not declare a monkfish DAS, their monkfish landings are constrained by a possession limit (900 lb and 750 lb tail weight for Category C and D, respectively, per NE multispecies used; Table 27). If these vessels do select the “monkfish option” while at sea, then they declare and use a monkfish DAS and do not have a monkfish possession limit (unlimited). Trips using a multispecies DAS but not a monkfish DAS accounted for 85% (8.4M lb) of the NFMA monkfish landings, averaged over FY 2019 and FY 2021. Trips using both a NE multispecies and monkfish DAS accounted for >14% (>1.35 M lb) that year. The vessels participating in the Northeast multispecies sector fishery accounted for the greatest amount of monkfish landings.

Besides the NE multispecies fishery, monkfish is landed in other fisheries without a monkfish DAS declaration: declared out of fishery (DOF), scallop, herring, surfclam/ocean quahog/mussel, squid/mackerel/butterfish, and undeclared (Table 24). Out of these fisheries, trips that are DOF or use only a scallop DAS account for the greatest amount of landings.

Table 24. Monkfish landings and total number of vessels and trips by trip declarations (plan code) and DAS used, average across FY 2019 and FY 2021. Orange highlights indicate trips where monkfish was landed without a monkfish DAS.

Declaration/ Plan Code	Program Code Description	DAS used	Whole weight, live lb (mt in parentheses)	# of Vessels	# of Trips
NORTH					
Monkfish	<i>Monkfish Northern Management Area Common Pool Vessel Trip</i>	Monkfish and Northeast Multispecies	C	C	C
	<i>Monkfish Northern Management Area Sector Vessel Trip</i>	Monkfish and Northeast Multispecies	1,347,155 (611)	21	222
	<i>Monkfish Northern Management Area Monkfish-Only Vessel Trip</i>	Monkfish	26,851 (12)	6	20
Northeast Multispecies	<i>Multispecies Common Pool Vessel Trip</i>	Northeast Multispecies	55,255 (25)	5	100
	<i>Multispecies Sector Vessel Trip</i>	Northeast Multispecies	8,289,963 (3,760)	99	2,992
Scallop	<i>Special Access Area</i>	Scallop	43,979 (20)	20	28
	<i>Limited Access General Category</i>	Scallop	17,145 (8)	19	223
	<i>Limited Access</i>	Scallop	12,611 (6)	7	11
Other	<i>Herring; undeclared; surfclam, ocean quahog, mussel; squid, mackerel, butterfish</i>	-	61,447 (28)	22	469
Declared out of Fishery (DOF)		-	10,820 (5)	11	32
NORTH Landings Total			> 9,865,226 (4,475)		

SOUTH					
Monkfish	<i>Monkfish Southern Management Area Common Pool Vessel Trip</i>	Monkfish and Northeast Multispecies	62,203 (28)	5	25
	<i>Monkfish Southern Management Area Sector Vessel Trip</i>	Monkfish and Northeast Multispecies	493,536 (224)	15	178
	<i>Monkfish Southern Management Area Monkfish-Only Vessel Trip</i>	Monkfish	3,200,563 (1,452)	50	1,183
Northeast Multispecies	<i>Multispecies Common Pool Vessel Trip</i>	Northeast Multispecies	50,555 (23)	14	145
	<i>Multispecies Sector Vessel Trip</i>	Northeast Multispecies	100,963 (46)	27	482
Scallop	<i>Special Access Area</i>	Scallop	168,319 (76)	91	210
	<i>Limited Access General Category</i>	Scallop	87,994 (40)	56	986
	<i>Limited Access</i>	Scallop	145,156 (66)	69	106
Other	<i>Herring, undeclared, surfclam/ocean quahog/mussel and squid/mackerel/butterfish</i>	-	575,484 (261)	243	2,195
DOF		-	293,271 (133)	152	2,094
SOUTH Landings Total			5,178,044 (2,349)		
<p><i>Notes:</i></p> <ul style="list-style-type: none"> • C = confidential, < 3 vessels. The 'Total' number of vessels is not the sum of the columns but the sum of the unique vessels. • In the "Other" rows, data for undeclared trips include incidental landings, which do not require any declaration. • The total monkfish landings from this table differs slightly from Table 17 likely due to differences in data source (CAMS versus quota monitoring), requirement of having a monkfish permit category associate with monkfish landings in Table 25, and when the data were pulled. • Data do not include RSA trips; DOF includes scientific and other research trips. <p><i>Source:</i> CAMS database. Accessed November 2022.</p>					

5.5.4.2 Possession Limits

There are multiple monkfish possession limits depending on whether the vessel has a limited access or open access incidental monkfish permit, the specific permit category, whether a monkfish DAS is being used, and if so, whether the monkfish DAS is used alone or in combination with DAS for other fisheries (Table 25, Table 26).

Monkfish Possession Limits while on a Monkfish DAS

Table 25. NFMA FY 2020-2022 monkfish limited access possession limits while fishing on a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	No change since at least FY 2011.
B		600 lb tail weight 1,746 lb whole weight	
C	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.
D	Only monkfish DAS	600 lb tail weight 1,746 lb whole weight	No change in since at least FY 2011.
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.

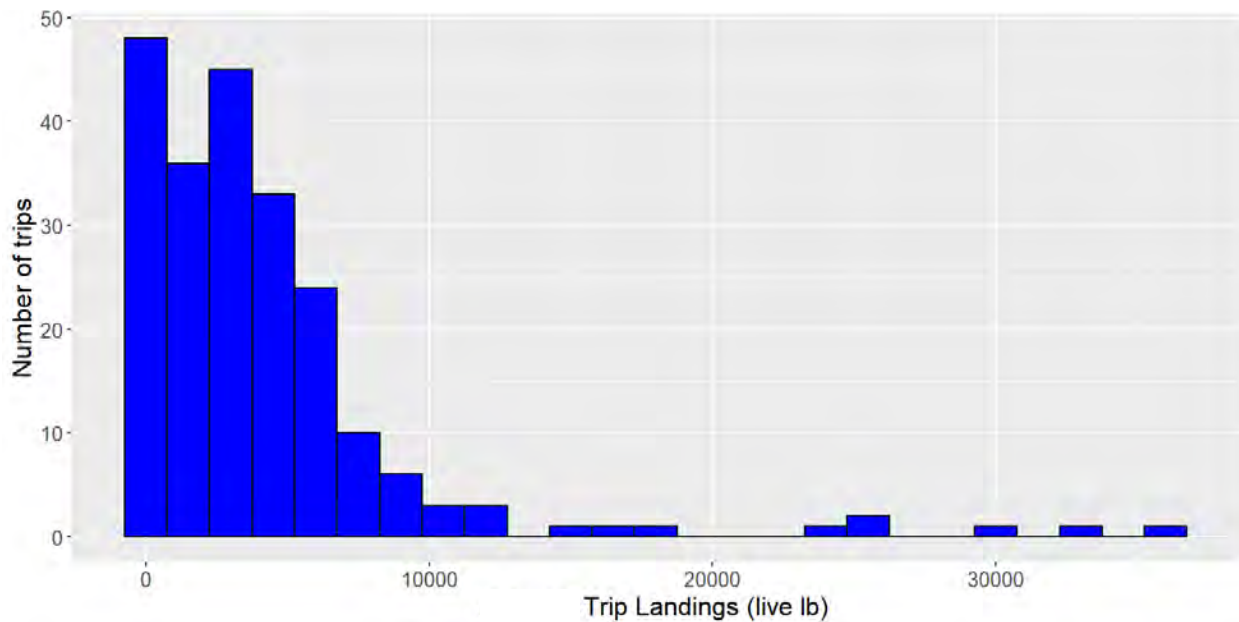
Table 26. SFMA FY 2020-2022 monkfish limited access possession limits while fishing on at least a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	No change since FY 2017.
B		575 lb tail weight 1,673 lb whole weight	
C	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
D	Only monkfish DAS	575 lb tail weight 1,673 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
F	Seasonal offshore monkfish fishery in SFMA (Oct. 1-April 30)	1,600 lb tail weight 4,656 lb whole weight	No change since at least FY 2011.
H	SFMA only	575 lb tail weight 1,673 lb whole weight	No change since FY 2017.

Vessels that use both a Northeast Multispecies (NE) DAS and a monkfish DAS in the NFMA have an unlimited monkfish possession limit. FY 2021, 16 vessels took at least one trip that used both DAS, taking a total of 208 trips, landing an average of 8,554 lb (whole weight) of monkfish per trip, with a

range from 603 lb to 36,212 lb, whole weight (Figure 23, Table 24). There is no monkfish landing limit for these trips.

Figure 23. Frequency of trip landings while using both a monkfish and Northeast Multispecies DAS, FY 2021.



Source: CAMS database. Accessed October 2022.

Incidental Possession Limits. To land incidental amounts of monkfish from federal waters, vessels must have a federal monkfish permit and not fish on a monkfish DAS. Incidental monkfish can be caught while on a Northeast Multispecies DAS, on a Scallop DAS or in the Sea Scallop Access Area Program, not under a DAS Program, and not under a DAS program that also hold permits in other fisheries/special cases. Incidental possession limits vary by trip type, gear, and management area (Table 27).

Vessels have the flexibility to land over the incidental limit when fishing on a Northeast Multispecies A DAS (e.g., a sector trip) if the vessel fishes only in the NFMA and declares the ‘monkfish option’ on the VMS unit before leaving port. If the vessel “flexes” the monkfish option during the trip (e.g., when landings exceed the incidental limit), then the vessel is charged both a Monkfish and NE Multispecies DAS and this is considered a directed monkfish trip. If the vessel selects the monkfish option prior to leaving port but does not flex on that option, then the vessel can only land incidental amounts of monkfish.

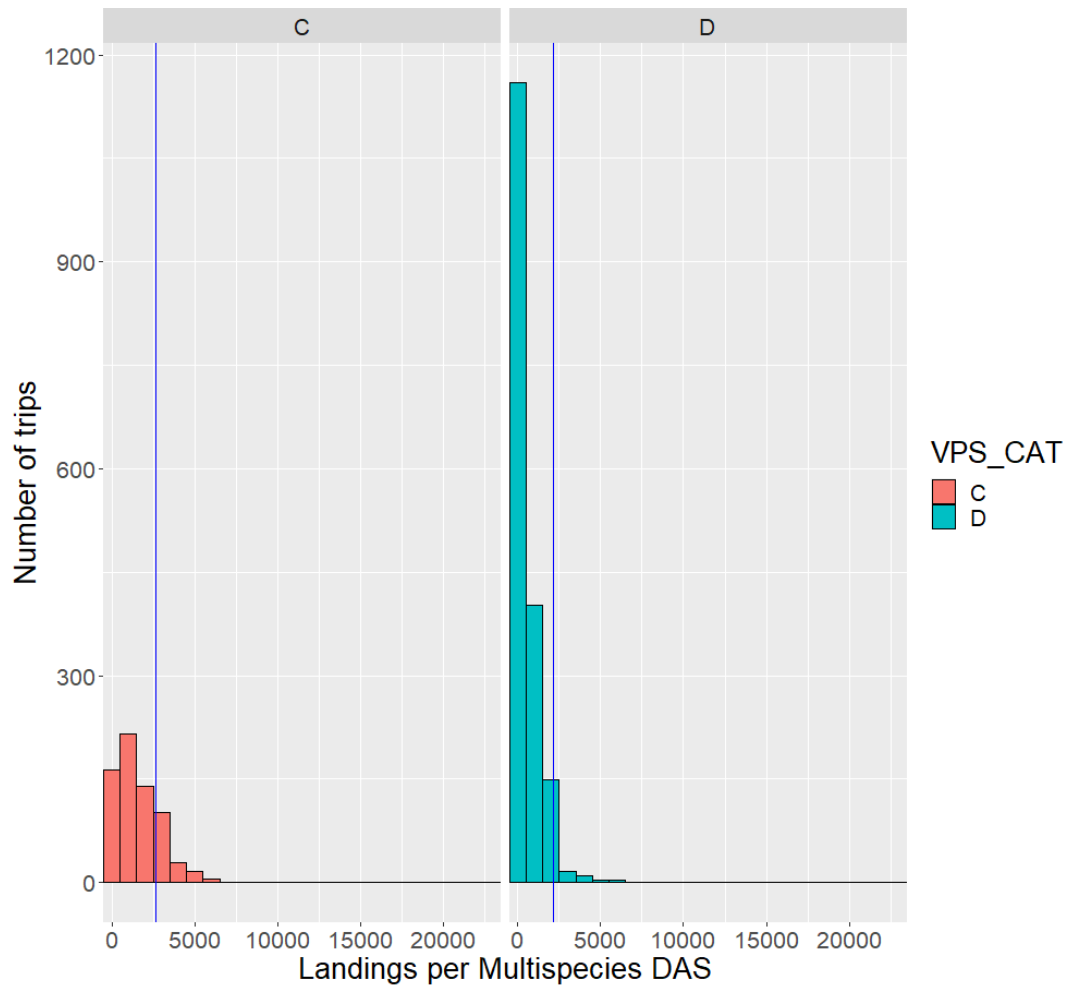
Table 27. Monkfish incidental possession limits by management area, gear, and permit category.

Source: [GARFO](#).

Incidental Possession Limit Category		Management Area	Incidental Possession Limits by gear, permits	
While on a NE Multispecies DAS		NFMA	<i>All gear</i> - 900 lb tail weight (2,619 lb whole weight; permit C), 750 lb (2,183 lb whole weight; permit D), up to 300 lb (permits E/F/H)	
		SFMA	<i>Non-trawl</i> – 50 lb tail weight for permits C, D, H <i>Trawl</i> – 300 lb tail weight for permits C, D, H	
While on a Scallop DAS or in the Sea Scallop Access Area Program		NFMA and SFMA	<i>All gear</i> - 300 lb tail weight	
While not under a DAS Program	GOM, GB Reg. Mesh Areas		5% of total fish weight on board	
	SNE Reg. Mesh Area		50 lb tail weight/day, up to 150 lb per trip	
	MA Exemption Area		5% of total fish weight on board up to 450 lb tail weight	
	NFMA or SFMA		50 lb tail weight/day, up to 150 lb per trip	
	And fishing under skate bait Letter of Authorization		SNE Reg. Mesh Area	50 lb tail weight/day, up to 150 lb per trip
	And holds permits in other fisheries/special cases	NE Multispecies Small Vessel Permit	NFMA or SFMA	<i>All gear</i> - 50 lb tail weight/day, up to 150 lb per trip
		Surfclam or ocean quahog permit		<i>Hydraulic clam dredge or mahogany quahog dredge</i> - 50 lb tail weight/day, up to 150 lb per trip
Sea scallop permit		<i>Scallop dredge only</i> - 50 lb tail weight/day, up to 150 lb per trip. <i>If in scallop dredge exemption areas</i> - 50 lb tail weight/trip		

In FY 2021, most NFMA monkfish landings were from vessels participating in the NE Multispecies sector program using only a Northeast Multispecies DAS (10.1 M live lb, Table 24). These incidental trips were harvested by vessels using either a monkfish C or D permit category using either trawl or gillnet gear, thus, have incidental limits of 2,619 lb and 2,183 lb whole weight per Northeast Multispecies DAS used (Table 27). The average incidental landings per Multispecies DAS used were 1,638 lb and 573 lb whole weight for permit category C and D, respectively (Figure 24). Most monkfish landings while only on a NE Multispecies DAS were less than the possession limits, however, some trips did exceed these limits (Table 28).

Figure 24. Frequency of monkfish landings per Northeast Multispecies DAS in the NFMA for permit categories C and D, FY 2021.



Notes: Blue vertical lines represent trip possession limits while using a Northeast multispecies DAS in the NFMA (2,619 lb for permit C and 2,183 lb for permit D, whole weight). RSA trips were removed.

Source: CAMS and discard modules, November 2022.

Table 28. Monkfish landings (lb, whole weight) under and over incidental trip limits while using and not using a Northeast Multispecies DAS, by permit category, FY 2021.

Permit Category	Trips using NE Mult. DAS					Trips <u>not</u> using NE Mult. DAS (undeclared or NE Mult. sector or common pool)*	
	Trips landing < incidental limit		Trips landing > incidental trip limits			Total Landings	# Trips
	Total Landings	# Trips	Total Landings	Landings in excess**	# Trips		
C	5,242,947	620	196,625	49,961	56	1,098,745	251
D	2,171,167	1,674	243,711	59,392	72	877,139	750
TOTAL	7,414,116	2,294	440,336	109,353	128	1,975,884	1,001

Notes: RSA trips were removed from data.

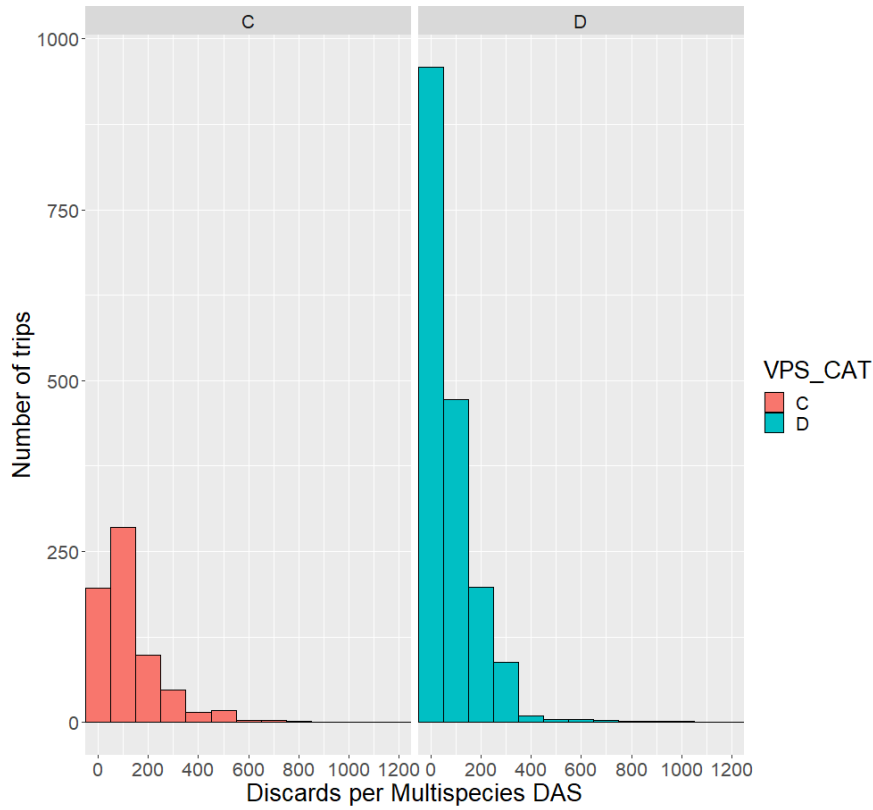
* These are either undeclared or NE Multispecies sector or common pool trips where a DAS is not required. These trips have incidental possession limits (146 lb whole weight per day, not to exceed 437 lb whole weight per trip). ~30% of these trips are landing over the incidental amount, landing 888,504 lb whole weight in excess, but some of these trips are Exempted Fishing Permit trips which have different possession limits.

** Only includes the landings more than the incidental possession limits (i.e., does not include the incidental landings legally allowed).

Source: CAMS and discard modules, November 2022.

When on a NE Multispecies DAS, vessels discarded about 80 to 129 lb (whole weight) per NE Multispecies DAS used, depending on whether a D or C permit category was used, respectively (Figure 25). The amount of discarding appears to increase as landings increase (Figure 26).

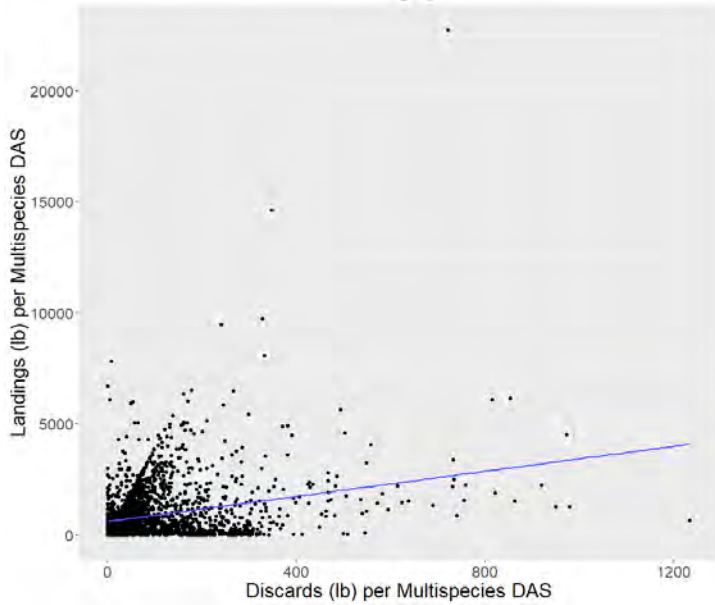
Figure 25. Frequency of trip discards per NE Multispecies DAS, by permit category, FY 2021.



Notes: RSA trips were removed.

Source: CAMS and discard modules, November 2022.

Figure 26. Discards as a function of landings (lb, whole weight), per NE Multispecies DAS in FY 2021.



Notes: RSA trips were removed. Blue line indicates a trend line.

Source: CAMS and discard modules, November 2022.

5.5.5 Fishing Communities

Consideration of the social and economic impacts on fishing communities of proposed fishery regulations is required by the National Environmental Policy Act of 1969, as Amended (NEPA 1969) and the Magnuson-Stevens Fishery Conservation and Management Act, particularly National Standard 8 (MSA 2007) which defines a “fishing community” as “a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community” (16 U.S.C. § 1802(17)). Here, “fishing communities” include communities with a substantial involvement in or dependence on the monkfish fishery.

5.5.5.1 Monkfish Fishing Communities Identified

Primary and secondary monkfish fishing ports are identified for the Monkfish FMP. Based on the criteria below, there are six primary ports in the fishery (Table 29). Of these, the highest revenue ports are New Bedford, Gloucester, and Boston, MA (Table 30). There are 14 secondary ports. The primary and secondary ports comprised 66% and 28% of total fishery revenue, respectively, during 2010-2019. There are 138 other ports that have had more minor participation (6%) in the fishery recently. More community information is available from the NEFSC [Social Sciences Branch website](#) and in Clay et al. (2007).

Primary Port Criteria. The monkfish fishery primary ports are those that are substantially engaged in the fishery. The primary ports meet at least one of the following criteria:

1. At least \$1M average annual revenue of monkfish during 2010-2019, or
2. Ranking of very high (factor score ≥ 5)² for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table 29).

Secondary Port Criteria. The monkfish fishery secondary ports are involved to a lesser extent. The secondary ports meet at least one of the following criteria:

- At least \$100,000 average annual revenue of monkfish, 2010-2019, or
- A ranking of high (factor score 1-4.99) for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table 30).

Table 29. Primary and secondary ports in the monkfish fishery.

State	Port	Average revenue 2010-2019		Monkfish Engagement, 2016-2020		Primary/ Secondary
		>\$100K	>\$1M	High	Very High	
ME	Portland	√		√		Secondary
NH	Portsmouth	√		√		Secondary
MA	Gloucester		√		√	Primary
	Boston		√		√	Primary
	Scituate	√		√		Secondary
	Chatham	√		√		Secondary
	Harwichport	√		√		Secondary
	New Bedford		√		√	Primary
	Westport	√		√		Secondary
RI	Little Compton	√		√		Secondary
	Newport	√		√		Secondary
	Narragansett/Point Judith		√		√	Primary
CT	New London	√		√		Secondary
NY	Montauk	√			√	Primary
	Hampton Bays/ Shinnecock	√		√		Secondary
NJ	Point Pleasant	√		√		Secondary
	Barnegat Light/Long Beach		√	√		Primary
	Cape May			√		Secondary
VA	Chincoteague	√				Secondary
	Newport News			√		Secondary

Table 30. Fishing revenue (unadjusted for inflation) and vessels in top Monkfish ports by revenue, calendar years 2010 – 2019.

Port	Average revenue, 2010-2019			Total active monkfish vessels, 2010-2019
	All fisheries	Monkfish only	% Monkfish	
New Bedford, MA	\$368,627,420	\$4,240,639	1%	479
Gloucester, MA	\$48,514,248	\$2,924,748	6%	190
Boston, MA	\$15,999,540	\$1,809,192	11%	44
Pt. Judith, RI	\$47,753,305	\$1,604,760	3%	214
Long Beach, NJ	\$26,124,402	\$1,459,529	6%	74
Chatham, MA	\$11,764,003	\$817,736	7%	57
Little Compton, RI	\$2,398,385	\$802,384	33%	31
Montauk, NY	\$17,192,554	\$726,690	4%	116
Hampton Bay, NY	\$5,746,477	\$578,235	10%	64
Portland, ME	\$24,798,943	\$559,798	2%	71
Other (n=146)	\$368,846,866	\$3,750,338	1%	
Total	\$937,766,141	\$19,274,049	2%	

Source: NMFS Commercial Fisheries Database (AA data), accessed April 2022.
 Note: "Active" defined as landing > 1 lb of monkfish.

The Engagement Index can be used to determine trends in a fishery over time. Those ports with very high monkfish engagement in 2016-2020, generally had very high engagement in 2006-2010 and 2011-2015, except for Boston, MA, which had increasing engagement over this time (Table 31). There are 14 ports that have had high or very high engagement during all three periods, indicating a stable presence in those communities. Annual data on port engagement is available at the [Commercial Fishing Performance Measures website](http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index).

Table 31. Changes in monkfish fishery engagement over time for all ports with high engagement during at least one year, 2006 – 2020.

State	Community	Engagement Index			
		2006-2010	2011-2015	2016-2020	2020 only
ME	Portland	High	High	High	High
NH	Portsmouth	High	Med.-High	High	High
MA	Gloucester	Very High	Very High	Very High	Very High
	Boston	High	High	Very High	Very High
	Scituate	High	High	High	High
	Chatham	High	High	High	High
	Harwichport	Medium	Medium	High	High
	New Bedford	Very High	Very High	Very High	Very High
	Westport	Med.-High	High	High	Med.-High
RI	Tiverton	Med.-High	Medium	Medium	Medium
	Little Compton	High	High	High	High
	Newport	High	High	High	High
	Narragansett/Pt. Judith	Very High	Very High	Very High	Very High
CT	Stonington	Med.-High	Med.-High	Med.-High	High
	New London	Med.-High	High	High	High
NY	Montauk	Very High	Very High	Very High	High
	Hampton Bays/Shinnecock	High	High	High	High
NJ	Point Pleasant	High	High	High	High
	Barnegat Light/Long Beach	Very High	Very High	High	High
	Cape May	High	High	High	High
MD	Ocean City	High	High	Med.-High	Med.-High
VA	Chincoteague	High	High	Medium	Medium
	Newport News	Med.-High	High	High	High
NC	Wanchese	High	Med.-High	Med.-High	Med.-High
	Beaufort	Medium	Med.-High	Med.-High	Medium

Source: <http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index>.

Landings by state

During CY 2012-2021, monkfish were landed in 11 states, mostly in Massachusetts (61%), followed by Rhode Island (13%), and New Jersey (9%, Table 32). Massachusetts continues to account for the greatest proportion of all monkfish landings.

Table 32. Monkfish landings by state, CY 2012 – 2021.

STATE	Monkfish landings (mt)											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	
ME	488	115	257	345	243	178	219	170	411	442	4,062	4%
NH	57	86	74	38	50	68	123	119	175	213	1,463	2%
MA	5,247	3,812	4,972	4,303	4,227	4,581	5,067	5,943	6,306	6,057	55,961	61%
RI	1,303	1,598	2,122	1,495	1,488	1,819	1,648	1,560	1,412	2,306	11,441	13%
CT	347	305	457	547	724	380	464	275	246	324	2,123	2%
NY	841	766	1,059	1,183	773	748	827	1,193	829	1,005	5,996	7%
NJ	1,003	1,418	1,676	1,389	1,351	1,740	1,250	1,335	1,229	1,205	7,946	9%
DE	0										0	0%
MD	51	83	98	69	86	78	36	51	32	19	285	0%
VA	412	402	638	567	413	352	259	218	88	142	1,748	2%
NC	10	27	10	3	38	47	56	33	36	20	244	0%
Total	9,758	8,612	11,365	9,940	9,394	9,992	9,949	10,897	10,765	11,735	91,271	100%

Source: ACCSP database, accessed April 2022.

5.5.5.2 Social and Gentrification Pressure Vulnerabilities

The NOAA Fisheries Community [Social Indicators](#) (see also Jepson & Colburn 2013) are quantitative measures that describe different facets of social and economic well-being that can shape either an individual’s or community’s ability to adapt to change. The indicators represent different facets of the concepts of social and gentrification pressure vulnerability to provide context for understanding the vulnerabilities of coastal communities engaged in and/or reliant on commercial fishing activities. Provided here are these indicators for the primary and secondary monkfish ports (Table 33).

Social Vulnerability Indicators. There are five social vulnerability indicators; the variables for which represent different factors that may contribute to a community’s vulnerability. The **Labor force structure** index characterizes the strength/weakness and stability/instability of the labor force. The **Housing characteristics** index measures infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. The **Personal disruption** index represents factors that disrupt a community member’s ability to respond to change because of personal circumstances affecting family life such as unemployment or educational level. The **Poverty** index is a commonly used indicator of vulnerable populations. The **Population composition** index shows the presence of populations who are traditionally considered more vulnerable due to circumstances often associated with low incomes and fewer resources. A high rank in any of these indicates a more vulnerable population.

Most monkfish port communities exhibited medium-high to high vulnerability in at least one of the five social vulnerability indicators. Across all monkfish ports, the highest indicator of vulnerability is labor force structure.

Gentrification Pressure Indicators. Gentrification pressure indicators characterize factors that, over time, may indicate a threat to the viability of a commercial or recreational working waterfront, including the displacement of fishing and fishing-related infrastructure. The **Housing Disruption** index represents factors that indicate a fluctuating housing market where some fishing infrastructure displacement may

occur due to rising home values and rents. The **Retiree migration** index characterizes areas with a higher concentration of retirees and elderly people in the population. The **Urban sprawl** index describes areas with increasing population and higher costs of living. A high rank in any of these indicates a population more vulnerable to gentrification.

Almost all monkfish ports scored medium-high to high in at least one of the three gentrification pressure indicators. This suggests that shoreside fishing infrastructure and fishing family homes may face rising property values (and taxes) from an influx of second homes and businesses catering to those new residents, which may displace the working waterfront. Across all monkfish ports, the highest indicator of vulnerability is housing disruption.

Combined Social and Gentrification Pressure Vulnerabilities. Overall, 11 of the 20 communities have medium to high levels of vulnerability for four or more of the eight indicators (combined social and gentrification pressure). This indicates high social and gentrification pressure vulnerability overall for both the primary and secondary communities. New Bedford, MA has six indicators at the medium to high level.

Table 33. Social vulnerability and gentrification pressure in monkfish ports, 2019.

State	Community	Social vulnerability					Gentrification pressure		
		Labor Force Structure	Housing Characteristics	Environmental Justice indicators			Housing Disruption	Retiree Migration	Urban Sprawl
				Personal Disruption	Poverty	Population Composition			
ME	Portland (s)	Low	Medium	Low	Medium	Low	Medium	Low	Medium
NH	Portsmouth (s)	Low	Low	Low	Low	Low	Med-High	Low	Medium
MA	Gloucester (p)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Boston (p)	Low	Low	Medium	Med-High	Med-High	High	Low	High
	Scituate (s)	Low	Low	Low	Low	Low	Med-High	Low	Med-High
	Chatham (s)	High	n/a	Low	Low	Low	High	High	Low
	Harwichport (s)	High	Low	Low	Low	Low	Med-High	High	Low
	New Bedford (p)	Low	Med-High	Med-High	High	Med-High	Medium	Low	Med-High
	Westport (s)	Medium	Medium	Low	Low	Low	Medium	Medium	Medium
RI	Little Compton (s)	Medium	Low	Low	Low	Low	Med-High	Med-High	Medium
	Newport (s)	Low	Low	Low	Medium	Low	High	Low	Medium
	Narragansett/Pt. Judith (p)	Medium	Low	Low	Low	Low	Med-High	Medium	Low
CT	New London (s)	Low	Med-High	High	High	Med-High	Low	Low	Low
NY	Montauk (p)	Med-High	Low	Low	Low	Low	High	High	Med-High
	Hampton Bays/Shinnecock (s)	Low	Low	Low	Low	Med-High	High	Low	Medium
NJ	Point Pleasant (s)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Barnegat Light/Long Beach (p)	High	n/a	Low	Low	Low	High	High	Medium
	Cape May (s)	Med-High	Medium	Low	Low	Low	High	Med-High	Low
VA	Chincoteague (s)	High	Med-High	Medium	Low	Low	Medium	Med-High	Low
	Newport News (s)	Low	Medium	Medium	Medium	Med-High	Low	Low	Low

Source: NOAA Fisheries Community [Social Indicators](#).
 *n/a indicates ranking is not available due to incomplete data. (p) = herring primary port. (s) = herring secondary port

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so Section 5.6 (monkfish focus) and 5.7 (spiny dogfish focus) differ in formatting.

5.5.6 Purpose

This section describes the performance of the spiny dogfish fishery to allow the reader to understand its socio-economic importance. Also see NMFS' communities page at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/socioeconomics/socioeconomic-cultural-and-policy-research-northeast>.

The most obvious way that human communities are affected by the fishery is from the revenues generated, and the jobs created. The affected communities include both individuals directly involved in harvesting and processing as well as indirect support services (e.g. vessel maintenance, insurance, ice, etc.). While the direct data points that are most available are landings and revenues, it is important to keep in mind that by contributing to the overall functioning of and employment in coastal communities, the fishery has indirect social impacts as well. Social impacts are strongly aligned with changes to fishing opportunities and while difficult to measure can include impacts to families from income changes/volatility, safety-at-sea (related to changes in fishery operations due to regulation changes), job satisfaction, and/or frustration by individuals due to management's impacts (especially if they perceive management actions to be unreasonable or ill-informed).

5.5.7 Recent Fishery Performance

This section establishes a descriptive baseline for the fishery with which to compare actual and predicted future socio-economic changes that result from management actions. The 2023 spiny dogfish Fishery Information Document and 2023 Spiny Dogfish Fishery Performance Report have details on recent commercial fishing activity, summarized below. These are available at <https://www.mafmc.org/dogfish>. There is negligible directed recreational effort/catch.

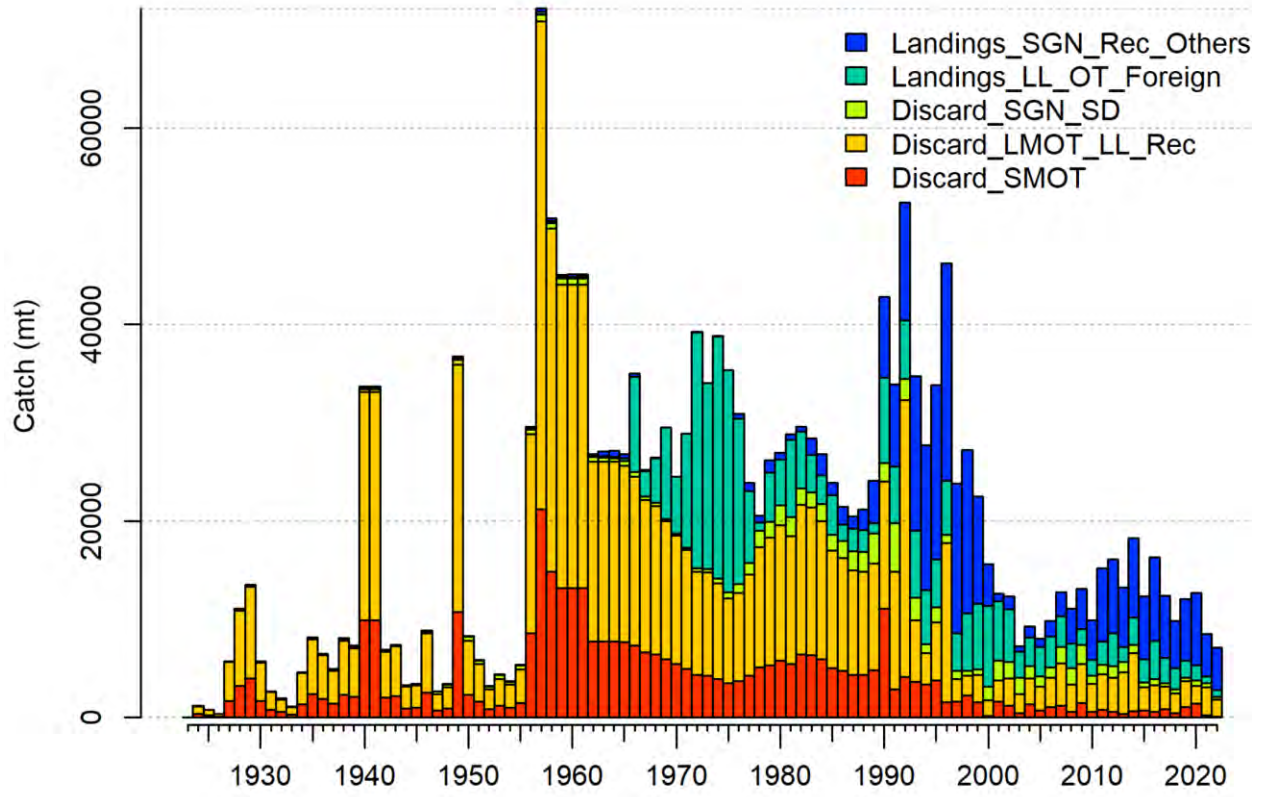
The NEFMC and MAFMC jointly manage spiny dogfish in federal waters (MAFMC has lead) and the ASMFC has a complementary state waters plan. Directed fishing was curtailed in 2000 when federal management began after overfishing in the 1990s led to an overfished finding. Examining vessels possessing any federal permit and landings of at least 10,000 pounds of spiny dogfish, during the initial rebuilding from 2001-2005, 29-68 vessels participated in the spin dogfish fishery. As abundance increased and fishing measures were liberalized, participation increased to a peak of 282 vessels in 2012. Participation has been declining since 2012, and 80 such vessels participated in the 2022 fishing year.

Figure 27 below, from the 2023 Assessment, describes spiny dogfish catch 1924-2022 and highlights the 1970s foreign fishery (teal color) and then domestication of the fishery in the 1990s (royal blue). Figure 28 to Figure 30 describe recent domestic landings, nominal ex-vessel revenues, and prices (inflation adjusted). Data since 1996 is more reliable than previous data due to improvements in reporting requirements. The Gross Domestic Product Implicit Price Deflator was used to report ex-vessel prices as "2022 dollars." Figure 31 illustrates preliminary weekly 2022 (yellow-orange) and 2023 (blue) landings through the year. Figure 32 displays locations of 2010-2021 NEFSC survey catches and VTR landings.

Recently most landings were in MA, VA, and NJ (Table 34). The fishery occurs throughout the year but is more focused north in the summer and south in the winter (Table 35). Most landings are made with

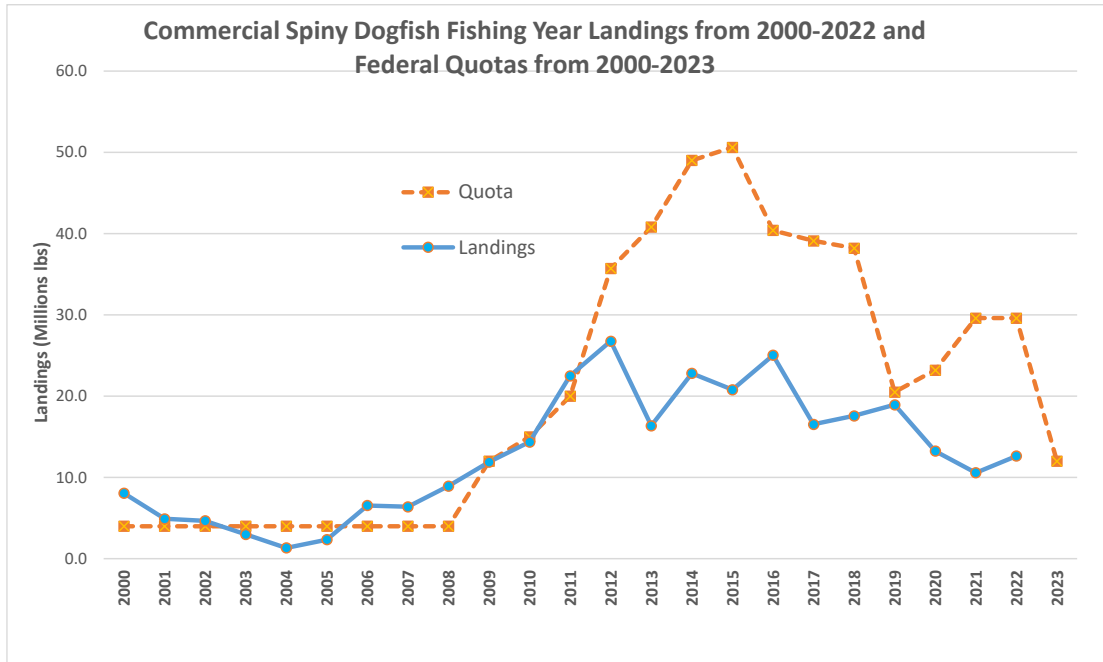
gillnet gear (Table 36). There has been a recent decline in the number of federally-permitted vessels participating (Table 37). Individual port data are not provided as it may violate the spirit of data confidentiality provisions even if not the letter of the law (an astute observer could potentially glean confidential data even if not obvious to some readers).

Figure 27. Spiny Dogfish Catches 1924-2022.



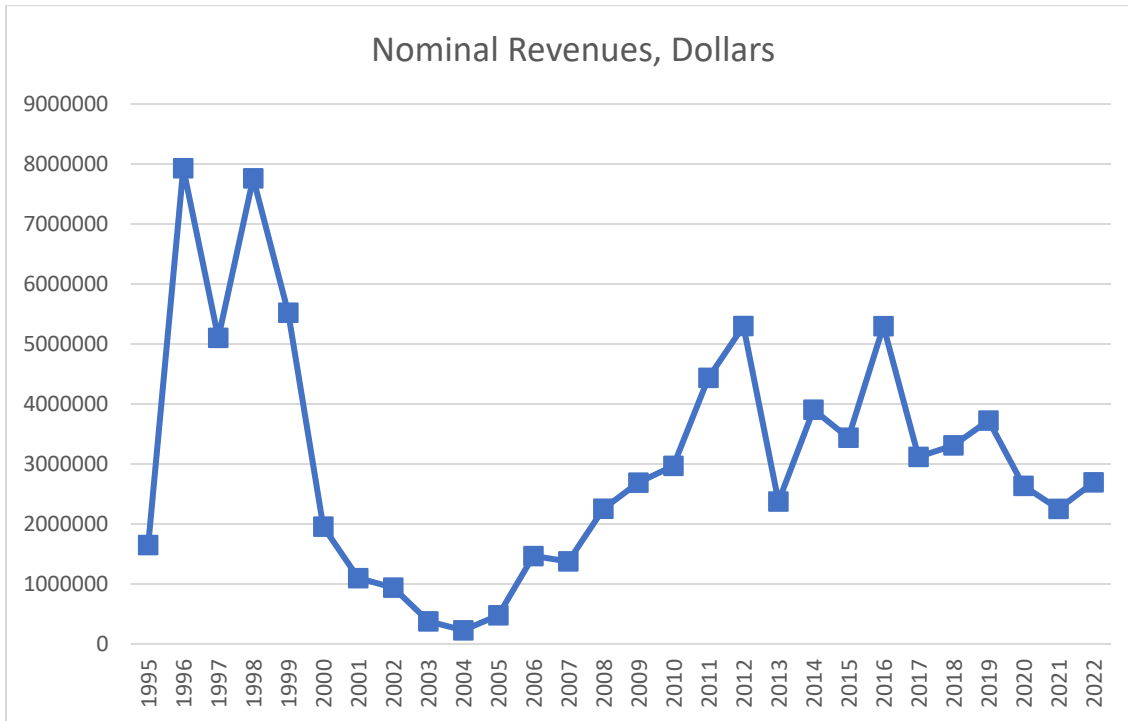
Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php>.

Figure 28. U.S. Spiny Dogfish Landings and Quotas 2000-2023 fishing years.



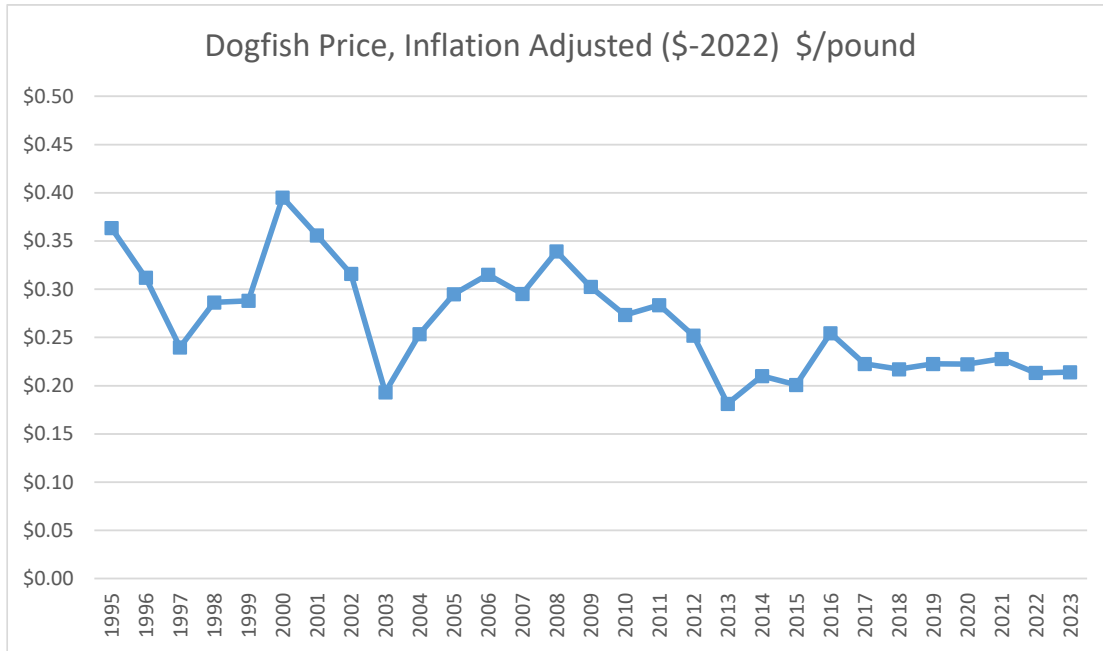
Source: NMFS unpublished dealer data.

Figure 29. Spiny Dogfish Ex-Vessel Revenues 1995-2022 fishing years, Nominal Dollars.



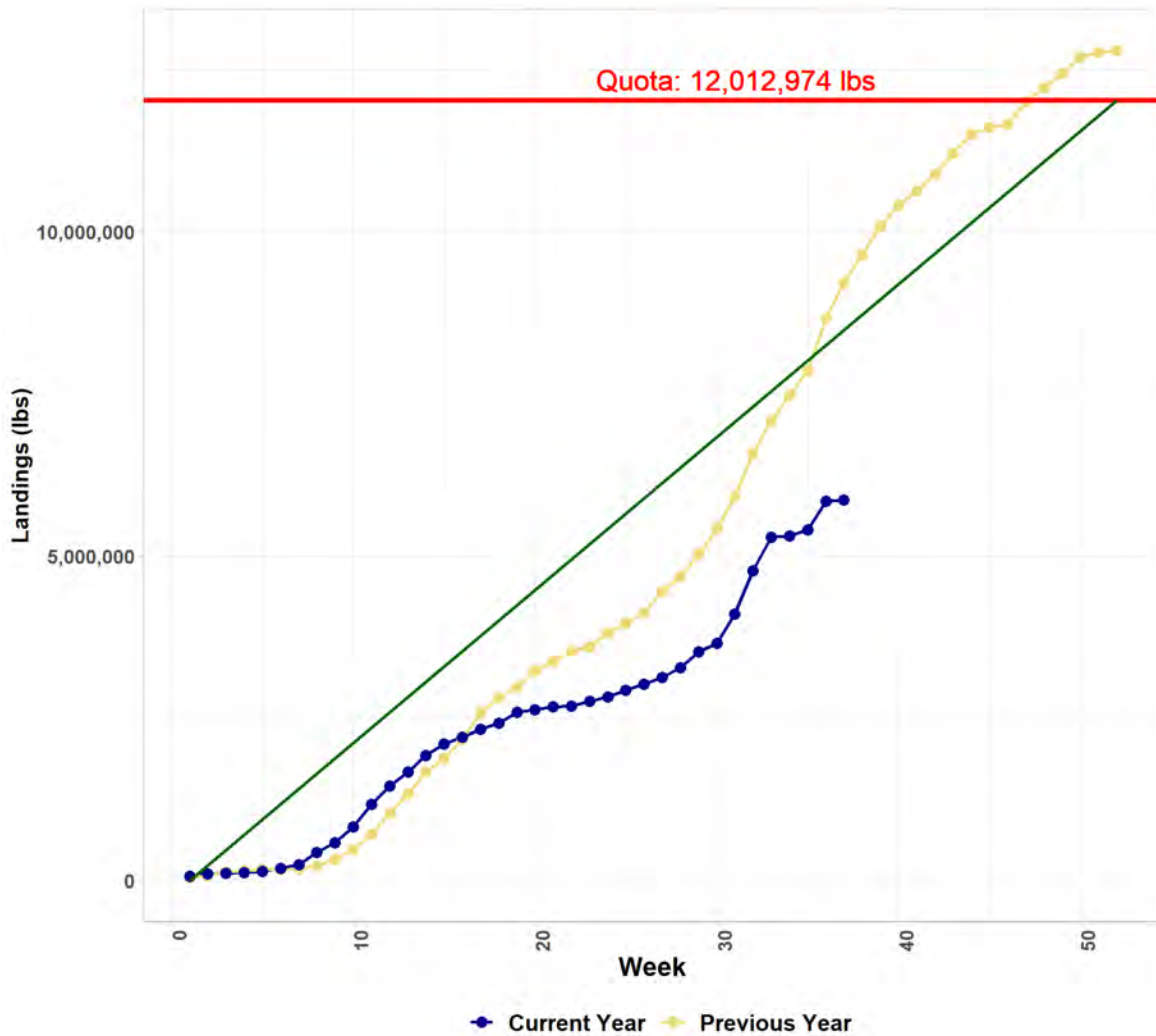
Source: Unpublished NMFS landings data.

Figure 30. Ex-Vessel Spiny Dogfish Prices 1995-2022 Adjusted to 2022 Dollars.



Source: NMFS unpublished dealer data.

Figure 31. U.S. Preliminary spiny dogfish landings; 2023 fishing year in dark blue, 2022 in yellow-orange.



Source: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region>. For data reported through 2024-01-17 Week 0 = May 1. 2023 fishing year quota noted (12.0 million pounds)

Figure 32. Survey and VTR Spiny Dogfish Catches 2010-2021 – Assessment – Jones 2022 Working Paper available at <https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php>.

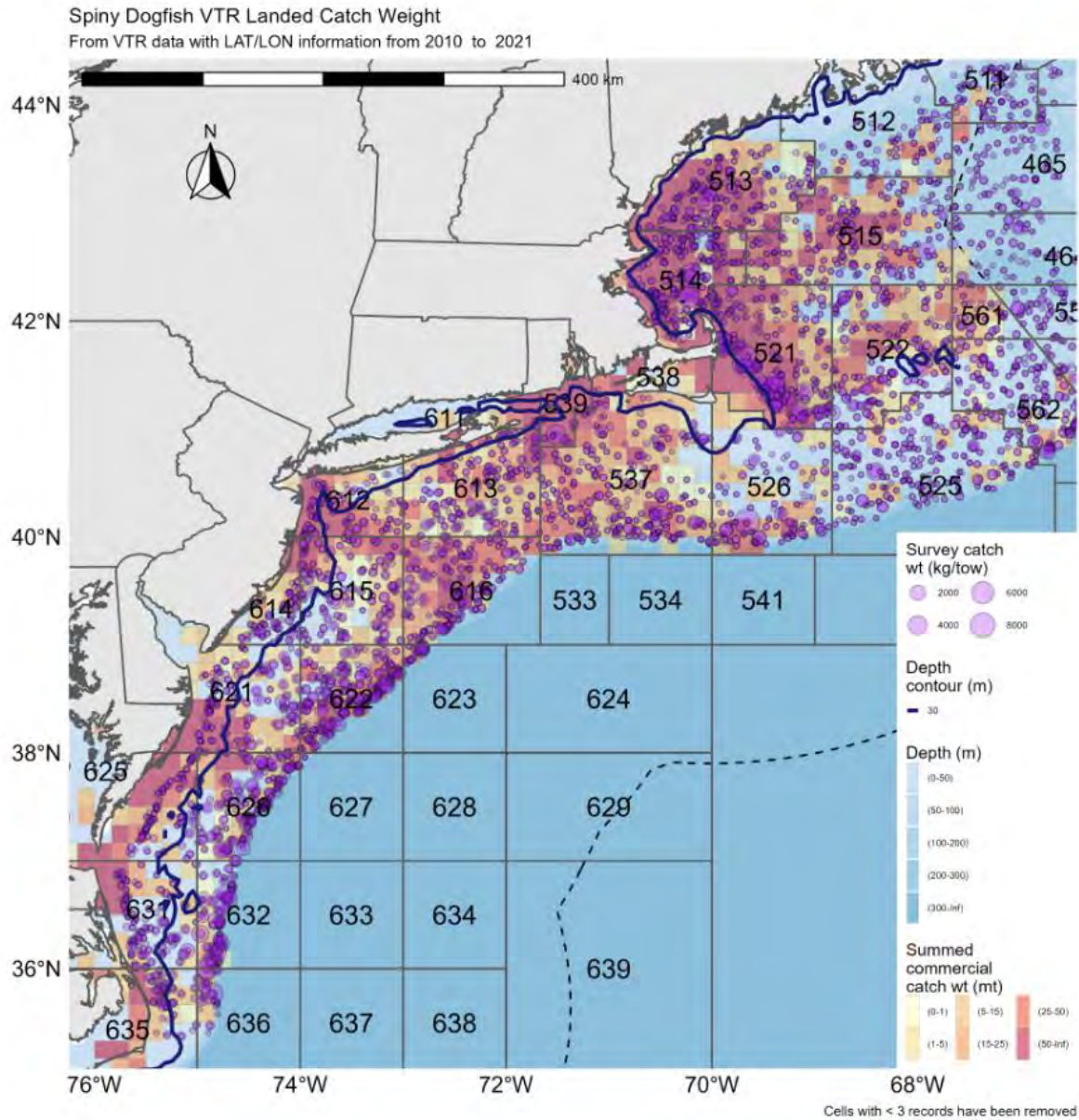


Table 34. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2020-2022 fishing years.

Year	MA	VA	NJ	Other (ME, NH, RI, CT, NY, MD, NC)	Total
2020	6.6	3.3	2.0	1.4	13.3
2021	3.8	4.0	1.6	1.2	10.6
2022	3.8	6.0	1.7	1.1	12.6

Source: NMFS unpublished dealer data.

Table 35. Commercial Spiny Dogfish landings (live weight – millions of pounds) by months for 2020-2022 fishing years.

Year	May-Aug	Sept-Dec	Jan-April	Total
2020	4.9	5.5	2.8	13.3
2021	2.9	4.6	3.1	10.6
2022	2.7	5.0	4.9	12.6

Source: NMFS unpublished dealer data.²

Table 36. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2020-2022 fishing years.

Year	GILL_NET_SINK_OTHER	LONGLINE_BOTTOM	TRAWL_OTTER_BOTTOM_FISH	Unknown/Other	Total
2020	9.7	1.8	0.4	1.4	13.3
2021	9.2	0.5	0.3	0.6	10.6
2022	10.1	0.9	0.2	1.3	12.6

Source: NMFS unpublished dealer data.²

Table 37. Vessel participation over time in the Spiny Dogfish Fishery based on annual landings (pounds). Note: State-only vessels are not included.

YEAR	Vessels 200,000+	Vessels 100,000 - 199,999	Vessels 50,000 - 99,999	Vessels 10,000 - 49,999	Total with at least 10,000 pounds landings
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	35	109
2019	29	25	21	29	104
2020	23	27	15	22	87
2021	15	27	11	26	79
2022	28	9	14	29	80

Source: NMFS unpublished dealer data.

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

6.1 INTRODUCTION

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section 5.0) and to each other. This action evaluates the potential impacts described in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high) based on the guidelines shown in Table 38.

Table 38. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and Nontarget Species	Overfished status defined by the MSA	Alternatives that would maintain or are projected to result in a stock status above an overfished condition*	Alternatives that would maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed Protected Species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)	Alternatives that result in interactions/take of listed resources, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA Protected Species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that will maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR	Alternatives that do not impact MMPA Protected Species
Physical Environment / Habitat / EFH	Many habitats degraded from historical effort (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality, quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human Communities (Social and Economic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
Impact Qualifiers				
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible	To such a small degree to be indistinguishable from no impact		
	Slight (sl) as in slight positive or slight negative	To a lesser degree / minor		
	Moderate (M) positive or negative	To an average degree (i.e., more than “slight”, but not “high”)		
	High (H), as in high positive or high negative	To a substantial degree (not significant unless stated)		
	Significant (in the case of an EIS)	Affecting the resource condition to a great degree, see 40 CFR 1508.27.		
	Likely	Some degree of uncertainty associated with the impact		
*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

6.1.1 Current Fishing Effort

Current fishing gear density compiled by the Decision Support Tool (DST) team are included below, which served as the basis for the evaluation of time/area closures. The figures include the current gear density from VTRs and VMS reports from a subset of years, 2017 - 2020 for federal gillnet, for both monkfish and dogfish fisheries in aggregate (Figure 33) and also separately (Figure 34 and Figure 35). The gear density figures are broken down by months being considered for time/area closure alternatives. These figures can also be further split out by mesh size categories if interested. It is worth noting that substantive changes in fishing effort in other gear types is not expected nor a shift to other gear types as a result of this action.

Figure 33. Current gillnet gear density for monkfish and dogfish based on VTR and VMS data from 2017-2020, compiled by DST team.

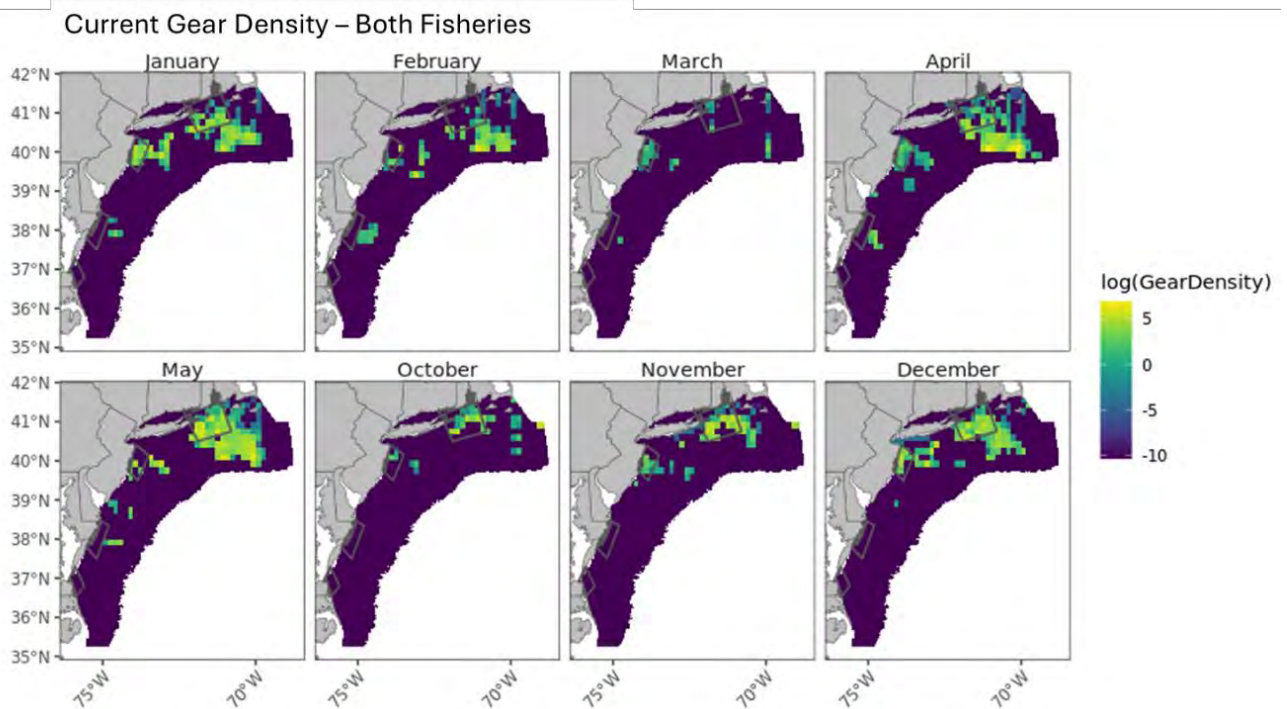
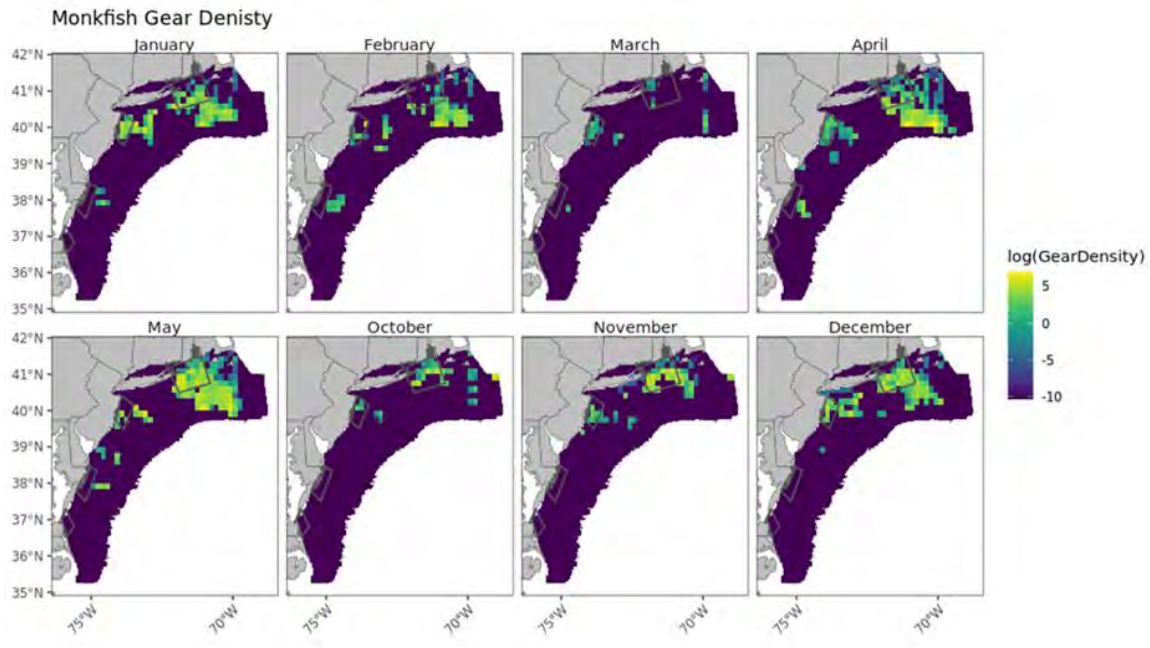
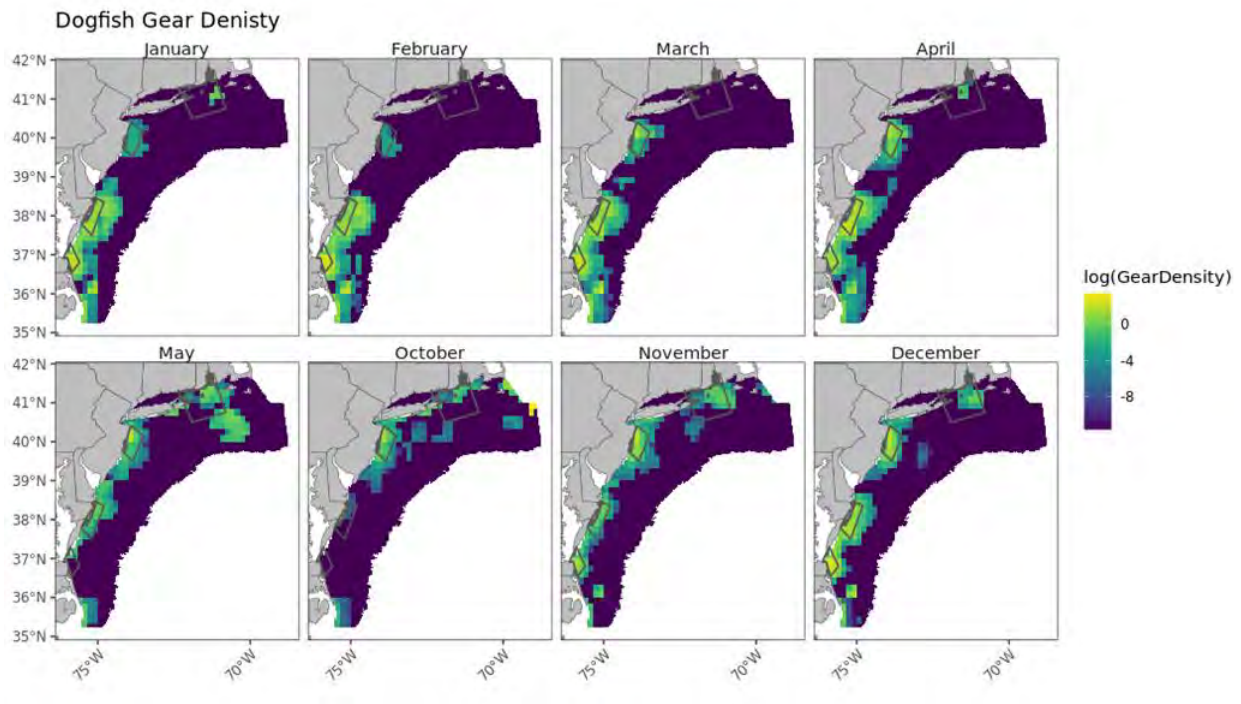


Figure 34. Current gillnet gear density for monkfish based on VTR and VMS data from 2017-2020, compiled by DST team.



Note: Potential months under consideration for monkfish closures in range of alternatives: April, May, December for SNE polygon; May, October (15-31), November, December for New Jersey polygon.

Figure 35. Current gillnet gear density for dogfish (data do not differentiate between spiny and smooth dogfish), based on VTR and VMS data from 2017-2020, compiled by DST team.



Note: Potential months under consideration for dogfish closures in range of alternatives: May, October (15-31), November, December for New Jersey polygon; January, February, March, November, December for DE/MD/VA polygons.

6.1.2 Expected Changes in Fishing Effort Under Each Alternative

The expected impacts of the alternatives on the VECs are derived from consideration of both the current conditions of the VECs and expected changes in fishing effort under each alternative. Fishing effort is influenced by a variety of interacting factors, including regulations (catch and landings limits, possession limits, gear restrictions, seasonal closures, etc.), availability of the species in question and other potential target species, market factors such as price of various potential target species, and other factors. It is important to note that actual fishing effort may differ from these expectations based on changes in availability, market factors, and other conditions which are difficult to predict. The Decision Support Tool was used to evaluate time/area closures and impacts from gear modifications and are summarized below.

Time/area closure evaluation methodology

The Decision Support Tool (DST), used to support development of Atlantic Large Whale Take Reduction Team measures, was adapted for use in the Council's sturgeon bycatch action. Specifically, the fixed-gear fishery layer was utilized to examine how gillnet effort/gear distribution might change in response to the proposed sturgeon bycatch measures. The fixed-gear fishery layer was isolated to the monkfish and dogfish species groups. Note: the monkfish fishery group includes monkfish and skates, and the dogfish fishery group includes spiny and smooth dogfish. Trips are assigned to Species Grouping based on primary species landed (from VTRs). The monkfish and dogfish species groups are further subdivided into mesh size (small [< 5 in], medium [$5 - 7$ in], and large [> 7 in]) and gillnet type (anchor or drift).

The DST uses VTRs and VMS reports from a subset of years (2017 - 2020 for federal gillnet). Where available and appropriate, gear configuration is additionally informed by fisheries observer reports and interviews with relevant state agencies. Each VTR is used to estimate the amount of gear that is deployed during an individual trip. That gear is distributed over space and assigned to 1 square mile cells throughout the coast based on the coordinates, depth or reporting area used in the trip report. Using the soak time to know how long that gear was deployed, the gear is distributed over the course of a month to get a monthly time-scale.

Using this monthly time-scale of gillnet gear density, the DST then estimates how gillnet effort might change in response to the proposed management measures, including whether gear is removed (i.e., ceases fishing) or is displaced to areas outside the polygons where measures are applied. Gear is only displaced to cells where the fishery is currently active, where there is at least one existing similar trip (same primary landed species, same gear configuration, and similar mesh size). Gear is not distributed to cells where the fishery and subset gear type [mesh size, gillnet type] has not reported effort during the subset years of which VTRs were queried. Gear cannot be displaced to a cell that is affected by another closure for the same fishery. The amount of gear displaced to qualifying cells depends on 1) how far the cell is from where the gear is currently located, and 2) the distribution of fishing effort in that cell (a cell with more fishing effort is estimated to be more favorable to fishing, and more gear is placed here). Gear without an eligible cell for displacement is removed from the fishery. The DST uses a specified cost-benefit parameter for the maximum distance for gear displacement (how far a vessel would travel). Each alternative was tested with two maximum distances for gear displacement: 20 and 50 miles from where the gear is currently placed. If no cell was available within this distance, gear was removed from the fishery.

For each alternative, the DST results describe the proportion of gear that is removed, and the proportion of gear displaced to areas outside the polygons where measures are applied.

The next step would be to combine the results of the gear density/redistribution with the sturgeon risk mapping. However, because the risk of sturgeon take is spatially diffuse, gear redistributes to areas with the same risk of sturgeon take (see Section 6.1.3). Thus, take reduction is seen when gear is removed rather than redistributed.

Time/area closure results

Preliminary results from the DST tool are included in the following tables and figures. Additional preliminary data results, both figures and tables, are included in Appendix A (Section 10). The preliminary results were reviewed by industry members who were previously involved in the application of the DST model for Atlantic Large Whales Take Reduction Team work and/or have knowledge in the monkfish and spiny dogfish fisheries. A summary of those informal meetings with industry is also available in Appendix A.

Table 39. Alternative 2 DST results for a 20-mile maximum gear replacement.

Alternative 2 - 20 miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,528	0.67%	17	75	23%
March	273	260	4.76%	13	75	17%
April	6,138	5,856	4.59%	282	524	54%
May	8,370	6,454	22.89%	1,916	2,698	71%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,744	0.36%	10	15	67%
November	3,275	3,209	2.02%	66	101	65%
December	3,918	2,150	45.13%	1,768	2,113	84%
	48,635	44,545	8.41%	4,088	5,666	72%

Table 40. Alternative 2 DST results for a 50-mile maximum gear replacement.

Alternative 2 – 50- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,537	0.31%	8	75	11%
March	273	266	2.56%	7	75	9%
April	6,138	6,113	0.41%	25	524	5%
May	8,370	8,215	1.85%	155	2,698	6%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,746	0.29%	8	15	53%
November	3,275	3,273	0.06%	2	101	2%
December	3,918	3,226	17.66%	692	2,113	33%
	48,635	47,728	1.86%	906	5,666	16%

Table 41. Alternative 3 DST results for a 20-mile maximum gear replacement.

Alternative 3 – 20- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,528	0.67%	17	75	23%
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	6,593	21.23%	1,777	2,528	70%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,265	0.31%	10	55	18%
December	3,918	2,150	45.13%	1,768	2,113	84%
	48,635	45,046	7.38%	3,588	4,837	74%

Table 42. Alternative 3 DST results for a 50-mile maximum gear replacement.

Alternative 3 – 50- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,537	0.31%	8	75	11%
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,215	1.85%	155	2,528	6%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,275	0.00%	0	55	0%
December	3,918	3,226	17.66%	692	2,113	33%
	48,635	47,770	1.78%	864	4,837	18%

Table 43. Alternative 4 DST results for a 20-mile maximum gear replacement.

Alternative 4 – 20- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,545	0.00%	0	0	NA
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,370	0.00%	0	0	NA
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,215	1.83%	60	80	75%
December	3,918	2,548	34.97%	1,370	1,694	81%
	48,635	47,188	2.98%	1,446	1,840	79%

Table 44. Alternative 4 DST results for a 50-mile maximum gear replacement.

Alternative 4 – 50-miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,545	0.00%	0	0	NA
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,370	0.00%	0	0	NA
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,275	0.00%	0	80	0%
December	3,918	3,254	16.95%	664	1,694	39%
	48,635	47,961	1.39%	673	1,840	37%

6.1.3 Potential Reduction in Sturgeon Bycatch

In order to assess the likelihood of sturgeon take occurrence in a given location based on the expected changes in fishing effort described in Section 6.1.1, an analysis was conducted to evaluate changes in sturgeon takes from the time/area closure alternatives. The main result is that a shift in total fishing effort may offset intended bycatch mitigation given there is a similar chance of encountering a sturgeon relative to where previous fishing activity occurred. Overall, there is a very similar percent take reduction to percent gear removed because risk of sturgeon interaction is spatially diffuse and effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction is seen when gear is removed. The final report of this work can be found in Appendix B.

As discussed in Section 5.3.5.2, the observed or documented interactions between Atlantic sturgeon and gillnet gear in the GAR has been described in several documents. Over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic sturgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017a). More recent studies support that habitat features such as depth and water temperature influence Atlantic sturgeon distribution in the Mid-Atlantic Bight (Breece et al. 2016; Breece et al. 2018).

Detections of acoustically-tagged sturgeon in an area identified for offshore wind leases located between Long Island and the coast of New Jersey, extending 11.5 to 24 nautical miles southeast of Long Island, with water depths ranging from 23 m to 41 m indicated that the tagged sturgeon were most abundant in the area in the winter months (i.e., December through February) and occurred throughout the area including the waters furthest from shore and up to 41 m deep. The sturgeon were least abundant, including zero detections in some years, during the months of July through September (Ingram et al. 2019). Further south, a broad-scale acoustic array detected 352 In Mid-Atlantic waters off Maryland over a two-year

period (Rothermel et al. 2020). As seen by Ingram et al., Atlantic sturgeon selected for deeper waters in the fall. In addition, as suggested by modeling (Breece et al. 2016; Breece et al., 2018), Atlantic sturgeon presence was associated with warmer water temperatures further offshore in the fall and winter compared to more near-shore waters (Rothermel et al. 2020). However, Rothermel et al. also noted that in their study area Atlantic sturgeon had a wider continental shelf distribution in their fall migration related to depth and water temperature gradients which likely reflects the temperature gradient across the continental shelf in more southern Mid-Atlantic waters in the winter.

The expected sturgeon takes per days fished in the sturgeon take analysis (Figure 3 of the analysis) reflects some of what we would expect based on the available literature. Specifically, the expected take of sturgeon in July through September is less than in other months; a time that coincides with sturgeon presence in coastal estuaries. The expected take of sturgeon is highest and most concentrated in the southern Mid-Atlantic Bight off Virginia in December and across the continental shelf, then declines somewhat through the winter months; findings that are consistent with Rothermel et al. (2020) and modeling by Breece et al. (2016; 2018). It is difficult to discern more detailed distribution of Atlantic sturgeon at the scale of the analysis as well as the scale of the sturgeon bycatch hotspot polygons. In addition, the expected sturgeon takes per day is influenced by where and when fishing effort occurs. However, telemetry detections of Atlantic sturgeon for Ingram et al. (2019) and Rothermel et al. (2020) were limited to the area where telemetry receiver arrays could be placed and the number of tagged sturgeon that passed through the telemetry arrays. Therefore, each method has its limitations for identifying Atlantic sturgeon presence throughout the Mid-Atlantic Bight in all months.

Table 45. Expected percent reduction of Atlantic Sturgeon takes by federally-permitted vessels using gillnet gears under various actions and behavior (max movement distance) scenarios. Action 1 is ‘no action’ and other alternatives not involving closures are also not listed.

<i>Action</i>	<i>Max Distance Move (nm)</i>	<i>Percent Reduction</i>
2	20	13.00%
2	50	4.20%
3	20	10.60%
3	50	3.20%
4	20	4.10%
4	50	1.90%

6.2 IMPACTS ON TARGET SPECIES

6.2.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the target species (monkfish and spiny dogfish) would likely be negligible to slight positive. The justification for this conclusion includes: According to the 2022 monkfish stock assessment, the stock status of monkfish is unknown and based on the 2023 management track assessment for spiny dogfish, the species was neither overfished (101% of target) nor experiencing

overfishing in 2022 (81% of target). Maintaining the same fishing areas and gear configurations would be unlikely to lead to substantive changes in fishing effort and/or behavior (e.g., number of trips, amount of discarding, etc.). There would likely be the same number of trips and the proportion of discards to landings on each trip would be unchanged. The No Action effort controls in the northern and southern fishery management areas would help constrain landings and help keep landings within the total allowable landings. Discard set asides, combined with landings limits should avoid ABC overages, which should maintain the health of the monkfish and spiny dogfish populations. The No Action alternative would not create any additional measures to constrain monkfish and spiny dogfish landings through time/area closures and gear restrictions, thus, the stock status of monkfish and spiny dogfish would likely remain the same.

6.2.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon.

Time/area closures

The impacts of Alternative 2 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5 (under any alternative ABCs should not be exceeded and current status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 8.4% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 39). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.9% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 40). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e. primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 2 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on these experimental low-profile gillnet gear is included in Alternative 2 rationale. Any potential reductions in overall monkfish or spiny dogfish catch would be unlikely to change their statuses.

6.2.3 Alternative 3 – Intermediate Impact Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 3 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5 (under any alternative ABCs should not be exceeded and current status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 7.4% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 41). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.8% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 42). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e. primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 3 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on these experimental low-profile gillnet gear is included in Alternative 2 rationale. It is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish. Sub-alternatives 5A and 5B would exempt a subset of the dogfish fishery using 5.25" mesh or less from overnight soak prohibitions. Given the DST results showing small overall effort changes coastwide, any potential reductions in monkfish or spiny dogfish catch would be unlikely to change their statuses.

[To be completed – additional DST gear modifications summary]

6.2.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 4 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5 (under any alternative ABCs should not be exceeded and current status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 3% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 43). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.4% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 44). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e. primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 4 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on these experimental low-profile gillnet gear is included in Alternative 2 rationale. It is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish. Sub-alternatives 5A and 5B would exempt a subset of the dogfish fishery using 5.25" mesh or less from overnight soak prohibitions. Given the DST results showing small overall effort changes coastwide, any potential reductions in monkfish or spiny dogfish catch would be unlikely to change their statuses.

[To be completed – additional DST gear modifications summary]

6.2.5 Alternative 5 – Gear-Only Sturgeon Package

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area.

The impacts of Alternative 5 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 4 (under any alternative ABCs should not be exceeded and current status should be maintained). In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. The research studies also found no significant difference in dogfish catch, though dogfish landings were modest compared to monkfish and winter skate (the top two species landed). Additional information on these experimental low-profile gillnet gear is included in Alternative 2 rationale. It is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish. Sub-alternatives 5A and 5B would exempt a subset of the dogfish fishery using 5.25” mesh or less from overnight soak prohibitions. Given the DST results showing small overall effort changes coastwide, any potential reductions in monkfish or spiny dogfish catch would be unlikely to change their statuses.

6.3 IMPACTS ON NON-TARGET SPECIES

This section considered the impacts on the non-target species identified in Section 5.2., specifically the Northeast skate and Northeast multispecies (groundfish) fisheries.

6.3.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the non-target species would likely be negligible and would be negligible relative to Alternatives 2, 3, 4, and 5. Maintaining the same fishing areas and gear configurations would unlikely change fishing effort and behavior (e.g., number of trips, amount of discarding, etc.). There would likely be the same number of trips and the proportion of discards to landings on each trip would be unchanged. The No Action effort controls in the northern and southern monkfish fishery management areas would help constrain landings and help keep landings of non-target species within their total allowable landings. The same applies for spiny dogfish given its quota controls. The No Action alternative would not create any additional measures to constrain non-target species landings through time/area closures and gear restrictions, thus, would likely not change the stock status of these species. Common non-target species include skate and Northeast multispecies and their catch is controlled by measures in their FMPs. Especially in the northern fishery management area, the monkfish fishery is largely incidental, prosecuted during fishing under other FMPs (Section 5.2). Catch of other species on trips landing monkfish and spiny dogfish are controlled by other days at sea limits, sector rules, trip limits, and other discard limiting measures in other FMPs.

6.3.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon.

Time/area closures

The impacts of Alternative 2 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently displaced, 8.4% of coastwide dogfish and monkfish is unable to be displaced, meaning 8.4% of gear would be predicted to be removed from the fisheries (see Table 39). For a 50-mile maximum distance for gear displaced, 1.9% of coastwide dogfish and monkfish is unable to be displaced (see Table 40). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed. This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 2 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale.

6.3.3 Alternative 3 – Intermediate Impact Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 3 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently displaced, 7.4% of coastwide dogfish and monkfish is unable to be displaced, meaning 7.4% of gear would be predicted to be removed from the fisheries (see Table 41). For a 50-mile maximum distance for gear displaced, 1.8% of coastwide dogfish and monkfish is unable to be displaced (see Table 42). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed. This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 3 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Spiny dogfish soak-time limitations would not be expected to change the status of any non-target species in a more than negligible fashion.

6.3.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 4 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently displaced, 3% of coastwide dogfish and monkfish is unable to be displaced, meaning 3% of gear would be predicted to be removed from the fisheries (see Table 43). For a 50-mile maximum distance for gear displaced, 1.4% of coastwide dogfish and monkfish is unable to be displaced (see Table 44). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and

spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed. This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 4 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Spiny dogfish soak-time limitations would not be expected to change the status of any non-target species in a more than negligible fashion.

6.3.5 Alternative 5 – Gear-Only Sturgeon Package

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area.

The impacts of Alternative 5 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 4. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Spiny dogfish soak-time limitations would not be expected to change the status of any non-target species in a more than negligible fashion.

6.4 IMPACTS ON PROTECTED RESOURCES

The Joint Framework alternatives are evaluated for their impacts on species protected under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972. The current conditions of protected species are summarized in Table 8 and described in Section 5.3. The species that are more likely to be impacted by this action are described in Section 5.3.4 (e.g., sea turtles, large whales, and the five Atlantic sturgeon DPSs).

All ESA-listed species are in poor condition and any interaction (i.e., take) can negatively impact that species' recovery. As a result, any action that may result in interactions of ESA-listed species, including actions that may reduce interactions, is likely to have some level of negative impact to these species. Actions likely to have positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions or take (Table 37). None of the Joint Framework alternatives would ensure that interactions with ESA-listed species would not occur. Therefore, for each ESA-listed species

described in Section 5.3.4, we considered the impact of each alternative relative to whether it would be more or less negative than each of the other alternatives.

The stock conditions for marine mammals not listed under the ESA varies by species; however, all need protection. For marine mammal stocks that have their PBR level reached or exceeded, some level of negative impacts would be expected from alternatives that result in the potential for interactions between fisheries and those stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), alternatives not expected to change fishing behavior or effort relative to current operating conditions in the fishery may have some level of positive impacts by maintaining takes below the PBR level and approaching the zero-mortality rate goal (Table 7). All of the Joint Framework alternatives, with the exception of Alternative 1 (i.e., current operating conditions in the fishery), are expected to change fishing behavior or effort. Some of the alternatives are likely to reduce effort relative to current operating conditions. Therefore, for marine mammals not listed under the ESA, we considered the impact of each alternative as well as the PBR level of the particular marine mammal to inform whether the overall impact of the alternative was likely to be positive or negative.

As described above, the Joint Framework alternatives are specific to federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using gillnet gear with $\geq 10''$ mesh size in federal and/or state waters, and to vessels with a federal fishing permit targeting spiny dogfish in federal or state waters using gillnet gear with mesh size of $5 - < 10''$. Therefore, for this impacts analysis, we consider only the impacts to protected species from gillnet gear used in the fisheries. The impacts to protected species from other gear types used in the monkfish fishery and the spiny dogfish fishery were most recently described in the Environmental Assessment for Framework Adjustment 13 to the Monkfish Fishery Management Plan and the Environmental Assessment for the 2023 Spiny Dogfish Specifications and will not change as a result of any of the Joint Framework Alternatives.

Gear quantity, soak time, and area fished influence the extent to which the gillnet gear used to target monkfish and spiny dogfish overlap with the distribution of protected species. Additionally, vessels participating in the monkfish fishery or in the spiny dogfish fishery using gillnet gear must comply, where applicable, with the HPTRP, the BDTRP, and the ALWTRP, and with the sea turtle resuscitation guidelines. Therefore, our consideration of the impacts to protected species from the Joint Framework alternatives also takes into account the take reduction plan measures that reduce the times when and areas where some protected species overlap with the gillnet gear used in the monkfish and spiny dogfish fisheries.

We qualitatively assessed the impacts of each Joint Framework alternative by considering the available information for the marine distribution of each protected species, the areas where the management measures would be implemented, and considering the preliminary DST results for how gillnet effort might change in response to each of the Joint Framework alternatives (section 6.1.2). For the Atlantic sturgeon DPSs, we also sought to quantify the change in sturgeon takes (i.e., percentage of sturgeon bycatch reduction) that would occur (section 6.1.3). Based on the methods used for the analysis, Atlantic sturgeon are more diffuse in their marine range than expected as related to risk of bycatch in gillnet gear given the literature on sturgeon habitat, but the model is the same peer-reviewed model used to estimate sturgeon bycatch. As a result, a reduction in Atlantic sturgeon bycatch is seen primarily when gear is removed as a result of the closure alternatives because effort shifts would result in gear redistributing to areas with similar risk of sturgeon encounters. The diffuse risk pattern is likely driven by the relatively low observer coverage and low total observed takes, which create relatively high uncertainty when the takes that do occur and relative effort are evaluated by the risk model. However, we considered the impact of the Joint Framework alternatives for the Atlantic sturgeon DPSs quantitatively, using the percentage of sturgeon bycatch reduction, and qualitatively based on the available literature that describes Atlantic sturgeon as having seasonal patterns of movement and distribution in marine waters. Finally, although each Atlantic sturgeon DPS is its own listed entity under the ESA, we consider the impacts of each alternative to

Atlantic sturgeon, in general, because individuals of all five DPSs occur in the Mid-Atlantic and our bycatch modeling is not specific to each DPS.

Effort from the SNE closure polygon is expected to shift east of the closure polygon, directly overlapping with areas of high density North Atlantic right whale habitat. The impact of such effort shifts under Alternatives 2, 3, and 4 for North Atlantic right whales is considered below.

Figure 36. North Atlantic right whale habitat relative to Southern New England bycatch polygon (closest to shore) and the South Island Restricted Area (further offshore).

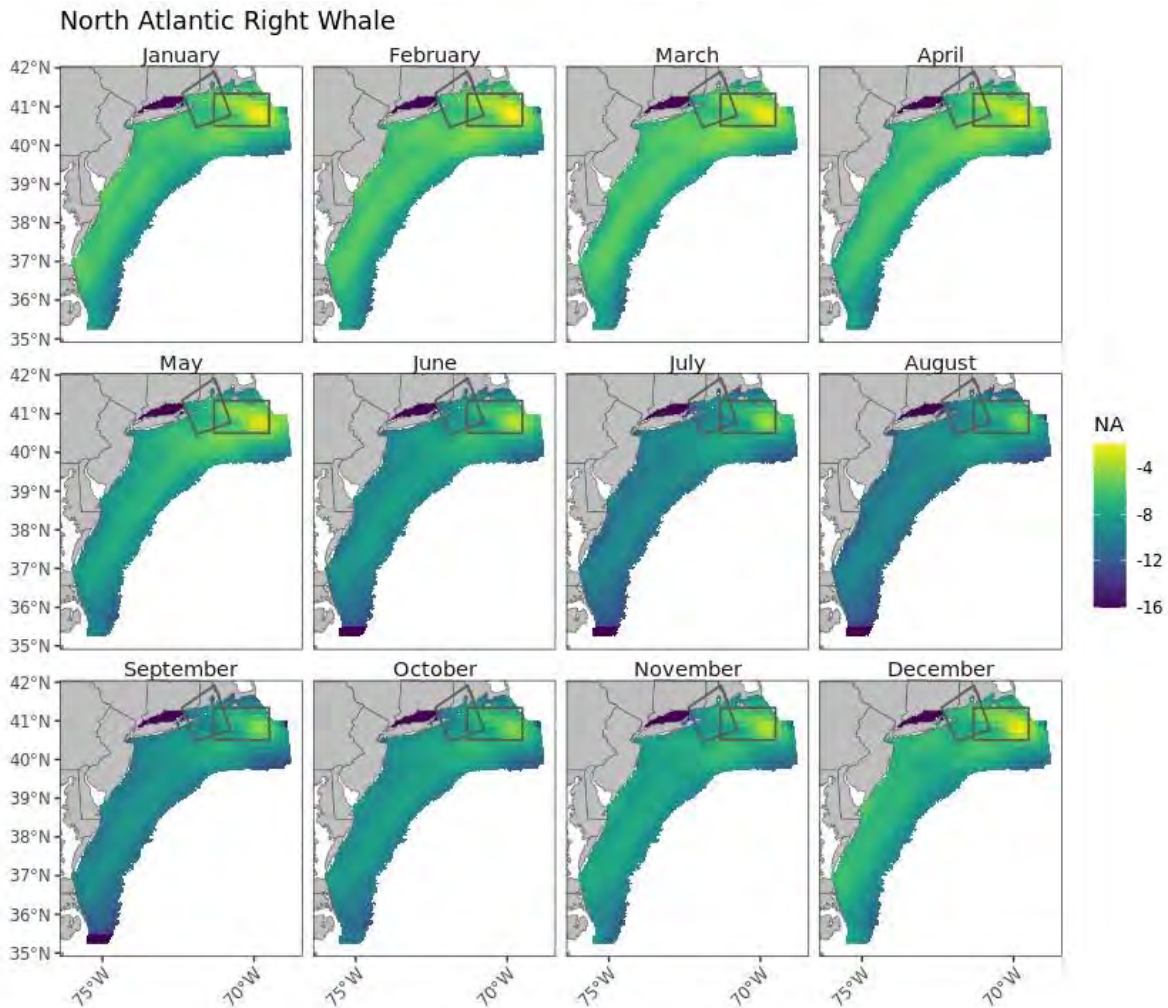
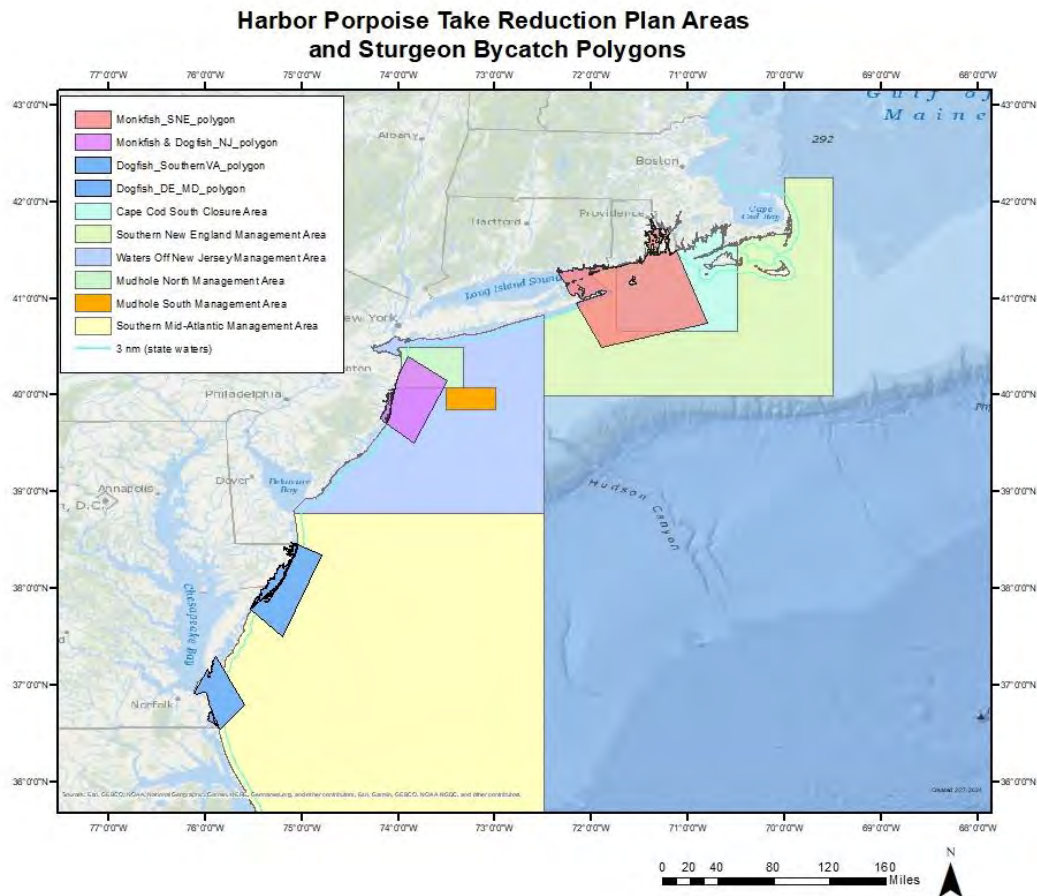


Figure 37. Harbor Porpoise Take Reduction Plan Areas overlapping and adjacent to the proposed sturgeon bycatch polygons.

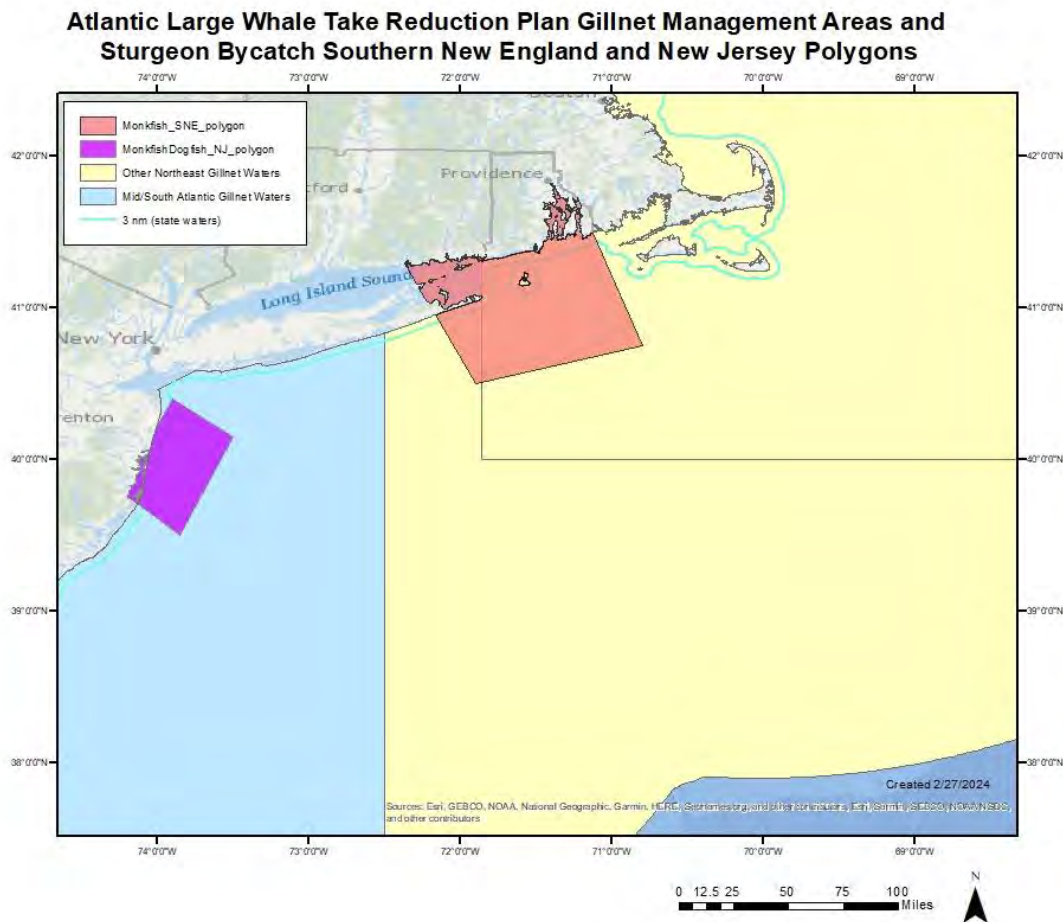


The SNE sturgeon bycatch hotspot polygon overlaps with the HPTRP’s Southern New England Management Area (pingers required on gillnets December 1 – May 31) and overlaps in part with the Cape Cod South Closure Area (closed to gillnets in March). The NJ sturgeon bycatch hotspot polygon overlaps with the HPTRP’s Waters off New Jersey Management Area, overlaps in part with the Mudhole North Management Area, and borders the Mudhole South Management Area (Figure 37). The DE/MA/VA sturgeon bycatch hotspot polygons overlap with the HPTRP’s Southern Mid-Atlantic Management Areas. The requirements for these areas include closures and gear modifications for large mesh (defined under the HPTRP as 7–18-inch mesh) and small mesh gillnet gear (defined under the HPTRP as >5-<7-inch mesh) (Table 46). We consider the HPTRP measures in the impacts section below with respect to how they add to or otherwise change the expected impacts of this action to Atlantic sturgeon and harbor porpoise.

Table 46. Harbor Porpoise Take Reduction Plan measures in relevant Management Areas.

Waters off New Jersey Management Area						
Large Mesh Gillnet Gear (7-18 inches)		Apr 1-20		Closed (No Large Mesh Gillnets)		
Large Mesh Gillnet Gear (7-18 inches)		Jan. 1-Mar. 31, Apr 21-30		Gear Modification Requirements		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Jan. 1-Apr 30		Gear Modification Requirements		
Mudhole North Management Area						
Large Mesh Gillnet Gear (7-18 inches)		Feb 15-Mar 15, Apr 1-20		Closed (No Large Mesh Gillnets)		
Large Mesh Gillnet Gear (7-18 inches)		Jan. 1-Feb 14, Mar 16-31, Apr 21-30		Gear Modification Requirements		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Feb 15-Mar 15		Closed (No Small Mesh Gillnets)		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Jan 1-Feb 14, Mar 16-Apr 30		Gear Modification Requirements		
Mudhole South Management Area						
Large Mesh Gillnet Gear (7-18 inches)		Feb 1-Mar 15, April 1-20		Closed (No Large Mesh Gillnets)		
Large Mesh Gillnet Gear (7-18 inches)		Jan 1-31, Mar 16-31, April 21-30		Gear Modification Requirements		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Feb 1-Mar 15		Closed (No Small Mesh Gillnets)		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Jan 1-31, Mar 16-Apr 30		Gear Modification Requirements		
Southern Mid-Atlantic Management Area						
Large Mesh Gillnet Gear (7-18 inches)		Feb 15-Mar 15		Closed (No Large Mesh Gillnets)		
Large Mesh Gillnet Gear (7-18 inches)		Feb 1-14, Mar 16-Apr 30		Gear Modification Requirements		
Small Mesh Gillnet Gear (>5 inches - <7 inches)		Feb 1- April 30		Gear Modification Requirements		
Large Mesh Gillnet Requirements						
Management Area	Floatline	Twine Size	Tie-downs	Net Size	Nets per vessel	Nets per String
Waters off NJ	4800 ft max	Min .90mm	Required No more than 24 ft apart in floatline No more than 48 inches from floatline to lead line	300 ft max	80 max	16 panels max
Mudhole North	3900 ft max					13 panels max
Mudhole South						
S Mid Atlantic						
Small Mesh Gillnet Requirements						
Management Area	Floatline	Twine Size	Tie-downs	Net Size	Nets per vessel	Nets per String
Waters off NJ	3000 ft max	Min .81mm	Prohibited	300 ft max	45 max	10 panels max
Mudhole N						
Mudhole S						
S Mid Atlantic	2811 ft max					7 panels max

Figure 38. Atlantic Large Whale Take Reduction Plan Gillnet Management Areas overlapping the proposed Southern New England and New Jersey sturgeon bycatch polygons.



Most of the SNE sturgeon bycatch hotspot polygon overlaps with the ALWTRP’s Northeast Gillnet waters, and the NJ and DE/MD/VA sturgeon bycatch hotspot polygons overlap with the ALWTRP’s Mid/South Atlantic Gillnet waters (Figure 38). The ALWTRP requirements for these areas include gear marking, use of weak links designed for the breaking strength of large whales, use of sinking groundlines, and no wet storage of gear (i.e., gear must be hauled once every 30 days). None of these measures will reduce the likelihood of sturgeon interactions with gillnet gear used in the monkfish and spiny dogfish fisheries given the differences in body size and, therefore, strength of Atlantic sturgeon compared to large whales. However, we consider the ALWTRP measures in the impacts section below with respect to whether they would change the expected impacts of this action to large whales.

6.4.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish fishery and for the spiny dogfish fishery would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action. Atlantic sturgeon bycatch is expected to continue to occur at or about the present levels. This level of bycatch will have negative impacts on the New York Bight, Chesapeake Bay,

Carolina, and South Atlantic DPSs of Atlantic sturgeon given the prevalence of individuals from these populations in the Mid-Atlantic Bight, and a slight negative impact on the Gulf of Maine DPS given its more limited presence in the Mid-Atlantic Bight.

Of the five alternatives considered in this Framework action, Alternative 1 is more negative for Atlantic sturgeon and sea turtles compared to Alternatives 2, 3, 4, and 5. Alternative 1 has the same level of negative impacts as Alternative 5 for all large whales and is more negative for large whales compared to Alternatives 2, 3, and 4 with the possible exception of North Atlantic right whales. Alternative 1 is likely slightly more negative for MMPA species compared to Alternatives 2 and 3, and likely has the same level of impacts for MMPA-protected species as Alternatives 4 and 5.

6.4.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

If vessels are willing to travel a maximum of 20 or 50 miles from their original fishing location in the time/area closures described above, modeling (the Decision Support Tool) developed for large whale take reduction suggests that 72% or 16% of the relevant effort in this alternative's closure areas/times would be eliminated (the remainder re-locates), which equates to 8% or 2% of total relevant effort. Relevant effort here is defined as gillnet sets' total soak days from trips landing mostly Monkfish/Skate/Spiny Dogfish/Smooth Dogfish with gillnet mesh larger than 5 inches. The shorter the maximum distance that vessels are able/willing to relocate (only 20 miles versus 50 miles), the more likely effort is eliminated versus re-locating to other areas.

Alternative 2 would reduce gillnet effort in each of the sturgeon bycatch hotspot polygons. Some gillnet effort would also shift from where it currently occurs within the polygons. In general, for the NJ and DE/MD/VA sturgeon bycatch hotspot polygons, the DST predicts gillnet effort will shift to the areas immediately adjacent to the polygons (all boundaries other than the landward boundary) with a more extensive shift predicted when considering gear displacement up to 50 miles from where it currently occurs compared to gear displacement of up to 20 miles from where it currently occurs. For the SNE sturgeon bycatch hotspot polygon, effort would shift to the areas adjacent to the southern and eastern boundaries of the polygon for the April 1-May 31 period under both the 20-mile and 50-mile gear redistribution scenarios. Gear redistribution for the December 1-December 31 time period was predicted to be more limited with gear redistributing to the area adjacent to the southeastern corner of the polygon when considering a gear displacement of up to 20 miles, and gear redistributing to both the area adjacent to the southeastern corner of the polygon and the area adjacent to the southwestern corner of the polygon when considering a gear displacement of up to 50 miles.

The results of the sturgeon bycatch reduction analysis indicate that Alternative 2 would reduce sturgeon bycatch by 13.3% or 4.2% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch should also result in a reduction in sturgeon bycatch mortality given that fewer fish would interact with gillnet gear and, therefore, be at risk of dying in the gear. However, this could be offset if shifts in effort result in longer soak times. If that were to occur, then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, at times when the closure is not in effect is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch. Reducing the capture of Atlantic sturgeon will also reduce sturgeon bycatch mortality resulting from capture in gillnet gear, particularly when soak time for the gear exceeds 16 hours.

Each of the sturgeon bycatch hotspot polygons overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from April 1-May 31 and December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from May 1-May 31 and October 15-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the Northern Mudhole Management Area from January 1-February 14 under the HPTRP requirements, and from May 1-May 31 and October 15-December 31 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

The distribution of the ESA-listed sea turtles overlaps with the sturgeon bycatch hotspot polygons from at least May through October and possibly from April through November depending on water temperature and sea turtle migrations to the Mid-Atlantic from Virginia and north. Therefore, the SNE closure for December 1-December 31, the NJ closure for October 15-December 31 and the closure of the DE/MD/VA closure areas from November-March 31 will have little to no effects to ESA-listed sea turtles. A reduction in gillnet gear in the closure areas in May would reduce the negative impacts of the monkfish and spiny dogfish fisheries as they currently operate by reducing the amount of gillnet gear in the water. The use of low-profile gillnet gear in the NJ sturgeon bycatch hotspot polygon at times of the year when sea turtles are likely to be present is unlikely to negatively affect sea turtles because lowering the profile of the gear should help to reduce sea turtle interactions. However, the extent to which low-profile gillnet gear will benefit sea turtles is unknown.

The distribution of large whales overlap with the sturgeon bycatch hotspot polygons at all times of the year. In general, any reduction in gillnet effort benefits large whales given their risk of entanglement in this gear type. Therefore, Alternative 2 may benefit large whales by reducing the risk of entanglement in gillnet gear due to the relatively small coastwide reduction in gillnet gear. However, most of the SNE sturgeon bycatch hotspot polygon overlaps with the area where the ALWTRP requirements for Northeast Gillnet waters apply year-round, and the NJ and the DE/MD/VA polygons overlap with the area where the ALWRP requirements for Mid/South Atlantic Gillnet waters apply from September 31-May 1. It is likely that Alternative 2 is only slightly less negative than Alternative 1 because the gillnet gear removed as a result of Alternative 2 should already have been following the ALWTRP requirements. The shifts in gillnet gear predicted by the DST are unlikely to change the risk of interaction with large whales with one exception. Shifts in effort to the area adjacent to the southeastern boundary of the SNE polygon would potentially shift spring and winter gillnet effort into the southern New England habitat of North Atlantic right whales that was recently described by O'Brien et al. (2022) (Figure 36). Given the species dire status, shifting gillnet effort into areas where North Atlantic right whales aggregate would potentially increase the negative impacts to this species despite the ALWTRP requirements currently in place to reduce the likelihood of a right whale entanglement or the severity of an entanglement in gillnet gear.

The distribution of the MMPA species listed in Table 7 overlap with the sturgeon bycatch hotspot polygons. The extent of overlap varies depending on the species and its temporal presence in Southern New England and the Mid-Atlantic. For example, harbor seals, grey seals, harp seals, and hooded seals range widely but primarily occur within New England waters. PBR levels have not been exceeded for any of these pinniped stocks. Therefore, the reduction in gillnet effort resulting from Alternative 2 would, at

best, have a slight positive impact for these pinnipeds. Alternative 2 would not add to the negative impacts already experienced by pinnipeds because of the monkfish fishery and the spiny dogfish fishery. Similarly, for small cetaceans for which PBR levels have not been exceeded, Alternative 2 would not add to the negative impacts and may, depending on the overlap in distribution with the sturgeon bycatch hotspot polygons, have a slightly positive impact compared to the current operating conditions. Similarly, Alternative 2 would not add to the negative impacts for the offshore, Northern, and Southern Migratory coastal stocks of Common bottlenose dolphins and may provide some benefit from the reduction in gillnet effort. However, we anticipate that any benefit would be limited given the relatively small coastwide reduction in gillnet gear, and the existing BDTRP requirements for gillnet gear.

Alternative 2 will be negative for all ESA-listed species. However, Alternative 2 is less negative for Atlantic sturgeon, sea turtles, and large whales except Northern right whales, compared to Alternatives 1, 4, and 5. The impact of Alternative 2 for large whales, including Northern right whales, is expected to be the same as Alternative 3. Alternative 2 is likely to be slightly less negative for MMPA species that have exceeded PBR and slightly more positive for MMPA species that have not exceeded PBR compared to Alternatives 1, 3, 4, and 5. The closures of the NJ polygon and the DE/MA/VA polygons to gillnet gear fished in the spiny dogfish fishery would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for their respective time periods. However, the prohibitions on overnight soaks under Alternatives 3, 4, and 5 would likewise eliminate the likelihood of sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 2 would afford an additional 10 weeks of sturgeon bycatch mortality reduction compared to Alternative 3, an additional 14 weeks compared to Alternative 4, and an additional 6 weeks of sturgeon mortality reduction compared to Alternative 5.

6.4.3 Alternative 3 – Intermediate Impact Sturgeon Package

If vessels are willing to travel a maximum of 20 or 50 miles from their original fishing location in the time/area closures described above, modeling (the Decision Support Tool) developed for large whale take reduction suggests that 74% or 18% of the relevant effort in this alternative's closure areas/times would be eliminated (the remainder re-locates), which equates to 7% or 2% of total relevant effort. Relevant effort here is defined as gillnet sets' total soak days from trips landing mostly Monkfish/Skate/Spiny Dogfish/Smooth Dogfish with gillnet mesh larger than 5 inches. The shorter the maximum distance that vessels are able/willing to relocate (only 20 miles versus 50 miles), the more likely effort is eliminated versus re-locating to other areas.

Under Alternative 3, there would be fewer closures of the same areas considered in Alternative 2 but these would be closed during the months with the highest observed sturgeon bycatch (i.e., May and December for the Southern New England Atlantic sturgeon bycatch hotspot polygon, and December for the New Jersey bycatch hotspot polygon). Alternative 3 would also require the use of low-profile gillnet gear in the monkfish fishery when fishing in the New Jersey bycatch hotspot polygon January through November beginning January 1, 2026. Vessels with a federal fishing permit targeting spiny dogfish would be prohibited from soaking gear overnight from 8pm until 5am in the New Jersey bycatch hotspot polygon during May 1- May 31.

The results of the sturgeon bycatch reduction analysis indicate that Alternative 3 would reduce sturgeon bycatch by 10.6% or 3.2% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch should also reduce sturgeon bycatch mortality, given that fewer fish would interact with gillnet gear and be at risk of dying in the gear. However, this could be offset if shifts in effort result in longer soak times. If that were to occur,

then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, for all months except December is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch. The overnight soak prohibition from May 1- May 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ bycatch hotspot polygon is likewise expected to reduce the amount of sturgeon bycatch although the extent of bycatch reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 47). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery.

Each of the sturgeon bycatch hotspot polygons overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from May 1-May 31 and December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from May 1-May 31 and December 1-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the Northern Mudhole Management Area from January 1- February 14 under the HPTRP requirements, and from November 1-December 31 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

Except the May 1-May 31 closure for the SNE sturgeon bycatch hotspot polygon, none of the Alternative 3 closures would occur when sea turtles are present in the Mid-Atlantic. The use of low-profile gillnet gear in the NJ sturgeon bycatch hotspot polygon at times of the year when sea turtles are likely to be present is unlikely to negatively impact sea turtles because lowering the profile of the gear should help to reduce sea turtle interactions. However, the extent to which low-profile gillnet gear will benefit sea turtles is unknown. The prohibition on overnight soaks in the spiny dogfish fishery in the NJ polygon from May 1-May 31 would occur when sea turtles were present in these waters and would benefit sea turtles by reducing the likelihood of interactions with gillnet gear and the likelihood of mortality for sea turtles caught in the gear.

Alternative 3 is likely to have similar impacts for large whales as Alternative 2 because the distribution of large whales overlap with the sturgeon bycatch hotspot polygons at all times of the year. The reduction in gillnet effort is unlikely to be significant for reducing the risk of large whale entanglements in gillnet gear given the relatively small coastwide reduction in gillnet gear and given the existing ALWTRP requirements for gillnet gear. The shifts in gillnet gear predicted by the DST are unlikely to change the risk of interaction with large whales with one exception. Shifts in effort to the area adjacent to the

southeastern boundary of the SNE polygon would potentially shift spring and winter gillnet effort into the southern New England habitat of North Atlantic right whales that was recently described by O'Brien et al. (2022) (Figure 36). Given the species dire status, shifting gillnet effort into areas where North Atlantic right whales aggregate would potentially increase the negative impacts to this species despite the ALWTRP requirements currently in place for gillnet gear.

The distribution of the MMPA species listed in Table 7 overlap with the sturgeon bycatch hotspot polygons. The extent of overlap varies depending on the species and its temporal presence in Southern New England and the Mid-Atlantic. For example, harbor seals, grey seals, harp seals, and hooded seals range widely but primarily occur within New England waters. PBR levels have not been exceeded for any of these pinniped stocks. Therefore, the reduction in gillnet effort resulting from Alternative 2 would, at best, have a slight positive impact for these pinnipeds. Alternative 2 would not add to the negative impacts already experienced by pinnipeds because of the monkfish fishery and the spiny dogfish fishery. Similarly, for small cetaceans for which PBR levels have not been exceeded, Alternative 2 would not add to the negative impacts and may, depending on the overlap in distribution with the sturgeon bycatch hotspot polygons, have a slightly positive impact compared to the current operating conditions. Similarly, Alternative 2 would not add to the negative impacts for the offshore, Northern, and Southern Migratory coastal stocks of Common bottlenose dolphins and may provide some benefit from the reduction in gillnet effort. However, we anticipate that any benefit would be limited given the relatively small coastwide reduction in gillnet gear, and the existing BDTRP requirements for gillnet gear.

Alternative 3 will be negative for all ESA-listed species. However, for Atlantic sturgeon, Alternative 3 is less negative compared to alternatives 1 and 5, and slightly less negative than Alternative 4. In addition, Alternative 3 is slightly more negative or equally negative compared to Alternative 2 given the relatively small difference in the percentage of sturgeon bycatch reduction suggested by the preliminary analysis, the uncertainty for the extent of effort shifts and the distribution of Atlantic sturgeon, and the positive benefit of reducing sturgeon bycatch and bycatch mortality in the monkfish and spiny dogfish fisheries within the NJ polygon year-round. In particular, Alternative 3 would effectively eliminate sturgeon bycatch mortality in the NJ sturgeon bycatch hotspot polygon for the spiny dogfish fishery in the month of May because of the prohibition on overnight soaks, and from November 1-December 31 because of the closure. Therefore, when looking at the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 3 would afford an additional 4 weeks of sturgeon bycatch mortality reduction compared to Alternative 4 but fewer weeks of protection compared to Alternative 2 and to Alternative 5.

For the spiny dogfish component of the alternative, Alternative 3 will have a similar impact for reducing Atlantic sturgeon bycatch mortality in the New Jersey polygon as Alternative 2 and Alternative 4. Alternative 3 is likely to be less negative than Alternatives 1, 4, and 5 for sea turtles but more negative than Alternative 2. For large whales, the impact of Alternative 3 is very similar to the impacts of Alternative 2, including potential negative impacts to North Atlantic right whales because of shifting more gillnet effort into their Southern New England habitat. With the exception of Northern right whales, Alternative 3 is less negative for large whales compared to alternatives 1, 4, and 5. Alternative 3 is likely to be slightly less negative for MMPA species that have exceeded PBR and slightly more positive for MMPA species that have not exceeded PBR compared to Alternatives 1, 4, and 5. However, compared to Alternative 2, Alternative 3 is likely slightly more negative for MMPA species that have exceeded PBR and slightly less positive for MMPA species that have not exceeded PBR.

Figure 39. Observed Atlantic sturgeon caught in gillnet gear \geq 5- <7-inch mesh and <5-inch mesh with spiny dogfish as the target species (sturgeon condition as alive, dead, or unknown) for 2017-2019 and 2021-2022. Data source: Observer data pulled Jan. 2024.

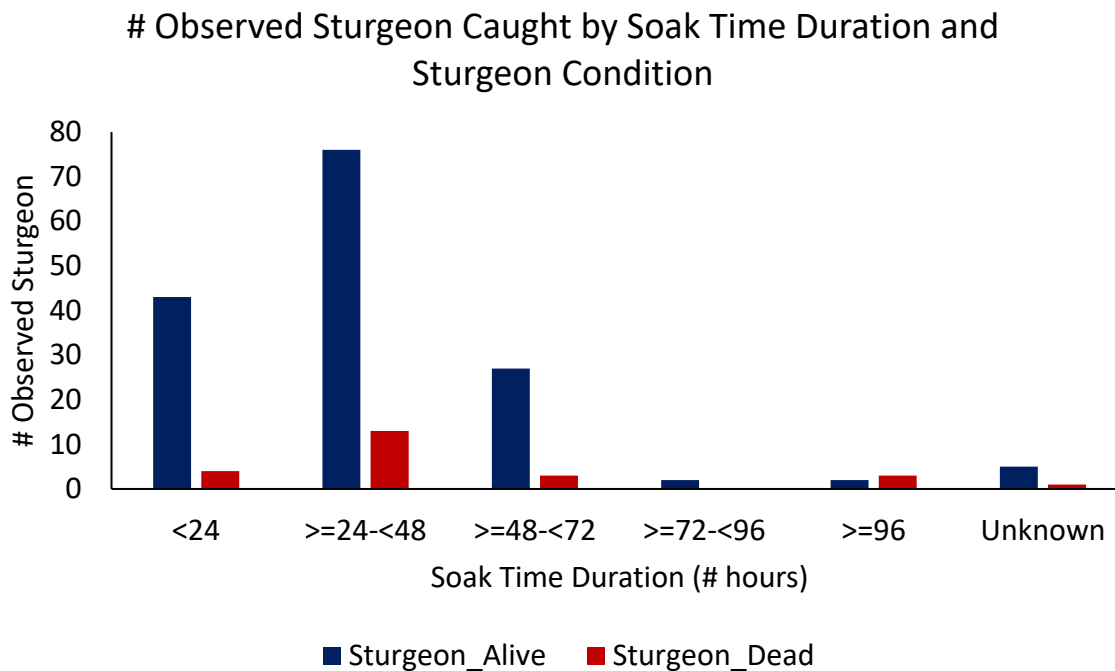


Table 47. Number of sturgeon caught alive and dead based on soak time duration in gillnet gear \geq 5- <7-inch mesh and <5-inch mesh with spiny dogfish as the target species. Data source: observer data pulled Jan. 2024.

Soak Time Duration	# Sturgeon Caught Alive	# Sturgeon Caught Dead	Total # of Sturgeon Caught	% Dead Sturgeon
<24	43	4	47	9%
\geq 24	112	20	132	15%

6.4.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

If vessels are willing to travel a maximum of 20 or 50 miles from their original fishing location in the time/area closures described above, modeling (the Decision Support Tool) developed for large whale take reduction suggests that 79% or 37% of the relevant effort in this alternative’s closure areas/times would be eliminated (the remainder re-locates), which equates to 3% or 1% of total relevant effort. Relevant effort here is defined as gillnet sets’ total soak days from trips landing mostly Monkfish/Skate/Spiny Dogfish/Smooth Dogfish with gillnet mesh larger than 5 inches. The shorter the maximum distance that vessels are able/willing to relocate (only 20 miles versus 50 miles), the more likely effort is eliminated versus re-locating to other areas.

Under Alternative 4, only the most targeted time/area closures and gear restrictions would be implemented in the Atlantic sturgeon bycatch hotspot areas. The results of the sturgeon bycatch reduction analysis indicate that Alternative 4 would reduce sturgeon bycatch by 4.1% or 1.9% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the

sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch should also result in a reduction in sturgeon bycatch mortality given that fewer fish would interact with gillnet gear and, therefore, be at risk of dying in the gear. However, this could be offset if shifts in effort result in longer soak times. If that were to occur, then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, for the month of December is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch. However, the extent of sturgeon bycatch reduction is highly uncertain given the limited period in which low-profile gear would be required and whether it would be set in areas within the polygon that overlapped with Atlantic sturgeon distribution.

The overnight soak prohibition from May 1- May 31 and from December 1-December 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon is expected to reduce the amount of sturgeon bycatch although the extent of the reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 47). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery.

Each of the sturgeon bycatch hotspot polygons under Alternative 4 overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from November 1-November 30 and, if not using low-profile gillnet gear, also December 1-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the Northern Mudhole Management Area from January 1-February 14 under the HPTRP requirements, and from November 1-November 30 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

With the exception of the May 1-May 31 prohibition on overnight soaks for vessels with a federal permit targeting spiny dogfish, none of the Alternative 4 measures would occur when sea turtles were present in the Mid-Atlantic. The prohibition on overnight soaks in the spiny dogfish fishery in the NJ polygon from May 1-May 31 would occur when sea turtles were present in these waters and would benefit sea turtles by reducing the likelihood of interactions with gillnet gear and the likelihood of mortality for sea turtles caught in the gear.

Alternative 4 is likely to have similar impacts for large whales as Alternative 2 and 3 because the distribution of large whales overlap with the sturgeon bycatch hotspot polygons at all times of the year. The reduction in gillnet effort is unlikely to be significant for reducing the risk of large whale entanglements in gillnet gear given the relatively small coastwide reduction in gillnet gear, and given the existing ALWTRP requirements for gillnet gear. The shifts in gillnet gear predicted by the DST are unlikely to change the risk of interaction with large whales with one exception. Shifts in effort to the area adjacent to the southeastern boundary of the SNE polygon would potentially shift winter gillnet effort in December into the southern New England habitat of North Atlantic right whales that was recently described by O'Brien et al. (2022) (Figure 36). Given the species dire status, shifting gillnet effort into areas where North Atlantic right whales aggregate would potentially increase the negative impacts to this species despite the ALWTRP requirements currently in place for gillnet gear.

The distribution of the MMPA species listed in Table 7 overlap with the sturgeon bycatch hotspot polygons. The extent of overlap varies depending on the species and its temporal presence in Southern New England and the Mid-Atlantic. For example, harbor seals, grey seals, harp seals, and hooded seals range widely but primarily occur within New England waters. PBR levels have not been exceeded for any of these pinniped stocks. Therefore, the reduction in gillnet effort resulting from Alternative 2 would, at best, have a slight positive impact for these pinnipeds. Alternative 2 would not add to the negative impacts already experienced by pinnipeds as a result of the monkfish fishery and the spiny dogfish fishery. Similarly, for small cetaceans for which PBR levels have not been exceeded, Alternative 2 would not add to the negative impacts and may, depending on the overlap in distribution with the sturgeon bycatch hotspot polygons, have a slightly positive impact compared to the current operating conditions. Similarly, Alternative 2 would not add to the negative impacts for the offshore, Northern, and Southern Migratory coastal stocks of Common bottlenose dolphins and may provide some benefit from the reduction in gillnet effort. However, we anticipate that any benefit would be limited given the relatively small coastwide reduction in gillnet gear, and the existing BDTRP requirements for gillnet gear.

Alternative 4 would be negative given that interactions between gillnet gear and Atlantic sturgeon would still occur. For all of the ESA-listed species, with the exception of Northern right whales, Alternative 4 would be slightly less negative compared to Alternatives 1 and 5 but more negative than Alternatives 2 or 3. However, Alternative 4 would effectively eliminate sturgeon bycatch mortality in the NJ sturgeon bycatch hotspot polygon for the spiny dogfish fishery in the months of May and December because of the prohibition on overnight soaks. When looking at the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 4 would afford approximately 20 weeks of sturgeon bycatch mortality reduction in the spiny dogfish which is the fewer than under Alternatives 2, 3, and 5. Considering this and the measures for the monkfish fishery, Alternative 4 will have less of an impact for reducing Atlantic sturgeon bycatch mortality in the New Jersey polygon as Alternative 2 and Alternative 3. Alternative 4 has the potential to be slightly more negative compared to Alternatives 1 and 5 for Northern right whales because of shifting more gillnet effort into the Southern New England habitat used by North Atlantic right whales. Alternative 4 is likely slightly more negative for MMPA species compared to Alternatives 2 and 3, and likely has the same level of impacts for MMPA-protected species as Alternatives 1 and 5.

6.4.5 Alternative 5 – Gear-Only Sturgeon Package

The use of low-profile gillnet gear year-round in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, is expected to reduce the number of sturgeon incidentally captured in the gear. A reduction in sturgeon caught should also result in a reduction in sturgeon bycatch mortality. The prohibition on overnight soaks for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon in the months of May and November, and a prohibition on overnight soaks in the DE/MD/VA bycatch hotspot polygons from November through March is similarly likely to benefit Atlantic sturgeon by reducing the amount of time that the gear could interact with sturgeon

although the extent of the reduction is uncertain. Perhaps more importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The overnight soak prohibition from May 1- May 31, November 1-November 30, and from December 1-December 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon as well as the overnight soak prohibition in the DE/MD/VA polygons from November 1-March 31 is expected to reduce the amount of sturgeon bycatch although the extent of the reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 47, Figure 39). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery.

The prohibition on overnight soaks in the NJ sturgeon bycatch hotspot polygon for vessels with a federal fishing permit targeting spiny dogfish would only overlap with the distribution of sea turtles in from May 1-May 31. Low profile gillnet gear is unlikely to have any added negative impact for sea turtles but there is no information for whether the gear would benefit sea turtles by reducing sea turtle interactions with gillnet gear.

Alternative 5 would not change the impacts to ESA-listed large whales compared to how the fisheries currently operate. The current ALWTRP measures for gillnet gear would still apply for gillnet gear fished in the monkfish and spiny dogfish fisheries. Similarly, impacts to MMPA protected species would be unchanged from how the fisheries currently operate.

Alternative 5 will be negative for all ESA-listed species. It will be slightly less negative for Atlantic sturgeon compared to Alternative 1. The prohibition on overnight soaks in the spiny dogfish fishery within the NJ polygon and the DE/MA/VA polygons under Alternative 5 would eliminate sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 5 would afford an additional 4 weeks of sturgeon bycatch mortality reduction compared to Alternative 3, and an additional 8 weeks compared to Alternative 4. Alternative 5 would afford 6 fewer weeks of sturgeon bycatch mortality reduction compared to Alternative 2 for the spiny dogfish fishery. The requirement to use low-profile gillnet gear in the NJ sturgeon bycatch hotspot polygon year-round has the potential to reduce sturgeon bycatch to a greater extent than what would be achieved with the NJ polygon closures under Alternatives 2, 3, and 4. However, the low-profile gillnet gear with a 0.81 mm twine size is still experimental and will also require a change to the HPTRP regulations for it to be used with large-mesh gillnet gear (i.e., >7-inch mesh). Therefore, given the uncertainty, Alternative 5 is as negative or more negative for Atlantic sturgeon compared to Alternatives 2, 3, and 4.

The sub-alternatives would likely result in very similar impacts as the base case for Alternative 5 (and similar relative to other alternatives) because while on one hand they would not remove gear during the night (more negative than the base case) the 5-inch exempted mesh appears to have a lower take rate than larger mesh (see discussion in Section 4), and vessels may adopt more 5-inch mesh instead of switching nets (less negative than the base case).

For sea turtles, Alternative 5 would be very slightly less negative than Alternative 1, more negative than alternatives 2 or 3, and the same level of impact as Alternative 4. Alternative 5 has the same level of negative impacts as Alternative 1 for all large whales and is more negative for large whales compared to Alternatives 2, 3, and 4 with the possible exception of North Atlantic right whales. Alternative 5 is likely slightly more negative for MMPA species compared to Alternatives 2 and 3, and likely has the same level of impacts for MMPA-protected species as Alternatives 1 and 4.

6.5 IMPACTS ON PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

6.5.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 1 is negligible relative to Alternatives 2, 3, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon.

The impacts of Alternative 2 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 2 is negligible relative to Alternatives 1, 3, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery, other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications

(low-profile gillnet gear) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.3 Alternative 3 – Intermediate Impact Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

The impacts of Alternative 3 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 3 is negligible relative to Alternatives 1, 2, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7

Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon.

The impacts of Alternative 4 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 4 is negligible relative to Alternatives 1, 2, 3, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects

on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.5 Alternative 5 – Gear-Only Sturgeon Package

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area.

The impacts of Alternative 5 including Sub-alternatives 5A and 5B on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 5 is negligible relative to Alternatives 1, 2, 3, and 4. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.6 IMPACTS ON HUMAN COMMUNITIES

6.6.0 Introduction and Baseline Conditions

Directed recreational fishing for spiny dogfish or monkfish is very low, and no measures in this action would affect recreational fishing, so the focus in this section is on commercial fishing impacts. Where possible, effects on ex-vessel revenues are described. Although ex-vessel revenues are a useful indicator of relative importance for various fisheries and impacts from management measures, we note that the full socio-economic importance of fisheries comes from the overall economic activity, jobs, and personal/community vitality that are supported by the fisheries and their ex-vessel revenues. In fact, when related impact multipliers are considered, the actual economic impact is generally several times larger than mere ex-vessel revenues. The social impacts of regulations relate to changes such as demographics, employment, fishery dependence, safety, attitudes, equity, cultural values, and the well-being of persons, families, and fishing communities (Burdge 1998; NMFS 2007). While difficult to measure, we expect positive social impacts to accompany measures that increase ex-vessel revenues and negative social impacts to accompany measures that decrease ex-vessel revenues. The above concepts apply to each alternative and are not repeated hereafter. The discussion below focuses on changes in catch, but for any of the alternatives that involve low-profile gear (NJ polygon) or mesh requirements (VA exemptions), there is also a cost of acquiring that gear and that is not repeated for each relevant alternative. The smaller twine may also lead to faster gear repair/ replacement cycles. Gear restrictions for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon would be implemented on January 1, 2026 to allow provisioning of gear and hopefully allow fishermen to plan the requirements into their gear replacement cycle to minimize costs.

Spiny Dogfish Fishery Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of spiny dogfish have been slightly positive in recent years. The justification for this conclusion includes: Due to the year-to-year variation in catch and effort in the fishery, it is difficult to fully quantify human community impacts but the current fishery supports a number of vessels (though declining in the last decade), as described in Section 5.5, and provides a variety of jobs related directly to fishing and also in associated support services. 79-87 federally-permitted vessels landed over 10,000 pounds of spiny dogfish (measured in live pounds) in the 2020-2022 fishing years, with total spiny dogfish landings ex-vessel revenues averaging \$2.5 million (range \$2.3-\$2.7 million). These ex-vessel amounts are smaller than many other Council-managed species, leading to the “slight” qualifier for positive noted above (also considering the declining participation). For an individual vessel or dealer/processor however, spiny dogfish may be a crucial part of their annual operations. Appendix D describes average 2020-2022 monthly spiny dogfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

Monkfish Fishery Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of monkfish have been moderate positive in recent years. The justification for this conclusion includes: Due to the year-to-year variation in catch and effort in the fishery, it is difficult to fully quantify human community impacts but the current fishery supports a number of vessels as described in Section 5.5, and provides a variety of jobs related directly to fishing and also in associated support services. 90-108 federally-permitted vessels landed over 10,000 pounds of monkfish (measured in landed pounds) in the 2020-2022 fishing years, with total monkfish landings ex-vessel revenues averaging \$10.7 million (range \$8.6-\$12.2 million). The “moderate” qualifier for positive is used given these revenues were substantially lower than the preceding decade. For an individual vessel

or dealer/processor however, monkfish may be a crucial part of their annual operations. As described in Section 5.5, skates, groundfish, and other fish make up a substantial portion of revenues on trips using monkfish DAS (39% in the 2021 fishing year), so the ability to target monkfish also likely facilitates these other revenues as well. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips. Appendix D describes average 2020-2022 monthly monkfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

Sturgeon Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of sturgeon have been high negative in recent years. The justification for this conclusion includes: In the Endangered Species Act of 1973, the U.S. Congress declared that extinct species and/or species in danger of extinction: “are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” These values are diminished and/or at risk for any endangered species. Landings value has also been lost. Sturgeon supported commercial landings generally between 40 metric tons (MT) (about 88,000 pounds) and 80 MT (about 176,000 pounds) from 1950 through the early 1990s, as well as landings as high as 3,000 MT (about 6.6 million pounds) for several years in the late 1800s.

6.6.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

No action should maintain the socioeconomic baselines for these fisheries/resources described above – slight positive for spiny dogfish and moderate positive for monkfish as the fisheries should continue to generate ex-vessel revenues and support relevant communities. Given the impacts discussed below for the action alternatives, this would be more positive than any of the action alternatives.

Given the following discussion, socioeconomic impacts from Alternative 1 related to the sturgeon fishery/resource would likely still be high negative, and slightly more negative versus any of the other action alternatives given they would likely reduce bycatch and/or bycatch mortality to some degree.

Any population improvements could lead to socioeconomic benefits related to society’s value of avoiding sturgeon's extinction as well as any potential future fishery value. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that “anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates.” The assessment also noted that “Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity,” concluding “that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation.” Without a traditional assessment model and reference points (which would require “significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc.”), it is not possible to quantify the population effects of Alternative 1. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact differences of no action compared to any action alternatives is likely slight.

6.6.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon whenever it is not closed.

Monkfish Socioeconomic Impacts – Alternative 2

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 2 related to the monkfish fishery/resource are likely high negative, and more negative than Alternatives 1, 3, 4, or 5. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 2 relative to monkfish, the Southern New England area closure would be for April, May, and December. Likewise, the New Jersey closure areas would be for May, the latter half of October, November, and December. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers. The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 2

Given the following discussion, socioeconomic impacts from Alternative 2 related to the spiny dogfish fishery/resource are likely high negative, and more negative than Alternatives 1, 3, 4, or 5.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 2 relative to spiny dogfish, New Jersey's area closure would be for May, the second half of October starting October 15, November, and December. Likewise, the DE/MD/VA closure areas would be for November, December, January, February, and March. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

Sturgeon Socioeconomic Impacts – Alternative 2

Given the following discussion, socioeconomic impacts from Alternative 2 related to the sturgeon fishery/resource would likely still be high negative, slightly less negative versus no-action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction as well as any potential future fishery value. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 2. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

6.6.3 Alternative 3 – Intermediate Impact Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon when it is not closed and overnight soak time prohibitions for the spiny dogfish fishery in the New Jersey bycatch hotspot polygon.

Monkfish Socioeconomic Impacts – Alternative 3

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 3 related to the monkfish fishery/resource are likely high negative, and more negative than Alternatives 1, 4, or 5 and less negative than Alternative 2. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 3 relative to monkfish, the Southern New England area closure would be for May and December. Likewise, the New Jersey closure areas would be for December. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers. The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 3

Given the following discussion, socioeconomic impacts from Alternative 3 related to the spiny dogfish fishery/resource are likely high negative, and more negative than Alternatives 1, 4, or 5 but less negative than Alternative 2.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 3 relative to spiny dogfish, New Jersey's area closure would be for November, and December. Likewise, the DE/MD/VA closure areas would be for December, January, and February. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

The Councils received public input that the overnight soak prohibitions in Alternative 3 (effective in May) for spiny dogfish may be feasible for New Jersey given some fishery participants already mostly fish without overnight soaks.

Sturgeon Socioeconomic Impacts – Alternative 3

Given the following discussion, socioeconomic impacts from Alternative 3 related to the sturgeon fishery/resource would likely still be high negative, slightly less negative versus no-action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction as well as any potential future fishery value. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 3. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

6.6.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and overnight soak time prohibitions for the spiny dogfish fishery in the New Jersey bycatch hotspot polygon.

Monkfish Socioeconomic Impacts – Alternative 4

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 4 related to the monkfish fishery/resource are likely slight negative, and more negative than Alternatives 1 or 5 but less negative than Alternatives 2-3. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 4 relative to monkfish, the Southern New England area closure would be for December. Likewise, the New Jersey closure areas would be for November. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers. The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 4

Given the following discussion, socioeconomic impacts from Alternative 4 related to the spiny dogfish fishery/resource are likely high negative, and more negative than Alternatives 1 or 5 but less negative than Alternatives 2-3.

In Appendix D, we considered which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability.

For Alternative 4 relative to spiny dogfish, New Jersey’s area closure would be for November. Likewise, the DE/MD/VA closure areas would be for December and January. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

The Councils received public input that the overnight soak prohibitions in Alternative 4 (effective in December and May) for spiny dogfish may be feasible for New Jersey given some fishery participants already mostly fish without overnight soaks.

Sturgeon Socioeconomic Impacts – Alternative 4

Given the following discussion, socioeconomic impacts from Alternative 4 related to the sturgeon fishery/resource would likely still be high negative, slightly less negative versus no-action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society’s value of avoiding sturgeon's extinction as well as any potential future fishery value. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that “anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates.” The assessment also noted that “Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity,” concluding “that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation.” Without a traditional assessment model and reference points (which would require “significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc.”), it is not possible to quantify the population effects of Alternative 4. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

6.6.5 Alternative 5 – Gear-Only Sturgeon Package

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a year-round requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and overnight soak time prohibitions in New Jersey and DE/MD/VA during parts of the year for spiny dogfish fishing when more sturgeon takes were observed.

Monkfish Socioeconomic Impacts – Alternative 5

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the baseline related to monkfish should be maintained – moderate positive impacts similar to the no action/Alternative 1 and high positive compared to Alternatives 2, 3, and 4.

Spiny dogfish Socioeconomic Impacts – Alternative 5

The Councils have received public input that the New Jersey overnight soak prohibitions in Alternative 5 (effective in May and November) for spiny dogfish may be feasible for New Jersey fishermen given some already mostly fish without overnight soaks. To the degree that New Jersey participants can fish successfully with this gear restriction, the baseline related to dogfish should be maintained – slight positive impacts similar to the no action/Alternative 1 and high positive compared to Alternatives 2, 3, and 4.

The Councils have received public input that the DE/MD/VA overnight soak prohibitions in Alternative 5 (effective in November, December, January, February, and March) for spiny dogfish may not be feasible for MD/VA participants given their standard fishing practices that depend on overnight soaks. To the degree that MD/VA participants cannot fish successfully with this gear restriction there would be negative impacts, potentially highly negative and similar to Alternatives 2, 3, and 4 (and high negative compared to Alternative 1). The Councils have also received input that the Alternative 5 sub-alternatives that exempt gear less than 5.25 inches mesh (i.e. allow 5-inch mesh) would mitigate the negative impacts, possibly resulting in slight positive impacts similar to the no action/Alternative 1 and high positive compared to Alternatives 2, 3, 4, as well as Alternative 5 without the exemption contained in the sub-alternatives.

Sturgeon Socioeconomic Impacts – Alternative 5

Given the following discussion, socioeconomic impacts from Alternative 5 related to the sturgeon fishery/resource would likely still be high negative, slightly less negative versus no-action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction as well as any potential future fishery value. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 5. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

7.0 GLOSSARY

Acceptable Biological Catch (ABC) – A level of a stock or stock complex’s annual catch that accounts for the scientific uncertainty in the estimate of OFL.

Annual Catch Limit (ACL) – The level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures (AMs).

Annual Catch Target (ACT) – An amount of annual catch of a stock or stock complex that is the management target of the fishery.

Adult stage – One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect – Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation – A group of animals or plants occurring together in a particular location or region.

Accountability Measure (AM) – A management control that prevents ACLs from being exceeded, where possible, and correct or mitigate overages if they occur.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure".

Availability – refers to the distribution of fish of different ages or sizes relative to that taken in the fishery.

Benthic community – Benthic means the bottom habitat of the ocean and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. Benthic community refers to those organisms that live in and on the bottom.

Biological Reference Points – specific values for the variables that describe the state of a fishery system which are used to evaluate its status. Reference points are most often specified in terms of fishing mortality rate and/or spawning stock biomass.

Biomass – The total mass of living matter in a unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan 1), Mid-Year, or mean (average during the entire year). Also, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc.). See also spawning stock biomass, exploitable biomass, and mean biomass.

Biota – All the plant and animal life of a region.

Bivalve – A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together, e.g., clams, mussels.

Bottom tending mobile gear – All fishing gear that operates on or near the ocean bottom that is actively worked to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear – All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a

particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

B_{MSY} – the stock biomass that would produce maximum sustainable yield (MSY) when fished at a level equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity.

B_{target} – A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy and was set in the original Monkfish FMP as the median of the 3-yr. running average of the 1965-1981 autumn trawl survey biomass index.

B_{threshold} – 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below B_{threshold}. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. For monkfish, B_{threshold} was specified in Framework 2 as 1/2B_{Target} (see below).

Bycatch – (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity – the level of output a fishing fleet can produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, if all variable inputs are utilized efficiently.

Catch – The total of fish killed in a fishery in a period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment – Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g., within the mud class, silt is coarser than clay.

Continental shelf waters – The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies but is about 200 meters in many regions.

CPUE – Catch per unit effort. This measure includes landings and discards (live and dead), often expressed per hour of fishing time, per day fished, or per day-at-sea.

DAS (day-at-sea) – A day-at-sea is an allocation of time that a vessel may be at-sea on a fishing trip. For vessels with VMS equipment, it is the cumulative time that a vessel is seaward of the VMS demarcation line. For vessels without VMS equipment, it is the cumulative time between when a fisherman calls in to leave port to the time that the fisherman calls in to report that the vessel has returned to port.

Demersal species – Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards – animals returned to sea after being caught; see Bycatch (n.)

Environmental Impact Statement (EIS) – an analysis of the expected impacts of a fishery management plan (or some other proposed federal action) on the environment and on people, initially prepared as a "Draft" (DEIS) for public comment. The Final EIS is referred to as the Final Environmental Impact Statement (FEIS).

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on

a legal text definition and geographical area that are described in the Habitat Omnibus Amendment 2 (NEFMC 2016).

Exclusive Economic Zone (EEZ) – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exempted fisheries – Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitation Rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fathom – A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Fishing Mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. F is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

F_{0.1} – F at which the increase in yield-per-recruit in weight for an increase in a unit-of effort is only 10% of that produced in an unexploited stock; usually considered a conservative target fishing mortality rate.

F_{MSY} – a fishing mortality rate that would produce the maximum sustainable yield from a stock when the stock biomass is at a level capable of producing MSY on a continuing basis.

F_{MAX} – the fishing mortality rate that produces the maximum level of yield per recruit. This is the point beyond which growth overfishing begins.

F_{target} – the fishing mortality that management measures are designed to achieve.

F_{threshold} – 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

FMP (Fishery Management Plan) – a document that describes a fishery and establishes measures to manage it. This document forms the basis for federal regulations for fisheries managed under the Regional Fishery Management Councils. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Individual Fishing Quota (IFQ) – A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Landings – The portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage – One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and

invertebrates. This life stage looks fundamentally different than the juvenile and adult stages and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited access – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation, and the participants remain constant over time (except for attrition).

Limited-access permit – A permit issued to vessels that met certain qualification criteria by a specified date (the "control date").

LPUE – Landings per unit effort. This measure is the same as CPUE but excludes discards.

Maximum sustainable yield (MSY) – the largest average catch that can be taken from a stock under existing environmental conditions.

Mesh selectivity (ogive) – A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter – A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton (mt) – A unit of weight equal to 1,000 kilograms (1kg = 2.2 lb). A metric ton is equivalent to 2,204.6 lb. A thousand metric tons is equivalent to 2.204M lb.

Minimum biomass level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mortality – Noun, either referring to fishing mortality (F) or total mortality (Z).

Multispecies – the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Natural Mortality (M) – a measurement of the rate of fish deaths from all causes other than fishing such as predation, cannibalism, disease, starvation, and pollution; the rate of natural mortality may vary from species to species.

Northeast Shelf Ecosystem – The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Observer – Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act.

Overfishing Limit (OFL) – The annual amount of catch that corresponds to the estimate of the maximum fishing mortality threshold applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Open access – Describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum yield (OY) – the amount of fish which-

(a) will provide the greatest overall benefit to the Nation, particularly with respect to food

production and recreational opportunities, and taking into account the protection of marine ecosystems;

(b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and

(c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished – A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing – A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council; the Council has a Monkfish PDT that meets to discuss the development of this FMP.

Proposed rule – a federal regulation is often published in the Federal Register as a proposed rule with a time for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding plan – a plan designed to increase stock biomass to the BMSY level within no more than ten years (or 10 years plus one mean generation period) when a stock has been declared overfished.

Recruitment overfishing – fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Recruitment – the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Regulated groundfish species – cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake, and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation – an index of exploitation derived by dividing landings by trawl survey biomass. This variable does not provide an estimate of the proportion of removals from the stock due to fishing but allows for general statements about trends in exploitation.

Sediment – Material deposited by water, wind, or glaciers.

Spawning stock biomass (SSB) – the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Status determination criteria – objective and measurable criteria used to determine if overfishing is occurring or if a stock is in an overfished condition according to the National Standard Guidelines.

Stock assessment – An analysis for determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock.

Stock – A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and

Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Surplus production models – A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include trends in stock biomass, biomass weighted fishing mortality rates, MSY, FMSY, BMSY, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Surplus production – Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). BMSY is often defined as the biomass that maximizes surplus production rate.

Survival rate (S) – Rate of survival expressed as the fraction of a cohort surviving the period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship $A=1-S$.

Survival ratio (R/SSB) – an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC – Total allowable catch is equivalent to the ICL.

TAL – Total allowable landings.

Ten-minute- “squares” of latitude and longitude (TMS) – A measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is about 70-80 square nautical miles at 40° of latitude. This is the spatial area that EFH designations, biomass data, and some of the effort data have been classified or grouped for analysis.

Total mortality – The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to $F + M$) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

8.0 REFERENCES

- Altenritter M.N., G.B. Zydlewski, M.T. Kinnison & G.S. Wippelhauser (2017). Atlantic sturgeon use of the Penobscot River and marine movements within and beyond the Gulf of Maine. *Marine and Coastal Fisheries*. 9: 216-230.
- ASMFC (2007). *Special Report to the Atlantic Sturgeon Management Board: Estimation of Atlantic Sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic*. Alexandria, VA: Atlantic States Marine Fisheries Commission. 95 p.
- ASMFC (2017a). *2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report*. Arlington, VA: Atlantic States Marine Fisheries Commission. 456 p.
- ASMFC (2017b). *Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report*. Arlington, Virginia p. <https://www.asmfc.org/species/atlantic-sturgeon#stock>.
- ASSRT (2007). *Status Review of Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus) - Report of the Atlantic Sturgeon Status Review Team to NMFS*. Gloucester, MA: U.S. Department of Commerce. 174 p.
- AWEA (2020). *U.S. Offshore Wind Power Economic Impact Assessment*. American Wind Energy Association. 19 p. https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA_Offshore-Wind-Economic-ImpactsV3.pdf.
- Bailey H., K.L. Brookes & P.M. Thompson (2014). Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future. *Aquatic Biosystems*. 10(1): 8. <https://doi.org/10.1186/2046-9063-10-8>.
- Bailey H., B. Senior, D. Simmons, J. Rusin, G. Picken & P.M. Thompson (2010). Assessing underwater noise levels during pile-driving at an offshore windfarm and its potential effects on marine mammals. *Marine Pollution Bulletin*. 60(6): 888-897. <http://www.sciencedirect.com/science/article/pii/S0025326X10000044>.
- Baum E.T. (1997). *Maine Atlantic Salmon - A National Treasure*. Hermon, ME: Atlantic Salmon Unlimited. p.
- Baumgartner M.F., N.S.J. Lysiak, C. Schuman, J. Urban-Rich & F.W. Wenzel (2011). Diel vertical migration behavior of *Calanus finmarchicus* and its influence on right and sei whale occurrence. *Marine Ecology Progress Series*. 423: 167-184.
- Baumgartner M.F. & B.R. Mate (2005). Summer and fall habitat of North Atlantic right whales (*Eubalaena glacialis*) inferred from satellite telemetry. *Canadian Journal of Fisheries and Aquatic Sciences*. 62(3): 527-543. <https://cdnsiencepub.com/doi/abs/10.1139/f04-238>
- Baumgartner M.F., C.A. Mayo & R.D. Kenney (2007). Enormous carnivores, microscopic food and a restaurant that's hard to find. In: *The Urban Whale: North Atlantic Right Whales at the Crossroads*. Cambridge, MA: Harvard University Press, p. 138-171.
- Bergström L., L. Kautsky, T. Malm, R. Rosenberg, M. Wahlberg, N. Åstrand Capetillo & D. Wilhelmsson (2014). Effects of offshore wind farms on marine wildlife—a generalized impact assessment. *Environmental Research Letters*. 9(3): 034012. <http://dx.doi.org/10.1088/1748-9326/9/3/034012>.
- Bergström L., F. Sundqvist & U. Bergström (2013). Effects of an offshore wind farm on temporal and spatial patterns in the demersal fish community. *Marine Ecology Progress Series* 485: 199-210.
- Bort J., S.M. Van Parijs, P.T. Stevick, E. Summers & S. Todd (2015). North Atlantic right whale *Eubalaena glacialis* vocalization patterns in the central Gulf of Maine from October 2009 through October 2010. *Endangered Species Research*. 26(3): 271-280. <https://www.int-res.com/abstracts/esr/v26/n3/p271-280/>.
- Braun-McNeill J. & S.P. Epperly (2002). Spatial and temporal distribution of sea turtles in the Western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). *Marine Fisheries Review*. 64(4): 50-56.

- Braun-McNeill J., S.P. Epperly, L. Avens, M.L. Snover & J.C. Taylor (2008). Life stage duration and variation in growth rates of loggerhead (*Caretta caretta*) sea turtles from the western North Atlantic. *Herpetological Conservation and Biology*. 3(2): 273-281.
- Braun J. & S.P. Epperly (1996). Aerial surveys for sea turtles in southern Georgia waters, June 1991. *Gulf of Mexico Science*. 1996(1): 39-44.
- Breece M.W., D.A. Fox, K.J. Dunton, M.G. Frisk, A. Jordaan & M.J. Oliver (2016). Dynamic seascapes predict the marine occurrence of an endangered species: Atlantic Sturgeon *Acipenser oxyrinchus oxyrinchus*. *Methods in Ecology and Evolution*. 7(6): 725-733. <https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.12532>.
- Breece M.W., D.A. Fox, D.E. Haulsee, I.I. Wirgin & M.J. Oliver (2017). Satellite driven distribution models of endangered Atlantic sturgeon occurrence in the mid-Atlantic Bight. *ICES Journal of Marine Science*. 75(2): 562-571. <https://doi.org/10.1093/icesjms/fsx187>.
- Breece M.W., D.A. Fox & M.J. Oliver (2018). Environmental drivers of adult Atlantic sturgeon movement and residency in the Delaware Bay. *Marine and Coastal Fisheries*. 10(2): 269-280. <https://afspubs.onlinelibrary.wiley.com/doi/abs/10.1002/mcf2.10025>.
- Brown D.M., J. Robbins, P.L. Sieswerda, R. Schoelkopf & E.C.M. Parsons (2018). Humpback whale (*Megaptera novaeangliae*) sightings in the New York-New Jersey Harbor Estuary. *Marine Mammal Science*. 34(1): 250-257. <https://onlinelibrary.wiley.com/doi/abs/10.1111/mms.12450>.
- Brown M.W., O.C. Nichols, M.K. Marx & J.N. Ciano (2002). *Surveillance of North Atlantic Right Whales in Cape Cod Bay and Adjacent Waters - Final Report to the Division of Marine Fisheries, Commonwealth of Massachusetts*. Provincetown, MA: Provincetown Center for Coastal Studies. 29 p.
- Burdge R.J. (1998). *A Conceptual Approach to Social Impact Assessment*. Revised ed. Madison, WI: Social Ecology Press. 284 p.
- Caillouet C.W., Jr., S.W. Raborn, D.J. Shaver, N.F. Putman, B.J. Gallaway & K.L. Mansfield (2018). Did declining carrying capacity for the Kemp's ridley sea turtle population within the Gulf of Mexico contribute to the nesting setback in 2010–2017? *Chelonian Conservation and Biology*. 17(1): 123-133. <https://doi.org/10.2744/CCB-1283.1> <https://bioone.org/journals/chelonian-conservation-and-biology/volume-17/issue-1/CCB-1283.1/Did-Declining-Carrying-Capacity-for-the-Kemps-Ridley-Sea-Turtle/10.2744/CCB-1283.1.pdf>.
- Carlson A.E., E.R. Hoffmayer, C.A. Tribuzio & J.A. Sulikowski (2014). The use of satellite tags to redefine movement patterns of spiny dogfish (*Squalus acanthias*) along the U.S. East Coast: Implications for fisheries management. *PLoS ONE*. 9(7): e103384. <https://doi.org/10.1371/journal.pone.0103384>.
- CeTAP (1982). *Final Report of the Cetacean and Turtle Assessment Program: A Characterization of Marine Mammals and Turtles in the Mid- and North Atlantic Areas of the U.S. Outer Continental Shelf*. Washington, DC: University of Rhode Island. AA511-CT8-48. 568 p.
- Charif R.A., Y. Shiu, C.A. Muirhead, C.W. Clark, S.E. Parks & A.N. Rice (2020). Phenological changes in North Atlantic right whale habitat use in Massachusetts Bay. *Global Change Biology*. 26(2): 734-745. <https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.14867>.
- Chavez-Rosales S., M.C. Lyssikatos & J. Hatch (2017). *Estimates of Cetacean and Pinniped Bycatch in Northeast and Mid-Atlantic Bottom Trawl Fisheries, 2011-2015*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 17-16. 18 p.
- Cholewiak D., D. Palka, S. Chavez-Rosales, G. Davis, E. Josephson, S. Van Parijs & S. Weiss (2018). *Updates on sei whale (Balaenoptera borealis) distribution, abundance estimates, and acoustic occurrence in the western North Atlantic*. Cambridge, UK: International Whaling Commission. Unpublished Scientific Committee meeting document SC/67B/NH07. p.
- Clapham P.J., L.S. Baraff, M.A. Carlson, D.K. Christian, D.K. Mattila, C.A. Mayo, M.A. Murphy & S. Pittman (1993). Seasonal occurrence and annual return of humpback whales, *Megaptera novaeangliae*, in the southern Gulf of Maine. *Canadian Journal of Zoology*. 71: 440-443.

- Clark C.W. & P.J. Clapham (2004). Acoustic monitoring on a humpback whale (*Megaptera novaeangliae*) feeding ground shows continual singing into late spring. *Proceedings of the Royal Society of London Series B: Biological Sciences*. 271(1543): 1051-1057.
<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2004.2699>.
- Cole T.V.N., P.C. Hamilton, A.G. Henry, P. Duley, R.M. Pace III, B.N. White & T. Frasier (2013). Evidence of a North Atlantic right whale *Eubalaena glacialis* mating ground. *Endangered Species Research*. 21(55-64).
- Cole T.V.N. & A.G. Henry (2013). *Serious injury determinations for baleen whale stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2007-2011*. Woods Hole, MA: Do Commerce. NEFSC Reference Document 13-24. 14 p.
- Collette B.B. & G. Klein-MacPhee, eds. (2002). *Bigelow and Schroeder's Fishes of the Gulf of Maine*. Washington, DC: Smithsonian Institution Press. 882 p.
- Collins M.R. & T.I.J. Smith (1997). Distribution of shortnose and Atlantic sturgeons in South Carolina. *North American Journal of Fisheries Management*. 17: 995-1000.
- Conant T.A., P.H. Dutton, T. Eguchi, S.P. Epperly, C.C. Fahy, M.H. Godfrey, S.L. MacPherson, E.E. Possardt, B.A. Schroeder, J.A. Seminoff, et al. (2009). *Loggerhead Sea Turtle (Caretta caretta) 2009 Status Review under the U.S. Endangered Species Act*. Silver Spring, MD: U.S. Department of Commerce. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service. 222 p.
- Dadswell M.J. (2006). A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. *Fisheries*. 31: 218-229.
- Dadswell M.J., B.D. Taubert, T.S. Squires, D. Marchette & J. Buckley (1984). Synopsis of biological data on shortnose sturgeon, *Acipenser brevirostrum*. *LeSuer*. 1818.
- Dannheim J., L. Bergström, S.N.R. Birchenough, R. Brzana, A.R. Boon, J.W.P. Coolen, J.-C. Dauvin, I. De Mesel, J. Derweduwen, A.B. Gill, et al. (2019). Benthic effects of offshore renewables: identification of knowledge gaps and urgently needed research. *ICES Journal of Marine Science*. 77(3): 1092-1108. <https://doi.org/10.1093/icesjms/fsz018>.
- Davis G.E., M.F. Baumgartner, J.M. Bonnell, J. Bell, C. Berchok, J. Bort Thornton, S. Brault, G. Buchanan, R.A. Charif, D. Cholewiak, et al. (2017). Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (*Eubalaena glacialis*) from 2004 to 2014. *Scientific Reports*. 7(1): 13460. <https://doi.org/10.1038/s41598-017-13359-3>.
- Davis G.E., M.F. Baumgartner, P.J. Corkeron, J. Bell, C. Berchok, J.M. Bonnell, J. Bort Thornton, S. Brault, G.A. Buchanan, D.M. Cholewiak, et al. (2020). Exploring movement patterns and changing distributions of baleen whales in the western North Atlantic using a decade of passive acoustic data. *Global Change Biology*. 26(9): 4812-4840.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.15191>.
- Degraer S., R. Brabant, B. Rumes & L. Vigin (2019). *Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Marking a Decade of Monitoring, Research, and Innovation*. In: *Memoirs on the Marine Environment*. ONE Royal Belgian Institute of Natural Sciences, Marine Ecology and Management, 134 p.
- Deroba J.J. (2022). *Draft 2022 Monkfish Management Track Assessment Report*. Woods Hole, MA 31 p.
- Dodge K.L., B. Galuardi, T.J. Miller & M.E. Lutcavage (2014). Leatherback turtle movements, dive behavior, and habitat characteristics in ecoregions of the northwest Atlantic Ocean. *PLoS ONE*. 9(3 e91726): 1-17.
- Dovel W.L. & T.J. Berggren (1983). Atlantic sturgeon of the Hudson River Estuary, New York. *New York Fish and Game Journal*. 30: 140-172.
- Dunton K.J., A. Jordaan, D.O. Conover, K.A. McKown, L.A. Bonacci & M.G. Frisk (2015). Marine distribution and habitat use of Atlantic sturgeon in New York lead to fisheries interactions and bycatch. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*. 7: 18-32.

- Dunton K.J., A. Jordaan, K.A. McKown, D.O. Conover & M.G. Frisk (2010). Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. *Fishery Bulletin*. 108: 450-465.
- Eckert S.A., D. Bagley, S. Kubis, L. Ehrhart, C. Johnson, K. Stewart & D. DeFreese (2006). Internesting and postnesting movements of foraging habitats of leatherback sea turtles (*Dermochelys coriacea*) nesting in Florida. *Chelonian Conservation Biology*. 5(2): 239-248.
- Ellison W.T., B.L. Southall, C.W. Clark & A.S. Frankel (2011). A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. *Conservation Biology*. 26: 21-28.
- Ellison W.T., B.L. Southall, A.S. Frankel, K. Vigness-Raposa & C.W. Clark (2018). Short note: An acoustic scene perspective on spatial, temporal, and spectral aspects of marine mammal behavioral responses to noise. *Aquatic Mammals*. 44(3): 239-243.
- Epperly S.P., J. Braun & A.J. Chester (1995a). Areal surveys for sea turtles in North Carolina inshore waters. *Fishery Bulletin*. 93: 254-261.
- Epperly S.P., J. Braun, A.J. Chester, F.A. Cross, J.V. Merriner & P.A. Tester (1995b). Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. *Bulletin of Marine Science*. 56(2): 547-568.
- Epperly S.P., J. Braun & Veishlow (1995c). Sea turtles in North Carolina waters. *Conservation Biology*. 9(2): 384-394.
- Erickson D.L., A. Kahnle, M.J. Millard, E.A. Mora, M. Bryja, A. Higgs, J. Mohler, M. DuFour, G. Kenney, J. Sweka, et al. (2011). Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic Sturgeon, *Acipenser oxyrinchus oxyrinchus* Mitchell, 1815. *Journal of Applied Ichthyology*. 27(2): 356-365. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1439-0426.2011.01690.x>.
- Fay C., M. Barton, S. Craig, A. Hecht, J. Pruden, R. Saunders, T.F. Sheehan & J. Trial (2006). *Status Review for Anadromous Atlantic Salmon (Salmo salar) in the United States - Report to the National Marine Fisheries Service and U.S. Fish and Wildlife Service*. 294 p.
- Finneran J.J. (2015). Noise-induced hearing loss in marine mammals: A review of temporary threshold shift studies from 1996 to 2015. *The Journal of the Acoustical Society of America*. 138(3): 1702-1726. <https://asa.scitation.org/doi/abs/10.1121/1.4927418>.
- Finneran J.J. (2016). *Auditory Weighting Functions and TTS/PTS Exposure Functions for Marine Mammals Exposed to Underwater Noise*. Vol. Technical Report 3026, December 2016., San Diego: SC Pacific. p.
- Forney K.A., B.L. Southall, E. Slooten, S. Dawson, A.J. Read, R.W. Baird & R.L. Brownell, Jr. (2017). Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity. *Endangered Species Research*. 32: 391-413. <https://www.int-res.com/abstracts/esr/v32/p391-413/>.
- Ganley L.C., S. Brault & C.A. Mayo (2019). What we see is not what there is: estimating North Atlantic right whale *Eubalaena glacialis* local abundance. *Endangered Species Research*. 38: 101-113. <https://www.int-res.com/abstracts/esr/v38/p101-113/>.
- Good C. (2008). *Spatial Ecology of the North Atlantic Right Whale (Eubalaena glacialis)* Duke University.
- Griffin D.B., S.R. Murphy, M.G. Frick, A.C. Broderick, J.W. Coker, M.S. Coyne, M.G. Dodd, M.H. Godfrey, B.J. Godley, L.A. Mawkes, et al. (2013). Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: Implications for conservation. *Marine Biology*. 160: 3071-3086.
- Hain J.H.W., M.J. Ratnaswamy, R.D. Kenney & H.E. Winn (1992). The fin whale, *Balaenoptera physalus*, in waters of the northeastern United States continental shelf. *Reports of the International Whaling Commission*. 42: 653-669.
- Hamilton P.K. & C.A. Mayo (1990). Population characteristics of right whales (*Eubalaena glacialis*) observed in Cape Cod and Massachusetts Bays, 1978-1986. *Reports of the International Whaling Commission*. 12: 203-208.

- Hare J.A., W.E. Morrison, M.W. Nelson, M.M. Stachura, E.J. Teeters, R.B. Griffis, M.A. Alexander, J.D. Scott, L. Alade, R.J. Bell, et al. (2016). A vulnerability assessment of fish and invertebrates to climate change on the Northeast U.S. continental shelf. *PLoS ONE*. 11: e0146756. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4739546/pdf/pone.0146756.pdf>.
- Haring P. & J.-J. Maguire (2008). The monkfish fishery and its management in the northeastern USA. *ICES Journal of Marine Science*. 65(7): 1370-1379. <https://doi.org/10.1093/icesjms/fsn131>.
- Hart D.R. & A.S. Chute (2004). *Essential Fish Habitat Source Document: Sea Scallop, Placopecten magellanicus, Life History and Habitat Characteristics* 2nd ed. Woods Hole, MA: U.S. Department of Commerce. NEFSC Technical Memorandum NE-198. p.
- Hatch J.J. & C.D. Orphanides (2014). *Estimates of Cetacean and Pinniped Bycatch in the 2012 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 14-02. 20 p. <https://doi.org/10.7289/V5NP22F9>.
- Hatch J.J. & C.D. Orphanides (2015). *Estimates of Cetacean and Pinniped Bycatch in the 2013 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 15-15. 26 p. <https://doi.org/10.7289/V5HD7SNK>.
- Hatch J.J. & C.D. Orphanides (2016). *Estimates of Cetacean and Pinniped Bycatch in the 2014 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 16-05. 22 p. <https://doi.org/10.7289/V50863BV>.
- Hawkes L.A., M.J. Witt, A.C. Broderick, J.W. Coker, M.S. Coyne, M.G. Dodd, M.G. Frick, M.H. Godfrey, D.B. Griffin, S.R. Murphy, et al. (2011). Home on the range: spatial ecology of loggerhead turtles in Atlantic waters of the USA. *Diversity and Distributions*. 17: 624-640.
- Hayes S.A., E. Josephson, K. Maze-Foley & P.E. Rosel (2017). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2016*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-241. p.
- Hayes S.A., E. Josephson, K. Maze-Foley & P.E. Rosel (2018). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2017*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-245. 371 p.
- Hayes S.A., E. Josephson, K. Maze-Foley & P.E. Rosel (2019). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2018*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-258. 291 p.
- Hayes S.A., E. Josephson, K. Maze-Foley & P.E. Rosel (2020). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2019*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-264. 479 p.
- Hayes S.A., E. Josephson, K. Maze-Foley, P.E. Rosel & J. Turek (2021). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2020*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-271. 403 p.
- Hayes S.A., E. Josephson, K. Maze-Foley, P.E. Rosel & J. Wallace (2022). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2021*. U.S. Department of Commerce. 386 p.
- Henry A.G., T.V.N. Cole, M. Garron, W. Ledwell, D. Morin & A. Reid (2017). *Serious Injury and Mortality Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2011-2015*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 17-19. 57 p.
- Henry A.G., T.V.N. Cole, L. Hall, W. Ledwell, D. Morin & A. Reid (2016). *Serious Injury and Mortality Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2010-2014*. U.S. Department of Commerce. NEFSC Reference Document 16-10. 51 p. <https://www.nefsc.noaa.gov/publications/crd/crd1610/>.
- Henry A.G., M. Garron, D. Morin, A. Reid & T.V.N. Cole (2020). *Serious Injury and Mortality Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2013-2017*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 20-06. 53 p. <https://doi.org/10.25923/fbc7-ky15>.

- Henry A.G., M. Garron, D. Morin, A. Smith, A. Reid, W. Ledwell & T.V.N. Cole (2021). *Serious Injury and Mortality and Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2014-2018*. Woods Hole, MA: U.S. Department of Commerce. 56 p.
- Henry A.G., M. Garron, D. Morin, A. Smith, A. Reid, W. Ledwell & T.V.N. Cole (2022). *Serious Injury and Mortality and Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2015-2019*. Woods Hole, MA: U.S. Department of Commerce. 65 p.
- Henry A.G., M. Garron, A. Reid, D. Morin, W. Ledwell & T.V.N. Cole (2019). *Serious Injury and Mortality and Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast and Atlantic Canadian Provinces, 2012-2016*. Woods Hole, MA: U.S. Department of Commerce. 54 p.
- Heppell S., D.T. Crouse, L. Crowder, S.P. Epperly, W. Gabriel, T. Henwood, R. Marquez & N.B. Thompson (2005a). A population model to estimate recovery time, population size, and management impacts on Kemp's ridley sea turtles. *Chelonian Conservation and Biology*. 4: 767-773.
- Heppell S.S., D.T. Crouse, L. Crowder, S.P. Epperly, W. Gabriel, T. Henwood, R. Marquez & N.B. Thompson (2005b). A population model to estimate recovery time, population size, and management impacts on Kemp's ridley sea turtles. *Chelonian Conservation and Biology*. 4: 767-773.
- Hilton E.J., B. Kynard, M.T. Balazik, A.Z. Horodysky & C.B. Dillman (2016). Review of the biology, fisheries, and conservation status of the Atlantic Sturgeon, (*Acipenser oxyrinchus oxyrinchus* Mitchill, 1815). *Journal of Applied Ichthyology*. 32(S1): 30-66.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/jai.13242>.
- Hirth H.F. (1997). *Synopsis of the Biological Data of the Green Turtle, Chelonia mydas (Linnaeus 1758)*. In: US Fish and Wildlife Service Biological Report 97.Vol. 1. 120 p.
- Hutchison Z.L., A.B. Gill, P. Sigray, H. He & J.W. King (2020). Anthropogenic electromagnetic fields (EMF) influence the behaviour of bottom-dwelling marine species. *Scientific Reports*. 10(1): 4219.
- Hyvärinen P., P. Suuronen & T. Laaksonen (2006). Short-term movements of wild and reared Atlantic salmon smolts in a brackish water estuary – preliminary study. *Fisheries Management and Ecology*. 13(6): 399-401. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2400.2006.00512.x>.
- Ingram E.C., R.M. Cerrato, K.J. Dunton & M.G. Frisk (2019). Endangered Atlantic Sturgeon in the New York Wind Energy Area: implications of future development in an offshore wind energy site. *Scientific Reports*. 9(1): 12432. <https://doi.org/10.1038/s41598-019-48818-6>.
- James M.C., R. Myers & C. Ottenmeyer (2005). Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. *Proceedings of the Royal Society of Biological Sciences*. 272(1572): 1547-1555.
- James M.C., S.A. Sherrill-Mix, K. Martin & R.A. Myers (2006). Canadian waters provide critical foraging habitat for leatherback sea turtles. *Biological Conservation*. 133: 347-357.
- Jefferson T.A., D. Fertl, J. Bolanos-Jimenez & A.N. Zerbini (2009). Distribution of common dolphins (*Delphinus sp.*) in the western North Atlantic: A critical re-examination. *Marine Biology*. 156: 1109-1124.
- Jepson M. & L.L. Colburn (2013). *Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions*. Silver Spring, MD: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-F/SPO-129. 64 p.
- Johnson M.R., C. Boelke, L.A. Chiarella & K. Greene (2019). *Guidance for Integrating Climate Change Information in Greater Atlantic Region Habitat Conservation Division Consultation Processes*. In: Greater Atlantic Region Policy Series.Vol. 19-01. 235 p.
<https://www.greateratlantic.fisheries.noaa.gov/policyseries/index.php/GARPS/article/view/3>.
- Kenney R.D., M.A.M. Hyman, R.E. Owen, G.P. Scott & H.E. Winn (1986). Estimation of prey densities required by western North Atlantic right whales. *Marine Mammal Science*. 2: 1-13.
- Kenney R.D., H.E. Winn & M.C. Macaulay (1995). Cetaceans in the Great South Channel, 1979-1989: Right whale (*Eubalaena glacialis*). *Continental Shelf Research*. 15: 385-414.

- Khan C.B., T.V.N. Cole, P. Duley, A. Glass & Gatzke (2010). *North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2009 Results Summary*. Woods Hole, MA: U.S. Department of Commerce. 10-07. 7 p.
- Khan C.B., T.V.N. Cole, P. Duley, A. Glass & Gatzke (2011). *North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2010 Results Summary*. Woods Hole, MA: U.S. Department of Commerce. 11-05. 6 p.
- Khan C.B., T.V.N. Cole, P. Duley, A. Glass & Gatzke (2012). *North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2011 Results Summary*. Woods Hole, MA: U.S. Department of Commerce. 12-09. 6 p.
- Khan C.B., T.V.N. Cole, P. Duley, A. Glass, M. Niemeyer & C. Christman (2009). *North Atlantic Right Whale Sightings Survey (NARWSS) and Right Whale Sighting Advisory System (NARWSS) 2008 Results Summary*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 09-05. 7 p.
- Kahn and Mohead 2010. A Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons. NOAA Technical Memorandum NMFS-OPR-45. Available at https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiMzon9uuiDAxWFD1kFHZ5wD3EQFnoECBgQAQ&url=https%3A%2F%2Frepository.library.noaa.gov%2Fview%2Fnoaa%2F3801%2Fnoaa_3801_DS1.pdf%3F&usq=AOvVaw2JbFd49qmYqUvV0uUU2Lk&opi=89978449
- Kocik J.F., S.E. Wigley & D. Kircheis (2014). *Annual Bycatch Update Atlantic Salmon 2013*. Old Lyme, CT: USASA Committee. U.S. Atlantic Salmon Assessment Committee. 6 p.
- Kraus S.D., S. Leiter, K. Stone, B. Wikgren, C. Mayo, P. Hughes, D. Kenney, C.W. Clark, A.N. Rice, B. Estabrook, et al. (2016). *Northeast large pelagic survey collaborative aerial and acoustic surveys for large whales and sea turtles*. Sterling, VA: BoOEM US Department of the Interior. OCS Study BOEM 2016-054. p. <https://windexchange.energy.gov/publications?id=5873>.
- Kynard B., M. Horgan, M. Kieffer & D. Seibel (2000). Habitat use by shortnose sturgeon in two Massachusetts rivers, with notes on estuarine Atlantic sturgeon: A hierarchical approach. *Transactions of the American Fisheries Society*. 129: 487-503.
- Lacroix G.L. & D. Knox (2005). Distribution of Atlantic salmon (*Salmo salar*) postsmolts of different origins in the Bay of Fundy and Gulf of Maine and evaluation of factors affecting migration, growth, and survival. *Canadian Journal of Fisheries and Aquatic Sciences*. 62: 1363-1376.
- Lacroix G.L. & P. McCurdy (1996). Migratory behavior of post-smolt Atlantic salmon during initial stages of seaward migration. *Journal of Fish Biology*. 49: 1086-1101.
- Lacroix G.L., P. McCurdy & D. Knox (2004). Migration of Atlantic salmon post smolts in relation to habitat use in a coastal system. *Transactions of the American Fisheries Society*. 133(6): 1455-1471.
- Laney R.W., J.E. Hightower, B.R. Versak, M.F. Mangold, W.W. Cole Jr. & S.E. Winslow (2007). Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988–2006. In: *Anadromous Sturgeons: Habitats, Threats, and Management*. Bethesda, MD: American Fisheries Society. p. 167-182.
- Langhamer O. (2012). Artificial Reef Effect in relation to Offshore Renewable Energy Conversion: State of the Art. *The Scientific World Journal*. 2012: 386713. <https://doi.org/10.1100/2012/386713>.
- Legault C.M., J. Wiedenmann, J.J. Deroba, G. Fay, T.J. Miller, E.N. Brooks, R.J. Bell, J.A. Langan, J.M. Cournane, A.W. Jones, et al. (2023). Data rich but model resistant: An evaluation of data-limited methods to manage fisheries with failed age-based stock assessments. *Canadian Journal of Fisheries and Aquatic Sciences*. 80: 27-42.
- Leiter S.M., K.M. Stone, J.L. Thompson, C.M. Accardo, B.C. Wikgren, M.A. Zani, T.V.N. Cole, R.D. Kenney, C.A. Mayo & S.D. Kraus (2017). North Atlantic right whale *Eubalaena glacialis* occurrence in offshore wind energy areas near Massachusetts and Rhode Island, USA. *Endangered Species Research*. 34: 45-59. <https://www.int-res.com/abstracts/esr/v34/p45-59/>.

- Lyssikatos M.C. (2015). *Estimates of Cetacean and Pinniped Bycatch in Northeast and Mid-Atlantic Bottom Trawl Fisheries, 2008-2013*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 15-19. p.
- Lyssikatos M.C. & S. Chavez-Rosales (2022). *Estimates of Cetacean and Pinniped Bycatch in Northeast and Mid-Atlantic Bottom Trawl Fisheries, 2015-2019*. Woods Hole, MA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-281. 16 p.
<https://repository.library.noaa.gov/view/noaa/39507>.
- Lyssikatos M.C., S. Chavez-Rosales & J.J. Hatch (2020). *Estimates of Cetacean and Pinniped Bycatch in Northeast and Mid-Atlantic Bottom Trawl Fisheries, 2013-2017*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 20-04. p. <https://doi.org/10.25923/5we2-g460>.
- Lyssikatos M.C., S. Chavez-Rosales & J.J. Hatch (2021). *Estimates of Cetacean and Pinniped Bycatch in Northeast and Mid-Atlantic Bottom Trawl Fisheries, 2014-2018*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 21-02. 12 p. <https://doi.org/10.25923/5we2-g460>.
- Madsen P.T., M. Wahlberg, J. Tougaard, K. Lucke & P. Tyack (2006). Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. *Marine Ecology Progress Series*. 309: 279-295. <https://www.int-res.com/abstracts/meps/v309/p279-295/>.
- MAFMC 2023. 2023 Spiny Dogfish Specifications Environmental Assessment. Available at www.mafmc.org.
- MSA (2007). Magnuson-Stevens Fishery Conservation and Management Reauthorization Act. Public Law 109-479, 16 USC 1801-1884.
- Mate B.R., S.L. Nieukirk & S.D. Kraus (1997). Satellite-monitored movements of the Northern right whale. *The Journal of Wildlife Management*. 61(4): 1393-1405.
- Mayo C.A., L. Ganley, C.A. Hudak, S. Brault, M.K. Marx, E. Burke & M.W. Brown (2018). Distribution, demography, and behavior of North Atlantic right whales (*Eubalaena glacialis*) in Cape Cod Bay, Massachusetts, 1998–2013. *Marine Mammal Science*. 34(4): 979-996.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/mms.12511>.
- McBride R.S. & R.K. Smedbol (2022). An Interdisciplinary Review of Atlantic Cod (*Gadus morhua*) Stock Structure in the Western North Atlantic Ocean. <https://repository.library.noaa.gov/view/noaa/48082>.
- McLellan W.A., E. Meagher, L. Torres, G. Lovewell, C. Harper, K. Irish, B. Pike & D.A. Pabst (2004). Winter right whale sightings from aerial surveys of the coastal waters of the U.S. Mid-Atlantic. Paper presented at: 15th Biennial Conference on the Biology of Marine Mammals, Greensboro, NC.
- Methratta E.T. & W.R. Dardick (2019). Meta-Analysis of Finfish Abundance at Offshore Wind Farms. *Reviews in Fisheries Science & Aquaculture*. 27(2): 242-260.
<https://doi.org/10.1080/23308249.2019.1584601>.
- Miller M.H. & C. Klimovich (2017). *Endangered Species Act Status Review Report: Giant Manta Ray (Manta birostris) and Reef Manta Ray (Manta alfredi)*. Silver Spring, MD: US Department of Commerce. 128 p. <https://repository.library.noaa.gov/view/noaa/17096>.
- Miller T.J. & G. Shepard (2011). *Summary of Discard Estimates for Atlantic Sturgeon*. Woods Hole, MA: NEFSC Population Dynamics Branch. p.
- Moore M.J., T.K. Rowles, D.A. Fauquier, J.D. Baker, I. Biedron, J.W. Durban, P.K. Hamilton, A.G. Henry, R.M. Pace III, H.M. Pettis, et al. (2021). Assessing North Atlantic right whale health: threats, and development of tools critical for conservation of the species. *Diseases of Aquatic Organisms*. 143: 205-226.
- Morano J.L., A.N. Rice, J.T. Tielens, B.J. Estabrook, A. Murray, B.L. Roberts & C.W. Clark (2012). Acoustically detected year-round presence of right whales in an urbanized migration corridor. *Conservation Biology*. 26(4): 698-707.
<https://conbio.onlinelibrary.wiley.com/doi/abs/10.1111/j.1523-1739.2012.01866.x>.
- Morreale S.J. & E. Standora (2005). Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. *Chelonean Conservation and Biology*. 4(4): 872-882.

- Muirhead C.A., A.M. Warde, I.S. Biedron, A. Nicole Mihnovets, C.W. Clark & A.N. Rice (2018). Seasonal acoustic occurrence of blue, fin, and North Atlantic right whales in the New York Bight. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 28(3): 744-753.
<https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.2874>.
- Murphy T.M., S.R. Murphy, D.B. Griffin & C.P. Hope (2006). Recent occurrence, spatial distribution and temporal variability of leatherback turtles (*Dermochelys coriacea*) in nearshore waters of South Carolina, USA. *Chelonian Conservation Biology*. 5(2): 216-224.
- Murray K.T. (2007). *Estimated Bycatch of Loggerheaded Sea Turtles (Caretta caretta) in U.S. Mid-Atlantic Scallop Trawl Gear, 2004-2005, and in Scallop Dredge Gear, 2005*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 07-04. 30 p.
- Murray K.T. (2008). *Estimated Average Annual Bycatch of Loggerhead Sea Turtles (Caretta caretta) in U.S. Mid-Atlantic Bottom Otter Trawl Gear, 1996–2004 (2nd edition)*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 08-21. 32 p.
- Murray K.T. (2009a). Characteristics and magnitude of sea turtle bycatch in U.S. Mid-Atlantic gillnet gear. *Endangered Species Research*. 8: 211-224.
- Murray K.T. (2009b). *Proration of Estimated Bycatch of Loggerhead Sea Turtles in US Mid-Atlantic Sink Gillnet Gear to Vessel Trip Report Landed Catch, 2002-2006*. Woods Hole, MA: US Department of Commerce. NEFSC Reference Document 09-19. p. <http://www.nefsc.noaa.gov/publications/crd/>.
- Murray K.T. (2013). *Estimated Loggerhead and Unidentified Hard-shelled Turtle Interactions in Mid-Atlantic Gillnet Gear, 2007-2011*. Woods Hole, MA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NM-225. 20 p.
- Murray K.T. (2015). The importance of location and operational fishing factors in estimating and reducing loggerhead turtle (*Caretta caretta*) interactions in U.S. bottom trawl gear. *Fisheries Research*. 172: 440-451.
- Murray K.T. (2018). *Estimated Bycatch of Sea Turtles in Sink Gillnet Gear*. Woods Hole, MA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-242. 20 p.
- Murray K.T. (2020). *Estimated Magnitude of Sea Turtle Interactions and Mortality in U.S. Bottom Trawl Gear, 2014-2018*. 2020. Woods Hole, MA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-260. 19 p.
- Murray K.T. (2023). *Estimated Magnitude of Sea Turtle Interactions in U.S. Sink Gillnet Gear, 2017-2021*.C Northeast Fisheries Science ed. Woods Hole, MA: US Department of Commerce. 20 p.
<https://repository.library.noaa.gov/view/noaa/48084>.
- Murray K.T. & C.D. Orphanides (2013). Estimating the risk of loggerhead turtle *Caretta caretta* bycatch in the U.S. Mid-Atlantic using fishery-independent and -dependent data. *Marine Ecological Progress Series*. 477: 259-270.
- NEPA (1969). National Environmental Policy Act. Public Law 91-190: 852-859 and as amended Public Law 94-52 and 94-83, 42 USC 4321-4347.
- NEFMC (2010). *Monkfish Fishery Management Plan Amendment 5*. Newburyport, MA: New England Fishery Management Council and Mid-Atlantic Fishery Management Council in consultation with National Marine Fisheries Service. 625 p.
- NEFMC (2016). *Final Omnibus Essential Fish Habitat Amendment 2*. Vol. 1-6 plus appendices. Newburyport, MA: New England Fishery Management Council. 490 p.
<https://www.nefmc.org/library/omnibus-habitat-amendment-2>.
- NEFMC (2017). *Monkfish Fishery Management Plan Framework Adjustment 10 Including Specifications for Fishing Years 2017-2019*. Newburyport, MA: New England Fishery Management Council and Mid-Atlantic Fishery Management Council in consultation with National Marine Fisheries Service. 218 p.
- NEFMC (2020a). *Monkfish Fishery Management Plan Framework Adjustment 12*. Newburyport, MA: New England Fishery Management Council in consultation with National Marine Fisheries Service. 49 p.

- NEFMC (2020b). *Northeast Skate Complex Fishery Management Plan Framework Adjustment 8*. Newburyport, MA: New England Fishery Management Council in cooperation with the National Marine Fisheries Service. 131 p. <https://www.nefmc.org/library/framework-8-2>.
- NEFMC (2022a). *Framework Adjustment 63 to the Northeast Multispecies Fishery Management Plan*. Newburyport, MA: New England Fishery Management Council in consultation with the National Marine Fisheries Service and Mid-Atlantic Fishery Management Council. 345 p.
- NEFMC (2022b). *Monkfish Fishery Performance Report*. Newburyport, MA: New England Fishery Management Council. 20 p.
- NEFMC & MAFMC (1998). *Monkfish Fishery Management Plan*. Saugus, MA: New England and Mid-Atlantic Fishery Management Councils. 480 p.
- NEFSC (2002). *34th Northeast Regional Stock Assessment Workshop (34th SAW) : Stock Assessment Review Committee (SARC) consensus summary of assessments*. Woods Hole, MA: U.S. Department of Commerce. 358 p. <https://repository.library.noaa.gov/view/noaa/3371>.
- NEFSC (2011). *EFH Source Documents: Life History and Habitat Characteristics*. Woods Hole, MA: U.S. Department of Commerce; <http://www.nefsc.noaa.gov/nefsc/habitat/efh/>.
- NEFSC (2020a). *Assessment Update for Atlantic Sea Scallops for 2020*. Woods Hole, MA: U.S. Department of Commerce. 7 p.
- NEFSC (2020b). *Operational Assessment of the Black Sea Bass, Scup, Bluefish, and Monkfish Stocks, Updated through 2018*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 20-01. 160 p.
- NEFSC (2022). *Management Track Assessments Fall 2021*. C Northeast Fisheries Science ed. Woods Hole, MA: US Department of Commerce. 53 p. <https://repository.library.noaa.gov/view/noaa/39403>.
- NMFS (1991). *Final Recovery Plan for the Humpback Whale (Megaptera novaeangliae)*. Silver Spring, MD: U.S. Department of Commerce. 105 p.
- NMFS (2005). *Recovery Plan for the North Atlantic Right Whale (Eubalaena glacialis)*. Silver Spring, MD: U.S. Department of Commerce. 137 p.
- NMFS (2007). *Guidelines for the Assessment of the Social Impact of Fishery Management Actions*. In: NOAA/NMFS Council Operational Guidelines - Fishery Management Process. Silver Spring, MD: National Oceanic and Atmospheric Administration. NMFSI 01-111-02. 39 p.
- NMFS (2010). *Final recovery plan for the fin whale (Balaenoptera physalus)*. Silver Spring, MD: U.S. Department of Commerce. 121 p.
- NMFS (2011). *Final recovery plan for the sei whale (Balaenoptera borealis)*. Silver Spring, MD: U.S. Department of Commerce. 108 p.
- NMFS (2021a). *Endangered Species Act Section 7 Consultation on the: (a) Authorization of the American Lobster, Atlantic Bluefish, Atlantic Deep-Sea Red Crab, Mackerel/Squid/Butterfish, Monkfish, Northeast Multispecies, Northeast Skate Complex, Spiny Dogfish, Summer Flounder/Scup/Black Sea Bass, and Jonah Crab Fisheries and (b) Implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2 [Consultation No. GARFO-2017-00031]*. Gloucester, MA: U.S. Department of Commerce. p. <https://repository.library.noaa.gov/view/noaa/30648>.
- NMFS (2021b). *Final Environmental Impact Statement, Regulatory Impact Review, and Final Regulatory Flexibility Analysis for Amending the Atlantic Large Whale Take Reduction Plan: Risk Reduction Rule*. U.S. Department of Commerce. 601 p. <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan>.
- NMFS & USFWS (1991). *Recovery Plan for U.S. Population of Atlantic Green Turtle (Chelonia mydas)*. Washington, DC: U.S. Department of Commerce and U.S. Department of the Interior. 58 p.
- NMFS & USFWS (1992). *Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 65 p. <http://www.nmfs.noaa.gov/pr/listing/reviews.htm>.

- NMFS & USFWS (1995). *Status Reviews for Sea Turtles Listed under the Endangered Species Act of 1973*. Washington, DC: U.S. Department of Commerce and U.S. Department of the Interior. 139 p.
- NMFS & USFWS (1998a). *Recovery Plan for U.S. Pacific Populations of the Green Turtle (Chelonia mydas)*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 58 p.
- NMFS & USFWS (1998b). *Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (Dermochelys coriacea)*. Silver Spring, MD: U.S. Department of Commerce. 65 p.
- NMFS & USFWS (2005). *Recovery Plan for the Gulf of Maine Distinct Population Segment of the Atlantic Salmon (Salmo salar)*. Silver Spring, MD: National Marine Fisheries Service. p.
- NMFS & USFWS (2007a). *Green Sea Turtle (Chelonia mydas) 5 Year Review: Summary and Evaluation*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 102 p. <http://www.nmfs.noaa.gov/pr/listing/reviews.htm>.
- NMFS & USFWS (2007b). *Kemp's Ridley Sea Turtle (Lepidochelys kempii) 5 Year Review: Summary and Evaluation*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 50 p. <http://www.nmfs.noaa.gov/pr/listing/reviews.htm>.
- NMFS & USFWS (2008). *National Recovery Plan for the Loggerhead Sea Turtle (Caretta caretta)*. 2nd ed. Silver Spring, MD: U.S. Department of Commerce. 325 p.
- NMFS & USFWS (2011). *Bi-national Recovery Plan for the Kemp's Ridley Sea Turtle (Lepidochelys kempii)*. 2nd ed. Silver Spring, MD: National Marine Fisheries Service. 156 & appendices p.
- NMFS & USFWS (2013). *Leatherback Sea Turtle (Dermochelys coriacea) 5 Year Review: Summary and Evaluation*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 91 p. <http://www.nmfs.noaa.gov/pr/listing/reviews.htm>.
- NMFS & USFWS (2015). *Kemp's Ridley Sea Turtle (Lepidochelys kempii) 5 Year Review: Summary and Evaluation*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 62 p.
- NMFS & USFWS (2016). *Draft Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (Salmo salar)*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. p. http://www.fisheries.noaa.gov/pr/pdfs/20160329_atlantic_salmon_draft_recovery_plan.pdf.
- NMFS & USFWS (2018). *Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (Salmo salar)*. Silver Spring, MD: U.S. Department of Commerce and U.S. Department of the Interior. 74 p. http://www.fisheries.noaa.gov/pr/pdfs/20160329_atlantic_salmon_draft_recovery_plan.pdf.
- NMFS & USFWS (2020). *Endangered Species Act status review of the leatherback turtle (Dermochelys coriacea)*. Silver Spring, MD: Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service. p. http://www.fisheries.noaa.gov/pr/pdfs/20160329_atlantic_salmon_draft_recovery_plan.pdf.
- NOAA (2008). *High Numbers of Right Whales Seen in Gulf of Maine: NOAA Researchers Identify Wintering Ground and Potential Breeding Ground*. U.S. Department of Commerce. NOAA press release. December 31, 2008. p.
- NOAA (2016). *Species in the Spotlight Priority Actions: 2016-2020 Atlantic Salmon (Salmo salar). Atlantic Salmon Five Year Action Plan.*: U.S. Department of Commerce. p.
- Northwest Atlantic Leatherback Working Group (2018). *Northwest Atlantic Leatherback Turtle (Dermochelys coriacea) Status Assessment (Bryan Wallace and Karen Eckert, Compilers and Editors)*. Godfrey, IL: Conservation Science Partners and the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). WIDECAST Technical Report No. 16. 36 p.
- Novak A., J., A. Carlson, E., C. Wheeler, R., G.S. Wippelhauser & J.A. Sulikowski (2017). Critical Foraging Habitat of Atlantic Sturgeon Based on Feeding Habits, Prey Distribution, and Movement Patterns in the Saco River Estuary, Maine. *Transactions of the American Fisheries Society*. 146(2): 308-317-2017. <https://dx.doi.org/10.1080/00028487.2016.1264472>.

- Nowacek D.P., L.H. Thorne, D.W. Johnston & P.L. Tyack (2007). Responses of cetaceans to anthropogenic noise. *Mammal Review*. 37(2): 81-115. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2907.2007.00104.x>.
- NRC (2000). *Marine Mammals and Low-Frequency Sound: Progress Since 1994*. NR Council ed. Washington, DC: NA Press. p.
- NRC (2002). *Effects of Trawling and Dredging on Seafloor Habitat*. Washington, DC: National Research Council Division on Earth and Life Studies Ocean Studies Board. 126 p.
- NRC (2003). *Ocean Noise and Marine Mammals*. NR Council ed. Washington, DC: NA Press. p.
- NRC (2005). *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects*. NR Council ed. Washington, DC: NA Press. p.
- O'Keefe C. (2020). *Evaluation of Methods to Estimate Monkfish Discards for Calculating Total Allowable Landings*. Fishery Applications Consulting Team LLC with support from the New England Fishery Management Council. 32 p.
- O'Keefe C. (2021). *2021 Evaluation of Monkfish Discard Estimation for Calculating Total Allowable Landings*. Fishery Applications Consulting Team LLC with support from the New England Fishery Management Council. 19 p.
- O'Leary S.J., K.J. Dunton, L. King, M.G. Frisk & D.D. Chapman (2014). Genetic diversity and effective size of Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus* river spawning populations estimated from the microsatellite genotypes of marine-captured juveniles. *Conservation Genetics*. 1-9.
- Orphanides C.D. (2010). Protected species bycatch estimating approaches: Estimating harbor porpoise bycatch in U.S. Northwestern Atlantic gillnet fisheries. *Fisheries Science*. 42: 55-76.
- Orphanides C.D. (2019). *Estimates of Cetacean and Pinniped Bycatch in the 2016 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 19-04. 12 p. <https://doi.org/10.25923/jp8y-sv79>.
- Orphanides C.D. (2020). *Estimates of Cetacean and Pinniped Bycatch in the 2017 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 20-03. 16 p. <https://doi.org/10.25923/fkbn-jr56>.
- Orphanides C.D. (2021). *Estimates of Cetacean and Pinniped Bycatch in the 2018 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 21-01. 21 p. <https://repository.library.noaa.gov/view/noaa/31572>.
- Orphanides C.D. & J.J. Hatch (2017). *Estimates of Cetacean and Pinniped Bycatch in the 2015 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 17-18. 21 p. <https://doi.org/10.7289/V5/RD-NEFSC-17-18>.
- Pace III R.M. & R. Merrick (2008). *Northwest Atlantic Ocean Habitats Important to the Conservation of North Atlantic Right Whales (*Eubalaena glacialis*)*. Woods Hole, MA: U.S. Department of Commerce. p.
- Palka D. (2020). *Cetacean Abundance Estimates in US Northwestern Atlantic Ocean Waters from Summer 2016 Line Transect Surveys Conducted by the Northeast Fisheries Science Center*. U.S. Department of Commerce. NEFSC Reference Document 20-05. p.
- Palka D.L., S. Chavez-Rosales, E. Josephson, D. Cholewiak, H.L. Haas, L. Garrison, M. Jones, D. Sigourney, G. Waring, M. Jech, et al. (2017). *Atlantic Marine Assessment Program for Protected Species: 2010-2014*. Washington, DC: BoOEM U.S. Department of the Interior, Atlantic OCS Region., OCS Study BOEM 2017-071. p. <https://www.fisheries.noaa.gov/resource/publication-database/atlanticmarine-assessment-program-protected-species>.
- Payne P.M. & D.W. Heinemann (1993). The distribution of pilot whales (*Globicephala sp.*) in shelf/shelf edge and slope waters of the northeastern United States, 1978-1988. *Reports of the International Whaling Commission*. 14: 51-68.
- Payne P.M., L.A. Selzer & A.R. Knowlton (1984). *Distribution and density of cetaceans, marine turtles, and seabirds in the shelf waters of the northeastern United States, June 1980 - December 1983, based on*

- shipboard observations*. Woods Hole, MA: Manomet Bird Observatory. 294 p. <https://apps-nefsc.fisheries.noaa.gov/rcb/publications/reports/NMFSNA81FAC00023.pdf>.
- Payne P.M., D.N. Wiley, S.B. Young, S. Pittman, P.J. Clapham & J.W. Jossi (1990). Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine in relation to changes in selected prey. *Fishery Bulletin*. 88: 687-696.
- Pendleton D.E., A.J. Pershing, M.W. Brown, C.A. Mayo, R.D. Kenney, N.R. Record & T.V.N. Cole (2009). Regional-scale mean copepod concentration indicates relative abundance of North Atlantic right whales. *Marine Ecology Progress Series*. 378: 211-225. <https://www.int-res.com/abstracts/meps/v378/p211-225/>.
- Piniak W.E.D. (2012). *Acoustic Ecology of Sea Turtles: Implications for Conservation* Duke University.
- Pol M. & B. Bowen (2009). *Determining the Best Size for Gillnetting Monkfish Lophius americanus*. Massachusetts Division of Marine Fisheries, Final report submitted to the Monkfish Research Set Aside program. p.
- Pollnac R.B. & J.J. Poggie (2008). Happiness, well-being and psychocultural adaptation to the stresses associated with marine fishing. *Human Ecology Review*. 15(2): 194-200.
- Pollnac R.B., T. Seara & L.L. Colburn (2015). Aspects of fishery management, job satisfaction, and well-being among commercial fishermen in the Northeast region of the United States. *Society and Natural Resources*. 28(1): 75-92. <https://doi.org/10.1080/08941920.2014.933924>.
- Popper A., A. Hawkins, R. Fay, D. Mann, S. Bartol & T. Carlson (2014). *Sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-accredited standards committee S3/SC1 and registered with ANSI*. Vol. ASA S3/SC1 4. p.
- Precoda K. & C.D. Orphanides (2022). *Estimates of Cetacean and Pinniped Bycatch in the 2019 New England Sink and Mid-Atlantic Gillnet Fisheries*. Woods Hole, MA: U.S. Department of Commerce. 26 p. <https://repository.library.noaa.gov/view/noaa/39407>.
- Record N.R., J.A. Runge, D.E. Pendleton, W.M. Balch, K.T.A. Davies, A.J. Pershing, C.L. Johnson, K. Stamieszkin, R. Ji, Z. Feng, et al. (2019). Rapid climate-driven circulation changes threaten conservation of endangered North Atlantic right whales. *Oceanography*. 32(2): 162-169. <https://www.jstor.org/stable/26651192>.
- Reddin D.G. (1985). Atlantic salmon (*Salmo salar*) on and east of the Grand Bank. *Journal of the Northwest Atlantic Fisheries Society*. 6(2): 157-164.
- Reddin D.G. & K.D. Friedland (1993). Marine environmental factors influencing the movement and survival of Atlantic salmon. Paper presented at: 4th International Atlantic Salmon Symposium, St. Andrews, NB.
- Reddin D.G. & P.B. Short (1991). Postmolt Atlantic salmon (*Salmo salar*) in the Labrador Sea. *Canadian Journal of Fisheries and Aquatic Sciences*. 48(2-6).
- Richards R.A. (2016). *2016 Monkfish Operational Assessment*. Woods Hole, MA: U.S. Department of Commerce. NEFSC Reference Document 16-09. 109 p.
- Richards R.A., P.C. Nitschke & K.A. Sosebee (2008). Population biology of monkfish *Lophius americanus*. *ICES Journal of Marine Science*. 65(7): 1291-1305. <https://doi.org/10.1093/icesjms/fnn108>.
- Richardson W.J., C.R.J. Greene, C.I. Malme & D.H. Thompson (1995). *Marine Mammals and Noise*. San Diego, CA: Academic Press p.
- Risch D., C.W. Clark, P.J. Dugan, M. Popescu, U. Siebert & S.M. Van Parijs (2013). Minke whale acoustic behavior and multi-year seasonal and diel vocalization patterns in Massachusetts Bay, USA. *Marine Ecological Progress Series*. 489: 279-295.
- Robbins J. (2007). *Structure and Dynamics of the Gulf of Maine Humpback Whale Population* Aberdeen, Scotland: University of St. Andrews.
- Roberts J.J., B.D. Best, L. Mannocci, E. Fujioka, P.N. Halpin, D.L. Palka, L.P. Garrison, K.D. Mullin, T.V.N. Cole, C.B. Khan, et al. (2016). Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. *Scientific Reports*. 6: 22615. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4776172/pdf/srep22615.pdf>.

- Romano T.A., M.J. Keogh, C. Kelly, P. Feng, L. Berk, C.E. Schlundt, D.A. Carder & J.J. Finneran (2004). Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure. *Canadian Journal of Fisheries and Aquatic Sciences*. 61(7): 1124-1134. <https://cdnsciencepub.com/doi/abs/10.1139/f04-055>
- Rothermel E.R., M.T. Balazik, J.E. Best, M.W. Brece, D.A. Fox & B.I. Gahagan (2020). Comparative migration ecology of striped bass and Atlantic sturgeon in the US Southern mid-Atlantic bight flyway. *PLoS ONE*. 15(6): e0234442. <https://doi.org/10.1371/journal.pone.0234442>.
- Salerno D., S. Eayrs, M. Pol, S. Lee & A.J. Baukus (2010). *Analysis of Size Selectivity and Bycatch in the Gillnet Fishery for Monkfish*. Portland, ME: Gulf of Maine Research Institute. p.
- Salisbury D.P., C.W. Clark & A.N. Rice (2016). Right whale occurrence in the coastal waters of Virginia, U.S.A.: Endangered species presence in a rapidly developing energy market. *Marine Mammal Science*. 32(2): 508-519. <https://onlinelibrary.wiley.com/doi/abs/10.1111/mms.12276>.
- Sasso C.R. & S.P. Epperly (2006). Seasonal sea turtle mortality risk from forced submergence in bottom trawls. *Fisheries Research*. 81: 86-88.
- Schevill W.E., W.A. Watkins & K.E. Moore (1986). Status of *Eubalaena glacialis* off Cape Cod. *Reports of the International Whaling Commission*. 10: 79-82.
- Seminoff J.A., C.D. Allen, G.H. Balazs, P.H. Dutton, T. Eguchi, H.L. Hass, S.A. Hargrove, M. Jensen, D.L. Klemm, A. Lauritsen, M., et al. (2015). *Status Review of the Green Turtle (Chelonia mydas) Under the Endangered Species Act*. U.S. Department of Commerce. NOAA Technical Memorandum: NOAA-TM-NMFS-SWFSC-539. p.
- Sheehan T.F., D.G. Reddin, G. Chaput & M.D. Renkawitz (2012). SALSEA North America: A pelagic ecosystem survey targeting Atlantic salmon in the Northwest Atlantic. *ICES Journal of Marine Science*. 69(9): 1580-1588.
- Sherman K., N.A. Jaworski & T.J. Smayda, eds. (1996). *The Northeastern Shelf Ecosystem - Assessment, Sustainability, and Management*. Cambridge, MA: Blackwell Science. 564 p.
- Shoop C. & R.D. Kenney (1992). Seasonal distributions and abundances of loggerhead and leatherback sea turtles in waters of the northeastern United States. *Herpetological Monographs*. 6: 43-67.
- Slabbekoorn H., N. Bouton, I. van Opzeeland, A. Coers, C. ten Cate & A.N. Popper (2010). A noisy spring: the impact of globally rising underwater sound levels on fish. *Trends in Ecology & Evolution*. 25(7): 419-427. <https://doi.org/10.1016/j.tree.2010.04.005>.
- Smith C.L. & P.M. Clay (2010). Measuring subjective and objective well-being: analyses from five marine commercial fisheries. *Human Organization*. 62(2): 158-168.
- Sosebee K.A. (2022). *Maturity of spiny dogfish in US waters from 1998-2021*. Woods Hole, MA Working Paper Submitted as part of the 2022 Spiny Dogfish Research Track Assessment. p.
- Sosebee K.A. & P.J. Rago (2018). *Status Report for Spiny Dogfish in 2018. Draft Working Paper for Predissemination Peer Review*. Woods Hole, MA p. <http://www.mafmc.org/s/2018-Status-Report-for-spiny-dogfish.pdf>.
- Stanistreet J.E., D.P. Nowacek, J.T. Bell, D.M. Cholewiak, J.A. Hildebrand, L.E.W. Hodge, S.M. Van Parijs & A.J. Read (2018). Spatial and seasonal patterns in acoustic detections of sperm whales *Physeter macrocephalus* along the continental slope in the western North Atlantic Ocean. *Endangered Species Research*. 35: 1-13. <https://www.int-res.com/abstracts/esr/v35/p1-13/>.
- Stein A., K.D. Friedland & M. Sutherland (2004a). Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. *North American Journal of Fisheries Management*. 24: 171-183.
- Stein A., K.D. Friedland & M. Sutherland (2004b). Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*. 133: 527-537.
- Stenberg C., J.G. Støttrup, M. van Deurs, C.W. Berg, G.E. Dinesen, H. Mosegaard, T.M. Grome & S.B. Leonhard (2015). Long-term effects of an offshore wind farm in the North Sea on fish communities.

- Marine Ecology Progress Series*. 528: 257-265. <https://www.int-res.com/abstracts/meps/v528/p257-265/>.
- Stenseth N.C., A. Mysterud, G. Ottersen, J.W. Hurrell, K.-S. Chan & M. Lima (2002). Ecological Effects of Climate Fluctuations. *Science*. 297(5585): 1292-1296. <https://science.sciencemag.org/content/sci/297/5585/1292.full.pdf>.
- Stevenson D., L. Chiarella, D. Stephan, R.N. Reid, K. Wilhelm, J. McCarthy & M. Pentony (2004). *Characterization of the Fishing Practices and Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat*. Woods Hole, MA: U.S. Dept. of Commerce. NEFSC Technical Memo NMFS-NE-181. 179 p.
- Stone K.M., S. Leiter, R.D. Kenney, B. Wikgren, J.L. Thompson, J.K.D. Taylor & S.D. Kraus (2017). Distribution and abundance of cetaceans in a wind energy development area offshore of Massachusetts and Rhode Island. *Journal of Coastal Conservation*. 21: 527-543.
- Swingle W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan & D.A. Pabst (1993). Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. *Marine Mammal Science*. 9(3): 309-315.
- Taormina B., J. Bald, A. Want, G. Thouzeau, M. Lejart, N. Desroy & A. Carlier (2018). A review of potential impacts of submarine Power cables on the marine environment: Knowledge gaps, recommendations and future directions. *Renewable and Sustainable Energy Reviews*. 96: 380-391.
- Taormina B., C. Di Poi, A. Agnalt, A. Carlier, N. Desroy, R.H. Escobar-Lux, J. D'eu, F. Freytet & C.M.F. Durif (2020). Impact of magnetic fields generated by AC/DC submarine power cables on the behavior of juvenile European lobster (*Homarus gammarus*). *Aquatic Toxicology*. 220(105401).
- TEWG (1998). *An Assessment of the Kemp's Ridley (Lepidochelys kempii) and Loggerhead (Caretta caretta) Sea Turtle Populations in the Western North Atlantic*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-409. 96 p.
- TEWG (2000). *Assessment of the Kemp's Ridley and Loggerhead Sea Turtle Populations in the Western North Atlantic*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-444. 115 p.
- TEWG (2007). *An Assessment of the Leatherback Turtle Population in the Western North Atlantic Ocean*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-555. 116 p.
- TEWG (2009). *An Assessment of the Loggerhead Turtle Population in the Western North Atlantic*. U.S. Department of Commerce. NOAA Technical Memorandum NMFS-SEFSC-575. 131 p.
- Thomsen F., K. Lüdemann, R. Kafemann & W. Piper (2006). *Effects of offshore wind farm noise on marine mammals and fish, biola*. Hamburg, Germany: C Ltd. p. https://tethys.pnnl.gov/sites/default/files/publications/Effects_of_offshore_wind_farm_noise_on_marine-mammals_and_fish-1-.pdf.
- USASAC (2004). *Annual Report of the U.S. Atlantic Salmon Assessment Committee*. Woods Hole, MA: U.S. Atlantic Salmon Assessment Committee. 133 p.
- USFWS (2018). *Recovery plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (Salmo salar)*. 74 p.
- Vu E., D. Risch, C.W. Clark, S. Gaylord, L. Hatch, M. Thompson, D.N. Wiley & S.M. Van Parijs (2012). Humpback whale song occurs extensively on feeding grounds in the western North Atlantic Ocean. *Aquatic Biology*. 14(2): 175-183.
- Waldman J.R., T.L. King, T. Savoy, L. Maceda, C. Grunwald & I.I. Wirgin (2013). Stock origins of subadult and adult Atlantic sturgeon, *Acipenser oxyrinchus*, in a non-natal estuary, Long Island Sound. *Estuaries and Coasts*. 36: 257-267.
- Warden M.L. (2011a). Modeling loggerhead sea turtle (*Caretta caretta*) interactions with US Mid-Atlantic bottom trawl gear for fish and scallops, 2005–2008. *Biological Conservation*. 144(9): 2202-2212. [//www.sciencedirect.com/science/article/pii/S0006320711002102](http://www.sciencedirect.com/science/article/pii/S0006320711002102).
- Warden M.L. (2011b). *Proration of Loggerhead Sea Turtle (Caretta caretta) Interactions in US Mid-Atlantic Bottom Otter Trawls for Fish and Scallops, 2005-2008, by Managed Species Landed*. Woods Hole,

- MA: US Department of Commerce. NEFSC Reference Document 11-04. 8 p.
<http://www.nefsc.noaa.gov/publications/crd/>.
- Waring G.T., E. Josephson, K. Maze-Foley & P.E. Rosel (2016). *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2015*. Woods Hole, MA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-NE-238. 512 p.
http://www.nmfs.noaa.gov/pr/sars/pdf/atlantic2015_final.pdf.
- Watkins W.A. & W.E. Schevill (1982). Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. *Fishery Bulletin*. 80(4): 875-880.
- Whitt A.D., K. Dudzinski & J.R. Laliberté (2013). North Atlantic right whale distribution and seasonal occurrence in nearshore waters off New Jersey, USA, and implications for management. *Endangered Species Research*. 20(1): 59-69. <https://www.int-res.com/abstracts/esr/v20/n1/p59-69/>.
- Winn H.E., C.A. Price & P.W. Sorensen (1986). The distributional biology of the right whale (*Eubalaena glacialis*) in the western North Atlantic. *Reports of the International Whaling Commission*. 10: 129-138.
- Wippelhauser G.S. (2012). *A Regional Conservation Plan for Atlantic Sturgeon in the U. S. Gulf of Maine. Prepared on behalf of Maine Department of Marine Resources, Bureau of Science*. NOAA Species of Concern Grant Program Award #NA06NMF4720249A. p.
- Wippelhauser G.S., J.A. Sulikowski, G.B. Zydlewski, M.A. Altenritter, M. Kieffer & M.T. Kinnison (2017). Movements of Atlantic Sturgeon of the Gulf of Maine Inside and Outside of the Geographically Defined Distinct Population Segment. *Marine and Coastal Fisheries*. 9: 93-107.
- Wirgin I.I., M.W. Breece, D.A. Fox, L. Maceda, K.W. Wark & T.L. King (2015a). Origin of Atlantic sturgeon collected off the Delaware Coast during spring months. *North American Journal of Fisheries Management*. 35: 20-30.
- Wirgin I.I., L. Maceda, C. Grunwald & T.L. King (2015b). Population origin of Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus* by-catch in U.S. Atlantic coast fisheries. *Journal of Fish Biology*. 86(4): 1251-1270.
- Wright A.J., N.A. Soto, A.L. Baldwin, M. Bateson, C.M. Beale & C. Clark (2007). Do marine mammals experience stress related to anthropogenic noise? *International Journal of Comparative Psychology*. 20: 274-316.

9.0 APPENDICES

9.1 APPENDIX A – ADDITIONAL DECISION SUPPORT TOOL INFORMATION

Additional figures and data tables from DST

Figure 40. Alternative 2 – max distance 20

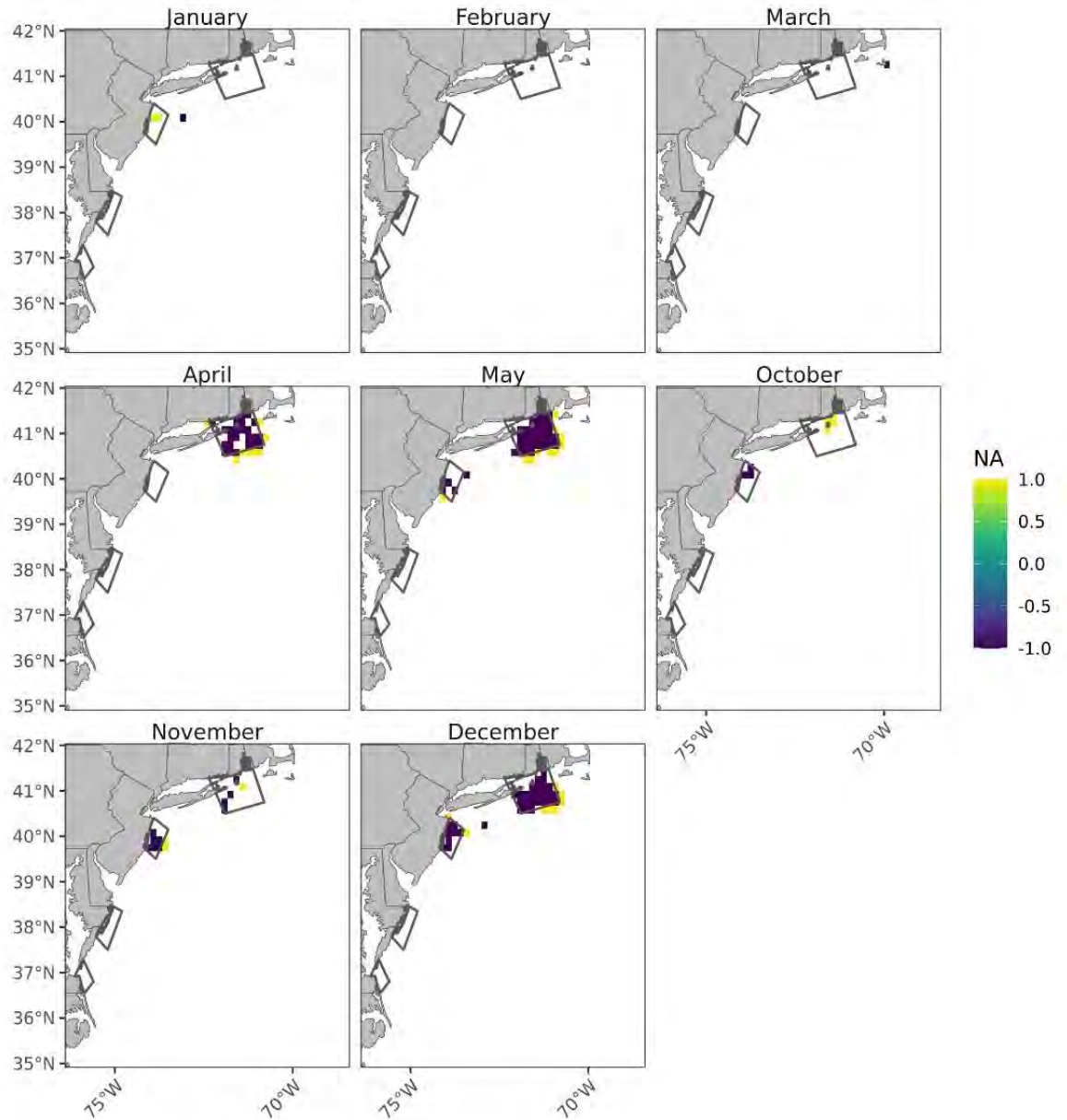


Table 48. Alternative 2 – max distance 20

Gear Numbers – Post Closure				
Variable	Month	Default	Scenario	Reduction
1 GearFished_PostClosure	1	4,109	4,093	0.4 %
2 GearFished_PostClosure	2	2,545	2,528	0.7 %
3 GearFished_PostClosure	3	273	260	4.9 %
4 GearFished_PostClosure	4	6,138	5,856	4.6 %
5 GearFished_PostClosure	5	8,370	6,454	22.9 %
6 GearFished_PostClosure	6	7,241	7,241	0 %
7 GearFished_PostClosure	7	4,019	4,019	0 %
8 GearFished_PostClosure	8	3,634	3,634	0 %
9 GearFished_PostClosure	9	2,358	2,358	0 %
10 GearFished_PostClosure	10	2,754	2,744	0.4 %
11 GearFished_PostClosure	11	3,275	3,209	2 %
12 GearFished_PostClosure	12	3,918	2,150	45.1 %
13 GearFished_PostClosure	Total	48,635	44,545	8.4 %

Figure 41. Alternative 2 - max distance 50

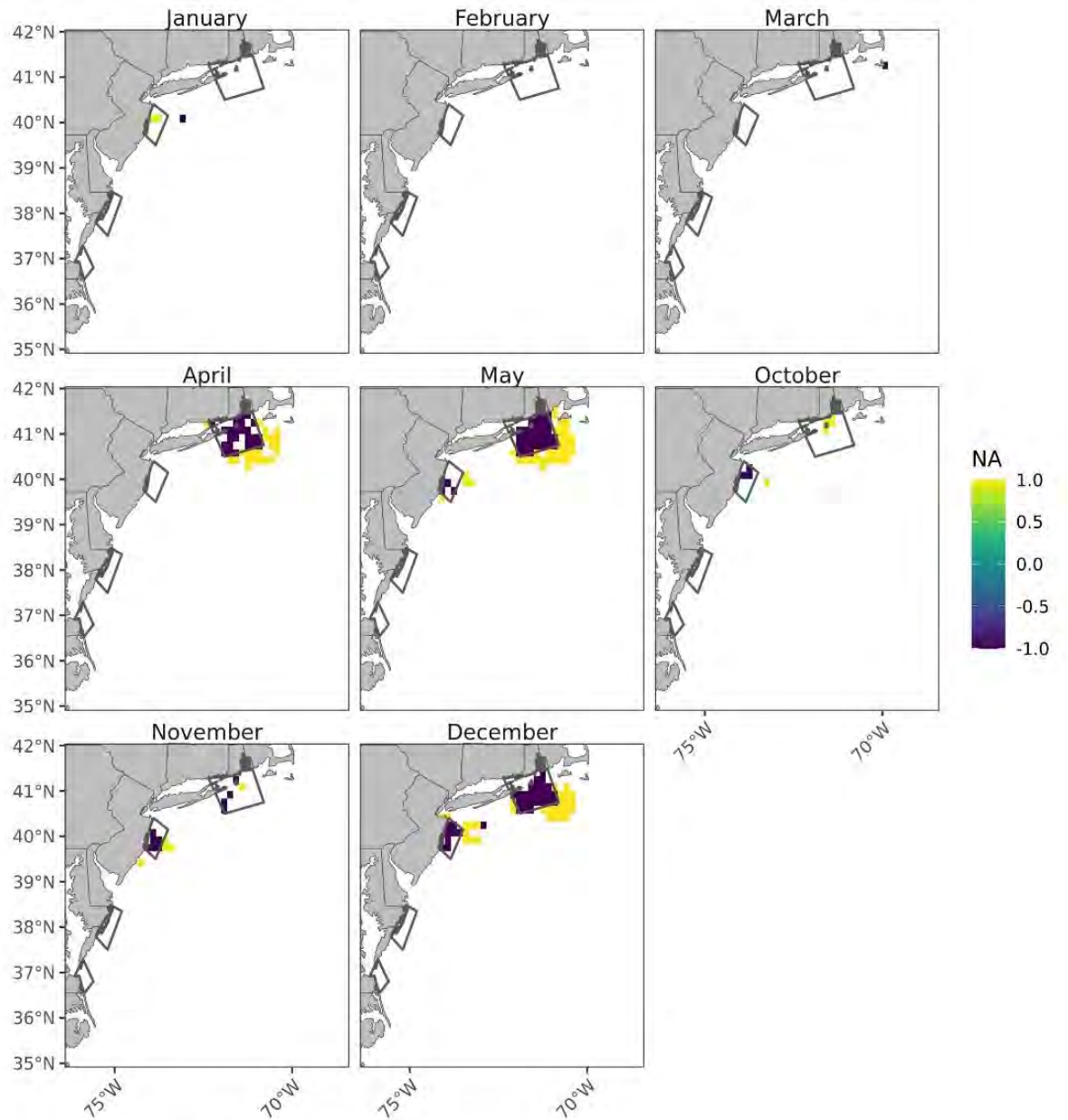


Table 49. Alternative 2 - max distance 50

Gear Numbers – Post Closure

	Variable	Month	Default	Scenario	Reduction
1	GearFished_PostClosure	1	4,109	4,100	0.2 %
2	GearFished_PostClosure	2	2,545	2,537	0.3 %
3	GearFished_PostClosure	3	273	266	2.6 %
4	GearFished_PostClosure	4	6,138	6,113	0.4 %
5	GearFished_PostClosure	5	8,370	8,215	1.9 %
6	GearFished_PostClosure	6	7,241	7,241	0 %
7	GearFished_PostClosure	7	4,019	4,019	0 %
8	GearFished_PostClosure	8	3,634	3,634	0 %
9	GearFished_PostClosure	9	2,358	2,358	0 %
10	GearFished_PostClosure	10	2,754	2,746	0.3 %
11	GearFished_PostClosure	11	3,275	3,273	0.1 %
12	GearFished_PostClosure	12	3,918	3,226	17.7 %
13	GearFished_PostClosure	Total	48,635	47,728	1.9 %

Figure 42. Alternative 3 - max distance 20

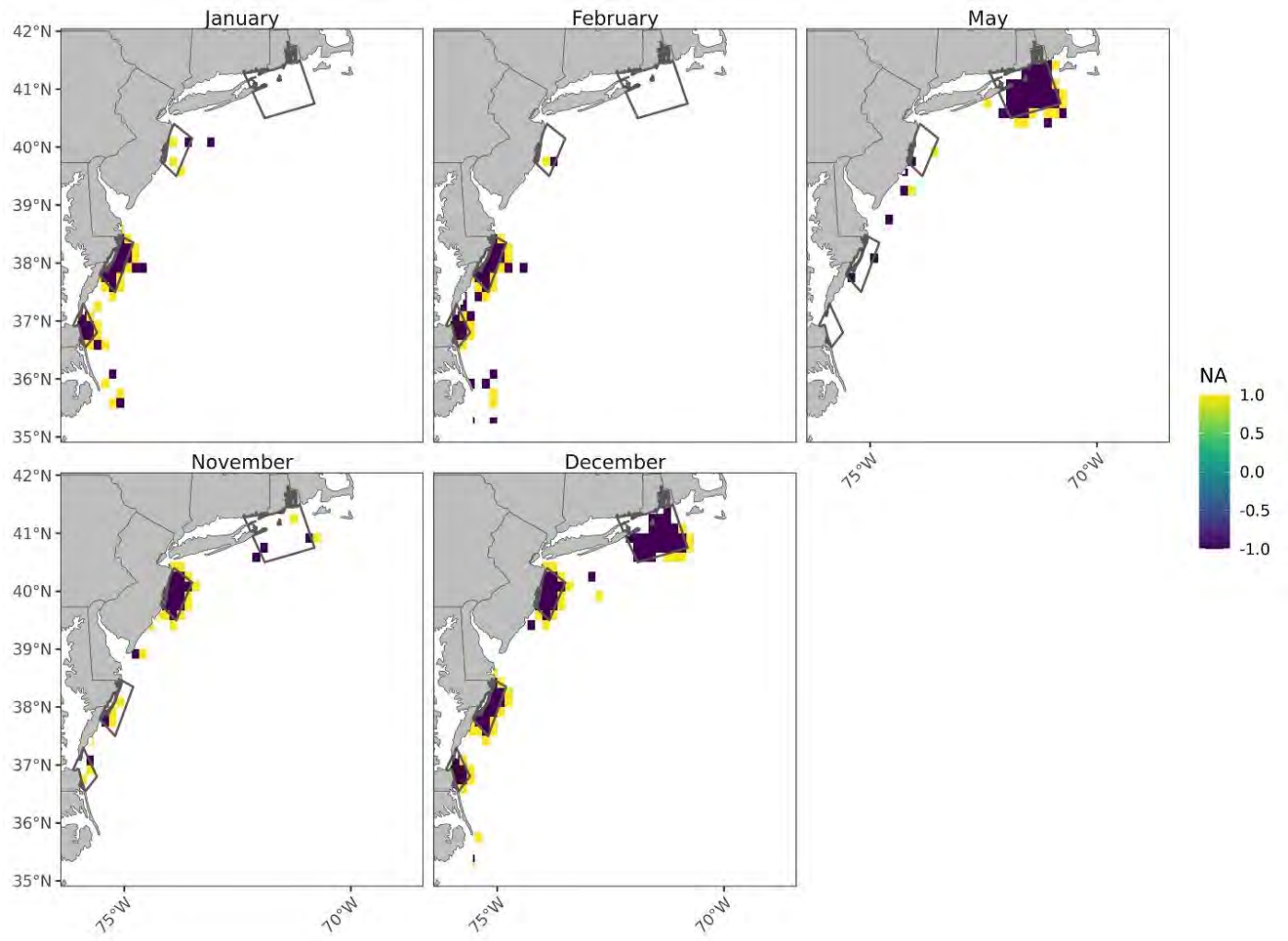


Table 50. Alternative 3 - max distance 20

Gear Numbers – Post Closure					
	Variable	Month	Default	Scenario	Reduction
1	GearFished_PostClosure	1	4,109	4,093	0.4 %
2	GearFished_PostClosure	2	2,545	2,528	0.7 %
3	GearFished_PostClosure	3	273	273	0 %
4	GearFished_PostClosure	4	6,138	6,138	0 %
5	GearFished_PostClosure	5	8,370	6,593	21.2 %
6	GearFished_PostClosure	6	7,241	7,241	0 %
7	GearFished_PostClosure	7	4,019	4,019	0 %
8	GearFished_PostClosure	8	3,634	3,634	0 %
9	GearFished_PostClosure	9	2,358	2,358	0 %
10	GearFished_PostClosure	10	2,754	2,754	0 %
11	GearFished_PostClosure	11	3,275	3,265	0.3 %
12	GearFished_PostClosure	12	3,918	2,150	45.1 %
13	GearFished_PostClosure	Total	48,635	45,047	7.4 %

Figure 43. Alternative 3 - max distance 50

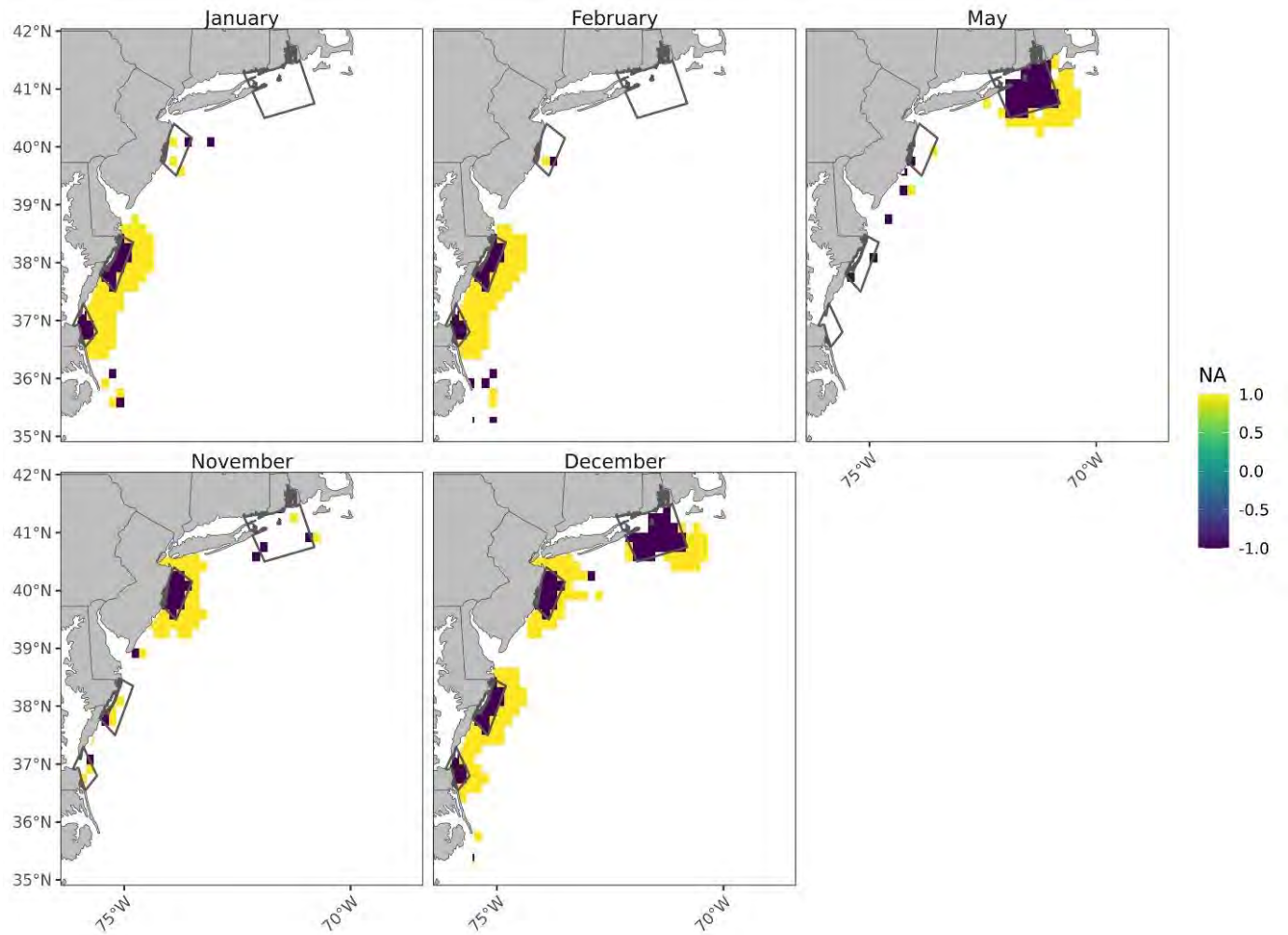


Table 51. Alternative 3 - max distance 50

Gear Numbers – Post Closure				
Variable	Month	Default	Scenario	Reduction
1 GearFished_PostClosure	1	4,109	4,100	0.2 %
2 GearFished_PostClosure	2	2,545	2,537	0.3 %
3 GearFished_PostClosure	3	273	273	0 %
4 GearFished_PostClosure	4	6,138	6,138	0 %
5 GearFished_PostClosure	5	8,370	8,215	1.9 %
6 GearFished_PostClosure	6	7,241	7,241	0 %
7 GearFished_PostClosure	7	4,019	4,019	0 %
8 GearFished_PostClosure	8	3,634	3,634	0 %
9 GearFished_PostClosure	9	2,358	2,358	0 %
10 GearFished_PostClosure	10	2,754	2,754	0 %
11 GearFished_PostClosure	11	3,275	3,275	0 %
12 GearFished_PostClosure	12	3,918	3,226	17.7 %
13 GearFished_PostClosure	Total	48,635	47,771	1.8 %

Figure 44. Alternative 4 - max distance 20

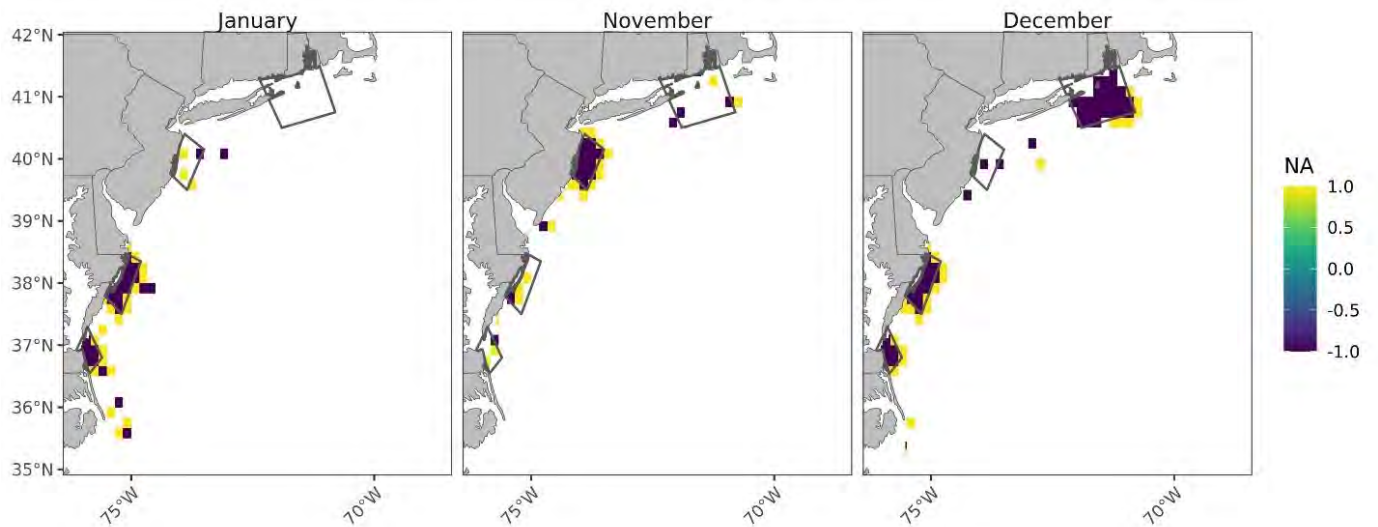


Table 52. Alternative 4 - max distance 20

Gear Numbers – Post Closure				
Variable	Month	Default	Scenario	Reduction
1 GearFished_PostClosure	1	4,109	4,093	0.4 %
2 GearFished_PostClosure	2	2,545	2,545	0 %
3 GearFished_PostClosure	3	273	273	0 %
4 GearFished_PostClosure	4	6,138	6,138	0 %
5 GearFished_PostClosure	5	8,370	8,370	0 %
6 GearFished_PostClosure	6	7,241	7,241	0 %
7 GearFished_PostClosure	7	4,019	4,019	0 %
8 GearFished_PostClosure	8	3,634	3,634	0 %
9 GearFished_PostClosure	9	2,358	2,358	0 %
10 GearFished_PostClosure	10	2,754	2,754	0 %
11 GearFished_PostClosure	11	3,275	3,215	1.8 %
12 GearFished_PostClosure	12	3,918	2,548	35 %
13 GearFished_PostClosure	Total	48,635	47,189	3 %

Figure 45. Alternative 4 - max distance 50

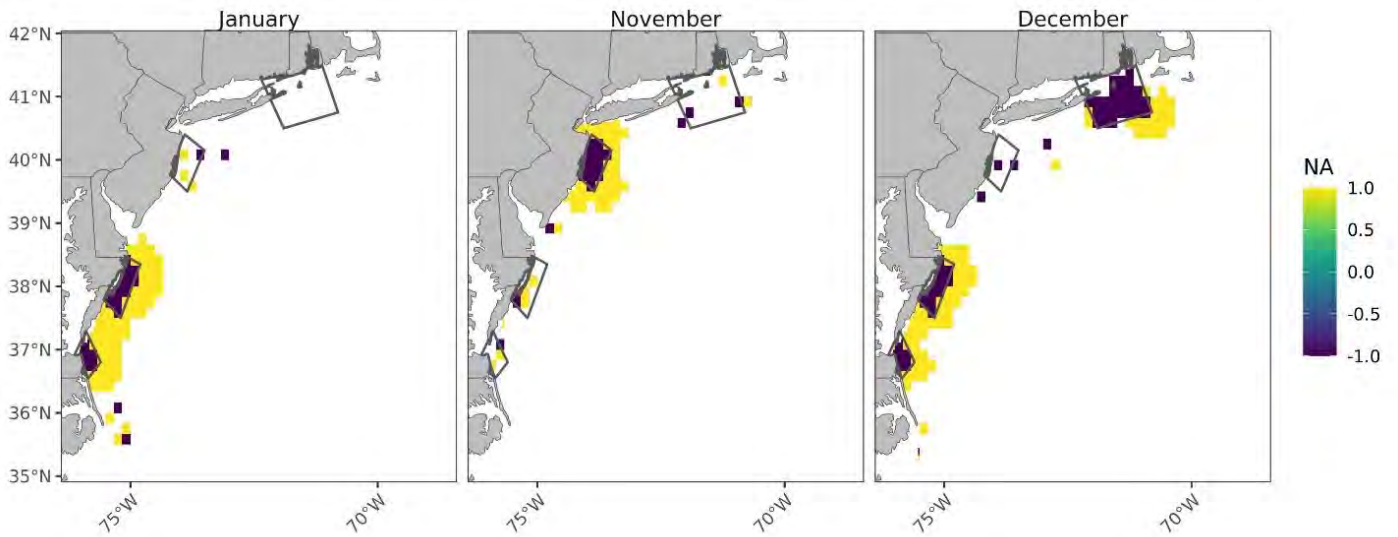


Table 53. Alternative 4 - max distance 50

Gear Numbers – Post Closure				
Variable	Month	Default	Scenario	Reduction
1 GearFished_PostClosure	1	4,109	4,100	0.2 %
2 GearFished_PostClosure	2	2,545	2,545	0 %
3 GearFished_PostClosure	3	273	273	0 %
4 GearFished_PostClosure	4	6,138	6,138	0 %
5 GearFished_PostClosure	5	8,370	8,370	0 %
6 GearFished_PostClosure	6	7,241	7,241	0 %
7 GearFished_PostClosure	7	4,019	4,019	0 %
8 GearFished_PostClosure	8	3,634	3,634	0 %
9 GearFished_PostClosure	9	2,358	2,358	0 %
10 GearFished_PostClosure	10	2,754	2,754	0 %
11 GearFished_PostClosure	11	3,275	3,275	0 %
12 GearFished_PostClosure	12	3,918	3,254	17 %
13 GearFished_PostClosure	Total	48,635	47,961	1.4 %

DST Industry Meeting Notes

From December 2023 through January 2024, the Joint Dogfish/Monkfish FMAT/PDT has been working to package alternatives under consideration in a Joint Framework Action to address Atlantic sturgeon bycatch in the dogfish and monkfish fisheries. To account for the potential effort shifts that may occur as the result of some closure area alternatives under consideration, the FMAT/PDT requested that the Atlantic Large Whale Take Reduction Team’s (ALWTRT) Decision Support Tool (DST) be used. The DST team advised that industry input was necessary to accurately model fishing behavior, particularly willingness and ability to change location in response to implementation of closure areas. The FMAT/PDT held a series of two informal sessions with members of industry already familiar with the application of the TRT or who were members of either the monkfish or dogfish advisory panels.

Meeting 1 Jan 9, 2024

Two industry members were in attendance, both from New Jersey.

NMFS GARFO staff explained the current status of the Framework Action under development, the incorporation of the DST in that development and the need for industry input. Industry members were shown the different alternatives packages, including the closure areas.

Feedback was as summarized below:

- The DST simplifies movement; it considers distance between where gear is pre-closure and where it can move to, but it does not consider homeport of the affected vessels. Depending on where a vessel is homeported, a closure could be more or less impactful than the DST might predict.
 - The SNE area in particular may be problematic, since the homeport for the bulk of those vessels may be too far from alternative grounds.
- Since the DST looks at places where people are fishing now to identify where gear could move, it is unable to allocate gear to historic fishing grounds that are not currently fished, but could be.
- The DST does not account for gear conflicts or the space needed between gillnet sets.
- Dynamics that affect fisherman decision-making regarding when and where to set gear are very complex and ever changing. Wind energy development, for example, is unaccounted for, and could affect industry behavior in unpredictable ways. This also affects decision making surrounding decisions to fish at all – all of the compounding issues in the fishery will cause a portion of the industry out of business. Fish prices in these fisheries have not been strong in recent years.
- It would be useful if charts showing these closure areas included others, such as the Harbor Porpoise Take Reduction Plan closures/regulated areas.
- Fishermen from Point Pleasant may steam to the other side of the mudhole

Meeting 2, January 17, 2024

Five industry members were in attendance, with participants from across the affected area (i.e. VA to SNE). NMFS GARFO staff ran through the same explanation as was provided at the Jan 9 meeting, but the DST team prepared new slides showing the alternatives and DST results.

Feedback was as summarized below:

- A similar discussion as was held on January 9th regarding the lack of information about vessel homeport
- With a monkfish season in SNE that lasts from April to June, a May closure would result in fishermen from RI simply not fishing during that entire period. The effort and cost to start up fishing in the spring just to be shut out in May would prevent the business from being profitable.
 - Areas southeast of the SNE closure do not seem realistic, and may conflict with as yet unknown Atlantic Large Whale measures.
 - One industry member believed that the % of gear removed from SNE in alternative 2 was an underestimate
- There was low confidence in the ability for sturgeon to be adequately tracked and distribution understood.
- Industry members generally did not like data that showed % of coastwide gear affected by the alternatives, given that it may underemphasize the effect these measures would have on affected industry.
- It was noted that the bulk of the bycatch reduction would come from full removal of gear from the water; these fisheries have few alternatives for the participants.
 - There was concern about the potential for success of these closures in comparison to their impact on the fishery.
 - Industry in attendance stated that they were discouraged that they and their cohort would be able to weather the closures as currently structured

- Not relevant to the discussion about effort shifts, but the group did briefly discuss the potential for low-profile gillnet gear as a solution, though more development is needed for it to be widely adoptable by industry

After the conclusion of the meeting, an industry member who had audio trouble reached out to NMFS GARFO staff to communicate comments that he intended to provide during the meeting. These were:

- VA beach closures would result in vessel movement south, where more sturgeon would be expected to be encountered. Any reduction that is achieved by the closure areas would occur as a result of gear removal
 - The area covering the mouth of the bay might be particularly important to close, however.
- Large potential for negative impacts to the dogfish fishery which is already struggling.

9.2 APPENDIX B – FINAL REPORT FROM DR. HOCKING

Atlantic Sturgeon Takes Under Closure Alternatives

Daniel J. Hocking NOAA/NMFS/GARFO January

29, 2024

This analysis calculates the risk of sturgeon takes per unit effort and combines that with various alternative actions involving gillnet closure areas by different months.

Gear Removal and Redistribution

The Large Whale Take Reduction Team’s NEFSC analyst, Laura Solinger, used the decision support tool (DST) to evaluate how gear would be moved or not fished under each scenario and relative to the baseline (gillnet gear effort distribution from 2017-2020).

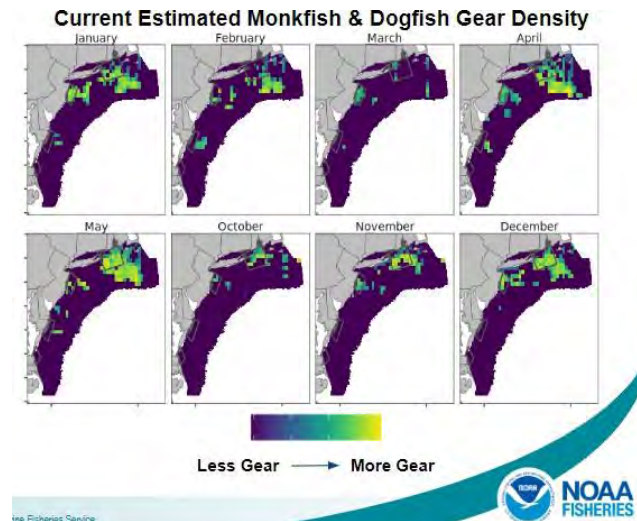


Figure 1: Example of current gillnet gear distribution relative to closure polygons.

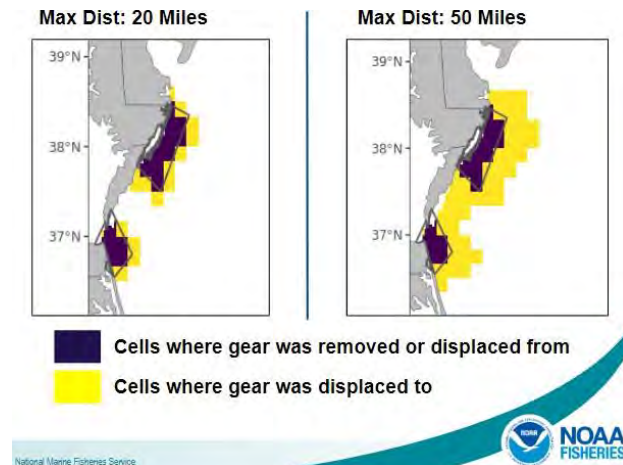


Figure 2: Example of gear redistribution based on maximum distance vessels will move in response to closures.

Create Risk Layer

The Northeast Fisheries Science Center (NEFSC) generated estimates of total annual discards of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) from 2000 - 2022 in the otter trawl and gillnet fisheries. The analysis was conducted most recently by Boucher and Curti (2022) following the methods used by Miller and Shepherd (2011), Miller (2015), and Curti (2016). The general approach was to use observer data to estimate discards as a function of gear type, year, quarter of the year, and species landed. The resulting generalized linear model was then applied to data from all federal commercial gillnet trips.

I created a risk distribution layer for sturgeon by taking the NEFSC sturgeon gillnet take model and predicting it to all gillnet trips from 2012-2022 (2020 drops out due to lack of data in the NEFSC model). Data back to 2012 were used for the risk mapping because sturgeon takes are low probability events and more data was needed to create a smooth layer for when vessels move to areas with previously little fishing effort during 2017-2022. Without going back to 2012 for sturgeon risk the map becomes disjunct with gaps that were difficult to smooth. The trade-off with this approach is that sturgeon populations, movements, and gear selectivity can change over this time frame. However, the informal sensitivity analysis using only 2017 - 2022 data did not show large differences compared to the current analysis.

The expected sturgeon takes on each trip from the model results were then divided by the effort (days fished) on that trip. I removed the upper and lower 5% of effort trips from the risk mapping because effort can be misreported with fixed gear and this change in the denominator would have large effects on the rates (e.g. trip lands thousands of pounds of fish and discarded a sturgeon but the effort was only recorded as 5 minutes resulting in an expectation of 288 sturgeon takes per day at that location). Additionally, a minimum of 2 fishing hours was required for data inclusion in the risk mapping. The point-estimates from trips were then smoothed using inverse distance weighted interpolation by month to create smoother risk layers with gaps filled in. A distance-decay coefficient of 1.8 was used to weight closer trips more and balance local vs regional smoothing effects.

Expected Sturgeon Takes per Day Fished

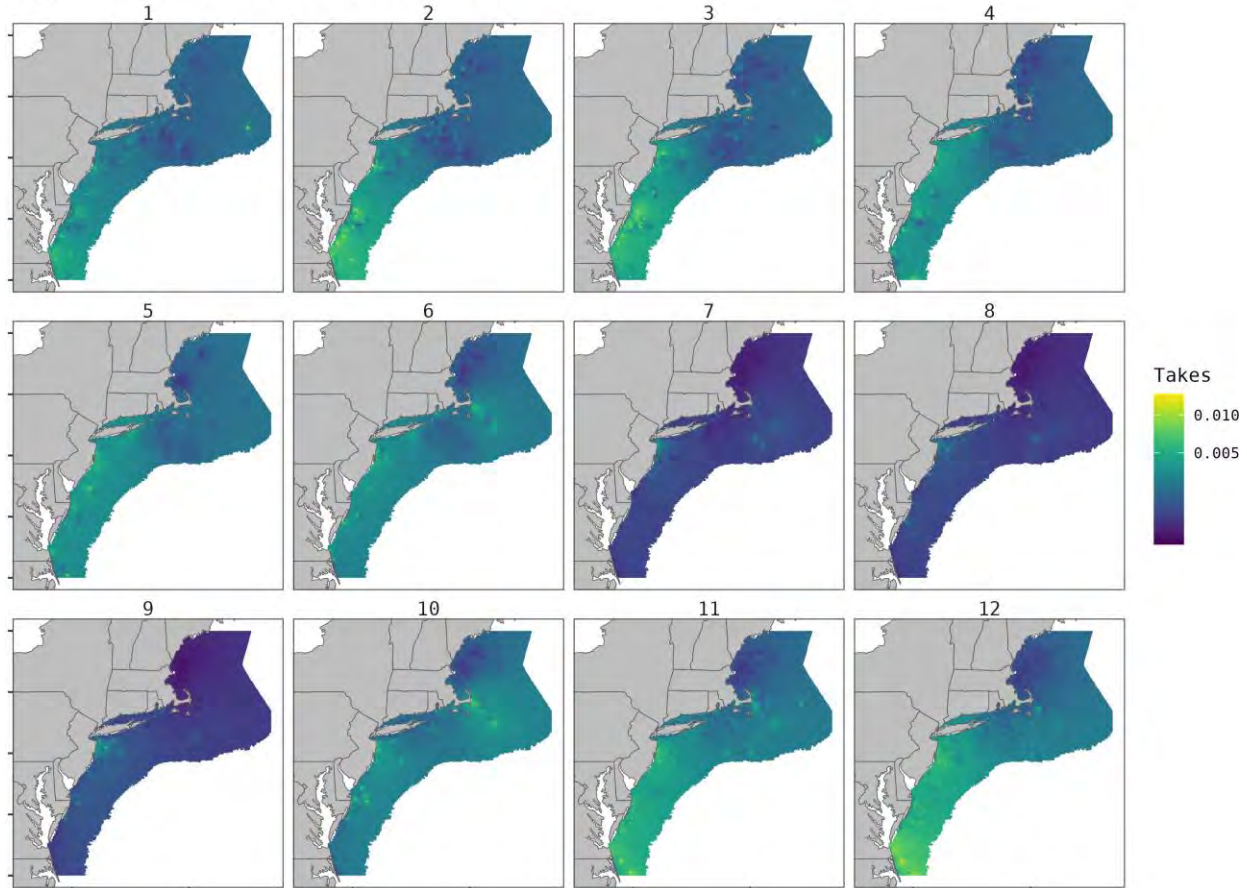


Figure 3: Expected Atlantic sturgeon takes per unit effort (days fished) by month.

Risk x Gear Density

I overlaid the resulting monthly risk maps on the various monthly scenario maps and multiplied the risk per unit effort by the total effort in each raster square to get an index of the total estimated takes in each square under each gear movement/removal scenario. I finally calculated the percent total reduction in sturgeon takes expected under each scenario.

Changes in Sturgeon Takes Alt1_MaxDist20

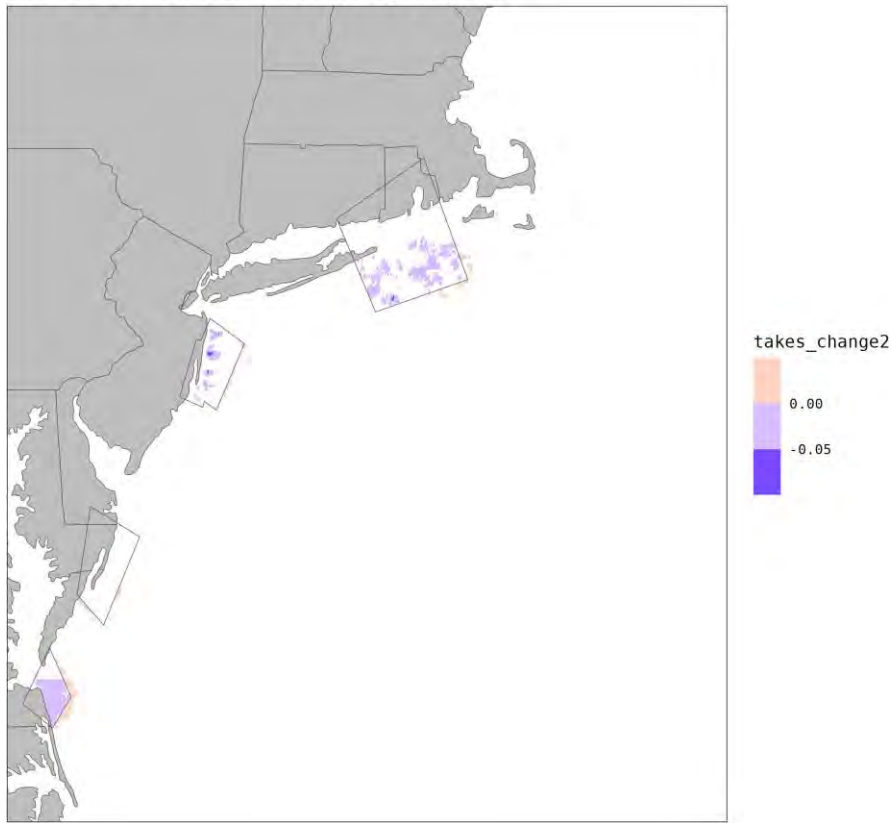


Figure 4: Example of change in sturgeon takes under alternative action 2 in December assuming a maximum distance of 20 nautical miles vessels will move from current fishing areas. In this scenario, most of the gear is removed from fishing due to lack of suitable fishing locations within the maximum distance allowed. Little gear is redistributed.

Changes in Sturgeon Takes Alt3_MaxDist50

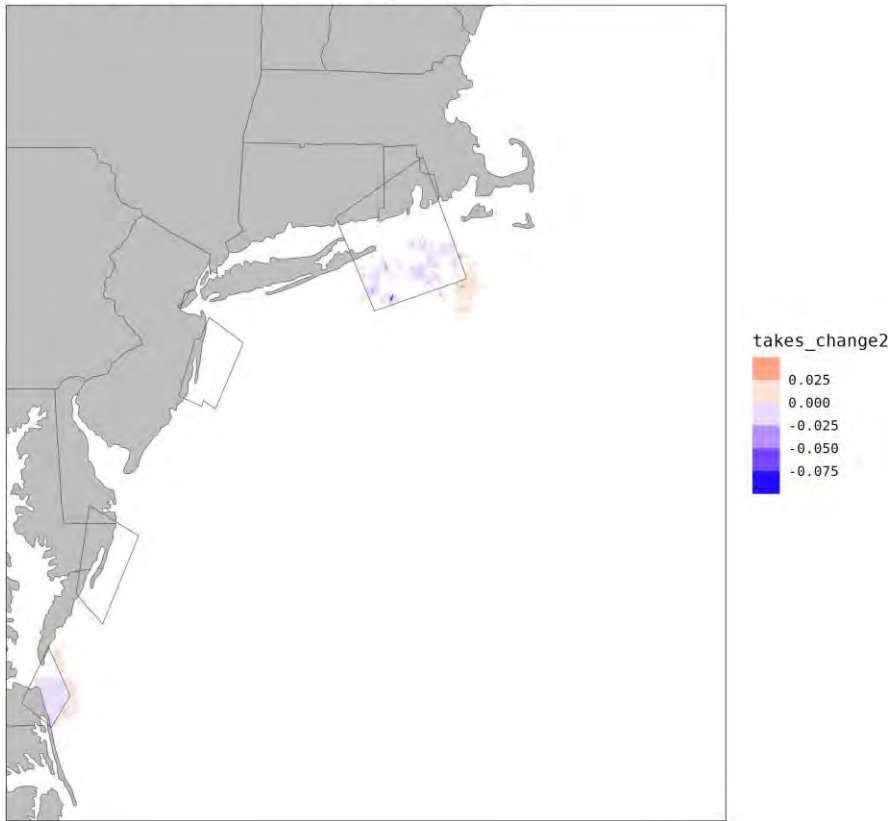


Figure 5: Example of change in sturgeon takes under alternative action 4 in December assuming a maximum distance of 50 nautical miles vessels will move from current fishing areas. In this scenario, most of the gear redistributes to other areas and little is removed. The results is only a slight decrease in expected sturgeon takes.

Table 1: Expected percent reduction of Atlantic Sturgeon takes by federally-permitted vessels using gillnet gears under various actions and behavior (max movement distance) scenarios. Action 1 is ‘no action’ and other alternatives not involving closures are also not listed.

<i>Action</i>	<i>Max Distance Move (nm)</i>	<i>Percent Reduction</i>
2	20	13.00%
2	50	4.20%
3	20	10.60%
3	50	3.20%
4	20	4.10%
4	50	1.90%

References

Boucher, J.M. and Curti, K.L. 2022. Discard Estimates for Atlantic Sturgeon through 2021. White paper (unpublished).

Curti, K. 2016. Updated Summary of Discard Estimates for Atlantic Sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.

Miller, T. J., and Shepherd, G.R. 2011. Summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.

Miller, T.J. 2015. Updated summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch. Provided to the Atlantic States Marine Fisheries Commission.

9.3 APPENDIX C – JANUARY 2024 TAKE ESTIMATE UPDATE

Discard Estimates for Atlantic Sturgeon Federal Waters

Daniel J. Hocking NOAA/NMFS/GARFO Last Updated
on 19 January 2024

The Northeast Fisheries Science Center (NEFSC) generated estimates of total annual discards of Atlantic Sturgeon (*Acipenser oxyrinchus m.r.yi·inchus*) from 2000 - 2021 in the otter trawl and gillnet fisheries. The analysis was conducted most recently by Boucher and Curti (2022) following the methods used by Miller and Shepherd (2011), Miller (2015), and Curti (2016). The general approach was to use observer data to estimate discards as a function of gear type, year, quarter of the year, and species landed. The resulting generalized linear model was then applied to data from modified vessel trip reports (VTR) in the NEFSC VESLOG to estimate total sturgeon discards and resulting mortality for all federally permitted vessels in state and federal waters.

Here we apply the models from Boucher and Curti (2022) to otter trawl and gillnet data on subtrips in federal waters. To best match the data used in the assessment, we used data from the Catch Accounting and Management System (CAMS) but restricted to data with valid latitude and longitude from a VTR that indicated they actively fished in non-coastal waters, as done through VESLOG data in the assessment. We further filtered the data to only trips with VTR fishing locations in federal waters.

The best trawl model did not include any year-specific predictor variables, therefore we were able to estimate discards for all years, including those not in the observer data used for model fitting (e.g. 2020). For years without observer-specific mortality rates, we used the mean across other years. The best gillnet model included year, species by year, and quarter by year as independent predictors, therefore discards could only be estimated for years used in the model fitting (e.g. not 2020).

The results presented in the tables below are estimates from federally-permitted vessels fishing in federal waters and reporting valid location data. The results do not always coincide precisely with those from the assessment due to slight differences in the data used and in some cases the federal bycatch presented here can be higher than the mean total estimate from the assessment but those are in situations of high uncertainty and fall well within the confidence interval.

Table 1: Annual estimates of Atlantic Sturgeon discards by federally permitted vessels in federal waters using bottom otter trawl gear.

Year	Total Federal Bycatch	Standard Error	Proportion Dead	Dead Bycatch	Lower CI (2.5%)	Upper CI (97.5%)
1996	779	115	0.035	27	20	35
1997	837	99	0.035	30	23	36
1998	749	80	0.035	26	21	32
1999	1446	664	0.035	51	5	97
2000	986	199	0.000	0	0	0
2001	721	79	0.000	0	0	0
2002	804	80	0.000	0	0	0
2003	665	66	0.000	0	0	0
2004	651	60	0.000	0	0	0
2005	639	63	0.143	91	74	109
2006	724	72	0.179	130	104	155
2007	591	68	0.086	51	39	62
2008	721	176	0.161	116	61	172
2009	712	82	0.021	15	12	18
2010	585	53	0.009	5	4	6
2011	557	50	0.000	0	0	0
2012	533	47	0.000	0	0	0
2013	547	53	0.000	0	0	0
2014	493	40	0.000	0	0	0
2015	409	29	0.000	0	0	0
2016	397	30	0.000	0	0	0
2017	359	28	0.000	0	0	0
2018	338	31	0.080	27	22	32
2019	401	33	0.000	0	0	0
2020	369	36	0.035	13	11	16
2021	354	32	0.062	22	18	26
2022	310	26	0.035	11	9	13

Table 2: Annual estimates of Atlantic Sturgeon discards by federally permitted vessels in federal waters using drift or sink gillnet gear.

Year	Total Federal Bycatch	Standard Error	Proportion Dead	Dead Bycatch	Lower CI -2.50%	Upper CI -97.50%
1996			0.297			
1997			0.297			
1998			0.297			
1999			0.297			
2000	1551	582	0.128	199	53	344
2001	607	483	0.298	181	0	463
2002	2643	1989	0.24	634	0	1570
2003	411	116	0.212	87	39	135
2004	957	228	0.487	466	249	684
2005	511	145	0.306	156	69	244
2006	821	172	0.124	102	60	143
2007	781	231	0.2	156	66	247
2008	531	327	0.279	148	0	327
2009	843	270	0.129	109	40	177
2010	392	76	0.507	199	123	274
2011	434	152	0.44	191	60	322
2012	354	85	0.435	154	81	227
2013	1233	390	0.375	462	175	749
2014	482	111	0.333	160	88	233
2015	598	89	0.277	166	117	214
2016	1336	137	0.316	422	337	507
2017	709	91	0.216	153	115	191
2018	885	115	0.265	235	175	294
2019	734	84	0.2	147	114	180
2020			0.297			
2021	393	100	0.462	181	91	272
2022	408	70	0.297	121	80	161

Table 3: Annual percent of Atlantic Sturgeon discards by federally-permitted vessels in federal waters using otter trawl gear.

Year	Total Bycatch	Federal Bycatch	State Bycatch	Percent Federal Waters Bycatch	Proportion Dead	Federal Dead	State Dead	Percent Federal Waters Dead
1996	1569	779	791	49.6	0.035	27	28	49.1
1997	1735	837	898	48.2	0.035	30	31	49.2
1998	1695	749	946	44.2	0.035	26	33	44.1
1999	2840	1446	1394	50.9	0.035	51	49	51
2000	1996	986	1010	49.4	0	0	0	
2001	1872	721	1152	38.5	0	0	0	
2002	1734	804	930	46.4	0	0	0	
2003	1644	665	979	40.5	0	0	0	
2004	1434	651	782	45.4	0	0	0	
2005	1231	639	591	51.9	0.143	91	85	51.7
2006	1391	724	668	52	0.179	130	120	52
2007	1198	591	607	49.3	0.086	51	52	49.5
2008	1283	721	562	56.2	0.161	116	90	56.3
2009	1238	712	526	57.5	0.021	15	11	57.7
2010	1235	585	650	47.4	0.009	5	6	45.5
2011	1206	557	648	46.2	0	0	0	
2012	1120	533	586	47.6	0	0	0	
2013	1206	547	659	45.4	0	0	0	
2014	1078	493	585	45.7	0	0	0	
2015	1005	409	595	40.7	0	0	0	
2016	945	397	548	42	0	0	0	
2017	927	359	567	38.8	0	0	0	
2018	905	338	567	37.3	0.08	27	45	37.5
2019	1001	401	600	40.1	0	0	0	
2020	883	369	514	41.8	0.035	13	18	41.9
2021	805	354	452	43.9	0.062	22	28	44
2022	664	310	354	46.7	0.035	11	12	47.8

Table 4: Annual percent of Atlantic Sturgeon discards by federally-permitted vessels in federal waters using drift or sink gillnet gear.

Year	Total Bycatch	Federal Bycatch	State Bycatch	Percent Federal Waters Bycatch	Proportion Dead	Federal Dead	State Dead	Percent Federal Waters Dead
1996					0.297			
1997					0.297			
1998					0.297			
1999					0.297			
2000	3062	1551	1511	50.6	0.128	199	193	50.8
2001	1717	607	1110	35.4	0.298	181	331	35.4
2002	4058	2643	1415	65.1	0.24	634	340	65.1
2003	2317	411	1906	17.7	0.212	87	404	17.7
2004	1740	957	782	55	0.487	466	381	55
2005	808	511	297	63.3	0.306	156	91	63.2
2006	1439	821	619	57	0.124	102	77	57
2007	1449	781	668	53.9	0.2	156	134	53.8
2008	943	531	412	56.3	0.279	148	115	56.3
2009	1871	843	1028	45.1	0.129	109	133	45
2010	557	392	166	70.3	0.507	199	84	70.3
2011	552	434	118	78.6	0.44	191	52	78.6
2012	483	354	129	73.3	0.435	154	56	73.3
2013	1689	1233	457	73	0.375	462	171	73
2014	707	482	225	68.2	0.333	160	75	68.1
2015	1073	598	475	55.7	0.277	166	131	55.9
2016	1930	1336	594	69.2	0.316	422	188	69.2
2017	1573	709	865	45.1	0.216	153	187	45
2018	1266	885	381	69.9	0.265	235	101	69.9
2019	1274	734	539	57.6	0.2	147	108	57.6
2020					0.297			
2021	692	393	299	56.8	0.462	181	138	56.7
2022	822	408	415	49.6	0.297	121	123	49.6

The percent of sturgeon bycatch and takes by federally-permitted vessels in federal waters relative to these vessels in total ranged from 37.3 to 57.5 for otter trawl trips and from 17.7 to 78.6 on gillnet trips. These percentages do not include any bycatch or takes by state vessels or vessels otherwise not required to submit a VTR.

References

- Boucher, J.M. and Curti, K.L. 2022. Discard Estimates for Atlantic Sturgeon through 2021. White paper (unpublished).
- Curti, K. 2016. Updated Summary of Discard Estimates for Atlantic Sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
- Miller, T. .T., and Shepherd, G.R. 2011. Summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
- Miller, T..J. 2015. Updated summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch. Provided to the Atlantic States Marine Fisheries Commission.

9.4 APPENDIX D – MONKFISH AND DOGFISH LANDINGS RELATIVE TO PROPOSED STURGEON MEASURE AREAS

Dr. Daniel Hocking of NMFS’ Greater Atlantic Regional Office staff calculated the following for Monkfish and Spiny Dogfish. For additional clarity, extra description was provided for the proceeding tables.

Monkfish:

Table 1: Average monthly coastwide monkfish landings and revenue for 2020 - 2022.

Table 2: Average monthly coastwide gillnet monkfish landings and revenue for 2020 - 2022. (a portion of Table 1 results)

Southern New England Monkfish:

Table 3: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod. (a portion of Table 2 results)

Table 4: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod **from within the southern New England proposed area.** (a portion of Table 3 results)

Table 5: Percent of average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod **from within the southern New England proposed area.** (i.e. what percent of regional monkfish gillnet landings might be affected by the southern New England proposed area in each month)

New Jersey Monkfish:

Table 6: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey. (a portion of Table 2 results)

Table 7: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey **from within the New Jersey proposed area.** (a portion of Table 6 results)

Table 8: Percent of average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey **from within the New Jersey proposed area.** (i.e. what percent of regional monkfish gillnet landings might be affected by the New Jersey proposed area in each month)

Spiny Dogfish:

Table 9: Average monthly coastwide spiny dogfish landings and revenue for 2020 - 2022.

Table 10: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 - 2022. (a portion of Table 9 results)

New Jersey Spiny Dogfish:

Table 11: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey. (a portion of Table 10 results)

Table 12: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey from within the New Jersey proposed area. (a portion of Table 11 results)

Table 13: Percent of average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey from within the New Jersey proposed area. (i.e. what percent of regional spiny dogfish gillnet landings might be affected by the New Jersey proposed area in each month)

Maryland/Virginia Spiny Dogfish:

Table 14: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA. (a portion of Table 10 results)

Table 15: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA from within the Delmarva proposed areas. (a portion of Table 14 results)

Table 16: Percent of average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA from within the Delmarva proposed areas. (i.e. what percent of regional spiny dogfish gillnet landings might be affected by the Delmarva proposed areas in each month)

Monkfish and Dogfish Landings Relative to Proposed Sturgeon Measure Areas

Daniel J. Hocking NOAA/NMFS/GARFO
March 13, 2024

Monkfish

Table 1: Average coastwide monkfish landings and revenue for 2020 - 2022.

Month	Landed (lb)	Revenue
1	1,014,049	\$1,203,031
2	793,121	\$947,059
3	949,034	\$1,177,203
4	887,464	\$1,123,107
5	957,670	\$1,054,728
6	1,068,315	\$1,147,811
7	369,888	\$553,931
8	373,473	\$604,586
9	345,923	\$552,352
10	424,759	\$651,785
11	503,278	\$801,419
12	736,331	\$1,075,319

Table 2: Average coastwide monkfish landings and revenue for 2020- 2022 using gillnets.

Month	Landed (lb)	Revenue
1	255,880	\$324,111
2	122,132	\$144,786
3	303,383	\$341,481
4	298,150	\$343,023
5	691,703	\$721,880
6	817,386	\$855,278
7	175,523	\$296,010
8	164,233	\$299,782
9	142,279	\$254,251
10	100,519	\$175,907
11	88,191	\$167,155
12	181,805	\$283,581

Area 1: Landings into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod including New Bedford, Hyannisport, Harwich Port, Hyannis, and Westport (gillnet)

Table 3: Average monthly monkfish landings and revenue for 2020 - 2022 using gillnets and landing in New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod.

Month	Landed (lb)	Revenue
1	123,895	\$138,614
2	93,913	\$102,276
3	282,211	\$313,503
4	271,607	\$303,743
5	611,755	\$625,878
6	682,765	\$668,494
7	75,326	\$69,745
8	40,082	\$41,090
9	43,863	\$40,193
10	39,899	\$40,081
11	46,532	\$65,531
12	51,421	\$80,381

Table 4: Average monthly monkfish landings and revenue for 2020 - 2022 using gillnets within the southern New England proposed closure area.

Month	Landed (lb)	Revenue
1	38,644	\$43,220
2	9,632	\$10,683
3	24,570	\$31,856
4	29,824	\$36,526
5	407,034	\$388,354
6	495,853	\$456,386
7	35,750	\$32,050
8	3,741	\$4,645
9	311	\$238
10	3,822	\$3,215
11	13,566	\$14,404
12	17,126	\$21,316

Table 5: Percent monkfish landings and revenue for 2020 – 2022 using gillnets within the southern New England proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.312	0.312
2	0.103	0.104
3	0.087	0.102
4	0.110	0.120
5	0.665	0.620
6	0.726	0.683
7	0.475	0.460
8	0.093	0.113
9	0.007	0.006
10	0.096	0.080
11	0.292	0.220
12	0.333	0.265

Table 6: Average monthly monkfish landings and revenue for 2020 -2022 using gillnets and landing in New Jersey.

Month	Landed (lb)	Revenue
1	121,215	\$163,624
2	26,007	\$37,464
3	9,127	\$14,934
4	10,164	\$12,875
5	71,180	\$77,788
6	72,308	\$73,295
7		
8		
9		
10		
11	3,243	\$5,547
12	103,734	\$147,834

Table 7: Average monthly monkfish landings and revenue for 2020 - 2022 using gillnets within the New Jersey proposed closure area.

Month	Landed (lb)	Revenue
1	61,552	\$82,096
2	7,596	\$11,360
3	2,830	\$4,371
4	2,779	\$3,884
5	28,464	\$29,845
6	19,874	\$18,286
7		
8		
9		
10		
11	3,011	\$5,174
12	65,345	\$94,141

Table 8: Percent monkfish landings and revenue for 2020 – 2022 using gillnets within the New Jersey proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.508	0.502
2	0.292	0.303
3	0.310	0.293
4	0.273	0.302
5	0.400	0.384
6	0.275	0.249
7		
8		
9		
10		
11	0.928	0.933
12	0.630	0.637

Dogfish

Table 9: Average coastwide dogfish landings and revenue for 2020 -2022.

Month	Landed (lb)	Revenue
1	1,734,657	\$327,834
2	585,588	\$120,328
3	647,133	\$132,980
4	431,998	\$82,886
5	67,841	\$17,486
6	290,442	\$64,296
7	1,081,667	\$242,851
8	1,212,626	\$272,771
9	547,698	\$121,773
10	445,545	\$100,150
11	1,222,992	\$235,228
12	1,822,421	\$343,759

Table 10: Average coastwide dogfish landings and revenue for 2020- 2022 using gillnets.

Month	Landed (lb)	Revenue
1	1,710,056	\$322,930
2	571,155	\$114,539
3	619,550	\$125,040
4	388,235	\$75,403
5	39,235	\$12,385
6	281,863	\$62,313
7	1,065,809	\$238,280
8	1,203,293	\$270,235
9	536,731	\$118,962
10	424,307	\$95,954
11	1,139,388	\$219,467
12	1,762,033	\$329,268

Table 11: Average monthly dogfish landings and revenue for 2020 -2022 using gillnets and landing in New Jersey.

Month	Landed (lb)	Revenue
1		
2		
3	49,473	\$8,335
4	201,551	\$36,490
5	26,135	\$8,784
6		
7		
8		
9		
10	67,333	\$12,599
11	690,887	\$133,521
12	262,946	\$49,565

Table 12: Average monthly dogfish landings and revenue for 2020 -2022 using gillnets within the New Jersey proposed closure area.

Month	Landed (lb)	Revenue
1		
2		
3	26,650	\$4,808
4	125,942	\$22,838
5	12,847	\$3,894
6		
7		
8		
9		
10	36,695	\$6,829
11	380,811	\$73,154
12	185,485	\$34,833

Table 13: Percent dogfish landings and revenue for 2020 - 2022 using gillnets within the NJ proposed closure area relative to total for NJ.

Month	Pct Landings	Pct Revenue
1		
2		
3	0.539	0.577
4	0.625	0.626
5	0.492	0.443
6		
7		
8		
9		
10	0.545	0.542
11	0.551	0.548
12	0.705	0.703

Table 14: Average monthly dogfish landings and revenue for 2020 - 2022 using gillnets and landing in Virginia and Maryland.

Month	Landed (lb)	Revenue
1	1,654,455	\$314,812
2	552,835	\$111,988
3	569,470	\$116,605
4	180,651	\$37,258
5		
6		
7		
8		
9		
10		
11	401,862	\$74,298
12	1,477,894	\$275,509

Table 15: Average monthly dogfish landings and revenue for 2020 - 2022 using gillnets within the Maryland-Virginia proposed closure area.

Month	Landed (lb)	Revenue
1	789,819	\$145,581
2	169,309	\$34,823
3	192,455	\$38,838
4	59,095	\$11,471
5		
6		
7		
8		
9		
10		
11	282,765	\$52,595
12	850,317	\$156,775

Table 16: Percent dogfish landings and revenue for 2020 – 2022 using gillnets within the MD-VA proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.477	0.462
2	0.306	0.311
3	0.338	0.333
4	0.327	0.308
5		
6		
7		
8		
9		
10		
11	0.704	0.708
12	0.575	0.569

Atlantic States Marine Fisheries Commission

ISFMP Policy Board

May 2, 2024
10:00 – 11:45 a.m.

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. Cimino</i>) | 10:00 a.m. |
| 2. Board Consent | 10:00 a.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from January 2024 | |
| 3. Public Comment | 10:05 a.m. |
| 4. Executive Committee Report (<i>J. Cimino</i>) | 10:15 a.m. |
| 5. 2024 State of the Ecosystem Report (<i>S. Gaichas</i>) | 10:20 a.m. |
| 6. Northeast Trawl Advisory Panel Progress Report for Industry- Base Survey Pilot Program (<i>D. Salerno</i>) | 10:55 a.m. |
| 7. Consider Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (<i>K. Blanchard</i>) Final Action | 11:25 a.m. |
| 8. Stock Assessment Updates (<i>K. Drew</i>) | 11:35 a.m. |
| 9. Review Non-compliance, If Necessary Action | 11:40 a.m. |
| 10. Other Business/Adjourn | 11:45 a.m. |

The meeting will be held at The Westin Crystal City, 1800 Richmond Highway, Arlington, VA; 703.486.1111, and via webinar; click [here](#) for details.

MEETING OVERVIEW

ISFMP Policy Board

May 2, 2024

10:00 – 11:45 a.m.

Chair: Joe Cimino (NJ) Assumed Chairmanship: 10/23	Vice Chair: Dan McKiernan (MA)	Previous Board Meeting: January 25, 2024
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 January 2024

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 (10:15-10:20 a.m.)

Background

- The Executive Committee will meet on May 1, 2024

Presentations

- J. Cimino will provide an update of the Executive Committee Work

Board actions for consideration at this meeting

- None

5. 2024 State of the Ecosystem Report (10:20-10:55 a.m.)

Background

- [State of the Ecosystem Reports](#) are completed annually for the Mid-Atlantic and New England areas. The reports provide the current status of the Northeast Shelf marine ecosystems (Georges Bank, Gulf of Maine, and the Mid-Atlantic Bight). They describe changes in physical, chemical, biological, and socioeconomic indicators that, when compiled, help describe the health of the ecosystem over time.

Presentations

- S. Gaichas will present and overview of the State of the Ecosystem Reports (**Supplemental Materials**)

Board actions for consideration at this meeting

- None

6. Northeast Trawl Advisory Panel Progress Report for Industry- Base Survey Pilot Program (10:55-11:25 a.m.)**Background**

- The Commission, along with the Mid Atlantic and New England Fishery Management Councils, requested information on an industry-based survey that would be complementary to the NEFSC Spring and Autumn bottom trawl survey
- At the Winter Meeting, the NEFSC presented white paper responding to the Councils and Commission's request
- The three management bodies requested NTAP and the NTAP Industry Based Survey (IBS) Working Group to develop an outline detailing a proposal to conduct an IBS Pilot Program

Presentations

- D. Salerno will provide an update on NTAPs progress (**Meeting Materials**)

Board actions for consideration at this meeting

- None

7. Consider Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (11:25-11:35 a.m.) Final Action**Background**

- The LEC has updated the Guidelines for Resource Managers on the Enforceability of Fishery Management Measures document. The guidelines cover a variety of management strategies that are employed in Commission FMPs. They are intended to help managers to take into account the enforceability of all management regulations that are developed. The Guidelines are intended to support and strengthen the effectiveness of Commission efforts to conserve fisheries resources.

Presentations

- K. Blanchard will provide and overview of the updated Enforceability (**Meeting Materials**)

Board actions for consideration at this meeting

- Consider approval of the Revised Guidelines for Resource Managers on the Enforceability of Fishery Management Measures

8. Stock Assessment Updates (11:35-11:40 a.m.)**Background**

- Sturgeon and River Herring have on-going stock assessment updates.

Presentations

- K. Drew will provide an update of on-going stock assessments

Board actions for consideration at this meeting

- None

9. Review Non-Compliance, If Necessary Action**10. Other Business/Adjourn (11:45 a.m.)**

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ISFMP POLICY BOARD**

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 25, 2024

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

TABLE OF CONTENTS

Call to Order, Chair Joe Cimino1

Approval of Agenda.....1

Approval of Proceedings from October 19, 20231

Public Comment1

Executive Committee Report3

Atlantic Striped Bass Catch and Release Mortality4

Review and Discuss 2023 Commissioner Survey Results5

Consider Jurisdiction Requests for Species Declared Interest7

Discuss Aquaculture in the Exclusive Economic Zone.....7

Review NOAA Fisheries White Paper for an Industry-Based Survey..... 14

Other Business..... 23

 American Lobster Process Issue 23

 Horseshoe Crab ESA Petition 24

 MRIP Queries 24

Adjournment 24

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 19, 2023** by consent (Page 1).
3. **Move to add New York as a state with a declared interest in the Cobia FMP** (Page 7). Motion by Marty Gary; second by Raymond Kane. Motion passes by consent (Page 7).
4. **Move to recommend to task NTAP and the NTAP Industry Based Survey (IBS) Working Group to develop an outline detailing a proposal to conduct an IBS Pilot Program to test the viability of the program as presented in the "Proposed Plan for a Novel Industry Based Bottom Trawl Survey" white paper with a particular focus on adapting Section 2 "Survey Design Elements" to current Industry platform capabilities. Delivery date for the outline should be in time for further discussion at the Spring 2024 meeting cycle for the Commission and both the Mid-Atlantic and New England Councils in April 2024** (Page 21). Motion by Eric Reid; second by Pat Keliher. Motion passes by consent (Page 23).
5. **Move to adjourn** by consent (Page 25).

ATTENDANCE TO BE FILLED ON A LATER DATE

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

The Interstate Fisheries Management Program 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; Wednesday, January 25, 2024, and was called to order at 8:30 a.m. by Chair Joe Cimino.

CALL TO ORDER

CHAIR JOE CIMINO: Good morning, everyone. My name is Joe Cimino; I'm the Administrative Commissioner for New Jersey, current Chair of the Commission. We're going to start Policy Board today. I will be playing DJ for the rest of this winter meeting, and the request line is already full. We're getting started a few minutes late, we've got a lot to cover today.

APPROVAL OF AGENDA

CHAIR CIMINO: I'm going to go through Approval of the Agenda. Are there any agenda items that need to be added? Start with David Borden.

MR. DAVID V. BORDEN: I would just like to have a brief couple of minutes to talk about striped bass, please.

CHAIR CIMINO: Yes, thank you, David. I realize there is a time constraint there for you, so we will take you after Public Comment, and I think the Board Chair for Striped Bass as well. Go ahead, Pat.

MR. PATRICK C. KELIHER: We have a process issue with lobster that we need to address, so we need to add that to the agenda if we could as well, please.

CHAIR CIMINO: Duly noted and I think if we can, we'll do that as Other Business, to cover David's thing we'll do that a little earlier. Chris Wright, go ahead.

MR. CHRIS WRIGHT: Hi, this is Chris Wright, NOAA Fisheries. I just have a short announcement regarding an ESA petition on horseshoe crab. I just have a short little statement to make. I could either do it after we do the agenda or in Other Business.

CHAIR CIMINO: Yes, if that is okay, we'll take that at Other Business, thank you. A few additional items.

APPROVAL OF PROCEEDINGS

CHAIR CIMINO: With that we'll go through the approval of the proceedings from the October, 2023 meeting. Any concerns, additions, edits? No seeing any hands, good.

PUBLIC COMMENT

CHAIR CIMINO: If I could get a show of hands online and in the room for Public Comment. I see one in the room.

MS. TONI KERNS: I have one hand online, just making sure there is not anybody else.

CHAIR CIMINO: Let's leave this at an even number here. It looks like we have two people, and we'll give two minutes to each speaker. We'll start in the room, if you can introduce yourself. Thank you.

MR. PHIL ZALESK: Mr. Chairman, my name is Phil Zalesak; I'm president of the Southern Maryland Recreational Fishing Organization, better known as SMRFO. SMRFO, along with the Chesapeake Legal Alliance has brought a law suit against the state of Virginia for violating Virginia code regarding the management of Atlantic Menhaden Reduction Fishery in Virginia waters. The law suit is ongoing.

We have also filed a petition for rulemaking to request and direct the state of Virginia to end Atlantic menhaden reduction fishing in the Chesapeake Bay and its entrance. I'm here today to respectfully request that the Commission hold an Atlantic Menhaden Management Board meeting this spring.

Why? Current Commission policy is based on the false assumption that Atlantic menhaden biomass density in the Chesapeake Bay is the same as the Atlantic Ocean. The science and the prevailing science are that they are not the same. In fact, the latest science and empirical data, provided by this Commission, the state of Maryland, the state of Virginia, and the National Oceanographic and

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

Atmospheric Administration support the position that localized depletion is occurring in the Chesapeake Bay.

Given that localized depletion of Atlantic menhaden in the Chesapeake Bay has been an issue with this Commission without resolution, under the current process since 2004, I request the following. The Commission holds an Atlantic Menhaden Management Board meeting this spring. The meeting will be structured in the form of a debate, a discussion and a decision on the future of Atlantic menhaden reduction fishing in the Chesapeake Bay and its entrance.

This proposal is supported by the Virginia Saltwater Sportfishing Association, Recreational Fishing Organization, Maryland's Tidal and Coastal Recreational Fishing Committee, the National Audubon Society, and the Virginia Osprey Foundation. This is a very reasonable request, which should be acted on as soon as possible. I thank you for your time.

CHAIR CIMINO: Well, thank you, appreciate that and appreciate you being so timely. We had a couple of extra hands here, so we'll keep moving through. Next up is Tom Lilly.

MR. TOM LILLY: Ladies and Gentlemen of the Policy Board, in the last year grim evidence of menhaden overharvesting in the Chesapeake Bay has piled up. Starvation of thousands of osprey chicks, and the failure of the striped bass spawning stock. Despite public outcry, and the effect that this is having on millions of Chesapeake Bay residents, repeat, millions of Chesapeake Bay residents and their children, and their grandchildren.

Despite all of this, the Menhaden Board has refused to meet in October, November, and they are refusing to meet right now. From the New York and New Jersey experience and your ERP science, we know very clearly how Chesapeake Bay would benefit by moving the factory fishing. We're talking about one company here, as you know, by moving them into the U.S. Atlantic Zone. There is no question about that. Have you all stopped to think that by refusing

to meet, by the Menhaden Board refusing to meet, that you have dashed the hopes of numerous groups, thousands if not millions of people that our Chesapeake Bay wildlife would get the menhaden forage, they need this year.

That hope is gone, it is gone completely. Also, by refusing to meet, you are not taking into consideration that thousands of schools of menhaden are being caught, just as they try and migrate into Maryland. I agree completely that you should have a Menhaden Board meeting this spring to consider these very important topics. Thank you so much.

CHAIR CIMINO: Thank you, Mr. Lilly. Voices are heard, we are planning on having a meeting this spring. There is a lot to cover and a lot of good updates, I think, for what is going on with our menhaden research and monitoring. I appreciate both of you keeping that within the timeframes. I think we have at least one other hand, two hands still. I'll go to George Socca.

MR. GEORGE SOCCA: Good morning, members of the Atlantic States Marine Fisheries Commission. My name is George Socca. I have a rich 35-year history as a publisher of a weekly fishing magazine in New York, and a deep involvement in the fishing community, including founding the first saltwater fishing website, leading a nationwide fishing network, serving as a founding president of the CC in New York, and the Recreational Advisor on the Atlantic States Marine Fisheries Weakfish Advisory Board.

Obviously, my connection to our marine environment is profound. Today I am here to discuss a significant environmental and economic impact following the cessation of reduction menhaden fishing operations in New York. The Hudson bass fishery is thriving, a fact that clearly demonstrates when you look and compare the YOY data between the Hudson and Chesapeake stock of striped bass since the end of the reduction fishing in our region.

The transformation is nothing short of remarkable. Our striped bass fishery has evolved into a vibrant

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

and extraordinary experience, providing a significant boost to anglers and the industry they support. Moreover, the overall marine ecosystem has experienced a significant revival. A prime example of this is a daily spectacle of breaching whale and dolphins off of Long Island's beaches, a sight so frequent that these fellows no longer need to board whale watching vessels to enjoy this majestic creature.

The consistent presence of bluefin tuna throughout the fishing season further indicates the thriving wildlife underscoring the richness, and robust health of our marine habitat. In addition, the resurgence of our bird population, especially the presence of 14 pairs of nesting eagles is now on Long Island. It's a testament to the broader ecological recovery.

These developments collectively illustrate a vibrant, rejuvenated marine and coastal ecosystems, a direct result of the positive changes in our fishing practices and environmental stewardship. In light of these positive changes, I strongly recommend that the Commission convene an Atlantic Management Board meeting this spring. This meeting should focus on discussions and decision making regarding the future of Atlantic menhaden reduction fishing, particularly in the Chesapeake Bay.

MR. CIMINO: Excuse me. I apologize, but as I mentioned, we have a very tight agenda today and that is a few minutes.

MR. SOCCA: Yes, I was told three minutes, I'm under that. But all right.

MR. CIMINO: Thank you. No, I'm sorry, it was two per individual, we are a bit behind on our agenda. I think you have clearly expressed your concerns, and I appreciate that, thank you. We have one more member of the public that wishes to speak, and that is Steve Atkinson.

MR. STEVE ATKINSON: Yes, good morning. My name is Steve Atkinson, I'm President of the Virginia Saltwater Sportfishing Association. I agree with the comments that have just been made about menhaden, as it relates to the Chesapeake Bay. As

you know, when we raise these concerns, we are often told there is no science.

This summer a team got together and developed a plan. This included a plan for research, basically. It included representatives from the industry. This resulted in a bill that is now pending before the General Assembly, and I'm sad to say that the industry is now lobbying against this bill. I just find this to be a stunning disregard for the Chesapeake Bay. That's all.

CHAIR CIMINO: Thank you. I appreciate all the comments, and as I mentioned, looking forward to a Menhaden Meeting at the spring, and a lot of updates will be provided.

EXECUTIVE COMMITTEE REPORT

CHAIR CIMINO: With that we'll move into the Executive Committee Report, very appreciative of the fantastic summary provided by Pat.

We met yesterday and got a kickoff from Alexander Law on staff, who reported on legislative happenings for us, including what is going on with the Legislative Committee. He spoke also about the uncertainty in the federal fiscal budget, which has been going on for some time, obviously. There is also some interest in trying to resurrect the reintroduction for reauthorization for Magnuson, so we will see where that goes.

One of the big issues for all of us trying to manage these fisheries resources is the continuing budget issues, and we know that even that static funding, year after year, that obviously results in some serious cuts. That's one of our biggest pushes at the Commission to drill it home at Congress how important that is to keep the lights on here.

We got a report from Jainita Patel, who is our Science Committee Coordinator on the CESS, which is our Economic and Social Science Committee. This is kind of a revitalization for this committee. We have a new Chair, Sabrina Lovell, and a new Vice-Chair, Andrew Scheld. We had put out a request to all Commissioners just for some ideas on what the CESS

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

should be working on. We went through a summary of that.

I have been referring to that as kind of a first blush on what they will be working on for us. I think really the importance is that we now have a group that is working on stuff not only for the Commission, but is interested in tackling this at a state-by-state level. We really appreciate their help. For any Commissioners here who are still thinking about stuff that might have missed that deadline, we would be happy to hear of other interest that they feel the states need. Quickly we went through the election procedures for Commission Chair and Vice-Chair. We have been traditionally going on a rotation of Mid-Atlantic, New England and South Atlantic. One of the interesting things is it's also traditional to have a two-year term for Chair and Vice-Chair. However, elections are required, more or less, on an annual basis.

That brings us to our Strategic Plan, so we're starting again at a new strategic plan for 2024 through 2028. We had a preview of that at our annual meeting last year. I think most Commissioners felt that that was looking pretty solid. We did some edits to that, thanks especially to Erika and to staff for putting together that Strategic Plan, and was approved.

Well, excuse me, yes, we'll go through that approval at the Business Session, but Ex-Com had no further edits there. We briefly discussed the idea of keeping Board meetings in person for the Commission, or should I say at least this hybrid procedure. The reason why we brought that up was, it was a discussion that started while we were still forced to be virtual during the pandemic.

I think there was a strong general consensus among Ex-Com that things are going pretty well. There are really good reasons to stay in person, but always have this virtual option for both Commissioners and the public. Then one other thing that we talked about in Ex-Com was staff will be putting together a letter that will come back before this Board, on what is happening with the Federal Disaster Relief.

There is some current legislation, and we're looking

for some clarity between what Congress was expecting to happen and the current procedures with NOAA. Staff will be putting that together and we'll see a draft to that. Is that for the next meeting, Bob? Yes, so by the next meeting we'll see a draft for that. That covers our Ex-Com report. We're going to turn it over to Alexander to go through our survey results. Letters first, sorry.

MR. ALEXANDER LAW: The Ex-Com recommended that the Policy Board approve a letter of support for a Working Waterfronts Protection Program. There are two bills in front of Congress right now, one in the Senate, one in the House that would both address creating a Working Waterfronts Protection Program. They differ in different provisions, how they approach this. The letter that I drafted is high level, and just speaks to the need and the impacts that our states are seeing, when it comes to working waterfronts, conversion, threats or climate change.

CHAIR CIMINO: Again, this is coming out of Executive Committee, and I'm just looking for a show of support here at the Policy Board to move this letter forward, so I can get some acknowledgement and consensus. Let's do it this way, is there any objection to putting this letter forward? Not seeing, thank you. Yes, Alexander, I appreciate you being up here with us. I did forget to go to David, so let's do that now, if we can. Go ahead, David.

ATLANTIC STRIPED BASS CATCH AND RELEASE MORTALITY

MR. BORDEN: Thank you, Mr. Chairman, for inserting me in the process early, because I've got to catch a plane. The only issue I wanted to talk about, and it's going to be very brief. At the last Board meeting I raised the subject of catch and release mortality on striped bass. It's well reflected in the minutes the concerns. But to summarize the concern is, we don't currently have a process to examine that issue. I'm getting increasingly concerned about the lack of that effort on that particular issue, because 40 percent of the mortality on striped bass relates to catch and release. When you combine that with the news that we seem to get at every single meeting about poor year classes here,

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

poor year classes there, invasive species feeding on striped bass in the estuaries and so forth. I think we're getting into a really dangerous place, where we have very limited management measures to address some of those types of concerns.

My suggestion at the last Board meeting was basically, we asked the Chair of the Board to focus some attention on that, and kind of bifurcate that issue of catch and release mortality into components that the Board could deal with, and figure out a process to deal with that issue, and then report back, for instance at the May meeting.

Toni had offered some staff assistance in doing that, I think she is still willing to do that. I think it would help here to have some input on this issue just quickly from the current Board Chair, because she's thought about it, and then we can move on with it. If people feel comfortable that this is a serious issue we need to work on, then I think we can leave it to the discretion of the current Board Chair to work on it, and draw in relevant expertise to help her out.

CHAIR CIMINO: I think we all realize; we share your concerns and we realize that this issue kind of got decoupled from previous actions. We weren't able to figure out a way forward through previous addenda and amendments. We are at a point where I think we have to be as proactive as possible to work on this, so I would like to bring Megan up, if you have another comment, David.

MR. BORDEN: Just quickly add, this is a really complex issue to deal with, and it's probably going to need to involve a diversity of expertise to deal with it. There is a lot of uncertainty with the issue. My rule of thumb when you get into a situation like this is you lean into the uncertainty, and try to work through the uncertainty. But hopefully Megan has the way forward on this.

CHAIR CIMINO: That is the weight of the world on your shoulders. I'm going to turn to Megan Ware, our current Board Chair for Striped Bass.

MR. BORDEN: No pressure, Megan.

MS. WARE: Yes, as David mentioned that he had brought this up at our previous Board meeting. Obviously, we were pretty focused on Addendum II yesterday. In talking with Emilie, some thoughts we've had over the next few weeks or months, we're going to compile some of the documentation we've had, in terms of discussions on discard mortality, what the challenges are, you know some of the thoughts from the Law Enforcement Committee, the Technical Committee, so that is all in one place.

Then potentially getting together a workgroup or a group of Commissioners to start a conversation on discard mortality. I don't know how much progress we would make on that workgroup ahead of the May meeting. But that would be a potential vision forward. I think we have some space time between now and the annual meeting, when we get the assessment to start to think about this. We've also been in contact with Mass DMF to potentially present some of their studies on discard mortality that they've been working on at the May meeting, so that is something else we've been thinking about.

CHAIR CIMINO: Yes, thanks, Megan. I appreciate that. I think our goal really is being prepared for the next assessment, more so than an upcoming meeting. I know we do have a tight schedule, but this is a very important issue to a lot of us, so I will look around the table to see if there are any other comments on this. Otherwise, we will proceed and do our best to be ready, as I said, for action knowing that the next assessment may not be so pleasant. With that, I think we now can turn it back over to Alexander.

REVIEW AND DISCUSS 2023 COMMISSIONER SURVEY RESULTS

MR. LAW: I'm going to be brief here. Because of how quickly I'm going through things., I encourage you guys to look over the answers to the open-ended questions included in the 2023 Commissioner Survey Results. Basically, for every one Commissioner saying one concern, there is a commissioner concerned about the exact opposite thing.

It really shows the diversity of opinions here. The ranked questions 1 through 16 are not particularly interesting. There hasn't been a large change from year to year in the past few years, and there is nothing to be concerned about there, in terms of our direction. Like in previous years, cooperation with federal partners, particularly the councils, is our lowest scoring question.

I believe last year people expressed that they would like the Council's to meet us in the middle more, and come to more of our meetings. Effective utilization and availability of Commission resources have consistently scored as our highest question, and open-ended question responses expressed thanks for staff knowledge and responsiveness.

The open-ended answers to questions 17 through 20 provide some unique insights, so again, I encourage you guys to look over those in your own time. Many Commissioners have expressed climate change as our biggest obstacle. One Commissioner talked about the need to revisit rebuilding programs, and gave southern New England lobster as an example.

A few mentioned not putting long term stock health before political pressure and interests within each state, influencing our management decisions. Others expressed concern about reliable data, especially facing increased uncertainty due to climate change. One of the interesting responses that was expressed in Question 19, a couple people mentioned this, was the need to create product for an audience that doesn't seek out engagement with our management process, and aren't necessarily trained fishery biologists.

Potentially creating different products for different audiences, with reduction in the usage of truncated acronyms, or fishery management terms, which may be a barrier entry for some people. A couple of people also asked for more frequent stock updates, and that is about what I am going to give you for now. Thank you.

CHAIR CIMINO: You know we had some discussions about the survey with Bob and Dan and I. We

certainly still see value in this, I hope you all do as well. Are there any questions or comments for us on this? Go ahead, Ray.

MR. RAYMOND E. KANE: Yes, being how we're going to move forward with hybrid meetings, I had to talk to a constituent last night from my state. In the future if, as we go around the table and motions are made, we all know who we're talking to at the table, but people on the webinars, they say, well who made the motion? Well, Mike Luisi made the motion. Well, they don't know who Mike Luisi is, so when you present or you want to make a motion, I'm Ray Kane from Massachusetts, so people on the webinar know who made the motion. Just a thought.

MS. KERNS: Ray, so you want people to say what state they're from, because it does say on the webinar screen who had made the motion.

MR. KANE: Yes, I'm sorry, Toni, the states.

MS. KERNS: Okay, just clarifying. I think if we, every time someone speaks, they what state they're from. I think that will add to the length of the meeting, so maybe when people are making motions, they try to do that. But I think if we said it every single time that might get tricky.

CHAIR CIMINO: Lynn.

MS. LYNN FEGLEY: How about, I mean the list is there, but how about just a list with every webinar that lists the Commissioners and where they're from, and then they can reference easier.

CHAIR CIMINO: Yes, Pat.

MR. KELIHER: Well, I think Toni touched on it, right. When the motion goes up on the Board and it says who it is, you can put in parentheses the state they are from.

CHAIR CIMINO: Yes, for those of you that remember parliamentary training. They were kind of adamantly opposed to the idea that names were even attached to motions. But we certainly see the importance of that. I think one of the most important things is to

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

absolutely always have a motion on the board, so that we all know what we're dealing with.

I always appreciate when we get clarity on the intention of that motion. But I don't see any reason, because we already have names attached, to not also have the state that is represented in those motions. As we move forward, that is something that we can continue to discuss if there are any concerns there. Thanks, Ray. Any other comments on the survey? Okay, I'm not seeing any.

CONSIDER JURISDICTION REQUESTS FOR SPECIES DECLARED INTEREST

CHAIR CIMINO: I'm going to turn it over to Toni for Jurisdiction Request.

MS. KERNS: In your meeting materials you have a letter from the state of New York. New York is requesting to declare into the cobia fishery. This request is consistent with the Plan Review Team's recommendation, at least for the last year if not the last two or three years to New York.

For the past five years the occurrence of cobia in New York state waters has dramatically increased. Prior to 2019, New York rarely saw over 1,000 pounds, and then from 2019 to 2022, landings were over 1,000 pounds each, in some years reaching a high of over 5,000 pounds. Their landings have been at least 6.9; 2.6; and 2 percent of the coastwide commercial landings in 2020, 2021 and 2022 respectively. Their recreational encounters have also increased in recent years, and in 2020 and 2022 they were just shy of 3,000 pounds, and just over 4,000 pounds respectively. Prior to 2020, the last recorded recreational cobia catch in New York had occurred in 1994.

We are also seeing in the literature that suitable habitats for cobia is moving northward, and so based on the criteria in the Commission's guiding documents, New York would meet the guidelines of being added into a species fishery, but it is something that we need the Board to consider here today. I don't know if Marty has anything he wanted to add.

MR. MARTIN GARY: No, thanks, Toni, you characterized it pretty well. I may or may not have touched on it, but we are seeing them in the commercial landings too, albeit at a very low level. But this is another instance of a species that's moving, and of course, we've seen them move from the south up into the Virginia Capes, and now it's not uncommon for our fishermen to tell us they could actually target these fish. They get around pods of menhaden, so as Toni indicated, we would like to declare an interest into this fishery.

CHAIR CIMINO: We'll do this through a motion, Marty, if you don't mind. We have something we can bring up for you. Marty, would you mind?

MR. GARY: I would like to **move to add New York as a state with a declared interest, right, in the Cobia FMP.** Interstate.

CHAIR CIMINO: We'll make that edit and we have a second by Ray Kane from Massachusetts. There we are, we have a motion and a second. Any discussion on this? Any concerns from the Board? **Any objections to this motion? No objections, good. Motion passes by consent.** We're going to move on.

DISCUSS AQUACULTURE IN THE EXCLUSIVE ECONOMIC ZONE

CHAIR CIMINO: Next agenda item is a discussion on aquaculture in the EEZ

We have Danielle Blacklock with us here from NOAA Fisheries. Again, I appreciate the presentation, Danielle, and due to timing, I think that we will do our best to allow some questions, but hopefully you'll provide some contact information for folks to discuss this, or continue this discussion with you at another time as well. Thank you.

MS. DANIELLE BLACKLOCK: Absolutely, thank you, Mr. Chair. Hi everyone! My name is Danielle Blacklock, I'm the Director of Aquaculture within the NOAA Fisheries Service. I am excited to be here with you today. As many of you know, aquaculture is a great tool to be used for species conservation and habitat restoration, pharmaceutical, nutraceuticals,

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

fertilizer, et cetera, et cetera.

But I'm here to talk about the food aspect. See, I like food, and I'm a little concerned that we don't have enough of it. We already import 70 percent of the seafood we eat. As we do that, we have to think about the fact that all countries aren't created equal, when it comes to conservation laws and policies. As we import our seafood, we export our impact. More than half of the seafood we're importing is farmed, just in other places. Global demand for seafood is rising, so in this busy marketplace the competition is going to get hot. We're expected to have a global seafood supplied gap of 50 million tons in the next 25 years, and that's with Americans only eating 70 percent of what is recommended for nutrition. Americans are malnourished, and that is probably not something that you think about regularly. But with 42 percent of adults obese in this country, and a higher percentage than that prediabetic.

At the same time 12.8 percent of households are food insecure. We have both sides of the malnutrition coin to tackle, and seafood is a component of the solution for both. As a lean protein that is good for your mind and your heart, full of Omega 3s. The more that we can produce locally, to get into those homes at a price point they can afford, the better off we'll be. All of those challenges are before we talk about climate change, which I know all of you are living day to day, as stocks shift, production changes.

We have to figure out how to build a climate smart food system. We're not the only ones talking about seafood anymore. Aquaculture is a topic that is across the government right now. The Administration last year released the Ocean Climate Action Plan, you may have heard of that. One of the key actions for using the Ocean for climate resilience and adaptation is to expand U.S. aquaculture production.

The White House is saying that aquaculture is a part of our climate solution. Then that middle image there is NSM-16. If NSM is not part of your daily vernacular, that is National Security Memorandum. National Security Memorandum-16, which is on the

strengthening the security and resilience of U.S. food and agriculture makes some big policy statements.

It says aquaculture is agriculture, and then it goes further to say that agriculture is designated as critical infrastructure of this nation. That means that our existing sea farmers are critical infrastructure. Not only are we looking to expand, but we also want to make sure our existing farms are resilient.

Then over to the right, a little bit of a creepy cover here. But this is the Department of Homeland Security, they put out a report on the threats to food and agricultural resources. In response to those threats, they have one of the six national priorities to build a resilient domestic food system to expand domestic aquaculture production.

My inbox has changed. The letters at the end of the e-mail addresses have changed. I get a lot of Ma'am; I would like to sit down with you and talk about the resilience of the U.S. aquaculture sector from .mil. Ma'am; I would like to run a tabletop exercise about how we're going to feed our country, and I would like you to be a part of it. HHS.

This is a bigger conversation and I'm here, so that is the framing of why I'm here to talk to you today. Why the Policy Board? Striped bass, I know that you have had a busy meeting on striped bass, and that yesterday was probably a hard day for many. I'm hoping that our conversation today can be seen as part of the solution set to some of the challenges that are happening.

Why do I want to talk about striped bass, when it is a pretty hot species on the east coast? Because it's really versatile, and we know how to do it. You can grow it in freshwater and saltwater. It has a large temperature range, as we know. It could be farmed up and down the east coast, and it also has multiple culture methods, so it is currently you can farm it in ponds on land, you can farm it in recirculating systems, freshwater/saltwater as I mentioned, and in net pens out in the ocean. Also, we're interested because there is an existing market. Creating a market is hard, and if there is an existing

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

marketplace, even though in some states and some places it is a seasonal marketplace.

What if we made that year-round, and created opportunity for what is also wildly harvested in that new marketplace. Then the final point is really the key one for me. In answering some of those .mil e-mails is about equal opportunity. What I mean by that is, as you guys know, it's illegal to fish, harvest, possess or retain striped bass in the Atlantic EEZ.

Then some states have a prohibition on sale. That doesn't affect the Gulf of Mexico, and we're actively receiving applications for Gulf of Mexico waters to farm Atlantic striped bass, not hybrid striped bass, Atlantic striped bass, and it's already happening. I mentioned that. Right now, there is pond farms in North Carolina, South Carolina and Texas.

Ohio is trying recirculating aquaculture that has been successful in research, now trying it commercially, and there are net pens in Mexico. I don't know if you all have heard of the company Pacifico. They just made an announcement last month that they are building the first Atlantic striped bass commercial hatchery. They expect to put 20,000 metric tons into our market place through this hatchery.

It is already in my Whole Foods and Wegmans, straight from Mexico. It's our technology. The U.S. figured it all out, and we've exported technology and now we're importing fish. In addition, farmed Atlantic striped bass is commanding a premium price, compared to wild harvested and farmed hybrid striped bass.

This is my last slide. We've been researching it for a long time. It started in 1874. I'm not going to give the whole history. But there have been dramatic improvements in our knowledge base, and that's why you are now seeing the commercial growth. We've sort of gone on the other side of the tipping point of it being economically and biologically viable.

Dramatic improvement in growth rates, due to selective breeding. This current generation is growing faster than hybrid striped bass, and it gets a premium price point, so of course people are

interested. The full genome is sequenced, which opens up the ability to do further selective breeding and collection.

Multiple known sterilization methods, so should farms go in our waters, we have techniques to make sure that they can't reproduce with wild populations. There are known feeding protocols all the way through the life cycle, and there is an investment in a consortium of research called StriperHub.

The National Sea Grant Program has invested in this collaboration and consortium of researchers, and the goal of that effort is commercialization of both striped bass and hybrid striped bass. The research is happening, the farming is happening. What we have is an imbalance in what is accessible to interested farmers. In the Gulf of Mexico and the U.S. they can go in with applications, et cetera, et cetera, that are then thoroughly reviewed, of course. On the Atlantic coast there is not a legal pathway currently to do so. Now, I'm not sure whether that is on purpose or not. I don't know that when those rules were made, people were really thinking about farming Atlantic striped bass, because the science wasn't there, and now it is.

What I would like to know is, how I and my team can be helpful in building an understanding of where the science is, and what policy implications that might have. I am not a striped bass expert, and I can't sit here and answer quizzical questions about, well what is the status of this in striped bass. But I can get back to you.

If there are specific things that you're interested in learning more about, I am happy to put my team to work, and the suite of researchers that have built this industry that has been exported abroad. With that, I take any questions. I know you're short on time, and I hope to hear from you all. My e-mail address is my first name dot last name at NOAA dot gov, like everyone else's. I'm sorry it's not on the slide, but I'm happy to have a conversation separate from this too.

CHAIR CIMINO: Well, thank you very much, and I appreciate that, and I've been so far voting on our

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

time constraints, and yet we are actually doing pretty well. This is a very interesting topic for sure. One of the struggles for all of us here, I think, especially with the introduction of offshore wind, our competing uses in our oceans.

I know that is one topic of importance to all of us, and obviously striped bass is near and dear to many of us, and the poster child for the Commission. I'm going to open it up to the Board for any questions or comments for NOAA on this. I'll go to Roy, and John, it looks like maybe you as well. Okay, go ahead.

MR. ROY W. MILLER: Thank you, Danielle, for the presentation. I have been around long enough on this Commission to remember when we had some policies concerning striped bass stocking that were generated in the late 1980s and early 1990s, and particularly in regard to aquaculture products.

We took a stance in those days, no active stocking of hybrid striped bass, for instance, for fear of damage to the genetic authenticity of wild stocks. We were also concerned at the time about escapees from aquaculture, particularly when aquaculture was conducted in a coastal zone area, let alone net pens. That technology pretty much wasn't considered actively in the late 1980s, but obviously net pens present a real challenge, particularly when they are stationed offshore.

The chance of storm events and escapement is high. Then striped bass that are aquaculture products, with let's say limited genetic diversification would be loosed upon the environment, and mixing with natural stocks. There are those concerns, and we did consider them important enough in the late eighties or early nineties that as a Commission we took some positions on it, say. I just wanted to bring that to your attention.

CHAIR CIMINO: Thanks, Roy, we'll go to John and then Pat.

MR. JOHN CLARK: Thank you for the presentation, Danielle. You mentioned that this is already going on in Mexico. As you mentioned, so many of these aquaculture techniques have been developed here,

but then they've moved to developing countries where the cost of production is so much less. I'm guessing with the water temperatures they probably grow faster there too. What are the economics of raising them, even in the Gulf, as you mentioned. What type of price point would they need to make this viable?

MS. BLACKLOCK: I think that we could do more analyses on that. What we're hearing is that by the price they're fetching now, which I would have to look at that. Actually, I have it in my notes. Fetching a price higher than hybrid striped bass, has made it now economically viable, because they are growing faster.

They are growing to market size in less than two years, which my understanding is that between the price point they're getting now, which I think is just over five dollars per pound, although when you buy it from the farm it's like, retail it's closer to \$15.00 to \$17.00, and how fast they are growing that it is now economically viable. Some studies have been done, but until we have a test case in the water we don't know for sure.

MR. CIMINO: I'm going to go to Pat Keliher and then Lynn.

MR. KELIHER: Danielle, good to see you again. Thanks for the presentation. This is the second time you've been before us and brought up the EEZ related issues. If I recall correctly, EEZ related issues for striped bass pertains to really on the recreational side, not being allowed to fish for or possess striped bass in the EEZ. But isn't that something that NOAA could simply change the rule for an exemption for aquaculture for possession of farm raised aquaculture?

I'm not sure if you're coming to us, because you have an ask of that, and you want that to come from the Commission. That is my first question, and my staff has also indicated that you and your folks might be developing a white paper around striped bass, and if that is the case, is that something you could provide the Policy Board or the Striped Bass Board?

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

MS. BLACKLOCK: We certainly could produce a white paper, if that is of interest. I think that with aquaculture, it's important to not be too heavy handed. We want to create opportunity and access, without creating undue fear. I think taking a measured approach is really important. Starting with our white paper or something like that, continuing the conversation with the Commission is something that in my perspective is the right path.

CHAIR CIMINO: Follow up.

MR. KELIHER: Yes, thank you. I appreciate the comment on not being too heavy handed, because this is one issue, as far as expanding other activities in the EEZ, you're going to displace existing users. They are going to potentially have a flora and fauna impacts or there is navigation impacts.

They are all the criteria that we have to use in Maine when we're dealing with any aquaculture, and they are highlighted with finfish aquaculture. Finfish aquaculture has become a lightning rod, whether it's in the water, or now even onshore. I appreciate the sentiment that you don't want to be heavy handed, and take a more measured approach. I think from a Commission standpoint, it's probably worth having more additional conversations around this, to understand where this is going. There certainly could be some benefits with this type of approach. The potential opposition is real, associated with this type of growth.

CHAIR CIMINO: We're going to Lynn and then Dan and then Eric online.

MS. FEGLEY: Thank you, Danielle, for your presentation. I have a lot of questions. I love the idea of a light keeper, and my two questions. One centers around, you know enforcement. We have people in our state who have gone to jail for malfeasance with striped bass tags, so you imagine we have the population of striped bass under a different enforcement. I would actually appreciate a little exploration into how that might work, and the other one is economic.

Also in my state, in the last two decades we've legalized, rewritten our laws to allow for oyster aquaculture, it's a burgeoning business in the state of Maryland. It's a wonderful thing, but it unleashed a lot of pretty ugly competition between the wild fishery and the aquaculture fishery. You know salmon, you see it in the market, you see that there is aquaculture salmon raised in Chili, or there is wild caught salmon from Alaska.

But you know you stated the market is established for striped bass, but I think that is primarily a wild caught market. I know that I would certainly get questions from fishermen in my state. We are the largest commercial fishery for striped bass, how this is going to impact their market. I would actually be a little bit interested in the economics of that if you're putting together a white paper. That is just some thoughts on that.

CHIAR CIMINO: I'll go to Dan.

MR. DANIEL MCKIERNAN: A friend of mine in college once said, you learn something new every semester. One of the nuggets that I'm taking home after this meeting is the fact that the eel aquaculture in Maine is exceeding the United States wild harvest. If there are any parallels to this, the striped bass in the Chesapeake appear to be failing, at least for the last five years.

I think in some ways there is an inevitability, and certainly a market that is a potential to be developed here. I think where this takes place is probably the most controversial. Whether it be right over a state waters line, the EEZ, and the potential for escapement. But one of the things Danielle, that you raised, was state regulations that ban sale.

I'm curious about that, and I'm wondering if as an ASMFCA initiative, staff could poll the states about their rules pertaining to aquaculture products and nonconforming fish, because I know that when New Hampshire had their cod and halibut aquaculture, you know we did everything we could to help get those products into the market, even though they were going to be undersized.

I think that we just need to modernize some of our regulations, as some of these products become farm raised. I guess I would ask Toni or Bob if this is something that we could look at among the states, to study the degree that states accommodate nonconforming fish, or shellfish that are farm raised, because I think that is sort of like next chapter here, in terms of allowing aquaculture to develop alongside wild fisheries.

CHAIR CIMINO: I'm going to go to Eric Reid online.

MR. ERIC REID: Thank you for your presentation. As far as things that are prohibited in the EEZ, Atlantic salmon possession is prohibited in the EEZ as well, and it's also prohibited for federally permitted vessels, no matter where they are. I would suggest anybody of interest would look at New England's action to accommodate salmon farming in the EEZ, about how we handled some of those.

My question is about competing interests or space in the ocean. Aquaculture is a competing interest, and offshore wind, the lease areas, those are competing interest for space as well. Those areas have the ability to do certain things other than offshore wind. My question is, who would regulate placement of aquaculture facilities within those areas?

MS. BLACKLOCK: I think that I can answer your question about who regulates space. For finfish aquaculture, which we're talking about, the permitting authorities are the Army Corp of Engineers, the EPA, and then NOAA plays a consultative role for endangered species, habitat, et cetera, et cetera.

The siting warehouse that finds farms space is inside of NOAA, it's in the Ocean Service. There are 30 scientists at the ready that help place, identify appropriate sites. The science is in NOAA, but the authority that permits the use of that space is the Army Corp of Engineers. Then the permitting agency for effluence and environmental impacts to water quality is EPA. Hopefully that was clear enough.

MR. REID: Follow up.

CHAIR CIMINO: Yes, go ahead, Eric.

MR. REID: I appreciate that, and I hope you're right. But in reality, the offshore wind lease areas are managed by BOEM. It's my experience that NOAA and everybody else is only in an advisory capacity that may or not be adhered to. I would like to find out for real what BOEM allows the offshore wind areas to do, other than offshore wind. They are all foreign companies, and they know a lot about farming a lot of things, so I don't need to know today, but I think it's something that we should address.

MS. BLACKLOCK: Sorry, just a clarification. I think I misunderstood originally. Are you talking about co-location with wind, specifically?

MR. REID: That is exactly what I'm talking about.

MS. BLACKLOCK: Got it, okay thank you, I took a note.

CHAIR CIMINO: I'm going to go to Erika and then Dave Sikorski online.

MS. ERIKA BURGESS: Thank you very much for this presentation. I'm in Florida, and we're paying attention to NOAAs development of that aquaculture opportunity areas. I'm very interested in seeing a white paper on this, and was wondering if we could also receive a copy of this presentation. Thank you.

CHAIR CIMINO: To Dave.

MR. DAVE SIKORSKI: This is an important conversation; I appreciate being able to participate. I would like to thank Ms. Fegley for her comments, from a Chesapeake perspective for sure, and highlight something that hasn't been raised today, and that's the forage needs of aquaculture fish, and how we have some various challenges that have already been raised in this committee today by some stakeholders, and continues to be a challenge, from a national security standpoint, exports, lots of different things, ecosystem balance, et cetera.

I think that's really important to consider, what are

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

these fish being fed, where the source is from. They've got to be really cognizant of robbing Peter to pay Paul, especially with the challenges that our commercial fisheries already face, and working waterfronts already face from so many angles.

I know that we will all keep that front of mind as we move forward with this. Just from a food resiliency program perspective. I would be remiss if I didn't mention the tremendous opportunity for wild caught protein here in the Chesapeake Bay with the invasive blue catfish. Many of us in this region have for years been bumping into the hurdles and the roadblocks and the challenges that exist.

As was said earlier, markets are hard to develop. But there is low hanging fruit, and of course there are some policy constraints that many in this region are concerned about. I think it's an all-hands-on deck effort if we really truly care about our domestic seafood sources, especially those that come from the Chesapeake Bay, and then fuel the coast, which of course we all are organized to manage. I really look forward to the white paper, and future conversations on this. Obviously, nothing happens in a vacuum, so thank you for bringing this to our attention today.

CHAIR CIMINO: If I may, I see Cheri's hand it up, but I'm going to editorialize here a bit myself. I'm always very skeptical by the numbers of imports, when we don't talk about the numbers of exports as well. You know I think if we remove the very cheaply raised shrimp and catfish that Americans are willing to pay for, and look at all of the exports from the fish that we do our absolute best to manage here as wild harvest that are being exported, as well as salmon that are caught here and then reimported.

I really do wonder about those numbers and those deficits of what we have available to us. I also worry about, you know competition. We've made some very tough choices just this week on keeping the spiny dogfish fishery alive here, on even with our great concerns for striped bass, we made a very difficult decision on where the commercial fishery should be.

Taking a reduction, doing our absolute empathic best to keep that fishery alive. To have these discussions on a competition, which our Commissioner Eric Reid, who is kind of our resident fishmonger, if you will allow me that, called it a niche fishery. I spent quite a few years in the Chesapeake Bay, and saw even in, you know the first weeks of that wild harvest fishery opening, prices of wild harvest striped bass going from \$4.00, \$4.50 a pound at the beginning of a week to \$2.50 a pound by the end of the week. The thought of adding aquaculture fish to that, I have some concerns. I just want to put that out there, and I'll turn it over to Cheri.

MS. CHERI PATTERSON: New Hampshire has had to deal with some aquaculture offshore aquaculture permits, or inquiries. The thing that I continue to be concerned about with aquaculture, apart from what we've heard so far, is oftentimes these permits or these inquiries don't necessarily include the complete project.

What I mean by a complete project has to do with land-based infrastructure, in shoreside facilities. You did hear a little bit on the shoreside facility aspect. Because without those sorts of components to an aquaculture facility, it really can't be assessed appropriately. I find it very important that not just NOAA Fisheries, but also, and I've expressed this to the Army Corp, that a complete application needs to be provided for public comment during the process.

CHAIR CIMINO: Any other hands around the table? I don't see any online either. Thank you, Danielle, I appreciate the presentation and appreciate you providing that information. I'm sure you'll get some follow ups from some folks here and others listening online as well.

MS. KERNS: If there is any other information that those folks think of later on, if you e-mail me, I can pass that information along to Danielle.

MS. BLACKLOCK: Thank you very much.

REVIEW NOAA FISHERIES WHITE PAPER FOR AN INDUSTRY-BASED SURVEY

CHAIR CIMINO: With that we're going to move on to a Review from NOAA Fisheries on a white paper. Those of you that follow the Mid-Atlantic and New England Councils, you will be familiar with this. This white paper is on an industry-based survey, and we're going to turn it over to Kathryn Ford.

DR. KATHRYN FORD: Good morning, everybody, thank you for having me here today. My name is Kathryn Ford, I am the Population Ecosystem Monitoring and Analysis Division Director at the Northeast Fisheries Science Center. We call this Division PEMAD, and it includes our Ecosystems Surveys Branch, which is run by Peter Chase.

That branch is responsible for several major fishery independent surveys at the Northeast Fisheries Science Center, including the multispecies bottom trawl survey, which will be the focus of the talk today. Today I'm talking about an industry-based trawl survey white paper that we wrote this fall.

This work, I only put my name on the slide, there really wasn't enough room for everybody's names on here, because so many people helped with this project. But most notably, the Northeast Trawl Advisory Panel and a workgroup that that panel set up, helped with this project. For those who aren't familiar with NTAP, it's the joint Mid-Atlantic and New England Council Advisory Panel. I'm here today to present the white paper that was developed in response to the Council and Commission motions from September and October of 2023, to develop a white paper outlining an industry-based survey that is complementary to the spring and autumn bottom trawl survey that the Science Center runs. The Northeast Fisheries Science Center's multispecies bottom trawl survey, which I'll generally refer to as the BTS or the bottom trawl survey, is operated by the Science Center, and the purpose of this survey is to monitor ecosystem changes in trends and abundance distribution and life history for demersal fish.

We provide information for 63 stocks, and we collect more than 600 species on this survey. It's a shelf-scale survey that extends from Cape Lookout to Nova Scotia. The reason that we sample in Canadian waters is because this survey predates the Hague Line. Key reports that we inform with this data include the status of ecosystem report, stock assessment and climate assessment.

This data is used much more broadly than just the reporting requirements to the Northeast Fishery Science Center, and it is a substantial scientific undertaking that is globally recognized. We sample 60 days in the fall and 60 days in the spring for a total of 120 survey days per year. We use as our primary platform the Bigelow.

The Bigelow also has a sister ship called the Pisces, and both of these ships are run by the NOAA Line Office, OMAO, or Office of Marine and Aviation Operations. We're in NOAA National Marine Fisheries Service. At the Northeast Fisheries Science Center, OMAO is a separate line agency within NOAA.

NOAA OMAO also ran the predecessor vessel to the Bigelow, the Albatross IV, which operated this survey until 2008, and we did an extensive calibration between the two vessels, as well as new gear that was used by the Bigelow, before the Bigelow started in 2009. The trawl survey gear that is used was designed with the Northeast Trawl Advisory Panel, and similar gear is used by the Southern New England Mid-Atlantic NEAMAP Survey that is done by VIMS, as well as ChesMMAP and other regions are thinking of using this gear.

This program includes five biologists and three gear technicians, for a total of eight full time staff that focus on making sure that this survey is conducted each year, two seasons a year. When we're out on the boat, we're sailing with 15 scientific staff, and the survey staff that are the fulltime staff, also support a variety of research effort, including taxonomic studies, re-stratification analyses, catch efficiency research, and a variety of modernization projects.

This is an extremely valuable survey for both

These minutes are draft and subject to approval by the ISFMP Policy Board.

The Board will review the minutes during its next meeting

fisheries and marine ecosystem monitoring, and a key goal in how we operate this survey is to provide consistency in our trawl performance. The reason why consistency is so important is to make sure we don't introduce uncertainty in what our scientific results are. We have protocols for this survey to be as consistent as we can, to compare catch results year over year.

We don't want to blame a gear change for a change in the catch, for example. The images on the left here show an example of inconsistent trawl performance. You can see the top image shows the trawl net right on the sea floor, and then the bottom image shows the trawl a little bit off the sea floor. That can result in different results, and the way we handle that is we use a tow evaluation program, and a variety of protocols to ensure that there is consistency. Any tows that exceed our standards will be re-towed. On the right-hand side, I'm showing an example of inconsistency in the time series. Inconsistency in the time period, you can see a gap between the orange line on the left and the green line on the right. This is just a theoretical dataset of humidity. This is just a random time series, not anything to do with fisheries.

But you can see that gap in between the two time periods. To fill that gap, you can use a variety of tools to extrapolate over that gap. But when you do that kind of work you introduce uncertainty. This isn't always a big problem, very data rich environment, we have excellent capabilities for creating extrapolation. But it can be especially a more data poor situation.

We do have a lot of tools to try and address any lack of consistency that we have. We use things like calibrations and catch efficiency studies. There are modeling advances that we're using. You can even start a new time series and have a brand-new dataset that could go into understanding a particular question.

But all of these types of activities to address inconsistency represent various tradeoff, either in precision or accuracy of the data, could involve slowing down the timeline of the analyses and the

availability of the data, the complexity of the analyses. In general, the less data massaging that you have to do, after collecting a dataset the better.

You really want to make sure that you're as consistent as possible in these long timer periods. One of the things that can affect gear performance, especially for trawl surveys, is the platform itself. The way we've been doing this for 60 years, is to rely on a single vessel, and be as consistent as we can with the vessel itself, as well as all of the trawl protocols that we use.

In recent years we've become concerned about the reliability of the Bigelow vessel. This graph here shows our spring survey in a solid line, and our fall survey in the dotted line. The first half of the survey years, 2009 to about 2015, we had very good survey performance. A good survey year for us, we target about 370 stations. We typically accomplish around 350 stations.

You see that we have very stable performance up until about 2017. In 2017, there was mechanical failure. The Pisces, a sister ship was brought in to complete the survey. You can also see the clear impact of the COVID year in 2020. We actually got out in the spring in March of 2020, but then we were brought in off the water once COVID really got going, and then in the fall we were off the water for the whole season.

Then last spring, spring of 2023, there were mechanical issues, a variety of issues with the vessel, and it got stuck in drydock for a couple of months. Over the history of the Bigelow time series, we've done 30 surveys, and 30 percent of them have less than 320 stations. It does look like we're seeing less reliable performance in the more recent years.

We're expecting more platform impacts, so we have the unintended lost sea days that we've been addressing. There is also increasing challenges, potentially with government shutdowns that could occur really now at any time of the year, it seems like. We also have offshore wind that we're facing, the Bigelow vessel will not be able to operate the trawl gear inside offshore wind energy areas. There is a

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

midlife refit that is coming up in September of 2027. We're in the process right now of making sure that the Pices will be available during that timeframe, but we'll be down to that single vessel during that timeframe. Then ultimately, we're going to have end of life in another 20 or 30 years for the Bigelow. Especially after last springs loss of two months of sampling, NTAP formed a working group to develop a contingency plan for the Bigelow.

This working group kicked off in September of 2023, and the term of reference is to describe vessel platforms that can support completing the Northeast Fishery Science Center spring and fall bottom trawl survey, when the Bigelow is unavailable. There are four major options that we're looking at right now.

The first is the Pisces, the second is a Northeast Fisheries Science Center vessel that is calibrated to the Bigelow. Right now, the Science Center operates the Gloria Michelle vessel, and we're interested in procuring a larger vessel that could work further offshore and tow the gear that we tow on the Bigelow.

The third option is an industry-based vessel calibrated to the Bigelow, and the fourth option is an industry-based survey that is not calibrated to the Bigelow. This would be a parallel separate time series entirely. That is the option that the motion addresses, is this fourth option under this contingency plan that we're building.

The goals for this project span three major thematic areas. The first is providing science for management. Here we want to improve our data products by improving our survey data consistency. For operations, I'm referring to our survey operations, the activities that we take to create this data. Our main goal under our survey operations is to be consistent.

We want to add resilience here to the existing multispecies bottom trawl survey, so we can continue to sample each season the maximum number of stations to get into that 350-station range. Then a third thematic area is industry

involvement. We think it's critical for our science to be informed by industry's perspective.

We want to make sure that we're being fully transparent about the activities that we're undertaking. A goal is to improve trust through collaboration. In building the industry-based survey white paper, the IBS white paper, we started back in September after the, we actually started, we have an outline together prior to the motions that the Councils and the Commission addressed.

In the last several months we've had two drafts that were reviewed. The first draft was reviewed internally and by the Northeast Trawl Advisory Panel's working group. Then we had a second draft that was also reviewed internally by the working group, and by external reviewers that included representatives from NOAA Headquarters.

Our National Survey Coordinator took a look at this. We had reviewers from the Northwest Fishery Science Center and the Alaska Fishery Science Center that both run industry-based trawl surveys on the west coast. We had input from several other folks that are associated with this project, and very interested in this project. We also held three separate meetings, two of them were with the NTAP Working Group, and one of them was with the Northeast Fisheries Science Center's Population Dynamics Branch that conducts our assessment work. What we have described in this white paper is to use the same design as the bottom trawl survey. We would use the same geographic range, season, strata and station allocation as we currently use. We would aim for 24-hour sampling, and determine if 12 hours per vessel is feasible.

This is a really important determination. We do sample 24 hours right now, and we do have species that exhibit various diurnal patterns. We've explored how we would do 12-hour surveys that would span the dawn and dusk periods. This is something that needs additional conversation and exploration for how to make that work, and if we even need to make that work.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

For gear, the plan is to use the same gear as the Science Center Survey, but provide flexibility on doors, again really focusing on making sure that trawl performance is consistent. We also allowed flexibility on no auto trawl, based on industry feedback. We would include net mensuration for the tow evaluation for all of the gear packages.

Sampling would include providing station data, water quality data, all of the gear performance and net spread data. For catch we would sample total number of biomass composition, age, sex, maturity, and stomach content, at least preserving stomach contents if they can't be processed on the ship. Then we need to determine additional biological sampling of catch during the pilot survey, which I'll explain in just a second.

The vessels would need to be of an appropriate length and horsepower to sample in open ocean conditions, and tow gear at 3 knots for 20 minutes. We would need sufficient winch capabilities for towing the standardized gear package across the survey area. We would need necessary deck space for processing stations and catch processing.

We're planning capacity for CTD casts to 200 fathoms. We're considering placement of the CTD on the trawl net, as they do in the Northwest Fisheries Science Center. We would need appropriate vessel crew for the length of the sampling day, whether it be 12 or 24 hours. Space for one spare net at least.

Depending on the length of the legs, if we do have vessels that are doing longer legs, more spare nets may be necessary, so more space would be needed for that kind of survey. It would be capable of using the appropriate doors to maintain the net performance, and if 24-hour operations are being done, the appropriate number of bunks for the vessel and science crews would be necessary.

Data management is an important consideration throughout this endeavor. We rely right now on electronic data collection and management, and we would plan on continuing that. The key element here is making sure that this data is available to stock

assessments relatively quickly. We try to get it to them as soon as we can, and aim for four weeks after a survey concludes, and we would try to match that performance with this survey as well.

With program management, the way we sketched this out in this framework was as a third party operated survey. But there are other options that are described here. This is an important consideration, in terms of how the program gets built out. The way we started was with kind of a simpler conceptual program management plan, which is to pass any funding through to a third party, and the third party would run the survey. This is similar to how the Southern New England/Mid-Atlantic NEAMAP survey is done, and the Gulf of Maine NEAMAP survey is done. It's the Maine/New Hampshire NEAMAP Survey.

Some of the key differences between the industry-based survey and the bottom trawl survey that we're doing on the Bigelow, is that the way we've described it now is that program management relies on a third party. We didn't build it up as a separate survey team within the Northeast Fisheries Science Center, we did this pass-through method.

There would be potential use of multiple vessels. Some folks did say that there are large enough vessels on the eastern seaboard to do what the Bigelow does. But we're opening the door to the possibility of multiple vessels. Potential use of different doors is a difference. Smaller wire diameter came up as a different potential difference.

The bottom trawl survey uses a 1-inch wire and the fleet in this region typically has 7/8-inch wire. It is possible that wire is provided to the survey, and we would stick with the one inch, but we could also use the wire on the vessels that is already there, the 7/8 inch. No auto trawls were requested in the design.

This is the way the Alaska Fisheries Science Center does its survey right now, they don't rely on auto trawl, they rely on protocols to ensure wire out consistency. But they are trying to move away from that, they want to use auto trawls, because it improves net consistency, the trawl performance.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

We cannot establish the specific towing protocols at this time, because they are really dependent on the vessels, and some other specifics of how the vessels are set up. That would need to be determined during a pilot study. Also, there was a fair bit of back and forth about biological sampling. The industry requested a minimum viable biological sampling protocol to optimize or maximize the number of vessels that might be able to conduct this type of survey.

However, a lot of the scientists who are doing industry-based surveys really think that full biological sampling can be accommodated on industry vessels. This is another area for exploration during a pilot study. Plankton sampling is also to be determined. The bottom trawl survey does do bongo towing, and it's to be determined if we could handle that on industry-based vessels, and what the impact on timing would be for the survey itself.

We simplified it by removing acoustic sampling that adds a fair bit of electronics and data processing, data storage and handling. We took out the acoustic sampling for now, and I alluded to complexities of the 12- and 24-hour day accommodation. That is something else that needs further exploration.

Back to the primary goals that we're trying to meet. How does the IBS address these goals? In providing science for management, the key scientific value is increasing resilience of our primary time series for many assessments. The operations goal will be able to create a replacement in the event that the Bigelow can't survey, and with industry involvement, we're working with industry to provide significant input into the design and operations. It is possible that industry vessels could be used as platforms for this survey. Our next steps are to finish the contingency plan. We want to flesh out those first three options of the contingency plan. For review, Option Number 1 is using Pisces that is the sister ship to the Bigelow.

We want to use Pisces as a backup, it's not ready to trawl right now, it needs some improvements. We want to make sure that that happens as soon as possible. Then Options Number 2 and 3 are looking at other vessel platforms that would be calibrated to

the Bigelow in some manner. We want to flesh out those options and see what the pros and cons of each of those are.

We also need to start to connect this with offshore wind. With offshore wind we have a few different projects underway right now, looking at the potential for mitigating our survey impacts. The Bigelow will not be able to sample inside of wind farms, and we're looking right now, evaluating what those impacts are going to be, what species are most affected by that, and what are the options for replacing those stations?

Then I'm thinking that we can plan out a pilot survey in the next 6 to 9 months that could be on the water in FY2025. This might be giving some people that are on this call a little bit of a heart attack. But I think it's possible, at least on a relatively small scale, to be able to have a pilot on the water in another year and a half or so.

That is dependent on an awful lot of variables, but I think it is a reasonable goal to strive for. That was it, thank you all for your time, and I'm happy to answer any questions if there is time, but certainly feel free to reach out to me if you have any questions, or want any additional information about what we're up to.

MS. KERNS: Thank you, Kathryn. We are going to go ahead with questions for Kathryn, and then we can go into some discussion if we want to do anything following up. Shanna, and then Jason.

MS. SHANNA MADSEN: Thank you, Kathryn, for your presentation. I think this is a really important topic, and I'm glad to see some progress being made here and the options that are available on the table. I have a few comments that I'll save for later when we get into comment time.

But I did have some questions regarding the pilot survey, and sort of what you are envisioning for that. It seems like you have four options on the table right now. Are you thinking that the 2025 pilot survey is just going to encompass one of those options, or that you might be testing several during that time period?

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

DR. FORD: Yes, thank you for the question. The pilot survey would be mostly focused on either Options 3 or 4. Option 1 is the Pisces, which is the sister ship. We don't need to test that. We have used the Pisces in the past as a fill in for the Bigelow, and so that won't need testing. The Northeast Fisheries Science Center is in the process of considering procuring a larger vessel, and we would need to determine whether or not we want to calibrate that vessel to the Bigelow survey or not. That would be an outstanding question. But really what I'm thinking about for a pilot survey, and again this is very early days in this line of thinking. Somewhere in addressing either Option 3, which is another platform calibrated to the Bigelow, or Option 4, which would be platform not calibrated to the Bigelow, so it would be a separate time series.

That Option 4 that we addressed in the white paper, may be most consistent with how we're going to be mitigating offshore wind. We really need to advance our progress on that conversation, and start to think about what is the regional need to do a multispecies bottom trawl survey inside of offshore windfarms, and how would we design that survey? How would we conduct that survey, and how could that serve in any sort of capacity as a backup for the Bigelow?

MS. KERNS: Thank you, any follow up, Shanna? Jason.

DR. JASON McNAMEE: Thanks, Kathryn, that was great. I really appreciated the presentation. A couple of just quick questions from me that I didn't see covered. But I'm thinking you guys probably at least talked about. Maybe I'll start by saying, this is fantastic. I remember the first time this concept came up that I was aware of, was under Bill Carp, and then I remember talking to John Hare about it as well, as he kind of came into the leadership role over at Woods Hole.

It's great to see how this has kind of kept going, and it's really far along in its evolution at this point. One of the ideas that came up in those discussions was this notion of efficiency and potential cost savings. Have you guys talked about that at all? Maybe you're not quite there yet, and you need to hammer

out the logistics a little more. But just wondering if this idea of efficiency and cost savings has come up in the context of the IBS.

DR. FORD: Yes, that is a great question, and it has come up. One of the items, one of the first things we looked at was comparing the cost of the West Coast Surveys, which are done using multiple industry-based vessels. What is the budget for say, the Gulf of Alaska survey compared to the budget for the Northeast Fisheries Science Center Survey Team?

They are vastly different, because we receive sea days from OMAO. We don't pay the ship time at the Northeast Fisheries Science Center level. In terms of our specific budget inside of the Science Center, this whole survey, this 120 days on the water per year is the out-of-pocket cost for less than a million dollars, they are half a million dollars, it's \$250,000.00 a season.

It's incredibly cost effective. However, if you start to look at how much do those individual sea days cost, and if the Science Center was given that money to do with whatever it wanted to, that is kind of a different perspective. We're starting to look at that now, and the initial price that we got on a sea day for the Bigelow is \$56,000.00.

In this white paper, one of the initial pieces of material that the Working Group was working with was a cost estimate. We had a spread sheet; we were trying to piece things together. But it got to the point where we had enough uncertainty that we couldn't really build that cost estimate that well. There are a lot of upfront costs, and then you start to get into how many vessels are you going to be using. That really starts to explode the cost, in terms of staffing, complexity of managing the program, the amount of gear that is needed for the program. It makes a lot more sense to kind of ease into the like, okay what would a smaller scale study look like to explore the types of vessels and the actual capacity of the vessel?

How many vessels would we end up wanting to hire in the end? Then what are those day rates looking like? We have seen day rates for commercial vessels

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

that we use on other surveys just skyrocketing. I mean in some cases almost doubling over a couple of years. I think there is a lot left there to really look at, in terms of the costing. I think the narrative is that it's going to be cheaper to use industry-based vessels. But I don't think we know enough yet to definitively answer that.

CHAIR CIMINO: Any other questions? John.

MR. CLARK: Just curious, I mean it seems like you are anticipating the Bigelow to continue to have problems. Did the previous vessel have anywhere near these number of missed days, or is this boat just extremely problematic for some reason?

MS. FORD: I don't know the answer to that question. I haven't looked at the Albatross performance. If there is anybody online who knows the answer to that off the top of their head, please raise your hand. What we're doing is we're being precautionary. The vessel itself, I wouldn't characterize it as being unusually problematic. I think that is probably unfair. But overall, there are challenges with getting repairs done on time, more from some of the contracting and program management end of the spectrum.

Some of these challenges are very difficult to resolve. You know it's not like we can just point the finger at OMAO and say, oh, they messed up. It's not that simple. We're really approaching this from the, you know we want to be as precautionary as possible. We can't necessarily read the tea leaves too far into the future, but we want to know what we're going to do if we have to pull that trigger.

CHAIR CIMINO: Pat.

MR. KELIHER: Thank you, Kathryn for that presentation. I mean it seems like this white paper is identifying ways to move in a good direction. But I just can't stress enough the need for the direction of industry-based surveys and using industry platforms. The transparency that comes along with that, the buy-in that comes along with that is certainly recognized as a great benefit, with the Maine/New Hampshire trawl survey.

That slide that you showed on performance to me is incredibly problematic. The life span of that vessel in the future is also being called into question. From Maine's perspective, we continue to stress the need to move in the direction of those industry-based surveys, and I understand the budget constraints and concerns. But if that is what the problem potentially is, then let's talk about that and how we potentially rectify those problems as well.

CHAIR CIMINO: Shanna.

MS. MADSEN: Since we're moving into comments I'll go ahead and echo what Pat just said. I found that when I was reading this paper it sounded very hypothetical, like a hypothetical industry-based survey. Working as the NEAMAP Coordinator over a decade ago, we were considering using NEAMAP as the platform for an industry-based survey, which would completely fulfill Options 3 and 4 within this document.

We have in my mind a pretty apparent solution, and I think that what I would like to see from the Center is less of a hypothetical white paper on how to utilize an industry-based survey, and more specific to utilizing the NEAMAP platform that we already have built, and has been up and running for 18 years.

You know there are a lot of comments in here regarding whether or not biological sampling could be conducted on these commercial fishing boats. I think both NEAMAPs have proved that that is incredibly possible. I think I would like to see as we move into the future, the development of a white paper that is specifically addresses the use of NEAMAP surveys, to fill this hole that we're talking about here.

CHAIR CIMINO: Others around the room, as Shanna pointed out, we're kind of moving into comments. I don't see any other hands around the table. Eric, we'll go to you in a minute. I also want to echo a lot of the comments that have been made, and Kathryn, I really want to thank you for this.

I think one of the last things that we as managers want to discuss is adding uncertainty, the un-comfort of that. I want to make an IBS joke for Shanna's sake.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

I'll just say that we need to go into this with eyes wide open, and this dialogue, I think is very important. I don't see any other hands around the table, so I want to go to Eric Reid. Go ahead, Eric.

MR. REID: Thank you, Dr. Ford, and the teams which include NTAP and the NTAP Working Group, which I'm a member. You really did a fabulous job in laying out the document and all the options that are available around the table. It's quite a bit of information at this point to digest today, and of course New England and the Mid-Atlantic will also get a presentation over the next two weeks.

But following along on the discussion by my fellow Commissioners, the next steps for all three of our management bodies, our partners are important to address, and if it pleases the Chair, whenever you're ready I have a motion if it's appropriate, or a notion of a motion that we can beat it up and see what happens, Joe.

CHAIR CIMINO: Yes, thanks, Eric, we have it up, so why don't you go ahead and then we'll see if we get a seconder.

MR. REID: Okay, thank you. My name is Eric Reid; I'm a Legislative Proxy from the state of Rhode Island, just so everybody knows who I am. I **move to recommend to task NTAP and the NTAP Industry Based Survey (IBS) Working Group to develop an outline detailing a proposal to conduct an IBS Pilot Program to test the viability of the program as presented in the "Proposed Plan for a Novel Industry Based Bottom Trawl Survey" whitepaper with a particular focus on adapting Section 2 "Survey Design Elements" to current industry platform capabilities. Delivery date for the outline should be in time for further discussion at the Spring 2024 meeting cycle for the Commission and both the Mid-Atlantic and New England Councils in April, 2024.** I have some additional rationale if I get a second. There is the motion.

CHAIR CIMINO: Pat, is that a second? We have a second from Pat Keliher from Maine. Go ahead, Eric.

MR. REID: I mean at this point I think it is critical, to

maintain momentum going forward. You know the current bottom trawl survey is the cornerstone that informs management decisions for all that we do for the entire fishing community. An IBS complementary to the Bigelow is a necessity, not a luxury at this point, given the recent performance of the federal survey and future concerns as well.

I do know that this is an aggressive, maybe overly aggressive timeline. But it certainly, you know like the lawyers say, time is of the essence. Once we get an outline from NTAP, to Mr. Keliher's point, that is when we're going to have to start working on funding options. That is my rationale, I'm happy to answer any questions as well, but thanks again to Dr. Ford and her teams.

CHAIR CIMINO: Great, thanks, Eric. We have a motion here, discussion on the motion. Well, actually, Pat, do you have anything you want to add. Then I have a hand from Shanna.

MR. KELIHER: No, Eric Reid said it very well. I don't have anything else to add.

CHAIR CIMINO: Go ahead, Shanna.

MS. MADSEN: I was wondering if Eric would entertain a small amendment to the motion, which I can put forward, unless he's okay with me making a friendly on this. I would like to see at the end of to current industry platform capabilities the words, with emphasis on existing platforms such as NEAMAP.

MR. REID: I'm okay with that, NEAMAP is protocol, the vessel is the Darana R. To me it's a slightly different thing. You know the Darana R. is an industry platform, it's got a lot of experience, and I would expect that that vessel is the poster child for what we would look for. But you want to put it in there, Shanna, that is fine with me. But I don't really know if it's necessary or not. I'll leave that up to you.

CHAIR CIMINO: Shanna, I mean I think with this discussion that notion is part of the record. If you're all right with that then leaving the motion as is, and having that discussion. Okay good, thank you. Any

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

other discussion on this motion? Not seeing any hands. Jon Hare, go ahead, please.

DR. JON HARE: Thank you very much for the opportunity. I appreciate the intent of this motion. I think the timeframe, and Mr. Reid you said it could be overly aggressive. I think the timeframe is too short to put something together of the quality that we want, and then have the review process, have people look at it and make sure we've got something together that everyone is reasonably happy with by April. I think I would question the timing. Then the other thing too, just as a process. Maybe this is a better motion for New England or Mid-Atlantic, since the Trawl Advisory Panel sort of reports to those two groups. Just those two points, and then just a correction. I think it's the NTAP Bigelow Contingencies Working Group, just to get the language correct. But thank you for the opportunity for the comment.

CHAIR CIMINO: Just trying to think this through. You know we were careful to list this as a recommendation, as this Board doesn't feel that we can task NTAP. As far as our hope for timing versus what we expect. I'm not sure how much we need to kind of lay that out, or excuse me, perfect the wording there. I guess I'll open that up to Eric or others, since this is before the Board now. We do want to give this another shot at John's ideas and some corrections. I see Jeff Kaelin's hand.

MR. JEFF KAELIN: As a member of the NTAP ten years ago, when I was a Mid-Atlantic Council member, this has taken a particularly long time to develop and come to this point. I appreciate your presentation today, Kathryn. But I was disappointed to see that the pilot project may or may not get on the water sometime between now and 2025. I don't see why that year needs to pass, frankly, after all this time.

I do think this is an appropriate motion for the Board, to demonstrate our support for the flexibility that we need to make sure that the surveys are going to give us the data that we need to make reasonable decisions. I think, in all due respect to Dr. Hare, I think this is absolutely important today for us to

support, and I would leave the April, 2024 date in there, because it always helps to have a fire lit under certain initiatives, to make sure that they get done as quickly as possible. I'm speaking in support of the motion.

CHAIR CIMINO: Any others? Shanna.

MS. MADSEN: Just ditto. I think Jeff said it beautifully, and that was kind of my point with some of my comments. We've been talking about this for a very, very long time, and we have determined that it's critical for a very long time. I'm speaking in support of this motion as well.

CHAIR CIMINO: Eric.

MR. REID: I appreciate Dr. Hare's comments and correcting my characterization of what the working group is. That's fine with me. Whatever the appropriate name is, I'm fine with that. I do think the timeline is appropriate. If it should read the delivery date for a draft outline is less stressful, I still want to move this thing forward.

As far as the ASMFCs position, ASMFC is an equal member with the Mid-Atlantic Council and the New England Council on NTAP. The Mid-Atlantic is certainly the lead, you know, and I don't know exactly what the protocol is. But ASMFC is well within its rights to make a suggestion to our other two management partners on NTAP for a draft or whatever. I don't think ASMFC is a back seat here.

CHAIR CIMINO: No, and I appreciate that, Eric. I think our thinking here, Toni and I is that is a discussion for all three entities together. With all of that said, I would like to call this and I'm actually going to just ask, **are there any objections to this motion? Okay, I'm not seeing any so this motion passes by consent.** John, your hand is still up, do you have a comment?

DR. HARE: No, sorry, Mr. Chair.

CHAIR CIMINO: I apologize to Jason McNamee, but I do want to go back to Jay, I missed him earlier. Go ahead, Jay.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

DR. McNAMEE: Yes, that was good. Sorry, I'm glad we kind of got through the motion there. I wanted to offer just a couple of more general comments, and these are just for consideration for Kathryn and the team that was kind of working on this. One thing I was thinking about, given the unique nature of how this will be set up with a third-party vendor, that kind of orchestrates the whole thing.

You might want to think about different governance structure models. Maybe it's just the simplest of, you know it's NOAA, and then they have their vendor, you know the contract that they hire for us, and that is one model. Another might be to involve the regional councils and the Commission within the group that kind of manages it.

It would be the vendor, NOAA, and then New England, Mid-Atlantic, South Atlantic and the Commission. Maybe there are other folks that should be in there too, but just thinking about the governance structure that might want to be thought about a little bit. Then the final thing I wanted to offer was about the idea of the different versions of how to set up the transition, I guess I'll call it.

There was a couple of options that were offered. Option 3 was kind of, it reminded me of the Albatross to Bigelow type approach. Then 4 is just nope, it's just going to be a new survey and once it gets enough years, we'll be able to move forward with it. I was thinking about the transition that we made from the Albatross to Bigelow, and the amount of effort that went in, and the great science that occurred on that calibration.

It served a really useful purpose for an interim period of time. But what has happened since then is we've; I think all of the assessments that I've been associated with at least, have now adopted, you know Albatross is one survey, Bigelow is the second survey. They are kind of now separate, they developed their own queues and all of that stuff within the assessment.

I was wondering if there might be some hybrid option between Options 3 and 4, with regard to this where you do some level of calibration work, but

probably don't invest the amount of effort and time that you did with the Albatross, the Bigelow. One, so you've got something that can get you through a couple of years, while the time series for the new IBS builds up.

But now with anticipation that you're going to be calibrating these things forever. Just some thoughts for consideration. Maybe folk have talked about this, and maybe I'm way off base, but I thought I would offer them. Thank you.

CHAIR CIMINO: I think that covers that agenda item. Next up on the agenda is noncompliance findings, we don't have any, fortunately.

OTHER BUSINESS

CHAIR CIMINO: So, we'll move into Other Business. I would like to start with Pat, you had an item for us.

AMERICAN LOBSTER PROCESS ISSUE

MR. KELIHER: Yesterday at the Lobster Management Board, we took up the issues of the Mitchell Provisions as they relate to our current FMP for minimum size. Then during those conversations, I raised the issue of, where does that leave us with the maximum size, so we amended the motion and included that language. Staff has since reviewed that and reviewed the FMP, and it would take an amendment instead of an addendum in order to address that.

I think we have to decouple that, and what I would recommend is we decouple the maximum piece from that motion, it would revert back to the original motion the way it was made, and then we continue to revisit this issue at a future Board meeting. I don't want to lose track of this conversation, but I would be hesitant to ask for an amendment for just that small piece. There is some other work, our Area 2 and 3, trap reductions. Maybe we just hold that maximum size conversation off, and address it at a later date.

CHAIR CIMINO: Thanks, Pat, this is important. I think Pat covered that very well, but you know there was an intent by the Lobster Board, and within that

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

motion we now realize that part of that would have to be done differently. That discussion on the amendment process will have to happen at a later date for that Board.

Since we do have Policy Board here, I'll just open it up if there are any questions or concerns with what we're thinking here. I don't see any. Good, thanks, Pat, I appreciate that, for you covering that for us. We have one other item, and then I would like to bring it to ACCSP staff. But I'm going to go to Chris Wright on the Horseshoe crab petition. Chris, if you're still there.

HORSESHOE CRAB ESA PETITION

MR. WRIGHT: We received a petition from Friends of Animals to list Atlantic Horseshoe Crab as threatened or endangered under the Endangered Species Act back on December 21, 2023. The petition also requested that critical habitat be designated for the species in the Atlantic waters. We're currently reviewing the petition under Section 4 of the ESA, to determine whether or not the petition presents a substantial scientific or commercial information threshold.

Once we conclude that we'll announce a finding after 90 days, which is approximately March 19, whether or not we accept it and will move forward, or whether or not we'll reject it. We just wanted to let folks know about that. I did send the petition to Bob and Toni, so if you want a copy it. I believe it's also posted on their website, Friends of Animals, and I think it should be posted on our website soon. But our point of contact is Jean Higgins at our Greater Atlantic Office, so if you have questions, you can ask Jean about the process or where we are in that.

CHAIR CIMINO: Thanks, Chris, I mean this impacts a lot of us. We'll make sure that we get that petition out to all Commissioners. I know some of us have received that already, but we'll make sure that through Bob, we send that out to everyone. Thanks again.

MR. WRIGHT: Great, thank you.

MRIP QUERIES

CHAIR CIMINO: I want to get Geoff White a minute here to talk about some ACCSP stuff on what they've done, as far as the MRIP queries.

MR. GEOFF WHITE: I appreciate the momentary, the ability to give you guys a brief update. Earlier this week MRIP did post an e-mail out that they are going to be presenting the wave-based data again on their website. I know that is exciting news for those doing assessment and management that have access to that data on their website.

We've been, of course, partnering and working with MRIP over the years for both state conduct of some of the APAIS and FHS surveys, and also being ACCSP is a partnership of 23 agencies to help you guys out. We've been working over several months to update the ACCSP public and log-in data warehouse, relative to the recreational queries. We've added in the cumulative and fishing year options that MRIP began presenting last year, and we've been able to maintain the wave level data through the ACCSP website of the MRIP estimates.

That has been adjusted and it's available today via the ACCSP website, so if you're interested or your staff are interested, please go ahead and let them know that that is there. There will be some outreach coming out in the coming weeks to expand on that information, but thank you for your time.

CHAIR CIMINO: Gee, Geoff, I think that's great and I appreciate that. Yes, obviously it was, I think very important news to see that, and rather exciting for some of us. I mean take an example like striped bass, where we put in emergency regulations midyear, and not knowing at that wave level what was actually happening is very challenging.

Exciting news, I appreciate that. Thank you.

ADJOURNMENT

CHAIR CIMINO: With that, unless there are any other items to come before this Board, I think we can adjourn. I'll take a motion for that. I see Pat and then Cheri as a second. We are adjourned.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting

(Whereupon the meeting adjourned at 10:35 a.m. on
Thursday, January 25, 2024)

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting



Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 28, 2024
To: Council
From: Hannah Hart, Staff
Subject: Northeast Trawl Advisory Panel Progress Report for the Industry-Based Survey Pilot Project

On Wednesday, April 10, 2024, the Mid-Atlantic Fishery Management Council (Council) will receive a progress report on the draft Industry-Based Survey Pilot Project. Background information and a list of materials are provided below for the Council's discussion of this agenda item.

Background

At the October 2023 Council meeting, Northeast Fisheries Science Center (NEFSC) staff provided an update on recent performance of federal fishery independent surveys in the Northeast region. The presentation highlighted recent challenges with the multispecies bottom trawl survey (BTS) conducted aboard the NOAA ship *Henry B. Bigelow*. The BTS monitors fishery stock abundance and distribution on the Northwest Atlantic continental shelf from Cape Lookout, North Carolina to the Scotian Shelf and is one of the longest fishery-independent time series in the world. In recent years the survey has experienced losses of survey days and/or reduced sampling coverage due to vessel mechanical issues, staffing shortages, weather, and other challenges. Most notably, the spring 2023 survey lost 43 of 60 sea days and was only able to sample 70 of the 377 planned stations due to staffing shortages and vessel mechanical issues.

During the October presentation to the Council, NEFSC staff described efforts underway to develop four potential options for contingencies in the event the *Bigelow* is not available for the BTS. The four options include using 1) the *Bigelow*'s sister ship, the *Pisces*, as a back-up ship, 2) a different NEFSC vessel calibrated to the *Bigelow*, 3) an industry vessel calibrated to the *Bigelow*, and 4) a parallel industry-based survey that operates complementary to the *Bigelow*. As a result of the presentation and subsequent discussion, the Council passed a motion requesting that the NEFSC develop a white paper further outlining option 4, an industry-based survey that is complementary to the BTS. The New England Council had passed an identical motion during their meeting the month prior.

In response to the Councils' requests, the NEFSC worked with a newly formed working group of the Northeast Trawl Advisory Panel's (NTAP) to develop a white paper titled "Draft Proposed Plan for a Novel Industry-Based Multispecies Bottom Trawl Survey on the Northeast U.S. Continental Shelf." The white paper was presented to the New England and Mid-Atlantic Councils at their January and February 2024 meetings, respectively. After reviewing the white

paper, both Councils passed motions recommending that NTAP develop a pilot project to test the viability of an industry-based survey as described in the white paper and provide a progress report of the draft pilot project to the Council at the April 2024 meeting.

The full NTAP met after the February Council meeting on February 8, 2024, and the NTAP Bigelow Contingency Plan working group met on February 29, 2024, to continue its discussion of the Industry-Based Survey Pilot Project. The following is a summary of recommendations resulting from those discussions:

- Survey should be able to operate in wind farms.
- Develop a list of data elements collected in the trawl survey, identify which elements are sensitive to standardization.
- Develop a biological sampling protocol for the pilot project that targets sampling needs.
 - The working group emphasized that survey-specific age-length keys are useful.
- Address who will process biological samples.
 - *Note: for the pilot project it is likely that the NEFSC will be able to; however, for a shelf-wide survey this will need to be addressed depending on the volume of sampling needed.*
- Consider some level of overlap between the industry-based survey and bottom trawl survey.
 - When there are multiple indices and data sources it is best to make sure there is overlap so that the model can better address the multiple surveys/data sources.
- Use a restrictor rope in the pilot project.
- Use the same gear as the Bigelow.
- Incorporate any re-stratification of the survey done on the Bigelow.
- Use the same electronics and mensuration gear across vessels.
- Sample in more than one of the 4 major areas for proof of concept.
- Reduce depth limit to 130-150m. Investigate minimum depth required before loss of data required for individual stock assessments versus ecosystem-based assessments.
- Host a follow up meeting to discuss net mensuration value, need, and similarity across different systems.
- Host a follow up meeting with existing survey programs to discuss sampling stations.
- Host a series of public meetings to gather industry feedback. Similar to what was done for pilot hook and line survey.
- Host a workshop with vessel owners to discuss feasibility and/or limitations.
- Have someone ready to help with [System for Award Management \(SAM\)](#) registration so vessels are able to bid on the project in a timely fashion.

Meeting Materials

Materials listed below are provided for the Council's consideration of this agenda item.

- 1) NTAP meeting summary from February 8, 2024
- 2) NTAP Working Group Summary from February 29, 2024

Northeast Trawl Advisory Panel Meeting

~ NOTES ~

Thursday, February 8, 2023

9:00 AM - 5:00 PM

I. Executive Summary

The meeting was held in-person on Thursday, February 8 in Arlington, VA. Attendance was high with most attendees joining virtually. The meeting covered a range of topics including updates on the Northeast fisheries Science Center (NEFSC) and NEAMAP fall surveys and spring preparations. **All fall surveys were successful though gear interference in Gulf of Maine (GOM) remains a concern for Bigelow and NH/ME surveys.** Presentations by NEFSC and School for Marine Science and Technology (SMAST) included an update on the restrictor rope research which will soon be submitted to a journal for peer review. **The restrictor rope did not cause significant changes to species composition or size classes in the area studied. Multiple NTAP members supported expanding the range of restrictor rope research into the GOM.**

Bigelow contingency plans as well as the industry-based survey (IBS) white paper was discussed. Option 1, using the Pisces as a primary backup for the Bigelow, was the preferred short-term plan. Some members expressed doubt regarding the viability of this option and its effectiveness but there was **strong support for continuing to plan and fund the necessary upgrades to the Pisces and ensure it could be used as backup for the Bigelow.** In the context of developing an IBS complementary to the Bigelow (contingency option 4), there was support for exploring this idea though members had some reservations about the viability of this option. Under this option, NTAP had a general consensus around keeping the net and sweep the same as the Bigelow and modifying certain standards (i.e., doors, wire, sweep, auto trawl) to ensure a wide variety of vessels could be considered (more details are provided in the white paper). There was also consensus for maintaining the Bigelow survey as the region's "backbone."

However, since initiating the IBS discussions with the understanding that the survey would start a new, standalone time series, there was **interest in considering an IBS survey not strictly as a Bigelow contingency** (the Pisces is a better contingency option, so use an IBS in a different way). NTAP supported broadening data collection, using gear/protocols that result in more stable net spread and head rope height that is more capable of sampling flatfish, and that can sample inside of wind farms. There is interest in using restrictor ropes but caution about applicability in the GOM. **There was also interest in splitting the survey area into 2 and using different sweeps in each area.** The areas are generally described as being divided by Cape Cod. There were different opinions about what elements of standardization are crucial (e.g., wire diameter). Many NTAP members supported not utilizing auto trawls if the captain is skilled. There are differences in opinion about vessels' ability to sample in wind farms though consensus at this time was that mobile gear will be incompatible of sampling within floating wind farms. There were differences in opinion related to sampling daylight hours vs. 24 hours.

The NTAP working group will meet next to continue discussions on an IBS pilot study. The next full panel meeting will be in summer 2024.

II. Participants

A. NTAP Members:

Name	Affiliation	In attendance
Kathryn Ford	NEFSC	x
Phil Politis	NEFSC	x
Anna Mercer	NEFSC	x
Tim Miller	NEFSC	
Dan Salerno	NEFMC Member Co- Chair	x
Jameson Gregg	MAFMC Scientist	
Jim Gartland	MAFMC Scientist	x
Dan Farnham	MAFMC Member	x
Peter Whelan	NEFMC Member	x
Wes Townsend	MAFMC Member Co-Chair	
Terry Alexander	MAFMC Stakeholder	x
Emerson Hasbrouck	MAFMC Stakeholder	x
Chris Parkins	ASMFC Representative	x
Pingguo He	NEFMC Scientist	x
Vito Giacalone	NEFMC Stakeholder	x
Mike Pol	NEFMC Scientist	x
David Goethel	NEFMC Stakeholder	x
Sam Novello	NEFMC Stakeholder	
Michael Hiller	MAFMC Stakeholder	x
Bobby Ruhle	ASMFC Representative	x

B. Other Participants:

Name	Affiliation
Katie Burchard	NEFSC
Hannah Hart	MAFMC
Alexander Dunn	NEFSC
Andy Jones	NEFSC
Catherine Foley	NEFSC
Angelia Miller	UMASS Dartmouth SMAST
Jainita Patel	ASMFC
Jessica Blaylock	NEFSC
Joe Grist	MAFMC
Chris Moore	MAFMC
GF	<i>unknown</i>
Rebecca Peters	ME Department of Marine Resources
Sefatia Romeo Theken	MA Department of Fish and Game
Catalina Roman	UMASS Dartmouth SMAST
Gareth Lawson	CLF
Kiley Dancy	MAFMC
Jon Hare	NEFSC
Russell Brown	NEFSC
Scott Curatolo-Wagermann	Cornell Cooperative Extension
Ron Larsen	Sea Risk Solutions LLC
Michelle Duval	MAFMC
Alex Mercado	Cornell Cooperative Extension
Andy Lipsky	NEFSC
Renee Reilly	ROSA
Michael Pentony	GARFO
Scott Olszewski	RI Department of Environmental Management
Brad Blythe	BOEM
David McElroy	NEFSC
Katie Viducic	NEFSC
Josh H	<i>unknown</i>

III. Notes by Agenda Topic:

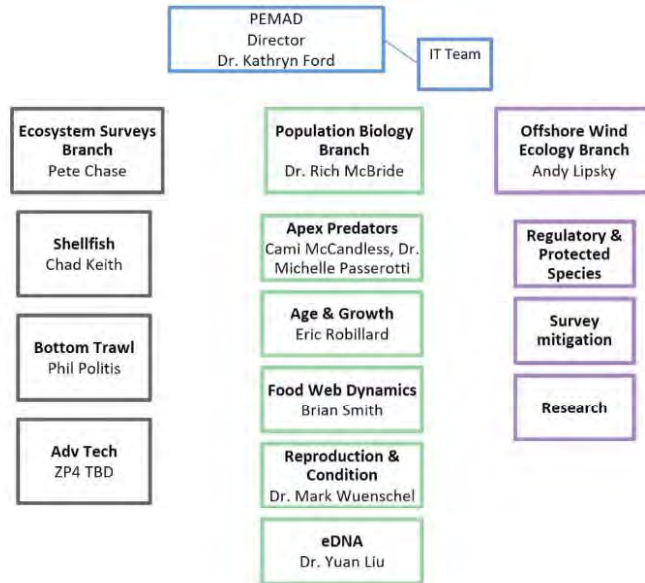
Welcome, Introductions, Logistics (D. Salerno)

- Round Table Introductions

Center Updates (K. Ford, A. Mercer, K. Burchard, A. Dunn)

- Update on action items from last meeting; actions taken on all items. Outstanding: waiting on OMAO guidelines regarding transiting through wind farms (NMFS has reached out to OMAO; they do not have a policy at this time; commanding officers have discretion for both transiting and trawling).
- Correspondence since last meeting
- Funding Update
 - NTAP funding received to support ~2 years of in-person meetings.
- **Bottom Trawl Survey update (Phil Politis)**
 - Fall 2023
 - This marked the 60th year of the NEFSC Bottom Trawl Survey (BTS).
 - Completed 335 trawls of 377 planned.
 - 107 bongo samples of 116 planned.
 - Some weather impacts during leg 1 in September, made up time on following two legs.
 - Significant fixed gear encountered Downeast Maine, Stratum 039. Fixed gear is a bigger problem in the fall.
 - Spring 2024
 - On track to begin as scheduled, currently preparing.
 - Planning for 60 days, 3 legs.
 - Tentative schedule: March 6 - May 15.
 - 377 stations planned.
 - One NTAP member requested additional details related to what stations were not completed and reasons why in future NEFSC update presentations.
- **Gulf of Maine Bottom Longline Survey Update (Anna Mercer)**
 - Completed 100% of stations (45 total) in fall 2023.
 - This marked the 10th year of the Bottom Longline Survey (BLLS).
 - Highlights:
 - Strong catches of groundfish, including haddock, pollock, and cod.
 - Strong catches of hakes (white hake and red hake).
 - Strong catches of large barndoor skates.
 - Two small halibut caught in the eastern strata.
 - One golden tilefish (6kg) caught in the eastern strata.
 - One blue shark (35kg) caught and sampled for the Apex Predator program.
 - Lowlights: High spiny dogfish catches made for a challenging workflow.

- Data recently used for Atlantic cod, barndoor skate, red hake and thorny skate stock assessments.
 - On track to contribute indices of abundance for 5 additional stocks in 2024.
- New [webpage](https://www.fisheries.noaa.gov/new-england-mid-atlantic/science-data/gulf-maine-bottom-longline-survey) (https://www.fisheries.noaa.gov/new-england-mid-atlantic/science-data/gulf-maine-bottom-longline-survey)
- **NEAMAP surveys (Jainita Patel, NEAMAP Coordinator)**
 - **MA DMF Fall Trawl Survey**
 - 88% station completion (91 of 103)
 - 100% stations in GOM 514.
 - Combination of vessel staffing issues related to family medical situation and prolonged poor weather were issues for second half of survey.
 - Lost a station in Muskeget Channel due to Vineyard Wind avoidance area around unprotected cable.
 - High catches of Spotted Hake, Red Hake and Silver Hake.
 - Scup is still the dominant species in southern stations.
 - Continued decline of Little Skate and Winter Skate.
 - Spring 2024 planned as normal. No major changes.
 - **Maine New Hampshire Inshore Trawl Survey**
 - Spring 2023
 - 97 tows completed out of 120 planned.
 - Missed tows were due to bad weather at start of survey and mechanical issues combined with bad weather at end of survey.
 - Fall 2023
 - 78 tows completed out of 120 planned.
 - Missed tows were due to fixed gear and bad weather.
 - The number of tows dropped because fixed gear increased again in the last two years.
 - State still communicating with fixed gear fishermen to try and reduce loss of stations.
 - **Mid Atlantic/Southern New England Nearshore Trawl Survey**
 - Spring 20023
 - 150/150 stations completed.
 - Completion in 35 calendar days.
 - Top species by count: Scup, Butterfish, Longfin Squid.
 - Notable: Three field employees departed our workgroup prior to/during the spring trip, including two chief scientists, one of which was the Chief of Trawl Operations.
 - Fall 2023
 - 150/150 stations completed.
 - Completion in 29 calendar days.
 - Top species by count: Spot, Scup, Butterfish.



- Offshore Wind Ecology Branch (OWEB) joined as a new branch in October 2023.
- Wind Update
 - Block Island (5 turbines) and CVOW Pilot (2 Turbines) – Operational.
 - South Fork (12 turbines), Rev Wind (65), and Vineyard Wind (62) are under construction.
 - Integrated Science Plan for Offshore Wind, Wildlife, and Habitat in U.S. Atlantic Waters (effort by RWSC).
 - BOEM and NOAA Fisheries released North Atlantic Right Whale and Offshore Wind Strategy.
 - Fisheries monitoring plan development (effort by ROSA)
 - Other resources: Mid-Atlantic Council wind website (<https://www.mafmc.org/northeast-offshore-wind>)

IBS Survey + Bigelow contingency plan next steps (K. Ford)

- Presentation covered background on NEFSC Multispecies BTS, need for Bigelow Contingency Plan due to performance concerns in last several years.
- Contingency planning
 - September 2023: NTAP working group started developing a plan.
 - Draft Contingency Plan was developed, considering multiple options:
 1. Pisces
 - Progress update: Readiness plan has been drafted and is being refined with NMFS and OMAO.
 2. NEFSC vessel calibrated to Bigelow
 - Progress update: Drafted memo about pursuing this option, started identifying potential vessels. Lots to still figure out including funding and calibration.
 3. Industry based vessel(s) calibrated to Bigelow

- Progress update: no progress (but can be informed by Option 4 conversations)
- 4. Industry based survey (IBS) not calibrated to Bigelow (parallel, separate survey)
 - Progress update: white paper provided to Councils and presented at Jan/Feb ASMFC, NEFMC, and MAFMC meetings.
- Presentation reviewed the IBS as described in the white paper.
- Following the presentation a similar motion was made at each of the meetings.
 - ASMFC Motion 1/25/2024: made by Mr. Reid and seconded by Mr. Keliher. Motion carried by consent.
 - *Move to recommend to task NTAP and the NTAP Industry Based Survey (IBS) Working Group to develop an outline detailing a proposal to conduct an IBS Pilot Program to test the viability of the program as presented in the "Proposed Plan for a Novel Industry Based Bottom Trawl Survey" white paper with a particular focus on adapting Section 2 "Survey Design Elements" to current Industry platform capabilities. Delivery date for the outline should be in time for further discussion at the Spring 2024 meeting cycle for the Commission and both the Mid-Atlantic and New England Councils in April 2024.*
 - NEFMC Motion 1/30/2024: made by Mr. Salerno and seconded by Mr. Pappalardo. Motion carried by consent with one abstention by NMFS (Mr. Pentony).
 - *Move to recommend to task NTAP and the NTAP Bigelow Contingency Working Group to develop an outline detailing a plan to conduct a multi-vessel IBS Pilot Program to test the viability of the program as presented in the "Draft Proposed Plan for a Novel Industry-Based Multispecies Bottom Trawl Survey on the Northeast U.S. Continental Shelf" white paper with a particular focus on refining Section 2 "Survey Design Elements," considering NEAMAP protocols and current Industry platform capabilities. A progress report on the draft plan should be presented in time for further discussion at the April 2024 meetings of the NEFMC and MAFMC, and the spring 2024 meeting of ASMFC.*
 - MAFMC Motion, 2/7/2024: made by Mr. Hughes and seconded by Mr. Rhule. Motion carried by consent.
 - *Move to recommend to task NTAP and the NTAP Bigelow Contingency Plan working group to develop an outline detailing a plan to conduct a multi-vessel IBS pilot program to test the viability of the program presented in the "Draft Proposed Plan for a Novel Industry-Based Multispecies Bottom Trawl Survey on the Northeast U.S. Continental Shelf" white paper with a particular focus on refining section 2 "Survey Design Elements", considering NEAMAP protocols and current industry platform capabilities. A progress report on the draft plan should be presented in time for further discussion at the April 2024 meetings of the NEFMC and MAFMC, and the spring 2024 meeting of ASMFC.*

- Next Steps
 - Finish the contingency plan.
 - Explore connections with offshore wind.
 - Plan out a pilot survey to be on the water in FY2025.
 - Give a progress report on the draft plan at the April/Spring Councils and Commission's meeting cycle.

Discussion and Questions:

- What is the objective? An industry-based survey that improves on the Bigelow/adds information that the Bigelow isn't collecting, or a contingency for the Bigelow (trying to match the Bigelow)? Would it be a standalone time series or calibrated to the Bigelow?
A: The white paper describes an approach that is a contingency for the Bigelow; it would be a standalone time series.
- Want to create a survey that doesn't have to wait 5 years before the data can be used. Something you can use in the short term.
A: data streams from the IBS that could be used more quickly were outlined in the white paper. Oceanographic data and age data could be incorporated in a short time scale.
- Can we use swept area biomass in assessments, efficiency?
A: Analytical assessments are a model-based assessment using Bigelow data as relative abundance. Empirical assessments (i.e. monkfish) use the trend. Some of our empirical assessments calculate swept area biomass. Taking area, the catch, and catch efficiency and calculating swept area biomass. Description of catch efficiency studies and how catch efficiency is used in stock assessments. Jon Hare will follow up with the Population Dynamics Branch and get back to Vito.
- What is the status of the Pisces?
A: Conversations have begun, we have a scoping plan with the Pisces. We are on track for 2026 and 2027, not on track to have it ready for this Spring.
- Status of a new NEFSC research vessel.
A: In an ideal world we would have estimates in a year. But there are a lot of variables outside of the Science Center at play that can influence timing.
- If the Pisces isn't ready to fill in for the Bigelow, are there any considerations to postpone the refit of Bigelow?
A: There is currently some uncertainty with currently scheduled refit. As far as timing, there are plans for each ship to be the replacement for each other, but that could shift depending on funding availability.
- What is the status of the restrictor rope study? When will it be submitted for peer review?
A: Not long, it is currently going through NMFS internal review and then will be submitted for peer review in a couple of months.
- We need to split the IBS and contingency plan issues. The first issue is the contingency plan for the Bigelow and the options that go along with that. The second issue is then to develop the IBS pilot project to get on the water ASAP. Test out the unknowns (12/24-hour sampling days, 20-min tows, etc.).

- Are there plans to calibrate the Pisces to the Bigelow? Are the physical characteristics similar enough to not calibrate? When the IBS is considered, does this mean that two vessels with similar tonnage and length will not need calibration either (or three vessels that are physically similar enough)?

A: Calibrating between the Pisces and Bigelow as a part of the contingency plan has not yet been decided. Need to understand the characteristics of the vessels that could do this work.

- Pisces has already filled in for our time-series. Maybe some assumptions that calibration is not needed? Sister ships should be the same, what are the similarities/dissimilarity of vessels that would require calibration?

A: NEFSC agrees that calibration may not be needed. We will also be limited to some level. We have not had the chance to calibrate Pieces and Bigelow yet, but it may be identified as a priority.

- Does the Pisces cost \$56,000/day?

A: That is the standard day rate; but the impact on NEFSC budget is not \$56,000 per day.

- Example given of the scallop survey – redundancies were available at reasonable costs when the research vessel was unavailable. The only way to ensure data is redundant.
- Keep in mind “cold start” problem; consider potential ways around that – splitting time or season across the vessels. Adds a tremendous amount of resilience if done right.
- Interesting to get feedback on whether we will be able to trawl in wind farms? Should we assume we cannot trawl there? May help us answer questions.
- Description of the cod IBS - make it so that anyone could do the work on the go. Cod survey uses 4 different boats, bottom sensors, the Notus System, and anything outside the parameters got thrown out. Most tow were completed using the same nets, same doors. Not worried about wire size, as long as net configuration and door configuration was the same. Ideally restrictor rope will be used in the IBS and will lessen concerns related to consistent door spread, etc.
- It’s easy to take things away from a survey but harder to add. I think we can accomplish both an IBS and a calibration if we used the 400x12 on multiple vessels based on strata. Doesn’t make sense to use vessels best suited for deep water to sample inshore. Survey overlap is crucial. Wire to wire is all that is important. Different vessels fit different criteria. Appropriate vessels to pull gear through GOM. Use industry vessel to fill in data gaps.
- With wind energy areas, significant holes will appear in our survey. Whatever we build as an IBS survey needs to be able to operate and maneuver in wind farm areas. GOM different windmills. But for southern New England/mid-Atlantic could an IBS still operate in those areas?
- We need more information about these wind farms to know who and what can tow there. Also, need additional details on how they will be cabled. Crosshatched? Buried? Block Island Wind farm is currently having trouble keeping their cable buried. I do think we still need to flesh out IBS. Restrictor rope work getting published gives us the answer. Standardize wing spread and have the best doors and be happy with your catch. There will always be uncertainty.
- Discussion about tow time: power take off hydraulic system vs. a haulback and the catch rate you’d encounter. NEAMAP protocols call the tow time at the initiation of trawling mainly because we are in shoal water. The survey tow time is from the time it starts until haulback. Technically it can still catch fish coming up. Tried minimizing that variance by stopping everything at the end of the tow.
- Discussion about restrictor rope, multiple vessels, and introduction of uncertainty.

- Cod IBS used 4 different vessels similar size and horsepower. Didn't use any sort of calibration but standardized gear. Minimizing variation via standardization.
- It is not ideal to use multiple vessels but may be needed. How can we conduct a multi-vessel survey without needing to calibrate but doing all that we can to eliminate as much of the potential variation as possible.
- Standardize wingspread, recognizing equipment differences. Could never calibrate all boat variables, need a way to minimize variation. It's a rabbit hole. If you change net ends you get different geometry, there is no way to get it perfect. We have to design something that will do the best job possible. I fear trying to design something perfect and never coming out of the rabbit hole.
- Bigelow wire size was too big.
- Need to be cautious we don't standardize the wrong thing. Better served to standardize performance metrics and geometry. Anything beyond that just creates problems for availability of vessels. You want to put bounds on the boat but don't focus on what is irrelevant to the application of the gear. Industry knows the implications of changes to gear. Wire size has no impact on catch. As long as spread isn't disrupted the door could be upside down and would not impact what is being caught.
- What was the added value of having an auto trawl on the Bigelow? Albatross didn't have it. I have never heard any justification related to why it is so important.

A: Auto trawl balances the tensions between the two warps. Comes into play when the current is pulling more on one side. Also, in high wind conditions the wind can start pushing the vessel to one side or the other relative to the gear. In this type of situation, the auto trawl will balance out the tension between the two warps. An auto trawl improves the consistency of tows and therefore the data collected. Also added benefit to when you hang minimizing gear damage. There is literature that has studied these elements.

- Leave Bigelow survey alone we don't want to mess up that time series. How important is it that these vessels are similar to each other and/or similar to Bigelow, given it will be a stand-alone/complementary data set? Is there flexibility in how we design the IBS?
- If the IBS data will be treated differently, will data coming off say 4 boats need to be as close as possible or can we have more vessel differences and deal with the data analytically? There are advantages to having different vessels operate according to the area being fished.
- As far as the vessel effect goes, it's not only towing speed and net geometry there is inertia from heavier boats so boats would need to be similar in size and horsepower. Vessels could be a class of vessels. The "cart" should be standardized but the "horse" should be similar in size and class. But the subtlety and variability in vessels will help us better cover geography, depth, and bottom.
- There are a number of ways to compare a new net and an old net. What's important is whatever you are doing. We need to be open and aware of where you are holding your nose as to where you are willing to accept variation and where you aren't. A net maker can make the same two of the exact net and one will catch differently than the other.
- Captain experience to deploy gear ensures consistent performance so that data is the highest we can get. To design an IBS, we'll lean on captains with experience. How do we leverage experience and maintain consistency? Experienced captains mean less need for auto trawls. It would be good to

get expertise from NTAP captains to ensure metrics across vessels could be valuable to all multi-vessel surveys.

[The following points were presented at the end of the meeting and placed here due to relevance to this section.]

- Edits are needed in Section 2.3 sampling gear. We never talked about using a chain sweep or considered it for use in a survey, we talked about the chain sweep efficiency factor not the chain sweep itself due to degradation of size. The cookie sweep has the least amount of variability.
- Endurance, nowhere you can't make port in several hours. 7 days is enough. 10 days with a single crew could weigh on them rather heavily.
- Need to know about the boat before building out the plan.
- There are portable acoustic units that could work for acoustic requirements. Boats have to have acoustics to see in front of them. Now-a-days we all have sounders.

Action: We need to think about at least 1-2 working group meetings to discuss metrics important to have consistency across vessels before April. Hannah will organize a doodle poll.

Survey redesign & mitigation (C. Foley, Fay, M. Hall, A. Mercer)

Presentation by Catherine Foley (NEFSC)

Current stratification is a problem. Oversamples some strata and under samples others. Currently, NEFSC is looking at reducing the number of strata by condensing existing strata into "superstrata" or using a spatially balanced sampling design such as Generalized Random Tessellation Stratified (GRTS), which is adaptable to change. The presentation provided some examples. Also looking at impact of wind energy areas. If there is no sampling inside of wind farms, are we able to estimate what's going on inside by sampling outside? Perimeter sampling was representative of the biomass for small wind areas. This declines with the increase in size of wind areas.

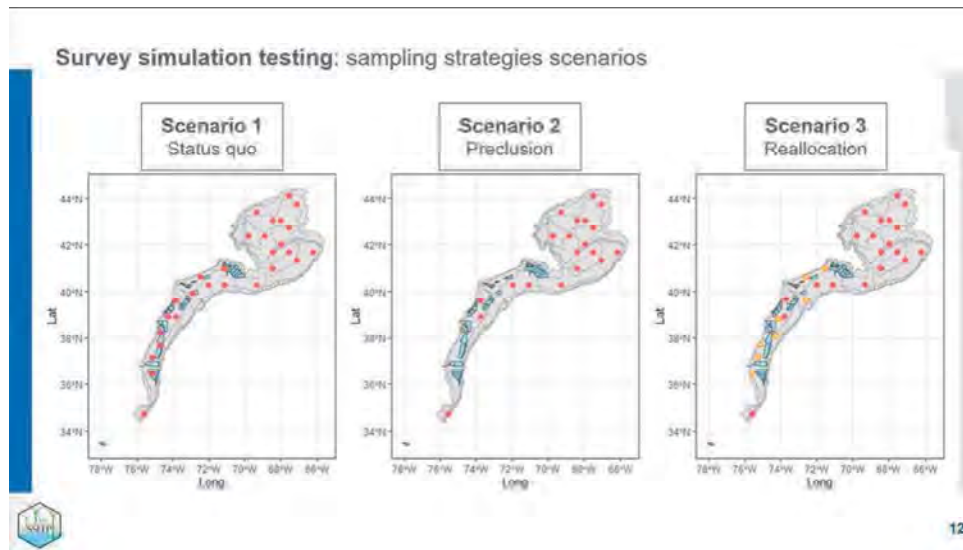
Next step is a collaboration with Ocean Science and Technology NOAA Head Quarter's Distribution Mapping and Analysis Portal (DisMAP), using our data as well as others to develop species distribution maps for every species we're interested in. We can start to assess different sampling designs and which species are most affected by perimeter sampling.

Presentation by Gavin Fay (SMAST)

Survey Simulation Experimentation and Evaluation Project (SSEEP) update. Goal: can we quantify likely changes of effort reduction associated with offshore wind? If supplemental sampling is done, what approaches might be better than others? Guided by two stakeholder workshops in 2022.

First part of project: Doing analysis using existing trawl survey data to look at the potential impact of survey effort reduction to sampling numbers and abundance indices. We looked at removing stations in wind farm areas. There was a change in the abundance index for summer flounder.

The second part of project: Using species distribution models for summer flounder and mackerel to test different sampling strategies.



Presentation by Madison Hall (NEFSC): Survey specific mitigation plans

Offshore wind will impact multiple surveys conducted by the NEFSC. There is a Federal Survey Mitigation Strategy that includes developing survey specific mitigation plans. Nineteen plans are being developed, including for the BTS and the BLLS. These are going through an internal and external review process.

Progress on drafts and reviews was presented.

It is unclear if the BLLS will be able to operate in floating wind areas in the GOM. Could reduce gear length if turbines adequately spaced; could do paired sampling between short and traditional gear to calibrate new approach.

BTS can't sample in wind farms; still evaluating impact of doing perimeter sampling. New approaches include smaller vessels to sample inside wind farms, passive gear, and remote sensing.

Discussion and Questions:

- There will be loss and exclusion for surveys in wind energy areas. What is the impact on abundance estimates? Is the change due to lost stations or will this reflect actual rise/lower stocks in wind areas? Do some of the simulations address estimates?

A: Very much at the front of our minds. SSEEP was designed to address these questions. We can use the simulator to test different spatial patterns. Won't tell us why the patterns are changing. Using species distribution models helps us determine what would happen if catch rates increase within these areas and we aren't able to survey them. We can test assumptions that catch rate will be higher in wind farms in one simulation and the opposite where the catch rate is lower in wind farms. Pull those simulated predicted catch rates and distribute across the grid. Starting to get at how to

incorporate those. It's also important to be careful to think about how we combine data streams if different surveys are covering wind areas.

- What are the expectations for the developers for the new mitigation requirements?

A: No answer yet. We're in the beginning phases of this conversation with Revolution Wind. The options Madison presented are some of the options we'd give to developers.

Presentation by Anna Mercer (NEFSC): Pilot hook and line survey

Project goal is to develop and test the methodology for a new hook and line survey to provide data continuity for multiple resource species in complex habitats and alongside offshore wind turbines. Assuming we won't be able to conduct current trawl surveys in wind farms. This is a pilot project, not year 1 of a new survey. Trying to identify if this type of survey is worth the resources it would take to fully develop a long-term survey. Not a species-specific survey. Intended to target a wide range of species. The pilot is meant to inform how close to the turbines we can get.

Presentation provided specifics on gear and vessel recruitment (14 vessels applied, 3 were selected).

Discussion and Questions:

- Lures or bait setup?

A: Baited using squid

- How are the sites selected? By bottom or depth?

A: Working with Catherine and Madison to select stations for smaller, pilot survey. Range of stations will encompass the entire survey area with structured bottom. Final decision not yet made, should be made by end of next week.

- Will any stations be chosen specifically in the wind farms,

A: Yes, include areas around the VA and RI/MA turbines.

Restrictor Rope Research (A. Jones)

Presentation by Andy Jones (NEFSC)

- Conclusions:
 - We observed limited impacts of the restrictor rope on catches.
 - Worth considering the positive impacts of the restrictor on standardizing gear performance when surveys in wind energy areas are being developed.
 - Specifically, in scenarios where standardizing net geometry is likely to be more important (e.g., when a large depth range is covered by a survey, or multiple survey vessels may be used).
 - One caveat is that we do not have enough data to definitively say that there is no effect of the restrictor rope for all species, but we have some confidence based on the diversity of species sampled through this research.

- Next steps and questions
 - Incorporating edits received from panel members.
 - Will likely target fisheries journal such as ICES Journal of Marine Science.
 - Work to be presented at World Fisheries Congress in Seattle in March.
 - Present work to NEFMC/MAFMC?
 - Work with other groups (e.g., ROSA) to provide guidance on the application of this gear to new surveys?
 - What would this look like?
 - Who would like to be involved?
 - Wait until after peer review is complete?
 - Create Decision Matrix to describe recommendations for restrictor rope use.
 - Survey Types:
 - New wind impact survey
 - New science survey
 - Existing wind impact survey
 - Existing science survey
 - Survey conditions:
 - Multi-vessel?
 - Spans large depth range?
 - Data used for assessments?
 - Data used for region/cumulative impacts?
 - Species overlap with experiment?

Discussion and Questions:

[Limited discussion time was available.]

- Happy to see this work reach a wider audience.

Brainstorming next research project

- [summary of previous discussion](#) - slides outline potential project ideas and considerations to make when prioritizing.
- Follow up on items raised during the meeting.
- Review previous materials - research recommendations from research track assessments.
- Goal: 3-5 titles of research projects NTAP would like to see funded.

Discussion and Questions:

Wide ranging discussion about priorities and needs.

- Multiple NTAP members supported expanding the range of restrictor rope into the GOM. Maybe there's more flexibility in using this if we use a boat without the historical data set. There is also

value in reaching out to the ICES group that has better data on the positive effects of the restrictor rope. **Andy Jones offered to solicit a presentation from that group.** If there's no problem using a restrictor rope in GOM, then we can bring in other boats without calibrating them. **(A. Jones will send restrictor rope draft to Terry Alexander).**

- One member indicated he was a big proponent of acoustics.
- Calibration and standardizing across many surveys in the wind areas is needed. Need to take into account working in impact zones. Linkages between new gear development (e.g., acoustics) and sampling in wind areas.
- Expand NEAMAP – extend sampling further offshore. If this is done to cover wind energy areas, keep in mind that 15-20 miles around wind areas should also be sampled to better understand how they will change fish distribution.
- For Bigelow contingency, there is at least one large industry vessel with an auto trawl. **Bobby Ruhle offered to get more information.**
- GOM will be a new ball game for surveying. Pilot jig study is interesting, though many species don't take jig. How to manage groundfish with floating offshore wind. We don't know what the anchoring system will look like, maybe 12" diameter cables? No towing or gillnetting will be possible. How to address in GOM is difficult. No footprint yet, either. Sample as much as we can and sit on it and use it to establish a baseline. Get as many data collection tools as possible on the water to see what's there first.
- ROSA is hosting meetings about developing a common database, part of the ROSA work plan.
- Unsure if sampling can occur with trawling inside of wind farms; uncertainty if some areas can be left for sampling. **It would be good to get these questions on paper to ask the wind industry (turbine spacing, cables, electric stations, heat generation).**
- If perimeter sampling has any value, it would be useful to have studies that establish spatial coherence at a very fine scale, say over a scale of miles. This would entail sampling in the vicinity of the boundaries. Before-After-Gradient (BAG) type studies do this. However, in the context of future monitoring, such information could be used to establish the correlation between observation from outside the area to unsampleable areas within the area. Species with fidelity to structure would not necessarily be amenable to this approach. Example black sea bass hanging around rock piles.

Discussion also covered funding. Currently there is no specific funding identified, but resolving the challenge of sampling inside of wind farms is a priority so there will probably be avenues for funding available through wind.

A general theme came up several times regarding the different objectives of adding an IBS and doing an IBS as a Bigelow contingency. NTAP can make their own recommendations for priorities that they think are important. A real need is to determine if we can sample in wind farms. The SMAST wind farm sampling program is assuming they'll be able to sample within 500 meters of foundations.

Discussion about data, developing standards and a common database. NEFSC described a small project where they're working with scallop research set aside partners to deliver data in a format NEFSC can use

more efficiently. At least one NTAP member was supportive of developing this kind of capacity, another indicated that data sharing is a high priority for wind developers.

Maybe worth updating the NTAP charter to include wind. Ideas like a Bigelow shadowing survey, NEAMAP expansion are all clearly within the NTAP remit, but the wind area work gets away from the charter.

Conversation covered concerns about BOEM as a regulator not listening to NMFS, lack of clarity regarding how NTAP can move the needle on some of these issues, regulatory issues such as letters of acknowledgement for fisheries surveys in wind farms.

IV. Wrap up & adjourn

- Scheduling next full panel meeting
 - This summer, considering June/July. Location/date TBD and details will be provided at a later date.
 - Location will likely be in New England
 - NEFMC meeting in June 24-27 in Freeport, ME
 - Scheduling NTAP meetings right after/before Council meetings can be easier for scheduling, booking rooms, etc.
 - MAFMC meeting will be in Riverhead in mid-June.
 - ASFMC meeting is planned for August.
 - Note: Holding the meeting in conjunction with the Council meeting was viewed as successful, but only because it was the winter meeting which has a light agenda. Coupling NTAP with Council meetings should consider the length and agenda of the Council meeting and may only work for Council meetings of shorter length (1-2 days) and limited agendas.
- Scheduling next working group meeting
 - A doodle poll will be sent out.
- Topics for next meeting
 - Please provide to the co-chairs

Northeast Trawl Advisory Panel

Bigelow Contingency Plan Working Group Meeting- Virtual

Thursday, February 29, 2024

9:00 AM - 12:00 PM

-- NOTES --

Working Group Attendees: Anna Mercer, Daniel Salerno, David Goethel, Eric Reid, Jameson Gregg, Kathryn Ford, Philip Politis, Sam Novello, Tim Miller, Vito Giacalone, Wes Townsend.

Other Attendees: Dave McElroy, Gareth Lawson, Katie Burchard, Hannah Hart, Will Poston.

Meeting purpose: Discuss next steps for Industry based survey.

Meeting minutes:

9:00-9:15 a.m. Welcome, Recap

Timeline of events

July 2023: NTAP formed Bigelow Contingencies Working Group (WG).

Sept 2023: Working group kickoff, 4 contingency options:

- Pisces
- NEFSC vessel
- Industry Based Survey (IBS) calibrated to Bigelow
- IBS not calibrated to Bigelow (parallel, separate survey)

Sep/Oct 2023: Council motions to develop Option #4 as a white paper.

Jan 2024:

- Working group meeting (Jan 12).
- White paper delivered to the Atlantic States Marine Fisheries Commission (ASMFC), MAFMC, NEFMC (Jan 18).
- Presentations to ASMFC (Jan 25), NEFMC (Jan 30), and MAFMC (Feb 7).
- Jan/Feb Council/ASMFC motions made to develop an IBS pilot project.

Feb 8, 2024: NTAP Full Panel meeting

- Discussion around supporting Pisces development and developing IBS pilot project.

Feb 29, 2024: WG meeting to discuss IBS and next steps.

April 2024: Progress report at MAFMC and NEFMC Council meetings.

9:15-9:45 a.m. Options 1-3

Status updates

1. Pisces
 - a. Proposal with needed improvements submitted to OMAO.
 - b. SEFSC agreement that Pisces can be primary backup to Bigelow.

- c. Next steps
 - i. Specific plan and funding for improvements.
 - ii. Discussion needed of when to “trigger” Pisces.
- 2. NEFSC vessel calibrated to Bigelow
 - a. Proposal provided to NEFSC Director, being discussed at NMFS HQ.
- 3. Industry vessel calibrated to Bigelow
 - a. No progress.
- 4. Industry-based survey
 - a. White paper completed, submitted and presented to Councils.

Lots of energy on 1 and 4, options 2 and 3 still need to be fleshed out. However, it may be wise to continue to put our effort into developing options 1 and 4.

Councils’ February 2024 Motion: *Move to recommend to task the NTAP Bigelow Contingency Plan working group to develop an outline detailing a plan to conduct a multi-vessel IBS pilot program to test the viability of the program presented in the “Draft Proposed Plan for a Novel Industry-Based Multispecies Bottom Trawl Survey on the Northeast U.S. Continental Shelf” white paper with a particular focus on refining section 2 “Survey Design Elements”, considering NEAMAP protocols and current industry platform capabilities. A progress report on the draft plan should be presented in time for further discussion at the April 2024 meetings of the NEFMC and MAFMC, and the spring 2024 meeting of ASMFC.*

Discussion/comments:

Where is the Pisces home ported?

A: *Mississippi, would take multiple days to get up to New England*

Need to be on standby right from the get-go. Would be two weeks best case minimum to get the boat up here from Mississippi.

Another thing that is concerning is that this vessel doesn’t trawl often, should be exploring having the vessel ready.

After white paper we have a lot of support for moving forward with the pilot. Today we need to put more meat on the bones to really start developing how this survey would run. New time series for the science center in addition to Bigelow and NEAMAP.

9:45- 10:45 a.m. Industry Based Survey (option 4)

- What are the key goals for a pilot?
 - Should it operate inside wind farms? Can we replicate survey tows inside of a wind farm?
 - Questions to address in a pilot: 12/24-hour day, vessel size, crew size, ops protocol, bio sampling protocol, gear incl. use of restrictor rope, towing across cables/proximity to fixed structures.

Discussion/comments:

- Context from NEFSC: Next biggest threat is wind farms. Assumption that the Bigelow will not be able to be in or tow within a wind farm. If we are losing those windfarm

stations, especially since wind farms are going to cause a change in habitat this is a big problem.

- Wind farm surveys not designed for a long-term solution with time series needed.
- Developing an IBS that can operate in wind farms, or determining now if it should, would be helpful.

Operating in wind farms

The group discussed the need for the IBS to operate in wind farms and for a pilot to be designed to test operability of different sized vessels in wind farms. No clear consensus - some felt that existing fisheries monitoring work and commercial fishing activities once farms are built will tell us what we need to know about what kind of vessels can fish mobile gear inside of the wind farms. Others recommend determining vessel requirements and feasibility of operations within wind farms as a goal of the IBS. Other comments:

- We're having two different conversations: pilot that an industry or pair of industry vessels can sample in a complimentary way to the Bigelow. We are going to have a pretty good idea how different size vessels will operate in a wind farm development anecdotally via wind farm monitoring currently being conducted without having to incorporate this into the pilot.
- We're not going to bring someone in if they are not willing to go into a wind farm area.
- Not going to be a difference in ability between different sized trawlers (100-foot vs 50 foot) to fish in the fixed platforms. In the Gulf of Maine (GOM) all of them will be floating. Still don't know what the logistics are going to look like.
- Insurance coverage to tow in the wind farms could be a problem. Should check with insurance companies on coverage. Set up an IBS outside of the windfarms. For the pilot, insurance might be unique for the project; will be affected by the number of people on board the vessel.
- There could be value in knowing the capacity - operation on deck of different vessels. What level of catch volume can be handled; number of staff need.

24 vs 12-hour sampling

- If the decision is to do 1 boat for 24-hour days, pool of capable vessel is going to be smaller.
- Two vessels operating a 12-hour day will require a smaller vessel/smaller crew, less insurance and more availability. Going to 24 hours per day is not a good idea as it will raise expenses and there are fewer capable/willing vessels.
- Catch handling and biological sampling requirements will be better managed on two smaller vessels working 12 hours per day. Will also provide more options on crew.
- Are there any cons to doing two smaller vessels with a 12-hour shifts that we aren't thinking of? Two vessels: one running during the daytime and one nights. Or overlap option: half-darkness, half day? The overlap option would have 24-hour day coverage but split duties. Getting more granularity is important.
- Under the overlap option, Vessel 1 would fish noon to midnight and vessel 2 fishing midnight to noon. Have the vessel not conducting the tow shift figuring out where the next two should be.
- More vessels will be able to bid on the contract if it's a 12-hour shift. Be more efficient with less people needed. Using a large vessel would be a sole source contract. If that vessel breaks down, we're in the same situation as the Bigelow.

- There are cons from a standardization standpoint and managing a survey that uses a fleet of vessels makes it more complicated.

Gear

- Use the gear package that is currently being used on the VIMS NEAMAP survey (ground cable and ground gear)?
- Bigelow uses rockhopper, VIMS NEAMAP uses cookie. Bigelow has wider cod end to get additional length. Differences in mesh sizes in side panels.
- Two workgroup members emphasized that being similar to the Bigelow survey should take precedence and that the Bigelow gear should be used in the pilot. They pointed out that NTAP research has provided information comparing rockhopper and cookie.

Communication needs?

The group discussed how to best plan for the pilot study. Should we conduct workshops similar to those conducted for the hook & line survey? Is an operations workshop needed and/or visiting vessels?

- Questions about solicitation for scallop vessels: What did that solicitation look like? How much interest did you get?
A: There were several vessel visits gauge folks interest in registering with the [System for Award Management](#) (SAMS). Fair amount of interest. The scallop solicitation was different because it's an existing survey. Pilot IBS study may need to follow a different process. But we don't currently have someone to lead this effort. The hook and line effort conducted a series of meetings down the coast to help with their design.
- The hook and line meetings were very helpful. It was helpful to have predefined questions we wanted discussion on. Definitely suggest having a point person dedicated to this effort. The meetings were a good platform for recruiting vessels, giving them information about requirements, and for responding to solicitations. A mix of in-person and virtual scoping workshops would be beneficial.
- Having someone in the office help with registration so the vessel can bid on the project would be beneficial. Including answering questions related to inspections, insurance requirements, etc. Starting earlier is better. Would likely need 9-12 months lead time.
- Also need to keep in mind deadlines for large contracts too. That will impact the timing and timeframe for setting the schedule. **This year the \$250K- 5M deadline is May 13th.**

Design elements

- Be adaptable to potential loss of survey area. Incorporate any re-stratification of the survey done on the Bigelow.
- Do we want to do exactly as Bigelow does or incorporate some previous industry recommendations such as 30-minute tows and re-stratification of deep-water strata?
- Where would this pilot occur? Southern New England? At what depths?
- Three or four areas required to figure out. Mid-Atlantic, Southern New England (SNE), George's Bank (GB), GOM. Pilot should cover three areas for a proof of concept. Potentially SNE/Mid-Atlantic, GB, and GOM. The pilot doesn't have to occur in each region at the same time and vessels could share gear.
- Is sampling all the way to 200 fathoms worthwhile? Staying within 130-150 fathoms should be better. The deeper depths may be more important in different regions (e.g.,

monkfish, white hake). From one working group member: Gulf of Maine out to the 140's is solid American plaice, witch flounder and monkfish habitat. So, 150 fathoms would be safe maximum depth for final IBS design.

- How much money are we going to need? How much gear are we going to need? Spare nets if there is space on each vessel? We need to figure out basic things like that to determine cost. Everyone must have the same electronics and net menstruation systems and safety equipment.
- We're not trying to replicate an ecosystem survey we are trying to provide data for stock assessments. What is the maximum depth need before we lose data for stock assessment versus for ecosystem assessment?
- How far inshore would we want to go to overlap with other state and NEAMAP surveys? Some gaps in coverage in the 60-90 ft range. May be a good starting point in addition to some of the deeper areas where NEAMAP currently samples so there is some overlap.
- Recommend that for pilot there is a focus on overlap with the Bigelow to determine if the survey could work, should stick with where Bigelow goes, and then can modify from there. Post pilot need to determine what was done well vs. what needs to be fixed.
- For pilot target mid-depths, cut out deeper depths because they're more expensive to do (need larger wire, cost more comparatively). It's easier and less expensive to go shallower than deeper.
- Discussion about ratio of wire out; Bigelow and NEAMAP use depth-dependent ratio, NEAMAP also considers net geometry, commercial vessels operate similarly (shorter wire out in deeper water). Use pilot to determine scope for a longer-term survey. Gear needs to be on the bottom and fish with proper net geometry. If using a restrictor rope may not need to worry about this. With restrictor rope you'd use bigger doors, and the rope would be the restricting factor so that net geometry is held consistent. Would simplify entire question.
- Consider sampling water chemistry. Also, acoustics, plankton, etc. (where/if possible). At least to understand if these could be part of pilot/longer-term survey.
- Tow speed and tow time need to be defined.
- Don't require auto trawl (several working group members agreed, but others see value in auto trawl at least long term).
- Do we need to standardize net mensuration gear? Might need a separate meeting on this. Differences of opinion about value of net mensuration gear.
- Would be useful to survey vessels to get a sense of what electronics are already used/on industry vessels (depth).
- What are the costs of the sampling electronics/workstations? Can we build standard workstations that will work across multiple vessels? Portable FSCS is a good option, on boats would need servers, barcode scanners, etc. Talking about at least \$30K (other working group members estimated much more, a scale alone can cost \$9k). FSCS has been used in the past on industry vessels.
- Also need to define what needs to be supplied to these stations - hydraulic, mechanical, electrical? Darana R. only provides electricity (110V). Understanding the reality of moving these stations from boat to boat is a need. Need 110V inside too to run servers. Would need at least 2 scales, 1 fish board, 1 scanner, display(s), computer(s), calipers etc. per station.
- Would be beneficial to have a follow-up meeting with those that have used these systems to talk through all the different options and potential needs. Have this meeting

prior to a public workshop, so at the public workshops the message could be relayed and vessel owners/operators would have an understanding of what would be needed/required. At public workshops should already have a clear idea on specifics about set up, workstations, power requirements, space, and sampling equipment.

- Consider a follow-up discussion on the data management process.
- Consider length of time required for a pilot - 10 day vs. 5 days, etc.
- *Reminder: there are currently no funds available for this work, capacity of Center funding is limited and is currently struggling to fund the surveys that already exist.*

Summary of recommendations:

- Ensure survey can operate in wind farms.
- Develop a list of data elements collected in the trawl survey, identify which elements are sensitive to standardization.
- Develop a biological sampling protocol for the pilot that targets sampling needs. (Point made that survey-specific age-length keys are useful.)
- Address who will process biological samples. (For the pilot it is likely this can be done by the NEFSC. For a shelf-wide survey the volume of sampling will need to be addressed.)
- When there are multiple indices and data sources it is best to make sure there is overlap so that the model can better address the multiple surveys/data sources.
- Use a restrictor rope in the pilot study.
- Use the same gear as the Bigelow.
- Host meetings like done for hook and line survey.
- Have someone ready to help with SAMS registration so the vessel can bid.
- Incorporate any re-stratification of the survey done on the Bigelow.
- Use same electronics, mensuration gear across vessels.
- Sample in more than one of the 4 major areas for proof of concept.
- Reduce depth limit to 130-150m - look at how deep we go before we lose data for stock assessment versus for ecosystem assessment.
- Meet about net mensuration value, need, similarity of different systems.
- Meet with existing survey programs to discuss sampling stations.
- Have workshop with vessel owners to discuss feasibility, limitations.

Notes from the slides as edited during the working group meeting:

Should it operate inside of (fixed foundation) wind farms?	Yes (ideally)
Questions to address in a pilot: 12/24-hour day, vessel size, crew size, ops protocol, bio sampling protocol, gear incl. use of restrictor rope, towing across cables/proximity to fixed structures	<p>2 boats sampling 12-hour periods over a 24-hour day (noon-midnight/midnight-noon); use restrictor rope.</p> <p>For the pilot, bio sample as much as possible, consider processing needs (who is doing it, what is their capacity); how/if CTD and plankton sampling is done, acoustics.</p> <p>Learn from other wind farm monitoring surveys and commercial activity in wind farms.</p>

	Use pilot to develop a scope table for optimal spread; consider impact of using restrictor rope (spread won't be dependent on scope).
Workshops like hook & line survey? Operations workshop?	Workshops useful - Confirm the gear we're moving forward with (gear used on Bigelow for consistency); make sure they're structured; describe process clearly (i.e. scallop survey; include specs as early as possible); fall better.
Connection to wind farm trawl surveys, will that answer questions around towing across cables/proximity to fixed structures?	(Skipped this - covered under 1 and 2)
What are key stat design questions - how does that matter for a pilot?	<p>Spatial overlap with other surveys.</p> <p>Future-proof survey designs, being adaptable to potential loss of survey area.</p> <p>Incorporate any re-stratification of the survey done on the Bigelow.</p> <p>More discussion of key elements of the survey design - consider if there is anything the pilot should examine - 20/30 min tow time, for example, tow speed.</p>
Where will the pilot occur?	<p>The 3 areas: MA-SNE, Georges, GOM. Include multiple areas ideally.</p> <p>Pilot doesn't have to occur in each region at the same time, vessels could share gear.</p> <p>Depth: using wire on the vessels will be less expensive; what would we miss stock assessment-wise 130-200 fathom (e.g., white hake); pilot focus on same strata as Bigelow, but truncate depth if needed to accommodate existing wire lengths; future need: overlap with NEAMAP/state surveys - include 60-90 ft range gap between NEAMAP and Bigelow.</p>

- Auto trawl - do not require this for the pilot.
- Mensuration - identify specific measurements needed; not necessarily a specific unit (keep data management complications in mind, though)
- Electronics - can use what is on the vessels (needs more exploration based on data management needs)
- Horsepower - 20 min tow at 3 kt.
- Sampling workstations - portable FSCS; costs are >\$30k; need to specify space and electrical needs.

10:45-11:30 a.m. Next Steps

- Develop cost estimates - back of the envelope we're in the \$750K to \$2M range.
 - Also need to consider how to handle the funds (maybe ASMFC).
- Co-chairs will provide an update at Councils' upcoming April 2024 meetings.
 - NEFSC staff will provide briefing materials to support Council meeting updates.
 - MAFMC briefing book is due March 29.
 - NEFMC briefing book is due April 5.
- Plan for a follow-up Working Group meeting following the April Council meetings prior to June meetings.
- Provide NTAP full panel meeting minutes and WG meeting summary. Prior to summer NTAP meeting, prepare any memos or background info required and share slides with MAFMC staff a day ahead of meeting.

Atlantic States Marine Fisheries Commission

Guidelines for Resource Managers on the Enforceability of Fishery Management Measures

Developed by ASMFC's Law Enforcement Committee

Sixth Edition
2024



Vision: Sustainable and Cooperative Management of Atlantic Coastal Fisheries

INTRODUCTION

The Law Enforcement Committee (LEC) of the Atlantic States Marine Fisheries Commission (ASMFC) first prepared the *Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (Guidelines)* in 2000. In keeping with ASMFC direction to periodically review and update the guidelines, the LEC revised this document in 2002, 2007, 2009, 2015, and now this sixth edition, effective July 1, 2024. The core of the new *Guidelines* is an enforceability matrix for fishery management measures. The matrix table was developed from the responses to a survey of LEC members. The enforceability ratings cover a variety of management strategies that are employed in marine fisheries management programs. We include ratings for these strategies based on overall, dockside, at-sea, and airborne enforceability. The LEC strongly encourages managers to consider the enforceability of all management regulations that are developed. We believe the *Guidelines* can support and strengthen the effectiveness of the Commissions efforts to conserve our marine fisheries resources.

Compliance with natural resource regulations helps ensure sustainable fisheries. Many factors contribute toward compliance, including but not limited to the perceived legitimacy of the regulations/process, moral norms, voluntary compliance, enforcement, and enforceability.

Acknowledgements

The LEC gratefully acknowledges our current and past members who contributed time and expertise to the *Guidelines*. We thank NOAA Fisheries Northeast Division of the Office of Law Enforcement, NOAA General Counsel, and United States Coast Guard Districts One and Seven, authors of the *Enforceability Precepts for Northeast Regional Fishery Management Councils (June 2013)*, for sharing their publication with us and allowing us to incorporate selected material from that document. We thank Toni Kerns, Tina Berger, and Madeline Musante for their assistance in updating this document. We also acknowledge the opportunity afforded to our committee by the commissioners and staff at ASMFC to revise the 2015 *Guidelines*, and to make them available for routine use and reference.

HOW TO USE THIS DOCUMENT

The *Guidelines* are organized into five sections for ease of reference.

SECTION ONE (Page 3)

This section provides a statement on **general enforcement operations** that should be considered when implementing new management options or strategies.

SECTION TWO (Page 3)

This section presents **enforcement tools** that should be considered when implementing new management options or strategies.

SECTION THREE (Page 4)

This section provides general guidance in the form of **general enforcement precepts** that should be considered when evaluating fishery management options or strategies. These precepts apply regardless of the species or area under consideration.

SECTION FOUR (Page 6)

This section presents the relative **enforceability ratings** of specific management options. Using a matrix table, readers may quickly identify the relative enforcement characteristics of the management strategies, including their overall, dockside, at-sea, and airborne ratings.

SECTION FIVE (Page 9)

This section provides details regarding the **enforcement strategies and recommendations** for the management measures covered in the *Guidelines*.

SECTION ONE

General Enforcement Operations

Enforcement operations, whether they are at-sea, dockside, or airborne, are resource intensive. Available enforcement resources are maximized by enacting regulations that can be enforced at more than one point during fishing activity.

Regulations that can only be enforced dockside through the monitoring of offloads are particularly time consuming. Law enforcement agencies will never have sufficient personnel to monitor more than a small fraction of the total fish landed. This is mitigated in certain fisheries where enforcement can use electronic monitoring technologies such as vessel monitoring systems (VMS), electronic logbooks, and pre-landing notifications to monitor the fishery remotely and improve directed tasking of available resources.

Law enforcement relies on state and federal partnerships for at-sea patrol, and inspection efforts. Officers work with these partners to provide effective at-sea enforcement of state and federal regulations, particularly those involving area, gear, and prohibited species restrictions. Traditional aircraft, as well as drones, may be used with limitations in the enforcement of marine fishery regulations. Many states lack these types of resources and, for those that do have a program, budget and or policy may limit use of said resources for this enforcement application.

SECTION TWO

Enforcement Tools

Enforcement tools are management measures that are not specifically designed to limit catch or effort but to aid in the enforcement of other management measures that do so. Enforcement tools such as electronic reporting, pre-landing notification, and VMS have improved the effectiveness of certain regulations by allowing enforcement staff to focus effort on high priority areas. These tools do not replace traditional enforcement but rather complement patrol work and inspections. The requirement for some of these tools should be considered essential for effective enforcement of some management measures (e.g., VMS requirement for closed areas). New and emerging technologies such as cameras, ropeless fishing and others should continue to be explored.

SECTION THREE

General Enforcement Precepts

SIMPLICITY

The most enforceable regulations are those that are simple, realistic, easy to understand, and presented in an accessible way to the regulated community.

Simple, straightforward regulations are easier for the regulated community to understand and remember, which is critical for voluntary compliance. They are also more enforceable because violations of simple regulations are easier to detect and to prove. For example, a simple regulation such as “possession of an undersized fish” stands on its own. A violation of this regulation would apply regardless of where the fish was taken, how it was harvested, or any other regulatory variable. Conversely, complex regulations are more susceptible to confusion, misunderstandings, and differing interpretations among the regulated community, law enforcement personnel and the court system.

The proliferation of regulations frustrates industry as well as law enforcement personnel. Cumulative, piecemeal modification of regulations to address fishery or environmental changes inevitably leads to more complex and occasionally even contradictory regulations unless the entire suite of regulations for a particular species is carefully reviewed in its entirety when modifications are made.

Every effort should be made to write regulations in simple, plain language that avoids jargon or technical terminology. And, where possible, all related regulations for a given species should be bundled or linked together in the appropriate regulatory format.

CONSISTENCY

Regulations should make every effort to minimize exceptions and exemptions. Wherever possible, managers should adopt the same management measures among different fishery management plans, across different state boundaries, and between state and adjacent federal waters. When considering modes of fishing, consistent regulations within specific sectors creates better compliance. For example, when regulations offer a different size and possession limit for a specific user, based on means of fishing or a specific location of fishing, this creates confusion among the users and regulators, reducing the effectiveness of a regulation.

Anytime you have an exception to a regulation, such as under a conservation equivalency, you have potentially made the regulation more difficult to enforce. The LEC recognizes that conservation equivalency is a useful tool for fishery resource managers working within the collaborative structure of ASMFC. However, to the extent possible, states should make every effort to work within a regional or coastwide regulatory framework. This is especially important where

two or more states share contiguous waters or concentrated fishing areas. When individual states choose conservation equivalency, this document should be used to select management measures that are the most enforceable.

To the extent possible, there should be consistent definitions of terms for management measures, gear types or use, measurement standards, regulatory areas, and between federal and state waters.

STABILITY

Regulations should avoid frequent changes. When this occurs, there must be a concerted outreach and educational effort to adequately inform the public. This principle especially applies to recreational angling, where bag or size limits that change from year to year diminish enforceability and increase the likelihood of unintentional violations.

Enforcement personnel may require several years just to provide adequate training or to get the equipment necessary to implement new or modified regulations. More frequent changes in regulations might result in little effective enforcement during those short regulatory periods.

EFFECTIVENESS

In general, the most effective regulations from an enforceability perspective are those based on controlling effort (closed area or season) and not the outputs (catch quota, trip limits). Effective regulations promote rather than hinder voluntary compliance. Development of effective regulations must consider and reflect available enforcement staffing, funding, technologies, and equipment.

In addition to adding complexity, the proliferation of new regulations often requires new or significantly enhanced enforcement resources. If added resources are not provided, enforcement will need to shift effort from what is currently being enforced. This can result in an arbitrary prioritization of enforcement effort that may or may not correspond to the conservation needs of the species affected.

Certain management measures can enhance effectiveness. For example, regulations that can be enforced through more than one means, or at more than one point during fishing operations, allow enforcement some flexibility in using available resources in the most efficient way possible. Regulations that strengthen documentation and labeling of fish and fish products would enable law enforcement personnel to track products back more effectively to the harvester and/or the initial purchaser and to intercept unlawful seafood at various points between harvest and final sale for consumption.

SAFETY

Regulations should be designed such that they do not create an unintended safety-at-sea issue. For example, specified allowable days for fishing may increase pressure to go out to sea when weather conditions are unsafe. Likewise, establishment and design of closed areas should consider safe and direct transit needs of fishers when weather conditions change rapidly.

SECTION FOUR Enforceability Ratings

The 2024 *Guidelines* included a survey of 20 voting members of the LEC who numerically rated the enforceability of 27 management measures based on three categories: dockside, at-sea, and airborne enforceability. The enforceability of each management measure was rated on a scale of one to five (1 = least enforceable, 5 = most enforceable) for each of the three categories. An average of at-sea and dockside ratings from the survey is also presented.

It is important to note the survey indicated limited applicability for airborne resources in the enforcement of most management measures. Therefore, the Airborne value was only included in the average rating when it increased the average value of the management measure. The LEC stresses that this does not imply that airborne resources are ineffective. While airborne enforcement may be restricted in applicability, there are clearly times and places when it is the most effective means of enforcement, thus an important enforcement tool.

The results of the updated survey are presented below in a visual matrix. Management measures were arranged in descending order of their average rating from the survey. Responses receiving a score of greater than or equal to 4 are color coded green, those with an average score greater than or equal to 3 but less than 4 are color coded yellow, and those less than 3 are color coded red.

Table 1. Enforceability of Marine Fisheries Management Measures

Management measures are ordered based upon the average of dockside and at-sea ratings. The enforceability of each management measure was rated numerically on a scale of one to five (1 = least enforceable, 5 = most enforceable) for each of the four categories. If the airborne rating increased the average rating, the inclusive average is indicated in parentheses.

Management Measures	Avg Dockside & Sea (avg w/Airborne)	Dockside	At-Sea	Airborne
Permits	4.61	4.53	4.68	1.53
Slot Limits	4.61	4.68	4.53	1.11
Prohibited Species	4.55	4.53	4.58	1.37
Bag / Possession Limits (Low Volume)	4.55	4.63	4.47	1.16
Maximum / Minimum Size Limits	4.53	4.63	4.42	1.21
Closed Seasons	4.18	3.89	4.47	3.21
Tagging, Labeling, or Marking of Species	4.00	4.26	3.74	1.11
Bycatch Prohibition	3.97	4.21	3.74	1.26
Trophy Fish Allowance	3.89	4.11	3.68	1.21
Vessel Monitoring System	3.82	3.63	4.00	2.74
Daily Trip Limits	3.82	4.32	3.32	1.26
Gear Marking requirement	3.50	2.68	4.32	1.95
Gear Regulations (excluding method of take)	3.42	2.89	3.95	1.89
Method of Take	3.37	2.53	4.21	2.11
Closed Areas	3.26 (3.58)	2.11	4.42	4.21
Catch and Release Fishing	3.24	2.95	3.53	1.58
Aggregate Trip Limits	3.16	3.42	2.89	1.26
Electronic Reporting	3.05	3.68	2.42	1.11
Gear Restricted Areas	3.05 (3.14)	1.84	4.26	3.32
Bycatch Limits by use of Weight or Volume	3.00	3.42	2.58	1.05
Days at Sea	2.87	2.95	2.79	1.74
Annual Quotas	2.84	3.32	2.37	1.05
Bycatch Limits by % of Total Catch	2.76	3.32	2.21	1.05
Harvest Tolerance by Weight, Volume or %	2.74	3.11	2.37	1.26
ITQ / IFQ / LAP	2.69	3.28	2.11	1.06
Limited Drag or Soak Time	1.89	1.11	2.68	1.84
Targeting Prohibition	1.87	1.63	2.11	1.16

SECTION FIVE

Enforcement Strategies and Recommendations

This section provides information about each of the management measures that were considered in the *Guidelines*. Included is a brief definition of the measure, its numerical ranking based on the survey results, and some thoughts for consideration when drafting regulations. For ease of organization, the management measures are listed alphabetically.

ANNUAL QUOTAS

Definition: A specified amount of a particular species is allowed to be landed per fishing year (or fishing season). Typically, a quota is established for the entire fishery, and occasionally is subdivided by region or time. Quotas are not usually employed for recreational fisheries.

Average Overall Rating: 2.84

Recommendations:

- A straightforward opening and closing of fishing to meet quota objectives is preferred over measures that will extend fishing, such as trip-limit triggers or progressive area closures, which complicate enforcement efforts.
- Incentives to under-report or not report are greater, so available enforcement resources must always be considered to ensure proper accounting of catch.
- Requirements for electronic reporting, timely reporting, and on-board monitoring, or tagging regulations can aid the enforcement effort.
- A well-designed catch documentation scheme to track fish from harvest to offloading, and through the processing and shipping phases, adds transparency and effective accountability.

BAG/POSSESSION LIMITS (low volume)

Definition: A specified amount of a particular species is allowed to be landed per trip, per fisher or per vessel. Low volume limits are established as some number of fish that is easily counted on board. They typically apply to recreational fisheries. In some cases, commercial fishers may also be subject to low possession limits.

Average Overall Rating: 4.55

Recommendations:

- This is considered among the more straightforward and enforceable regulations, at least as it would apply to small quantities of catch.
- Bag and possession limits should be consistent across state and federal boundaries, as well as modes of fishing. The standard of measurement should be clear if the limit is based on weight.

- A possession limit is superior to a landing limit and allows for at-sea as well as dockside enforcement.
- Requiring fish to remain intact facilitates identification. Particularly for large party charters, processing at-sea or filleting out catch onboard complicates enforcement. Where processing at sea is allowed, enforcement staff should be consulted. Supporting regulations requiring that skin must remain on filets, counting two filets as one fish regardless of size, or requiring retention of “racks” may aid enforceability in specific circumstances.
- Enforcement personnel find that frequently changing bag limits, either by mode of fishing or time of year are difficult for fishers to follow. Maintain limits for a minimum of 3 years to ensure consistency of enforcement and greater compliance.

BYCATCH LIMIT (Weight/volume)

Definition: Bycatch limits restrict, but do not prevent, the incidental harvest of non-targeted or otherwise protected species during legal fishing activity.

Average Overall Rating: 3.00

Recommendations:

- These limits, especially when there may be large quantities on board, are difficult to enforce and even more difficult to prosecute.
- Enforcement would be enhanced if bycatch were required to be segregated from the targeted species. Accurate count of catch onboard cannot easily be done at-sea due to species mixing, loading, icing, and the safety of boarding party in accessing the fish hold, etc.
- Typically, enforcement of bycatch limits are time and labor intensive.
- Bycatch limits and measurement standards should be consistent across jurisdictions.
- A possession limit is superior to a landing limit and allows for at-sea as well as dockside enforcement.

BYCATCH LIMIT (percent of total catch)

Definition: Bycatch limits restrict, but do not prevent, the incidental harvest of non-targeted or otherwise protected species during legal fishing activity.

Average Overall Rating: 2.76

Recommendations:

- These limits, especially when there may be large quantities on board, are difficult to enforce and even more difficult to prosecute.

- Enforcement would be enhanced if bycatch were required to be segregated from the targeted species. Accurate count of catch onboard cannot easily be done at-sea due to species mixing, loading, icing, and the safety of boarding party in accessing the fish hold, etc.
- Enforcement is very time and labor intensive to verify the percentage of the catch that is bycatch, and to successfully document excessive bycatch volumes.
- Bycatch limits and measurement standards should be consistent across jurisdictions.
- A possession limit is superior to a landing limit and allows for at-sea as well as dockside enforcement.
- Regulations should specify how much target species catch is required to justify retention of bycatch species and in what amounts. This is necessary to prevent a bycatch species from becoming the target species.

BYCATCH PROHIBITION

Definition: Incidental retention or possession of non-targeted or otherwise prohibited species caught during normal fishing operations is prohibited. Any bycatch must be discarded immediately. It may not be retained.

Average Overall Rating: 3.97

Recommendations:

- A bycatch prohibition is the most effective enforcement measure for bycatch.
- The enforceability of a bycatch prohibition is reduced if adjacent or nearby jurisdictional waters allow limited bycatch quantities (weight, volume, or percent of catch).
- Because of perceptions of waste from discarding bycatch, other regulations (gear specifications, soak times, area restrictions, and/or landing flexibility) may be implemented to minimize the likelihood of catching incidental or non-targeted species in large quantities. Enforcement challenges presented by these other regulations may negate the enforceability advantage of a full bycatch prohibition.
- Clearly identify when possession of a prohibited species is restricted (i.e., returned to the sea as soon as practicable).

CATCH-RELEASE FISHING

Definition: A fish or marine organism cannot be retained and must be immediately released at the site of capture without any unnecessary harm or destruction. This is typically applied to certain recreational fisheries. Temporary possession may be allowed for proper identification, photographing, or determining compliance with applicable regulations.

Average Overall Rating: 3.24

Recommendations:

- Regulatory language should clearly specify the conditions for any temporary possession of a catch and release species onboard (Identifying, measuring, photographing).

CLOSED AREAS

Definition: Fishing in a specified area is prohibited.

Average Overall Rating: 3.26 (3.58)

Recommendations:

- It is critical to have clearly defined areas. Use exact latitude/longitude and straight lines with regularly shaped areas as much as possible. Avoid general descriptions such as distance offshore, or a center point and radius. Do not use depth contours to define closed areas.
- Closed areas are more likely to be understood by fishers and result in less unintentional non-compliance, if they are regular in shape and, where possible, are oriented north-south and east-west in concert with latitude/longitude boundaries.
- While clearly defined, regularly shaped and large areas simplify enforcement, advances in tracking and monitoring technology are mitigating factors that might allow for smaller, irregularly shaped closed areas, especially when such areas are more likely to garner support and compliance, enhance safety at sea, or better protect fish and habitat.
- Successful prosecution of violations must include the capability to conduct vessel monitoring, aerial, and at-sea surveillance. Even with VMS capability, law enforcement may need to document the violation at-sea or via airborne detection to gather sufficient evidence for prosecuting the violation.
- Depending on the fishery and gear type, restrictions on only certain activities within a closed area may require at-sea boarding to document a violation.
- The more complete the closure to all fishing activity, the easier it is to enforce and successfully prosecute violations.
- Large, contiguous areas are preferable to numerous, smaller areas.
- If possible, the area should be closed to transit with fishing gear onboard. If transit is allowed, regulations should clearly specify the proper stowage of fishing gear during transit through the closed area. Transit must be specified as continuous, direct, and expeditious. If an allowance for loitering or stopping is included in regulations, there should be a mandatory call-in or reporting requirement.
- Gear closure areas or regulated mesh areas are difficult to enforce. If regulations only prohibit the use of a particular gear type within a closed area, possession of that gear within the closed area should be prohibited.

- Emergency, temporary, or short-term rolling closures are difficult to enforce and increase the likelihood of unintentional violations because communicating the requirement to the fishing fleet can be challenging. In addition, shifting closed areas within a season increases the confusion of enforcement officials on the status of an area.

CLOSED SEASONS

Definition: A specific fishing activity is prohibited during certain times of the year.

Average Overall Rating: 4.18

Recommendations:

- It is important to clearly define the date and times of seasonal closures, even to the minute.
- Describe what activity is allowed to occur before, during, and after the closure. For example: “all gear must be hauled in prior to the closure and gear may not be set prior to opening the closed area.”
- For high-value, short-duration fisheries, fishing for other species with the same or similar gear should be prohibited for at least 72 hours before and after the established closed season.
- Minimize exemptions or exceptions to prohibited activities during the closed season. If possible, avoid the allowance of gear placement or transport prior to the opening of a closed season.
- Enforcement is enhanced if retention, possession, purchase, and sale of species included in a seasonal closure are all prohibited. Violations could then be inferred if a covered species is encountered in the market during a closed season and would prompt an investigation into the origin of any fish or product encountered and how it got to market.
- Fisheries in which smaller vessels participate are more difficult to monitor during closed seasons. Small quantities of fish can be more easily hidden in the marketplace or sold outside of normal market channels or dealers when the season is closed.

DAYS AT-SEA

Definition: A specified number of days that are allotted for fishing for a particular species. Days at-sea are typically allocated to individuals or groups.

Average Overall Rating: 2.87

Recommendations:

- In its simplest form, days at-sea, without any exceptions or exemptions, is enforceable. However, it is labor intensive unless VMS or other electronic tracking is implemented.
- Additional complicated regulations, such as associated trip limits, should be avoided.

ELECTRONIC REPORTING

Definition: Data transmission, electronic logbooks or other digital recording systems are used to record harvest activity on a vessel. Enforceability is based primarily on use in commercial fishing operations.

Average Overall Rating: 3.05

Recommendations:

- Reporting systems should be established to record and transmit data as soon as possible after actual harvest activity occurs.
- Delayed reporting should be specified to occur on a daily or weekly basis. Lengthy delays between harvest activity and required reporting intervals reduce the effectiveness of enforcement monitoring.
- Data storage systems should be readily accessible to enforcement personnel in the field or on the water.
- Regulations should include provisions requiring tamper-resistant and tamper-evident electronic monitoring units.

GEAR MARKING

Definition: Regulations require specific marking of gear to identify the owner or permittee, to mark the location of gear that may not be visible at the surface, or for other identification purposes.

Average Overall Rating: 3.50

Recommendations:

- Regulations specifying the marking of gear should be clear and unambiguous as to the exact markings to be used, tags or tag placement, information included on any markings, visibility requirements or size of markings, and all other marking details to ensure standardized criteria can be enforced.
- Exceptions or exemptions to any gear marking requirements hinder overall enforcement efforts.
- To the extent possible, markings should be required to be located where enforcement personnel can easily and quickly inspect them both when deployed and while onboard awaiting use.

GEAR REGULATIONS (excluding method of take)

Definition: Specific gear types or gear modifications are restricted or prohibited. "Gear" might include not only the primary methods and tools to harvest the resource, but also the vessel, horsepower, number of traps, mesh size, and other such variables. In some cases, gear regulations might stipulate a

particular type or design (e.g., bycatch reduction devices, number of pots on a trawl, or escape panels on traps, etc.).

Average Overall Rating: 3.42

Recommendations:

- Limitations on the maximum length of line, number of fixed gear/hooks, traps or pots are extremely difficult to enforce and labor intensive to monitor on the water.
- Regulations stipulating how gear is to be deployed (e.g., soak time, net, or trawl depth) are difficult to enforce because of inspection requirements once the gear is deployed or being actively worked.
- Monitoring and checking gear require specialized equipment and training, and enforcement agencies may incur liability costs while handling gear.
- If a gear limitation is employed to restrict or control catch, an associated catch limitation should also be implemented. For example, a mesh size restriction to control the size of fish caught should have a companion minimum or maximum fish-size regulation.
- Standardize gear requirements, measurement procedures, equipment, and techniques across all appropriate jurisdictions and time periods.
- Trap limits are more enforceable in conjunction with trap tags being required on all traps at-sea (i.e., not transferable from trap to trap while underway).
- If a specific type of gear is prohibited for use in a fishery, then carriage of the gear type should also be prohibited.
- When considering specific gear restrictions within the recreational sector, such as terminal tackle in a hook and line fishery or prohibited use of a “gaffing” type device to retrieve a specific species of fish, officers must prove use of said equipment. The possession is not typically a violation unless possession on board a vessel or possession while fishing is articulated in the regulation.

GEAR RESTRICTED AREAS

Definition: Areas where the use of specific fishing gear is prohibited. Regulations may also prohibit the possession of such gear in the specified area.

Average Overall Rating: 3.05 (3.14)

Recommendations:

- These are labor intensive regulations to enforce. A gear restricted area often requires a boarding to determine if specific gear is legal, such as nets of a specific mesh size.
- In general, gear prohibitions are more enforceable than gear restrictions. Areas prohibiting nets are more enforceable than areas restricting certain net mesh sizes. Trap prohibitions are more enforceable than restrictions on certain trap types or sizes.

- Prohibit possession of restricted gear, rather than prohibiting “use” in a gear restricted area.
- Do not allow the use of similar gears within the area. Law enforcement assets may be able to differentiate between a trap boat and a dragger from a distance but will have to conduct a boarding to differentiate between two types of draggers.

HARVEST TOLERANCE (weight/volume/percent)

Definition: A catch is allowed to exceed a legally defined limit of allowable harvest by a defined amount. This may allow retention of over or undersized animals or retention of a defined number of harvested species over a specified landing limit.

Average Overall Rating: 2.74

Recommendations:

- Tolerances are often applied to large catches or landings, and so they may require extensive time and labor to verify the weight, volume, or percentage of the catch that exceeds a specified limit.
- Additional tools or equipment may be required to assess amounts of catch exceeding a specified limit.

ITQ / IFQ / LAP

Definition: Individual or vessel transferable fishing quotas and limited access programs where a specified amount of the total allowable harvest of a species is allotted to that individual or vessel. Such individual allotments may be taken over the course of a fishing season or year. This management measure is considered as it applies to commercial fishing operations only.

Average Overall Rating: 2.69

Recommendations:

- Enforcement is limited by the ability to monitor and verify individual quota limits and reported harvests under that quota. Real-time access to landings information is essential and it often requires cross-agency 24/7 communications.
- Regulations must limit the number and location of authorized landing points to ensure proper harvest monitoring and dockside enforcement.
- Specific call-in procedures should be established to maximize dockside enforcement capability.
- Monitoring and enforcing individual quotas are labor intensive. Because of variable and extended times during which an individual could fish, it is difficult to focus enforcement efforts for maximum effectiveness.

LIMITED DRAG OR SOAK TIME

Definition: This management measure limits the amount of time between deploying and hauling back the gear, normally to allow for live discards of bycatch. This management measure is considered as it applies to commercial fishing operations only.

Average Overall Rating: 1.89

Recommendations:

- Ensuring that specified time limits are followed requires close, at-sea enforcement of fishing operations, and/or onboard observer capabilities.
- Electronic reporting, onboard video monitoring, and vessel monitoring systems provide needed additional support for enforcement monitoring.

MAXIMUM/MINIMUM SIZE LIMIT

Definition: Possession of fish below/above a specified size is prohibited. *See also "Slot Limits"!*

Average Overall Rating: 4.53

Recommendations:

- This type of regulation is considered among the more straightforward and enforceable regulations, at least as it would apply to small quantities of catch.
- Standardized measurements, procedures, equipment, and techniques must be used across jurisdictions to be effective.
- Exceptions allowing at-sea or onboard processing hinder enforceability. There should not be any allowable filleting at sea. Measurement standards should stipulate head and tail intact.
- Maintain size limits for a minimum of 2-3 years to maximize compliance.
- Clearly explain in the regulation exactly how a species is to be measured (e.g., total length, curved fork length, fork length, etc.).
- Specified size tolerances are not necessary and complicates officer discretion in dealing with individual violations.

METHOD OF TAKE

Definition: A regulation stipulating a particular type of gear or fishing operation for legally harvesting a species. *See also "Gear Regulations (excluding method of take)."*

Average Overall Rating: 3.37

Recommendations:

- If a certain gear type is prohibited, that gear should not be allowed onboard if otherwise legal fishing gear or operations are being employed.
- Regulations should specifically prohibit the possession of any net with prohibited mesh sizes from being onboard the vessel. Similarly, if a net, pot, longline, or other gear type is required to be modified to reduce bycatch, then the possession of any gear not properly modified should be prohibited, not just prohibited from use.
- When considering specific gear restrictions within the recreational sector, such as terminal tackle in a hook and line fishery or prohibited use of a “gaffing” type device to retrieve a specific species of fish, officers must prove use of said equipment. The possession is not typically a violation unless possession on board a vessel or possession while fishing is articulated in the regulation.

PERMITS

Definition: Fishing (usually for an identified species) is only authorized by the issuance and possession of a permit.

Average Overall Rating: 4.61

Recommendations:

- This is considered among the more straightforward and enforceable regulations.
- Successful enforcement depends on real-time access to permit-holder databases.
- Technologically sound permit tracking systems should be implemented or already in place for any permit requirement.
- Laws or rules should provide for permit suspension and revocation upon successful prosecution of fishing violations.
- Permit numbers should be required to be displayed on commercial fishing vessels. Permits must always be in the possession of the fisher or vessel.

PROHIBITED SPECIES

Definition: Possession or retention of a particular species or group of species is prohibited.

Average Overall Rating: 4.55

Recommendations:

- This is considered among the more straightforward and enforceable regulations.
- For difficult-to-identify species, it may be necessary to include species groupings in a prohibition, or to ensure adequate identification training and tools for both fishers and enforcement personnel.

- Prohibitions should be restricted to a species or group of species across the board. There should be no exceptions for where it was taken or how it was harvested.
- Any permitted species kept on board must remain in a form easily differentiated from similar prohibited species.

SLOT LIMIT

Definition: Retention and/or possession of any species outside of a specified size range is prohibited. A slot limit may prohibit possession between a certain size range, or it may prohibit possession above or below a certain size range. *See also "Maximum/Minimum Size Limit"*

Average Overall Rating: 4.61

Recommendations:

- Regulations should clearly stipulate the range of the slot size and measurement standards should be consistent across all appropriate jurisdictions.
- Provisions allowing onboard filleting of fish or other processing of animals hinder enforcement of slot limits.

TAGGING, LABELING OR MARKING OF MARINE SPECIES

Definition: The act of placing an approved manufactured tag, label, or a manipulation/alteration of the respective marine species for the purpose of marking a marine species for a management purpose.

Average Overall Rating: 4.00

Recommendation:

- The tag should be an approved device that is identifiable, traceable, and tamper proof.
- The tag should be placed on a marine species in a location that will cause least harm to the species whether alive or dead.
- When any alteration to a marine species (i.e., fin clipping, v-notching or other) the requirement should be consistent among all jurisdictions.
- Improved documentation and labeling of fish and fish products would enable law enforcement to track such products back to the harvester and/or the initial purchaser and to intercept unlawful seafood product at various points between harvest and final sale for consumption.

TARGETING PROHIBITION

Definition: A regulation that prohibits the act of fishing for a particular species, to the exclusion of effort to catch other species.

Average Overall Rating: 1.87

Recommendations:

- This management measure is the least enforceable of the 27 considered in the *Guidelines*.
- Enforcement would require a level of physical observation and surveillance beyond the scope of most agencies.
- Any regulation that requires law enforcement to prove the “intent” of a fisher is less enforceable and difficult to prosecute.

TRIP LIMITS (daily)

Definition: A specified amount of a species is allowed to be caught and possessed onboard or landed by weight, volume, or number, daily. In most situations this applies to commercial fishing regulations. It is a form of possession limit intended to slow down the rate of harvest in a commercial fishery.

Average Overall Rating: 3.82

Recommendations:

- Enforcement is typically restricted to dockside and requires adequate measuring capability while offloading. Checking and verifying a trip possession limit at-sea is extremely difficult.
- A “possession limit” as opposed to a “landing limit” would allow better at-sea enforcement.
- There is a considerable time and labor commitment to enforcing such limits, even at dockside.
- When daily trip limits are implemented a limited number of designated landing points and pre-landing reporting would enhance enforcement.
- Limit any at-sea processing to ensure accurate identification of species subject to trip limits at dockside.
- The trip limit or possession amounts should be consistently defined and used across all appropriate jurisdictions, along with any measurement standards and techniques that are to be applied.
- Allowance for multi-jurisdictional trip limits (landing flexibility) should not be considered without an adequate cooperative management program to provide for responsible fishers, clearly labeled and segregated trip limits, and sufficient sanctions for a violation of the program rules.

TRIP LIMITS (aggregate)

Definition: A specified amount of a species is allowed to be caught and possessed onboard or landed by weight, volume, or number, covering a specified duration of time. In most situations this applies to the commercial sector. It is a form of possession limit intended to reduce bycatch, provide for safety at-sea while also considering the economics of the fishing industry. Aggregate limits allow a vessel to remain at-sea fishing, rather than having to come to port with each day’s possession limit. An aggregate possession limit allows for a vessel to catch a multi-day trip limits in one shortened trip but requires this vessel to stay out of a fishery for the remaining period. This type of allowance is typically based on a one- or two-week duration.

Average Overall Rating: 3.16

Recommendations:

- Most of the difficulties or concerns with enforcing daily trip limits would still apply to aggregate trip limits.
- It is even more difficult to enforce an aggregate trip limit at sea.
- This type of regulation allowing for a vessel to remain at sea and catch multiple daily trip limits precludes any significant at-sea enforcement.
- This type of aggregate program or a multi-jurisdictional trip limit (landing flexibility) program should not be considered without an adequate cooperative management program to provide for responsible fishers, clearly defined rules, and sufficient sanctions for a violation of the program rules.
- This type of program should require both a vessel monitoring system and timely electronic reporting.

TROPHY FISH ALLOWANCE

Definition: Usually applied in recreational fisheries. It allows retention of one or more fish over a specified maximum size or slot limit.

Average Overall Rating: 3.89

Recommendations:

- Any allowance for filleting or processing at-sea hinders enforcement of such provisions.
- Measurement standards should be consistent across all appropriate jurisdictions.

VESSEL MONITORING SYSTEM (VMS)

Definition: A requirement to keep a positioning transmitter (transponder) onboard a fishing vessel. The transponder transmits position and movement information at specified time intervals to the management agency.

Average Overall Rating: 3.82

Recommendations:

- As VMS use is expanded, it should incorporate data transmission regarding gear onboard and the fish being targeted. It can increase the efficiency and effectiveness of enforcement patrols and inspections but does not replace on-the-water or dockside enforcement requirements.
- VMS should be considered for any large-scale fishery that is conducted in remote waters or offshore where at-sea and airborne enforcement is difficult or inefficient.

Atlantic States Marine Fisheries Commission

Commission Business Session

May 2, 2024
11:45 a.m. – Noon

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*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from January 2024
3. Consider Noncompliance Recommendations, if necessary **Final Action**
4. Other Business/Adjourn

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click [here](#) for details.

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
BUSINESS SESSION**

**The Westin Crystal City
Arlington, Virginia
Hybrid Meeting**

January 25, 2024

These minutes are draft and subject to approval by the Business Session.
The Board will review the minutes during its next meeting.

TABLE OF CONTENTS

Call to Order, Chair Joe Cimino1

Approval of Agenda.....1

Approval of Proceedings from October 18, 20231

Public Comment1

Consider Approval of Revision to 2024 Action Plan.....1

Addition to Goal 1 to Develop an Action with the Mid-Atlantic Fishery Management Council for Summer
Flounder Commercial Measures1

Review and Consider Approval of 2024-2028 Strategic Plan.....2

Adjournment3

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 18, 2023** by consent (Page 1).
3. **On Behalf of the Lobster Board move the Commission send a letter to NOAA Fisheries to withdraw the Commission’s recommendation to implement the measures of Sections 3 and 4, except Sections 3.1.1 and 3.2.1 transfers of multi-LCMA Trap Allocation of Addendum XXI and all of Addendum XXII** (Page 2). Motion by Jason McNamee; second by Cheri Patterson. Motion passes by consent (Page 2).
4. **Move to adjourn** by consent (Page 3).

ATTENDANCE TO BE FILLED ON A LATER DATE

These minutes are draft and subject to approval by the Business Session.
The Board will review the minutes during its next meeting.

The Commission Business Session 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, January 25, 2024, and was called to order at 10:45 a.m. by Chair Joe Cimino.

CALL TO ORDER

CHAIR JOE CIMINO: I'm calling to order the Commission's Business Session. We do have a couple agenda items that we need to cover here.

APPROVAL OF AGENDA

CHAIR CIMINO: I'm going to ask if there are any, excuse me, are there any additions to the agenda? Toni, do you want to do this formally as an addition?

MS. TONI KERNS: Yes.

CHAIR CIMINO: We have one from, Toni, go ahead.

MS. KERNS: During Policy Board we forgot about a letter that the American Lobster Board asked us to send to NOAA Fisheries on rulemaking, pertaining to Addendum XXI and XXII, so the Board Chair will bring that up.

CHAIR CIMINO: Yes, we'll cover that. Unless there are any other additions or concerns, I'm going to assume that we can approve the agenda with that addition. I don't see any hands up.

APPROVAL OF PROCEEDINGS

CHAIR CIMINO: We'll move on to approval of the proceedings from the annual meeting of October, '23. I see a hand, Doug.

MR. DOUGLAS E. GROUT: Just briefly. It indicates on the time page that we met there in 2022 instead of 2023.

CHAIR CIMINO: Well, thank you, that's a great catch. That was one of those Easter eggs that we just put out there every once in a while, make sure somebody is looking. You win the prize there, thank you. I

appreciate that. We'll make that edit. If there are no other edits.

MR. GROUT: I'm glad to offer my services.

CHAIR CIMINO: I love it, I love it. The proceedings approved with that edit. It's a very important edit, I may add.

PUBLIC COMMENT

CHAIR CIMINO: Are there any public comments for the Business Session here? We do have some folks from the public, but I don't see any hands, and no online. Okay, great.

CONSIDER APPROVAL OF REVISION TO 2024 ACTION PLAN

CHAIR CIMINO: We'll move on. Toni will cover the Action Plan.

MS. KERNS: Thank you, Mr. Chairman, and I just have one slide and I'll talk while that slide gets put up. But the Commission Summer Flounder, Scup, and Black Sea Bass Management Board met with the Mid-Atlantic Council in December, to set recreational specifications.

ADDITION TO GOAL 1 TO DEVELOP AN ACTION WITH THE MID-ATLANTIC FISHERY MANAGEMENT COUNCIL FOR SUMMER FLOUNDER COMMERCIAL MEASURES

MS. KERNS: Also, during that time there was a discussion on the summer flounder flynet definition, and boundaries of the small mesh exemption area.

Both bodies agreed to take up this issue, or their intent to take up these issues immediately in 2024, in order to address changes in time for NOAA to promulgate regulations by November of this year. This issue was not included in the Commission's Action Plan, so we wanted to see if the Commission would consider adding it to the Action Plan, so we can have similar regulations if changes are made.

The reason why we would put these regulations in the Commission's FMP is because states have these

regulations in their definitions, in particular for the flynet definition, as well as some states reference the exemption areas, while the measures are pertaining to mostly federal water fisheries, it is important to have cohesiveness between the two FMPs.

The one thing to note for this, and this is something that we did not discuss at the Council meetings, because we weren't sure how it would impact the timeline of work that these two management bodies are doing, as well is that there is an amendment on sector separation and recreational accountability that the Policy Board is working on with the Mid-Atlantic Council.

Because of this work on the summer flounder commercial measures, that work would be pushed back, and would be addressed at the earliest in the fall of this year. That would be presenting a scoping document for recreational accountability and the sector separation, and I can take any questions.

CHAIR CIMINO: Questions for Toni. I realize not every member state is paying close attention to this, but you know although this is a longstanding issue, we feel like it is something that needs to be addressed. I was glad to see the Mid take action, and most likely doing the heavy lifting on this. I'll just ask if there is any objection to adding this to our Plan for 2024.

I don't see any objections. I personally really appreciate that. I would like to get this straightened out. With no objections we'll move forward on that. Well, let's cover the lobster letter that we have as an added agenda item. We have a motion on the board, so Jason, if you don't mind.

DR. JASON McNAMEE: **On behalf of the Lobster Board, move the Commission to send a letter to NOAA Fisheries to withdraw the Commission's recommendation to implement the measures of Section 3 and 4, except Sections 3.1.1 and 3.2.1; transfers of multi-LCMA trap allocation of Addendum XXI, and all of Addendum XXII.**

CHAIR CIMINO: Great, thank you, do we have a second for that motion? Cheri Patterson from New

Hampshire, thank you. Any discussion on this motion? Yes, go ahead, Toni, sorry.

MS. KERNS: Just to add to the record that the Board, as Pat talked about at the Policy Board, did note the intention of us expressing to NOAA Fisheries how we intend the Mitchell Provision to apply to the minimum size. Oh, that is for a different letter, and I'm so sorry. Never mind.

CHAIR CIMINO: No problem. We're still going to have that on the record. We'll have that on the record as much as possible. However, yes, that does not necessarily apply to this motion. Any further discussion on this motion? **Any objection to this motion? Not seeing any. We'll consider that passed by unanimous consent.**

REVIEW AND CONSIDER APPROVAL OF 2024-2028 STRATEGIC PLAN

CHAIR CIMINO: With that I'm going to turn it over to Bob to go over the 2024 to 2028 Strategic Plan.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Great, thank you, Mr. Chair. In the interest of time, and recognition of the fact that most folk around the table were here at the Executive Committee yesterday when I went over this in fairly high detail. I'm just going to go over some of the changes that were agreed to at the Executive Committee yesterday, then I'm happy to answer any questions.

But the idea is that we are seeking approval of this document at this point. It's been a couple iterations have gone past the Executive Committee; you know it was brought up at the Policy Board at the annual meeting. The suggested staff edits were included in briefing materials for the Executive Committee, and for this Business Session.

With that, there are a couple of highlights worth noting that were not reflected in the edits that are included here. At the top of Page 2 we're going to insert recognition that we also partnership and work with U.S. Fish and Wildlife Service and USGS. Then moving down along the majority of this was

approved, or recommended for approval as edited yesterday.

Then getting down into goals themselves. Goal 1, there were no recommended changes yesterday, and Goal 2, Jason McNamee brought up the notion that a lot of pieces of Goal 2 kind of look like MSE. But we're going to put a specific reference to Management Strategy Evaluations included as one of the bullets in Goal 2.

Then moving along, actually, I missed one item, two items. Okay, so on Page 8 there is a notion about, well the bullet reads, promote sustainable harvest and access to rebuild fisheries. There is a side note there about, this might take some further discussion. The Executive Committee felt that it was okay as written, so we're going to maintain that in Goal Number 1, as it's written.

Then in Goal 2, there is a note, same idea that this may warrant some more discussion for the bullet that reads, balance request from fishery management with finite assessment workload capacity. There was some good discussion on that yesterday, but ultimately, the Executive Committee recommended that we keep that the same.

Then no changes to Goals 3, 4, and 5. When we went down to Goal 6, there was a conversation about some of the sort of new approaches and strategies that some of our stakeholders have, as far as commenting and generating a lot of press and a lot of e-mail activity and social media activity that really isn't accurate, based on some of the science that the Commission has. There is a suggestion that we include a bullet there that really goes at, directly and proactively, engaging and commenting on some of the Commission management decisions and scientific information to prevent, or at least reduce some of the misinformation that is out there for some of these topics. Throughout the document there is also references to offshore wind/renewable energy. We're going to balance that out.

The offshore wind does take a lot of the bandwidth for a lot of the states, and some of the Commission activities, but there are also other renewable energy

activities that are out there that may be emerging and may become an issue for the fish. We'll balance that out a little bit better throughout the document.

Other than the staff suggested edits, those few that I just mentioned really are all the other changes that we will weave into this document. The idea is, if the Commission is comfortable approving this today, you can do that. Staff will update the document and publish it on the website, and share it with all the Commissioners. Happy to answer any questions, but those are the highlights of the suggested changes.

CHAIR CIMINO: Thank you, Bob, any questions or comments for Bob? Not seeing any; as noted previously in our Policy Board discussions, we don't have any noncompliance findings.

ADJOURNMENT

Is there anything else to come before us today? Not seeing anything, any hands online? Well, it's great with that, I'll entertain a motion to adjourn. John Clark, second by Lynn Fegley. That is Delaware and Maryland. The folks closest to home are ready to go. Good for you, safe travels everyone.

(Whereupon the meeting adjourned at 10:57 a.m. on Thursday, January 25, 2024)

These minutes are draft and subject to approval by the Business Session.
The Board will review the minutes during its next meeting