Atlantic States Marine Fisheries Commission
1050 N. Highland Street
Arlington, VA 22201

Robert E. Beal, Executive Director

New Hampshire Marine Fisheries Division
225 Main Street
Durham, NH 03824-4732

Douglas E. Grout, Chief

MEMORANDUM

October 22, 2019

TO: Commissioners; Proxies; American Eel Management Board; American Lobster Management Board; Atlantic Coastal Cooperative Statistics Program Coordinating Council; Atlantic Coastal Fish Habitat Partnership Steering Committee; Atlantic Herring Management Board; Atlantic Menhaden Management Board; Atlantic Striped Bass Management Board; Coastal Sharks Management Board; Executive Committee; Habitat Committee; Horseshoe Crab Management Board; ISFMP Policy Board; Law Enforcement Committee; Management and Science Committee; Shad and River Herring Management Board; South Atlantic State/Federal Fisheries Management Board; Spiny Dogfish Management Board; Tautog Management Board; Weakfish Management Board

FROM: Robert E. Beal REB
Executive Director

RE: **78th Annual Meeting of the Atlantic States Marine Fisheries Commission**
October 27-31, 2019

The Atlantic States Marine Fisheries Commission's 78th Annual Meeting will be held October 27-31, 2019 at the Wentworth by the Sea, 588 Wentworth Road, New Castle, New Hampshire. Meeting materials are available on the Commission website http://www.asmfc.org/home/2019-annual-meeting. Supplemental materials will be posted to the website on Wednesday, October 23rd.

Board meeting proceedings will be broadcast daily via webinar beginning Monday, October 28th at 8:30 a.m. and continuing daily until the conclusion of the meeting (expected to be 12:15 p.m.) on Thursday, October 31st. The webinar will allow registrants to listen to board deliberations and view presentations and motions as they occur. No comments or questions will be accepted via the webinar. Should technical difficulties arise while streaming the broadcast the boards/sections will continue their deliberations without interruption. We will attempt to resume the broadcast as soon as possible. Please go https://attendee.gotowebinar.com/register/2059114101381638411 to register.

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

Enclosures: Final Agenda, TA # 19-086

Public Comment Guidelines

With the intent of developing policies in the Commission's procedures for public participation that result in a fair opportunity for public input, the ISFMP Policy Board has approved the following guidelines for use at management board meetings:

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

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

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

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

1. Comments received 3 weeks prior to the start of a meeting week will be included in the briefing materials.
2. Comments received by 5:00 PM on the Tuesday immediately preceding the scheduled ASMFC Meeting (in this case, the Tuesday deadline will be ***October 22, 2019***) will be distributed electronically to Commissioners/Board members prior to the meeting and a limited number of copies will be provided at the meeting.
3. Following the Tuesday, ***October 22, 2019 5:00 PM deadline***, the commenter will be responsible for distributing the information to the management board prior to the board meeting or providing enough copies for the management board consideration at the meeting (a minimum of 50 copies).

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, fax, and email.

Final Agenda

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

Sunday, October 27

2:00 – 7:00 p.m. **Registration**

Monday, October 28

7:00 a.m. – 1:00 p.m. **Registration**

8:30 – 9:30 a.m. **Atlantic Herring Management Board**
Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey
Other Members: NEFMC, NMFS
Chair: Keliher
Other Participants: Zobel, Brown, Beal, Boelke
Staff: Rootes-Murdy

1. Welcome/Call to Order *(P. Keliher)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from April 2019
3. Public Comment
4. Progress Update on 2019 Atlantic Herring Area 1A Fishery Performance *(R. Zobel*)
5. Update on Development of New England Fishery Management Council's (NEFMC) Georges Bank Spawning Protection Discussion Document *(D. Boelke*) **Possible Action**
6. Review and Set 2020-2021 Atlantic Herring Fishery Specifications *(K. Rootes-Murdy*) **Final Action**
7. Update on Maine Enforcement Efforts on Quota Violation *(R. Beal)*
8. Elect Vice-Chair **Action**
9. Other Business/Adjourn

9:45 – 10:30 a.m. **American Lobster Management Board**
Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia
Other Members: NEFMC, NMFS
Chair: Train
Other Participants: Reardon, Perry, Beal
Staff: Starks

1. Welcome/Call to Order *(S. Train)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from April 2019
3. Public Comment

4. Discuss Reporting Requirements for 2020 *(C. Starks)*
5. Update on Resiliency in the Gulf of Maine (Draft Addendum XVII) *(C. Starks)*
6. Progress Update on the 2020 American Lobster Benchmark Stock Assessment *(J. Kipp)*
7. Other Business/Adjourn

10:45 – 11:45 a.m. **Tautog Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia
Other Members: NMFS, USFWS
Chair: McKiernan
Other Participants: Barry, Snellbaker
Staff: Rootes-Murdy

1. Welcome/Call to Order *(D. McKiernan)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Progress Report on Commercial Harvest Tagging Program *(K. Rootes-Murdy)* **Possible Action**
5. Other Business/Adjourn

11:45 – 1:15 p.m. **Lunch** *(On Your Own)*

1:00 – 5:00 p.m. **Atlantic Coastal Fish Habitat Partnership (ACFHP) Steering Committee**
Members: Babb, Bell, Campfield, Carloni, Chiarella, Coakley, Erikson, Faulkner, Greenberg, Groskin, Johnson, Kornbluth, Laney, Lorson, McMunigal, Medders, Powell, Rousseau, Socrates, Thomas-Blate, Topolski
Chair: Smith
Other Participants: Devers, Macone
Staff: Havel

1. Welcome/Introductions *(K. Smith)*
2. Committee Consent
   - Approval of Agenda
3. Funding Updates
   - RepYourWater (*L. Havel*)
   - Donate to ACFHP!
   - FishAmerica Funding *(L. Havel, K. Smith)*
   - 2019 – 2020 Operational Funding *(P. Campfield)*
   - Regional Business Plan 2-Pagers Update (L. Havel)
4. National Fish Habitat Plan Update *(L. Havel*)
   - American Fisheries Society Film Festival
   - Waters to Watch
   - Fish Habitat Act Status
5. National Fish Habitat Action Plan Funding Update *(J. Devers)*
   - FY2019 Funding
   - FY2020 Project Rankings
6. Whitewater to Bluewater Update (*J. Thomas-Blate*)

7. Merrimack River Watershed Council Update *(J. Macone)*
8. Day 1 Wrap Up *(K. Smith)*
9. Recess

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: Meserve
Other Participants: Ballenger, Kersey
Staff: Appelman

1. Welcome/Call to Order *(N. Meserve)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Progress Update on the 2019 Atlantic Menhaden Single-Species and Ecological Reference Point Benchmark Stock Assessments *(K. Anstead, K. Drew)*
5. Update on 2019 Reduction Fishery Harvest from Chesapeake Bay *(N. Meserve*)
   - Consider Compliance with the Fishery Management Plan **Action**
6. Other Business/Adjourn

2:00 – 5:00 p.m. **Registration**

3:00 – 5:30 p.m. **Atlantic Coastal Cooperative Statistics Program (ACCSP) 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: Fegley
Staff: White

1. Welcome/Introductions *(L. Fegley)*
2. Council Consent
   - Approval of Agenda
   - Approval of Minutes from April 2019
3. Public Comment
4. Funding Subcommittee Report *(J.D. Simpson)*
5. Consider Recommendations for FY2020 Submitted Proposals *(L. Fegley)* **Action**
6. Consider Revision of the ACCSP Technical Committee Structure *(J.D. Simpson)* **Action**
7. Consider Establishment of Data Coordination Committee *(G. White)* **Possible Action**
8. Program/Committee Updates
   - Electronic Trip Reporting Status *(G. White)*
   - Registration Tracking *(J.D. Simpson)*
   - Updates from Operations/Advisors Joint Meeting *(N. Lengyel-Costa)*

- Committee Updates *(N. Lengyel-Costa)*
- For-Hire Methods Workshop Summary *(G. White)*
- State Conduct of For-hire Telephone Survey *(G. White)*

9. Other Business/Adjourn

6:00 – 8:00 p.m. **Welcome Reception**

Tuesday, October 29

7:00 a.m. – 1:00 p.m. **Registration**

8:00 – 9:30 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: Batsavage
Other Participants: Newlin, Moran
Staff: Rootes-Murdy

1. Welcome/Call to Order *(C. Batsavage)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Consider Addendum VI for Final Approval **Final Action**
   - Review Options and Public Comment Summary *(K. Rootes-Murdy*)
   - Consider Final Approval of Addendum VI
5. Review and Revise (If Needed) 2020/2021 Specifications *(K. Rootes-Murdy*) **Possible Action**
6. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(K. Rootes-Murdy*) **Action**
7. Elect Vice-Chair **Action**
8. Other Business/Adjourn

8:30 a.m. – 5:00 p.m. **Management and Science Committee**
Members: Armstrong, Burns, Dukes, Giannini, King, Knowlton, Madsen, McKown, McManus, Michels, Miller, Orner, Rawls, Ryan, Stevens, Sullivan, Wilson
Chair: Gartland (Knowlton will serve as Chair for this meeting)
Other Participants: Andrews, Faulkner
Staff: Murray

1. Welcome/Introductions *(K. Knowlton)*
2. Approval of Agenda
3. Review Committee Roles and Past Projects *(M. Armstrong)*
4. Discuss Measuring Success in Rebuilding and Sustaining Stocks *(T. Kerns)*
5. Discuss Climate Change Impacts to Fisheries Resources
6. Overview of Management Strategy Evaluations *(J. McNamee)*
7. Overview of New Marine Recreational Information Program Survey Data *(R. Andrews)*
8. Overview of United States Geological Survey Scientific Support to ASMFC *(S. Faulkner)*

9. Review ASMFC Research Priorities *(P. Campfield)*
10. Discuss Offshore Wind and Fisheries Interactions
11. Other Business
12. Adjourn

8:30 a.m. – 5:00 p.m. **ACFHP Steering Committee (continued)**

10. Review Current Action Plan *(L. Havel)*
11. Discuss 2020-2021 Action Plan *(K. Smith, L. Havel)*
12. Update on Conservation Mapping *(L. Havel, E. Martin)*
    - Southeast Mapping
    - Northeast Mapping
    - Assessment of Existing Information
13. Communications Discussion *(L. Havel)*
    - 10-Year ACFHP Factsheet
    - Western Native Trout Initiative Trout Challenge Discussion *(B. Groskin)*
    - World Fish Migration Day: May 16, 2020
14. Submerged Aquatic Vegetation Monitoring Protocols Discussion (*A. Kornbluth)*
15. Elect Vice-Chair
16. Other Business/Adjourn

9:45 – 11:45 a.m. **Horseshoe Crab Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: NMFS, PRFC, USFWS
Chair: Rhodes
Other Participants: Brunson, Messeck, Sweka
Staff: Schmidtke

1. Welcome/Call to Order *(M. Rhodes)*
2. Board Consent
    - Approval of Agenda
    - Approval of Proceedings from August 2019
3. Public Comment
4. Review Delaware Bay Ecosystem Technical Committee and Adaptive Resource Management Subcommittee Report *(J. Sweka*)
5. Consider Re-initiation of Postponed Draft Addendum VIII *(M. Rhodes)* **Possible Action**
6. Set 2020 Harvest Specifications **Final Action**
    - Review Horseshoe Crab and Red Knot Abundance Estimates and 2019 ARM Model Results *(J. Sweka)*
    - Set 2020 Harvest Specifications *(M. Rhodes)*
7. Consider Approval of 2019 Fishery Management Plan Review and State Compliance (*M. Schmidtke*) **Action**
8. Other Business/Adjourn

11:45 a.m. – 1:15 p.m. **Lunch** *(On Your Own)*

1:30 – 5:00 p.m. **Law Enforcement Committee (LEC)**
(A portion of this meeting may be a closed session for the LEC Coordinator* and *Committee members only)
Members: Beal, Blanchard, Brown, Eastman, Furlong, Gadomski, Garner, Hettenbach, Hodge, Hogan, Kersey, King, Lauderman, Messeck, Moore, Moran, Noel, Pearce, Ray, Santiago, Snellbaker, Walker, Williams
Vice-Chair: Messeck (Chair has retired, Vice Chair Messeck will serve as Chair for the meeting)
Other Participants: Odom
Staff: Robson

1. Call to Order/Roll Call of the LEC Representatives *(D. Messeck, M. Robson)*
2. Approval of Agenda and May 2019 Minutes
3. Public Comment
4. Appoint Nominations Subcommittee for LEC officers
5. Review LEC Input on Circle Hook Regulations and Enforcement
6. Review LEC Input on Atlantic Striped Bass Addendum VI
7. Review and Discuss ASMFC Species (as Needed)
8. Review and Discussion Ongoing Enforcement Activities **(Closed Session)**
9. State Agency Reports
10. Recess

1:15 – 2:15 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: Gary
Other Participants: Zimmerman, Beal
Staff: Rootes-Murdy

1. Welcome/Call to Order *(M. Gary)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Consider Approval of Coastwide Cap Overages Policy (*K. Rootes-Murdy*) **Final Action**
5. Consider Approval of 2019 Fishery Management Plan Review and State Compliance (*K. Rootes-Murdy*) **Action**
6. Other Business/Adjourn

2:00 – 5:00 p.m. **Registration**

2:30 – 4:00 p.m. **Weakfish Management Board**

Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: NMFS, PRFC, USFWS
Chair: Clark
Other Participants: Levesque, Walker
Staff: Schmidtke

1. Welcome/Call to Order *(J. Clark)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from October 2018
3. Public Comment
4. 2019 Stock Assessment Update *(E. Levesque)*
   - Presentation of 2019 Assessment Update Report
5. Consider Management Response to Stock Assessment Update *(J. Clark)* **Possible Action**
6. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(M. Schmidtke*) **Action**
7. Elect Vice-Chair **Action**
8. Other Business/Adjourn

4:15 – 5:15 p.m. **Business Session**

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

1. Welcome/Call to Order *(J. Gilmore)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Review and Consider Approval of the 2020 Action Plan *(R. Beal)* **Action**
5. Elect Chair and Vice-Chair **Action**
6. Recess

6:00 – 9:00 p.m. **Annual Dinner**

Wednesday, October 30

8:00 – 10:00 a.m. **Executive Committee**

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

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

Members: Abbott, Anderson, Bowman, Boyles, Jr. (Bell), Cimino, Clark, Estes, Gilmore, Grout, Haymans, Keliher, McNamee, Miller, Miner, Murphey, Pierce, Shiels

Chair: Gilmore

Staff: Leach

1. Welcome/Call to Order *(J. Gilmore)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Meeting Summary from August 2019
3. Public Comment
4. Report of the Administrative Oversight Committee (*P. Keliher*)
   - Consider Approval of Fiscal Year 2019 Audit/Financial Statement **Action**
   - Review Draft 2020 Action Plan
5. Consider Allocation of Remaining Plus-Up Funds *(R. Beal)*
   - Striped Bass Tagging Survey
   - Discuss Other Uses
6. Discuss Public Input Processes *(R. Beal)*
   - Advisory Panel Involvement
   - Public Hearing Process
7. Review Policy Addressing Non-payment of State Assessments *(R. Beal)*
8. Review Revised Investment Policy for Commission Reserves *(L. Leach)*
9. Future Annual Meetings Update *(L. Leach)*
10. Other Business/Adjourn

8:00 – 11:30 a.m. **Law Enforcement Committee (continued)**

11. Social
12. Federal Agency Reports
13. Review Offshore Enforcement Issues for American Lobster (tentative)
14. Review and Discuss State Compliance Reporting Process (tentative)
15. Review and Discuss ASMFC Species (as Needed)
16. Follow-up Discussion on Tautog Commercial Tagging Implementation
17. Elect Chair and Vice-Chair **Action**
18. Adjourn

8:30 a.m. – 3:30 p.m. **Habitat Committee**

Members: Ayvazian, Babb, Bachman, Carloni, Chiarella, Chintala, Coakley, Fay, Gill, J. Johnson, S. Johnson, Laney, Lorson, McTigue, Medders, Rousseau, Sanger, Schneider, Sherwood, Smith, Socrates, Tinsman, Watkinson, Wilber, Wilke
Chair: Topolski
Staff: Havel

1. Welcome/Introductions *(M. Topolski)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2019
3. ACFHP Update (*L. Havel*)
4. Northeast Regional Habitat Assessment Data Discussion (*J. Coakley, M. Bachman*)
5. Status Updates (*L. Havel & R. Babb*)
   - Habitat Management Series: Aquaculture/Survey
   - Habitat Management Series: Acoustics
   - Habitat Hotline
6. Fish Habitats of Concern Workshopping
7. Species Assignments Check-in *(L. Havel*)
8. Other Business/Adjourn

10:15 – 11:45 a.m. **Shad and River Herring Management Board**

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: DC, NMFS, PRFC, USFWS
Other Participants: Sprankle, Furlong, Lyons Gromen
Chair: Armstrong
Staff: Starks

1. Welcome/Call to Order *(M. Armstrong)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from February 2019
3. Public Comment
4. Review Technical Committee Recommendations on Management and Monitoring Inconsistencies with Amendments 2 and 3 *(K. Sprankle)* **Possible Action**
5. Consider Approval of Revisions to the Maine River Herring Sustainable Fishery Management Plan *(K. Sprankle)* **Action**
6. Discuss Updates to Shad Habitat Plans *(C. Starks)*
7. Progress Update on Shad Benchmark Stock Assessment *(J. Kipp)*
8. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(C. Starks)* **Action**
9. Review and Populate Advisory Panel Membership *(T. Berger*) **Action**
10. Other Business/Adjourn

11:45 a.m. – 1:15 p.m. **Captain David H. Hart Award Luncheon**

1:15 – 2:30 p.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, USFWS
Chair: Batsavage
Other Participants: Frazier, Garner
Staff: Rootes-Murdy

1. Welcome/Call to Order *(C. Batsavage)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from April 2019
3. Public Comment
4. Consider Postponed Motion from April 2019 *(C. Batsavage)* **Final Action**
   Move to require, for state waters, the use of circle hooks on lines intended to catch sharks.
   - Law Enforcement Committee Report *(M. Robson)*
   - Advisory Panel Report *(K. Rootes-Murdy)*
5. Set Coastal Sharks Fishery Specifications for 2020 (*K. Rootes-Murdy*) **Final Action**
6. Consider Approval of 2019 Fishery Management Plan Review and State Compliance (*K. Rootes-Murdy*) **Action**
   - Status Update on State Implementation of North Atlantic Shortfin Mako Recreational Measures
7. Elect Vice-Chair **Action**
8. Other Business/Adjourn

2:45 – 5:45 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: Armstrong
Other Participants: Lengyel, Blanchard, Bassano
Staff: Appelman

1. Welcome/Call to Order *(M. Armstrong)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Addendum VI for Final Approval **Final Action**
   - Review Options and Public Comment Summary *(M. Appelman)*
   - Review Advisory Panel Report *(M. Appelman)*
   - Review Law Enforcement Committee Report *(K. Blanchard)*
   - Consider Final Approval of Addendum VI
5. Review Criteria for Development of Conservation Equivalency Proposals *(K. Drew*)
6. Other Business/Adjourn

Thursday, October 31

8:00 – 10:00 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
Chair: Gilmore
Staff: Kerns

1. Welcome/Call to Order *(J. Gilmore)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2019
3. Public Comment
4. Update from Executive Committee (*J. Gilmore*)
5. Discuss Process Implications for Ecological Reference Point Benchmark Assessment *(T. Kerns, K. Drew)*
6. Standing Committee Reports **Action**
   - Law Enforcement *(M. Robson*)
   - Habitat (*L. Havel*)
     - Consider Approval of the Habitat Management Series: Aquaculture Impacts to Fish Habitat along the Atlantic Coast
   - Atlantic Coastal Fish Habitat Partnership Steering Committee *(L. Havel*)
   - Management and Science *(S. Murray*)
   - Assessment Science *(S. Murray*)
     - Consider Approval of Assessment Schedule
7. Review Noncompliance Findings (If Necessary) **Action**
8. Other Business/Adjourn

10:00 – 10:15 a.m. **Business Session (continued)**

7. Consider Changes to the Rules and Regulations to Adopt a Policy to Address Non-Payment of State Appropriations (*R. Beal*) **Final Action**
8. Consider Noncompliance Findings, If Necessary **Final Action**
9. Other Business/Adjourn

10:30 a.m. – 12:15 p.m. **South Atlantic State/Federal Fisheries Management Board**

Member States: New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: DC, NMFS, PRFC, SAFMC, USFWS
Chair: Geer
Other Participants: Giuliano, McDonough, Rickabaugh, Hodge, Powers
Staff: Schmidtke

1. Welcome/Call to Order *(P. Geer)*
2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2019

3. Public Comment
4. Consider Approval of Atlantic Croaker Draft Addendum III and Spot Draft Addendum III for Public Comment (*M. Schmidtke*) **Action**
5. Discuss Differences between Federal and Commission Management of Spanish Mackerel *(P. Geer)* **Possible Action**
6. Consider Approval of 2019 Fishery Management Plan Reviews and State Compliance for Red Drum, Black Drum, and Spotted Seatrout *(M. Schmidtke*) **Action**
7. Other Business/Adjourn

STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

October 15, 2019

Michael Pentony
Regional Administrator
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Robert Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200A-N
Arlington, Virginia 22201

Dear Mr. Pentony and Mr. Beal,

On September 5th and 12th, Maine Marine Patrol issued citations to individuals for violating regulations designed to protect Atlantic herring. The citations included exceeding the weekly Area 1A landing limit of 160,000 pounds, as set by the Atlantic States Marine Fisheries Commission (ASMFC), failing to file accurate reports of harvest, and failing to hold a permit to buy and sell herring. While these violations are concerning, they are made more egregious by the current status of the Atlantic herring stock, which has experienced low levels of recruitment and subsequent declines in spawning stock biomass over the last few years.

Given the need to ensure accurate reporting of all Atlantic herring harvest, the Maine Department of Marine Resources requests NOAA Fisheries increase the harvest attributed to the Area 1A fishery in 2019 by 175,000 pounds. While it is disappointing that the imprudent actions of a few have consequences for all Area 1A harvesters, it is critical that we fully account for all catch and landings. This will ensure the Area 1A fishery closes when the sub-ACL is projected to be reached, safeguarding against overfishing, and that harvest data used for future stock assessments is as accurate as possible.

I appreciate your consideration of this important issue. Please do not hesitate to contact me if you have questions.

Sincerely,

Pat Keliher, Commissioner

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr

PHONE: (207) 624-6550

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Atlantic States Marine Fisheries Commission

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MEMORANDUM

October 22, 2019

To: **American Lobster Management Board**

From: **Toni Kerns, ISFMP Director**

RE: **Lobster/Jonah Crab Reporting Requirements**

American Lobster Addendum XXVI and Jonah Crab Addendum III (the addenda) approved in February of 2018 address deficiencies in the harvester reporting and biological data collection requirements for the lobster and Jonah crab fisheries. Specifically, the addenda improve the spatial resolution of data by requiring fishermen to report fishing location via 10 minute squares, which further divide the existing statistical areas. For harvester trip reports, the addenda require additional data elements including number of traps per trawl and number of buoy lines in order to collect information on gear configurations. The new data elements were to be implemented on January 1, 2019, but implementation was delayed 1 year in order to incorporate the elements into all reporting platforms by all states and jurisdictions.

While the majority of the data elements have been added to all reporting platforms, there are two (10 minute squares and number of buoy lines) that have not. It is recommended the Board postpone the requirement to collect these two data elements until January 1, 2021. In addition, there are four data elements that are not being collected consistently (see list below). It is recommended the Board task the data work group with determining a consistent data collection process for these data elements. Lastly, as the Whale Work Group deliberated issues this summer, it identified several additional data elements that would be beneficial for states to collect. It is recommended states and jurisdictions add these data elements to help evaluate lobster-whale interactions and other issues facing the industry.

As a reminder, the addenda also establish a deadline that states are required to implement 100% harvester reporting within five years, with the prioritization of electronic harvester reporting development during that time.

Data Elements Required for January 1, 2020:

1. Unique Trip ID
2. Vessel Number
3. Trip Start Date
4. Location (NMFS Stat Area)
5. LCMA
6. Species
7. Reported Quality
8. Soak Time

9. Number of Buoy lines (total)
10. Trip length

Recommended Data Elements to Postpone until January 1, 2021

1. Location (10 minute square)
2. Total gear fishing person level

Inconsistently Collected Data Elements

1. Number of traps hauled - Collection varies by partner. Some partners collect this field directly while others derive it (e.g. average number of traps per string x number of strings hauled)
2. Number of traps set – All partners are collecting this field. A potential issue is that some are collecting it at the effort level and others are collecting it at the trip level.
3. Number of traps per trawl – Collection varies by partner. Some partners collect this field directly while others derive it (e.g. number of traps per effort/number of strings hauled)
4. Number of buoy lines (total)

Suggested Additional Data Elements for Implementation

1. Maximum depth
2. Bait type
3. Bait quantity
4. Buoy line diameter

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

October 21, 2019

To: **Tautog Management Board**

From: **Kirby Rootes-Murdy, Senior FMP Coordinator**

RE: **Update on Implementation of the Commercial Harvest Tagging Program**

In August, the Tautog Management Board (Board) requested states with a declared interest in the resource indicate whether they would be able to implement the commercial harvest tagging program by January 1, 2020. Amendment 1 to the Tautog Fishery Management Plan (FMP) requires the implementation of commercial harvest tagging program to combat illegal and unreported harvest of tautog. While the Amendment outlines the tagging program was to be implemented in January 2019, the Board postponed implementation until January 2020 due to issues identifying a suitable tag and applicator.

The following outlines the anticipated implementation date for the commercial tagging program in 2020 by state:

Massachusetts: Will implement the tagging program by **January 1, 2020**

Rhode Island: Will implement the tagging program by **January 1, 2020**

Connecticut: Will implement the tagging program by the start of the 2020 commercial fishing season (**April 1, 2020**)

New York: Will implement the tagging program by the start of the 2020 commercial fishing season (**April 16, 2020**)

New Jersey: Regulatory package to allow New Jersey Division Fish and Wildlife to implement commercial tagging program is anticipated to be approved in early 2020

Delaware: Will implement the tagging program by **January 1, 2020**

Maryland: Will implement the tagging program by **July 1, 2020**

Virginia: Will implement the tagging program by **January 1, 2020**

In addition to the states listed above, Pennsylvania and North Carolina both have fish markets where tautog are sold commercially. Neither state is required to implement the commercial tagging program per Amendment 1. Pennsylvania has yet to determine if it will be able to enforce the commercial tagging requirement in its fish markets.

North Carolina does not plan to implement a commercial tagging program for tautog due to low landings levels; only 511 lbs. have been landed since 2014, with no more than 137 lbs. landed in a given year. The state does plan to conduct outreach to their fishermen and commercial dealers that tautog landed in North Carolina without a tag may not be sold in the states of Massachusetts through Virginia starting next year.

For more information on the tautog commercial harvest program, please contact Kirby Rootes-Murdy at krootes-murdy@asmfc.org or 703-842-0740.

M19-85

Comments

From: Daniel Kelley <danieljkelley@verizon.net>
Sent: Monday, September 9, 2019 8:07 AM
To: Comments
Subject: comment

you should regulate the excessive bait fish harvest that produces a product(fish oil) with no scientifically proven medical benefit and increase the penalties on commercial fisherman who violate quotas rather than regulating the recreational fisherman whose actual impact on the fisheries is minor and whose economic impact is major.

Tina Berger

Subject: FW: Subject: Request for Legal Action Against Omega Protein

From: Phil Zalesak [mailto:flypax@md.metrocast.net]
Sent: Friday, October 04, 2019 6:04 AM
To: 'FVHATTIEROSE@aol.com'; 'FVHATTIEROSE@aol.com'; 'Jay.McCreight@legislature.maine.gov'; 'cheri.patterson@wildlife.nh.gov'; 'r-dwhite@comcast.net'; 'swamper199@gmail.com'; 'dan.mckiernan@state.ma.us'; 'ray@capecodfishermen.org'; 'sarah.ferrara@mahouse.gov'; 'jason.mcnamee@dem.ri.gov'; 'lizzy.2@charter.net'; 'Ericreidri@gmail.com'; 'matthew.gates@ct.gov'; 'William.a.hyatt@snet.net'; 'melissa.ziobron@cga.ct.gov'; 'maureen.davidson@dec.ny.gov'; 'ech12@cornell.edu'; 'kaminsky@nysenate.gov'; 'Heather.corbett@dep.nj.gov'; 'allenra133@gmail.com'; 'captadam@karenannii.com'; 'ashiels@pa.gov'; 'senseofwonder@pa.net'; 'david.saveikis@state.de.us'; 'fishmaster70@comcast.net'; 'crabman31@aol.com'; 'john.clark@state.de.us'; 'bill.anderson@maryland.gov'; 'robert.t.brown@shopcove.net'; 'captphillangley@gmail.com'; 'steve.bowman@mrc.virginia.gov'; 'bplumlee@pbp-attorneys.com'; 'District01@senate.virginia.gov'; 'Chris.Batsavage@ncdenr.gov'; 'jmannen@yfmlaw.com'; 'Mblanton9394@gmail.com'; 'BELLM@DNR.SC.GOV'; 'rhodesmm@musc.edu'; 'RonnieCromer@scsenate.gov'; 'Doug.Haymans@dnr.ga.gov'; 'swoodward1957@gmail.com'; 'Trey.Rhodes@house.ga.gov'; 'jessica.mccawley@myfwc.com'; 'BillOrndorf@yahoo.com'; 'Thad.Altman@myfloridahouse.gov'; 'jim.estes@myfwc.com'
Cc: Bob Beal (rbeal@asmfc.org); Amy Widerman (amywiderman@gmail.com); Bill Bonner (bill_bonner@verizon.net); Bruno Vasta (captbruno@comcast.net); Chris (cjgoudreau@comcast.net); Cy Staniec; Dallen Hall (panasea125@gmail.com); Dave Allaire (davea494@gmail.com); Eric Packard; Jeff Lewis (jeffrey.lewis41@gmail.com); Jerry Gaff (jerrygaff@yahoo.com); Julian or Judi Tsai; Reed Brodnick (brodnikreed@gmail.com); Ron Smith (rssmithins@yahoo.com); 'Charles Lynch - NOAA Federal'; Tom Meiser (tmeiser@verizon.net); Tracy Norris (tracy.norris65@gmail.com); David Sikorski (davidsikorski@ccamd.org); foragematters@aol.com; 'chesapeake@cbf.org'; Martin Gary; 'Stephen Shechtel'
Subject: Request for Legal Action Against Omega Protein

Atlantic States Marine Fisheries Commissioners,

Ref: (a) 2016 Title 16 Conservation, Chapter 71 Atlantic Coastal Fisheries Cooperative Management
https://uscode.house.gov/view.xhtml?path=/prelim@title16/chapter71&edition=prelim

Encl: (1) Omega Protein Statement on the Chesapeake Bay Cap dated 9/12/19
(2) Decline in Atlantic Menhaden Predators in the Chesapeake Bay dated 9/30/19

In accordance with Section 5105 of reference (a) I am requesting that ASMFC Commissioners commence legal action against Omega Protein due to its announcement that it will exceed ASMFC's quota for Atlantic menhaden in the Chesapeake Bay.

A fishery as defined in Section 5102 of reference (a) is "one or more stocks of fish that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographical, scientific, technical, commercial, recreational, or economic characteristics".

The decline of the Atlantic menhaden predator fishery is well documented by the Virginia Marine Resources Commission, the Maryland Department of Natural Resources, and the Potomac River Fisheries Commission over the last 20 years (enclosure (2)). It includes species such as striped bass, summer flounder, bluefish, Spanish mackerel, and weakfish which are important to the commercial and recreational industries along the Chesapeake Bay and the entire Atlantic Coast.

Atlantic menhaden are forage fish for 22 species in the Chesapeake Bay. So, exceeding the ASMFC quota for Atlantic menhaden is damaging not only to species important to the commercial and recreational fishing industry but to the ecological environment of the Chesapeake Bay in general.

Therefore, the contention by Omega Protein that the Chesapeake Bay cap is "arbitrarily low and unscientific" is laughable if not outright dishonest. And their desire to do all of their fishing in the Chesapeake Bay would further devastate the ecological environment of the Chesapeake Bay.

Given that Omega Protein has announced that they will exceed the Atlantic menhaden quota for the Chesapeake Bay and that the State of Virginia is not compliant with the coastal fishery management plan, the ASMFC should notify the Secretary of Commerce immediately in accordance with Section 5105 of reference (a).

Further, the ASMFC should demand a fishing moratorium on the Atlantic menhaden within the waters of Virginia in accordance with Section 5106 of reference (a).

Forwarded for your review and consideration.

Very respectfully,

Phil Zalesak
President
Southern Maryland Recreational Fishing Organization
www.smrfo.com

October 6, 2019

To: Nichola Meserve, Chair, Atlantic Menhaden Management Board

Subj: Permanent Moratorium on Atlantic Menhaden Reduction Fishing in the Chesapeake Bay

Ref: (a) Omega Protein Statement on the Chesapeake Bay Cap, dated 9/12/19
(b) Evaluating Ecosystem-Based Reference Points for Atlantic Menhaden by Andre Buchheister, Thomas J. Miller & Edward D. Houde, dated 10/11/17
(c) Draft Addendum VI to Amendment 6 to the IFMP for Atlantic Striped Bass, dated 9/2019

Summary

I strongly recommend a permanent moratorium on Atlantic menhaden reduction fishing in the Chesapeake Bay.

This recommendation is based on fishery data and studies provided by the Maryland Department of Natural Resources (MD DNR), the Virginia Maritime Resources Commission (VMRC), the Potomac River Fisheries Commission (PRFC), the Chesapeake Biological Laboratory (CBL), the Atlantic States Marine Fisheries Commission (ASMFC) and other scientific sources.

Ecological Impact

Currently, Omega Protein, a Canadian owned company, has an annual Atlantic menhaden harvest quota of 51,000 metric tons or 112,435,620 pounds or approximately 337,306,860 fish per year for the Chesapeake Bay . They are not only going to exceed this quota but want to harvest all of their catch out of the Virginia waters of the Chesapeake Bay (reference (a)). See figure 1 below. In 2006 their annual quota was 109,000 metric tons or 240,303,580 pounds or approximately 720,910,740 fish per year.

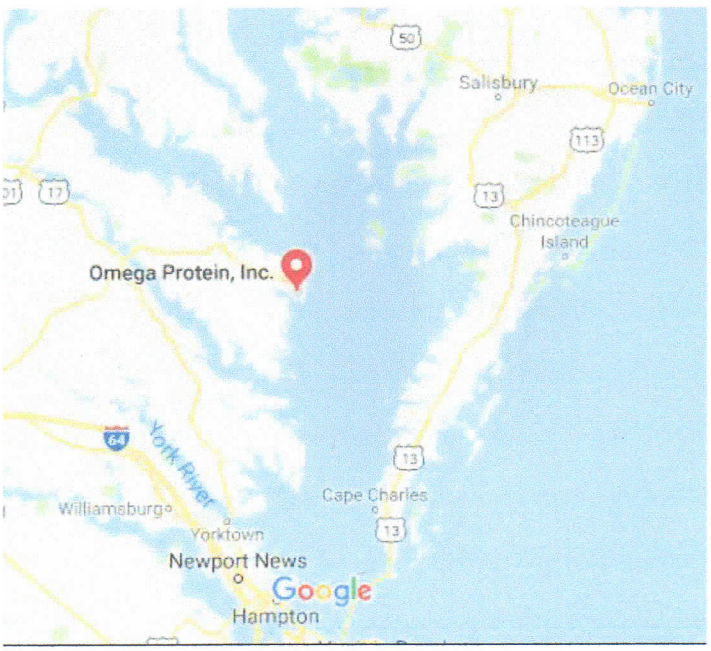


Figure 1. Virginia Chesapeake Bay

What has been the impact on Atlantic menhaden predators over the last 20 years?

According to the CBL there are 22 Atlantic menhaden predators in the Chesapeake Bay. At least five of these are important to commercial and recreational fishermen. They include striped bass, weakfish, bluefish, summer flounder, and Spanish mackerel. The MD DNR, VMFC, and the PRFC have documented a steady decline in the commercial harvest of Atlantic menhaden predators in the Chesapeake Bay over the last 20 years. Here are the actually declines for each species:

- Striped Bass – 34% decline
- Weakfish – 99% decline
- Bluefish – 85% decline
- Summer flounder – 92%
- Spanish mackerel – 80%

Figures 2 through 6 below document the commercial harvest decline in the Maryland Chesapeake Bay, the Virginia Chesapeake Bay, and the Potomac River.

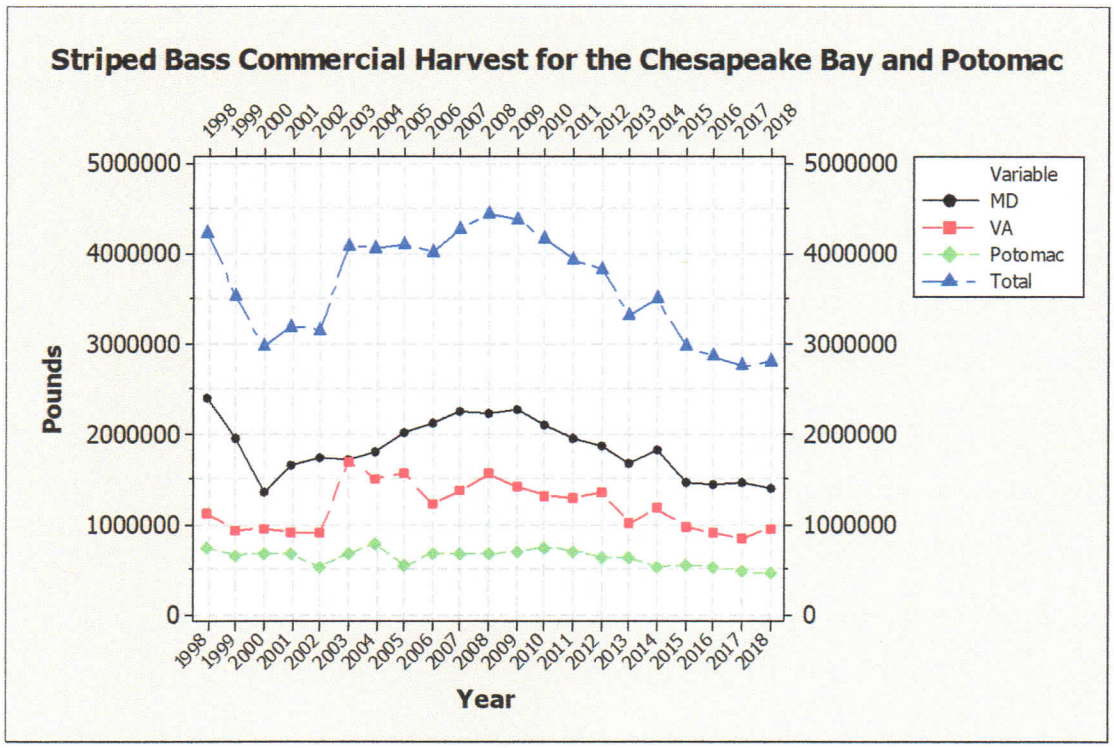


Figure 2: The decline of commercial harvest of Striped Bass in the Chesapeake By

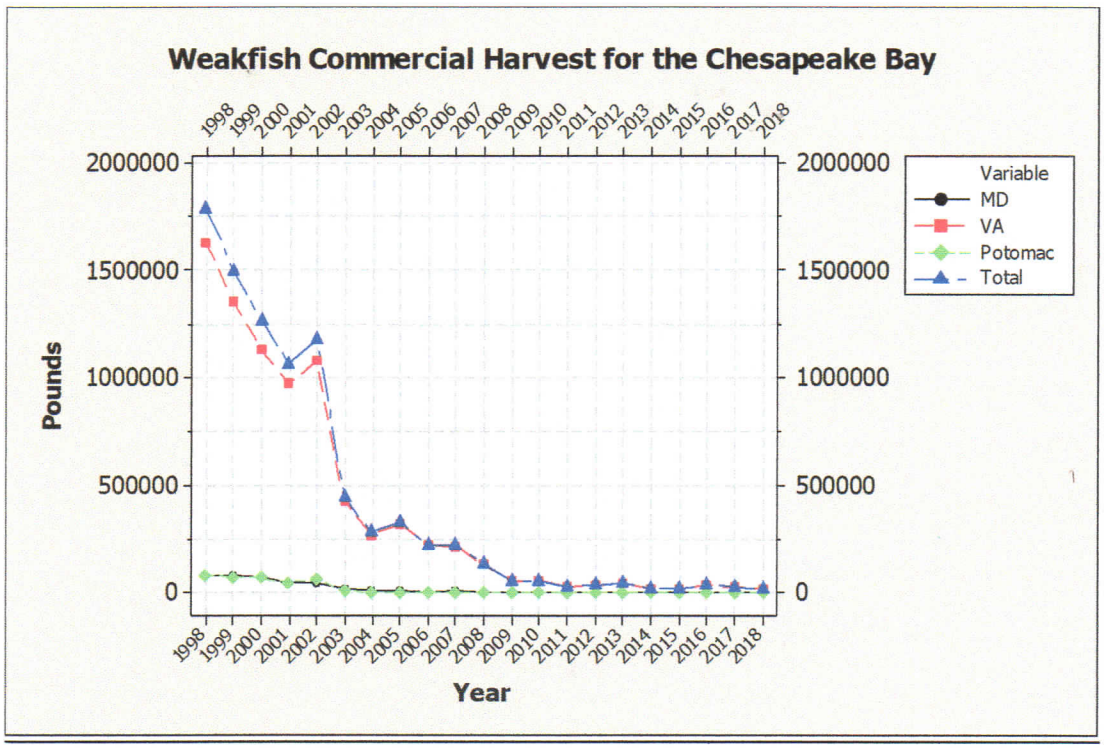


Figure 3. The decline of commercial harvest of Weakfish in the Chesapeake Bay

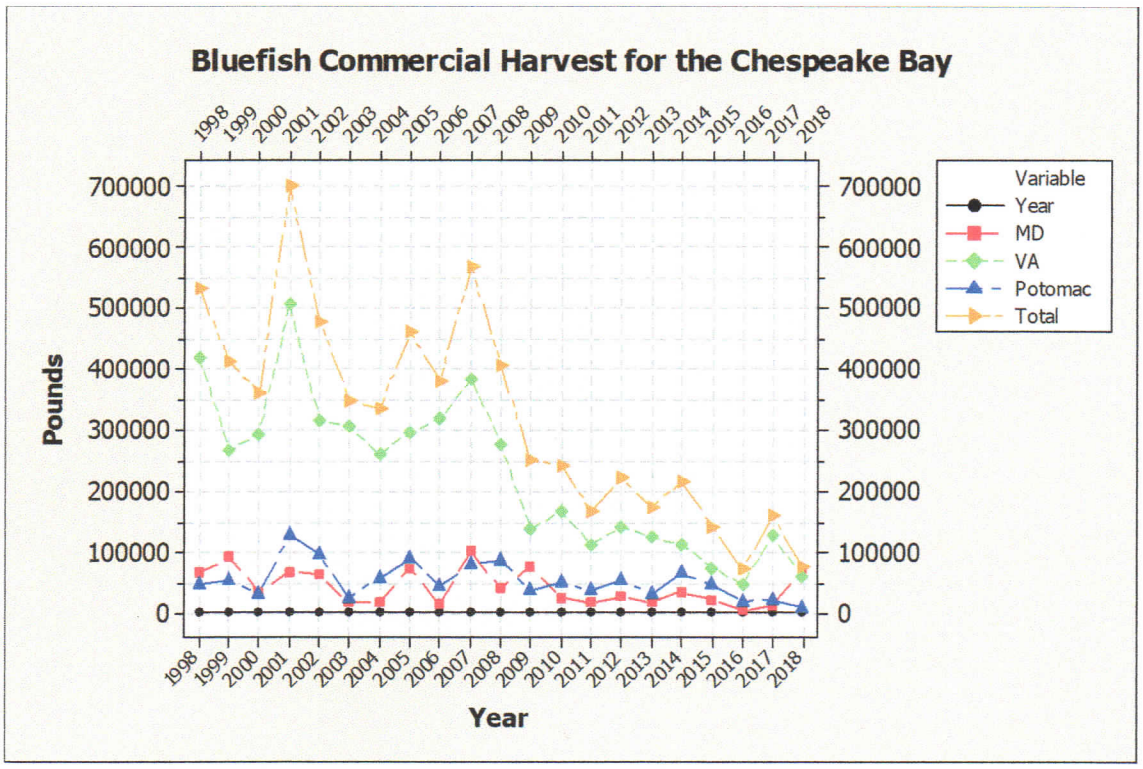


Figure 4. The decline of commercial harvest of Bluefish in the Chesapeake Bay

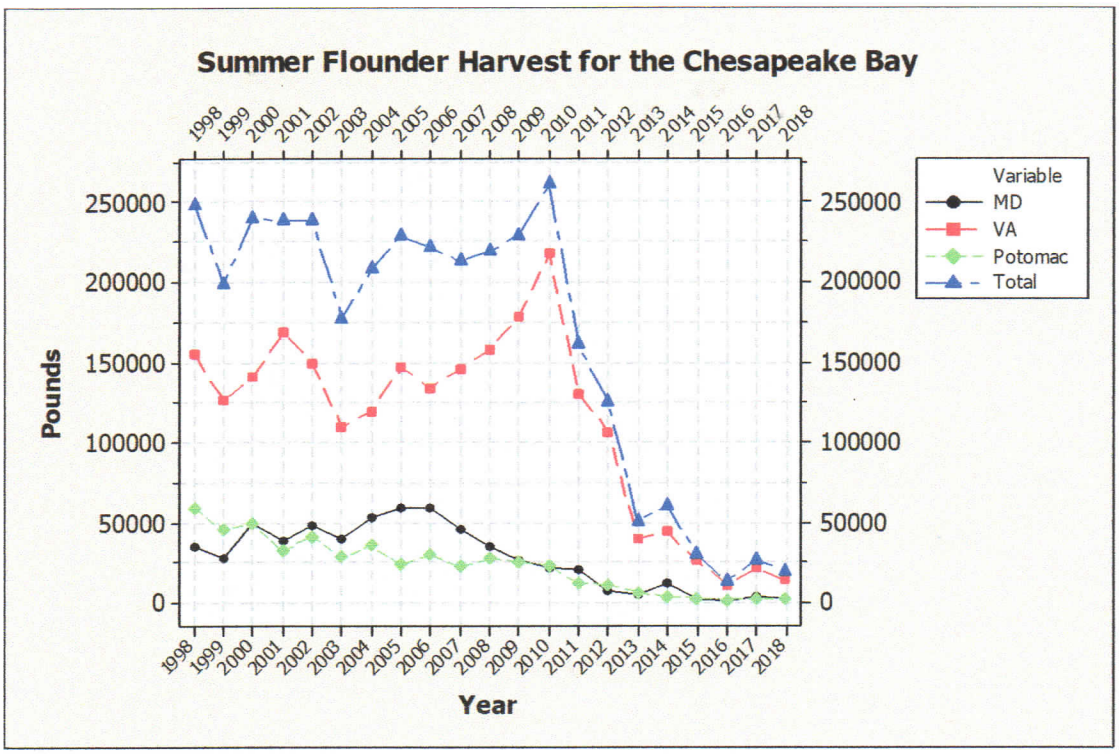


Figure 5. The decline of commercial harvest of Summer Founder in the Chesapeake Bay

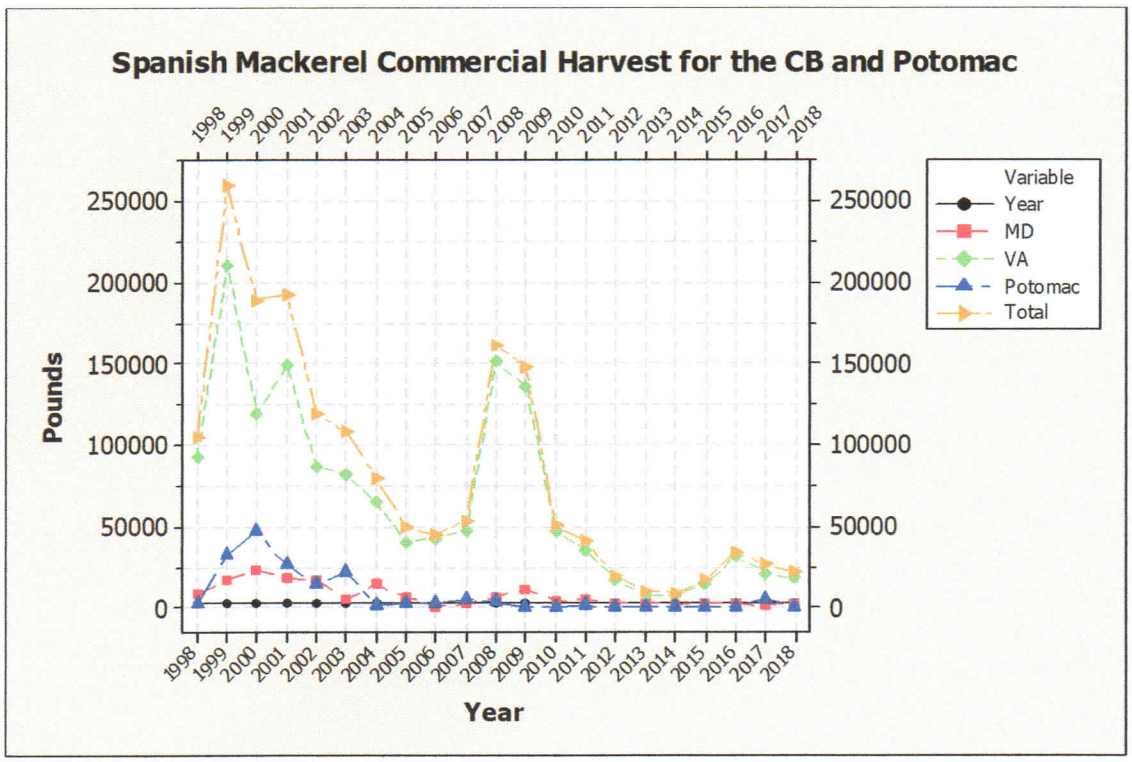


Figure 6. The decline of commercial harvest of Spanish Mackerel in the Chesapeake Bay

Impact on Striped Bass

Other scientific justification for establishing a permanent moratorium on Atlantic menhaden reduction fishing in the Chesapeake Bay can be found in reference (b) where scientists determined that:

"Striped Bass (Morone saxatilis) were most sensitive to increases in Atlantic Menhaden fishing, largely due to their strong dietary reliance on this prey species, but other higher-trophic-level groups (birds, highly migratory species, sharks, and marine mammals) were also negatively impacted."

This scientific finding is further supported by reference (c) which documents the decline in both commercial and recreational striped bass harvest along the entire Atlantic Coast. See figures 7 and 8 below:

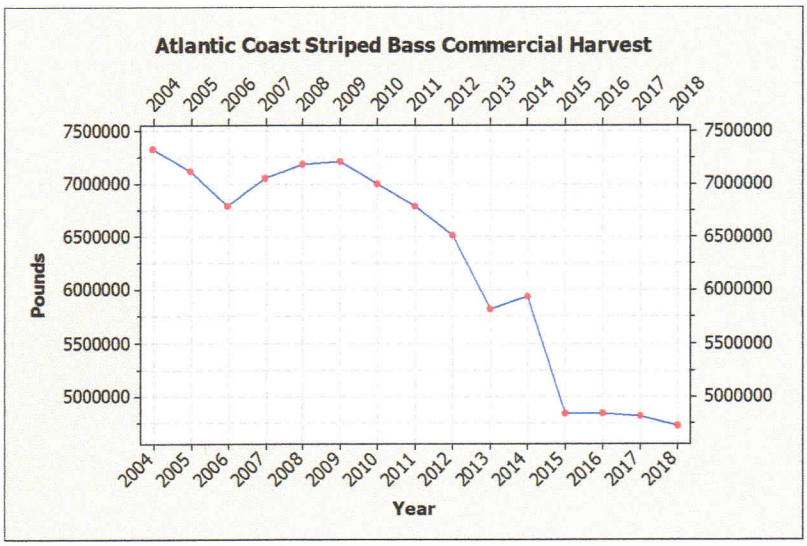


Figure 7. Decline in Atlantic Coast Striped Bass Commercial Harvest

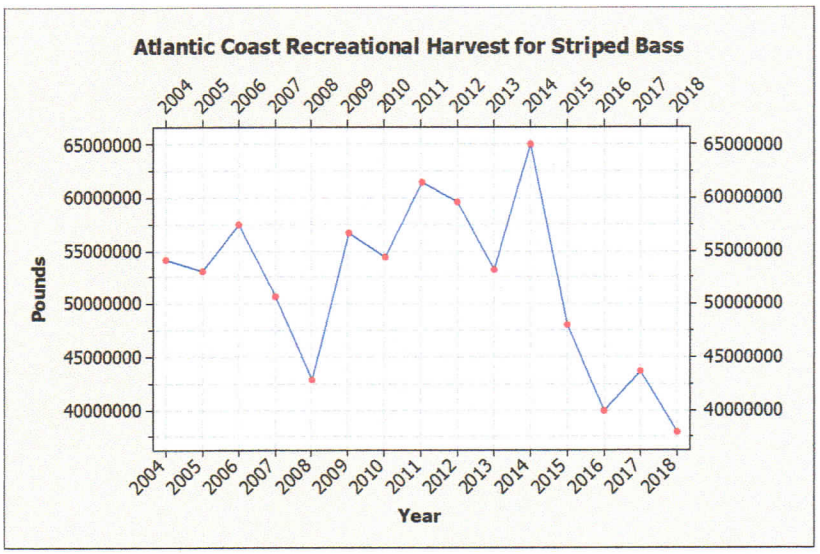


Figure 8. Decline in Atlantic Coast Striped Bass Recreational Harvest

Economic impact

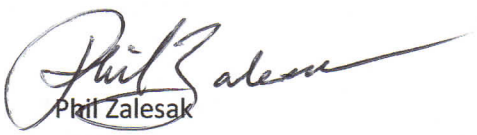
Striped bass is just one species of many impacted by the reduction fishery removal of Atlantic menhaden from the Atlantic Coast. This is what the ASMFC reported about the economic impact of striped bass on the regional economy (page 6, reference (c)):

"The contribution of the commercial sector to the region's gross domestic product (GDP) when attempting to account for all industries involved in harvesting, processing, distributing, and retailing striped bass to consumers, was $103.2 million and supported 2,664 regional jobs. In comparison, the contribution of the recreational sector to the region's GDP was $7.7 billion and supported 104,867 jobs."

If Omega Protein, a Canadian owned company, is required to harvest their Atlantic menhaden catch in the Atlantic Ocean and not harvesting Atlantic menhaden in the Chesapeake Bay, they will still be in business. Their approximately 546 employees will generate approximately $342 million for Cooke, Inc., their parent company, which is located in New Brunswick, Canada.

The continued existence of Omega Protein as a reduction fishery for Atlantic menhaden in the Chesapeake Bay will be at the expense of American jobs and American taxpayers.

Very respectfully,



Phil Zalesak
President
Southern Maryland Recreational Fishing Organization
www.smrfo.com

Max Appelman

From: Beth Cardwell <shrink@shentel.net>
Sent: Saturday, September 21, 2019 12:14 PM
To: Max Appelman
Subject: menhaden

I am writing asking the commission to find the Commonwealth of Virginia out of compliance with the provisions of Amendment 3 to the Fishery Management Plan for Atlantic Menhaden, specifically the Commonwealth's failure to implement the Chesapeake Bay reduction fishery cap of 51,000 mt.
Omega Protein exceeded your cap this year.
I don't actually know what happen to Virginia if this occurs, but there are many citizens of the Commonwealth who value the Bay despite how their legislators vote.

Thanks for any information you can provide.

Sincerely,
Beth Cardwell

Max Appelman

From: STEPHEN ATKINSON <steveatkinson52@verizon.net>
Sent: Friday, October 4, 2019 12:37 PM
To: Monty Mason; Bryan Plumlee; Robert Beal
Cc: Max Appelman
Subject: Va violation of menhaden bay cap

Gentlemen, as you are aware omega protein has exceeded the bay cap As contained in the fishery management plan and continues there netting in the bay . Thousands of anglers find this to be totally unacceptable, especially in light of their stated excuse that It has been too rough to fish in the ocean this summer. This comes at a difficult time given the condition of our striped bass fishery which is facing new restrictions. It has been demonstrated that striped bass are heavily dependent on menhaden for forage.
I urge you to find Virginia out of compliance with ASMFC directives. This flagrant abuse of the Chesapeake Bay by the menhaden reduction industry cannot be tolerated. All parties including the Virginia General assembly must be held accountable.
Thank you.
Steve Atkinson
Richmond ,Va

Sent from my iPhone

Max Appelman

From: Corinne Green <75cgreen@gmail.com>
Sent: Friday, October 4, 2019 7:39 PM
To: Comments
Subject: Omega Violating Chesapeake Bay Cap: Time for Accountability

Omega Protein recently announced that they will exceed the Chesapeake Bay Reduction Fishing Cap of 51,000 MT, undermining conservation in the Chesapeake Bay and directly impacting recreational fishing. The ASMFC should now allow this to stand.

Omega Protein is a foreign-owned industrial harvester that sucks up more than 70 percent of coast-wide menhaden catch, and this announcement of the Bay Cap violation is yet another example of what a bad actor this company is. Omega Protein has violated the Clean Water Act on numerous occasions and earlier this month was fined by the SEC for mispresenting their violations of federal law in connection with Federal loans provided to the company. Omega vessels frequently run recreational anglers off their fishing grounds, setting nets around boats to suck up vast quantities of menhaden. The company has also had dozens of OSHA violations and conducts a dirty fishery with numerous on-the-Bay accounts of wasteful by-catch, including cobia, red drum, and bluefish.

Recreational anglers and the recreational fishing economy pay the price for all of this bad behavior. Research suggests that the reduction fishery could be responsible for as much as a 30 percent decline in striped bass. At a time when anglers are being asked to reduce their take of striped bass, this violation of the Chesapeake Bay Cap adds insult to injury.

The striped bass fishery generated $7.8 billion toward our nation's gross domestic product and recreational anglers accounted for 98 percent of the total economic contribution. The economics of recreational fishing dwarf whatever economic benefit that comes from the foreign owned reduction industry.

Menhaden are critical to the Chesapeake Bay ecosystem and Omega Protein's claim that there is no scientific basis for Bay Cap is false. Omega has been unable to prove that their industrial fishery does not adversely impact the Bay. Every other state on the East Coast has banned the practice of reduction fishing and now is time for the ASMFC to hold this company accountable to the fishery management plan.

Omega Protein is a foreign-owned industrial harvester that sucks up more than 70 percent of coast-wide menhaden catch, and this announcement of the Bay Cap violation is yet another example of what a bad actor this company is. Omega Protein has violated the Clean Water Act on numerous occasions and earlier this month was fined by the SEC for mispresenting their violations of federal law in connection with Federal loans provided to the company. Omega vessels frequently run recreational anglers off their fishing grounds, setting nets around boats to suck up vast quantities of menhaden. The company has also had dozens of OSHA violations and conducts a dirty fishery with numerous on-the-Bay accounts of wasteful by-catch, including cobia, red drum and bluefish.

John & Corinne Green

Sent from my iPhone

JERSEY COAST ANGLERS ASSOCIATION
Working For Saltwater Resource & Marine Anglers
1594 Lakewood Rd (Rt. 9), Unit 13, Toms River, NJ 08755
Phone: 732-506-6565
FAX: 732-506-6975
Web Site http://www.JCAA.org
Email: jcaa@jcaa.org

Max Appelman, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St. Suite 200A-N
Arlington, VA. 22001

Max and ASMFC Menhaden Management Board,

Omega Violating Chesapeake Bay Cap: Time for Accountability

Omega Protein recently announced that they will exceed the Chesapeake Bay Reduction Fishing Cap of 51,000 MT, undermining conservation in the Chesapeake Bay and directly impacting recreational fishing. The ASMFC should now allow this to stand.

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Recreational anglers and the recreational fishing economy pay the price for all of this bad behavior. Research suggests that the reduction fishery could be responsible for as much as a 30 percent decline in striped bass. At a time when anglers are being asked to reduce their take of striped bass, this violation of the Chesapeake Bay Cap adds insult to injury.

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Menhaden are critical to the Chesapeake Bay ecosystem and Omega Protein's claim that there is no scientific basis for Bay Cap is false. Omega has been unable to prove that their industrial fishery does not adversely impact the Bay. Every other state on the East Coast has banned the practice of reduction fishing and now is time for the ASMFC to hold this company accountable to the fishery management plan.

Sincerely,

Capt. Paul Eidman
Forage & Habitat Committee Chairman

Riverkeeper
832 individuals submitted this form letter

Max Appelman

From: Riverkeeper <info@Riverkeeper.org>
Sent: Sunday, October 20, 2019 2:05 PM
To: Comments
Subject: Protect Atlantic menhaden, hold Omega Protein accountable

Oct 20, 2019

Comments ASMFC

Dear: ASMFC,

I care deeply about the Hudson River and its life and I am writing to urge your action to compel Omega Protein to comply with harvest restrictions for Atlantic menhaden as determined by the Atlantic States Marine Fisheries Commission. Given Omega Protein's recent threat to deliberately exceed their harvest cap, we hope you will deem them "Out of Compliance" at the next meeting of the Menhaden Management Board on October 23, 2019.

Menhaden are one of the most important fishes along the Atlantic Coast, providing food for striped bass, bluefish, tuna, codfish, whales, dolphins and osprey. Their abundance buffers depleted populations of river herring and shad from the effects of predatory fish and they clean our waterways of excessive phytoplankton and algae caused by sewage contamination.

I know that menhaden are an important fishery and I want to make sure they continue in abundance for all of us. The management quotas recommended by the ASFMC and our nation's top fishery scientists cannot be flouted by an industrial fishing company that already holds an 85 percent share of the quota.

I am counting on you to use your vote on the ASMFC to follow through and enforce the quotas. In the longer term, I am counting on the ASMFC to improve its approach to managing this species and use an ecosystem perspective, rather than menhaden's individual status as a species. We need to protect these fish.

Please protect our rivers and oceans from greed. The bounties of our earth should be for the many not the few.

Sincerely,

[redacted]

Max Appelman

From: Robert Beal
Sent: Monday, October 21, 2019 11:10 PM
To: Max Appelman
Subject: Fwd: REBUTTAL OF LYNCH AND OMEGA LEGAL POSITIONS
Attachments: Scan_0157.pdf; ATT00001.htm; Scan_0158.pdf; ATT00002.htm

Max,

Can you also include these comments

Thanks,
Bob

Sent from my iPad

Begin forwarded message:

From: "rr" <foragematters@aol.com>
To: "james.gillmore@dec.ny" <james.gillmore@dec.ny>, "NICHOLA MESERVE" <nichola.meserve@state.ma.us>, "Robert Beal" <Rbeal@asmfc.org>
Cc: "Sen. Craig A. Miner" <craig.miner@cga.ct.gov>, "WILLIAM HYATT" <william.a.hyatt@snet.net>, "Melissa Ziobron" <melissa.ziobron@cga.ct.gov>, "Justin Davis" <justin.davis@ct.gov>, "david.saveikis@state.de.us" <david.saveikis@state.de.us>, "Craig D Pugh" <crabman31@aol.com>, "Roy Miller" <fishmaster70@comcast.net>, "john.clark@state.de.us" <john.clark@state.de.us>, "Rep. William J Carson" <william.carson@delaware.gov>, "Thad Altman" <thad.altman@myfloridahouse.gov>, "JIM ESTES" <jim.estes@myfwc.com>, "Bill R. Orndorf" <william_orndorf@ml.com>, "JESSICA MCCAWLEY" <jessica.mccawley@myfwc.com>, "Spud Woodward" <swoodward1957@gmail.com>, "Doug Haymans" <doug.haymans@dnr.ga.gov>, "Rep. TREY RHODES" <trey.rhodes@house.ga.gov>, "Patrick Keliher" <patrick.keliher@maine.gov>, "Rep. JAY MCCREIGHT" <jay.mccreight@legislature.maine.gov>, "Russell Dize" <mjdize@verizon.net>, "Stephen Train" <FVHATTIEROSE@aol.com>, "Sen. Dave Miramant" <david.miramant@legislature.maine.gov>, "LYNN FEGLEY" <lynn.fegley@maryland.gov>, "dana.stein@house.state.md.us" <dana.stein@house.state.md.us>, "Raymond Kane" <ray@capecodfishermen.org>, "PHIL LANGLEY" <captphillangley@gmail.com>, "sarahpeake@gmail.com" <sarahpeake@gmail.com>, "Sherry White" <sherry_white@fws.gov>, "Dan Mckiernan@state.ma.us" <dan.mckiernan@state.ma.us>, "Dennis Abbott" <swamper199@gmail.com>, "jkealin@lundsfish.com" <jkealin@lundsfish.com>, "G. RITCHIE WHITE" <r-dwhite@comcast.net>, "Cheri Patterson" <cheri.patterson@wildlife.nh.gov>, "TOM FOTE" <tfote@jcaa.org>, "Adam S. Nowalsky" <karenannii@karenannii.com>, "Joe Cimino" <joseph.cimino@dep.nj.gov>, "Maureen Davidson" <maureen.davidson@dec.ny.gov>, "Sen. TODD KAMINSKY" <kaminsky@nysenate.gov>, "steve.murphy@ncdenr.gov" <steve.murphy@ncdenr.gov>, "senandrzejzak@njleg.org" <senandrzejzak@njleg.org>, "james.gillmore@dec.ny" <james.gillmore@dec.ny>, "Emerson Hasbrouck" <ech12@cornell.edu>, "Chris Batsavage" <chris.batsavage@ncdenr.gov>, "Jerry Mannen Jr." <jmannen@yfmlaw.com>, "Andrew Shiels" <ashiels@pa.gov>, "Robert Ballou" <robert.ballou@dem.ri.gov>, "bob.steinberg@ncleg.net"

<bob.steinberg@ncleg.net>, "TIM SCHAEFFER" <tischaeffe@pa.gov>, "Sen. Susan Sosnowski" <sen-sosnowski@rilin.state.ri.us>, "Senator Ronnie W. Cromer" <RonnieCromer@scsenate.gov>, "Mel Bell" <bellm@dnr.sc.gov>, "DAVID BORDEN" <lizzy.2@charter.net>, "DR. MALCOLM RHODES" <rhodesmm@musc.edu>, "JOEY BALLENGER" <ballengerj@dnr.sc.gov>, "STEVEN G. BOWMAN" <steve.bowman@mrc.virginia.gov>, "MARTIN GARY" <martingary.prfc@gmail.com>, "Bryan Plumlee" <bplumlee@pbp-attorneys.com>, "Monty Mason" <district01@senate.virginia.gov>
Subject: REBUTTAL OF LYNCH AND OMEGA LEGAL POSITIONS

Bob Beal...please review and add to package....Thanks Tom

Subject: DRAFT LETTER ON LEGAL ISSUES ..RELEVANT AND NECESSARY EVIDENCE . SECOND EDITION

Chairmen ...Gilmore and Meserve. These are some thoughts I had about the basic issue here..the alleged lack of hard survey data to " prove " the need for the decreased cap.....this is what Mr Lynch was saying to the board. I thought this might be helpful for you to review these thoughts.... Bob could reply to Omega by saying that under the Charter, as we will explain below, the Commission uses the information that is available and isn't required to wait for data that may or may not be available in the future.

This concerns the review by the Secretary under Section 5106 of an action by the ASMFC under the " necessary for conservation " clause. The definition of conservation in the ASMFC Charter is " The restoring rebuilding and maintaining of any coastal fishery resource and the marine environment in order to insure..."

Lawyer Lynch's comments to the board were directed to the lack of a quantitative survey ,like an aerial count, to establish a threshold or ratio for the decreased cap. We know such a spotter plane abundance survey and multi factor depletion model exists in Rhode Island , but does not exist for the Chesapeake Bay.

The apparent assumption by both Omega and Lynch that the lack of such a quantitative number can prevent the board from taking action for conservation under the Charter and Amendment 3 should be explored.

In the past menhaden were managed under the single species approach that concerned sustainability and setting commercial quotas. There was an essential change in direction with the definition of "best scientific information available," under ASMFC Charter section 8 (f) which ;

" includes but is not limited to the body of biological, environmental, ecological, economic and social data concerning the fish stock and fisheries"

This change of emphasis from looking at only the single species to looking at the role of menhaden in the entire Atlantic ecosystem and basing management decisions on environmental , economic and social effects was carried further with Amendment 3.

(page 29. Equitable distribution to the four user groups ;, reduction, commercial and recreational fishermen, fish and wild life and businesses)

Under the Charter definition of "best scientific information available " we suggest the board was completely within its authority and discretion to pass the reduced cap measure or allotment without a quantitative survey or measurement. The definition is very clear that when certain data , such as an aerial survey , is not available, you use what is available. If the board had to wait until all the data or a certain piece of data was available to move toward it's goal of conservation there would never be any progress, never be any decisions !

Our second question also relates to the information the Secretary will consider relevant in making his decision. . As we said the board considered the wide range of information relevant under " Best Scientific Information Available " , the effect on the entire ecosystem and the best means available to allocate the menhaden between the four user groups under Amendment 3. The combined training and experience of over forty delegates whose careers involve state level Fisheries management, commercial and recreational fishing and conservation, from every state on the Atlantic coast should be know and considered by the Secretary. The Charter and Amendment 3 require the delegates to make qualitative as opposed to quantitative value judgments as to the cause and effect of the decline in the bay fish and wildlife . To some extent this is a subjective decision. They use their judgment to propose allocations that equitably divide the menhaden resource between the four user groups. That is what the decreased cap is , it is an Amendment 3 allocation.

Therefore we should determine if we can proffer to the Secretary a summary of the qualifications and experience of the delegates who made the Amendment 3 decision .The social information to be considered is the effect of the decline of the Bay fish stocks and fishing over the last fifteen years. Some of the fisheries have declined more that 90%, the spawning rockfish stock is 35% below the threshold. The effect has been the loss of 80,000 fishermen and fishing families from saltwater fishing in Virginia and Maryland and the profound consequences to thousands of businesses and hundreds of communities.. The loss of our Bay traditions is at stake here. The Secretary should be aware of the social and economic effects on Chesapeake Bay

scan 0157 REQIEUM FOR TANGIER SOUND
0158 REDUCING RISK AS CONSERVATION PURPOSE, PROOF OF CAUSE AND EFFECT

Thank you.....Tom Lilly. 443 235 4465

From: Tll foragematters@aol.com
Subject: Virginia noncompliance hearing 10/28/2019
Date: Oct 6, 2019 at 8:42:00 AM
To: Rbeal@asmfc.org, Max Appelman mappelman@asmfc.org
Cc: flypax@md.metrocast.net

Dear Mr. Beal;

Please file this in the Delegate's folder ...scans sent separately.

The purpose of this letter is to answer the claims by Omega Protein in their letter to you of September 12, 2019. Omega makes the following argument: the research does not show any evidence of negative impacts from menhaden fishing in the bay , the measure in Amendment 3 reducing the Bay cap to 51,000 metric tons was unscientific and arbitrary. Omega says it supports science-based management of menhaden.

Omega seeks to distract the Board by the often repeated no "scientific evidence " comment. In his reply to Virginia dated January 17, 2018 Chairman Gilmore emphasizes that Amendment 3 decisions were based on the ecological role of menhaden in the entire Atlantic ecosystem including the Bay. This is the holistic approach . Factors include equitable distribution to the primary user groups which include recreational fisherman, the fish and wildlife. The Chairman cited the overwhelming public support of the conservation conservation purpose of Amendment .

Section Eight of the Charter states " Best Scientific Informative Available " .."includes but is not Limited to that body of biological, environmental, ecological, economic and social data concerning the fish stock....."

This is definition allowed the Board to consider a wide range of factors in deciding that The Amendment 3 revised cap was needed for conservation as opposed to the narrow quantitative approach suggested by Omega in their September letter.

In deciding the conservation purpose of the decreased cap the Board members considered that allowing Omega to be in the Virginia Bay for the entire time the menhaden were there ,with up to ten purse seine ships, was to much pressure on the menhaden. The Board considered the the rapid decline since of the 22 fish species that depend on menhaden forage since 2008. Background research such as "Evaluating Ecosystem-Based Reference Points for Atlantic Menhaden" Buchheister, Miller Houde, pub. Marine and Coastal Fisheries (2013) had been conducted . This reported a dependence of large Chesapeake Bay rockfish on menhaden. pg. 3/43.The Board had information that warming seas have caused a shift in the stock of menhaden toward New England leading to the inference Omega was catching out of a declining stock, leaving far less for the wild life. At page 23/43 of the Buchheister article it says...weights of striped bass fell significantly after 1998 correlated to declines in menhaden . Shifting to other food sources was not successful "given Atlantic Menhaden's rich lipid content

relative to nonclupeid fish"

There is research from New England , Mark Gibson, prepared for a symposium. (Scan 0106) citing Oviatt,C.A. "Environmental effects of Atlantic menhaden on Surrounding waters . Chesapeake Science 13:321-323, that " found that Large scale commercial fishing in the Bay could take up to 80% of the adult Menhaden present. From our personal aerial survey work over the Virginia bay there have been many times when we have heard the pilots say they have run out of fish.

The decision was supported by thousands of comments from the public and scientists . We request those comments be made part of this record . Please also include the proposed Addendum 6 to Amendment 6 of the to rockfish FMP. This contains a wealth of information on the serious decline of the rockfish particularly the large breeding stock. They are overfished and are now subject to conservation management by the Commission. Virginia had to close its Spring season.

The above information links the dependence of the large rockfish on Menhaden to poor condition if the menhaden are scarce. The lack of food becomes at least one cause of the problem, it becomes a very likely cause when we consider the intensity of the Omega fishing in Virginia. The Virginia Bay in surface area is only about 3% of the Atlantic Coast but 40% of the entire Atlantic catch is caught there.

The question becomes ; Does it benefit conservation to stop the factory fishing at 51,000mt. If that took effect all of the menhaden in the Bay and all of the menhaden entering the Bay would be food for the fish and wildlife.

Regarding the issue of conservation purpose I think most people would agree that they would insult the intelligence, experience and conservation values of any fisheries manager to question a cap that would leave an additional 30,000 tons of menhaden in the water to feed a distressed and declining population of fish and wildlife.

The second question here is the risk to Chesapeake Bay if the Amendment 3 reduced Cap fails.

If we pay any attention to history there is a clear and present risk here. In the 1980s there was a serious decline in the rockfish particularly the large breeding stock. This is the same thing that is happening now. There was a moratorium for a number of years and the fish rebounded. Unfortunately the supply of menhaden had not been increased. As a result of a lack of menhaden forage the Chesapeake Bay rockfish became undernourished and a bacterial infection set in. For the next five years most of the rockfish in the bay showed lesions and poor body condition. Fishing virtually stopped. This was a very difficult time for anyone who fished

in Virginia and Maryland. See Uphoff Article (2003 scan 0129) and Uphoff , Sharov Article (2018 scan 0131)

We are on the same track right now . We understand the rockfish Biomass is now 137,000 tons and the target is 230,000 tons , a 60% increase. The Chesapeake Bay ecosystem and it's wildlife are already under severe stress. We have low oxygen levels, pollution, red tides and huge influx of polluted water from the Susquehanna River . Adding 60% more rockfish without increasing the forage base substantially almost certainly will lead to history repeating itself. The reduced cap could help prevent that. It could protect over 30,000 tons of Manhattan forage in the fall of the year. This is the time that the large migrating rockfish are in the bay . This Is the distressed stock of fish, these fish need to fatten up for the winter,

In summary, the commissioners decision to promote conservation with a decreased Cap even without any exact measurement of the resource is the normal and expected way managers make these decisions. We will never have all the data because the Chesapeake Bay ecosystem is so complicated and changing with thousands if not millions of variables. We have a decision made by 40 commissioners. Many have spent their careers as fisheries managers and working together and sharing information and understanding the importance of Chesapeake Bay as a nursery for the Rockfish and all of the other fish species. They demonstrated a shared value for conservation.Mathematical formulas and statistics do not contain conservation values and the goal of fairness and equity promised in the commission charter.

Thank you. Menhaden Project. Tom Lilly

From: rr foragematters@aol.com
Subject: Addendum to this mornings mail with scans
Date: Oct 6, 2019 at 9:27:53 AM
To: rbeal@asmfc.org

Bob:

Can this be put in the Delegates Material ?

The scans are attached. Can the scans be printed out for the package or could I mail them in?

I need to add to the discussion that Omega may be suggesting that all the factors were not known when the decision was made.
As I pointed out in the prior mail that is the normal situation involving a complex ecosystem. To the extent this could refer to not having an abundance
survey Omega is not in a position to complain as they have in the past and are now frustrating survey efforts. The proof of this is in scan 0141 titled
History of Omega Noncooperation. Please review that

Scans for the Noncooperation piece...0137,0138,0139, 0140,0141

Scans for the Discussion main mail to Beal 0106,0129,0131,0109,0107,0142

Tap to Download Scan_0137.pdf 848 KB	Tap to Download Scan_0138.pdf 310 KB	Tap to Download Scan_0139.pdf 864 KB
Tap to Download Scan_0140.pdf 938 KB	Tap to Download Scan_0141.pdf 1.3 MB	Tap to Download Scan_0106.pdf 2.9 MB
Tap to Download Scan_0129.pdf 1 MB	Tap to Download Scan_0131.pdf 1.7 MB	Tap to Download Scan_0109.pdf 1.4 MB

From: Tom Lilly foragematters@aol.com
Subject: Second edition of my topics.
Date: Oct 17, 2019 at 10:38:43 AM
To: kdrew@asmfc.org
Cc: flypax flypax@md.metrocast.net, foragematters@aol.com

Katie

I thought I should outline the topics to be discussed. This is about ways to articulate
the conservation purpose of the reduced cap. This is relevant to the menhaden board meeting coming up.

THE REDUCED CAP CAN HELP PREVENT A SERIOUS THREAT TO THE ROCKFISH

The menhaden board is well aware that since 2004 the spawning rockfish stock has fallen from 250 million pounds to 150 million pounds. Efforts will soon be implemented to increase this population by as much as another 100 million pounds.

If we pay any attention to history there is a clear and present risk involved here. In the 1980s there was a serious decline in the rockfish. The same thing is happening now. There was a moratorium on all fishing and the stock rebounded. Unfortunately, the supply of menhaden in the bay had not been increased to accommodate this. As a result of the lack of menhaden our rockfish became under nourished and disease set in. There followed a five-year period when most of the rockfish had sores, lesions and high mortality. This was a very difficult time for Maryland and Virginia fisherman. The connection between the lack of menhaden and the disease that weakened the rockfish is well documented in two journal articles by Jim Uphoff and Alexei Sharov.

We are on track to repeat the mistakes of the 80s unless we protect and increase the supply of menhaden in Chesapeake Bay. During the entire time menhaden are entering the Virginia bay Omega Protein has eight factory purse seine boats catching them. There is no measurement of the amount of menhaden left in the water while this fishing is going on day after day. There is information however, that all of the species of fish that depend on menhaden have declined significantly in the last 10 years. From this information the menhaden board in

passing Amendment 3, properly inferred a link between the intense fishing and the decreased fish in Chesapeake Bay.

The board recognized the purpose of the decreased cab was to protect the resource. What happened to the rockfish in the early 90s adversely affected 100s of thousands of people in Virginia and Maryland and thousands of businesses. Right now Omega is fishing over the reduced cap of 51,000 tons. If the reduced cap was in effect all of the schools of Menhaden in route to Virginia or in the bay as of September 1st would have been protected . That could be 1000 schools of menhaden. The fall is when the migrating schools of large pre-spawning rockfish will be migrating into Chesapeake Bay. This is the time of the year that these fish need abundant menhaden as they should be fattening up to survive the winter.

The purpose of Amendment 3 was insure these fish had enough food.

WHERE THERE ARE TWO POTENTIAL CAUSES OF THE DECLINING ROCKFISH SPAWNING STOCK THE COMMISSION AND THE MENHADEN BOARD CAN PROPERLY
ADDRESS EACH WITHOUT KNOWING THE EXACT PERCENTAGE EACH CONTRIBUTES. A CONSERVATION MEASURE THAT IS INTENDED TO SOLVE A PART OF A SERIOUS PROBLEM HAS GREAT VALUE TO THE BAY WILD LIFE

The decline in the spawning stock could be due to a shortage of food , as we just discussed or it could be due to "overfishing" , it may be due to both combined. Taking the research you discussed with the board in February and the inferences I just discussed the shortage of food is a potential cause. The expected significant increase in the need for forage just discussed There will be a significant increase in the need for forage due to the spawning stock conservation . This increases the likelihood food is the factor. If we use the licensing data I sent you from MDNR we have information of a significant decline in people fishing during the period "overfishing" was to be happening. As many as 60,000 fewer fishermen. This may not "prove" the alternative cause of food shortage is most

important but it does support that as the primary cause.

From all of the information available, using the multi species and qualitative process required by Amendment 3 , do you agree the board was correct in passing the reduced cap to address one of the two likely causes of the fishery declines in the bay? Even if the cause addressed was responsible for only part of the problem the Board acted properly to solve that part. Would you agree?

Thanks. Tom Lilly

TOPIC TWO. CAUSE AND EFFECT

We are making the usual assumptions. Qualitative decisions based on the overall ecosystem under Amendment 3. Conservation purpose to restore or rebuild the stock, valuing menhaden for its forage purpose, multi species analysis, fairness for each of the four user groups, the industry, the fisherman the fish and wildlife and marine oriented businesses and communities.

Additional facts are the eight or more Omega purse seiners operating in the Virginia Bay five days a week from early May too late November. The fact that it is not know how much menhaden is left in the Virginia bay on a daily basis after Omega finishes fishing.

Also consider the overall decline in the bay of the fish species, including the female spawning stock of rockfish over the last 10 years. These fish favor menhaden forage.

We also have information from the MDNR that 60,000 of the recreational anglers in Maryland have quit fishing during that time. Certainly the others have fished a lot less if the fishing was bad enough to make half of their fellow anglers quit.

Can this be reduced to a simple Issue of likely cause and effect ? As we said, there are two suggested causes for the decline in the fish and the fishermen . They are lack of food and overfishing . It could be a combination of both. In the absence of a quantitative survey the Commission has made its decisions using the Best Evidence Available and applying Amendment 3 goals. The goal under the Charter is conservation of the resource.

Now to the question. Is it a correct statement to say the fact over half of the Maryland fishermen were quitting or had quit fishing during the period of fishery decline argue very strongly that " overfishing" was not the significant cause? Fishermen that have quit don't "overfish". Doesn't that leave a lack of food as the most likely primary cause ? Am I correct the Commission could decide the lack of food was not the primary cause but was a significant factor in the decline ? If so, wouldn't they still be justified in decreasing the cap ? Can't it be said that adding up to 30,000 tons of forage to the bay , when the migrating rockfish were there, would likely " restore , rebuild or maintain " the spawning rock fish stock" ? Isn't the Board completely justified , even required, to act to solve a serious problem, using the tools it has available , even if their action doesn't solve the complete problem ? Obviously there are many other factors cited by Dr. Drew from which the board could infer causation . Also, I am not aware of any evidence that the lack of food is not the cause of our dwindling fish stocks.

The other topic is the risk to conservation if the cap fails. I discussed that in the letter to Bob Beal at the end of page 2. Do you agree with that?

If you could weigh in on this it could help the Commission find a path to save the Bay cap and restore the Commission's reputation. (scans sent separately)

Thank you. Tom Lilly. 443 235 4465

Cancel

What really matters ?

THIS IS THE EFFECT OF THE OMEGA HAVEST IN CHESAPEAKE BAY.
From MDNR records there are 60,000 fewer salt water fishermen than fifteen years ago. These are our friends and neighbors, these are the pJust a secondarents , the grandparents, the kids. Do they matter? I have just been told the Virginia number is 20,000 less . Do these people matter? At least a thousand Maryland businesses are losing about 180 million dollars a year on those missing customers. There are many hundreds of jobs lost. Do these business and jobs matter? Some of our small marine oriented communities are failing because head boats and charter businesses have dried up. Do they matter?
It's the people that do matter, isn't it ? Our bay fish dependent on menhaden have declined...That affects hundreds of thousands of people in Virginia and Maryland . Do these people count? The data shows declines of trout 99%, bluefish 85%, flounder 92%, mackerel 80% , rock fish 34% . Does that matter? The decreased cap could save about a thousand schools of menhaden for the fish in the fall when the migrating breeding stock is in the Bay. Does that matter? What about the ten or fifteen million new rock fish spawners that may come from the planned conservation measures? These fish could restore the bay to the nursery of the Atlantic. If we don't enforce measures like the reduced cap to increase and protect the bay menhaden we are on track to repeat what happened 25 years ago when the increased rock from the moratorium overwhelmed the supply of menhaden. There followed five years of weakened fish and diseases . Fishing stopped. Do we want to try to avoid that awful episode ? Does it matter? Carrying out the conservation purpose of the Charter and the holistic approach of Amendment 3 ? Do we care about that or not ?

IF YOU THINK THESE PROBLEMS AND CONCERNS MATTER THEN WHAT JUSTIFICATION DO YOU HAVE FOR CONTINUING TO ALLOW ONE NONRESIDENT CORPORATION THAT SELLS ANIMAL AND FISH FOOD TO TAKE THE FOOD NATURE INTENDED FOR OUR WILDLIFE ?

AS COMMISSIONERS WILL YOU TAKE CONTROL AND CHANGE THIS INJUSTICE THAT HAS HAPPENED TO THE PEOPLE OF MARYLAND AND VIRGINIA? WHAT IF YOUR CHILDREN AND GRANDCHILDREN HAD LOST INTEREST IN FISHING ? WOULD THAT MATTER? THAT IS WHAT HAS HAPPENED TO THOUSANDS OF US.

The Commission has such tremendous power over the lives of so many people. We can only hope they will use that power wisely. Please protect the cap . Please have a plan

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The Commission has such tremendous power over the lives of so many people. We can only hope they will use that power wisely. Please protect the cap . Please have a plan review team revise the current allocation system and bring it into line with principles of fairness and equity among the states required by Section Six (a)(7) of the Charter. Have the review team suggest how the Amendment 3 requirement of fairness to the four user groups can become a reality. As things are now these are just hollow words. Do what is needed to right the ship . Get the ship on a course that considers the people and the proper allocation of the people's natural resources. Look at some of the ratios of the number benefiting and the number harmed .. its often close to a thousand to one. There is a lot of value in 150,000 tons of menhaden that's being given to Omega. They have showed how grateful they are by fishing in the bay in defiance of what the public and the states wanted. There would be ten times the value if the menhaden were left in the water to grow our fish. Instead of millions in profits going to Canada those fish produced would bring a 100 thousand fishermen back and allow many watermen a chance to make some additional money. The money would be spread out among hundreds if not thousands of businesses. That's what is at stake here.

Sincerely. Tom Lilly

REQUIEM FOR TANGIER SOUND

R.I.P. 2008

It is never pleasant to read an obituary. It is equally, if not more difficult, to write one for someone, in this case some thing, that you care about. When I think back on all the memories I have a good many of them are about good times on the River and the Sound with friends and family . If you spend much time fishing then you know what has happen to the Bay.

Tangier Sound was a very busy place twenty years ago. Lots of fishermen, charters and head boats. It was also a noisy place with hundreds of birds working over schools of "bait" as fish in turn fed on the bait schools. On a typical day during the Spring and Fall trophy seasons would see 25 to 30 private boats and a number of charters off Deal Island bridge, there were flounder off Wenona , lots of nice fish were being caught. The was some very good speckled trout to be caught off Crisfield and Dave's tackle shop in Crisfield sold a lot of umbrella rigs. That is all gone now.

I personally date the disappearance of our fish as follows ..trout – 10 years.....flounder -10 years .....hardheads... 8 years ....well nourished young rockfish.....2-5 years ..... schools of juvenile menhaden in the fall...steady decline from 8-10 or more years ago to practically nothing last fall.....schools of adult menhaden in the mid bay and Tangier sound : steady decline for thirty plus years to about nothing now.

I spoke to Arby Holland, who has the store and fuel dock in Wenona. Ten years ago they had 18 charter boats , many ran two charters a day on weekends. Now there are three or four left. During the week "one to none" operates , there are a few that will get a charter on a weekend. These captains are aging and there is no interest in the younger people. Arby's tackle and restaurant business is just "hanging on" financially.

I also spoke to Mary Taylor about Sommers Cove Marina. With the decrease in fish over the last ten years their charter boats have gone from 10 to 3 or 4. Now, as with Wenona ,the captains are older and have other jobs during the week..its just a weekend charter here and there. There are no head boats any more. There were four. The last one to leave was the Barbara Ann, the one before that was 5-6 years ago.

The "Barbara Ann" owned by John Asanovich was sold for whale watching in Maine where there are plentiful menhaden for whales and tuna to feed on. As the menhaden stock has moved north and increased off New England there are whale watching excursion boats operating From Maine south and several are taking customers into the Atlantic just outside of Manhatten.

In four flights last Summer with an experienced menhaden spotter pilot covering Tangier sound and Pocomoke Sound , from Hooper's straights to Tangier Island we did not see a single school of menhaden. If you use the Rhode Island work as a benchmark, as I have explained in that section of the notebook, we should have seen up to 100 schools of adult menhaden in the sound. That is the effect of factory fishing in Virginia.

We have five osprey nests at Whitehaven ,two are in my front yard on the river. I have watched these nests for over forty years. For the last three years or more these birds have struggled to raise even

one chick and several nests have been abandoned. The nesting eagles we have left the area. For many years we had a blue heron rookery behind the Whitehaven hotel but most of those birds have also left.

Our Bay was once the nursery for the Atlantic menhaden , that means there were plentiful juvenile menhaden. This was important for the entire Atlantic Coast. Menhaden spawn offshore , their eggs change into nymphs which eat plankton; these are carried by currents into the Bay and become juveniles . It is the nutrients coming from the rivers that draws the menhaden into the Bay to start off with. The DNR has sampled juvenile menhaden for many years and has found severe declines for the last twenty years. These juveniles should be one of the primary food sources for our young rockfish, blues, trout and flounder.

The reasons for the juvenile menhaden situation in the Bay and what can be done to change it is a subject I do not hear discussed. It should be. Omega is probably catching thousands of schools of menhaden before they spawn . There is currently no sampling of the catch , no protection of the spawning fish and no seasonal closures to protect the spawn. All of these tools are used in the herring fishery, none are used for menhaden.

As for the future of Tangier Sound ? It will take some thinking and planning and leadership by the Department of Natural Resources and the Delegates to the ASMFC to begin to reverse the downward spiral of Tangier Sound and Chesapeake Bay . The people look to the State to protect their natural resources and environment . This needs to be an open process with input from the citizen of Maryland . I think there are many bright people who care deeply about the Bay but to a large extent they have been shut out of the process and feel they have been ignored. Without this input the flawed process moves on and on.

Tangier Sound its people, fishermen , captains and small businesses are just an unwilling poster child for what is happening all over Chesapeake Bay. There are hundreds of thousands of people directly affected by this... There are another ten million people who live on or near the Bay. There needs to be a day of reckoning here and an acceptance of responsibility for what has happened . There needs to be change ; there needs to be action now not years from now. If we continue to repeat over and over again the same process that has caused this situation the downward spiral of our Bay will continue.

There are many obvious steps that could be taken now to restore menhaden to the Chesapeake Bay . If the Department of Natural Resources will encourage and promote a discussion of menhaden then we can restore menhaden to Chesapeake Bay.

2019 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

HORSESHOE CRAB
(*Limulus polyphemus*)

2018 Fishing Year

Horseshoe Crab Plan Review Team:
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Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval:	December 1998
Amendments	None
Addenda	Addendum I (April 2000) Addendum II (May 2001) Addendum III (May 2004) Addendum IV (June 2006) Addendum V (September 2008) Addendum VI (August 2010) Addendum VII (February 2012)
Management Unit:	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
States With Declared Interest:	Massachusetts - Florida
Active Boards/Committees:	Horseshoe Crab Management Board, Advisory Panel, Technical Committee, and Plan Review Team; Delaware Bay Ecosystem Technical Committee

Goals and Objectives

The Interstate Fishery Management Plan for Horseshoe Crabs (FMP) established the following goals and objectives.

2.0. Goals and Objectives

The goal of this Plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of the coastal ecosystem, while providing for continued use over time. Specifically, the goal includes management of horseshoe crab populations for continued use by:

1) *current and future generations of the fishing and non-fishing public (including the biomedical industry, scientific and educational research);*
2) *migrating shorebirds; and,*
3) *other dependent fish and wildlife, including federally listed (threatened) sea turtles.*

To achieve this goal, the following objectives must be met:

(a) prevent overfishing and establish a sustainable population;

(b) achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit;

(c) establish the appropriate target mortality rates that prevent overfishing and maintain adequate spawning stocks to supply the needs of migratory shorebirds;

(d) coordinate and promote cooperative interstate research, monitoring, and law enforcement;

(e) identify and protect, to the extent practicable, critical habitats and environmental factors that limit long-term productivity of horseshoe crabs;

(f) adopt and promote standards of environmental quality necessary for the long-term maintenance and productivity of horseshoe crabs throughout their range; and,

(g) establish standards and procedures for implementing the Plan and criteria for determining compliance with Plan provisions.

Fishery Management Plan Summary

The framework for managing horseshoe crabs along the Atlantic coast was approved in October 1998 with the adoption of the Interstate Fishery Management Plan for Horseshoe Crabs (FMP). The goal of this plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of coastal ecosystems, while providing for continued use over time.

In 2000, the Horseshoe Crab Management Board approved Addendum I to the FMP. Addendum I established a state-by-state cap on horseshoe crab bait landings at 25 percent below the reference period landings (RPL's), and *de minimis* criteria for those states with a limited horseshoe crab fishery. Those states with more restrictive harvest levels (Maryland and New Jersey) were encouraged to maintain those restrictions to provide further protection to the Delaware Bay horseshoe crab population, recognizing its importance to migratory shorebirds. Addendum I also recommended that the National Marine Fisheries Service (NMFS) prohibit the harvest of horseshoe crabs in federal waters (3-200 miles offshore) within a 30 nautical mile radius of the mouth of Delaware Bay, as well as prohibit the transfer of horseshoe crabs in federal waters. A horseshoe crab reserve was established on March 7, 2001 by NMFS in the area recommended by ASMFC. This area is now known as the Carl N. Shuster Jr. Horseshoe Crab Reserve.

In 2001, the Horseshoe Crab Management Board approved Addendum II to the FMP. The purpose of Addendum II was to provide for the voluntary transfer of harvest quotas between states to alleviate concerns over potential bait shortages on a biologically responsible basis. Voluntary quota transfers require Technical Committee review and Management Board approval.

In 2004, the Board approved Addendum III to the FMP. The addendum sought to further the conservation of horseshoe crab and migratory shorebird populations in and around the Delaware Bay. It reduced harvest quotas and implemented seasonal bait harvest closures in New Jersey, Delaware, and Maryland, and revised monitoring components for all jurisdictions.

Addendum IV was approved in 2006. It further limited bait harvest in New Jersey and Delaware to 100,000 crabs (male only) and required a delayed harvest in Maryland and Virginia. Addendum V, adopted in 2008, extends the provisions of Addendum IV through October 31, 2010. In early 2010, the Board initiated Draft Addendum VI to consider management options that would follow expiration of Addendum V. The Board voted in August 2010 to extend the Addendum V

provisions, via Addendum VI, through April 30, 2013. The Board also chose to include language, allowing them to replace Addendum VI with another Addendum during that time, in anticipation of implementing an Adaptive Resource Management (ARM) Framework.

The Board approved Addendum VII in February 2012. This addendum implemented an ARM framework for use during the 2013 fishing season. The framework considers the abundance levels of horseshoe crabs and shorebirds in determining the optimized bait harvest level for the Delaware Bay states of New Jersey, Delaware, Maryland, and Virginia (east of the COLREGS).

II. Status of the Stock and Assessment Advice

A benchmark stock assessment was completed and approved for management use in 2019 (available at: http://www.asmfc.org/uploads/file/5cd5d6f1HSCAssessment_PeerReviewReport_May2019.pdf).

This assessment was the first to successfully apply a stock assessment model to a component of the horseshoe crab stock. A Catch Multiple Survey Analysis model, a stage-based model that tracks progression of crab abundances from pre-recruits to full recruits to the fishery, was applied to female crabs in the Delaware (DE) Bay region (New Jersey-Virginia). This model estimated regional female crab abundance using relative abundance information from the Virginia Tech Benthic Trawl Survey, New Jersey Ocean Trawl Survey, and Delaware Adult Trawl Survey, and estimates of mortality including natural mortality, commercial bait harvest, commercial discard mortality, and mortality associated with biomedical use. While reference points were not approved to determine stock status, the CMSA population estimates were recommended as the best estimates for female horseshoe crab abundance in the DE Bay region.

The base CMSA model population estimates show an increase in the number of female crabs in the DE Bay region since 2012, when the ARM Framework was established via Addendum VII. This increasing trend is supported by positive trends in regional fishery-independent surveys during this time period. Population estimates from the base model are not publicly viewable due to the inclusion of confidential biomedical data. However, a sensitivity run assuming no biomedical mortality is publicly viewable, and these estimates are not significantly different from the base run. Estimates of discard mortality from the Northeast Fisheries Observer Program (NEFOP) were also included in the base CMSA model and indicate that discard mortality could be significant, of similar or greater magnitude than mortality due to bait harvest. Population estimates from the CMSA are currently being considered for incorporation into the ARM Framework, which is run annually to specify bait harvest quotas for the DE Bay region.

Autoregressive Integrated Moving Average (ARIMA) models, similar to those used in previous assessments, were applied to all regions. ARIMA models were fit to fishery-independent survey

indices trends of abundance in each of the regional horseshoe crab populations: Northeast (Massachusetts-Rhode Island), New York (Connecticut-New York), DE Bay, and Southeast (North Carolina-Florida). No definitions for overfishing or overfished status have been adopted by the Management Board. However, the assessment characterized the status of each regional and the coastwide population based on the percentage of surveys within a region (or coastwide) having a >50% probability of the final year being below the ARIMA reference point. The ARIMA reference point was the 1998 index for each survey. "Poor" status was >66% of surveys meeting this criterion, "Good" status was <33% of surveys, and "Neutral" status was 34 – 65% of surveys. Based on this criteria, stock status for the Northeast region was neutral; the New York region was poor; the Delaware Bay region was neutral; and the Southeast region was good. Coastwide, abundance has fluctuated through time with many surveys decreasing after 1998 but increasing in recent years. The coastwide status includes surveys from all regions and indicates a neutral trend, likely due to positive and negative trends being combined.

III. Status of the Fishery

Bait Fishery

For most states, the bait fishery is open year round. However, because of seasonal horseshoe crab movements (to the beaches in the spring; deeper waters and offshore in the winter), the fishery operates at different times. New Jersey has prohibited commercial harvest of horseshoe crabs in state waters since 2006. State waters of Delaware are closed to horseshoe crab harvest and landing from January 1st through June 7th each year, and other state horseshoe crab fisheries are regulated with various seasonal/area closures.

Reported coastwide bait landings in 2018 remained well below the coastwide quota (Table 1, Figure 1). Bait landings decreased 35% from the previous year, due primarily to landings decreases in Maryland (72% decrease from 2017), Delaware (37%), and New York (29%), although significant decreases were evident in almost all states. Delaware harvested 2,925 crabs above their adjusted quota over a two-week period in 2018, and reduced their quota for 2019 from their allocated 162,136 male crabs to 159,211 male crabs.

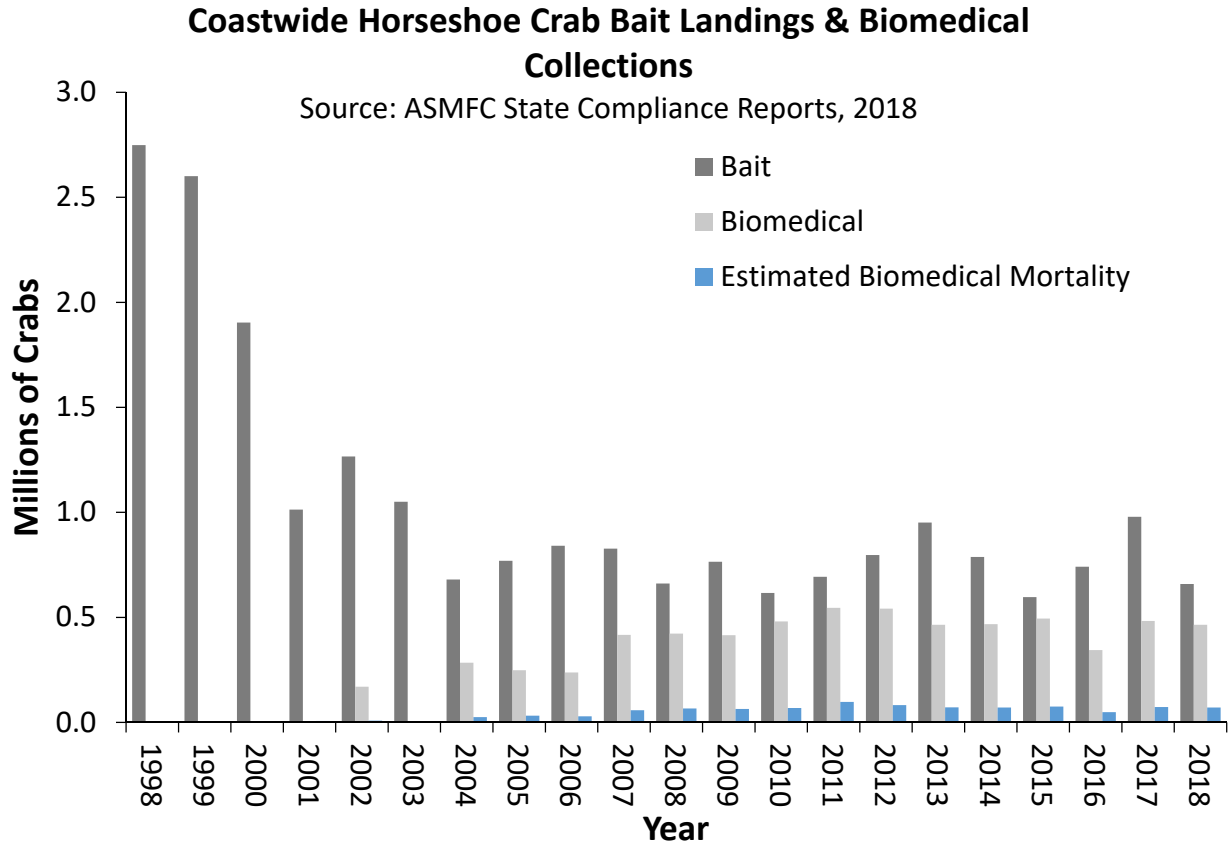
Table 1. Reported commercial horseshoe crab bait landings by jurisdiction. Note: Landings from 2017 and earlier were updated to numbers validated by all jurisdictions for use in the 2019 benchmark stock assessment.

Jurisdiction	ASMFC Quota 2018	State Quota 2018	2018	2017	2016	2015	2014
MA	330,377	165,000	159,002	134,707	110,399	117,611	130,316
RI	26,053	8,398	1,889	3,415	20,676	7,867	13,841
CT	48,689	48,689	15,181	19,778	12,135	19,632	20,634
NY	366,272	150,000	138,223	195,717	176,632	145,324	134,370
NJ*	162,136	0	0	0	0	0	0
DE*	162,136	123,140	126,065	201,132	109,836	151,262	168,044
MD*	255,980	255,980	66,647	237,146	157,013	27,494	148,269
PRFC	0	-	0	0	0	0	0
DC	0	-	0	0	0	0	0
VA**	172,828	172,828	140,584	160,331	128,848	102,235	145,266
NC***	24,036	24,036	10,998	25,161	25,197	24,839	24,557
SC	0	0	0	0	0	0	0
GA	29,312	29,312	0	0	0	0	0
FL****	9,455	9,455	C	1,394	689	264	2,046
TOTAL	1,587,274	986,838	658,589	978,781	741,425	596,528	787,342

***Male-only harvest**

****Virginia harvest east of the COLREGS line is limited to 81,331 male-only crabs under the ARM harvest package #3. Virginia data shown are preliminary. Virginia harvest east of the COLREGS in 2018 was 65,692 crabs. The total above represents harvest on both sides of the COLREGS line.**

Figure 1: Number of horseshoe crabs harvested for bait and used for biomedical purposes, 1998-2018.



*** Biomedical collection numbers, which are annually reported to the Commission, include all horseshoe crabs brought to bleeding facilities except those that were harvested as bait and counted against state quotas.**

*** Most of the biomedical crabs collected are returned to the water after bleeding; a 15% mortality rate is assumed for all bled crabs that are released. This number plus observed mortality reported annually by bleeding facilities via state compliance reports is noted in the above graph as 'Estimated Biomedical Mortality.'**

Reported coastwide landings since 1998 show more male than female horseshoe crabs were harvested annually. Several states presently have sex-specific restrictions in place which limit or ban the harvest of females. The American eel pot fishery prefers egg-laden female horseshoe crabs as bait, while the whelk (conch) pot fishery is less dependent on females. States with greater than 5% of coastal landings are required to report sex for at least a portion of their bait harvest, and within these states, 16.6% of landings were unclassified in 2018.

The hand, trawl, and dredge fisheries typically account for the majority of reported commercial horseshoe crab bait landings. Other gears that account for the remainder of the harvest include rakes, hoes, and tongs, fixed nets, and gill nets.

Biomedical Use

The horseshoe crab is an important resource for research and manufacture of materials used for human health. There are five companies along the Atlantic Coast that process horseshoe crab blood for use in manufacturing Limulus Amebocyte Lysate (LAL): Associates of Cape Cod, Massachusetts; Lonza (formerly Cambrex Bioscience), Limuli Laboratories, New Jersey; Wako Chemicals, Virginia; and Charles River Endosafe, South Carolina. Addendum III requires states where horseshoe crabs are collected for biomedical bleeding to collect and report total collection numbers, crabs rejected, crabs bled (by sex) and to characterize mortality.

The Plan Review Team annually calculates total coastwide collections and estimates mortality associated with biomedical use. In 2018, 464,482 crabs coastwide were collected for biomedical for bleeding (Table 2). This does not include bait crabs that were counted against state quotas and bled. This represents a 4% decline from 2017. Males accounted for 40% of total biomedical collections, females comprised 25%, and 32% of collections were of unknown sex. Crabs were rejected prior to bleeding due to mortality, injuries, slow movement, and size (mortality observed while crabs were going through the biomedical process is included in Row D below). Approximately 1% of crabs collected solely for biomedical purposes were observed and reported as dead from the time of collection up to the point of bleeding.

During the 2019 benchmark stock assessment, literature estimates were analyzed to estimate post-bleeding mortality. Although many of these studies did not implement biomedical best practices, these values are the only available estimates of mortality experienced after bleeding. Post-bleeding mortality was estimated at 15%. Tagging data was used in the assessment to compare survivorship between crabs that were and were not bled. These results indicated some decrease in short-term survivorship, but greater long-term survivorship for bled crabs. These results are likely attributable to the culling process used by biomedical facilities to select healthy crabs for bleeding.

Post-bleeding mortality, calculated as 15% of the number of bled biomedical (non-bait) crabs, for 2018 was estimated as 65,319. Total mortality of biomedical crabs for 2018 was estimated as 70,881 crabs. This represents approximately 10% of the 2018 total directed use mortality (729,470 crabs), which includes removals from both bait and biomedical uses of horseshoe crabs.

Table 2. Numbers of horseshoe crabs collected, bled, and estimated mortality for the biomedical industry. Numbers shown are for crabs collected solely for biomedical use. Mortality of bled crabs that later enter the bait industry is included in bait harvest.

Year	Crabs Collected	Crabs Bled	Post-Bleeding Mortality	Observed Mortality	Total Mortality
2009	414,959	386,118	57,918	6,318	64,236
2010	480,914	412,781	61,917	6,829	68,746
2011	545,164	486,850	73,028	24,139	97,167
2012	541,956	497,956	74,693	7,370	82,063
2013	464,657	440,402	66,060	5,447	71,507
2014	467,897	432,340	64,851	5,658	70,509
2015	494,123	464,506	69,676	5,362	75,038
*2016**	344,495	318,523	47,778	1,004	48,782
2017	483,245	444,115	66,617	6,056	72,673
2018	464,482	435,463	65,319	5,562	70,881

***Some biomedical collections were reduced in 2016 due to temporary changes in production.**

The 1998 FMP establishes a mortality threshold of 57,500 crabs that, if exceeded, requires the Board to consider management action. Based on an estimated total mortality of 70,881 crabs, this threshold was exceeded in 2018, as it has been for 11 of the last 12 years. Estimated mortality from biomedical use in 2018 is a larger percentage of total directed use mortality but smaller in number than in 2017. Results of the 2019 Benchmark Stock Assessment indicate that current levels of biomedical mortality, which have been relatively consistent for the last six years (with the exception of 2016), have not had a significant effect on horseshoe crab population estimates or fishing mortality in the Delaware Bay region.

IV. Status of Research and Monitoring

The Horseshoe Crab FMP set forth an ambitious research and monitoring strategy in 1999 and again in 2004 to facilitate future management decisions. Despite limited time and funding there are many accomplishments since 1999. These accomplishments were largely made possible by forming partnerships between state, federal and private organizations, and the support of hundreds of public volunteers.

Addendum III Monitoring Program

Addendum III requires affected states to carry out three monitoring components:

All states who do not qualify for *de minimis* status report monthly harvest numbers and subsample a portion of the catch for sex and harvest method. In addition, those states with annual landings above 5% of the coastwide harvest report all landings by sex and harvest method. Although states with annual landings less than 5% of annual coastwide harvest are not required to report landings by sex, the PRT recommends all states require gender reporting for horseshoe crab harvest.

States with biomedical collections are required to monitor and report collection numbers and mortality associated with the transportation and bleeding of the crabs.

States must identify spawning and nursery habitat along their coasts. All states have completed this requirement, and a few continue active monitoring programs**.**

Virginia Tech Research Projects

The Virginia Tech Horseshoe Crab Trawl Survey (VT Survey) was not conducted in 2013 - 2015, due to a lack of funding, but was conducted in 2016-2018, and is in progress for 2019. The 2018 survey results indicate increases from 2017 in mature, newly mature, and juvenile females and newly mature and juvenile males but a decreases in mature males. Mature male and female crabs have shown increasing trends across the time series (2002-2018). The Adaptive Resource Management (ARM) Working Group will use the indices from this survey to estimate horseshoe crab abundance for the ARM model, which specifies harvest limits for the upcoming year. The VT Survey for 2019 is currently in progress and is funded for 2020. Funding sources beyond 2020 continue to be explored.

Spawning Surveys

The redesigned Delaware Bay spawning survey was completed for the 20th year in 2018. No trend was detected in the baywide indices of spawning activity (both male and female) for the time series; though the slope was slightly negative. Trends in male spawning exhibited a slightly positive slope in both states, and the trend in New Jersey was significant. The trend from the index of female spawning activity in both states exhibited a slightly negative slope, and the trend in Delaware was significant. Female spawning activity in 2018 peaked during the third lunar period sampled (May 27 – May 31). The annual baywide sex ratio was 5.6:1 (Male: Female) equaling the highest ratio in the time series. The range of annual observed sex ratios on the Delaware Bay spawning beaches over the time series has ranged as low as 3.1:1.

Tagging Studies

The USFWS continues to maintain a toll-free telephone number as well as a website for reporting horseshoe crab tag returns and assists interested parties in obtaining tags. Tagging work continues to be conducted by biomedical companies, research organizations, and other parties involved in outreach and spawning surveys. Beginning with the 2013 tagging season, additional efforts were implemented to ensure that current tagging programs are providing data that benefits the management of the coast-wide horseshoe crab population. All existing and new tagging programs are required to submit an annual application to be considered for the tagging program and all participants must submit an annual report along with their tagging and resight data to indicate how their tagging program addresses at least one of the following objectives: determine horseshoe crab sub-population structure, estimate horseshoe crab movement and migration rates, and/or estimate survival and mortality of horseshoe crabs. The PRT recommends all tagging programs approved by the states coordinate with the USFWS tagging program, in order to ensure a consistent coastwide program for providing management input.

Since 1999, over 340,000 crabs have been tagged and released through the USFWS tagging program along the Atlantic coast. Crabs have been tagged and released from every state on the Atlantic Coast from Florida to New Hampshire. In the early years of the program, tagging was centered around Delaware Bay; however, in recent years, tagging has expanded and increased in the Long Island Sound and Southeast. Tagging information from this database has been used in the 2019 Benchmark Stock Assessment to define stock structure, estimate total mortality, and characterize impacts of biomedical use on crab mortality.

New York Region Monitoring

Following the 2019 Benchmark Stock Assessment, which characterized the status of the horseshoe crab population in the New York region as "Poor", the Board directed the Plan Review Team to monitor fishery-independent surveys in this area to track progress of state management actions toward improving this regional population. During the assessment, five surveys were included in the ARIMA model to characterize this population. One of these, the NorthEast Area Monitoring and Assessment Program (NEAMAP), includes sample areas outside of the New York region, making it too data-intensive to specify the regional index on an annual basis. The most recent information from the state-conducted surveys used in the assessment is summarized below, but can be viewed in greater detail in the Connecticut and New York state compliance reports. The Western Long Island (WLI) Little Neck Bay and Manhasset Bay seine surveys were combined in the assessment to form a single index, but are shown below separately.

Connecticut

- Long Island Sound Trawl (Fall) – 2017 index = 0.95 kg/tow, increase from 2016, 2nd consecutive year of increase

New York

- Peconic Trawl – 2018 index = 0.19 (delta distribution average catch per unit effort [CPUE]), increase from 2017, below 2009-18 average (0.27)
- WLI Jamaica Bay Seine (all horseshoe crabs) – 2018 index = 0.43 (geometric mean), increase from 2017, above 2009-18 average (0.35)
- WLI Little Neck Bay Seine (all) – 2018 index = 0.93 (geometric mean), increase from 2017, below 2009-2018 average (1.15)
- WLI Manhasset Bay Seine (all) – 2018 index = 0.68 (geometric mean), increase from 2017, above 2009-18 average (0.64)

V. Status of Management Measures and Issues

ASMFC

Initial state-by-state harvest quotas were established through Addendum I. Addendum III outlined the monitoring requirements and recommendations for the states. Addendum IV set harvest closures and quotas, and other restrictions for New Jersey, Delaware, Maryland, and Virginia, which were continued in Addendums V and VI.

The Board approved Addendum VII, implementation of the ARM Framework, in February 2012 for implementation in 2013. Addendum VII includes an allocation mechanism to divide the

Delaware Bay optimized harvest output from the ARM Framework among the four Delaware Bay states (New Jersey, Delaware, Maryland, and Virginia east of the COLREGS). Season closures and restrictions, present within Addendum VI, remain in effect as part of Addendum VII.

Included in this report are state-by-state charts outlining compliance and monitoring measures. The PRT recommends all jurisdictions were in compliance with the FMP and subsequent Addenda in 2018.

MASSACHUSETTS		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	330,377 (165,000)	330,377 (165,000)
- Other Restrictions	Bait: 300 crab daily limit year round; limited entry; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit All: May and June 5-day lunar closures; No mobile gear harvest Fri-Sat during summer flounder season; 7" PW minimum size; Pleasant Bay Closed Area	Bait: 300 crab daily limit year round; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit All: May and June 5-day lunar closures; No mobile gear harvest Fri-Sat during summer flounder season; 7" PW minimum size; Pleasant Bay Closed Area
- Landings	159,002	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes, plus weekly dealer reporting through SAFIS	Yes, plus weekly dealer reporting through SAFIS
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay

RHODE ISLAND		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de minimis*	Does not qualify for *de minimis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	26,053 (8,398)	26,053 (8,398)
- Other Restrictions	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1-May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1-May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May
- Landings	1,889	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes, weekly call in and monthly on paper	Yes, weekly call in and monthly on paper
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes, details within Massachusetts' reports	Captured in Massachusetts' reports
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes, since 2000 (methods unspecified)	Yes
Monitoring Component B_4 Tagging program	RI DEM 2001-2004 only, No current state program	No

CONNECTICUT		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	48,689	48,689
- Other Restrictions	Limited entry program, possession limits, and seasonal and area closures	Limited entry program, possession limits, and seasonal and area closures
- Landings	15,181	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No – exempt under Addendum III because landings are < 5% of coastwide total	No – exempt under Addendum III because landings are < 5% of coastwide total
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes, since 1999 (methods differ from DE Bay survey)	Yes
Monitoring Component B_4 Tagging program	Yes, in collaboration with local universities (Sacred Heart University since 2015)	Yes

NEW YORK		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	366,272 (150,000)	366,272 (150,000)
- Other Restrictions	Ability to close areas to harvest; seasonal quotas and daily harvest limits	Ability to close areas to harvest; seasonal quotas and daily harvest limits
- Landings	138,223	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes – adapted from DE Bay survey	Yes
Monitoring Component B_4 Tagging program	Yes	Yes

NEW JERSEY		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Qualified for *de miminis*	Qualifies but not requesting *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary state quota)	162,136 [male only] (0)	162,136 [male only] (0)
- Other Restrictions	Bait harvest moratorium	Bait harvest moratorium
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	N/A	N/A
- Characterize commercial bait fishery	N/A	N/A
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Outside, independent groups currently	No
Monitoring Component B_5 Egg abundance survey	Yes, but removed as a mandatory component	Yes
Monitoring Component B_6 Shorebird monitoring program	Yes	Yes

DELAWARE		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Adjusted Quota from Overage)	162,136 [male only] 123,140 [male only]	162,136 [male only] 159,211 [male only]
- Other Restrictions	Closed season (January 1 – June 7); season closed early on June 16	Closed season (January 1 – June 7)
- Landings	126,065 males	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (daily call-in reports & monthly logbooks)	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes –updates once every 5 years or as needed	Yes – updates once every 5 years or as needed
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	No state program but has assisted in the past with various Delaware Bay horseshoe crab tagging initiatives	No
Monitoring Component B_5 Egg abundance survey	Removed as component	Removed as component
Monitoring Component B_6 Shorebird monitoring program	Yes	Yes

Note: The egg abundance survey has been discontinued as a mandatory monitoring element. Delaware will include information on the survey if it continues, but is no longer required to perform the survey.

MARYLAND		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	255,980 (male only)	255,980 (male only)
- Other Restrictions	Delayed harvest and closed season/area combinations	Delayed harvest and closed season/area combinations
- Landings	66,647 males	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (weekly reports for permit holders; monthly for non-permit holders)	Yes (weekly reports for permit holders; monthly for non-permit holders)
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Yes – through biomedical use	Yes – through biomedical use

POTOMAC RIVER FISHERIES COMMISSION		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	*De minimis* status granted for 2017.	*De minimis* requested and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	No horseshoe crab fishery	No horseshoe crab fishery
- Daily possession limit <25 for *de minimis* state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	0
Monitoring Component A_1		
- Mandatory monthly reporting	Yes - weekly	Yes - weekly
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Not Applicable	Not Applicable
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Not Applicable	Not Applicable
Monitoring Component B_3 Implement spawning survey	Not Applicable	Not Applicable
Monitoring Component B_4 Tagging program	Not Applicable	Not Applicable

VIRGINIA		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	172,828 (81,331 male-only east of COLREGS line)	172,828 (81,331 male-only east of COLREGS line)
- Other Restrictions	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.
- Landings	140,584 (65,692 males)	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes – new permit system; limited entry to fishery and individual quotas established	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes – completed	No
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	No	No
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

NORTH CAROLINA		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de minimis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	24,036	24,036
- Other Restrictions	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.
- Landings	10,998	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes – trip level reporting each month	Yes – trip level reporting each month
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Little information available; Survey discontinued after 2002 and 2003 due to low levels of crabs recorded	Not specified
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

SOUTH CAROLINA		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2018.	*De minimis* requested for 2019 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	No horseshoe crab bait fishery	No horseshoe crab bait fishery
- Daily possession limit <25 for *de minimis* state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (Biomedical)	Yes (Biomedical)
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Completed	No
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Yes	Yes

GEORGIA		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2018.	*De minimis* requested for 2019 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	Yes	Yes
- Daily possession limit <25 for *de minimis* state	25/person; 75/vessel with 3 licensees	25/person; 75/vessel with 3 licensees
- HSC landing permit	Must have commercial shrimp, crab, or whelk license; LOA permit required	Must have commercial shrimp, crab, or whelk license; LOA permit required
Bait Harvest Restrictions and Landings		
- ASMFC Quota	29,312	29,312
(State Quota)	29,312	29,312
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No bait landings	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Completed	Not Applicable
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

FLORIDA		
	2018 Compliance	**2019 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2018.	*De minimis* requested for 2019 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	Yes	Yes
- Daily possession limit <25 for *de minimis* state	25/person w/ valid saltwater products license; 100/person with marine life endorsement	25/person w/ valid saltwater products license; 100/person with marine life endorsement
- HSC landing permit	See above	See above
Bait Harvest Restrictions and Landings		
- ASMFC Quota	9,455	9,455
- Other Restrictions	None	None
- Landings	Confidential	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2018	Yes, VT Trawl Survey will be conducted in 2019 & 2020; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	No	No
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	No	No

Alternative Baits
Trials testing effectiveness of alternative baits to horseshoe crab for the American eel and whelk fisheries have previously been conducted. Additionally, a survey of current bait usage in the eel and whelk fisheries was conducted in 2017. This survey is available at: http://www.asmfc.org/uploads/file/5a04b785HSC_BaitSurveyTCReport_Oct2017.pdf. The Horseshoe Crab TC is currently determining whether any additional alternative bait products will be tested in the near future.

Shorebird
The USFWS received petitions in 2004 and 2005 to emergency list the red knot under the Endangered Species Act. In fall 2005, it determined that emergency listing was not warranted at the time. As part of a court settlement, the USFWS agreed to initiate proposed listings of over 200 species, including the red knot. In fall 2013, the USFWS released a proposal for listing the red knot as threatened. In January 2015 the USFWS determined that red knot be designated as threatened under the Endangered Species Act.

The red knot remains listed as an endangered species in the state of New Jersey (since 2012).

VI. Research Needs/PRT Recommendations

Funding for Research and Monitoring Activities
The PRT strongly recommends the funding and continuation of the VT benthic trawl survey. This effort provides a statistically reliable estimate of horseshoe crab relative abundance that is essential to continued ARM implementation and use of the CMSA stock assessment model.

De Minimis
States may apply for *de minimis* status if, for the last two years, their combined average horseshoe crab bait landings (by numbers) constitute less than one percent of coastwide horseshoe crab bait landings for the same two-year period. States may petition the Board at any time for *de minimis* status, if their fishery falls below the threshold level. Once *de minimis* status is granted, designated States must submit annual reports to the Board justifying the continuance of *de minimis* status.

States that qualify for *de minimis* status are not required to implement any horseshoe crab harvest restriction measures, but are required to implement components A, B, E and F of the monitoring program (Section 3.5 of the FMP; further modified by Addendum III). Since *de minimis* states are exempt from a harvest cap, there is potential for horseshoe crab landings to shift to *de minimis* states and become substantial, before adequate action can be taken. To control shifts in horseshoe crab landings, *de minimis* states are encouraged to implement one of the following management measures:

1. Close their respective horseshoe crab bait fishery when landings exceed the *de*

minimis threshold;
2. Establish a state horseshoe crab landing permit, making it only available to individuals with a history of landing horseshoe crabs in that state; or
3. Establish a maximum daily harvest limit of up to 25 horseshoe crabs per person per day. States which implement this measure can be relieved of mandatory monthly reporting, but must report all horseshoe crabs harvests on an annual basis.

The following states have been removed from the Management Board in recent years: Pennsylvania (2007), Maine (2011), and New Hampshire (2014). The Potomac River Fisheries Commission, South Carolina, Georgia, and Florida are requesting *de minimis* status for the 2018 fishing season based on the 2017-18 season landings and meet the FMP requirements for being granted this status (Table 1). The PRT recommends granting these jurisdictions *de minimis* status.

Discard Mortality Estimation
Results of the 2019 Benchmark Stock Assessment indicate that discard mortality may be significant, of similar or greater magnitude than bait harvest. The Review Panel's report indicated that these estimates could be further refined to reduce their uncertainty and more precisely characterize this mortality source. The PRT recommends the Board take steps to increase access to and use of data from the NEFOP, allowing for improved monitoring and estimation of discard mortality.

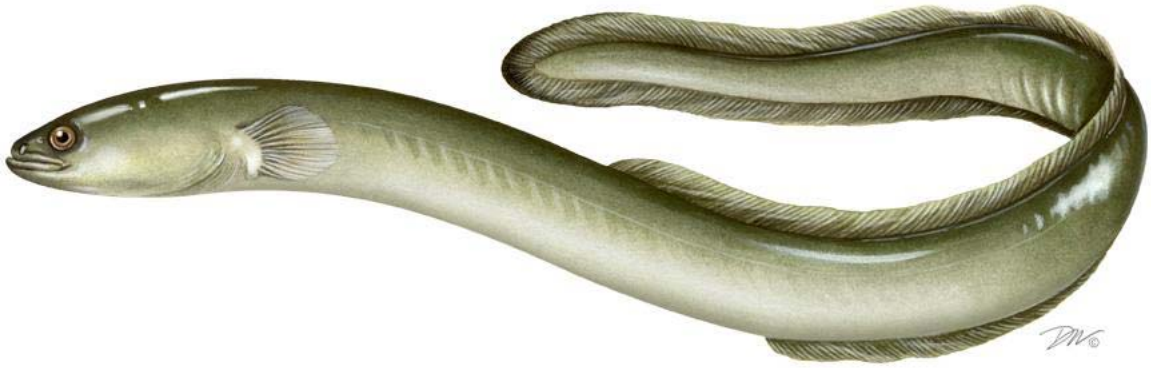
Improvement of the New York Regional Population
Results of the 2019 Benchmark Stock Assessment indicate a "Poor" status for the New York regional population, due to negative trends in regional abundance indices. New York and Connecticut have indicated that they will take actions within their states to improve this population. The PRT recommends that the Board encourage such actions to continue so that this population's status may improve. The PRT has begun and will continue to annually report regional indices of abundance so that progress of management actions may be tracked through the annual FMP Reviews.

Biomedical Threshold
In 2018, biomedical mortality exceeded the FMP's mortality threshold of 57,500 crabs that, which requires the Board to consider management action. This threshold has been exceeded in 11 of the last 12 years. However, the PRT notes that results of the 2019 Benchmark Stock Assessment indicate that current levels of biomedical use do not result in mortalities that would significantly alter population status.

Compliance Report Due Date
Particularly in recent years, states have had difficulty meeting the annual compliance report due date of March 1. In many years, the Board does not receive the FMP Review until the summer or fall, when it meets to set annual harvest specifications. Therefore, the PRT recommends a later compliance report due date of July 1.

2019 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **AMERICAN EEL** ***(Anguilla rostrata)***

2018 FISHING YEAR



Prepared by the American Eel Plan Review Team
Fall 2019

2019 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR AMERICAN EEL
(Anguilla rostrata)

I. Status of the Fishery Management Plan

Date of FMP approval:	November 1999
Addenda:	Addendum I (February 2006) Addendum II (October 2008) Addendum III (August 2013) Addendum IV (October 2014) Addendum V (August 2018)
Management unit:	Migratory stocks of American Eel from Maine through Florida
States with a declared interest:	Maine through Florida, including the District of Columbia and the Potomac River Fisheries Commission
Active committees:	American Eel Management Board, Plan Review Team, Technical Committee, Stock Assessment Subcommittee, and Advisory Panel

The ASMFC American Eel Management Board (Board) first convened in November 1995 and finalized the Fishery Management Plan (FMP) for American Eel in November 1999 (ASMFC 2000). The goal of the FMP is to conserve and protect the American eel resource to ensure its continued role in the ecosystems while providing the opportunity for its commercial, recreational, scientific, and educational use. In support of this goal, the following objectives are included:

- Improve knowledge of eel utilization at all life stages through mandatory reporting of harvest and effort by commercial fishers and dealers, and enhanced recreational fisheries monitoring.
- Increase understanding of factors affecting eel population dynamics and life history through increased research and monitoring.
- Protect and enhance American eel abundance in all watersheds where eel now occur.
- Where practical, restore American eel to those waters where they had historical abundance but may now be absent by providing access to inland waters for glass eel, elvers, and yellow eel and adequate escapement to the ocean for pre-spawning adult eel.
- Investigate the abundance level of eel at the various life stages, necessary to provide adequate forage for natural predators and support ecosystem health and food chain structure.

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, a possession limit and a state license for recreational fishermen 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.

In August 2005, the Board directed the American Eel Plan Development Team (PDT) to initiate an addendum to establish a mandatory catch and effort monitoring program for American eel. The Board approved Addendum I at the February 2006 Board meeting.

In January 2007, the Board initiated a draft addendum with the goal of increasing escapement of silver eels to spawning grounds. In October 2008, the Board approved Addendum II, which placed increased emphasis on improving the upstream and downstream passage of American eel. The Board chose to delay action on management measures in order to incorporate the results of the 2012 stock assessment.

In August 2012, the Board initiated Draft Addendum III with the goal of reducing mortality on all life stages of American eel. The Addendum was initiated in response to the findings of the 2012 Benchmark Stock Assessment, which declared American eel stock along the US East Coast depleted. The Board approved Addendum III in August 2013.

Addendum III requires states to reduce the yellow eel recreational possession limit to 25 eel/person/day, with the option to allow an exception of 50 eel/person/day for party/charter employees for bait purposes. The recreational and commercial size limit increased to a minimum of 9 inches. Eel pots are required to be ½ by ½ inch minimum mesh size or have at least a 4" by 4 inch escape panel of ½ by ½ inch mesh escape panel. The glass eel fishery is required to implement a maximum tolerance of 25 pigmented eels per pound of glass eel catch. The silver eel fishery is prohibited to take eels from September 1st to December 31st from any gear type other than baited traps/pots or spears. The Addendum also set minimum monitoring standards for states and required dealer and harvester reporting in the commercial fishery.

In October 2014, the Board approved Addendum IV. This addendum was also initiated in response to the 2012 American Eel Benchmark Stock Assessment and the need to reduce mortality on all life stages. The Addendum established a coastwide cap of 907,671 pounds of yellow eel, reduced Maine's glass eel quota to 9,688 pounds (2014 landings), and allowed for the continuation of New York's silver eel weir fishery in the Delaware River. For yellow eel fisheries, the coastwide cap was implemented for the 2015 fishing year and established two management triggers: (1) if the cap is exceeded by more than 10% in a given year, or (2) the cap is exceeded for two consecutive years regardless of the percent overage. If either one of the triggers are met, then states would implement state-specific allocation based on average landings from 2011-2013. The addendum also requires any state or jurisdiction with a commercial glass eel fishery to implement a fishery independent life cycle survey covering glass, yellow, and silver eels within at least one river system.

In August 2018, the Board approved Addendum V. The Addendum increases the yellow eel coastwide cap starting in 2019 to 916,473 pounds to reflect a correction in the historical harvest.

Further, the Addendum adjusts the method (management trigger) to reduce total landings to the coastwide cap when the cap has been exceeded, and removes the implementation of state-by-state allocations if the management trigger is met. Management action will now be initiated if the yellow eel coastwide cap is exceeded by 10% in two consecutive years. If the management trigger is exceeded, only those states accounting for more than 1% of the total yellow eel landings will be responsible for adjusting their measures. A workgroup will be formed to define the process to equitably reduce landings among the affected states when the management trigger has been met. Additionally, the Addendum maintains Maine's glass eel quota of 9,688 pounds. The Board also slightly modified the glass eel aquaculture provisions, maintaining the 200 pound limit for glass eel harvest, but modifying the criteria for evaluating the proposed harvest area's contribution to the overall population consistent with the recommendations of the Technical Committee.

II. Status of the Stock

In 2009, the Board initiated a benchmark stock assessment. After reviewing over 100 surveys and studies, the American Eel Stock Assessment Subcommittee (SAS) selected 19 YOY surveys and 15 yellow eel surveys along the East Coast for use as indices of abundance in the assessment. Despite the large number of surveys and studies available for use, the American eel stock is still considered data-poor because very few surveys target eels and collect information on length, age, and sex of the animals caught. Additionally, eels have an extremely complex life history that is difficult to describe using traditional stock assessment models. Therefore, several data-poor methods were used to assess the American eel resource.

The first set of analyses (trend analyses) aimed to determine if there was a statistically significant trend in the fishery-independent survey data and whether or not there was evidence for significant trends on the regional and coastwide scales. The second approach involved a Depletion-Based Stock Reduction Analysis (DB-SRA) model, which uses trends in historical catch to estimate biomass trends and maximum sustainable yield. Both the trend analyses and DB-SRA results indicated that the American eel stock declined in recent decades, and the prevalence of significant downward trends in multiple surveys across the coast is cause for concern. Therefore, the stock status for American eels is depleted, although overfishing and overfished status in relation to the reference points could not be determined with confidence. The benchmark stock assessment was peer reviewed in March 2012 and was approved for management use in May 2012 (ASMFC 2012).

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, the Canada Department of Fisheries and Oceans (DFO) conducted a stock assessment on American eels in Canadian waters and found that region-specific status indices show that 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.

The 2017 American Eel Stock Assessment Update updates the 2012 American Eel Benchmark Stock Assessment with data from 2010-2016. The trend analysis results in this stock assessment update are consistent with the 2012 results, with few exceptions. Despite downward trends in the indices, commercial yellow American eel landings have been stable in recent decades along the Atlantic coast (U.S. and Canada), although landings still remain much lower than historical landings. The trend analysis and stable low landings support the Assessment Update's conclusion that the American eel population in the assessment range is similar to five years ago and remains depleted. Therefore, the resource is considered depleted and no stock status specific to overfishing determination can be made based on the trend analyses performed (ASMFC 2017).

III. Status of the Fishery

American eel currently support commercial fisheries throughout their range in North America, with significant fisheries occurring in the US Mid-Atlantic region and Canada. These fisheries are executed in riverine, estuarine, and ocean waters. In the US, commercial fisheries for glass eel/elvers exist in Maine and South Carolina and a silver eel weir fishery exists in New York's Delaware River, whereas yellow eel fisheries exist in all states and jurisdictions with the exception of Pennsylvania and the District of Columbia.

Although eel have been continuously harvested, consistent data on harvest are often not available. Harvest data from the Atlantic coastal states (Maine to Florida) indicate that the harvest fluctuated widely between 1970 and 1980, but showed an increasing trend that peaked in 1979 at 3,951,936 pounds. Harvest has declined since then, with the lowest harvest of 641,225 pounds occurring in 2002. Because fishing effort data are unavailable for the entire time series, finding a correlation between population numbers and landings data is difficult.

Commercial

Please Note: Landings information for the following section are from state compliance reports. The states are working with ACCSP to provide updated and correct landings information; as such, some of the information below may not reflect updated landings information.

Commercial landings have decreased from a high of 3.95 million pounds in 1979 to a low of 641,000 pounds in 2002, and have only recently begun to exceed one million pounds. State reported landings of yellow/silver eels in 2018 totaled approximately 781,200 pounds[1] (Table 1, Figure 1), which represents a 8.24% decrease in landings from 2017 (851,391 pounds) and was the second lowest value in the last 20 years. Yellow eel landings decreased in eight states and jurisdictions, while increasing in three others. In 2018, state reported landings from Delaware, Maryland, PRFC, and Virginia together accounted for 82% of the coastwide commercial total landings. Landings of glass eels were reported from Maine and South Carolina, totaled approximately 9,194 pounds.

[1] Preliminary landings data for 2018 comes from state compliance reports.

Table 1. Preliminary 2018 Commercial Landings by State and Life Stage[1]

	State Reported	
	Glass	**Yellow**
Maine	9,194	2,831
New Hampshire	No Fishery	0
Massachusetts	No Fishery	NA
Rhode Island	No Fishery	3,988
Connecticut	No Fishery	2,047
New York	No Fishery	37,576
New Jersey	No Fishery	69,668
Pennsylvania	No Fishery	No Fishery
Delaware	No Fishery	31,378
Maryland	No Fishery	522,596
D.C.	No Fishery	No Fishery
PRFC	No Fishery	31,151
Virginia	No Fishery	57,271
North Carolina	No Fishery	18,058
South Carolina	Confidential (<750 pounds)	0
Georgia	No Fishery	Confidential
Florida	No Fishery	4,636
Total	**Glass: Approx 9,194 Elver: 0**	**781,200**

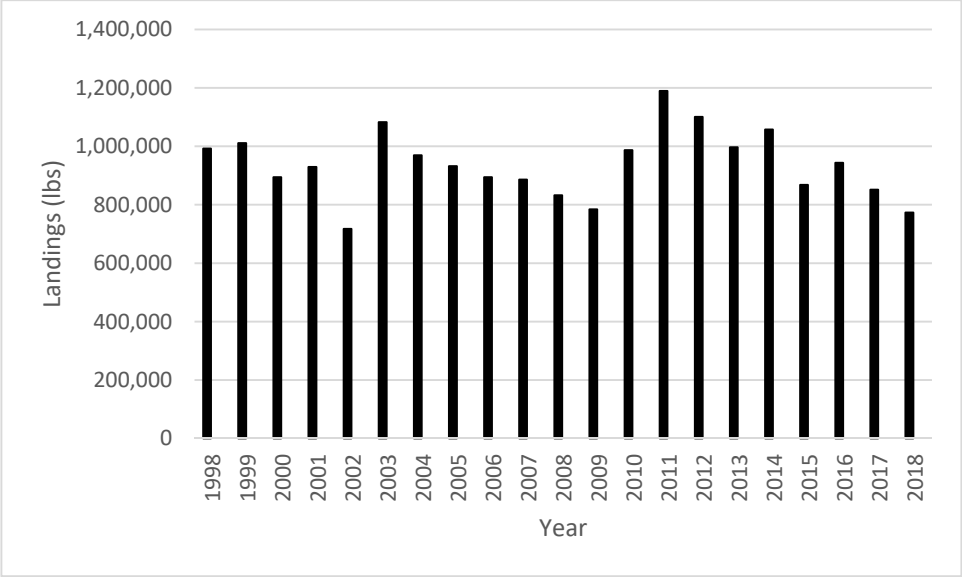


Figure 1. American Eel Yellow-Life Stage Coastwide Landings 1998-2018

Table 2. State commercial regulations for the 2018 fishing year.*

State	Min Size Limit	License/Permit	Other
ME	Glass No minimum size	Daily dealer reports/swipe card program; monthly harvester report of daily landings. Tribal permit system in place for some Native American groups.	In 2017, the Legislature authorized the DMR commissioner to adopt rules to implement the elver fishing license lottery, including provisions for the method and administration of the lottery.
	Yellow 9”	Harvester/dealer license and monthly reporting. Tribal permit system in place for some Native American groups.	Seasonal closures. Gear restrictions. Weekly closures.
NH	9”	Commercial saltwater license and wholesaler license. No dealer reports. Monthly harvester reporting includes dealer information.	Gear restrictions in freshwater.
MA	9"	Commercial permit with annual catch report requirement. Registration for dealers with purchase record requirement. Dealer/harvester reporting.	Traps, pots, spears, and angling only. Mesh restrictions.
RI	9"	Commercial fishing license. Dealer/harvester reporting.	Seasonal gear restrictions.
CT	9"	Commercial license (not required for personal use). Dealer/harvester reporting.	Gear restrictions.
NY	9"	Harvester/dealer license and monthly reporting.	Gear restrictions. Maximum limit of 14” in some rivers.
NJ	9"	License required. No dealer reports. Monthly harvester reporting includes dealer information.	Gear restrictions.
PA	NO COMMERCIAL FISHERY		
DE	9"	Harvester reporting, no dealer reporting. License required.	Commercial fishing in tidal waters only. Gear restrictions.
MD	9"	Dealer/harvester license and monthly reporting.	Prohibited in non-tidal waters. Gear restrictions. Commercial crabbers may

State	Min Size Limit	License/Permit	Other
			fish 50 pots per day, must submit catch reports.
DC	NO COMMERCIAL FISHERY		
PRFC	9"	Harvester license and reporting. No dealer reporting.	Seasonal gear restrictions. Mesh size restrictions on eel pots.
VA	9"	Harvester license required. Dealer/harvester monthly reporting.	Mesh size restrictions on eel pots. Seasonal closures.
NC	9"	Standard Commercial Fishing License for all commercial fishing. Dealer/harvester monthly combined reports on trip ticket.	Mesh size restrictions on eel pots. Seasonal closures.
SC	Glass No minimum size	Fyke and dip net only permitted. Dealer/harvester monthly combined reports on trip ticket. License required.	Max 10 individuals. Gear and area restrictions.
	Yellow 9"	Pots and traps permitted only. Dealer/harvester monthly combined reports on trip ticket. License required.	Gear restrictions.
GA	9"	Personal commercial fishing license and commercial fishing boat license. Dealer/harvester monthly combined reports on trip ticket.	Gear restrictions on traps and pots. Area restrictions.
FL	9"	Permits and licenses. Harvester reporting. No dealer reporting.	Gear restrictions.

* For specifics on licenses, gear restrictions, and area restrictions, please contact the individual state.

Recreational

Available information indicates that few recreational anglers directly target American eel. For the most part, hook-and-line fishermen catch eel incidentally when fishing for other species. American eel are often purchased by recreational fishermen for use as bait for larger gamefish such as striped bass, and some recreational fishermen may catch their own to use as bait.

The National Marine Fisheries Service (NMFS) Marine Recreational Information Program (MRIP) shows a declining trend in the catch of eel during the latter part of the 1990s. As of 2009, recreational data are no longer provided for American eel, due to the unreliable design of MRIP that focuses on active fishing sites along coastal and estuarine areas.

Table 3. State recreational regulations for the 2018 fishing year.*

State	Size Limit	Possession Limit	Other
ME	9"	25 eels/person/day	Gear restrictions. License requirement and seasonal closures (inland waters only). Bait limit of 50 eels/day for party/charter boat captain and crew.
NH	9"	25 eels/person/day	Coastal harvest permit needed if taking eels other than by angling. Gear restrictions in freshwater.
MA	9"	25 eels/person/day	Nets, pots, traps, spears, and angling only; seasonal gear restrictions and mesh requirements. Bait limit of 50 eels/day for party/charter boat captain and crew.
RI	9"	25 eels/person/day	Bait limit of 50 eels/day for party/charter boat captain and crew.
CT	9"	25 eels/person/day	
NY	9”	25 eels/person/day	Maximum limit of 14” in some rivers. Bait limit of 50 eels/day for party/charter boat captain and crew.
NJ	9"	25 eels/person/day	Bait limit of 50 eels/day for party/charter boat captain and crew. Mesh size restriction on pots.
PA	9"	25 eels/person/day	Gear restrictions.
DE	9"	25 eels/person/day	Two pot limit/person.
MD	9"	25 eels/person/day	Gear restrictions.
DC	9"	10 eels/person/day	
PRFC	9"	25 eels/person/day	
VA	9"	25 eels/person/day	Recreational license. Two pot limit. Mandatory monthly catch report. Gear restrictions. Bait limit of 50 eels/day for party/charter boat captain and crew.
NC	9"	25 eels/person/day	Gear restrictions. Non-commercial special device license. Two eel pots allowed under Recreational Commercial Gear license. Bait limit of 50 eels/day for party/charter boat captain and crew.
SC	9"	25 eels/person/day	Gear restrictions. Permits and licenses. Two pot limit.
GA	9"	25 eels/person/day	
FL	9"	25 eels/person/day	Gear restrictions. Wholesale/retail purchase exemption applies to possession limit for bait.

* For specifics on licenses, gear restrictions, and area restrictions, please contact the individual state.

IV. Status of Research and Monitoring

The FMP requires states and jurisdictions with a declared interest in the species to conduct an annual YOY survey to monitor annual recruitment of each year's cohort. In 2018, the states and jurisdictions of Maine (West Harbor Pond), Connecticut (Fishing Brook Eel Pass), Delaware (Millsboro Pond), and Maryland (Turville Creek) had above average YOY counts. The 2018 catch at Maine's West Harbor Pond site was the eighth largest catch in 18 year time series. The 2018 catch at Connecticut's Fishing Brook Eel Pass was the highest in the 19 year time series. The 2018 catch at Delaware's Millsboro Pond was the eighth highest in the 19 year time series. The 2018 catch at Maryland's Turville Creek site was the eight highest in the 18 year time series. All other states with YOY surveys (New Hampshire, Rhode Island, New York, New Jersey, North Carolina, South Carolina, and Florida) had at or below average survey counts. The results from Virginia's YOY surveys are forthcoming. Pennsylvania, D.C., and Georgia do not have YOY surveys, but instead have yellow eel surveys. New Jersey additionally developed and implemented a fishery-independent eel pot survey to collect abundance data of yellow American eels within nursery grounds. This survey, which began in 2015, supplements the current glass eel survey by sampling more life stages and will allow biologists to collect additional biological samples (age-length-weight data).

As required by Addendum IV, Maine continued the fishery independent life cycle survey covering glass, yellow, and silver eels within at least one river system (Cobboseecontee Stream drainage) in 2018. Maine Department of Marine Resources staff will conduct the life cycle survey on at the West Harbor Pond YOY site starting in 2019.

Maine's glass eel aquaculture proposal was approved for the 2019 fishing season, allowing for an additional 200 pounds of glass eels to be harvested for aquaculture; this amount is in addition to the Maine's glass eel quota of 9,688 pounds. In 2019, a total of 130 pounds were harvested out of the 200 pound allocation.

North Carolina's aquaculture plan for an American Eel Farm was approved for 2019, allowing the harvest of up to 200 pounds of glass eel aquaculture. In 2019, the American Eel Farm (AEF) harvested 13 pounds though the facility suffered a total mortality event in June 2019 and no eels survived.

The FMP does not require any other research initiatives in participating states and jurisdictions. Nonetheless, the American Eel Technical Committee has identified several research topics to further understanding of the species' life history, behavior, and biology. Research needs for American eel include:

High Priority

- Accurately document the commercial eel fishery to understand participation in the fishery and the amount of directed effort.

- Investigate, develop, and improve technologies for American eel passage upstream and downstream at various barriers for each life stage. In particular, investigate low-cost alternatives to traditional fishway designs for passage of eel.
- Formulate a coastwide sampling program for yellow and silver American eels using standardized and statistically robust methodologies.
- Conduct regular periodic stock assessments and establish sustainable reference points for eel to develop a sustainable harvest rate and to determine whether the population is stable, decreasing, or increasing.
- Research coastwide prevalence of the swim bladder parasite *Anguillacolla crassus* and its effects on the American eel's growth and maturation, migration to the Sargasso Sea, and spawning potential.
- Evaluate the impact, both upstream and downstream, of barriers to eel movement with respect to population and distribution effects. Determine relative contribution of historic loss of habitat to potential eel population and reproductive capacity**.**

Medium Priority

- Investigate survival and mortality rates of different life stages (leptocephalus, glass eel, yellow eel, and silver eel) to assist in the assessment of annual recruitment. Continuing and initiating new tagging programs with individual states could aid such research.
- Tagging Programs: A number of issues could be addressed with a properly designed tagging program. These include:
    - Natural, fishing, and/or discard mortality; survival
    - Growth
    - Validation of aging method(s)
    - Reporting rates
    - Tag shedding or tag attrition rate
- Research contaminant effects on eel and the effects of bioaccumulation with respect to impacts on survival and growth (by age) and effect on maturation and reproductive success.
- Investigate fecundity, length, and weight relationships for females throughout their range; growth rates for males and females throughout their range; predator-prey relationships; behavior and movement of eel during their freshwater residency; oceanic behavior, movement, and spawning location of adult mature eel; and all information on the leptocephalus stage of eel.
- Assess characteristics and distribution of eel habitat and the value of habitat with respect to growth and sex determination.
- Identify triggering mechanism for metamorphosis to mature adult, the silver eel life stage, with specific emphasis on the size and age of the onset of maturity, by sex. A maturity schedule (proportion mature by size or age) would be extremely useful in combination with migration rates.

Low Priority

- Perform economics studies to determine the value of the fishery and the impact of

regulatory management.

- Review the historic participation level of subsistence fishers in wildlife management planning and relevant issues brought forth with respect to those subsistence fishers involved with American eel.
- Examine the mechanisms for exit from the Sargasso Sea and transport across the continental shelf.
- Research mechanisms of recognition of the spawning area by silver eel, mate location in the Sargasso Sea, spawning behavior, and gonadal development in maturation.
- Examine age at entry of glass eel into estuaries and fresh waters.
- Examine migratory routes and guidance mechanisms for silver eel in the ocean.
- Investigate the degree of dependence on the American eel resource by subsistence harvesters (e.g., Native American Tribes, Asian and European ethnic groups).
- Examine the mode of nutrition for leptocephalus in the ocean.
- Provide analysis of food habits of glass eel while at sea.

V. Status of Management Measures and Issues

The FMP required that all states and jurisdictions implement an annual YOY abundance survey by 2001 in order to monitor annual recruitment of each year's cohort. Addendum III requires a 9 inch minimum size restriction in the commercial and recreational yellow eel fisheries, as well as the use of ½ by ½ inch mesh in the commercial yellow eel pot fishery. The recreational bag limit is 25 fish/angler/day, and the silver eel fishery is restricted, as is the development of pigmented eel fisheries.

Proposed Listing of American Eel

The US Fish and Wildlife Service (USFWS) reviewed the status of American eel in 2007 and found that, at that time, protection under the Endangered Species Act (ESA) was not warranted. American eel was later petitioned for listing as threatened under the ESA in April 2010 by the Center for Environmental Science, Accuracy, and Reliability (CESAR, formally the Council for Endangered Species Act Reliability). The USFWS published a positive 90 day finding on the petition in September 2011, acknowledging that the petition may be warranted and that a status review would be conducted. CESAR filed a lawsuit in August 2012 against the USFWS for failure to comply with the statutes of the ESA, which specifies a proposed rule based on the status review be published within one year of the receipt of the petition. A Settlement Agreement was approved by the court in April 2013, which required the USFWS to publish a 12-month finding by September 30, 2015. In the published finding, the USFWS determined that a listing under the ESA was not warranted.

VI. Current State-by-State Implementation of FMP Compliance Requirements

The PRT reviewed the state compliance reports for the 2018 fishing year. Massachusetts has not submitted a compliance report as of October 1 due to challenges in finalizing landings data. The

PRT notes the following changes with states implementing the required provisions of the American Eel Fishery Management Plan:

Silver Eel Fishery Measures:

- Florida does not have a regulation preventing harvest of eels from pound nets from September 1 through December 31, but the state is unaware of any active pound net fishery in the past 10-15 years.

Reporting Measures:

- New Hampshire and New Jersey do not have dealer reporting, but harvesters report some information on dealers. Delaware, the Potomac River Fisheries Commission, and Florida do not have dealer reporting.

Monitoring Efforts:

- Connecticut installed and tested eel passes at Chapmans Pond Fishway in 2017. This Irish Elver style eel pass ramp and trap operated for its first season in 2018, passing a total of 45,859 eels (45,804 YOY, 5,193 elvers, and 178 yellow phase). It is anticipated that the number of elvers will decrease as those fish that were previously prevented from migrating upstream are now able to pass.

Section 4.4.2 of the FMP stipulates that 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 1% of the coastwide commercial landings for that life stage for the same two-year period. States meeting this criterion are exempted from having to adopt commercial and recreational fishery regulations for a particular life stage listed in Section 4 and any fishery-dependent monitoring elements for that life stage listed in Section 3.4.1.

Qualification for *de minimis* is determined from state-reported landings found in compliance reports. In 2018, New Hampshire, Pennsylvania, District of Columbia, South Carolina, Georgia, and Florida requested *de minimis* status for their yellow eel fisheries. All states that applied for *de minimis* of the yellow eel fishery meet the *de minimis* criteria. The state of South Carolina additionally requested *de minimis* status for its glass eel fishery and does meet the 1% landings criteria for this life stage.

VII. Recommendations/Findings of the Plan Review Team

1. The PRT recommends the Board consider state compliance issues as detailed in Section VI.

2. The PRT recommends *de minimis* be granted to New Hampshire, Pennsylvania, District of Columbia, South Carolina, Georgia, and Florida for their yellow eel fisheries, and South Carolina for their glass eel fishery.

3. The PRT had previously requested that the Board reevaluate the requirement that states provide estimates of the percent of harvest going to food versus bait, as there is a high level of uncertainty and subjectivity inherent in the data. The PRT requests that the Board task the Committee on Economic and Social Sciences (CESS) to conduct an analysis of the market demand for all life stages of eel, specific to food vs bait markets, as well as international market demand.

4. The PRT requests that states work with the law enforcement agencies to include information on any confiscated poundage from illegal or undocumented fisheries, and that the Board continue to encourage interstate enforcement actions with regards to poaching, due to the broad geographic scale at which the issue occurs. Specifically, the PRT recommends that information from law enforcement investigations such as Operation Broken Glass and the recent illegal glass eel harvest in Maine be provided to the Board (if allowable) for consideration of management action as soon as possible.

5. The PRT recommends that the Commission and USFWS work together to annually compare domestic landings data to export data for American eel across all life stages.

6. The PRT requests that New York separate its yellow and silver eel landings, if possible, when reporting harvest.

7. The PRT requests that states quantify escapements, changes in upstream and downstream passage (e.g. dam removals, new impediments to passage) annually and provide this information to the Technical Committee for evaluation.

VIII. Works Cited

Atlantic States Marine Fisheries Commission (ASMFC). 1998. Interstate Fishery Management Plan for American Eel (*Anguilla rostrata*). Washington D.C. NOAA Oceanic and Atmospheric Administration Award No. NA97 FGO 0034 and NA07 FGO 024.

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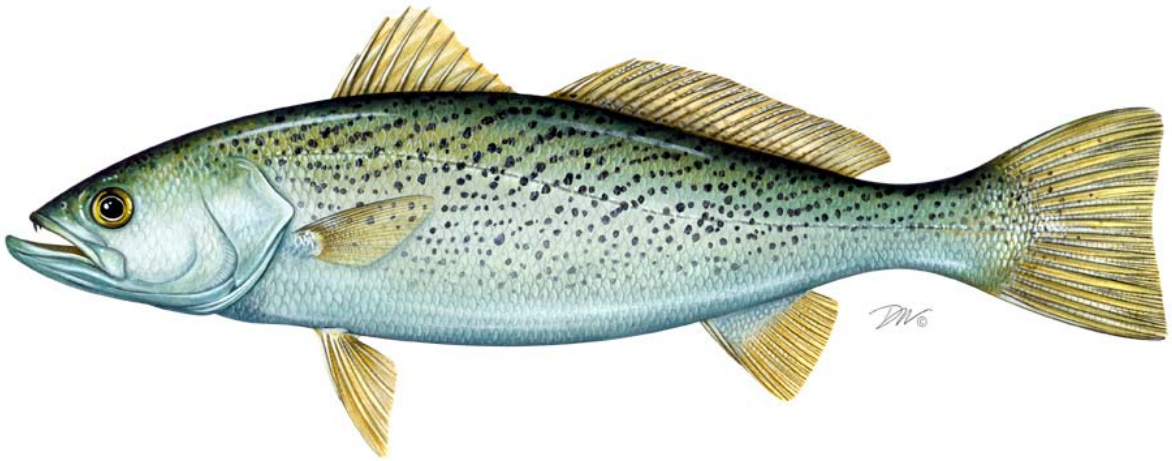
2019 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR

WEAKFISH (Cynoscion regalis)

2018 FISHING YEAR



Weakfish Plan Review Team

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I. Status of the Fishery Management Plan

The Atlantic States Marine Fisheries Commission (Commission) adopted its first Fishery Management Plan (FMP) for Weakfish in 1985. Amendment 1 to the FMP (1992) unsuccessfully aimed to improve the status of Weakfish. Amendment 2 (1995) resulted in some improvement to the stock, but several signs indicated that further improvement was necessary. Thus, Amendment 3 (1996) was implemented to increase the sustainability of the fishery. Addendum I to Amendment 3 was approved in 2000 in order to extend the management program until the next amendment was implemented.

Amendment 4, approved in 2002, strives to establish two goals. One is the utilization of interstate management so that Atlantic coastal weakfish recover to healthy levels that will maintain commercial and recreational harvest consistent with a self-sustaining spawning stock. The second goal is to provide for restoration and maintenance of essential habitat (ASMFC 2002). The management objectives are to:

1) establish and maintain an overfishing definition which includes target and threshold fishing mortality rates and a threshold spawning stock biomass in order to prevent overfishing and to maintain a sustainable weakfish population;

2) restore the weakfish age and size structure to that necessary for the restoration of the fishery;

3) return weakfish to their previous geographic range;

4) achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit, including states' waters and the federal EEZ;

5) promote cooperative interstate research, monitoring, and law enforcement necessary to support management of weakfish;

6) promote identification and conservation of habitat essential for the long term stability in the weakfish population; and

7) establish standards and procedures for both the implementation of Amendment 4 and for determination of states' compliance with provisions of the management plan.

Amendment 4 established target and threshold fishing mortality rates and a threshold spawning stock biomass level to determine overfishing and overfished stock status. The amendment requires states to implement recreational and commercial management measures to achieve annual fishing mortality targets. Some management measures are specified (e.g., minimum size limit, minimum mesh size, bycatch limit), while the Amendment provides the states flexibility in implementing other regulations (e.g., trip limits, area or season closures). States may request implementation of alternative management plans with conservationally equivalent measures.

States deemed to have insignificant landings were exempt from the recreational and commercial requirements, with the exception of the bycatch reduction device requirements.

The Commission adopted Addendum I to Amendment 4 (2005) to replace the biological sampling program in Section 3.0 of Amendment 4. In response to a significant decline in stock abundance and increasing total mortality since 1999, the Commission approved Addendum II to Amendment 4 (2007) to reduce the recreational creel limit and commercial bycatch limit, and set landings levels that when met will trigger a re-evaluation of management measures. Addendum III to Amendment 4 (2007) altered the bycatch reduction device certification requirements in Section 4.2.8 of Amendment 4 for consistency with the South Atlantic Fishery Management Council's Shrimp FMP. The Commission approved Addendum IV to Amendment 4 in 2009 to respond to the results of the 2009 benchmark stock assessment (additional information is provided in Section VI. Status of Management Measures and Issues).

Weakfish are managed under this plan as a single stock throughout their coastal range. All Atlantic coast states from Massachusetts through Florida and the Potomac River Fisheries Commission have a declared interest in weakfish, as do the US Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NOAA Fisheries). See Table 1 for a summary of state-by-state regulations in 2015.

II. Status of the Stock

The most recent benchmark stock assessment, conducted in 2016, concluded that the weakfish stock was depleted and overfishing was not occurring (ASMFC 2016). A stock assessment update was completed in 2019 (ASMFC 2019), applying the Bayesian statistical catch-at-age model from the 2016 benchmark assessment to data through 2017. This update also incorporated the new, calibrated estimates of recreational catch by the Marine Recreational Information Program.

Estimates of recruitment, spawning stock biomass, and total abundance remained low in recent years. Estimates of fishing mortality were moderately high in recent years, although not near the time-series highs of the mid- to late-2000s, or the earliest years. Natural mortality remained high, averaging 0.92 in the most recent 10 years, compared to 0.16 over the first 10 years of the time series.

Spawning stock biomass in 2017 was estimated at 1,922 mt, below the SSB threshold of 6,170 mt, indicating the stock is depleted. SSB has shown a slight increasing trend in recent years, but is still well below the SSB threshold.

Total mortality in 2017 was estimated at 1.45, above both the Z target = 1.03 and the Z threshold = 1.43, indicating total mortality on the stock is too high.

III. Status of the Fishery

In 2018, total coastwide landings of weakfish were 228,094 pounds, a 62% decline from 2017 and the lowest annual total harvest since 1981. The commercial fishery (102,492 lb) accounted for 45% of the total 2018 landings, and the recreational fishery (125,602 lb) for 55% (Table 2).

Commercial Fishery

Commercial data are cooperatively collected and compiled by the Atlantic Coastal Cooperative Statistics Program (ACCSP) and state fishery agencies from state mandated trip-tickets, landing weigh-out reports from seafood dealers, federal logbooks, shipboard and portside interviews, and biological sampling of catches. In this report, commercial landings from 2017 and earlier are from ACCSP and landings from 2018 are from state compliance reports, unless otherwise stated (see notes for Table 3).

Commercial harvest of weakfish peaked in 1980 at 36 million pounds, but has declined since then (Figure 2). Commercial landings have not exceeded 1 million pounds since 2004. Landings in 2018 were the lowest on record at 102,492 pounds. North Carolina (34%), New York (23%) and Virginia (22%) landed the largest shares of the 2018 coastwide commercial weakfish harvest (Table 3).

The dominant commercial gear type was gill nets (about 55% of commercial landings). There has been a shift in the dominant source of landings from trawls in the 1950s-1980s to gill nets in the 1990s-present. The majority of commercial landings tend to occur in the fall and winter months, presumably as the fish congregate to migrate to over-wintering grounds in the South Atlantic (Hogarth et al. 1995).

Recreational Fishery

Recreational catch statistics are collected by NOAA Fisheries. Effort data are collected through telephone interviews. Catch expansions are based on angler interviews and biological sampling conducted by trained interviewers stationed at fishing access sites. Recreational data from 2016 and earlier in this report are from the Fisheries Statistics Division of NOAA Fisheries, queried from the Marine Recreational Information Program (MRIP; 2019), except as noted in Section VI of this report for Florida's estimates. Some states also monitor and report recreational landings through their own sampling and estimation efforts. Recreational landings for 2018 are calculated from landings reported in state compliance reports.

Coastwide recreational landings peaked at 20 million pounds in 1987, but have generally declined since then through the present (Figure 2). Recreational landings have not exceeded 1 million pounds since 2008. In 2018, recreational landings were 125,602 pounds or 90,309 fish, the lowest harvest on record for both measurement units. North Carolina harvested the largest percentage of the 2018 recreational harvest (24% by pounds; 34% by numbers), followed by New Jersey (19%; 18%) and South Carolina (16%; 12%).

The number of fish released alive by anglers has typically been above 1 million fish since 1991. However in 2018, 860,599 fish were released, the lowest number of releases since the coastwide

one fish bag limit went into effect in 2010 (Table 6, Figure 3). North Carolina had the largest share of releases (35%), followed by Virginia (27%) and New York (14%).

The size of fish sampled to provide the MRIP weight estimates has historically varied in a latitudinal fashion, with larger fish caught in the north and smaller fish caught in the south. The mean weight per fish sampled throughout the recreational time series (1981-2018) is less than or equal to 1.5 pounds for all states from Florida through Virginia and over 1.5 pounds for all states north of Virginia. In 2018, the mean weights for fish caught in Delaware, North Carolina, South Carolina, Georgia, and Florida (2.36, 0.97, 1.86, 1.19, and 1.50 lb, respectively) were greater than or equal to each state's time series mean, and the mean weights for fish caught in Massachusetts, Connecticut, New York, New Jersey, and Virginia (1.92, 3.01, 2.16, 1.51, and 1.22 lb, respectively) were less than each state's time series mean.

The recreational fishery catches weakfish using live or cut bait, jigging, trolling, and chumming. The majority of recreationally harvested weakfish are caught in state waters (87% in 2018 by pounds).

IV. Status of Assessment Advice

The 2016 benchmark assessment was completed by the ASMFC Weakfish Stock Assessment Subcommittee (SAS) and peer reviewed by the ASMFC Weakfish Stock Assessment Review Panel (ASMFC 2016). The benchmark assessment includes fishery data and survey indices through 2014. An update to this assessment was conducted by the Weakfish TC in 2019, with data through 2017 and updated recreational catch estimates from the MRIP (ASMFC 2019).

As a result of the update, the Weakfish TC recommends maintaining the Z and SSB reference points as re-calculated by the update, along with a two-stage control rule for evaluating weakfish stock status and management response.

Under conditions of time-varying natural mortality, there is no long-term stable equilibrium population size, so an SSB target is not informative for management. The Weakfish TC recommends an SSB threshold of $SSB_{30\%}$ = 6,170 mt that is equivalent to 30% of the projected SSB under average natural mortality and no fishing. When SSB is below that threshold, the stock is considered depleted.

SSB in 2017 was estimated at 1,922 mt, below the SSB threshold of 6,170 mt, indicating the stock is depleted (Figure 1). SSB has shown a slight increasing trend in recent years, but is still well below the SSB threshold.

The TC recommends the use of total mortality (Z) benchmarks to prevent an increase in fishing pressure when F is low but M is high. When Z is below the Z target, F reference points can be used to assess overfishing status.

Total mortality in 2017 was estimated at 1.45, above both the Z target = 1.03 and the Z threshold = 1.43, indicating total mortality on the stock is too high (Figure 1).

V. Status of Research and Monitoring

Fishery-Independent Data

Young-of-year indices of relative abundance are provided by Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Florida. Massachusetts, Connecticut, New Jersey, Delaware, North Carolina, Georgia, and Florida provide age- 0+ or 1+ indices of relative abundance. The Northeast Fisheries Science Center Groundfish Trawl Survey also produces an age-structured index for the Mid-Atlantic coast, while the Southeast Area Monitoring and Assessment Program (SEAMAP) survey produces another index for the South Atlantic Coast. The Northeast Area Monitoring and Assessment Program (NEAMAP) began spring and fall surveys between Martha's Vineyard and Cape Hatteras in the fall of 2007, and provided an Age 1+ index which is included in the 2016 assessment. Stomach content analysis was also done to assess food habit changes and investigate the possible decrease in preferred food availability as a driver of natural mortality, however results were inconclusive. The Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), which began in 2002, collects data on relative abundance, length, weight, age, sex, and trophic interactions in the Bay. See Table 7 for the indices provided in the 2019 compliance reports. While only the most recent years of data are shown, full data sets for each survey are available upon request to the state or Commission.

Fishery-Dependent Data

The coastal states and the NMFS collect data on commercial and recreational landings. Addendum I to Amendment 4 requires the collection of otoliths and lengths to characterize the catch; the number of samples required is based on the magnitude of each state's fisheries. Each spring, the states are required to submit biological sampling plans, and each fall, through the compliance reports, the states are required to provide the actual sampling levels completed. See Section VII for more information.

VI. Status of Management Measures and Issues

Fishery Management Plan

Addendum IV to Amendment 4 was approved in November 2009, and was implemented in May 2010. In response to the 2009 stock assessment results, the addendum implements more appropriate biological reference points in response to recent stock dynamics and reduces harvest while attempting to minimize unnecessary bycatch waste. Addendum IV requires all states in the management unit (including those that are *de minimis*) to implement a recreational creel limit no greater than 1 fish, commercial trip and bycatch limits no greater than 100 pounds, and a finfish trawl fishery allowance for up to 100 undersized fish. The addendum adopted percentage based biological reference points with an overfished/depleted threshold of 20% SSB and a target of 30%

SSB. The biological sampling requirements under Addendum I are unchanged, and all regulations previously enacted to protect weakfish and reduce bycatch are to remain effective.

No additional amendments or addenda are under development.

Florida Management Area and Landings Data
In November 2009, the Management Board approved a proposal from Florida to reduce the state's weakfish management area to a small area in northeast Florida where pure weakfish are known to occur based on genetics data. The revision is intended to address the misidentification of weakfish, sand seatrout, silver seatrout, and their hybrids, and the consequential law enforcement issue. Inside the newly established weakfish management area (St. Mary's River only), any fish that resembles weakfish will be considered weakfish for enforcement purposes, both for commercial and recreational limits. Outside the weakfish management area, all fish that resemble weakfish will be considered sand seatrout.

As a result of the approved proposal, the commercial and recreational landings data provided in Florida's 2019 compliance report represent the best estimate of pure weakfish landings in the state. Commercial landings data from Florida's trip ticket program and recreational landings from the NMFS's Marine Recreational Fisheries Statistics Survey include only weakfish landed in Nassau and Duval counties, as revised on the basis of the genome proportions within the *Cynoscion*-complex found in the counties (48% weakfish in Nassau County and 17% in Duval County). The landings, tables, and figures in this report use the landings as reported by Florida.

De Minimis Status
Amendment 4 permits states to request *de minimis* status if, for the last two years, their combined average commercial and recreational landings (by weight) constitute less than 1% of the coastwide commercial and recreational landings for the same two year period. The *de minimis* threshold for the 2018 fishing year, calculated with 2017 and 2018 harvest data, is 4,125 pounds.

Three states requested *de minimis* status in their 2018 compliance reports: Massachusetts, Connecticut, and Florida. All three of these states qualify for *de minimis* status (0.9%, 0.9%, and 0.6%, respectively.

Addendum II Management Triggers
In 2010, the recreational and commercial management measures in Addendum IV replaced those in Addendum II. However, the Plan Review Team (PRT) will continue to include an evaluation of the two management triggers as they provide perspective on the magnitude of fishery landings (but hitting a trigger will not require Board reconsideration of the management measures).

Addendum II established two management triggers that would require the Board to consider modifying management measures if reached. First, commercial management measures are to be re-evaluated if coastwide commercial landings exceed 80% of the mean commercial landings from 2000-2004, or 2.99 million pounds. Second, commercial and recreational management measures

are to be re-evaluated if any single state's landings exceed its five-year mean by more than 25% in any single year.

The 2018 coastwide commercial landings are 102,492 pounds, thus the first trigger has not been exceeded. The second trigger was met in Florida because their total estimated landings in 2018 were 53% greater than their average total landings from 2014-2018 (Table 8). While Florida's landings are high relative to their average, they constitute less than 1% of total coastwide landings. Thus, the PRT does not find the 2018 Florida harvest to be a cause for concern.

VII. Implementation of FMP Compliance Requirements for 2018

Mandatory compliance elements for 2018 were provided by Amendment 4 and its four addenda.

Regulatory Requirements
The management program includes regulatory requirements for non *de minimis* states as follows:

- Recreational management measures including minimum size limits and a maximum creel limit of one fish(see Addenda II and IV to Amendment 4)
- Commercial management measures including minimum size limits, minimum mesh size limits, landings limits, trip limits, bycatch limits, closed seasons and areas, and bycatch reduction device requirements (see Section 4.2 of Amendment 4, and Addendum IV)

The PRT finds all states to have implemented the plan's compliance requirements.

See Table 1 for a summary of state commercial and recreational regulations in 2018.

Monitoring Requirements
Addendum I implemented monitoring requirements for non *de minimis* states as follows:

- Maintenance of at least the 2005 level of recreational sampling of individual lengths through the Marine Recreational Fisheries Statistics Survey;
- Collection of six individual fish lengths for each metric ton of weakfish landed commercially;
- Collection of three individual fish ages for each metric ton of total weakfish landed, with a maximum of 1000 ages annually per state [Samples may come from commercial and/or recreational fishery as long as they come from the same general area (inshore versus offshore) that those fisheries are prosecuted in.

Table 9 provides the otolith and length collection requirements for 2018. These are based on the best available 2018 landings data provided to the Commission by the ACCSP, NMFS, and the states. The MRIP transition from evaluating effort via the Coastal Household Telephone Survey to the new, mail-based Fishing Effort Survey (FES) impacted recreational catch estimates and sampling requirements based on those estimates. Therefore, while sampling efforts are compared to requirements based on the FES (Table 9), the PRT will use discretion in

recommending compliance based on age sample collection. Current and future sampling efforts (2019 and beyond) should be based on recreational harvests estimated using the FES. All states except New York, New Jersey, and North Carolina met the biological sampling requirements in 2018, as reported in state compliance reports.

New York collected 28 fewer ages than their required 78 ages and collected 50 fewer lengths than their required 100 lengths. This is the third consecutive year that New York has not fulfilled sampling requirements for lengths and the first year that they have not fulfilled the sampling requirement for ages. The PRT recognizes the difficulty in acquiring weakfish samples and has no reason to believe that this state is neglecting efforts to fulfill the requirements of the FMP. However, given the consecutive years of not meeting requirements for length samples, the PRT would encourage greater efforts from New York to fulfill this requirement in the future.

New Jersey collected 170 fewer ages than their required 314 ages. Weakfish recreational harvest in New Jersey for 2017 was significantly higher than other recent years at 225,225 pounds (by contrast the next highest year within the last five years was 61,426 pounds in 2014). With a 2018 recreational harvest that was roughly 10% of the year on which requirements were based, there is reasonable expectation that this state would be unable to meet its age sampling requirement. Although they did not meet the required amount, collection of 144 age and length samples indicates a significant effort towards fulfilling the requirement.

North Carolina collected 22 fewer ages than their required 192 ages. Weakfish harvest in North Carolina for 2018 was significantly lower than most years and their lowest harvest on record, which likely made sample acquisition more difficult. Additionally, the MRIP transition increased North Carolina's recreational harvest estimate (in pounds) by approximately three times, also increasing the number of samples required. Given the timing of the transition relative to sample collections and the small margin of missing the requirement, the PRT has no reason to believe that North Carolina did not put forth appropriate effort to meet their sampling requirement and does believe that North Carolina will likely meet this requirement in future years.

Given the difficulty of obtaining weakfish samples and efforts made by New York, New Jersey, and North Carolina, the PRT does not recommend that any of these states be found out of compliance for failing to meet sampling requirements in 2018.

VIII. Recommendations of the Plan Review Team

Management Recommendations

- That the Board approve the *de minimis* requests from Massachusetts, Connecticut, and Florida.
- That the Board consider for management the use of biological reference points from the 2019 stock assessment update.
- That the Board consider updating management triggers established in Addendum II to Amendment 4.

- That the Board consider updating age sampling requirements to reflect the update to MRIP data.

Research Recommendations

Fishery-Dependent Priorities

High

- Increase observer coverage to identify the magnitude of discards for all commercial gear types from both directed and non-directed fisheries.[1]

Moderate

- Continue studies on temperature, size, and depth specific recreational hook and release mortality rates, particularly catches from warm, deep waters. Investigate methods to increase survival of released fish.
- Continue studies on mesh size selectivity, particularly trawl fisheries.[2]
- Improve methods to estimate commercial bycatch. Refine estimates of discard mortality based on factors such as distance from shore and other geographical differences for all sizes including below minimum size.

Low

- Determine the onshore versus offshore components of the weakfish fishery.
- Collect catch and effort data including size and age composition of the catch, determine stock mortality throughout the range, and define gear characteristics. In particular, increase length frequency sampling in fisheries from Maryland and further north.
- Develop latitudinal, seasonal, and gear-specific age-length keys coast wide. Increase sample sizes for gear specific keys.

Modeling / Quantitative Priorities

High

- Evaluate predation of weakfish with a more advanced multispecies model (e.g., the ASMFC MSVPA or Ecopath with Ecosim); consider an expanded suite of predators (e.g., marine mammals) and include weakfish as predator and prey.
- Develop a bioenergetics model that encompasses a broader range of ages than Hartman and Brandt (1995) and use it to evaluate diet and growth data.

[1] Some Mid-Atlantic trawl fleet observer coverage has been implemented under ACCSP funding.

[2] Gillnet selectivity has been investigated by Swihart et al (2000). Some gear selectivity information in Amendment 3 to the ASMFC Weakfish FMP. Information can also be obtained from the North Carolina Pamlico Sound Independent Gill Net Survey.

Life History, Biological, and Habitat Priorities

High

- Develop a coastwide tagging program to identify stocks and determine migration, stock mixing, and characteristics of stocks in over wintering grounds. Determine the relationship between migratory aspects and the observed trend in weight at age.[3]
- Estimate weakfish mortality through independent approaches (e.g., alternative models, tagging) to corroborate trends in mortality from the assessment model.
- Determine the impact of scientific monitoring surveys on juvenile weakfish mortality. Calculate the resulting impact on adult stock size.
- Monitor weakfish diets over a broad regional and spatial scale, with emphasis on new studies within estuaries.
- Continue to investigate the geographical extent of weakfish hybridization.

Moderate

- Identify and delineate weakfish spawning habitat locations and environmental preferences to quantify spawning habitat.
- Compile data on larval and juvenile distribution from existing databases to obtain indications of spawning and nursery habitat location and extant.
- Examine geographical and temporal differences in growth rate (length and weight at age).
- Determine the impact of power plants and other water intakes on larval, post larval, and juvenile weakfish mortality in spawning and nursery areas. Calculate the resulting impact on adult stock size.[4]
- Monitor predation on weakfish from bird, fish, and marine mammal species.

Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Assemble socioeconomic data as it becomes available from ACCSP.

Low

- Define restrictions necessary for implementation of projects in spawning and over wintering areas and develop policies on limiting development projects seasonally or spatially.

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[3] A university led weakfish tagging study has been ongoing in North Carolina and Delaware since 2014. The objective of the study is to evaluate movement and stock mixing of weakfish along the U.S. east coast and to estimate seasonal and annual rates of fishing and natural mortality. The study is slated to be completed in late 2017 with results available to the weakfish TC in early 2018.

[4] Data are available for power plants in the Delaware Bay area and North Carolina. Also see Heimbuch et al. 2007. Assessing coastwide effects of power plant entrainment and impingement on fish populations: Atlantic menhaden example. *North American Journal of Fisheries Management*. 27: 569-577.

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X. Tables

Table 1. Summary of state regulations for weakfish in 2018.

	Commercial	Recreational	Implementation Date
MA	16", open 1/1-12/31, 100 lb possession limit.	16", 1 fish	June 2010
RI	16"; open 6/1-6/30 & 8/7-11/8, 100 lb possession limit. Other times of year: 100 pound bycatch limit with at least an equal poundage of other species as weakfish. Trawl codend mesh size >=4.5" diamond or 4.0" square.	16", 1 fish	April 28, 2010
CT	16"; open 1/1-12/31, 100 lb possession limit.	16", 1 fish	April 25, 2010
NY	16" (12" dressed & 10" filleted); Hook and line open 4/1-6/24 & 8/28-11/15; 0 lb bycatch limit. All other gears open 4/1-6/24 and 8/28-11/15; 100 lb bycatch limit.	16" (12" dressed, 10" fillet), 1 fish	By May 1, 2010
NJ	Gill net: 13"; open 1/1-5/20 & 9/3-10/19 & 10/27-12/31, 100 lb possession limit; mesh ≥ 3.25" stretched except 2.75 - 3.25" allowed within 2nm for permitted fishermen doing monthly reporting. Otter trawl: 13"; open 1/1-7/31 & 10/13-12/31, 100 lb possession limit; mesh ≥ 3.75" diamond or 3.375 square. Pound net: 13"; open 1/1/-6/6 & 7/1-12/31, 100 lb possession limit. 100 lb bycatch limit & 50% rule. Hook & line: 13", 1 fish, open 1/1-12/31.	13", 1 fish	March 25, 2010
DE	Gill net: 12"; only nets with stretch mesh ≥ 3.125" allowed in water 4/1-6/30, none permitted weekends and legal holidays 5/10-9/30, 100 lb possession limit. Drift gill net: open 1/1-12/31 except 34 specified days of gear out of water in May and June. Anchor gill net: open 1/1-5/9 and 10/1-12/31, otherwise gear out of water. Hook & line: 13"; 100 lb possession limit 4 days/week during 5/1-10/31, 1 fish creel limit all other times.	13", 1 fish	April 11, 2010
MD	12". Ocean all gears: 100 lb bycatch limit & 50% rule. Chesapeake Bay hook & line: open 8/1-9/30, 50 lb possession limit, 0 lb bycatch. Chesapeake Bay all other gears: 50 lb bycatch limit & 50% rule. Gillnet: mesh ≥ 3.0" stretched. Trawl: mesh ≥ 3.375" square or 3.75" diamond.	13", 1 fish	June 28, 2010
PRFC	12"; open 7/28-12/31, 50 lb possession limit; 50 lb bycatch limit & 50% rule for certified pound nets with approved cull panels, and 0 lb bycatch for all other gears. Pound net: limited entry.	12", 1 fish	January 1, 2010

Table 1. (continued)

State	Commercial	Recreational	Implementation Date
VA	Gill net: 12"; open 3/16-5/13 & 10/21-12/30, 100 lb possession limit. Pound net: no minimum size; limited entry; open 4/1-4/30 & 5/23-9/12 unless exempted by license forfeit, 100 lb possession limit. Haul seine: no minimum size; open 4/16-6/10 & 8/21-9/24, 100 lb possession limit. Out of state trawl: 12" except 100 undersized fish allowed; open 4/1-9/25, 100 lb possession limit; codend mesh ≥ 3.0". Hook & line: 12”; open 1/1-12/31, 100 lb possession limit. 100 lb bycatch limit (per vessel), 50% rule for all gears during closed seasons.	12”, 1 fish	May 1, 2010
NC	12", except 10" for long haul seines & pound nets in internal waters 4/1-11/15; open 1/1-12/31, 100 lbs trip limit. Gill net: mesh ≥ 2.875” stretch. Gill nets and flynets that do not meet mesh requirements can only take weakfish as bycatch provided the weight of weakfish doesn’t exceed 50% of catch up to 100lbs, 100lb limit in shrimp or crab trawl. BRDs in shrimp trawls.	12”, 1 fish	August 20, 2010
SC	12", 1 fish. BRDs in shrimp trawls.	12", 1 fish	July 1, 2010
GA	13", 1 fish. BRDs in shrimp trawls.	13", 1 fish	June 3, 2010
FL	12", 100 lb possession limit. BRDs in shrimp trawls.	12", 1 fish	July 27, 2010

Table 2. Commercial and recreational Atlantic coast weakfish landings from 2009 to 2018 (see Tables 3 and 4 for source information and state-specific landings).

Year	Recreational Landings (lbs)	Commercial Landings (lbs)	Total Landings (lbs)	% Com
2009	429,684	328,923	758,607	43%
2010	173,352	152,971	326,323	47%
2011	102,754	110,528	213,282	52%
2012	671,631	211,489	883,120	24%
2013	466,930	309,775	776,705	40%
2014	218,581	179,133	397,714	45%
2015	451,266	129,819	581,085	22%
2016	228,857	151,047	379,904	40%
2017	436,042	159,464	595,506	27%
2018	125,602	102,492	228,094	45%

Table 3. Commercial landings (pounds) of weakfish by state, 2009-2018 (Source: ACCSP for 2017 and earlier and state compliance reports for 2018, except as noted below). "C" values are confidential.

Year	MA	RI	CT	NY	NJ	DE	MD
2009	C	6,286	506	101,561	30,196	C	5,230
2010	58	5,400	960	13,102	12,053	C	2,930
2011	615	5,766	2,105	17,136	13,324	C	646
2012	616	17,908	4,723	63,119	19,291	C	2,078
2013	3,400	31,826	5,960	108,656	14,829	C	3,344
2014	918	15,583	3,343	33,303	8,415	C	2,126
2015	473	6,327	1,666	24,487	9,655	C	1,394
2016	882	12,022	2,731	30,714	6,596	C	914
2017	2,175	17,243	3,956	36,671	5,875	C	858
2018	1,190	8,785	2,004	23,070	7,693	800	555

	PRFC	VA	NC	SC	GA	FL	Total
2009	17	18,202	163,146			453	328,923
2010	80	11,996	106,319			73	152,971
2011	45	4,386	65,897		C	608	110,528
2012	98	10,274	91,383			1,999	211,489
2013	24	20,484	120,188		C	1,065	309,775
2014	10	9,633	105,246			557	179,133
2015	3	4,843	80,230			741	129,819
2016		12,610	83,958			621	151,047
2017	5	5,560	85,442			1,680	159,464
2018	0	22,882	35,133	0	0	381	102,492

N**otes:** FL: state-reported landings (NMFS-reported landings limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex in those counties' waters). VA: ACCSP-reported landings minus the PRFC-reported harvest landed in VA for 2016 and earlier; state-reported landings minus the PRFC-reported harvest landed in VA for 2017. PRFC: agency-reported landings (fish caught in Potomac River and landed in MD and VA). MD: ACCSP-reported landings minus the PRFC-reported harvest landed in MD for 2016 and earlier; state-reported landings minus the PRFC-reported harvest landed in MD for 2017.

Table 4. Recreational landings (pounds) of weakfish by state, 2009-2018 (Source: MRIP FES-calibrated estimates, except as noted below).

Year	MA	RI	CT	NY	NJ	DE	MD
2009				0	51,251	16,812	5,611
2010	0			6,526	8,435	121	6,476
2011				164	6,845	27	241
2012				43,385	373,328	11,621	42,885
2013		4,063		85,934	226,756	21,522	7,539
2014			0	14,916	61,426	7,118	2,808
2015				5,852	53,485	2,293	68,225
2016	571		4,240	29,573	26,616	3,601	1,947
2017	3,108		0	20,962	225,225	2,385	5,926
2018	756	0	1,404	19,593	24,407	4,199	0

		VA	NC	SC	GA	FL	Total
2009		71,511	245,358	22,740	14,449	1,952	429,684
2010		11,416	103,903	29,554	6,466	455	173,352
2011		14,185	62,543	17,028	1,191	530	102,754
2012		51,999	95,952	45,528	6,265	668	671,631
2013		4,657	66,720	45,031	3,771	937	466,930
2014		26,220	70,988	28,773	5,570	762	218,581
2015		66,528	157,269	96,416	1,096	102	451,266
2016		44,242	83,702	29,448	4,264	653	228,857
2017		15,649	55,944	58,510	47,776	557	436,042
2018		6,788	29,924	19,930	16,492	2,109	125,602

Notes: FL: state-reported landings 1983-present (NMFS-reported, FES-calibrated estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters.

Table 5. Recreational landings (numbers) of weakfish by state, 2009-2018 (Source: MRIP FES-calibrated estimates, except as noted below).

Year	MA	RI	CT	NY	NJ	DE	MD
2009				0	23,217	9,417	9,655
2010	0			7,894	3,943	144	12,532
2011				106	8,393	34	284
2012				12,895	276,856	11,077	38,598
2013		737		20,659	89,805	16,325	3,736
2014			0	1,838	16,146	6,624	1,542
2015				2,123	73,062	1,511	12,567
2016	327		1,601	4,626	12,344	1,440	2,100
2017	1,880		0	16,534	78,831	1,365	9,175
2018	393	0	466	9,086	16,177	1,782	0

		VA	NC	SC	GA	FL	Total
2009		59,169	204,814	28,583	27,325	2,028	364,208
2010		12,745	110,770	33,968	6,752	589	189,337
2011		18,999	48,727	17,834	1,796	471	96,644
2012		46,275	96,947	51,947	7,436	988	543,019
2013		4,336	63,090	28,117	4,407	2,086	233,298
2014		32,380	71,912	24,733	7,896	905	163,976
2015		10,286	143,543	74,085	1,673	143	318,993
2016		37,664	77,341	22,843	5,328	1,251	166,865
2017		14,405	51,795	45,836	55,471	848	276,140
2018		5,556	30,935	10,705	13,805	1,404	90,309

Notes: FL: state-reported landings 1983-present (NMFS-reported, FES-calibrated estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters).

Table 6. Recreational releases (numbers) of weakfish by state, 2009-2018 (Source: MRIP FES-calibrated estimates, except as noted below). Atlantic coastal releases that occurred outside the management area (ME-NH) are included in the Total though not shown at the state level.

Year	MA	RI	CT	NY	NJ	DE	MD
2009				6,702	205,284	10,106	29,705
2010	1,853			6,799	240,108	42,070	417,219
2011				118,616	288,439	13,584	50,974
2012				29,613	1,383,894	212,573	72,092
2013		32,344		18,652	330,665	51,611	19,847
2014			724	794	193,962	55,077	27,392
2015				14,459	598,126	33,522	340,850
2016	4,130		1,932	8,767	278,043	62,864	161,159
2017	557		791	138,156	146,036	38,219	41,674
2018	8,072	1,139	2,206	124,349	40,600	26,657	5,029

		VA	NC	SC	GA	FL	Total
2009		168,214	494,626	112,183	29,232	285	1,056,337
2010		532,657	739,955	123,236	18,048	38	2,121,983
2011		743,528	374,910	19,138	21,044	520	1,630,753
2012		273,507	381,441	332,241	85,553	0	2,770,914
2013		205,203	252,362	23,534	21,012	561	955,791
2014		374,944	1,067,230	568,787	7,640	614	2,297,164
2015		232,363	1,608,036	215,117	48,052	0	3,090,525
2016		1,467,470	1,091,422	118,374	16,152	0	3,210,313
2017		454,456	351,433	186,547	95,061	0	1,452,930
2018		233,912	300,195	85,941	31,987	512	860,599

Notes: FL: state-reported landings 1983-present (NMFS-reported, FES-calibrated estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters).

Table 7. Indices of relative weakfish abundance from 2009 to 2018. (Source: State compliance reports)

Year	MA Tr BB & VS YOY	MA Tr BB & VS 1+	RI Tr Coast YOY	CT Tr LIS YOY	CT Tr LIS 1+	NY Tr Coast YOY	NJ Tr DE Bay YOY	NJ Tr Ocean 1+	DE Tr DE Bay YOY	DE Tr Inland YOY	DE Tr DE Bay 1+
	mean#/ tow	mean#/ tow	mean #/ tow	GM#/ tow	GM#/ tow	AM#/ tow	GM#/ tow	GM#/ tow	GM#/ tow	GM#/ tow	#/ nm
2009			7.29	6.48	0.30	13.30	7.29	0.33	8.56	5.91	35.83
2010			7.95			15.30	10.51	0.69	11.98	3.49	43.57
2011			70.63	11.64	0.68	34.50	15.80	22.32	7.89	3.30	89.22
2012			122.30	21.96	0.73	9.40	1.26	0.23	7.55	3.44	106.43
2013			13.20	7.01	0.52	22.60	15.55	0.39	13.49	4.47	71.78
2014			1.27	41.53	0.08	97.70	4.87	0.98	13.67	4.71	38.01
2015	0.21		46.47	30.91	0.46	56.00	2.27	1.44	10.22	3.88	76.46
2016	23.00	0.29	4.14	5.87	0.81	57.60	2.34	1.34	7.47	3.00	154.40
2017	0.30	0.00	32.25	8.20	0.43	59.20	4.13	3.74	5.18	1.44	101.98
2018	3.89	0.03	60.85	25.66	0.56	139.90	7.19	2.67	6.92	2.45	133.19

Table 7 (continued). Indices of relative weakfish abundance from 2000 to 2017. (Source: State compliance reports)

Year	MD Tr ChesBay YOY	MD Tr Coast YOY	VA Tr ChesBay YOY	NC Tr Pamlico YOY	NC Tr Pamlico YOY	NC Gn Pamlico 1+	SC Tr Inshore YOY	SC SEAMAP Summer 0+/1+	SC SEAMAP Fall 0+/1+	GA Tr Coast 0+	FL Tr Jax YOY	FL Tr IR & Jax 1+
	GM#/ tow	GM#/ ha	GM#/ tow	#/ tow	#/ tow	#/ set	#/ tow	#/ tow	#/ tow	#/ obs hr	med/ tow	med/ tow
2009	1.42	1.33	6.18	58.89		0.31		15.30	11.90	104.76	2.12	1.17
2010	1.68	2.16	14.11	32.45		0.48		14.80	14.60	128.48	0.74	0.70
2011	2.04	1.90	5.23	33.69		0.36		74.10	13.90	104.20	0.74	0.52
2012	0.46	0.46	3.02	40.66		0.92		18.80	9.80	91.64	1.79	0.65
2013	2.15	1.02	9.41	58.53		0.69		25.50	0.20	131.52	0.69	0.12
2014	2.95	1.28	3.77	32.83		0.50		12.00	7.60	64.16	0.62	0.19
2015	2.23	0.88	3.77	43.30		0.30	19.30	18.20	257.80	89.84	1.08	0.03
2016	0.71	1.69	1.44	43.00	34.50	0.30	22.60	14.50	24.30	62.40	0.69	0.21
2017	0.65	0.54	2.41	41.90	19.10	0.31	26.60	1.46	5.73	44.30	0.49	0.27
2018	1.03	1.48		16.68		0.23				94.90	0.00	0.23

Table 8. Evaluation of the Coastwide Management Trigger (Section 3.3.1 of Addendum II to Amendment 4): percent change of each state's 2018 total landings (lbs) to its five-year (2014-2018) mean total landings.

	MA	RI	CT	NY	NJ	DE	MD
2014-2018	2,015	11,992	3,869	47,828	85,878	4,079	16,951
2018	1,946	8,785	3,408	42,663	32,100	4,999	555
% change	-3%	-27%	-12%	-11%	-63%	23%	-97%
	PRFC	**VA**	**NC**	**SC**	**GA**	**FL**	
2014-2018	6	42,991	157,567	46,615	15,040	1,633	
2018	0	29,670	65,057	19,930	16,492	2,490	
% change	-100%	-31%	-59%	-57%	10%	53%	

Table 9. Biological sampling of weakfish in 2018, Massachusetts-Florida (Sampling requirements are based on Addendum I to Amendment 4 and 2018 landings data and are reported in state compliance reports. Values highlighted with red bold font do not meet sampling requirements).

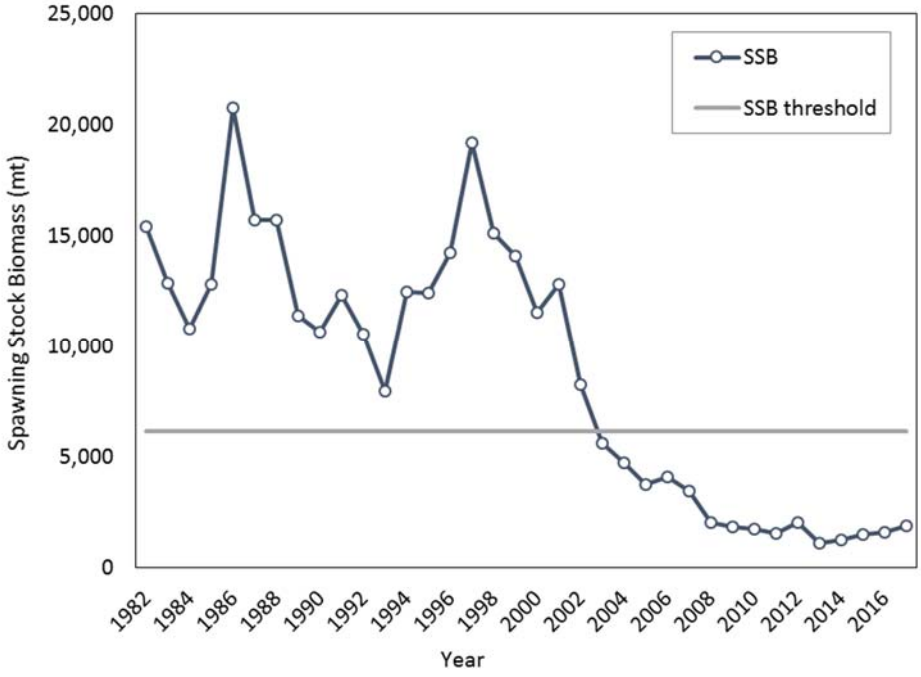
	Samples Required		Samples Completed		Fisheries Sampled
	Ages	Lengths	Ages	Lengths	
MA*	7	6	0	0	NA
RI	23	47	38	93	commercial, RIDFW Trawl Survey
CT*	5	11	0	0	NA
NY	78	100	50	50	commercial (GN, TR, PN, H&L)
NJ	314	16	144	144	commercial, recreational
DE	5	4	0	0	commercial (GN)
MD	9	2	15	16	commercial (PN)
PRFC	0	0	0	0	NA
VA	29	15	289	3,009	commercial (GN, PN, HS), recreational
NC	192	233	170	804	commercial (SN, GN, PN, HS, TR, H&L), recreational
SC	80	0	80	700	fishery independent (additional samples from fishery-dependent sources)
GA*	65	0	5	5	recreational
FL*	3	5	0	0	NA

**de minimis* in 2018; not required to conduct sampling; sample numbers provided to show from what states were exempt

NA=not applicable, GN= gill net, PN=pound net, H&L=hook and line, HS=haul seine, SN=sink net

XI. Figures

Figure 1. Spawning stock biomass (top) and total mortality (bottom) plotted with their respective targets and thresholds, where defined (ASMFC 2019).



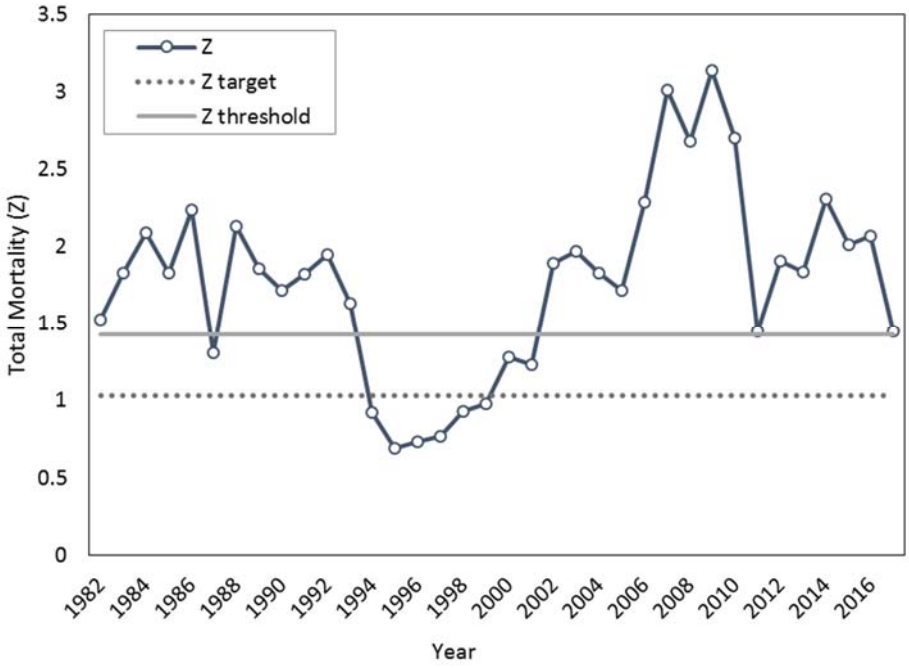


Figure 2. Commercial and recreational weakfish harvest (pounds), from 1950 to 2018 (see Tables 3 and 4 for source information and values). Recreational data is unavailable prior to 1981.

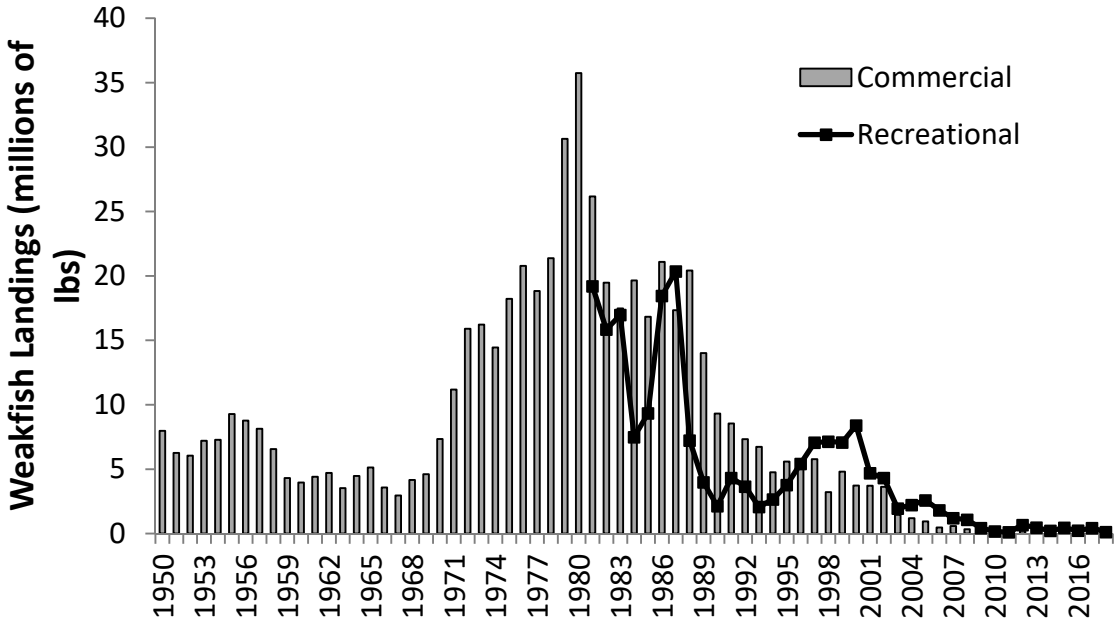
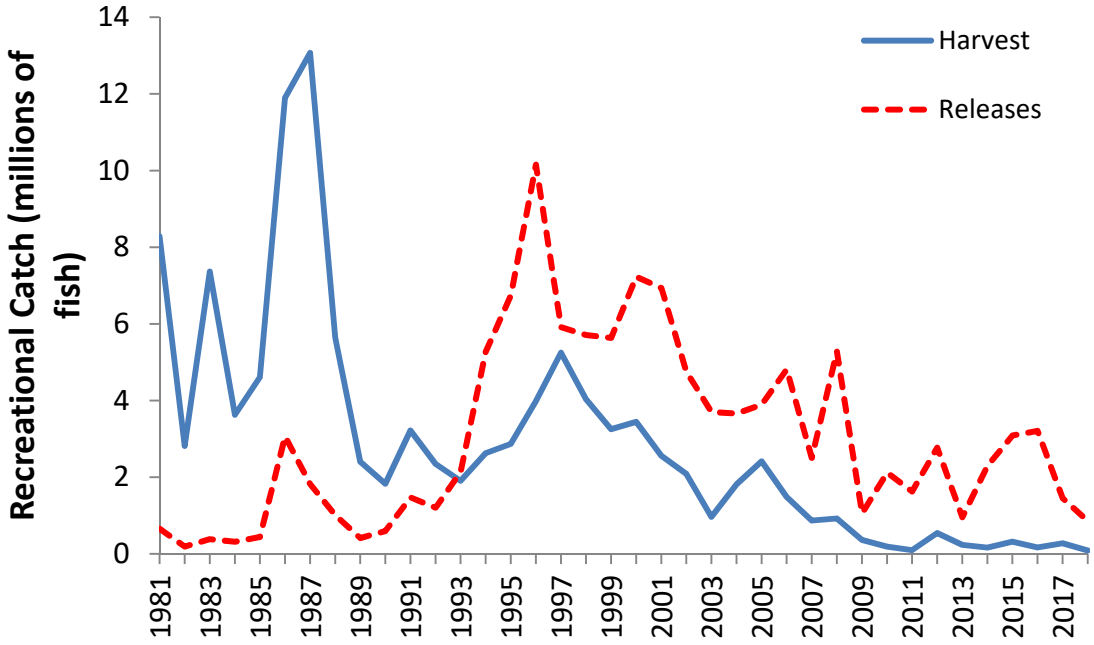


Figure 3. Recreational weakfish harvest and releases (number of fish), from 1981 to 2018 (see Tables 5 and 6 for source information and values).



Maine Center for COASTAL FISHERIES

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October 22, 2019

Chairman Armstrong and River Herring and Shad Management Board Members
Atlantic States Marine Fisheries Commission

Dear Mr. Armstrong and Board Members,

My name is Mike Thalhauser, Fisheries Biologist with the Maine Center for Coastal Fisheries and I would like to express my and Maine Center for Coastal Fisheries' full support of the Maine Department of Marine Resource's proposed addendum to the Maine Sustainable Fishery Management Plan for River Herring. In addition to my position at MCCF, I sit on the Shad and River Herring Advisory Panel.

This addendum will reduce the burden that towns currently have to take on in order to see any benefit from a local and sustainable commercial river herring fishery. In turn, it will incentivize more communities to participate in local restoration efforts and in data collection, that this board's technical committee has repeatedly indicated is needed to responsibly manage river herring at the state and federal level.

Federal and state government lack the capacity to collect these data and to support local fish restoration projects. The one common theme in river herring success stories is that local communities support the efforts and are actively participating. In Maine, these communities are fishing communities that have strong socio-economic ties to local river herring fisheries. In order to gain the support, Maine (with this addendum) will take advantage of these socio-economic connection that ASMFC encouraged in Amendment 2 of the Shad and River Herring IFMP where it states that:

"Considering the socioeconomic aspects of river herring management at the state and regional level should increase the likelihood of implementing or continuing those monitoring and research tasks."

Maine DMR staff members worked collaboratively with myself, stakeholders, and other support organizations to create this addendum that will allow communities to benefit from participating in monitoring and associated harvest/management. Because of this collaborative approach, this work will have full support of these sectors and a better chance for success.

This strategy should be encouraged in other states that support river herring populations, and the ASMFC should support more management that takes advantage of the capacity of fishermen and fishing communities.

Sincerely,

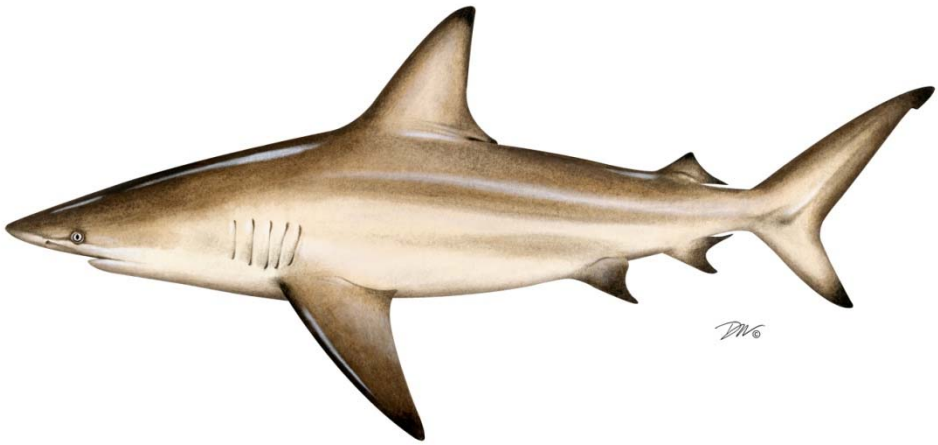
Mike Thalhauser
Fisheries Biologist

Paul Anderson
Executive Director

2019 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR

COASTAL SHARKS

2018 FISHING YEAR



Coastal Sharks Plan Review Team

Bryan Frazier, South Carolina Department of Natural Resources
Tina Moore, North Carolina Department of Environmental Quality
Karyl Brewster-Geisz, NOAA Fisheries
Gregory Skomal, Massachusetts Division of Marine Fisheries
Kirby Rootes-Murdy, Atlantic States Marine Fisheries Commission, Chair

Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval:	August 2008
Amendments:	None
Addenda:	Addendum I (September 2009) Addendum II (May 2013) Addendum III (October 2013) Addendum IV (August 2016)
Management Unit:	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
States With Declared Interest:	Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Active Boards/Committees:	Coastal Shark Management Board, Advisory Panel, Technical Committee, and Plan Review Team

a) Goals and Objectives

The Interstate Fishery Management Plan for Coastal Sharks (FMP) established the following goals and objectives.

GOAL

The goal of the Interstate Fishery Management Plan for Coastal Sharks is "to promote stock rebuilding and management of the coastal shark fishery in a manner that is biologically, economically, socially, and ecologically sound."

OBJECTIVES

In support of this goal, the following objectives proposed for the FMP include:

1. Reduce fishing mortality to rebuild stock biomass, prevent stock collapse, and support a sustainable fishery.
2. Protect essential habitat areas such as nurseries and pupping grounds to protect sharks during particularly vulnerable stages in their life cycle.
3. Coordinate management activities between state and federal waters to promote complementary regulations throughout the species' range.
4. Obtain biological and improved fishery related data to increase understanding of state water shark fisheries.
5. Minimize endangered species bycatch in shark fisheries.

b) Fisheries Management Plan Summary

The Atlantic States Marine Fisheries Commission (Commission) adopted its first fishery management plan (FMP) for coastal sharks in 2008. Coastal sharks are managed under this plan as six different complexes: prohibited, research, small coastal, non-sandbar large coastal, pelagic and smooth dogfish. The Board does not actively set quotas for any shark species. The Commission follows National Oceanic and Atmospheric Administration's (NOAA Fisheries) openings and closures for small coastal sharks, non- sandbar large coastal shark, and pelagic sharks. Species in the prohibited category may not be possessed or taken. Sandbar sharks may only be taken with a shark fishery research permit. All species must be landed with their fins attached to the carcass by natural means.

The FMP has been adapted through the following addenda:

Addendum I (2009) modified the FMP to allow limited smoothhound processing at sea (removal of fins from the carcass), as long as the total wet weight of the shark fins does not exceed 5 percent of the total dressed weight. In addition, smoothhound recreational possession limits and gill net check requirements for smoothhound fishermen were removed. These restrictions were removed because they were intended for large coastal sharks. The removal allowed smoothhound fishermen to continue operations while upholding the conservation measures of the FMP.

Addendum II (2013) modified the FMP to allow year-round smoothhound processing at sea. If fins are removed the total wet weight of the shark fins may not exceed 12 percent of the total dressed weight. State-shares of the smoothhound coastwide quota were allocated. The goal of Addendum II was to implement an accurate fin-to-carcass ratio and prevent any one state from harvesting the entire smoothhound quota.

Addendum III (2013) modified the species groups in the FMP to ensure consistency with NOAA Fisheries (Table 1). The recreational size limit for the hammerhead species group was increased to 78" fork length.

Addendum IV (2016) was added to reflect measures outlined in the Shark Conservation Act into state regulations. It amends the Coastal Sharks FMP to allow smoothhound carcasses to be landed with corresponding fins removed from the carcass as long as the total retained catch, by weight, is composed of at least 25 percent smooth dogfish. Fishermen can retain smoothhound in an amount less than 25 percent of the total catch provided the smoothhound fins remain naturally attached to the carcass.

Addendum V (2018) provides the Board the ability to respond to changes in the stock status of coastal shark populations and adjust regulations through Board action rather than an addendum, ensuring greater consistency between state and federal shark regulations. Moving forward the Board to change a suite of commercial and recreational measures, such as recreational size and possession limits, season length, and area closures (recreational and

commercial) in addition to the current specifications for just the commercial fishery, throughout the year when needed.

In 2019, in response to measures implement by NOAA Fisheries through Amendment 11 for federal Highly Migratory Species (HMS) Permit Holders, the Board approved changes to the recreational size limit for Atlantic shortfin mako sharks in state waters, specifically, a 71-inch straight line fork length (FL) for males and an 83-inch straight line FL for females. These measures, were implemented in response to the 2017 Atlantic shortfin mako stock assessment that found the resource is overfished and experiencing overfishing. The states will implement the changes to the recreational minimum size limit for Atlantic shortfin mako by January 1, 2020.

Table 1. List of commercial shark management groups

Species Group	Species within Group
Prohibited	Sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, reef, narrowtooth, Caribbean sharpnose, smalltail, Atlantic angel, longfin mako, bigeye thresher, sharpnose sevengill, bluntnose sixgill and bigeye sixgill sharks
Research	Sandbar sharks
Non-Blacknose Small Coastal	Atlantic sharpnose, finetooth, and bonnethead sharks
Blacknose	Blacknose sharks
Aggregated Large Coastal	Silky, tiger, blacktip, spinner, bull, lemon, and nurse
Hammerhead	Scalloped hammerhead, great hammerhead and smooth hammerhead
Pelagic	Shortfin mako, porbeagle, common thresher, oceanic whitetip and blue sharks
Smoothhound	Smooth dogfish and Florida smoothhound

II. Status of the Stocks

Stock status is assessed by species or by species complex if there is not enough data for an individual assessment. Fourteen species have been assessed domestically, three species have been assessed internationally, and the rest have not been assessed. Table 2 describes the current stock status of several shark species along with references for the stock assessment.

The 2017 International Commission on the Convention of Atlantic Tunas (ICCAT) assessment of the North Atlantic population of shortfin mako indicates that the stock is overfished and overfishing is occurring. Multiple models were explored and new data sources integrated. Combined probability of overfishing occurring and the stock being in an overfished state was 90% across all models.

The 2017 Southeast Data and Assessment Review (SEDAR 54) stock assessment for sandbar sharks indicates the stock is overfished and not experiencing overfishing. This assessment used a new approach (Stock Synthesis) instead of the State Space Age Structure Production Model that was used in the previous assessment (SEDAR 21). A replication analysis conducted using the prior model (updated with data through 2015) resulted in the same stock status as the new model (overfished, no overfishing occurring).

The 2016 stock assessment update (SEDAR 21) for Atlantic dusky sharks indicates the stock is overfished and experiencing overfishing. This latest review functioned an update to the 2011 assessment, so no new methodology was introduced. However, all model inputs were updated with more recent data (i.e. 2010-2015 effort, observer, and survey data).

In 2015, a benchmark stock assessment (SEDAR 39) was conducted for the smoothhound complex, including smooth dogfish, the only species of smoothhound occurring in the Atlantic. The assessment indicates Atlantic smooth dogfish (*Mustelus canis*) are not overfished and not experiencing overfishing.

The North Atlantic blue shark (*Prionace glauca*) stock was assessed by ICCAT's Standing Committee on Research and Statistics (SCRS) in 2015. Similar to results of the 2008 stock assessment, ICCAT's 2015 analysis, the assessment indicated the stock is not overfished and not experiencing overfishing. However, scientists acknowledge there is a high level of uncertainty in the data inputs and model structural assumptions; therefore, the assessment results should be interpreted with caution.

SEDAR 34 (2013) assessed the status of Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*) and bonnetheads (*Sphyrna tiburo*). The Atlantic sharpnose shark stock is not overfished and not experiencing overfishing. The stock status of bonnethead stocks (Atlantic and Gulf of Mexico) is considered unknown. Assessment results indicated the stock was not overfished with no overfishing occurring, however all available data pointed towards separate stocks. As the assessment framework would not allow stocks to be split, the assessment continued under a single stock scenario. The results of the assessment were rejected by reviewers noting that the stocks need to be assessed independently. A benchmark assessment is recommended for both stocks of bonnetheads.

A 2011 benchmark assessment (SEDAR 21) of dusky (*Carcharhinus obscures*), sandbar (*Carcharhinus plumbeus*), and blacknose (*Carcharhinus acrontus*) sharks indicates that dusky and blacknose sharks are overfished and experiencing overfishing. Sandbar sharks continued to be overfished (SEDAR 54). As described in the Magnuson-Stevens Act, NOAA Fisheries must establish a rebuilding plan for an overfished stock. As such, the rebuilding date for dusky sharks is 2108, sandbar sharks is 2070, and blacknose sharks is 2043.

Porbeagle sharks (*Lamna nasus*) were assessed by the ICCAT's SCRS in 2009. The assessment found the Northwest Atlantic stock is increasing in biomass, however the stock is considered to

be overfished with overfishing not occurring. NOAA Fisheries established a 100-year rebuilding plan for porbeagle sharks; the expected rebuilding date is 2108.

A 2009 stock assessment for the Northwest Atlantic and Gulf of Mexico populations of scalloped hammerhead sharks (*Sphyrna lewini*) indicated the stock is overfished and experiencing overfishing. This assessment was reviewed by NOAA Fisheries and deemed appropriate to serve as the basis for U.S. management decision. In response to the assessment findings, NOAA Fisheries established a scalloped hammerhead rebuilding plan that will end in 2023. However, since the assessment, research has determined that in the US Atlantic a portion of animals considered scalloped hammerheads are actually a cryptic species, recently named the Carolina hammerhead (*Sphyrna gilberti*). Little to no species-specific information exists regarding the distribution, abundance and life history of the two species, therefore for now, both species are currently managed under the name scalloped hammerhead.

SEDAR 11 (2006) assessed the Large Coastal Sharks (LCS) complex and blacktip sharks (*Carcharhinus limbatus*). The LCS assessment suggested that it is inappropriate to assess the LCS complex as a whole due to the variation in life history parameters, different intrinsic rates of increase, and different catch and abundance data for all species included in the LCS complex. Based on these results, NMFS changed the status of the LCS complex from overfished to unknown. As part of SEDAR 11, blacktip sharks were assessed for the first time as two separate populations: Gulf of Mexico and Atlantic. The results indicated that the Gulf of Mexico stock is not overfished and overfishing is not occurring, while the current status of blacktip sharks in the Atlantic region is unknown.

Table 2. Stock Status of Atlantic Coastal Shark Species and Species Groups

III. Status of the Fishery

Specifications (Opening, closures, quotas)

NOAA Fisheries sets quotas for coastal sharks through the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan. The opening dates, closures dates and quotas are detailed in Table 3. All non-prohibited coastal shark management groups, except aggregated large coastal and hammerheads shark groupings, opened on January 1, 2018. NOAA Fisheries closes commercial shark fisheries when 80% of the available quota is reached. Commercial shark dealer reports indicate the following commercial fisheries exceeded 80% of the available quota and had an early closure: blacknose, non-blacknose small coastals, aggregated large coastal and hammerhead fisheries. When the fishery closes in federal waters, the Interstate FMP dictates that the fishery also closes in state waters.

Species or Complex Name	Stock Status		References/Comments
	Overfished	Overfishing	
Pelagic			
Porbeagle	Yes	No	Porbeagle Stock Assessment, ICCAT Standing Committee on Research and Statistics Report (2009); Rebuilding ends in 2108 (HMS Am. 2)
Blue	No	No	ICCAT Standing Committee on Research and Statistics Report (2015)
Shortfin mako	Yes	Yes	ICCAT Standing Committee on Research and Statistics Report (2017)
All other pelagic sharks	Unknown	Unknown	
Aggregated Large Coastal Sharks (LCS)			
Atlantic Blacktip	Unknown	Unknown	SEDAR 11 (2006)
Aggregated Large Coastal Sharks - Atlantic Region	Unknown	Unknown	SEDAR 11 (2006); difficult to assess as a species complex due to various life history characteristics/ lack of available data
Non-Blacknose Small Coastal Sharks (SCS)			
Atlantic Sharpnose	No	No	SEDAR 34 (2013)
Bonnethead	Unknown	Unknown	SEDAR 34 (2013)
Finetooth	No	No	SEDAR 13 (2007)
Hammerhead			
Scalloped	Yes	Yes	SEFSC Scientific Review by Hayes et al. (2009); Rebuilding ends in 2023 (HMS Am. 5a)
Blacknose			
Blacknose	Yes	Yes	SEDAR 21 (2010); Rebuilding ends in 2043 (HMS Am. 5a)
Smoothhound			
Atlantic Smooth Dogfish	No	No	SEDAR 39 (2015)
Research			
Sandbar	Yes	No	SEDAR 54 (2017)
Prohibited			
Dusky	Yes	Yes	SEDAR 21 (2016); Rebuilding ends in 2108 (HMS Am. 2)
All other prohibited sharks	Unknown	Unknown	

Table 3. Commercial quotas and opening dates for 2018 shark fishing season

Species Group	Region	2018 Annual Quota (mt dw)	Season Opening Dates	Closing Date
Aggregated Large Coastal Sharks (LCS)	Atlantic	168.9	June 1, 2018	
Hammerhead Sharks	Atlantic	27.1	June 1, 2018	
Non-Blacknose Small Coastal Sharks (SCS)	Atlantic	264.1	January 1, 2018	
Blacknose Sharks	Atlantic	17.2	January 1, 2018	
Blue Sharks	No regional quotas	273.0	January 1, 2018	
Porbeagle Sharks	No regional quotas	1.7	January 1, 2018	
Pelagic Sharks other than Porbeagle or Blue	No regional quotas	488.0	January 1, 2018	
Shark Research Quota (Aggregated LCS)	No regional quotas	50.0	January 1, 2018	
Sandbar Research Quota	No regional quotas	90.7	January 1, 2018	

Commercial Landings

Commercial landings of Atlantic large coastal sharks species in 2018 were 434,653 pounds (lbs) dressed weight (dw), a 14% increase from 2017 landings (Table 4). Commercial landings of small coastal shark species in 2018 were 403,706 lbs dw, a 37% increase from 2017 landings (Table 5). 2016 Landings were the lowest for the time series over the last 9 years and a result of the early closure of both blacknose and non-blacknose sharks south of 34˚00' N. latitude on May 29, 2016. Commercial landings of Atlantic pelagic sharks was 167,159 lbs dw, which represents an approximate 33% increase from 2017 landings (Table 6).).

Table 4. Commercial landings of authorized Atlantic large coastal sharks by species (pounds dw), 2009-2018. Source: ACCSP Data Warehouse, August 2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Great hammerhead	0	0	371	7,406	13,538	36,892	20,454	17,646	31,876
Scalloped hammerhead	0	0	15,800	27,229	24,652	13,197	12,329	4,919	8,238
Smooth hammerhead	7,802	110	3,967	1,521	601	304	125	1,193	737
Unclassified	43,345	35,618	9,617	0	0	0	0	0	
Hammerhead Total	**51,147**	**35,728**	**29,755**	**36,156**	**38,791**	**50,393**	**32,908**	**23,758**	**40,851**
Blacktip	246,617	176,136	215,403	256,277	282,009	229,823	248,470	205,138	170,969
Bull	56,901	49,927	24,504	33,980	32,372	33,737	31,417	23,802	23,163
Lemon	25,316	45,448	21,563	16,791	13,047	18,158	19,205	12,005	12,293
Nurse	71	0	81	0	0	24	0	0	
Silky	1,049	992	29	186	289	1,246	446	702	239
Spinner	13,544	4,113	10,643	26,892	25,716	33,002	55,610	62,314	83,006
Tiger	43,145	36,425	23,245	16,561	29,062	28,460	14,896	6,324	5,657
Unclassified	2,229	50,711	53,705	0	0	0	0		
Aggregated LCS Total	**388,872**	**363,752**	**349,173**	**350,687**	**382,495**	**344,450**	**370,044**	**310,286**	**295,326**
Sandbar	84,339	94,295	46,446	46,868	82,308	112,610	62,984	47,023	98,476
Hammerhead, Aggregated LCS, Sandbar Total	**524,358**	**493,775**	**425,374**	**433,711**	**503,594**	**507,453**	**465,936**	**381,067**	**434,653**

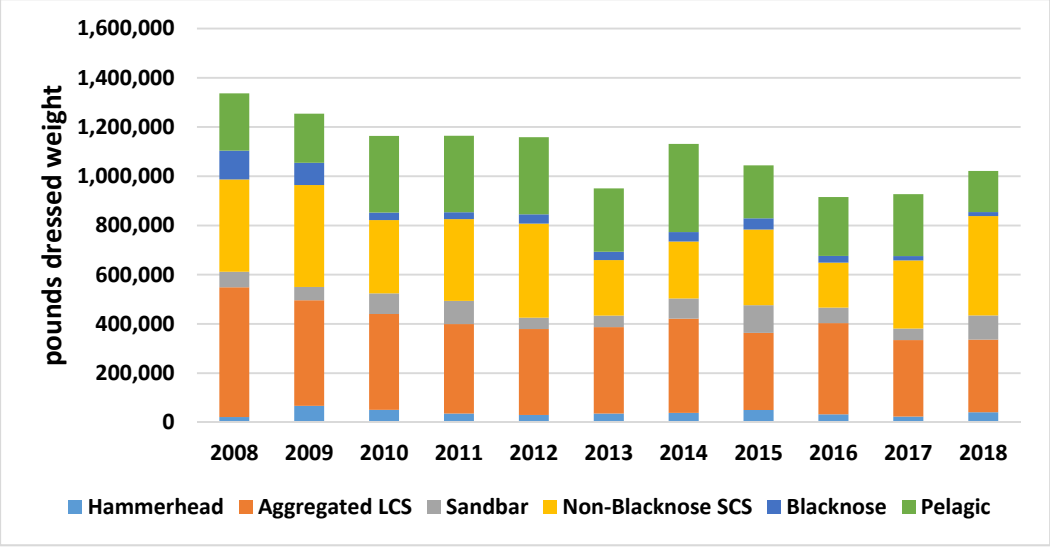
Table 5. Commercial landings of authorized Atlantic small coastal sharks by species (lbs dw), 2009-2018. Source: ACCSP Data Warehouse, August 2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Blacknose	30,287	28,373	37,873	33,382	38,437	45,405	26,842	17,241	15,711
Bonnethead	9,069	28,284	19,907	22,845	13,221	5,885	1,688	6,077	6,059
Finetooth	76,438	52,318	15,922	19,452	19,026	8,712	5,647	19,874	23,356
Atl. Sharpnose	211,190	214,382	345,625	183,524	198,568	293,128	175,890	251,289	374,291
Unclassified assigned to SCS	851	36,639	492	0	0	0	0	19,874	0
SCS Total	**327,835**	**359,996**	**419,819**	**259,203**	**269,252**	**353,130**	**210,067**	**294,481**	**419,417**

Table 6. Commercial landings of authorized pelagic sharks by species off the Atlantic coast of the United States (lbs dw), 2010-2018. Source: ACCSP Data Warehouse, August 2019.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Blue	9,135	13,370	17,200	9,767	17,806	1,114	607	4,272	
Porbeagle	4,097	5,933	4,250	54	6,414	0	0	C	1,092
Shortfin Mako	220,400	207,630	198,841	199,177	218,295	141,720	160,829	184,993	77,988
Unclassified Mako	0	0	0	0	0	0	0	0	0
Oceanic whitetip	796	2,435	258	62	22	0	0	0	0
Thresher	61,290	47,462	63,965	48,768	116,012	72,463	78,219	61,990	88,079
Unclassified pelagic	16,160	33,884	28,932	0	0	0	0	0	0
Pelagic Total	**311,878**	**310,714**	**313,446**	**257,828**	**358,549**	**215,297**	**239,655**	**251,375**	**167,159**

Figure 1: Commercial landings of coastal sharks off the east coast of the United States by species complex, 2008-2018. Source: ACCSP Data Warehouse, August 2019



Recreational Landings

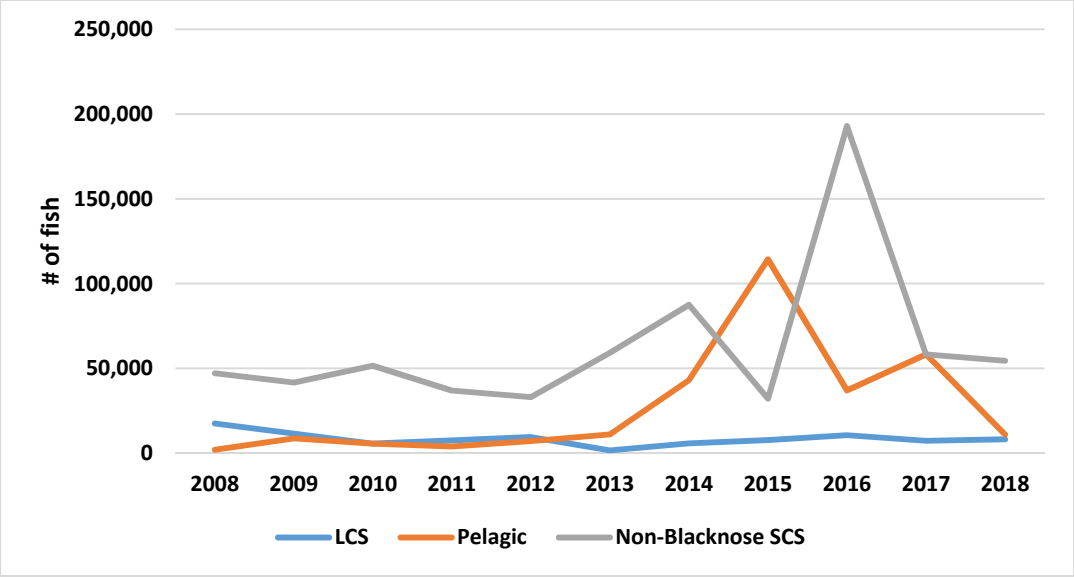
Approximately 114,212 sharks were harvested during the 2018 recreational fishing season, a decrease from 2016 landings by approximately 38% (Table 7). The non-blacknose small coastal shark group and pelagic shark group both comprised 35% of the overall recreational harvest.

Table 7. Estimated recreational harvest of all Atlantic shark species by species group in numbers of fish, 2010-2018. Source: ACCSP Data Warehouse, August 2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Aggregated LCS	5,540	7,397	9,386	1,547	5,704	7,622	10,596	7,215	8,128
Hammerhead	13	178	41	600	900	1	799	0	0
Pelagic*	5,529	3,806	7,034	11,057	43,047	114,282	37,009	58,259	10,943
Blacknose	0	573	0	70	4,146	1,211	225	13	0
Non-Blacknose SCS	51,529	36,851	33,005	59,208	87,480	32,065	192,855	58,239	54,416
Sandbar	2,193	1,125	857	399	1,873	1,252	5	2,604	0
Prohibited	4	23	15	16	2	0	0	6	
Smoothhound				46,115	55,792	88,316	145,689	58,446	40,725
Total	64,808	49,952	50,338	72,895	143,152	156,433	241,489	126,419	114,212

*Pelagic sharks include Gulf of Mexico landings.

Figure 2: Estimated recreational harvest for LCS, SCS and pelagic species by species group, in numbers of fish, 2009-2019. Source: ACCSP Data Warehouse, August 2019.



IV. Status of Research and Monitoring

Under the Interstate Fishery Management for Coastal Sharks, the states are not required to conduct any fishery dependent or independent studies; however, states are encouraged to submit any information collected while surveying for other species. This section describes the research and monitoring efforts through the 2018 fishing year, where available.

The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) appears in multiple state monitoring efforts. The survey monitors the presence of young-of-year and juvenile sharks along the east coast. It is managed and coordinated by NOAA's Northeast Fisheries Science Center (NEFSC) through the Apex Predators Program based at the NEFSC's Narragansett Laboratory in Rhode Island. Longline and gillnet sampling, along with mark-recapture techniques are used to determine relative abundance, distribution and migration of sharks utilizing nursery grounds from Massachusetts to Florida. In 2018, COASTSPAN program participants were the University of North Florida (samples Georgia and North Florida state waters) and the South Carolina Department of Natural Resources. In addition, the survey is conducted in summer months in Narragansett and Delaware Bays, and in Massachusetts waters. Standardized indices of abundance from COASTPAN surveys are used in the stock assessments for large and small coastal sharks.

Massachusetts

Movement and Habitat Studies:

White Shark: Massachusetts Division of Marine Fisheries' efforts to study the movement ecology of white sharks continued with an additional 19 sharks being tagged in 2018, bringing the total to 151 individuals since 2009. These sharks were tagged with one or more of the following technologies: pop-up satellite tag, real-time satellite tags, coded acoustic transmitters, active acoustic transmitters, and NMFS conventional tags. Work also continued on a five-year study (initiated in 2014) to quantify the regional population size and relative abundance of white sharks in Massachusetts waters; aerial and vessel surveys were conducted from mid-June through October off the eastern coast of Cape Cod.

Rhode Island

Fishery independent monitoring is limited to coastal shark species taken in the RI Division of Fish & Wildlife, Marine Fisheries Section monthly and seasonal trawl survey. During the 2018 calendar year the only coastal shark species captured in the trawl survey was smooth dogfish (*Mustelus canis*). A summary of fishery independent monitoring for coastal sharks is summarized in Figure 3 below.

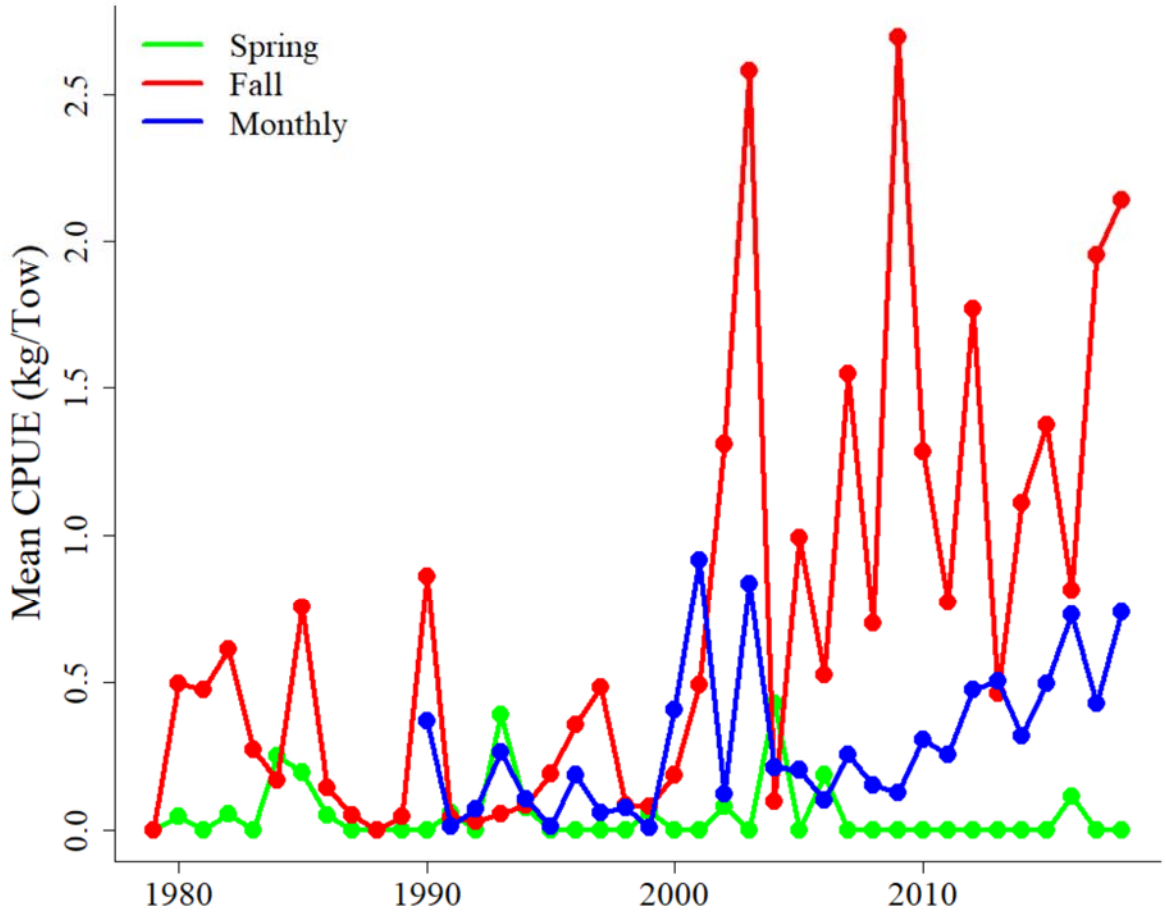


Figure 3. Smooth dogfish catch per unit effort (CPUE) from the RIDEM DMF bottom trawl through 2018.

Connecticut

The Connecticut Department of Energy and Environmental Protection monitors the abundance of marine resources in nearby coastal waters with the Long Island Sound Trawl Survey. Spring (April, May and June) and fall (September and October) surveys are conducted each year. Other than smooth dogfish, coastal sharks are not encountered by the Long Island Sound Trawl Survey. Smooth dogfish are caught most often in the fall and the fall indices are presented below. See the link below for the latest Long Island Sound Trawl Survey report.

Table 10. Long Island Trawl Survey Fall Smooth Dogfish indices (geometric mean catch/tow)

Year	Kg/tow	Count/tow

1996	1.16	0.80
1997	1.09	0.59
1998	1.32	0.72
1999	1.27	0.93
2000	2.85	1.88
2001	3.02	1.69
2002	6.09	3.58
2003	6.18	3.10
2004	2.95	1.44
2005	2.70	1.41
2006	2.46	0.94
2007	6.23	2.27
2008	1.25	0.63
2009	2.8	1.13
2010	-	-
2011	3.66	1.43
2012	4.69	2.41
2013	7.93	4.13
2014	11.05	5.78
2015	11.70	7.30
2016	8.30	5.24
2017	14.82	8.29
2018	9.57	7.17

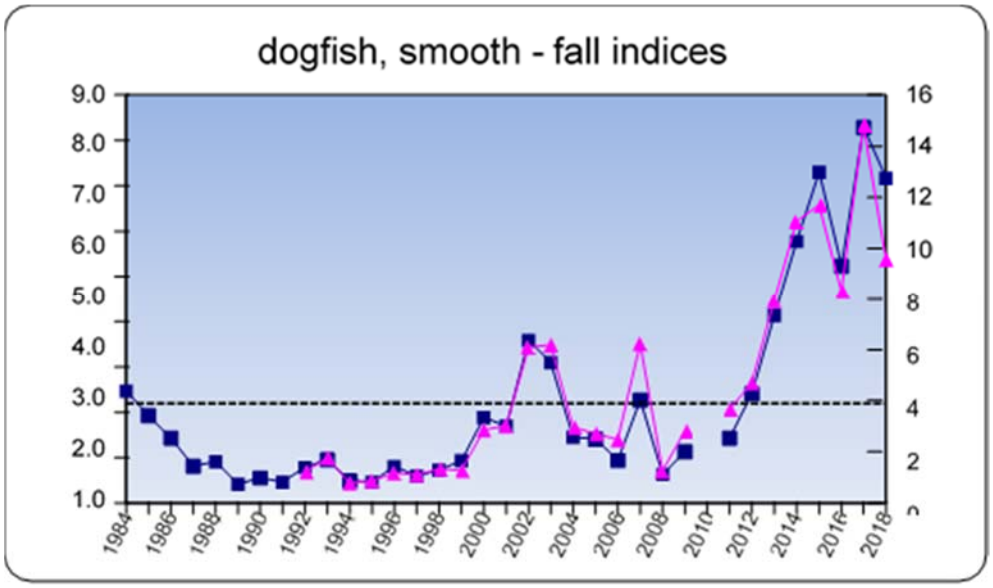


Figure 4. CT DEEP Smooth Dogfish Long Island Sound Trawl Survey

New York

While NY DEC does not currently conduct fishery-independent monitoring programs for Atlantic Coastal Sharks, multiple research permits was issued in 2018 for the collection of information on sand tiger sharks (*Carcharias taurus*), blue sharks (*Prionace glauca*), sandbar sharks (*Carcharhinus plumbeus*), shortfin mako sharks (*Isurus oxyrinchus*), and white sharks (*Carcharodon carcharias*). In 2018, two sand tiger sharks, two blue sharks, two sandbar sharks, four shortfin mako sharks, and two white shark were caught and released. Information on each (morphometrics and sex) as well location, date, biological samples collected, telemetry gear deployed, and final disposition of the animals were recorded.

New Jersey

New Jersey does not currently conduct any fishery-independent monitoring programs specifically for Atlantic Coastal Sharks, but does encounter sharks from the State's Ocean Stock Assessment Survey. In 2018, the Survey caught approximately 157 lbs of Atlantic Angel Sharks, 165 lbs of Atlantic Sharpnose Shark, 126 lbs of Sand Tiger Sharks, 22 lbs of Sandbar Sharks, 4,784 lbs of Smooth Dogfish, and 63 lbs of Thresher Sharks (see figure below). Sharks from the New Jersey Ocean Stock Assessment Survey were collected by a 30-meter otter trawl every January, April, June, August, and October since 1989. Tows are approximately 1 nautical mile and are performed via a stratified random sampling design. Latitudinal strata are identical to those used by the National Marine Fisheries Service groundfish survey. Longitudinal boundaries are defined by the 18-30, 30-60, and 60-90 foot isobaths. Smooth Dogfish are cumulatively weighed and measured by total length in centimeters. All other shark species are sorted by gender, weighed individually, and measured by total length in centimeters.

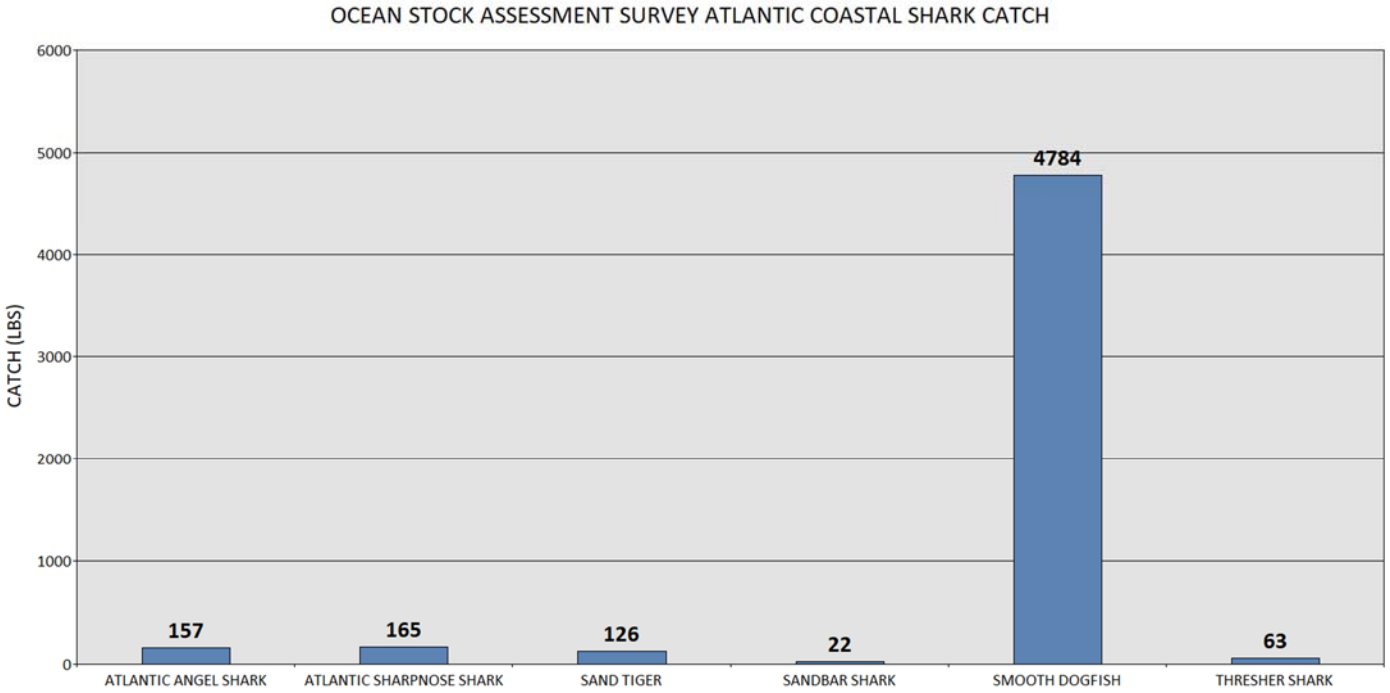


Figure 5. NJ 2018 Ocean Stock Assessment Survey- Atlantic Coastal Sharks

Delaware

Delaware conducts a 30' adult trawl survey and a 16' juvenile trawl survey in the Delaware Bay. In the adult trawl survey, Smoothhound are the most common shark species caught (Figure 6), with Sand Tiger Shark (Figure 7) and Sandbar Sharks (Figure 8) taken in low numbers. Thresher, Atlantic Angel, Atlantic Sharpnose (Figure 9) and Dusky shark were caught in the past, but rarely. There were no Sand Tiger Shark caught in the 2018 survey. Sandbar Shark catch per nautical mile increased in 2018 to its highest point since 1967. Smoothhound catch per nautical mile decreased slightly in 2018. In the juvenile trawl, the species caught were sand tiger shark (Figure 10), Sandbar Sharks (Figure 11) and Smoothhound (Figure 12). With the exception of Smoothhound, the capture of coastal sharks in the juvenile trawl is a rare occurrence.

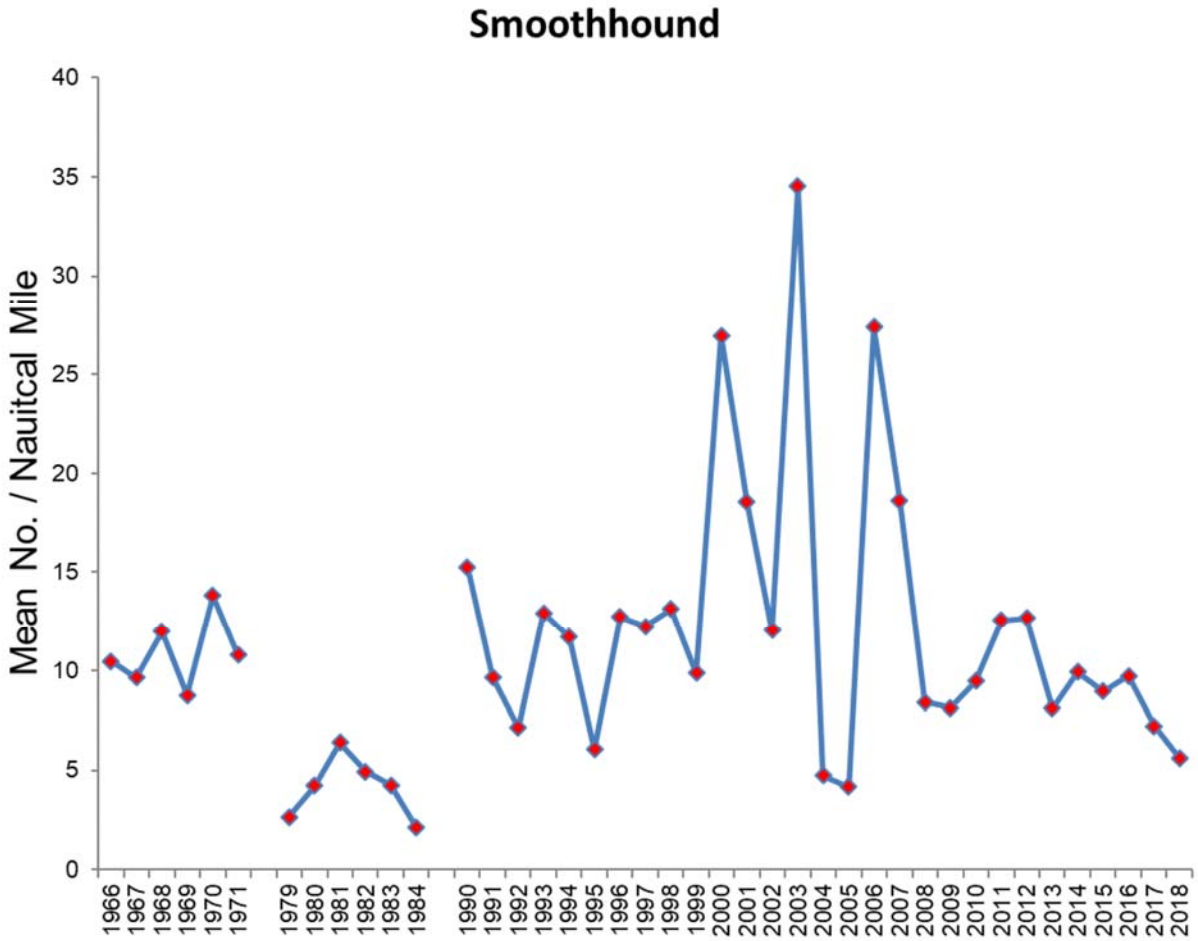


Figure 6. Smoothhound relative abundance (mean number per nautical mile), time series (1966 – 2018) as measured in 30-foot trawl sampling in the Delaware Bay.

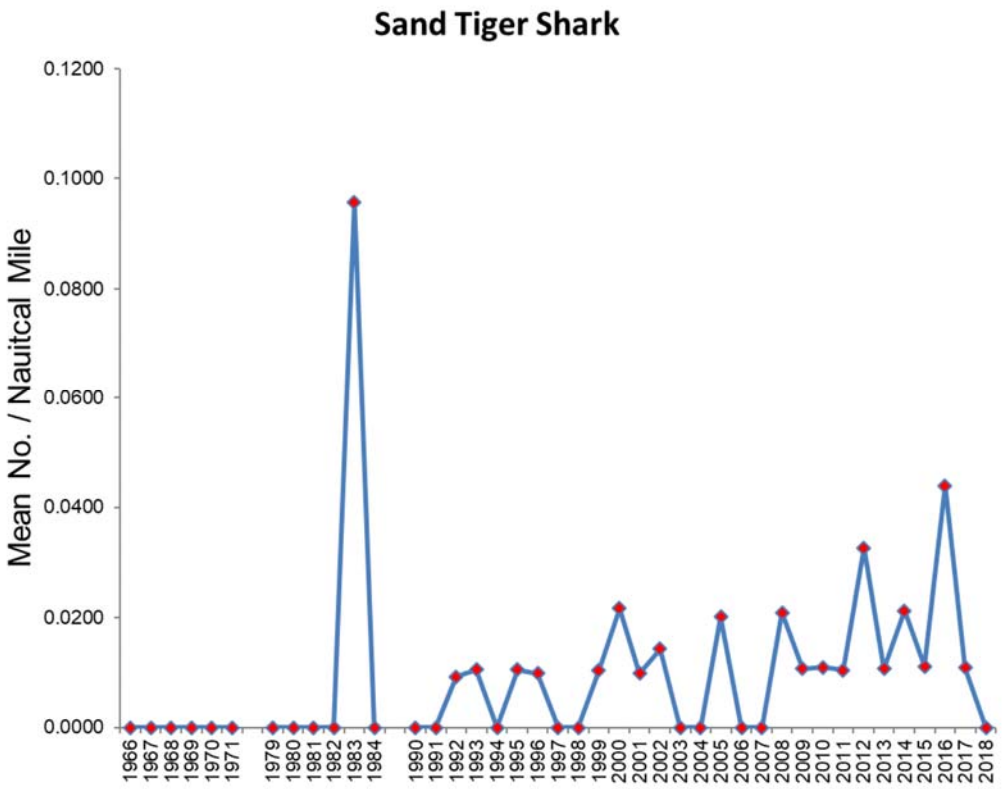


Figure 7. Sand Tiger Shark relative abundance (mean number per nautical mile), time series (1966 – 2018) as measured in 30-foot trawl sampling in the Delaware Bay.

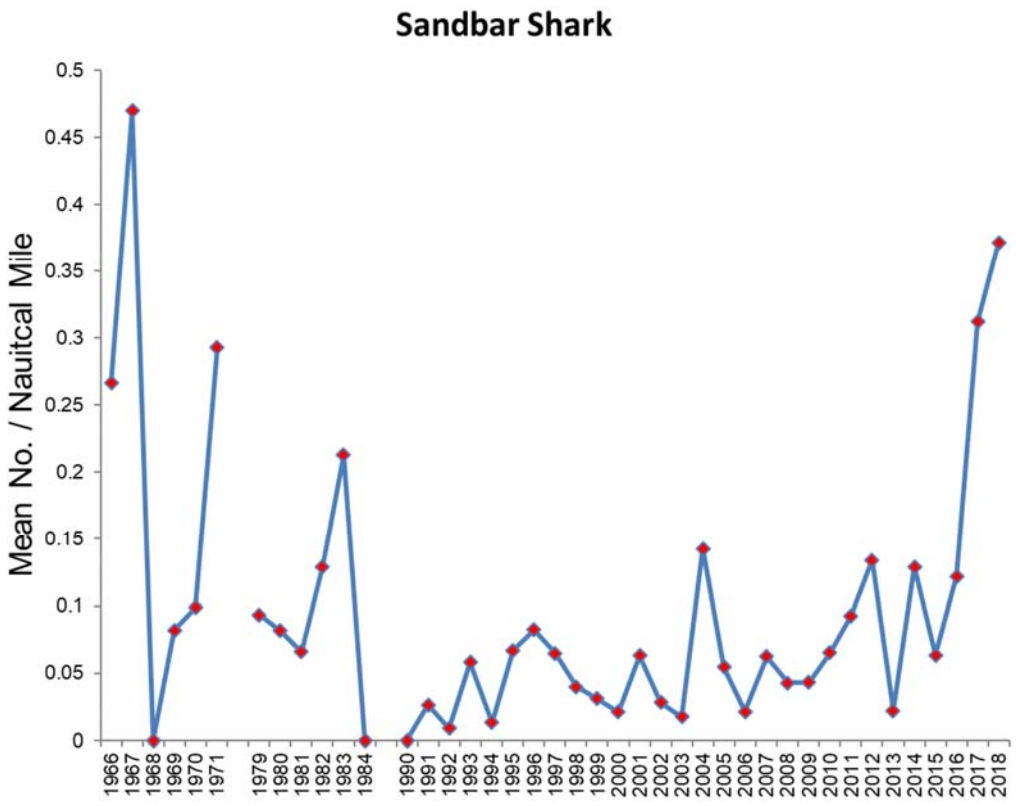


Figure 8. Sandbar Shark relative abundance (mean number per nautical mile), time series (1966 – 2018) as measured in 30-foot trawl sampling in the Delaware Bay.

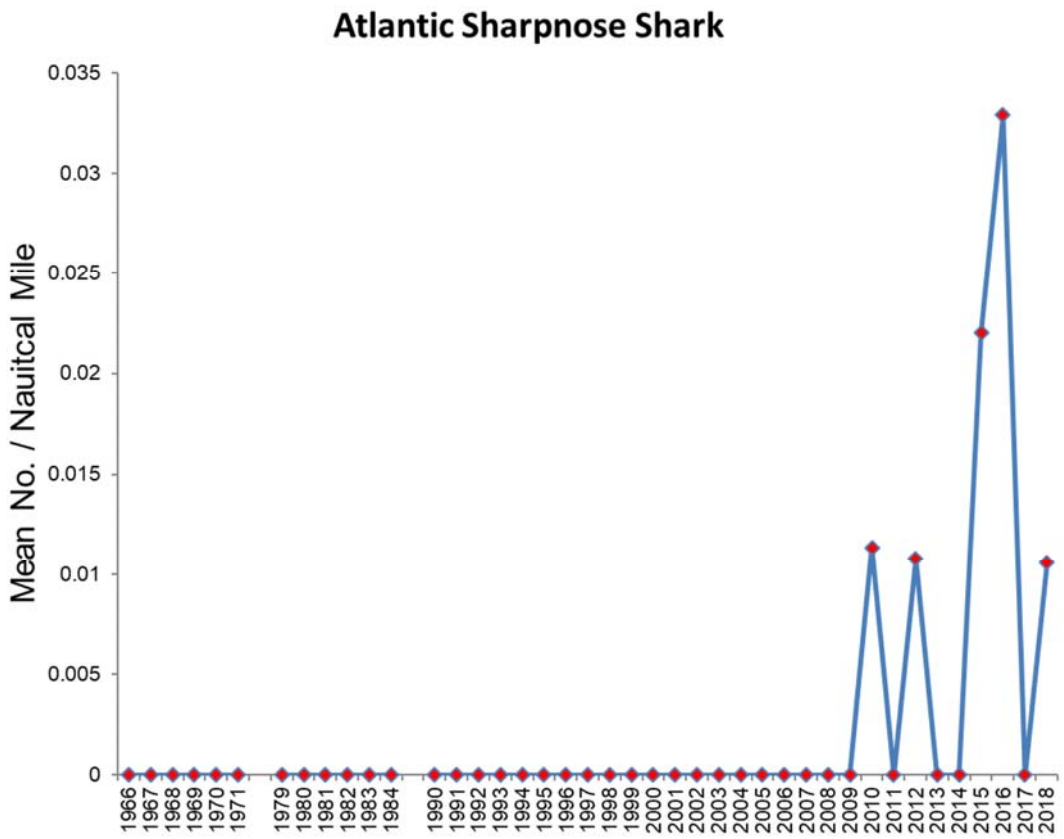


Figure 9. Atlantic Sharpnose Shark relative abundance (mean number per nautical mile), time series (1966 – 2018) as measured in 30-foot trawl sampling in the Delaware Bay.

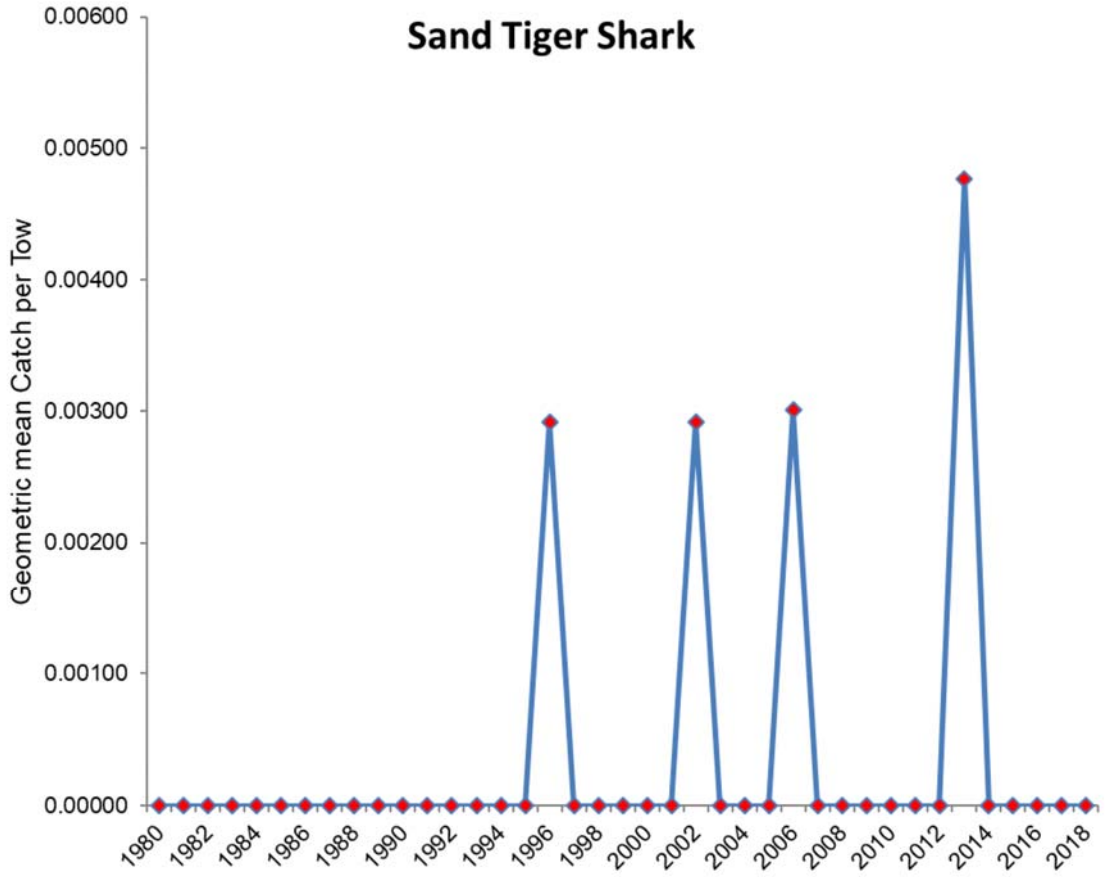


Figure 10. Index of Sand Tiger Shark, time series (1980 – 2018) as measured by 16-foot trawl sampling in the Delaware estuary.

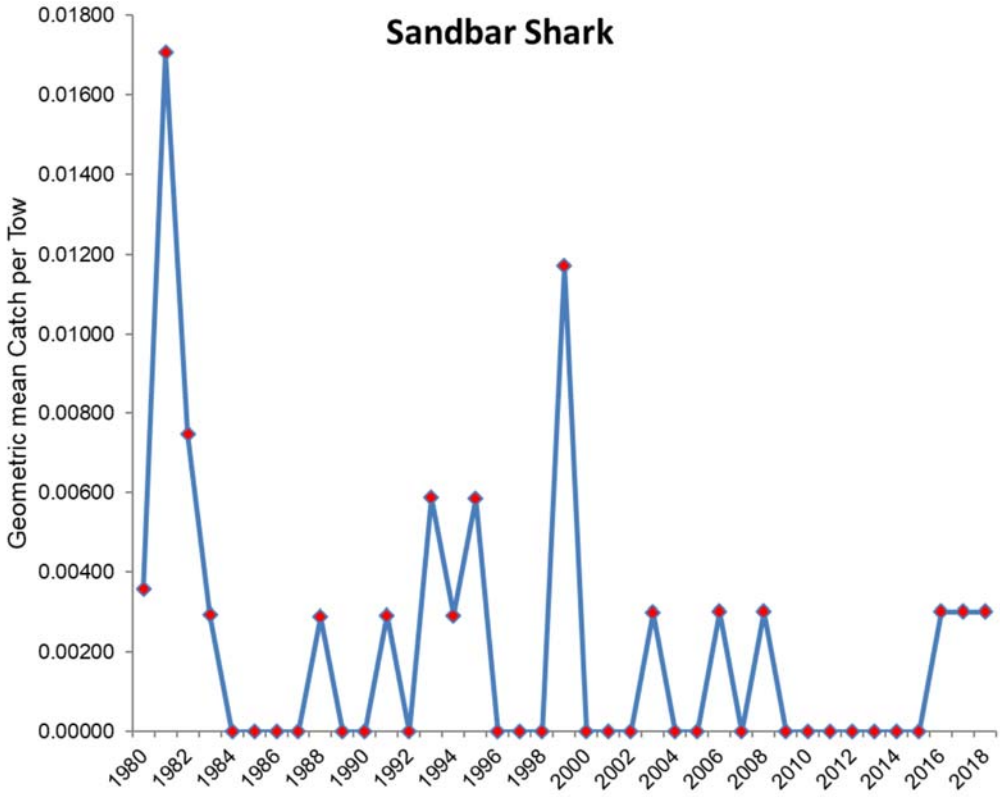


Figure 11. Index of Sandbar Shark, time series (1980 – 2018) as measured by 16-foot trawl sampling in the Delaware estuary.

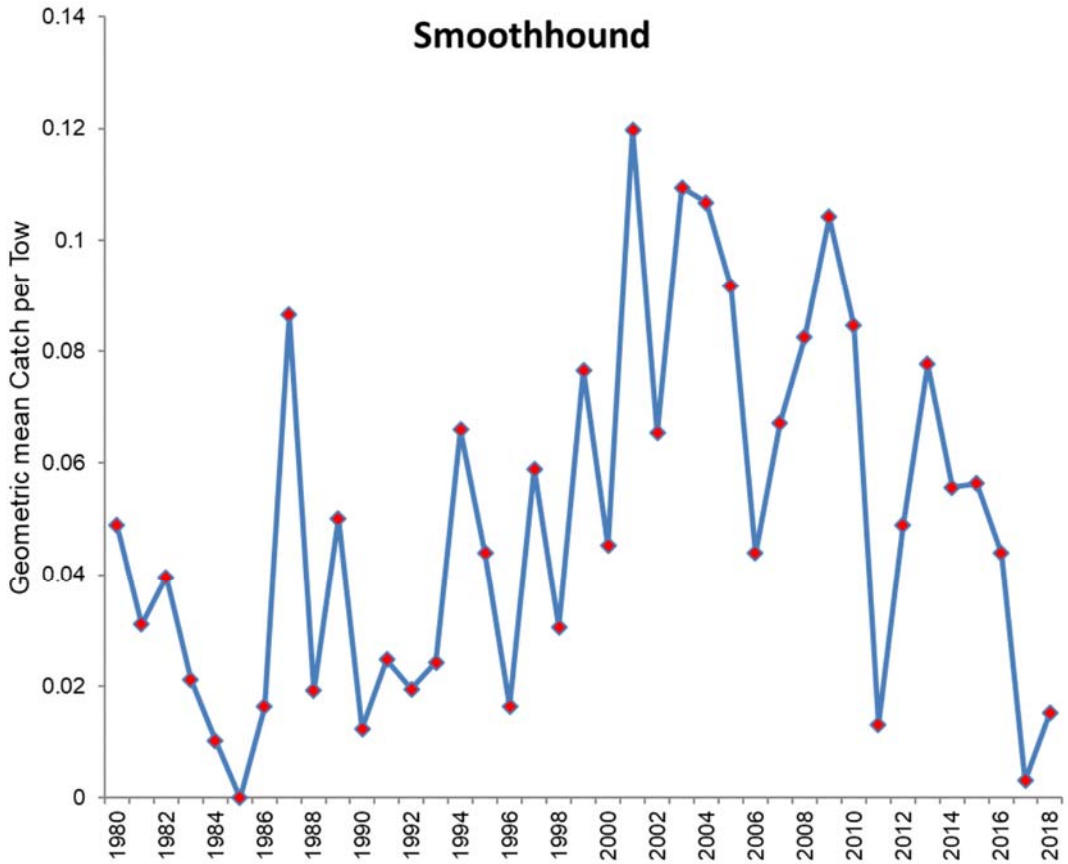


Figure 12. Index of young-of-the-year Smoothhound abundance, time series (1980 – 2018) as measured by 16-foot trawl sampling in the Delaware estuary.

Maryland

There was no specific at sea sampling program for coastal sharks in Maryland. Limited biological sampling of catch onboard a commercial offshore trawler targeting horseshoe crabs occurred at night in June, July, August, and October. While sharks were encountered through a scientific permit, information regarding species and number encountered are confidential.

Virginia

The Virginia Institute of Marine Science Shark Research Program began in 1973 and is one of the longest running longline surveys in the world. The program has provided data on habitat utilization, age, growth, reproduction, trophic interactions, basic demographics, and relative abundance for dominant shark species.

Beginning in 2012 a separate longline survey, conducted by the Virginia Institute of Marine Science designed specifically to target YOY sandbar sharks in the lower Chesapeake Bay and Eastern Shore, was initiated. The new survey follows a stratified random sampling design, rather than a fixed survey design, and falls under the broader COASTSPAN umbrella survey.

In 2018, sandbar shark (*Carcharhinus plumbeus*) was the most commonly encountered species by the offshore survey, followed by Atlantic sharpnose shark (*Rhizoprionodon terraenovae*), spinner (*Carcharhinus brevipinna*), and blacktip (*Carcharhinus limbatus*) shark (Table 11). Seasonal patterns in survey catches were also evident with the June and September showing higher overall catches of sharks, respectively, followed by July and August.

COASTSPAN catches of neonate sandbar shark (<= 71 cm total length) were highest in magnitude during July in the lower Chesapeake Bay followed by August and June. In the coastal lagoons of the Eastern Shore, peak neonate catch occurred in June followed by July and August (Table 12). For 2018, neonate total catch was slightly higher in the coastal lagoons of the Eastern Shore when compared to that of the lower Chesapeake Bay.

Table 11. Monthly catch summaries for key shark species encountered during offshore longline cruise conducted by VASMAP, 2018 pooled across the standard six sampling sites. Effort is expressed as total longline soak time.

Month	Effort (hrs)	Sand Tiger	Sandbar	Tiger	Atlantic sharpnose	Spinner	Dusky	Blacktip	Great White
Jun	31.7	12	105	1	3	9	12	9	1
Jul	28.7	1	4	4	44	1	0	2	0
Aug	28.1	1	0	1	11	0	0	2	0
Sep	30.7	0	64	1	15	21	9	2	0
Total		14	173	7	73	31	21	15	1

Table 12. Neonate catch summaries for each monthly COASTSPAN cruise, 2018, pooled across the sampling sites with the lower Chesapeake Bay and coastal lagoons of the Eastern Shore. Effort is expressed as total longline soak time of 50 hooks.

Lower Chesapeake Bay

Month	Effort (hrs)	Neonate
Jun	10.2	51
Jul	10.0	139
Aug	10.0	54
Total		244

Lagoons, Eastern Shore

Month	Effort (hrs)	Neonate
Jun	7.50	116
Jul	7.52	99
Aug	7.50	39
Total		254

North Carolina

The North Carolina Division of Marine Fisheries (NCDMF) conducts both fishery-dependent and independent sampling within state waters. Fishery-dependent sampling of North Carolina commercial fisheries has been ongoing since 1982 (conducted under Title III of the Interjurisdictional Fisheries Act and funded in part by the U.S. Department of Commerce, National Marine Fisheries Service). Predominant fisheries sampled included the ocean gill net, estuarine gill net, ocean trawl, long haul seine/swipe net, beach seine and pound net fisheries.

A total of 37 fishery-dependent samples containing sharks were collected from the ocean gill net, ocean trawl and estuarine gill net fisheries in 2018 (Table 11). This sample number is down compared to the 50 samples obtained in 2017. Whole weights and lengths for sharks other than spiny dogfish are rarely obtained during sampling. Sharks are typically dressed or processed when sampling occurs therefore the number of processed individuals and aggregate weights are obtained during sampling. Atlantic sharpnose and smoothhound sharks were the most abundant species in dependent sampling by numbers and weight (Table 12).

Table 12. North Carolina fishery-dependent shark sampling summary by month for the 2018 fishing year.

Month	# of Samples
January	4
February	5
March	0

Month	# of Samples
April	3
May	7
June	4
July	1
August	0
September	6
October	4
November	0
December	3
Total	37

Table 13. North Carolina fishery-dependent shark sampling summary by species, number of individuals, and sum of sample weight (lbs) for the 2018 fishing year.

Species	# Indv.	Sum of Sample Wgt. (kg)
Atlantic Sharpnose Shark (*R. terraenovae*)	42	69
Blacktip (*C. limbatus*)	4	56
Bonnethead (*S. tiburo*)	12	27
Common thresher (*A. vulpinus*)	37	223
Smoothhound Shark (*M. canis*)	99	165
Hammerhead	5	24

Fishery-Independent

The NCDMF initiated a fishery-independent red drum longline survey in 2007 for developing an index of abundance for adult red drum (*S. ocellatus*); this project also allows for capture and tagging of Atlantic coastal sharks in cooperation with the (NEFSC) Cooperative Shark Tagging Program. The red drum longline survey in the Pamlico Sound resulted in a catch of 1 bull shark in 2018. No measurements were taken.

The NCDMF initiated a fishery-independent gill net survey in 2001 and expanded its coverage in 2008 to include the Cape Fear and New Rivers and the near shore (0-3 miles) Atlantic Ocean from New River Inlet south to the South Carolina state line. The Atlantic Ocean portion of the survey was discontinued in June of 2015 due to low catches of target species, none of which were sharks. The objective of this project is to provide annual, independent, relative abundance indices for key estuarine species in the, Pamlico Sound, Pamlico, Pungo, Neuse, New, and Cape Fear rivers. The survey employs a stratified random sampling design and utilizes multiple mesh gill nets (3.0 inch to 6.5 inch stretched mesh, by ½ inch increments. In 2018, 8 species of shark were encountered in the gill net survey, with Atlantic sharpnose (n=257) representing the highest abundance (Table 15).

Table 15. Species, number of individuals, minimum, maximum, and average total length [TL (mm)] of sharks caught in the 2018 North Carolina Pamlico Sound and Cape Fear, Pamlico, Pungo Neuse and New rivers gill net survey.

Shark Species	Number Measured	Min of TL (mm)	Max of TL (mm)	Average of TL (mm)
Atlantic Sharpnose	257	262	1,019	463
Blacknose	4	410	488	445
Blacktip	21	830	1,347	1,081
Bonnethead	129	245	1,080	598
Bull	10	640	827	718
Dusky	5	750	1,300	1,001
Finetooth	4	683	1,344	1,034
Sandbar	45	570	813	685

South Carolina

Data related to the presence and movement of sharks in South Carolina's coastal waters will continue to be collected as encountered within the context of existing fishery dependent or fishery independent programs conducted by the SCDNR. Currently, data are collected from estuarine waters by the SCDNR Cooperative Atlantic States Shark Pupping and Nursery Habitat survey (COASTSPAN) and the SCDNR trammel net survey. The COASTSPAN survey monitors the presence and abundance of young-of-year and juvenile sharks in the estuaries and bays of South Carolina. The survey operates from April-September using gillnets, longlines, and

drumlines to sample index stations. Species captured are measured, sexed, tagged, released, and physical and water quality parameters are recorded (Table 16).

The SCDNR trammel net survey is designed to sample recreationally important species in shallow estuarine waters. Sharks are not a target species, but their abundance as well as length and sex data are recorded (Table 16). Stations selected based on suitable habitats are randomly sampled using a multi-panel gillnet to encircle a section of marsh. Species captured are measured, sexed if possible, select species (no sharks) are tagged and released and physical and water quality data are recorded.

The presence and abundance of juvenile and adult coastal sharks in the bays, sounds and coastal waters of South Carolina are documented by the Adult Red Drum and Coastal Shark Longline survey. This survey uses a stratified-random approach to sample for adult red drum and coastal sharks. The survey operates annually from August to December using longlines to sample suitable habitat for targeted species. Species captured are measured, sexed, tagged and released, and physical and water quality parameters are recorded. Species encountered and tagged for all surveys are reported in Table 16. The data gathered from these programs are shared with the NMFS apex predators program and are utilized in stock assessments and management decisions in South Carolina.

Table 16. Number of sharks captured by South Carolina Department of Natural Resources' Cooperative Atlantic States Shark Pupping and Nursery Habitat Survey (COASTSPAN), the Trammel Net Survey, and Adult Red Drum and Coastal Sharks Longline survey in 2018

	COASTSPAN		Trammel Net		Adult Red Drum and Coastal Sharks	
Shark Species	Captured	Tagged	Captured	Tagged	Captured	Tagged
Atlantic Sharpnose	158	0	51	0	735	0
Blacknose	7	3	0	0	77	72
Blacktip	167	98	15	0	77	64
Bonnethead	273	182	157	0	57	54
Bull	9	8	0	0	7	5
Finetooth	403	154	88	0	63	60
Great Hammerhead	0	0	0	0	1	1
Lemon	5	3	5	0	6	3
Nurse	0	0	0	0	1	0
Sandbar	195	179	0	0	157	140
Sand Tiger	1	1	0	0	0	0
Scalloped/Carolina Hammerhead	206	2	0	0	5	3
Smooth Dogfish	1	1	0	0	0	0
Spinner	5	0	0	0	21	5
Tiger	0	0	0	0	3	1

Georgia

Although a directed fishery for sharks does not exist in Georgia waters, there are a several fishery dependent sampling surveys conducted by the Coastal Resources Division that could result in the incidental capture of coastal sharks. In 2016, coastal sharks were found in the following fishery independent surveys.

Sampling for the *Adult Red Drum Survey (via SEAMAP)*: Sampling occurs in inshore and nearshore waters of southeast Georgia and in offshore waters of northeast Florida. Sampling occurs from mid-May through the end of December. Sampling gear consists of a bottom set 926m, 600lb test monofilament mainline configured with 60, 0.5 m gangions made of 200lb test monofilament. Each gangion consists of a longline snap and a 15/0 circle hook. Thirty hooks of each size are deployed during each set. All hooks are baited with squid or mullet. Soak time for each set is 30 minutes. During 2017, CRD staff deployed 179 sets consisting of 10,662 hooks and 89.5 hours of soak time. A total of 500 sharks, representing nine species were captured (Table 16).

Sampling for the *Shark Nursery Survey (via COASTSPAN)*: The University of North Florida assumed field operations for this survey in 2016. Data for the complete time series are maintained by the National Marine Fisheries Service's Apex Predator Program in Narragansett, RI (contact: Cami McCandless).

Each month the *Ecological Monitoring Trawl Survey (EMTS)*, a 40-foot flat otter trawl with neither a turtle excluder device nor bycatch reduction device is deployed at up to 42 stations across six estuaries. At each station, a standard 15 minute tow is made. During this report period, 482 tows/observations were conducted, totaling 120.41 hours of tow time. A total of 120 sharks, representing five species, were captured during 2017 (Table 16).

Monitoring of estuarine finfish and crustaceans in the lower salinity, upriver sectors of selected estuaries is done monthly as part of the *Juvenile Trawl Survey* conducted onboard the research vessel *Navigator*. A 20-foot, semi-balloon otter trawl is towed for 5 minutes at up to 18 stations within three Georgia estuaries. In 2017, 99 tows (observations) were conducted, totaling 8.25 hours of tow time. No sharks were observed during the 2017 season.

The Marine Sportfish Population Health Survey (MSPHS) is a multi-faceted ongoing survey used to collect information on the biology and population dynamics of recreationally important finfish. Currently two Georgia estuaries are sampled on a seasonal basis using entanglement gear. During the June to August period, young-of-the-year red drum in the Altamaha/Hampton River and Wassaw estuaries are collected using gill nets to gather data on relative abundance and location of occurrence. During the September to November period, fish populations in the Altamaha/Hampton River and Wassaw estuaries are monitored using monofilament trammel nets to gather data on relative abundance and size composition. In 2018, a total of 216 gillnet and 150 trammel net sets were made, resulting in the capture of 134 individuals representing five species of coastal sharks (Table 17).

Table 17. Numbers of coastal sharks captured in Georgia fishery independent surveys in 2018 by species and by survey.

	SEAMAP	EMTS	MSPHS
SHARK, ATLANTIC SHARPNOSE	283	67	19
SHARK, BLACKNOSE	70	---	---
SHARK, BLACKTIP	25	---	2
SHARK, BONNETHEAD	66	63	120
SHARK, BULL	1	---	---
SHARK, FINETOOTH	11	1	10
SHARK, LEMON	---	---	2
SHARK, SANDBAR	42	1	---
SHARK, SCALLOPED HAMMERHEAD	2	1	---
SHARK, SPINNER	2	---	---
SHARK, TIGER	5	---	---
ALL SPECIES COMBINED	507	133	154

V. Status of Management Measures and Issues

Fishery Management Plan

Coastal Sharks are managed under the Interstate FMP for Coastal Sharks, which was implemented in August 2008, Addendum I (2009), Addendum II (2013), and Addendum III (2013). The FMP addresses the management of 40 species and establishes a suite of management measures for recreational and commercial shark fisheries in state waters (0 – 3 miles from shore). In 2016, Smooth dogfish was added to NOAA Fisheries' Atlantic Highly Migratory Species FMP through Amendment 9; as part of the Amendment, a new requirement that smooth dogfish harvest need to make up at least 25% of the retained catch in order for fishermen to be able to remove their fins at sea. The Commission later in the year approved Addendum IV (2016) to maintain consistency between state and federal FMP.

ASMFC will continue to respond to changes in the Atlantic Highly Migratory Species FMP and make changes as necessary to the interstate FMP.

VI. Implementation of FMP Compliance Requirements for 2018

Addendum III to the Coastal Sharks FMP was implemented in March 2014. All states must demonstrate through the inclusion of regulatory language that the following management measures were implemented.

i. Recreational Minimum Size Limits

This modifies Section 4.2.4 Recreational Minimum Size Limits in the FMP.

Sharks caught in the recreational fishery must have a minimum fork length of 4.5 feet (54 inches) with the exception of smooth hammerhead, scalloped hammerhead, great hammerhead, smoothhound, Atlantic sharpnose, blacknose, finetooth, and bonnethead.

Smooth hammerhead, scalloped hammerhead and great hammerhead must have a minimum fork length of 6.5 feet (78 inches).

Smoothhound, Atlantic sharpnose, blacknose, finetooth and bonnethead do not have recreational minimum size limits.

Table 4.4. Recreational minimum size limits, 2018.

No Minimum Size	Minimum Fork Length of 4.5 Feet		Minimum Fork Length of 6.5 Feet
Smoothhound	Tiger	Shortfin mako*	
Atlantic sharpnose	Blacktip	Porbeagle	Scalloped hammerhead
Finetooth	Spinner	Thresher	Smooth hammerhead
Blacknose	Bull	Oceanic whitetip	Great hammerhead
Bonnethead	Lemon	Blue	
	Nurse		

***Per emergency rule measures implemented in March 2018 in response to the 2017 Assessment, minimum size limit (fork length) for Shortfin makos is now 83 inches or 6.9 feet**

ii. Commercial Species Groupings

This modifies Section 4.3.3 Commercial Species Groupings (and the appropriate sub-sections, outlined below). Two new species groups ('Blacknose' and 'Hammerhead') are created.

This FMP establishes eight commercial 'species groups' for management (Table 1): Prohibited, Research, Smoothhound, Non-Blacknose Small Coastal, Blacknose, Aggregated Large Coastal, Hammerhead and Pelagic. These groupings apply to all commercial shark fisheries in state waters.

VII. PRT Recommendations

State Compliance
All states with a declared interest in the management of sharks have submitted compliance reports and have regulations in place that meet or exceed the requirements of the Interstate Fisheries Management Plan for Coastal Sharks and associated addenda.

De Minimis Status
This FMP does not establish specific *de minimis* guidelines that would exempt a state from

regulatory requirements contained in this plan. *De minimis* shall be determined on a case-by case basis. *De minimis* often exempts states from monitoring requirements in other fisheries but this plan does not contain any monitoring requirements.

De minimis guidelines are established in other fisheries when implementation and enforcement of a regulation is deemed unnecessary for attainment of the fishery management plan's objectives and conservation of the resource. Due to the unique characteristics of the coastal shark fishery, namely the large size of sharks compared to relatively small quotas, the taking of a single shark could contribute to overfishing of a shark species or group. Therefore, exempting a state from any of the regulatory requirements contained in this plan could threaten attainment of this plans' goals and objectives.

Massachusetts is the only state that have been granted *de minimis* status. Maine and New Hampshire have renounced management interest and therefore are no longer members of the coastal shark Management Board. These states do not land sharks in any significant quantity and very few of the species managed by this plan are ever encountered in their state waters. Massachusetts can continue to have *de minimis* status until their landings patterns change or they request a discontinuation.

In some cases, it is unnecessary for states with *de minimus* status to implement all regulatory requirements in the FMP.

A. Massachusetts has implemented all regulations with two exceptions, it is exempt from the possession limit and closures of the aggregated large coastal and hammerhead shark fisheries.

Research Priorities

Species-Specific Priorities

- Investigate the appropriateness of using vertebrae for ageing adult sandbar sharks. If appropriate, implement a systematic sampling program that gathers vertebral samples from entire size range for annual ageing to allow tracking the age distribution of the catch as well as updating of age-length keys.[1]
- Determine what is missing in terms of experimental design or/and data analysis to arrive at incontrovertible conclusions on the reproductive periodicity of sandbar sharks
- Continue work on reconstruction of historical catches of sandbar sharks, especially catches outside of the US EEZ

[1] Recent bomb radiocarbon research has indicated that past age estimates based on tagging data for sandbar sharks may be correct and that vertebral ageing may not be the most reliable method for mature individuals. See Andrews *et al.* 2011.

- Investigate the length composition of the F3 Recreational and Mexican fisheries for sandbar sharks more in depth as this fishery is estimated to have a large impact on the stock mainly due to selecting age-0 fish.
- Research to estimate the degree of connectivity between the portions of the sandbar stock within the US and outside of the US EEZ.
- Study the distribution and movements of the sandbar stock relative to sampling coverage. It is possible that none of the indices alone track stock-wide abundance trends.
- Develop and conduct tagging studies on dusky and blacknose stock structure with increased international collaboration (e.g., Mexico) to ensure wider distribution and returns of tags. Expand research efforts directed towards tagging of individuals in south Florida and Texas/Mexico border to get better data discerning potential stock mixing.

General Priorities

- Update age and growth and reproductive studies for all species currently assessed, especially for studies with low sample sizes or over 20 years old.
- Determine gear-specific post-release mortality estimates for all species currently assessed
- Determine life history information for data-poor species that are currently not assessed
- Examine female sharks during the pupping periods to determine the proportion of reproductive females. Efforts should be made to develop non-lethal methods of determining pregnancy status
- Expand or develop monitoring programs to collect appropriate length and age samples from the catches in the commercial sector by gear type, from catches in the recreational sector, and from catches taken in research surveys to provide reliable length and age compositions for stock assessment
- Continue investigations into stock structure of coastal sharks using genetic, conventional and electronic tags to determine appropriate management units
- Evaluate to what extent the different CPUE indices track population abundance (e.g., through power analysis)
- Explore modeling approaches that do not require an assumption that the population is at virgin level at some point in time.
- Increase funding to allow hiring of additional HMS stock assessment scientists. There are currently inadequate staff to conduct stock assessments on more than one or two stocks/species per year.

References

Andrews et al. 2011. Bomb radiocarbon and tag-recapture dating of sandbar shark (*Carcharhinus plumbeus*). Fisheries Bulletin. 109: 454-465.

Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species. 2018. NOAA Fisheries, April 9, 2019.

< https://www.fisheries.noaa.gov/resource/document/2018-stock-assessment-and-fishery-evaluation-report-atlantic-highly-migratory>

APPENDIX 1. OVERVIEW OF COASTAL SHARK REGULATIONS

Coastal Sharks FMP Regulatory Requirements

1. Recreational seasonal closure (Section 4.2.1)

    a. Recreational anglers are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15—regardless of where the shark was caught.

    b. Recreational fishermen who catch any of these species in federal waters may not transport them through the state waters of VA, MD, DE, and NJ during the seasonal closure.

2. Recreationally permitted species (Section 4.2.2)

    a. Recreational anglers are allowed to possess aggregated large coastal sharks, hammerheads, tiger sharks, SCS, and pelagic sharks. Authorized shark species include: aggregated LCS (blacktip, bull, spinner, lemon, and nurse); hammerhead (great hammerhead, smooth hammerhead, scalloped hammerhead); tiger sharks; SCS (blacknose, finetooth, Atlantic sharpnose, and bonnethead sharks); and, pelagic sharks (blue, shortfin mako, common thresher, oceanic whitetip, and porbeagle). Sandbar sharks and silky sharks (and all prohibited species of sharks) are not authorized for harvest by recreational anglers.

3. Landings Requirements (Section 4.2.3)

    a. All sharks (with exception) caught by recreational fishermen must have heads, tails, and fins attached naturally to the carcass. Anglers may still gut and bleed the carcass by making an incision at the base of the caudal peduncle as long as the tail is not removed. Filleting sharks at sea is prohibited.

    b. All sharks (with exception) harvested by commercial fishermen within state boundaries must have the tails and fins attached naturally to the carcass through landing. Fins may be cut as long as they remain attached to the carcass (by natural means) with at least a small portion of uncut skin. Sharks may be eviscerated and have the heads removed. Sharks may not be filleted or cut into pieces at sea.

    c. Exception: Fishermen holding a valid state commercial permit may process smooth dogfish sharks at sea out to 50 miles from shore, as long as the total weight of smooth dogfish shark fins landed or found on board a vessel does not exceed 12 percent of the total weight of smooth dogfish shark carcasses landed or found on board.

4. Recreational Minimum Size Limits (Section 4.2.4)

    a. Sharks caught in the recreational fishery must have a fork length of at least 4.5 feet with the exception of Atlantic sharpnose, blacknose, finetooth, bonnethead

and smoothhound which have no minimum size. Hammerhead species must have a fork length of 6.5 feet.

5. Authorized Recreational Gear (Section 4.2.5)
    a. Recreational anglers may catch sharks only using a handline or rod & reel. Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline must be retrieved by hand, not by mechanical means.

6. Possession limits in one twenty-four hour period (Section 4.2.7 and 4.3.6)
    a. Recreational and commercial possession limits as specified in Table 9.
    b. Smooth dogfish harvest is not limited in state waters and recreational shore-anglers may harvest an unlimited amount of smooth dogfish.

7. Commercial Seasonal Closure (Section 4.3.2)
    a. All commercial fishermen are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15. Fishermen who catch any of the above species in a legal manner in federal waters may transit through the state waters listed above is allowed if all gear is stowed.

8. Quota Specification (Section 4.3.4)
    a. When NOAA Fisheries closes the fishery for any species, the commercial landing, harvest, and possession of that species will be prohibited in state waters until NOAA Fisheries reopens the fishery.

9. Permit requirements (Section 4.3.8)
    a. State: Commercial shark fishermen must hold a state commercial license or permit in order to commercially catch and sell sharks in state waters.
    b. Federal: A federal Commercial Shark Dealer Permit is required to buy and sell any shark caught in state waters.
    c. Display and research permit is required to be exempt from seasonal closure, quota, possession limit, size limit, gear restrictions, and prohibited species restrictions. States are required to include annual information for all sharks taken for display throughout the life of the shark.

10. Authorized commercial gear (Section 4.3.8.3)
    a. Commercial fishermen can only use one of the following gear types (and are prohibited from using any gear type not listed below) to catch sharks in state waters.
        i. **Rod & reel**

ii. **Handlines.** Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline is retrieved by hand, not by mechanical means, and must be attached to, or in contact with, a vessel.
iii. **Small Mesh Gillnets.** Defined as having a stretch mesh size smaller than 5 inches.
iv. **Large Mesh Gillnets.** Defined as having a stretch mesh size equal to or greater than 5 inches.
v. **Trawl nets.**
vi. **Shortlines.** Shortlines are defined as fishing lines containing 50 or fewer hooks and measuring less than 500 yards in length. A maximum of 2 shortlines are allowed per vessel.
vii. **Pounds nets/fish traps.**
viii. **Weirs.**

11. Bycatch Reduction Measures (Section 4.3.10)
    a. Any vessel using a shortline must use corrodible circle hooks. All shortline vessels must practice the protocols and possess the recently updated federally required release equipment for pelagic and bottom longlines for the safe handling, release, and disentanglement of sea turtles and other non-target species; all captains and vessel owners must be certified in using handling and release equipment.
12. Smooth Dogfish
    a. Each state must identify their percentage of the overall quota (Addendum II, 3.1)
    b. Smooth dogfish must make up at least 25%, by weight, of total catch on board at time of landing. Trips that do not meet the 25% catch composition requirement can land smooth dogfish, but fins must remain naturally attached to the carcass. (Addendum IV, 3.0; modifies Addendum II Section 3.5)

Table 10. Possession/retention limits for shark species in state waters

Recreational	*Shore-angler*	1 shark (of any species except prohibited) per person per day; plus one Atlantic sharpnose, bonnethead and smoothhound
	Vessel-fishing	1 shark (of any species except prohibited) per vessel per trip; plus one Atlantic sharpnose, bonnethead and smoothhound per person, per vessel
Commercial	*Directed permit*	Variable possession limit for aggregated large coastal sharks and hammerhead shark management groups, the Commission will follow NMFS for in-season changes to the possession limit. The possession limit range is 0-55, the default is 45 sharks per trip. No limit for SCS or pelagic sharks.
	Incidental permit	3 aggregated LCS per vessel per trip, 16 pelagic or SCS (combined) per vessel per trip

Atlantic States Marine Fisheries Commission

ISFMP Policy Board

October 31, 2019
8:00 - 10:00 a.m.
New Castle, New Hampshire

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. Gilmore)* — 8:00 a.m.

2. Board Consent *(J. Gilmore)* — 8:00 a.m.
   - Approval of Agenda
   - Approval of Proceedings from August 2019

3. Public Comment — 8:05 a.m.

4. Update from Executive Committee (*J. Gilmore*) — 8:15 a.m.

5. Discuss Process Implications for Ecological Reference Point Benchmark Assessment (*T. Kerns/K. Drew*) — 8:30 a.m.

6. Committee Reports **Action** — 8:45 a.m.
   - Law Enforcement (*M. Robson*)
   - Habitat (*L. Havel*)
     - Consider Approval of the Habitat Management Series: Aquaculture Impacts to Fish Habitat along the Atlantic Coast **Action**
   - Atlantic Coastal Fish Habitat Partnership (*L. Havel*)
   - Management and Science (*S. Murray*)
   - Assessment Science (*S. Murray*)
     - Consider Approval of the Assessment Schedule **Action**

7. Review Noncompliance Findings, If Necessary **Action** — 9:20 a.m.

8. Other Business — 9:45 a.m.

9. Adjourn — 10:00 a.m.

The meeting will be held at Wentworth by the Sea, 588 Wentworth Road, New Castle, NH; 603.422.7322

MEETING OVERVIEW

ISFMP Policy Board Meeting
Thursday October 31, 2019
8:00 - 10:00 a.m.
New Castle, New Hampshire

Chair: Jim Gilmore (NY) Assumed Chairmanship: 10/17	Vice Chair: Pat Keliher (ME)	Previous Board Meeting: August 7, 2019
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 7, 2019

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

4. Update from Executive Committee (8:15-8:30 a.m.)
Background • The Executive Committee will meet on October 30, 2019
Presentations • J. Gilmore will provide an update of the two meetings
Board action for consideration at this meeting • none

5. Discuss Process Implications for ERP Benchmark Assessment (8:30-8:45 a.m.)
Background • The results of the ERP Benchmark Assessment will be presented at the 2020 Winter Meeting.
Presentations • T. Kerns will provide some background on the issue.
Board discussion at this meeting • Since this assessment could have implications for other species management boards, staff seeks guidance from the Policy Board regarding what process to follow up in making management decisions (e.g., what board(s) should have oversight).

6. Committee Reports (8:45-9:20 a.m.) Action

Background

- The Law Enforcement Committee will meet on October 29-30, 2019
- The Atlantic Coastal Fish Habitat Partnership Steering Committee will meet on October 28-29, 2019
- The Habitat Committee will meet on October 30, 2019. The Habitat Committee has completed the latest instalment of the Habitat Management Series: Aquaculture Impacts to Habitat along the Atlantic Coast. The document provides a broad description of current and common marine aquaculture practices along the Atlantic seaboard and some potential effects on fish habitats.
- The Management and Science Committee will meet on October 28-29, 2019
- The Assessment Committee met on August 29, 2019 to discuss several topics including the ASMFC Stock Assessment. The ASC made revisions to the schedule for Board review and approval (**meeting materials**)

Presentations

- Staff will present an overview of the LEC, ACFHP, Habitat, MSC and ASC activities

Board action for consideration at this meeting

- Under the HC report: Consider approval of the Habitat Management Series: Aquaculture Impacts to Habitat along the Atlantic Coast
- Under the ASC report: Consider approval of the ASMFC Stock Assessment Schedule

7. Review Non-Compliance Findings, if Necessary Action

8. Other Business

9. Adjourn

Aquaculture Impacts to Fish Habitat along the Atlantic Coast

This issue of the Habitat Management Series provides a broad description of current and common marine aquaculture (mariculture) practices along the Atlantic seaboard and some potential effects on fish habitats. It should serve as an introduction to the topic and facilitate a discussion of the intersection of aquaculture planning and fishery habitat conservation.

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Why Aquaculture?

Marine aquaculture, or mariculture is a potentially vital and sustainable component of seafood production. Half of world seafood was sourced from aquaculture in 2016, and it is the fastest-growing sector in animal-based food production (NMFS 2017, FAO 2018). The current production in the United States is lagging on the world stage, contributing only 20% to U.S. seafood production, however significant opportunity for aquaculture industry growth exists (NOAA 2019a). The US aquaculture and mariculture industry was valued at $1.4 billion and produced 627 million pounds of meat and 1.2 million jobs in 2015 (NOAA 2019b). This industry creates jobs, supports communities, and promotes secondary industry as well as international trade (Slater 2017, NOAA 2019a). Human population growth means an ever-increasing need for food that may not be sustainable by shifting wild stocks; mariculture can help fulfill that need.

Effects on Habitats

Water Quality

The production of finfish and shrimp is often associated with impairment to water quality, however, macroalgae and bivalve culture may improve water quality through the removal of nutrients and suspended solids. On a global scale, marine and brackish water aquaculture cause a net reduction in nutrients (Verdegem 2013). Seaweed and bivalves reduce eutrophication, and bivalves improve water quality through filtration and grazing (Rose et al. 2015, Cerco and Noel 2007) and can control phytoplankton bloom intensity in shallow waters (Gallardi 2014). Fish and shrimp culture can cause nutrient loading in overcrowded, overfed, and poor flow conditions (Price et al. 2015), but placement in deeper waters and stronger currents reduces this risk (Gentry et al. 2016).

Equipment deployed in open and intertidal waters is subject to fouling, and exposed structures to accumulation of bird waste. Antifoulant treatments can contaminate water (Burridge et al. 2010) and physical removal may increase nutrients from bird waste, temporarily deplete oxygen levels as fouling organisms decay, and release toxins if antifoulants were used. There is a need for innovative antifouling strategies that are practical and environmentally responsible (Fitridge et al. 2012).

Sediment

An accumulation of nutrients, wastes, or excess feed can deplete oxygen and impair sediment conditions. Sediment deposition from biodeposits can alter benthic structure. However, accumulation is less likely with adequate flow and good husbandry. Recent investigations into the effects of elevated bivalve culture on the benthos have suggested that impacts are localized and minor by comparison with many other forms of aquaculture (Forrest et al. 2009).

Populations and Communities

In the marine environment, changes to the water column, benthos, flow, and the introduction of physical barriers/structure can impact populations and communities. However, they can also attract structure-oriented species and increase biomass and biodiversity on an otherwise featureless bottom. Gentry et al. (2019) reviewed ecosystem benefits of mariculture and provided a quantitative method to evaluate these benefits.

Marine life aggregates around structures, including aquaculture gear. Biofouling organisms are diverse and include microbes, algae, sponges, hydroids, worms, molluscs, arthropods, and tunicates. These communities provide a nursery habitat and food source to higher trophic levels, including fish. This so-called reef effect may result in a localized increase in biomass and local biodiversity during the production phase. Oyster and mussel mariculture can temporarily enhance populations of large macroinvertebrates and benthic fishes, including ecologically and commercially important species (Costa-Pierce and Bridger 2002, D'Amours et al. 2008, Forrest et al. 2009). Many of the structure-associated fish that are attracted to gear are highly valued for recreational and commercial fishing, and bivalve aquaculture gear can provide substantially better habitat than a shallow, nonvegetated seabed. Even the animals themselves can create habitat when colonists move into the interstitial spaces on and around cultured oysters and other bivalves.

There are other potentially negative biological effects from aquaculture. Disease transmission is a concern for fish, and escapees can outcompete and interbreed with wild fish stocks. Shellfish seed transfer between states may increase the risk of parasite and pathogen transmission if protocols are not established and enforced (see *Bivalve Culture* below for current initiatives). Structures like pens, cages, racks, and bags can exclude or deter resident fauna from their feeding grounds or migration routes. In the Delaware Bay, red knots, a threatened bird, rely on eggs deposited by horseshoe crabs, and research into the effect of shellfish aquaculture on horseshoe crabs and red knots is ongoing. Biocides, used to deter microorganisms in antifoulant treatments, can impact non-target organisms and the antibiotic varieties can lead to antibiotic resistance (Guardiola et al. 2012).

Common Practices

Mariculture along the Atlantic Seaboard includes algae (microalgae and macroalgae), bivalves (oysters, clams, scallops, and mussels), crustaceans (shrimp), and fish (salmon). As of 2016, Atlantic salmon and oysters were the largest components of this market (NMFS 2017). Common practices in this region, along with their known environmental effects, are described below. The most common aquaculture practices in each of the ASMFC states are shown in Table 1. Effects depend on the culture method and species, the size of the operation, and the site itself.

Tidal Water Mariculture

Coastal waters are used for growing shellfish, finfish, and algae. A variety of equipment, locations, and techniques are used to maximize growth and high-quality product.

Bivalve Culture

Bivalve aquaculture typically involves moving immature stock to areas that facilitate grow-out to market size. Juvenile oysters and clams sourced from hatcheries and nurseries are called seed. In areas with a healthy spawning population, newly settled oysters, called spat, can be obtained by laying cultch (typically broken oyster shell) or setting spat collectors just before spawning occurs. For clams and oysters, hatchery-produced seed is now more commonplace than transplanting native set.

This process, called shell planting, is an important part of natural oyster stock management programs in most oyster producing states, where it is done on a large scale. Seed and spat may be grown without any gear to house them (i.e. directly on shelled bottom), or in bags or cages to protect the growing organisms and facilitate maintenance and harvest. The timely harvest of cultured oysters has been shown to reduce rates of the pathogen *Perkinsus marinus* (Dermo) in native stocks (Ben-Horin et al. 2018). While only hard and soft shell clams and oysters are currently grown commercially, there is ongoing research into sourcing and growing sea scallops, razor clams, urchins, and surf clams.

Importing seed from other states or other countries may be necessary if local sources are insufficient. If seed importation is not properly managed, this may pose a risk of introducing disease, parasites, and potentially non-native species. Hatchery capacity is already strained in some areas, and those states are seeing significant increases in requests to import seed stock from out-of-state. Many states have developed specific regulations governing the interstate transport of shellfish products, including shellfish seed, to prevent the introduction or spread of diseases and parasites. To reduce this risk, shellfish growers should be familiar with regulations prior to importing seed from other states or regions. As aquaculture efforts expand, importation may become increasingly necessary, so the associated risks must be understood and minimized by managers. Importation protocols, such as the Hazard Analysis and Critical Control Points (HAACCP) standard operating procedure, should be rigorous enough to reduce the risk of introduction of pathogens or invasive species but also practical enough for the aquaculture industry to navigate in a timely manner. An Atlantic and Gulf Shellfish Seed Biosecurity Collaborative effort is underway to increase regulatory compliance and reduce risk of spreading shellfish diseases through transfers. The effort includes a hatchery certification protocol outlining Best Management Practices (BMPs) and disease surveillance which facilitates biosecure interstate commerce. Habitat managers along with agencies charged with aquaculture development should work cooperatively to encourage the development of regional scale tools (e.g., North Atlantic region, Mid-Atlantic region, and South Atlantic region).

Non-structured/Bottom Planting

Seed or spat can be spread across the bottom without containment (extensive shellfish culture), called non-structured or bottom-planting, in areas that are accessible by boat and conducive to growth, but not already occupied naturally by oysters or clams. Bottom planting reduces the amount of gear maintenance required, but moving stock (relay) and harvesting require the grower to dredge, pick, or tong the product. Predator screening is typically used to cover younger stocks of clams. Planted oysters have been shown to promote biodiversity by attracting settling invertebrates, bottom feeders, and fish (Forrest et al. 2009).

FLUPSYs

Floating upweller systems (FLUPSYs) are a popular way to grow clams and oysters from small seed until they are large enough to be deployed in gear for grow-out (Rivara et al. 2002). Stock is housed in suspended, mesh-bottomed compartments that tidal water circulates through from bottom to top, providing oxygen and algae and removing waste. FLUPSYs are often tied to or built into existing docks or boat slips, making them accessible from shore, and potentially alleviating some permitting concerns

(such as total footprints of shading, etc.). FLUPSYs are typically used post-hatchery to raise seed to sub-adults prior to grow-out. There are concerns that waste can accumulate under the FLUPSY if flushing is not adequate. However, low flow areas are often avoided or overcome by the use of electric-powered pumps to provide desired current flow by growers.

Bags/rack-and-bag/predator nets

Options for intertidal aquaculture are considered intensive shellfish culture, which are grown in cages or bags set on the bottom; or in the water column suspended from a float (often called a Lentz System), attached to a stake, or laid on racks ("rack-and-bag"). Rack-and-bag is the most common of these systems for oysters. Bags or cages are set on racks in the intertidal or shallow sub-tidal zones, where naturally circulating tidal waters provide food and remove waste. Maintenance of bags requires removal of fouling to ensure good flow, typically by scrubbing, scraping, power washing, air drying, and salt dips. As the oysters grow, they are sorted and moved into gear with more space and larger mesh. Commercial clam producers sometimes use predator nets, which are usually attached by stakes under the substrate. Market-sized oysters and clams are easily harvested from bags by taking the entire bag and removing marketable oysters while sub-market oysters are returned to bags. Bags laid directly on the substrate are often secured with stakes and connected with lines to facilitate harvest and husbandry.

Cages/bottom screens

Oyster cages are also deployed directly on the bottom, typically in sub-tidal areas. This practice may enhance soft-bottom habitat by replacing it with structured bottom that may increase production and biodiversity. Cages become habitat for a variety of species, including juvenile and adult fish (Costa-Pierce and Bridger 2002). The Northeast Fisheries Science Center is studying how reef fish are using these cages (NOAA 2019c).

Suspension culture

Suspended bivalve culture systems include rope culture for mussels (vertical lines within the water column) and trays, bags, or lantern nets, which hang below the surface and shift with the tide. Mussel line culture can be started with hatchery-reared seed or through natural set, depending upon location.

Fish Farming

Open-net pens or cages are used to grow fish in coastal waters. Currents flow through the system removing waste and providing oxygenated water. Feed must be provided.

As described in Effects on Habitats above, fish farming can have significant effects on water quality and sediment, and net-pen aquaculture can alter local habits and ecosystems if they are not sited properly (Findlay et al. 1995).

Escaped fish can breed with wild fish and possibly alter genetic fitness or compete with native fish for resources. High population densities increase the chance for transmission of disease, which can then be transferred to wild populations or vice versa.

Informed siting, good husbandry, and regular maintenance are critical to mitigating effects. Siting in deep, well-mixed water reduces the accumulation of wastes that impair water quality and sediment (Price et al. 2015). Appropriate stock densities, feeding, and care reduce the risk of release of nutrients,

antibiotics, pesticides, and growth enhancers (though not commonly used). Regular maintenance, including removal of fouling, is essential to avoid structural failure. In 2016, hundreds of thousands of non-native salmon were released in the San Juan Islands of Washington State when a heavily-fouled pen collapsed.

Atlantic salmon have been grown in Maine in open-net pens since the 1970s. Water quality impairments have been significantly reduced by the use of vaccines and integrated pest management, and the minimal to non-existent use of antibiotics and growth enhancers (Maine Seafood Guide – Salmon 2019). In 2016, Maine-raised salmon were upgraded from "avoid" to "good alternative" by the Monterey Bay Aquarium Seafood Watch Program, which rates seafood according to whether it supports a healthy ocean (Seafood Watch 2019). Improvements in feed efficiency, escape prevention (Rust et al. 2014), and effects on dissolved oxygen, turbidity, and nutrient enrichment have been seen in this industry (Price et al. 2015).

Other effects are more difficult to address. Feed is typically wild-caught coastal forage fish. Farms can attract and entangle predators such as cormorants, sharks, and marine mammals. The pens thereby alter predator behavior and subject them to adverse actions (i.e. lethal control measures) by net pen operators. Regular gear maintenance and stock tending result in increased boat traffic and dock use. The implementation of responsible production and husbandry practices as BMPs can mitigate many of these concerns. For example, the use of properly weighted (taut) predator nets have diminished entanglement risk to near-zero for sharks and marine mammals.

Seaweed Culture

Seaweeds are a highly nutritious food source, and the world's largest mariculture crop. They are readily grown on longlines in open waters. These autotrophs remove carbon dioxide and nutrients and release oxygen. Seaweed culture has the potential to mitigate ocean acidification, hypoxia, and eutrophication. A review by Kim et al. (2017) found that seaweed aquaculture provides ecosystem services that improve conditions of coastal waters, and that these benefits need further study and better public awareness of the opportunities of this industry.

Integrated Multitrophic Aquaculture (IMTA)

IMTA is an exciting new field of mariculture and is being studied worldwide. Similar to polyculture in terrestrial agriculture, IMTA is the practice of growing multiple species together to reduce environmental effects, provide ecosystem services, and improve profit. The theory behind IMTA is that nutrient inputs are limited as the fish waste serves to promote plant growth. The removal of nutrients by algae and particulates by bivalves provides cleaner water for the other species in the system. Scientists at the University of Maine are looking into using benthic polychaetes, which can be sold as bait, to reduce impacts from salmon open-net pens (University of Maine 2019). For the marine environment, the greatest potential for IMTA systems is the use of less space to grow more species. This can limit user conflicts while still yielding environmental and economic benefits.

Land-Based Mariculture

While state waters are used to grow-out most marine species, there is a need for land-based systems that provide a more controlled environment. These typically include hatcheries and nurseries, though some species, like shrimp, most finfish, and bivalves, can be grown entirely on land. Land-based mariculture facilities are usually sited close to shore for access to seawater (though fresh water from wells can be used with the addition of salts), and produce effluent that may be discharged, accidentally or intentionally, to nearby surface waters. Fish hatchery effluent may be regulated by the National Pollutant Discharge Elimination System (NPDES), and some states require additional permitting. Some states do not require permits for bivalves with the understanding that water quality is not degraded and may even be improved (e.g., due to clearance and filtration by shellfish).

Environmental effects vary widely with the species being cultivated, the location, and the size and type of facility. Organisms lower on the food chain, like algae and bivalves, produce less waste. Pollutants found in aquaculture effluents are similar to those found in effluents from agriculture and municipal wastewater treatment plants, such as nutrients, organic matter, and suspended solids (Boyd and McNevin 2014). Less common effluents include dissolved salts, toxic substances, pesticides, and disease-control compounds.

Hatcheries and Nurseries

Hatcheries contain spawning brood stock and produce juveniles of various species; nurseries are used for further growth of bivalves prior to deployment in tidal waters. Microalgae is cultured in hatcheries and nurseries as feed for early life stages of fish and shellfish.

Upwellers and Raceways

These systems pass seawater through a series of tanks and out to surface waters. Upwellers, common for bivalves, circulate water from bottom to top. Raceways are horizontal rows of tanks. Stock may be moved between raceways for more growing space. Wastewater can contain nutrients and solids that affect receiving waters. If appropriate BMPs are not implemented for health requirements and the containment of nonnatives, there is a possibility of nonnative species and disease being released into the environment if regulations are not followed.

Recirculation Systems

These systems are similar to flow-through systems in types of effects, but because they recirculate and filter water, both water usage and effluent is reduced.

Ponds

Ponds are used to grow finfish, shrimp, and macroalgae, among other species. Broodstock are placed in a controlled, closed environment such as a natural or man-made pond to spawn. The larvae and juveniles can be separated by age or size and placed in different ponds for optimal growth. When they reach adult size, they may be kept for broodstock, released in aquatic ecosystems for fishing, or sold to consumers.

Sometimes untreated water is discharged with leftover nutrients and sediments to other water bodies and can increase the risk of eutrophication. BMPs can reduce or eliminate nutrients in effluent.

Siting Considerations

Thoughtful spatial planning before aquaculture facilities are sited can mitigate many of the potential environmental impacts, reducing unwanted results and amplifying the benefits of the industry. In fact, proper siting is usually the most important aspect of planning. Understanding the existing environment and how particular aquaculture methods and culture species might affect it is a critical step in reducing conflicts. The implementation of a siting strategy early in the process allows for public involvement and consideration of social benefits. This should include considering novel locations, such as offshore wind farms. As states develop areas for aquaculture, existing uses, sensitive species and habitats, and carrying capacity of the environment must be considered.

Minimizing Use Conflicts

Like any other form of agriculture, marine aquaculture requires space, so it must compete for real estate with other user groups, such as boaters, fishers, and landowners in the coastal zone. If uses are not compatible, conflict resolution with other users is required. While very few areas will be entirely conflict free, knowledge of how potential aquaculture areas are being used is critical to siting.

In some areas, misconceptions exist about impact of aquaculture on coastal habitats and the safety of farmed seafood, which can lead to conflict with stakeholders. While there are known potential negative effects, the general public is less aware of the potential benefits of aquaculture on habitats, particularly those provided by bivalve culture.

Protecting Habitats

An understanding of the existing resources and siting of potential aquaculture areas is critical to mitigating impacts to fish habitats. Sensitive microhabitats in prospective aquaculture areas should be identified and avoided. Corals, mangroves, and submerged aquatic vegetation (SAV), for example, are valuable microhabitats that are sensitive to nutrient fluxes and disturbance.

Leases should not be sited on to existing or historic SAV locations, since the equipment used can cause shading and increased sedimentation. NOAA identifies SAV as an “underwater neighborhood” that is essential habitat for federally managed species. With that being said, not all gear damages SAV (Vaudrey et al. 2009), and in certain circumstances, aquaculture can improve conditions for SAV by reducing turbidity (Dumbauld et al. 2009), adding nitrogen to the benthos, and sheltering new growth from currents (Normant pers. com. 2019). Scientists at the University of North Carolina are studying how aquaculture affects SAV growth (Blackburn 2015).

In the Delaware Bay there is concern about aquaculture activities interfering with foraging of red knots, a threatened species that relies on eggs deposited by horseshoe crabs. A number of research projects are under way looking at the effect of aquaculture on horseshoe crabs and red knots.

As the mariculture sector continues to grow in both volume and product diversity, it is likely to generate potential disturbances or threats to other important or critical habitats (for example long lines or net pens in designated Right Whale critical habitats along the eastern seaboard). Consultations with local,

state, and federal permitting agencies during site selection are critical to understanding the nature and extent that new or expanding technologies will impact important habitats.

Carrying Capacity

Another important consideration for siting is carrying capacity, or how much aquaculture a given area can sustain without adverse environmental or social impacts. Too much aquaculture activity in a specific location will create other access and use limitations and erode public perception and support of aquaculture activities in certain areas. Determining optimal densities and spacing is an important aspect of BMPs and should be considered early in the lease siting process. This depends on the type of aquaculture, species in culture, and site-specific conditions. Fish aquaculture is associated with more significant environmental effects than bivalve aquaculture, including nutrient loading, sedimentation, lipids, turbidity, oxygen depletion (Pillay 2004, Rust et al. 2014), and rarely to sometimes, the use of antibiotics, pesticides, and growth enhancers. Overcrowding and poor husbandry increase the risk of disease transmission and escape.

Conclusions

This document outlined a number of the potential positive and negative impacts that may result from the culture of marine species along the Atlantic Seaboard. Inappropriately sited structures can obstruct migration as well as reduce available habitat for sensitive species. Improperly managed effluents can impair water quality and alter local community dynamics and trophic structure. These impacts, however, are species specific, with bivalve shellfish aquaculture demonstrating minimal detrimental effects (Crawford et al. 2003), balanced with a suite of ecosystem benefits.

Filter-feeding bivalves have been shown to abate eutrophication and algal blooms, enhance the growth of SAV, and benefit benthic macroinvertebrate communities and populations of ecologically and economically important fish. Oysters can also provide ecosystem services by removing excess carbon, reducing acidification, and improving water clarity and coastal resiliency (Gentry et al. 2019). Research has even demonstrated their potential to control disease in wild oyster populations.

The most critical way for habitat managers to avoid direct impacts to marine habitat is through the leasing and site selection process. Site-specific knowledge of sensitive species and habitats, coupled with the establishment of BMPs can mitigate problems like accumulation of food and wastes, disease transmission, water quality impairment, and escape. Research into the carrying capacity of various environments and mariculture practices is still in early stages but remains a critical area in need of support. Supporting research in aquaculture can have far-reaching benefits, particularly in near-shore communities that may be most at risk of economic effects of climate change.

Table 1. Current mariculture practices by state.

State	Method*	Species
Connecticut	Non-structured/bottom planting Bags/rack-and-bag/predator nets Cages/bottom screens Suspension culture Seaweed culture Flow-through systems	Hard clams and oysters Oysters Hard clams and oysters Oysters Kelp Shellfish hatchery
Delaware	Non-structured/bottom planting Bags/rack-and-bag/predator nets Cages/bottom screens	Oysters Oysters Oysters
Florida	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets Cages/bottom screens Suspension culture IMTA Hatcheries and nurseries Upwellers and raceways Recirculation systems Ponds	Clams Hard clams and oysters Hard clams and oysters Oysters Oysters Numerous species of fish and invertebrates Hard clams and oysters Hard clams and oysters Numerous species of fish and invertebrates Numerous species of fish and invertebrates
Georgia	Non-structured/bottom planting Bags/rack-and-bag/predator nets Hatcheries and nurseries	Hard clams Hard clams Oysters
Maine	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets Suspension culture Seaweed culture Open net pens and cages Hatcheries and nurseries Recirculation systems Ponds	Hard clams, soft shell clams, and razor clams Oysters Blue mussel Oysters, sea scallops, razor clams, hard clams, blue mussel Sea vegetables Atlantic salmon Atlantic salmon, eel, yellowtail Atlantic salmon, eel, yellowtail Atlantic salmon, eel, yellowtail
Maryland	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets Ponds	Soft shell clams and oysters Oysters and striped bass Oysters Striped bass
Massachusetts	Non-structured/bottom planting Bags/Rack-and-bag/predator nets	Softshell clam, oyster, quahog, bay scallop, blue mussel

	Cages/bottom screens Suspension culture Seaweed culture Recirculation systems	Offshore: blue mussel Inshore: seaweeds (*Gracilaria*, sugar kelp), Pacific white shrimp (*Vannamei* sp.)
New Hampshire	Non-structured/bottom planting FLUPSYs Bags/Rack-and-bag/predator nets Cages/bottom screens Suspension culture Seaweed culture	Oysters Oysters Oysters Oysters, quahog Offshore: blue mussel, seaweeds (*Gracilaria*, sugar kelp)
New Jersey	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets Cages/bottom screens Upwellers and raceways	Hard clams and oysters Hard clams and oysters Oysters Oysters Hard clams and oysters
New York	Non-structured/bottom planting FLUPSYs Cages/bottom screens Upwellers and raceways	Hard clams and oysters Hard clams and oysters Oysters Hard clams and oysters
North Carolina	Non-structured/bottom planting Bags/rack-and-bag/predator nets Cages/bottom screens Upwellers and raceways Recirculation systems Ponds	Clams and oysters Clams and oysters Oysters Clams and oysters Numerous species of fish and invertebrates Numerous species of fish and invertebrates
Rhode Island	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets Cages/bottom screens Suspension culture Upwellers and raceways	Hard clams, soft shell clams, and oysters Oysters Oysters Oysters and scallops Kelp, mussels Oysters
South Carolina	Non-structured/bottom planting Bags/rack-and-bag/predator nets Cages/bottom screens Upwellers and raceways	Clams and oysters Clams Oysters Clams and oysters
Virginia	Non-structured/bottom planting FLUPSYs Bags/rack-and-bag/predator nets	Clams and oysters Oysters Oysters

	Cages/bottom screens	Clams and oysters
	Hatcheries and nurseries	Clams and oysters
	Upwellers and raceways	Clams and oysters
	Recirculation systems	Clams and oysters

*The methods listed are the same as the categories found on pages 7-12 of the document. For multiple methods in a category (e.g. upwellers and raceways), the state may be carrying out one, some, or all of the method methods listed.

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Florida https://www.freshfromflorida.com/Divisions-Offices/Aquaculture

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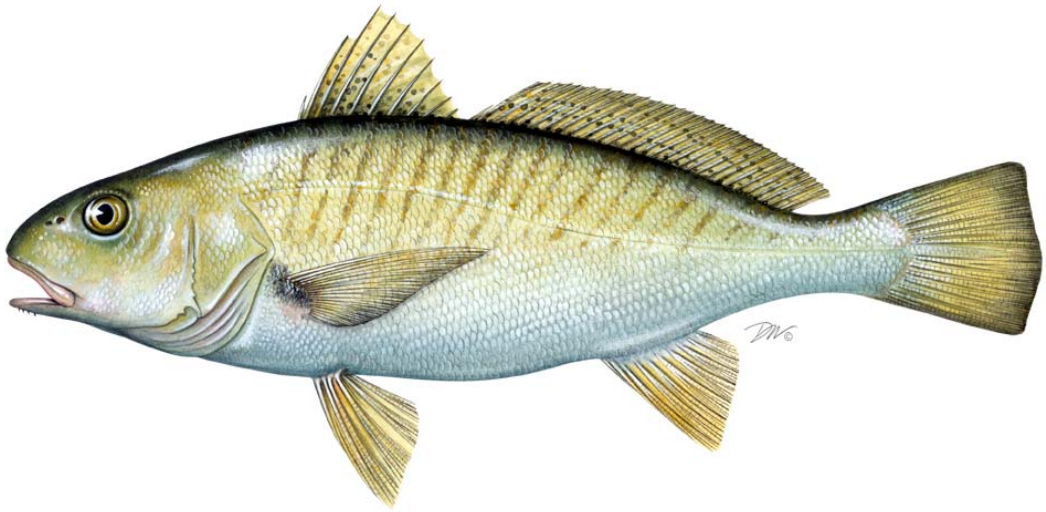
Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM III TO AMENDMENT 1 TO THE INTERSTATE FISHERY MANAGEMENT PLAN FOR ATLANTIC CROAKER

Revisions to Management using the Traffic Light Approach



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.

October 2019

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In May 2019, the South Atlantic State/Federal Fisheries Management Board initiated the development of an addendum to the Interstate Fishery Management Plan (FMP) for Atlantic Croaker to incorporate updates to the annual Traffic Light Analyses and associated management. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of Atlantic croaker, 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 **January XX, 2020 at 5:00 p.m**. Comments may be submitted at state public hearings or by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.

Mail: Dr. Michael Schmidtke, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Croaker Draft Addendum III)
Phone: (703) 842-0740
Fax: (703) 842-0741

Commission's Process and Timeline

May 2019	South Atlantic Board Tasks PDT to Develop Draft Addendum III
May 2019 – October 2019	PDT Develops Draft Addendum III for Public Comment
October 2019	South Atlantic Board Review Draft Addendum III and Considers Its Approval for Public Comment
October 2019 – January 2020	Board Solicits Public Comment and States Conduct Public Hearings
February 2020	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum III
TBD	Provisions of Addendum III are Implemented

1.0 INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) is responsible for managing Atlantic croaker (*Micropogonias undulatus*) in state waters (0-3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through an interstate fishery management plan (FMP) since 1987. Atlantic croaker are currently managed under Amendment 1 (2005) to the FMP and Addenda I-II. The states of New Jersey through Florida have a declared interest in the fishery and are responsible for implementing management measures consistent with the interstate FMP as members of the South Atlantic State/Federal Fisheries Management Board (Board).

Addendum II established the Traffic Light Approach (TLA) as a precautionary management framework to evaluate fishery trends and develop management actions (ASMFC, 2014). 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. When a population characteristic declines, the proportion of red 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 population characteristics (harvest and abundance) meet or exceed a threshold for a two year period, then management action is required.

In recent years, the Atlantic croaker fishery has experienced significant declines in harvest, while such declines have not been evident in fishery-independent survey abundance indices used in the TLA. Furthermore, a 2017 stock assessment was not recommended for management use, due partially to conflicting signals between harvest and fishery-independent indices. These conflicting signals indicate that the harvest and fishery-independent characteristics may not be representing comparable aspects or components of the stock, thus making management advice from the TLA unclear.

In response to the recent TLA and assessment results, a 2018 report from the Atlantic Croaker Technical Committee (TC) recommended five updates to the TLA (ASMFC, 2018a). Additionally, a 2018 report from the Atlantic Croaker and Spot Plan Development Team (PDT) discussed how the management responses required by Addendum II could be updated to better reflect stock characteristics and develop more achievable management goals. Draft Addendum III addresses the recommendations of these documents by incorporating TC-recommended updates to the TLA analysis and considering changes to the TLA triggers and management responses.

2.0 OVERVIEW

2.1 Statement of the Problem

The TLA has been used since 2014 to monitor the Atlantic croaker population. The lack of a recent assessment approved for management use makes this approach the prominent source

of management advice for this species. While strong declines in harvest and reports of poor fishing have prompted concern, management action has not been triggered through the TLA because similar declines have not been observed in abundance indices. These conflicting signals suggest that the current abundance indices used in the TLA may not adequately represent coastwide adult abundance and that the TLA may not be sensitive enough to trigger management action when changes to the fishery occur. Additionally, current management responses required by Addendum II lack specificity in terms of required measures and attainability in terms of requiring a percent reduction in harvest to achieve a percent increase in abundance. Draft Addendum III incorporates TC-recommended updates that improve the TLA analysis and considers alternatives to the current management triggers and responses.

2.2 Background

Atlantic croaker are small sciaenid forage species that support commercial and recreational fisheries in the Mid and South Atlantic regions. Atlantic croaker migrate seasonally along the coast, moving northward and inshore to estuaries and bays during warmer months (spring-fall) and southward and offshore to more oceanic waters in the winter. Atlantic croaker feed on planktonic organisms as post-larvae and young of the year, and as juveniles and adults they prey on bottom dwelling organisms such as worms and crustaceans. Atlantic croaker reach maturity by approximately age two and can live up to 17 years, but more commonly live no longer than 10 years.

2.2.1 Stock Status and Assessment

The most recent stock assessment, conducted in 2017, upon peer review was not recommended for management use. Therefore, current stock status is unknown, although the Peer Review Panel did not indicate problems in the Atlantic croaker fishery that would require immediate management action. The Peer Review Panel did recommend continued evaluation of the fishery using the annual TLA.

The last benchmark stock assessment for Atlantic croaker recommended for management use by a peer review was conducted in 2010. Unlike previous assessments it evaluated the resource as a single coastwide stock. The assessment indicated that the resource was not experiencing overfishing, biomass had increased, and age-structure had expanded since the late 1980s. However, it could not determine stock status given uncertain model estimates due to limited data on shrimp trawl discards and fishing mortality. Improvements on estimation of these discards were made in the 2017 assessment, allowing the potential for shrimp trawl discards to be included as supplemental information with the annual TLA. Annual monitoring of shrimp trawl fishery discards is important because these represent a considerable proportion of Atlantic croaker removals, ranging from 7% to 78% annually during 1988-2008, according to the 2010 assessment (ASMFC, 2010).

One of the reasons that the 2017 stock assessment was not approved for management use was due to conflicting signals in harvest and abundance characteristics. Theoretically, increases in

adult abundance should result in more fish available to be caught by the fishery; thus, fishing would be more efficient (greater catch per unit effort) and harvest would increase in a pattern similar to adult abundance. However, several of the most recent abundance indices have shown increases while harvest has declined to some of the lowest levels on record. One factor that has been identified to contribute to overestimates of adult abundance is an increase in the number of juveniles misclassified as adults in surveys that historically have typically caught adults.

2.2.2 Traffic Light Approach as Applied to Atlantic Croaker

The TLA was originally developed as a precautionary management framework for data poor fisheries whereby reference points could be developed that would allow for a reasonable level of resource management. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of different indicators for either a fish population or a fishery. Examples of indicators include growth and reproduction parameters, abundance and stock biomass estimates, recreational harvest, commercial landings, or fishing mortality. Additionally, the indicators can be combined to form composite characteristics within similar categories (e.g. biological, population estimates, or combined fisheries harvest). However, each indicator must be evaluated separately to determine its appropriateness for use in management.

In general practice when applying the TLA, the green/yellow boundary is typically set at the average for a reference time period and the yellow/red boundary is set at 60% of the reference period average, which would indicate a 40% decline (Halliday et al., 2001). Index values in the intermediate zone can be represented by a mixture of either yellow/green or yellow/red depending on where they fall in the transition zone. Since increasing proportions of red reflect decreasing trends away from the reference period average, the relative proportion of red offers a way of determining if any management response is necessary.

For Atlantic croaker, the TLA is used to provide management guidance in between stock assessments. It has two components, a harvest characteristic, comprised of commercial landings and recreational harvest data, and an abundance characteristic, comprised of fishery-independent abundance indices. The TC annually runs the TLA and provides the results to the PRT for the annual FMP Review. To utilize the best data available, the TC and PRT are able to modify the TLA as needed through annual reviews and updates.

2.2.3 Recommended Changes to the TLA and Management Responses

Following the 2017 assessment, the Board tasked the TC with exploring potential updates to improve the TLA. The TC developed five recommendations (ASMFC, 2018a), which are listed below and are being considered for implementation through this addendum.

1. Incorporation of indices from the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the South Carolina Department of Natural Resources (SCDNR) Trammel Net Survey into the adult composite characteristic index, in addition to the currently used indices from the Northeast Fishery Science Center

(NEFSC) Multispecies Bottom Trawl Survey and Southeast Area Monitoring and Assessment Program (SEAMAP).

2. Use of revised adult abundance indices from the surveys mentioned above, in which age-length keys and length composition information are used to estimate the number of adult (age 2+) individuals caught by each survey.
3. Use of regional metrics to characterize the fisheries north and south of the Virginia-North Carolina state border. The ChesMMAP and NEFSC surveys would be used to characterize abundance north of the border, and the SCDNR Trammel Net and SEAMAP surveys would be used to characterize abundance south of the border.
4. Change/establish the reference time period for all surveys to be 2002-2012.
5. Change the triggering mechanism to the following: Management action will be triggered according to the current 30% red and 60% red thresholds if both the abundance and harvest thresholds are exceeded in any 3 of the 4 terminal years.

Some of these changes, such as the selection of fishery-independent surveys used for the abundance characteristic, incorporation of age and length information, and establishment of a new reference time period are already allowed under Addendum II. Addendum III would retain the TC's ability to alter the TLA as needed to best represent trends in Atlantic croaker harvest and abundance, including selection of surveys and methods to analyze and evaluate these data. However, changes to the triggering mechanism are beyond the scope of Addendum II. Thus, they are considered for incorporation through Addendum III.

After considering the recommended changes to the TLA, the Board tasked the Atlantic Croaker and Spot PDT with exploring potential responses to management triggers that could result after incorporation of these updates (ASMFC, 2018b). The PDT noted that there are currently no coastwide management requirements for Atlantic croaker. Additionally, due to the strong association of Atlantic croaker abundance with environmental variables, their exhibition of cyclical abundance trends, and the apparent disconnect between Addendum II harvest and abundance characteristics, a reduction in harvest would not necessarily result in a proportional increase in abundance. Therefore, the PDT recommended establishment of base management measures that would reduce fishing impacts to not exacerbate periods of low abundance. Additionally, with the recommended updates incorporating regional TLAs, the PDT noted that this approach was developed to increase survey coverage throughout the stock, but Atlantic croaker are still a single, coastwide stock. Therefore, any management triggers resulting from regional TLAs should incorporate some form of response throughout the management unit.

2.2.4 Population Characteristics

The following figures show composite harvest characteristic TLA analyses for Atlantic croaker through 2018 using the methods of Addendum II (Figure 1) and those of Draft Addendum III (Figures 2 and 3). Changes to analyses being incorporated through Draft Addendum III are shown in bold font in the captions for Figures 2 and 3, including use of regional information and a different reference time period.

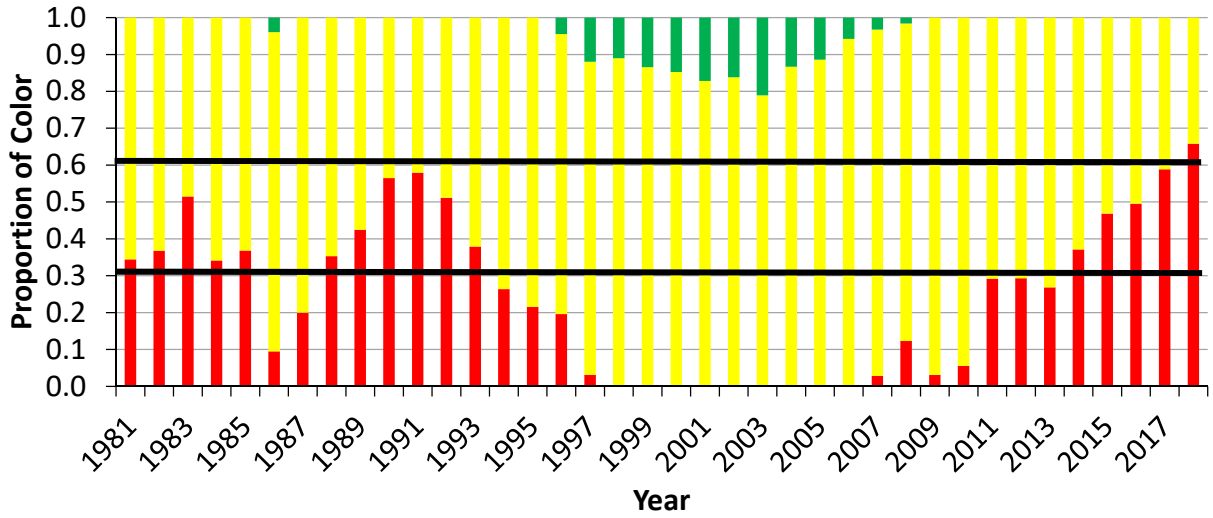


Figure 1. Addendum II Composite TLA analysis using commercial landings and recreational harvest for Atlantic croaker with management thresholds of 30% and 60% proportion red (reference period 1996 – 2008).

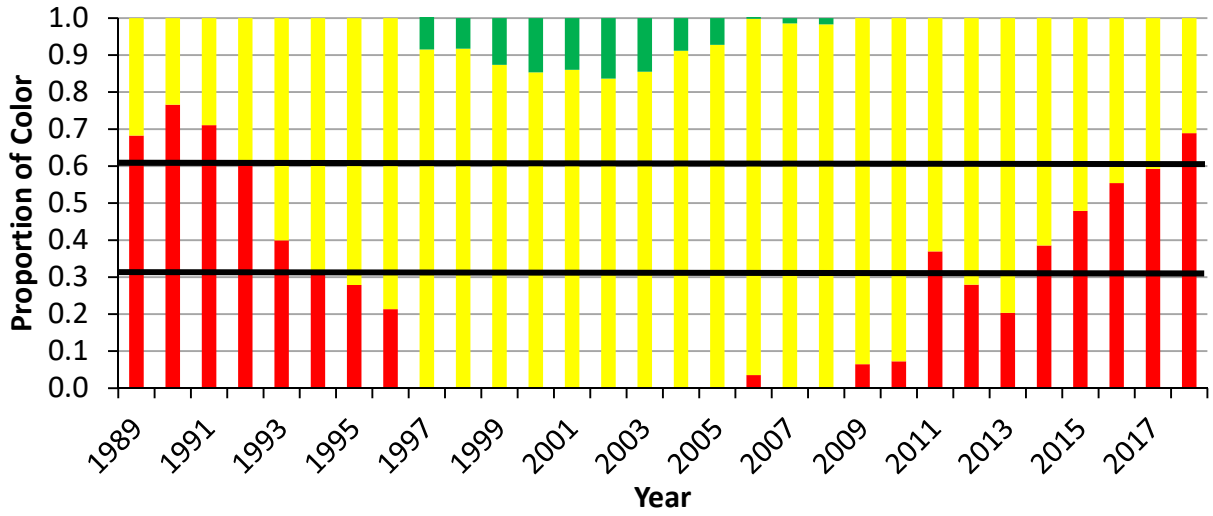


Figure 2. Draft Addendum III **Mid-Atlantic (NJ-VA) Regional** Composite TLA analysis using commercial landings and recreational harvest for Atlantic croaker with management thresholds of 30% and 60% proportion red (**reference period 2002 – 2012**).

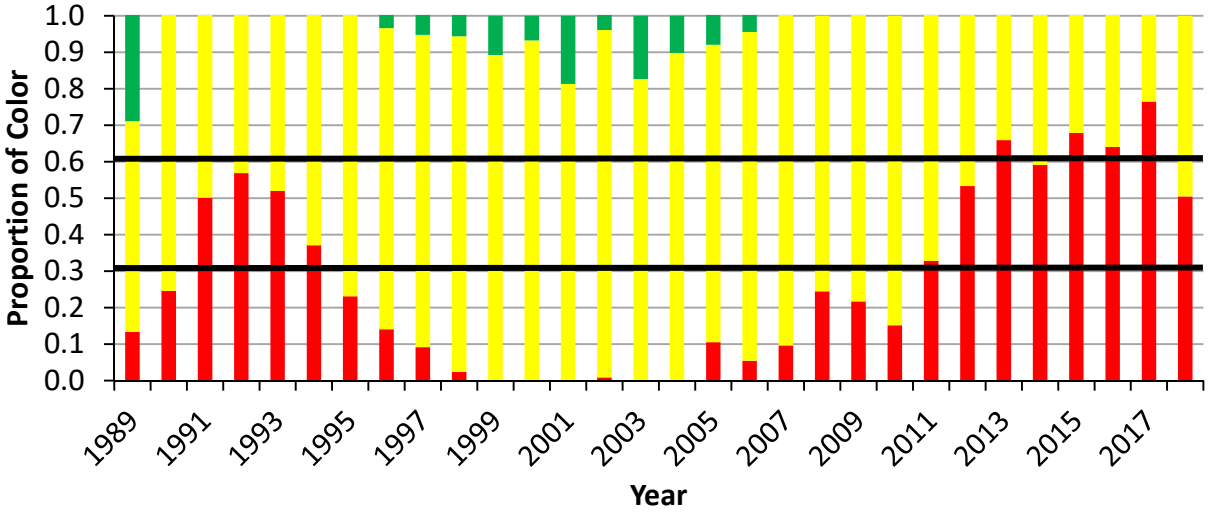


Figure 3. Draft Addendum III **South Atlantic (NC-FL) Regional** Composite TLA analysis using commercial landings and recreational harvest for Atlantic croaker with management thresholds of 30% and 60% proportion red (**reference period 2002 – 2012**).

The following figures show composite abundance characteristic TLA analyses for Atlantic croaker through 2018 using the methods of Addendum II (Figure 4) and those of Draft Addendum III (Figures 5 and 6). Changes to analyses being incorporated through Draft Addendum III are shown in bold font in the captions for Figures 5 and 6, including use of age and regional information and a different reference time period.

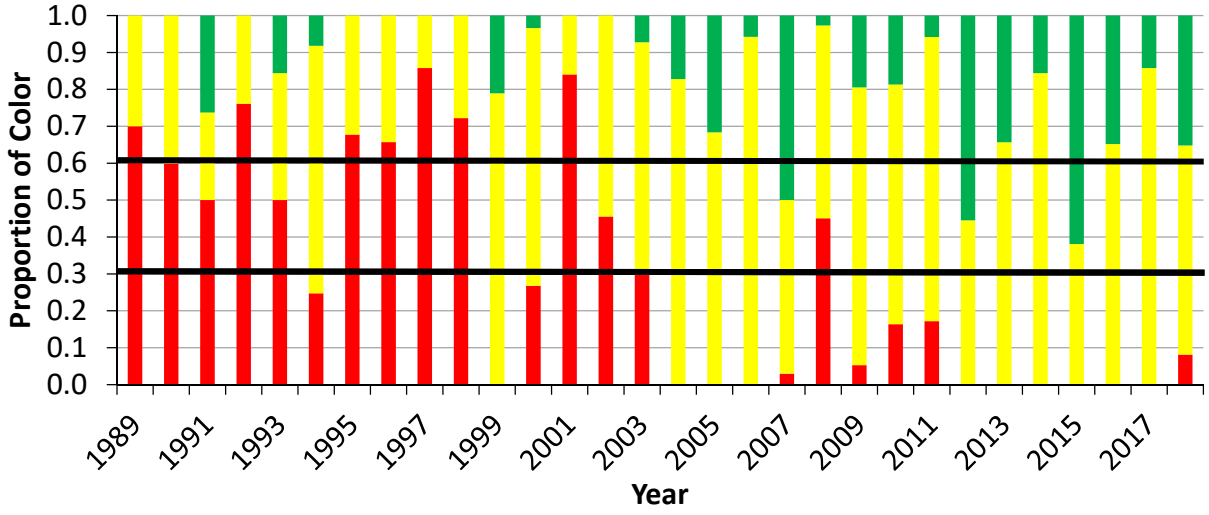


Figure 4. Addendum II Composite TLA analysis using fishery-independent survey indices (NEFSC Trawl Survey and SEAMAP) for Atlantic croaker with management thresholds of 30% and 60% proportion red (reference years 1996 – 2008).

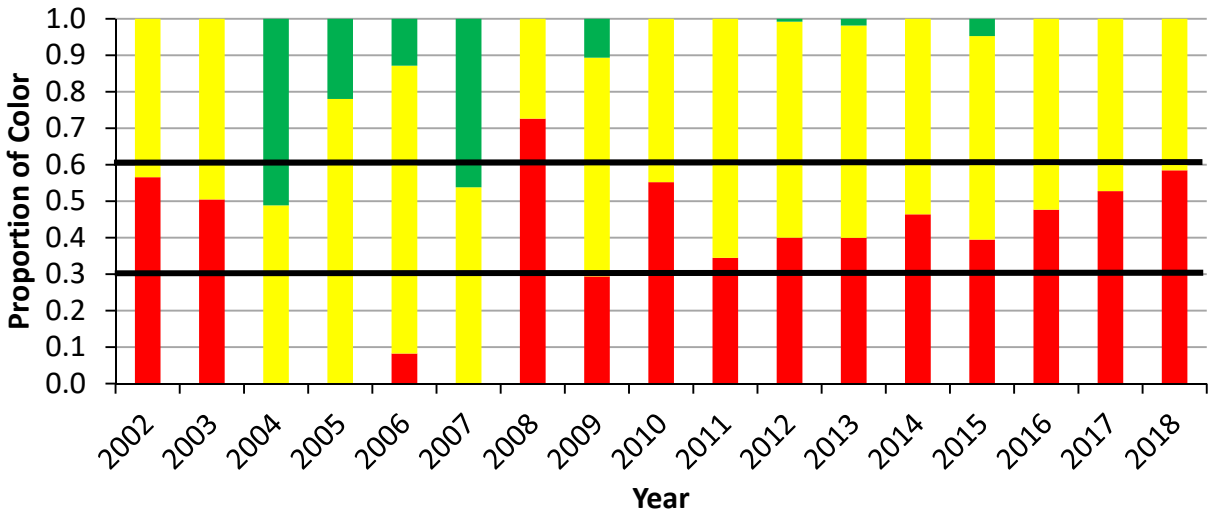


Figure 5. Draft Addendum III **Mid-Atlantic (NJ-VA) Regional** Composite TLA analysis using **age-specified** fishery-independent survey indices (NEFSC Trawl Survey and **ChesMMAP**) for Atlantic croaker with management thresholds of 30% and 60% proportion red (**reference period 2002 – 2012**).

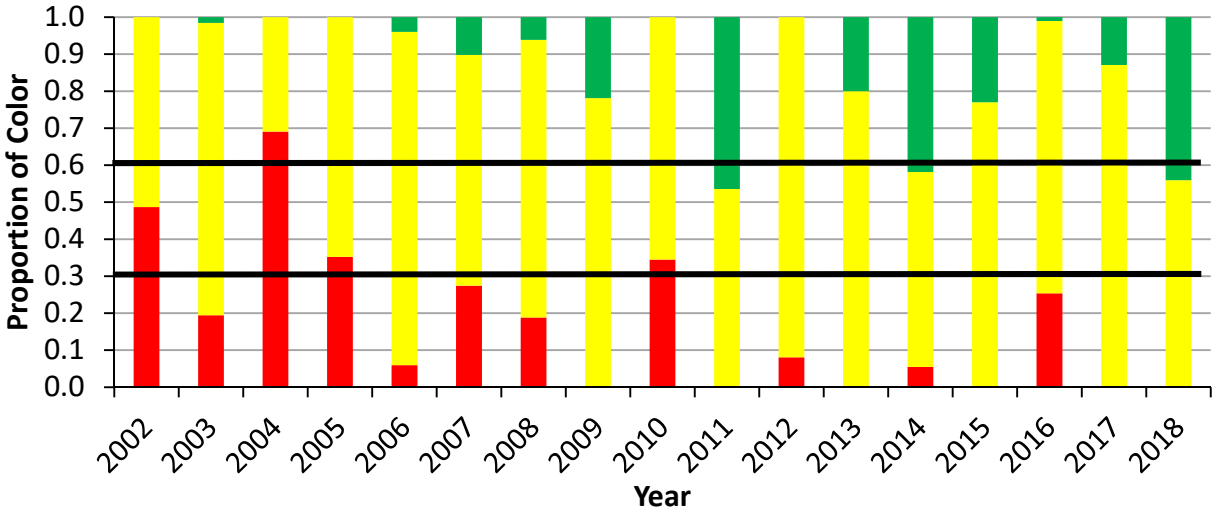


Figure 6. Draft Addendum III **South Atlantic (NC-FL) Regional** Composite TLA using **age-specified** fishery-independent survey indices (SEAMAP and **SCDNR Trammel Net Survey**) for Atlantic croaker with management thresholds of 30% and 60% proportion red (**reference period 2002 – 2012**).

3.0 PROPOSED MANAGEMENT PROGRAM

Changes to the management program would replace Section 3.0 of Addendum II to Amendment 1 to the Atlantic Croaker FMP.

The following issues consider options for the TLA management triggering mechanism (Issue 1) and required management responses for the recreational (Issue 2) and commercial (Issue 3) fisheries. Recommended updates to the TLA analyses including additional fishery-independent survey indices, use of age information, use of regional characteristics, and changing the reference time period, will be incorporated into the TLA as part of this addendum, but are not considered with alternatives in the following issues as they apply the most current scientific advice, which is allowed under Addendum II. Draft Addendum III also retains the TC's ability to alter the TLA as needed to best represent trends in Atlantic croaker harvest and abundance.

3.1 Issue 1: Management Trigger Based on Proportion Red Options

Status quo is not included in either of the following options due to the incorporation of regional characteristics, which is based on the most current scientific advice. Option A is closest to status quo, as it retains the Addendum II trigger timeframe.

Option A. If red proportions for both population characteristics (adult abundance and harvest) in a regional, with both characteristics being for the same region, or a coastwide TLA meet or exceed the proportion of a threshold for the three terminal (most recent) years, then management action will be taken.

Option B. If red proportions for both population characteristics (adult abundance and harvest) in a regional, with both characteristics being for the same region, or a coastwide TLA meet or exceed the proportion of a threshold for any three of the four terminal years, then management action will be taken. (TC recommendation from *Section 2.2.3*)

Thresholds for both options are listed below:

30%- this represents moderate concern to the fishery with moderate management response
60%- this represents significant concern to the fishery with elevated management response

3.2 Management Response to Triggers

If management action has not been triggered according to *Section 3.1*, there will be no coastwide management requirements, in accordance with Amendment 1. States regulations restricting Atlantic croaker harvest are encouraged to be maintained.

Per the PDT recommendations and direction of the Board, TLA-triggered management response options were developed to reduce fishing impacts to not exacerbate periods of low abundance. As the TLA does not offer advice on overfished or overfishing status, resulting management responses are not designed to stop overfishing or recover an overfished stock. Such status designations should be evaluated through a stock assessment and responded to accordingly.

Recreational response alternatives include bag limits while commercial alternatives include seasons and percentage reductions. In developing these different regulatory responses, the

PDT considered sector differences in gears, fishing behavior, and state regulations already in place.

If management action is triggered according to *Section 3.1*, the Draft Addendum proposes the following coastwide requirements (NOTE: the public is asked to identify its preferred option for both the recreational and commercial sectors):

3.2.1 Issue 2: Recreational Management Trigger Response Options

Option A. (Status Quo) The TC will recommend the appropriate percent reduction in recreational harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their fisheries. The application of an overall harvest percentage reduction would be proportional to the magnitude of exceeding the trigger, using a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

Option B. If management action is triggered by meeting or exceeding the 30% red threshold, all recreational non-*de minimis* states will be required to institute a bag limit of no more than 50 Atlantic croaker per person. If management action is triggered by meeting or exceeding the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 40 Atlantic croaker per person.

Option C. If management action is triggered by meeting or exceeding the 30% red threshold, all recreational non-*de minimis* states will be required to institute a bag limit of no more than 40 Atlantic croaker per person. If management action is triggered by meeting or exceeding the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 30 Atlantic croaker per person.

Option D. If management action is triggered by meeting or exceeding the 30% red threshold, all recreational non-*de minimis* states will be required to institute a bag limit of no more than 30 Atlantic croaker per person. If management action is triggered by an exceedance of the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 20 Atlantic croaker per person.

Under any option selected, states would be encouraged to maintain any measures already in place that are more restrictive than those required by this addendum.

De minimis states are those in which enforcement actions would be expected to contribute insignificantly to a coastwide conservation plan. Per *Section 4.4.3* of Amendment 1, states may apply for this status if, for the preceding three years for which data are available, their average commercial or recreational Atlantic croaker landings (by weight) constitute less than one percent of the average coastwide commercial or recreational Atlantic croaker landings for the same period. A state that qualifies for *de minimis* based on their commercial landings will qualify for exemptions in their commercial fishery only, and a state that qualifies for *de minimis*

based on their recreational landings will qualify for exemptions in their recreational fishery only.

Recreational for-hire vessels may possess live Atlantic croaker for use as bait. The maximum number of Atlantic croaker allowed to be held onboard for this use prior to beginning a trip, during a trip or after a trip is completed will be the bag limit in effect multiplied by the number of customers allowed on the vessel. During a trip, the number of Atlantic croaker in possession to be harvested may not exceed the bag limit in effect multiplied by number of anglers onboard the vessel during the trip (any additional Atlantic croaker in possession, up to the limit stated above, must be those to be used as live bait). In this context, a trip is defined as a period of time in which fishing is conducted, beginning when the vessel leaves port and ending when the vessel returns to port. If no coastwide bag limit is in effect, then this use is not limited by this addendum.

Recreational private vessels that possess live Atlantic croaker for use as bait would be subject to personal bag limits of anglers on the vessel, with live fish possessed counting towards the bag limits. If no coastwide bag limit is in effect, then this use is not limited by this addendum.

3.2.2 Issue 3: Commercial Management Trigger Response Options

Option A. (Status Quo) The TC will recommend the appropriate percent reduction in commercial harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their fisheries. The application of an overall harvest percentage reduction would be proportional to the magnitude of exceeding the trigger, using a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

Option B. Include the following language defining commercial responses to triggers at the 30% and 60% thresholds, with selection of one of Sub-Options B1-B3.

30% Threshold *(single option proposed)*

If management action is triggered by meeting or exceeding the 30% red threshold, commercial non-*de minimis* states that do not already have a minimum size limit or possession limit will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) that reduce commercial harvest by 1% of the average state commercial harvest from the previous 10 years. States may establish differential measures by gear or area, as long as measures implemented are quantifiable and achieve the required 1% reduction for the entire state commercial harvest.

60% Threshold *(choose one of Sub-Options B1-B3)*

Sub-Option B1. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) that reduce commercial harvest by 5% of the average state commercial harvest from the previous 10 years.

Sub-Option B2. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) that reduce commercial harvest by 10% of the average state commercial harvest from the previous 10 years.

Sub-Option B3. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) that reduce commercial harvest by 20% of the average state commercial harvest from the previous 10 years.

All restrictions established as required responses to TLA triggers must be evaluated to determine if they are both quantifiable and meet the objective reduction by the TC and approved by the Board prior to implementation.

3.2.3 Management Alternatives

If management action is triggered by meeting or exceeding the 60% red threshold and the Board determines more restrictive actions are necessary than those defined in *Sections 3.2.1* or *Section 3.2.2*, the Board may task the TC to determine an alternative reduction to the recreational or commercial fisheries. The TC will recommend the appropriate percent reduction in harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their state's fisheries. The application of an overall harvest percentage reduction may include use of a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

3.3 Issue 4: Evaluation of Fishery Response to Management Measures

Option A. (Status Quo) Management measures set in response to any trigger will remain in place for three years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the thresholds will not be applied to the harvest characteristics in assessing the fishery for three years, as the fishery-dependent data may be influenced by management action.

Option B. Management measures set in response to any trigger will remain in place for at least three years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the harvest characteristics will no longer be used to trigger management action, as the fishery-dependent data may be influenced by triggered measures. While triggered measures are in effect, a composite regional abundance characteristic, by itself, may trigger action at the next highest level of management response by the proportion red exceeding the next highest threshold in any three of the four terminal years.

After a minimum of three years, once no composite regional abundance characteristics trigger management action at either threshold, triggered measures will no longer be required, and the TC will resume using the harvest characteristics as components of the TLA that would be required to trigger management action.

If triggered measures have remained in place for a minimum of four years due to proportions of red above a threshold for either of the composite regional abundance characteristics, the TC will, as part of conducting the annual TLA, evaluate trends in abundance to recommend to the Board whether triggered measures should remain in place or more restrictive measures should be considered.

4.0 COMPLIANCE

The management framework contained in *Section 3.0* of Addendum III to Amendment 1 is effective immediately upon its approval.

5.0 REFERENCES

Atlantic States Marine Fisheries Commission (ASMFC). 2005. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker. Washington (DC): ASMFC. Fishery Management Report No. 44. 92 p.

ASMFC. 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. Washington (DC): ASMFC. 366 p.

ASMFC. 2014. Addendum II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker.

ASMFC. 2018a. Memorandum 18-8: Recommended Updates to the Annual Traffic Light Analyses for Atlantic Croaker and Spot.

ASMFC. 2018b. Memorandum 18-73: Recommendations for Management Response to Triggers from Updated Traffic Light Analyses.

Halliday, R.G., L.P. Fanning, and R.K. Mohn. 2001. Use of the Traffic Light Method in Fishery Management Planning. Canadian Science Advisory Secretariat, Research Document No. 108. 41 p.

6.0 APPENDIX

To aid in public interpretation of TLA figures and results, the following figures depict components of Atlantic croaker TLA characteristics in a linear format with the long-term mean (average) (LTM) of the proposed reference period (2002-2012).

Commercial and Recreational Harvest

Commercial landings show a general declining trend has occurred since the late 1990s.

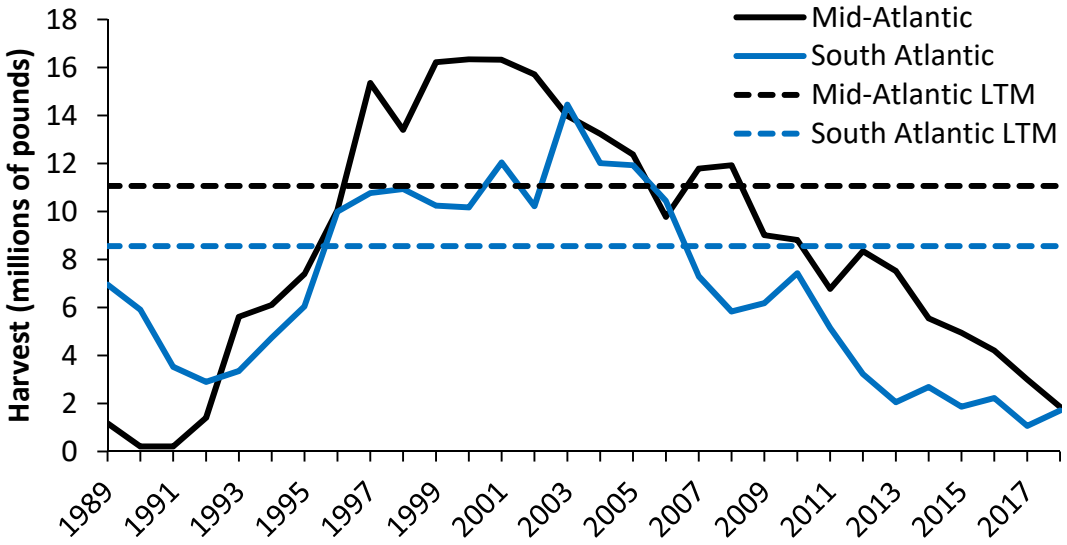


Figure A1. Commercial harvest and the LTM harvest for 2002-2012 in the Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) regions.

Mid-Atlantic recreational harvest shows an increase to a peak in the early 2000s, followed by a decline with values under its LTM since 2011. South Atlantic recreational harvest declined in the late 1980s and has remained low, varying about its LTM.

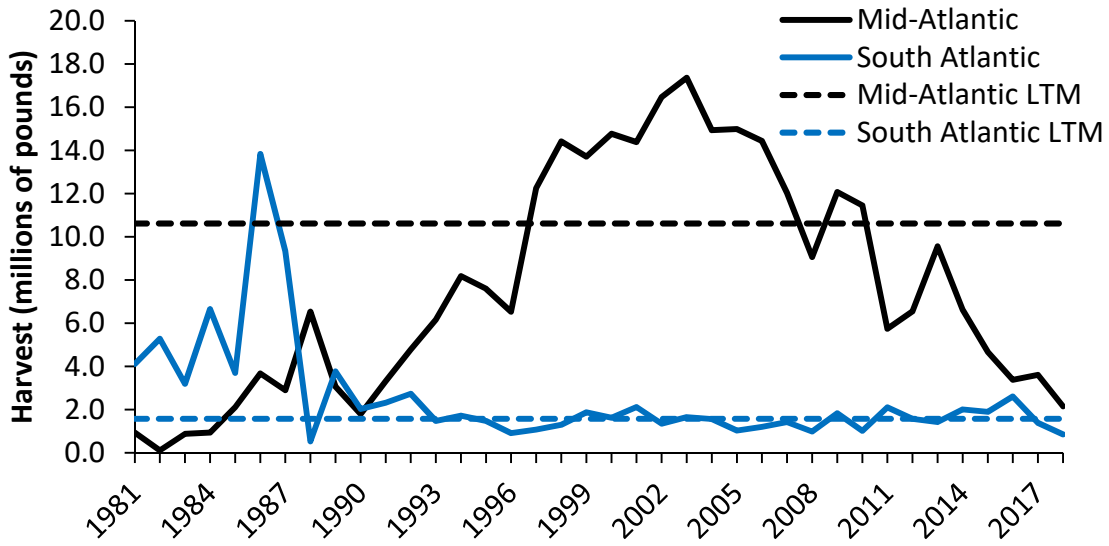


Figure A2. Recreational harvest and the LTM harvest for 2002-2012 in the Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) regions.

Abundance Indices

Mid-Atlantic

The Northeast Fishery Science Center (NEFSC) Multispecies Bottom Trawl Survey adult index has declined from its peak years (2007-2009), and general index levels have been below the LTM for the last three years.

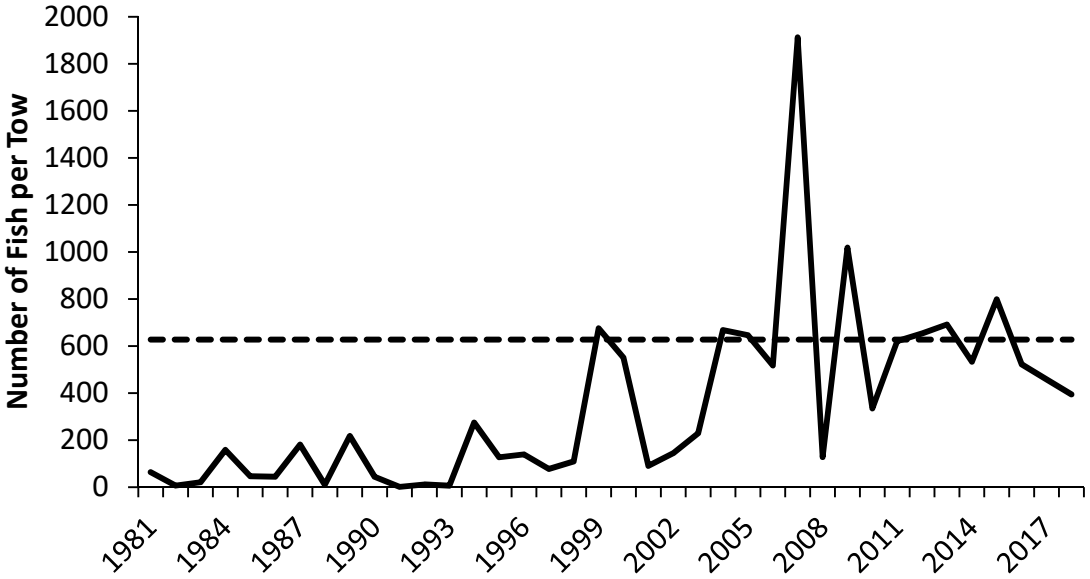


Figure A3. NEFSC adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

The Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) adult index shows a general long-term decline since the series peak in 2004.

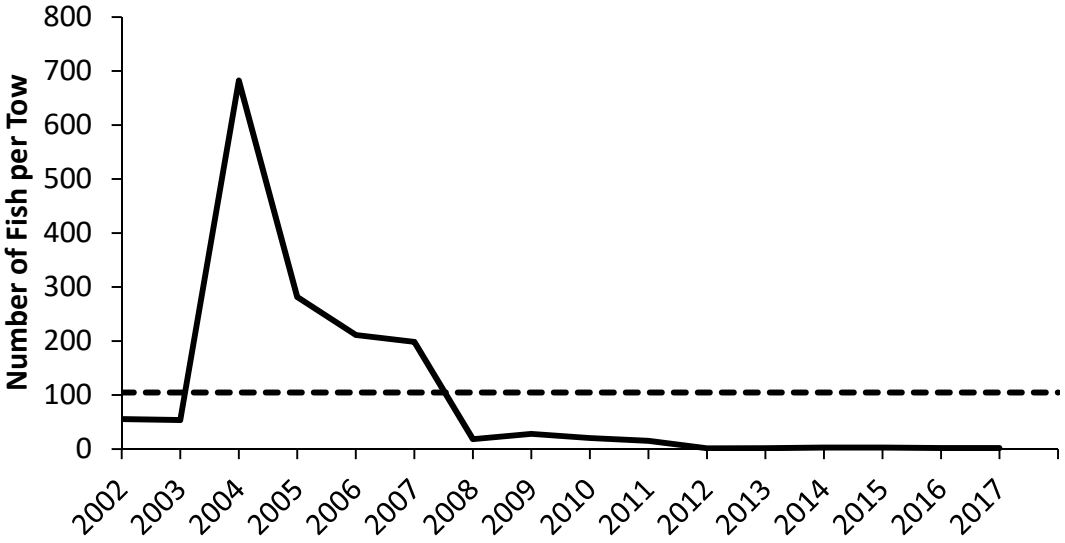


Figure A4. ChesMMAP adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

South Atlantic

The Southeast Area Monitoring and Assessment Program (SEAMAP) adult index shows a general increasing trend since the early 2000s.

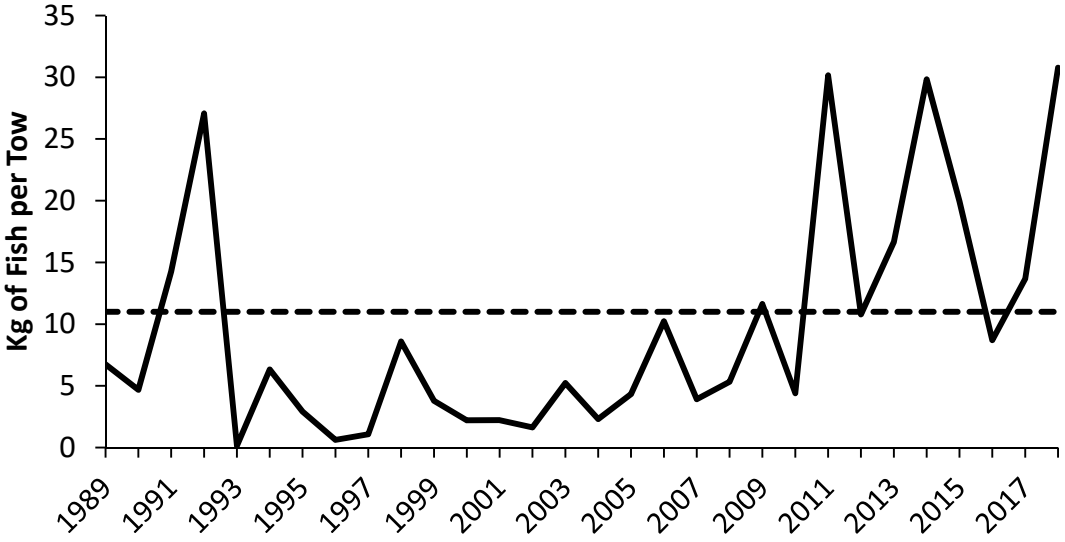


Figure A5. SEAMAP adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

The South Carolina Department of Natural Resources (SCDNR) Trammel Net Survey index shows a general declining trend since 2009 with annual values above and below the LTM.

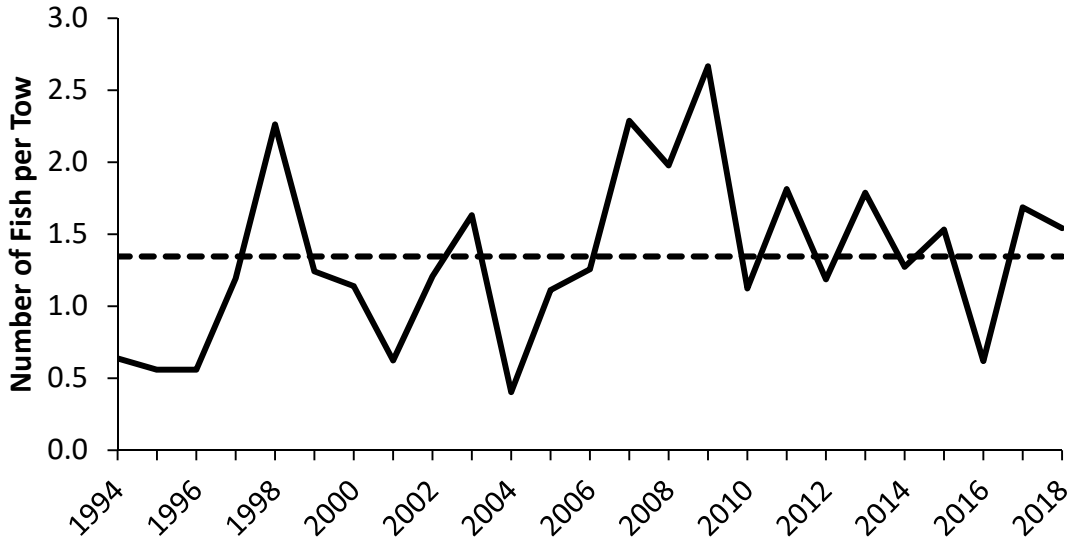
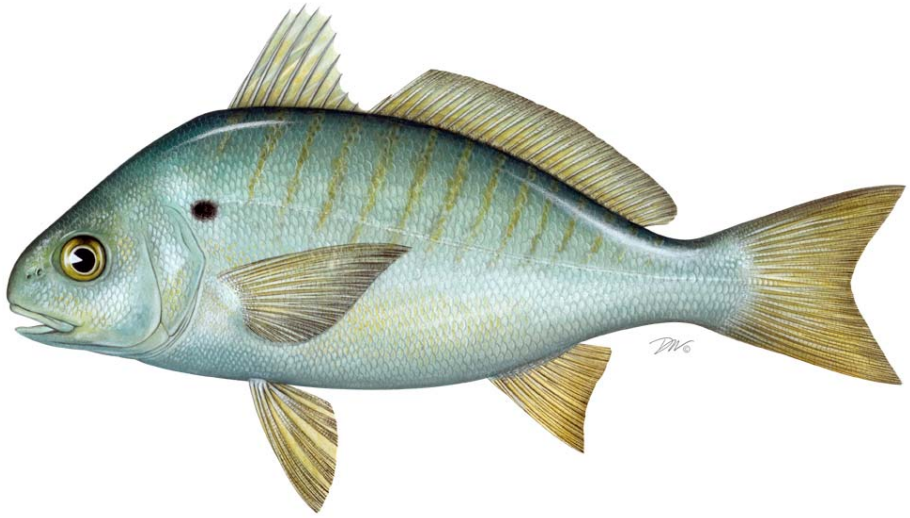


Figure A6. SCDNR adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM III TO THE OMNIBUS AMENDMENT TO THE INTERSTATE FISHERY MANAGEMENT PLANS FOR SPANISH MACKEREL, SPOT, AND SPOTTED SEATROUT

Revisions to Spot Management using the Traffic Light Approach



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.

October 2019

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In May 2019, the South Atlantic State/Federal Fisheries Management Board (Board) initiated the development of an addendum to the Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout to incorporate updates to the annual Traffic Light Approach and associated management for spot. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of spot, 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 **January XX, 2020 at 5:00 p.m**. Comments may be submitted at state public hearings or by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.

Mail: Dr. Michael Schmidtke, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Spot Draft Addendum III)
Phone: (703) 842-0740
Fax: (703) 842-0741

Commission's Process and Timeline

May 2019	South Atlantic Board Tasks PDT to Develop Draft Addendum III
May 2019 – October 2019	PDT Develops Draft Addendum III for Public Comment
October 2019	South Atlantic Board Review Draft Addendum III and Considers Its Approval for Public Comment
October 2019 – January 2020	Board Solicits Public Comment and States Conduct Public Hearings
February 2020	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum III
TBD	Provisions of Addendum III are Implemented

1.0 INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) is responsible for managing spot (*Leiostomus xanthurus*) in state waters (0-3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through an interstate fishery management plan (FMP) since 1987. Spot are currently managed under the Omnibus Amendment (2011) to the Spot, Spotted Seatrout, and Spanish Mackerel FMPs and Addendum II. The states of New Jersey through Florida have a declared interest in the fishery and are responsible for implementing management measures consistent with the interstate FMP as members of the South Atlantic State/Federal Fisheries Management Board (Board).

Addendum II established the Traffic Light Approach (TLA) as a precautionary management framework to evaluate fishery trends and develop management actions (ASMFC, 2014). 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. When a population characteristic declines, the proportion of red 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 population characteristics (harvest and abundance) meet or exceed a threshold for a two year period, then management action is required.

In recent years, the spot fishery has experienced significant declines in harvest, while such declines have not been evident in fishery-independent survey abundance indices used in the TLA. Furthermore, a 2017 stock assessment was not recommended for management use, due partially to conflicting signals between harvest and fishery-independent indices. These conflicting signals indicate that the harvest and fishery-independent characteristics may not be representing comparable aspects or components of the stock, thus making management advice from the TLA unclear.

In response to the recent TLA and assessment results, a 2018 report from the Spot Plan Review Team (PRT) recommended five updates to the TLA (ASMFC, 2018a). Additionally, a 2018 report from the Atlantic Croaker and Spot Plan Development Team (PDT) discussed how the management responses required by Addendum II could be updated to better reflect stock characteristics and develop more achievable management goals. Draft Addendum III addresses the recommendations of these documents by incorporating TC-recommended updates to the TLA analysis and considering changes to the TLA triggers and management responses.

2.0 OVERVIEW

2.1 Statement of the Problem

The TLA has been used since 2014 to monitor the spot population. The lack of a recent assessment approved for management use makes this approach the prominent source of

management advice for this species. While strong declines in harvest and reports of poor fishing have prompted concern, management action has not been triggered through the TLA because similar declines have not been observed in abundance indices. These conflicting signals suggest that the current abundance indices used in the TLA may not adequately represent coastwide adult abundance and that the TLA may not be sensitive enough to trigger management action when changes to the fishery occur. Additionally, current management responses required by Addendum II lack specificity in terms of required measures and attainability in terms of requiring a percent reduction in harvest to achieve a percent increase in abundance. Draft Addendum III incorporates PRT-recommended updates that improve the TLA analysis and considers alternatives to the current management triggers and responses.

2.2 Background

Spot are a small sciaenid forage species that support commercial and recreational fisheries in the Mid- and South Atlantic regions. Spot migrate seasonally along the coast, moving northward and inshore to estuaries and bays during warmer months (spring-fall) and southward and offshore to more oceanic waters in the winter. Spot feed on planktonic organisms as post-larvae and young-of-the-year, and as juveniles and adults prey on bottom dwelling organisms such as worms and crustaceans. Spot reach maturity by approximately age two and are considered a short-lived species, rarely living beyond six years.

2.2.1 Stock Status and Assessment

While state level stock assessments for spot have been conducted over the years, a coastwide benchmark assessment has not been approved for management use. The most recent coastwide assessment, conducted in 2017, was not recommended for management use by the Peer Review Panel. Therefore, current stock status is unknown, although the Peer Review Panel did not indicate problems in the spot fishery that would require immediate management action. The Peer Review Panel did recommend continued evaluation of the fishery using the annual TLA.

One of the reasons the 2017 stock assessment was not approved for management use was due to conflicting signals in harvest and abundance characteristics. Theoretically, increases in adult abundance should result in more fish available to be caught by the fishery; thus, fishing would be more efficient (greater catch per unit effort) and harvest would increase in a pattern similar to adult abundance. However, several of the most recent abundance indices have shown increases while harvest has declined to some of the lowest levels on record. One factor that has contributed to overestimates of adult abundance is an increase in the number of juveniles misclassified as adults in surveys that historically have typically caught adults.

2.2.2 Traffic Light Approach as Applied to Spot

The TLA was originally developed as a precautionary management framework for data poor fisheries whereby reference points could be developed that would allow for a reasonable level

of resource management. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of different indicators for either a fish population or a fishery. Examples of indicators include growth and reproduction parameters, abundance and stock biomass estimates, recreational harvest, commercial landings, or fishing mortality. Additionally, the indicators can be combined to form composite characteristics within similar categories (e.g. biological, population estimates, or combined fisheries harvest). However, each indicator must be evaluated separately to determine its appropriateness for use in management.

In general practice when applying the TLA, the green/yellow boundary is typically set at the average for a reference time period and the yellow/red boundary is set at 60% of the reference period average, which would indicate a 40% decline (Halliday et al., 2001). Index values in the intermediate zone can be represented by a mixture of either yellow/green or yellow/red depending on where they fall in the transition zone. Since increasing proportions of red reflect decreasing trends away from the reference period average, the relative proportion of red offers a way of determining if any management response is necessary.

For spot, the TLA is used to provide management guidance in between stock assessments. It has two components, a harvest characteristic, comprised of commercial landings and recreational harvest data, and an abundance characteristic, comprised of fishery-independent abundance indices. The PRT annually runs the TLA and includes the results in the annual FMP Review. To utilize the best data available, the PRT is able to modify the TLA as needed through annual reviews and updates.

2.2.3 Recommended Changes to the TLA and Management Responses

Following the failed assessment in 2017, the Board tasked the Spot PRT with exploring potential updates to improve the TLA. The PRT developed five recommendations (ASMFC, 2018a), which are listed below and are being considered for implementation through this Draft Addendum.

1. Incorporation of indices from the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the North Carolina Division of Marine Fisheries (NCDMF) Pamlico Sound Survey, into the adult composite characteristic index, in addition to the currently used indices from the Northeast Fisheries Science Center (NEFSC) Multispecies Bottom Trawl Survey and the South Atlantic component of the Southeast Area Monitoring and Assessment Program (SEAMAP).
2. Use of revised adult abundance indices from the surveys mentioned above, in which age-length keys and length composition information are used to estimate the number of adult (age 1+) individuals caught by each survey.
3. Use of regional metrics to characterize the fisheries north and south of the Virginia-North Carolina state border. The ChesMMAP and NEFSC surveys would be used to characterize abundance north of the border, and the NCDMF Program 195 and SEAMAP surveys would be used to characterize abundance south of the border.
4. Change/establish the reference time period for all surveys to be 2002-2012.

5. Change the triggering mechanism to the following: Management action will be triggered according to the current 30% and 60% red thresholds if both the abundance and harvest thresholds are exceeded in any 2 of the 3 terminal years.

Some of these changes, such as the selection of fishery-independent surveys used for the abundance characteristic, incorporation of age and length information, and establishment of a new reference time period are already allowed under Addendum II. However, changes to the triggering mechanism are beyond the scope of Addendum II. Thus, they are considered for incorporation through Draft Addendum III. Draft Addendum III proposes the establishment of a Spot Technical Committee (TC) with the ability to alter the TLA as needed to best represent trends in spot harvest and abundance, including selection of surveys and methods to analyze and evaluate these data. The TC would also evaluate implementation of management responses triggered through the TLA.

After considering the recommended changes to the TLA, the Board tasked the Atlantic Croaker and Spot PDT with exploring potential responses to management triggers that could result after incorporation of these updates (ASMFC, 2018b). The PDT noted that there are currently no coastwide management requirements for spot. Additionally, because of a lack of information on environmental impacts on spot abundance or harvest and the apparent disconnect between Addendum II harvest and abundance characteristics, a reduction in harvest may not necessarily result in a proportional increase in abundance. Therefore, the PDT recommended establishment of base management measures that would reduce fishing impacts so as to not exacerbate periods of low abundance. Additionally, with the recommended updates incorporating regional TLAs, the PDT noted this approach was developed to increase survey coverage and sensitivity, but spot are still a single, coastwide stock. Therefore, any management triggers resulting from regional TLAs should incorporate some form of response throughout the management unit.

2.2.4 Population Characteristics

The following figures show composite harvest characteristic TLA analyses for spot through 2018 using the methods from Addendum II (Figure 1) and those proposed in Draft Addendum III (Figures 2 and 3). Changes to analyses being incorporated through Draft Addendum III are shown in bold font in the captions for Figures 2 and 3, including use of regional information and a different reference time period.

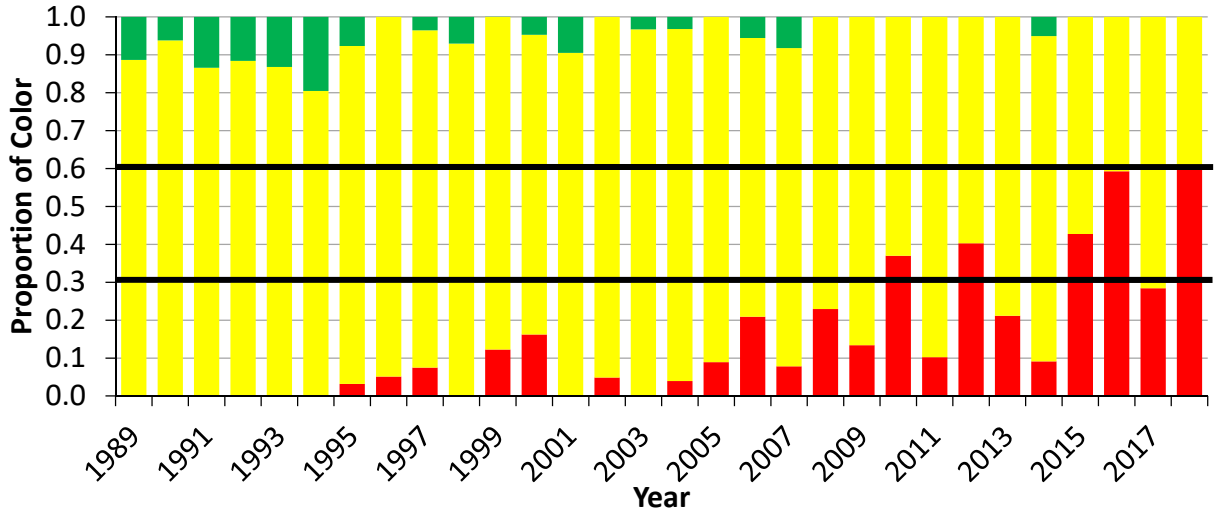


Figure 1. Addendum II Composite TLA using commercial landings and recreational harvest for spot with 30% and 60% red management thresholds (reference years 1989 – 2012).

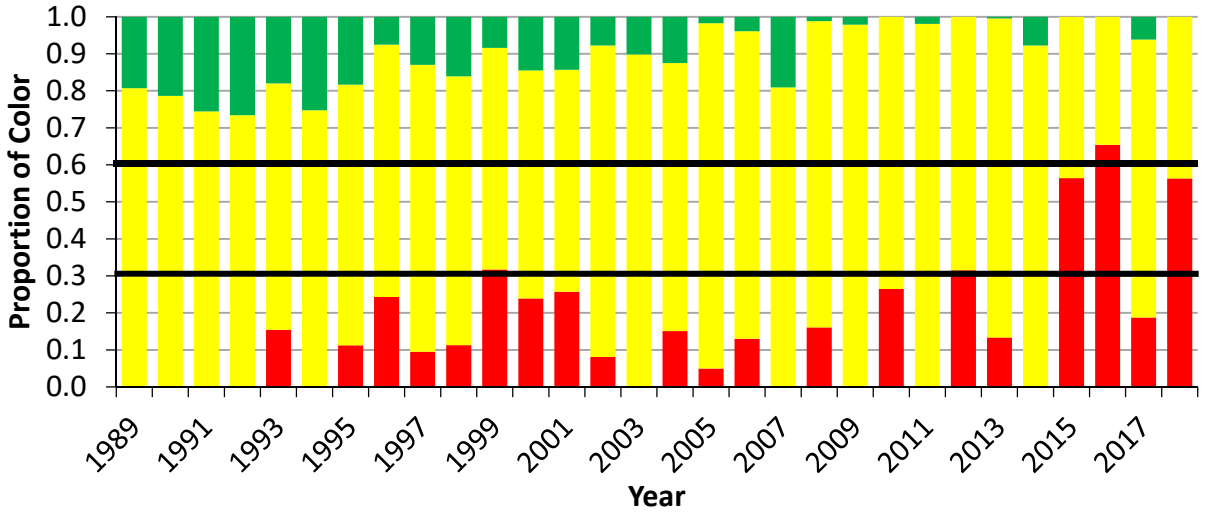


Figure 2. Draft Addendum III **Mid-Atlantic (NJ-VA) Regional** Composite TLA using commercial landings and recreational harvest for spot with 30% and 60% red management thresholds (**reference years 2002 – 2012**).

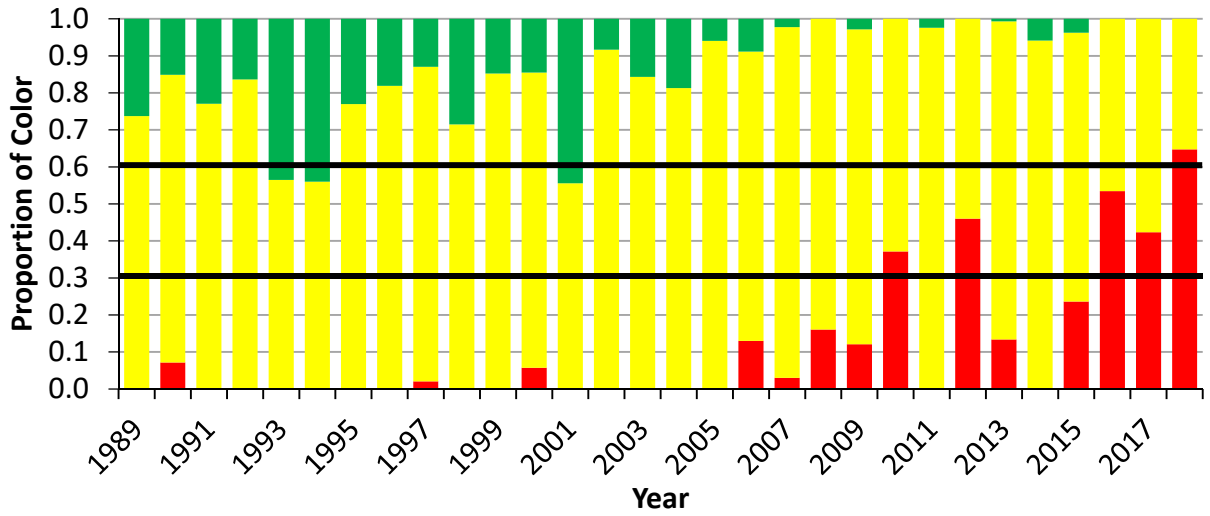


Figure 3. Draft Addendum III **South Atlantic (NC-FL) Regional** Composite TLA using commercial landings and recreational harvest for spot with 30% and 60% red management thresholds (**reference years 2002 – 2012**).

The following figures show composite abundance characteristic TLA analyses for spot through 2018 using the methods from Addendum II (Figure 4) and those proposed in Draft Addendum III (Figures 5 and 6). Changes to analyses being incorporated through Draft Addendum III are shown in bold font in the captions for Figures 5 and 6, including use of age and regional information and a different reference time period.

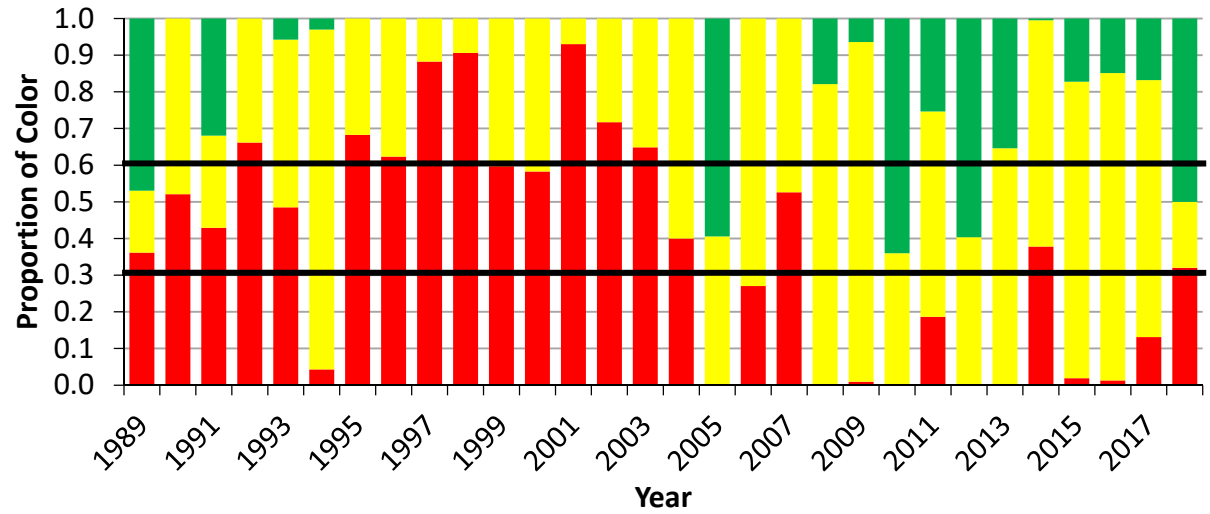


Figure 4. Addendum II Composite TLA using fishery-independent survey indices (NEFSC Trawl Survey and SEAMAP) for spot with 30% and 60% red management thresholds (reference period years 1989 – 2012).

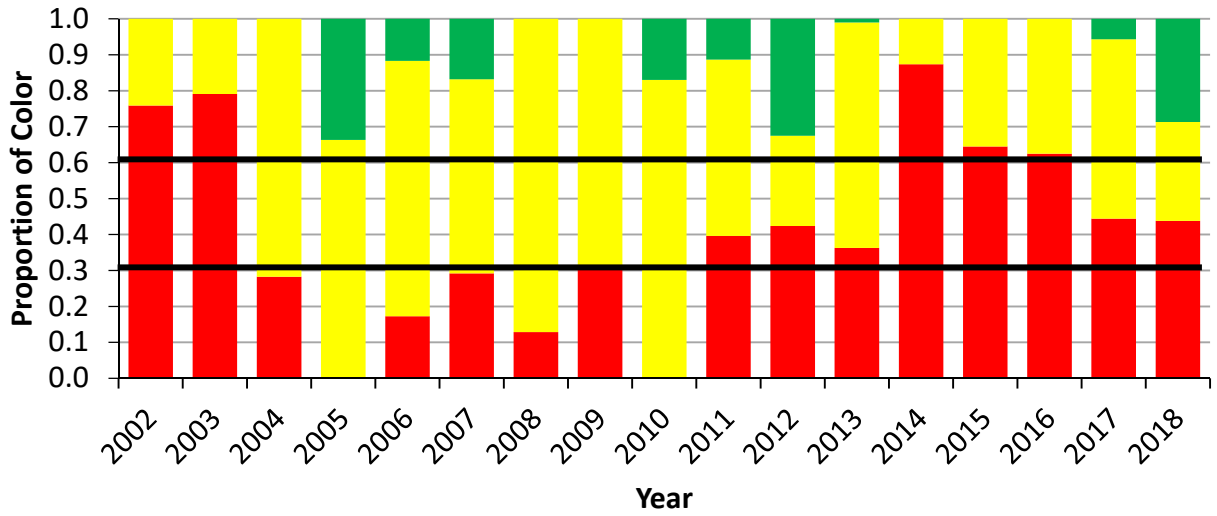


Figure 5. Draft Addendum III **Mid-Atlantic (NJ-VA) Regional** Composite TLA using **age-specified** fishery-independent survey indices (NEFSC Trawl Survey and **ChesMMAP**) for spot with 30% and 60% red management thresholds (**reference period years 2002 – 2012**).

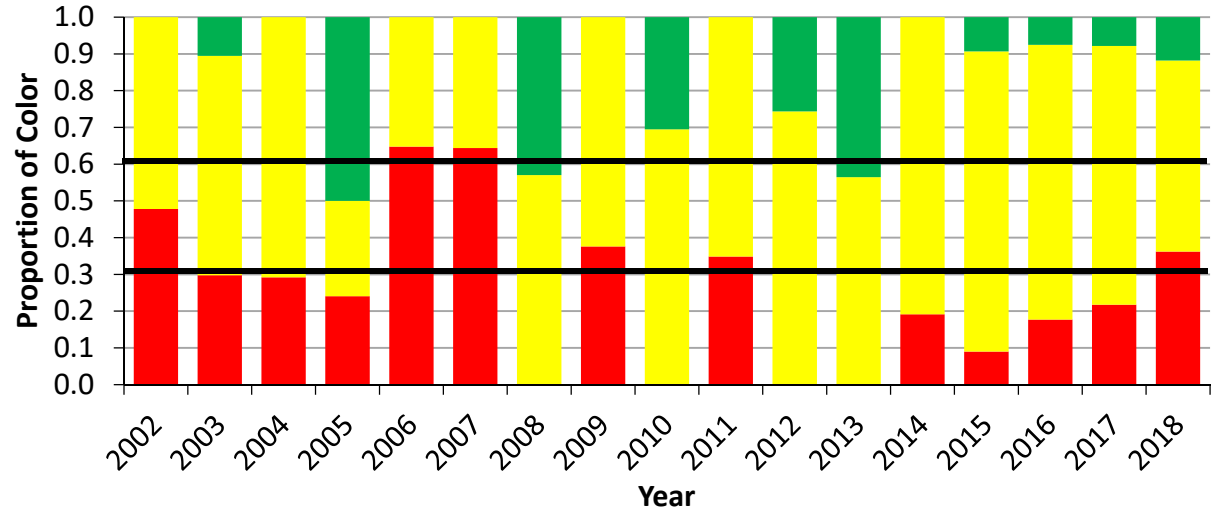


Figure 6. Draft Addendum III **South Atlantic (NC-FL) Regional** Composite TLA using **age-specified** fishery-independent survey indices (SEAMAP and **NCDMF**) for spot with 30% and 60% red management thresholds (**reference period years 2002 – 2012**).

3.0 PROPOSED MANAGEMENT PROGRAM

Changes to the management program would replace Section 3.0 of Addendum II to the Omnibus Amendment to the Interstate FMPs for Spanish Mackerel, Spot, and Spotted Seatrout.

The following issues consider options for the TLA management triggering mechanism (Issue 1) and required management responses for the recreational (Issue 2) and commercial (Issue 3) fisheries. Recommended updates to the TLA analyses including additional fishery-independent survey indices, use of age information, use of regional characteristics, and changing the reference time period, will be incorporated into the TLA as part of this addendum, but are not considered with alternatives in the following issues as they apply the most current scientific advice, which is allowed under Addendum II. Draft Addendum III also retains the TC's ability to alter the TLA as needed to best represent trends in spot harvest and abundance.

3.1 Issue 1: Management Trigger Based on Proportion Red

Staus quo is not included in either of the following options due to the incorporation of regional characteristics, which is based on the most current scientific advice. Option A is closest to status quo, as it retains the Addendum II trigger timeframe.

Option A. If red proportions for both population characteristics (adult abundance and harvest) in a specific regional or a coastwide TLA meet or exceed the proportion of a threshold for the two terminal (most recent) years, then management action shall be required.

Option B. If red proportions for both population characteristics (adult abundance and harvest) in a specific regional or a coastwide TLA meet or exceed the proportion of a threshold for any two of the three terminal years, then management action shall be required. (PRT recommendation from *Section 2.2.3*)

Thresholds for both options are listed below:

30% - this represents moderate concern to the fishery with moderate management response
60% - this represents significant concern to the fishery with elevated management response

3.2 Management Response to Triggers

If management action has not been triggered according to *Section 3.1*, there will be no coastwide management requirements, in accordance with the Omnibus Amendment. States regulations restricting spot harvest are encouraged to be maintained.

Per the PDT recommendations and direction of the Board, TLA-triggered management response options were developed to reduce fishing impacts to not exacerbate periods of low abundance. As the TLA does not offer advice on overfished or overfishing status, resulting management responses are not designed to stop overfishing or recover an overfished stock. Such status designations should be evaluated through a stock assessment and responded to accordingly.

If management action is triggered according to *Section 3.1*, the Draft Addendum proposes the following coastwide requirements (NOTE: the public is asked to identify its preferred option for both the recreational and commercial sectors):

3.2.1 Issue 2: Recreational Management Trigger Response Options

Option A. (Status Quo) The PRT will recommend the appropriate percent reduction in recreational harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their fisheries. The application of an overall harvest percentage reduction would be proportional to the magnitude of exceeding the trigger, using a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

Option B. If management action is triggered by meeting or exceeding the 30% red threshold, all non-*de minimis* states will be required to institute a bag limit of no more than 50 spot per person. If management action is triggered by meeting or exceeding the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 40 spot per person.

Option C. If management action is triggered by meeting or exceeding the 30% red threshold, all non-*de minimis* states will be required to institute a bag limit of no more than 40 spot per person. If management action is triggered by meeting or exceeding the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 30 spot per person.

Option D. If management action is triggered by meeting or exceeding the 30% red threshold, all non-*de minimis* states will be required to institute a bag limit of no more than 30 spot per person. If management action is triggered by meeting or exceeding the 60% threshold, all states (including *de minimis*) will be required to institute a bag limit of no more than 20 spot per person.

De minimis states are those in which enforcement actions would be expected to contribute insignificantly to a coastwide conservation plan. Per *Section 4.4.3* of the Omnibus Amendment, states may apply for this status if, for the preceding three years for which data are available, their average combined commercial and recreational spot landings (by weight) constitute less than one percent of the average combined coastwide commercial and recreational spot landings for the same period.

Recreational for-hire vessels may possess live spot for use as bait. The maximum number of spot allowed to be held onboard for this use prior to beginning a trip, during a trip or after a trip is completed will be the bag limit in effect multiplied by the number of customers allowed on the vessel. During a trip, the number of spot in possession to be harvested may not exceed the bag limit in effect multiplied by number of anglers onboard the vessel during the trip (any additional spot in possession, up to the limit stated above, must be those to be used as live bait). In this context, a trip is defined as a period of time in which fishing is conducted, beginning when the vessel leaves port and ending when the vessel returns to port. If no coastwide bag limit is in effect, then this use is not limited by this addendum.

Recreational private vessels that possess live spot for use as bait would be subject to personal bag limits of anglers on the vessel, with live fish possessed counting towards the bag limits. If no coastwide bag limit is in effect, then this use is not limited by this addendum.

3.2.2 Issue 3: Commercial Management Trigger Response Options

Option A. (Status Quo) The PRT will recommend the appropriate percent reduction in commercial harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their fisheries. The application of an overall harvest percentage reduction would be proportional to the magnitude of exceeding the trigger, using a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

Option B. Include the following language defining commercial responses to triggers at the 30% and 60% thresholds, with selection of one of Sub-Options B1-B3.

30% Red Threshold *(single option proposed)*

If management action is triggered by meeting or exceeding the 30% red threshold, non-*de minimis* states that do not already have a minimum size limit or possession limit will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) to reduce commercial harvest by 1% of the average state commercial harvest from the previous 10 years. States may establish differential measures by gear or area, as long as measures implemented are quantifiable and achieve the required 1% reduction for the entire state commercial harvest.

60% Red Threshold *(choose one of Sub-Options B1-B3)*

Sub-Option B1. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) to reduce commercial harvest by 5% of the average state commercial harvest from the previous 10 years.

Sub-Option B2. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) to reduce commercial harvest by 10% of the average state commercial harvest from the previous 10 years.

Sub-Option B3. If management action is triggered by meeting or exceeding the 60% red threshold, all states (including *de minimis*) will be required to institute quantifiable measures (e.g. season, trip limit, or size limit) to reduce commercial harvest by 20% of the average state commercial harvest from the previous 10 years.

All restrictions established as required responses to TLA triggers must be evaluated to determine if they are both quantifiable and meet the objective reduction by the TC and approved by the Board prior to implementation.

3.2.3 Technical Committee

This Draft Addendum proposes the establishment of a Spot TC to provide scientific and technical advice, as defined in *Section 4.7.4* of the Omnibus Amendment. This advice would include evaluation of plans to implement management actions. All seasonal restrictions established as required responses to TLA triggers must be reviewed by the TC and approved by the Board prior to implementation.

3.2.4 Management Alternatives

If management action is triggered by meeting or exceeding the 60% red threshold and the Board determines more restrictive actions are necessary than those defined in *Sections 3.2.1* or *Section 3.2.2*, the Board may task the TC to determine an alternative reduction to the recreational or commercial fisheries. The TC will recommend the appropriate percent reduction in harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their state's fisheries. The application of an overall harvest percentage reduction may include use of a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

3.3 Issue 4: Evaluation of Fishery Response to Management Measures

Option A. (Status Quo) Management measures set in response to any trigger will remain in place for two years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the thresholds will not be applied to the harvest characteristics in assessing the fishery for two years, as the fishery-dependent data may be influenced by management action.

Option B. Management measures set in response to any trigger will remain in place for at least two years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the harvest characteristics will no longer be used to trigger management action, as the fishery-dependent data may be influenced by triggered measures. While triggered measures are in effect, a composite regional abundance characteristic, by itself, may trigger action at the next highest level of management response by the proportion red exceeding the next highest threshold in any two of the three terminal years.

After a minimum of two years, once no composite regional abundance characteristics trigger management action at either threshold, triggered measures will no longer be

required, and the TC will resume using the harvest characteristics as components of the TLA that would be required to trigger management action.

If triggered measures have remained in place for a minimum of three years due to proportions of red above a threshold for either of the composite regional abundance characteristics, the TC will, as part of conducting the annual TLA, evaluate trends in abundance to recommend to the Board whether triggered measures should remain in place or more restrictive measures should be considered.

4.0 COMPLIANCE

The management framework contained in *Section 3.0* of Addendum III to the Omnibus Amendment is effective immediately upon Addendum III's approval.

5.0 REFERENCES

Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Spot. Washington (DC): ASMFC. Fisheries Management Report #11. 90 p.

ASMFC. 2011. Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout. Arlington (VA): ASMFC. 161 p.

ASMFC. 2014. Addendum I to the Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout.

ASMFC. 2018a. Memorandum 18-8: Recommended Updates to the Annual Traffic Light Analyses for Atlantic Croaker and Spot.

ASMFC. 2018b. Memorandum 18-73: Recommendations for Management Response to Triggers from Updated Traffic Light Analyses.

Halliday, R.G., L.P. Fanning, and R.K. Mohn. 2001. Use of the Traffic Light Method in Fishery Management Planning. Canadian Science Advisory Secretariat, Research Document No. 108. 41 p.

6.0 APPENDIX

To aid in public interpretation of TLA figures and results, the following figures depict components of spot TLA characteristics in a linear format with the long-term mean (average) (LTM) of the proposed reference period (2002-2012).

Commercial and Recreational Harvest

Commercial landings show general declining trends in both regions with greater variability in the Mid-Atlantic.

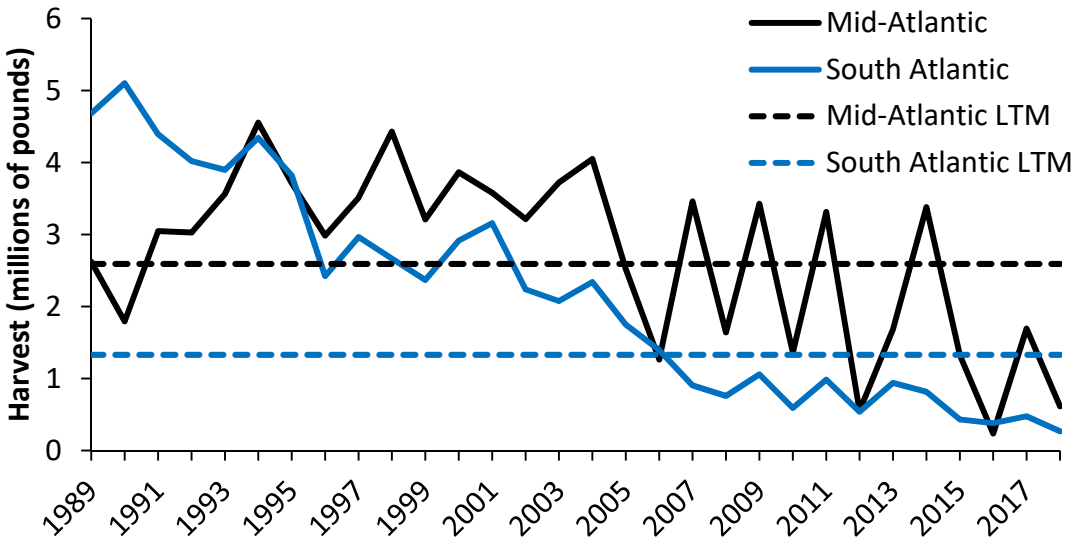


Figure A1. Commercial harvest and the LTM harvest for 2002-2012 in the Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) regions.

Recreational harvest shows a highly variable trend in the Mid-Atlantic, with most of the last ten years near or below the LTM. South Atlantic recreational harvest shows a declining trend with most of the last ten years near or below the LTM.

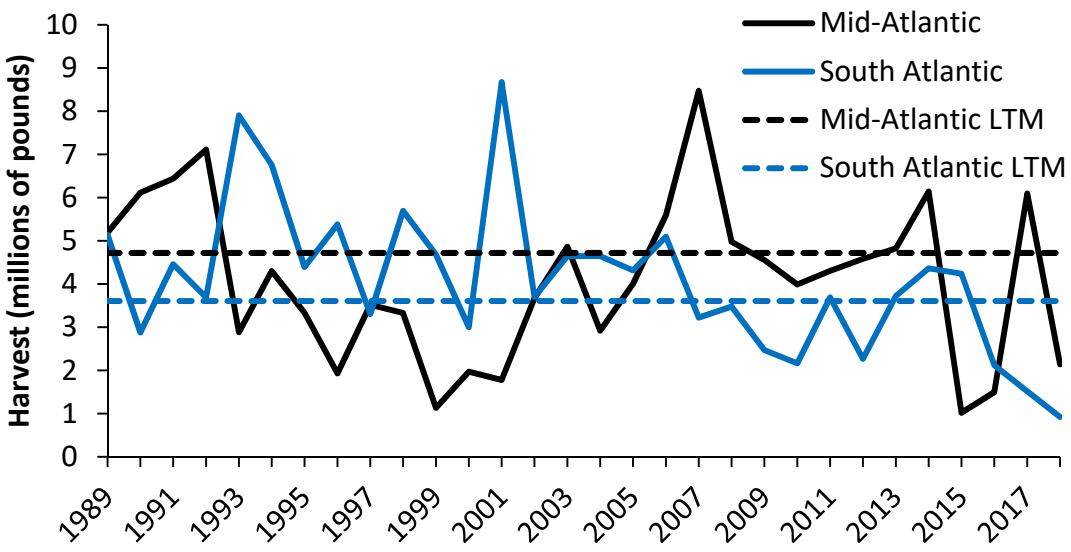


Figure A2. Recreational harvest and the LTM harvest for 2002-2012 in the Mid-Atlantic (NJ-VA) and South Atlantic (NC-FL) regions.

Abundance Indices

Mid-Atlantic

The Northeast Fishery Science Center (NEFSC) Multispecies Bottom Trawl Survey adult index showed a general increasing trend from the early 1990s to 2012, after which the index has been highly variable.

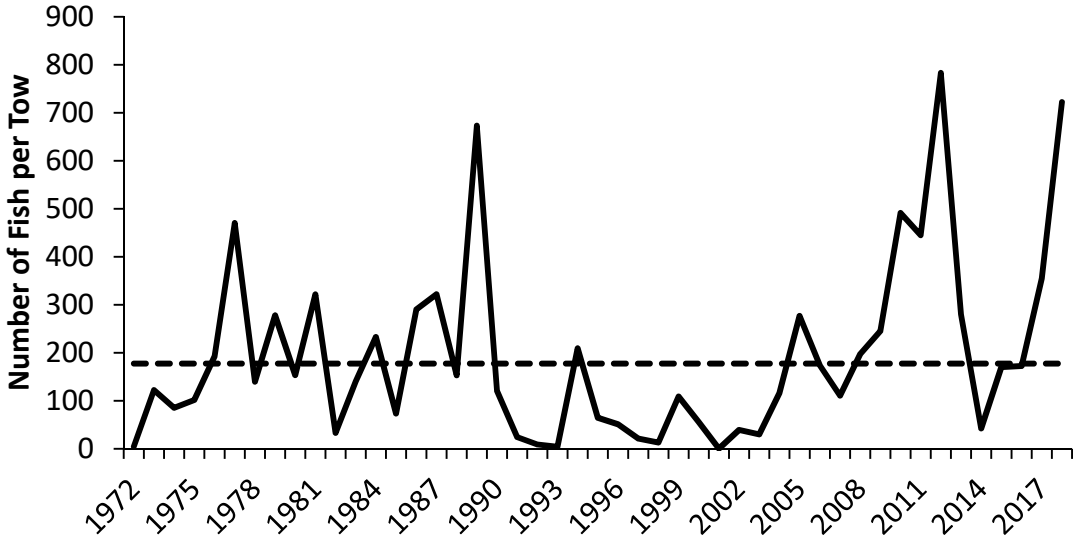


Figure A3. NEFSC adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

The Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) adult index shows a steady decline from the peak in 2005 and values below the LTM since 2008.

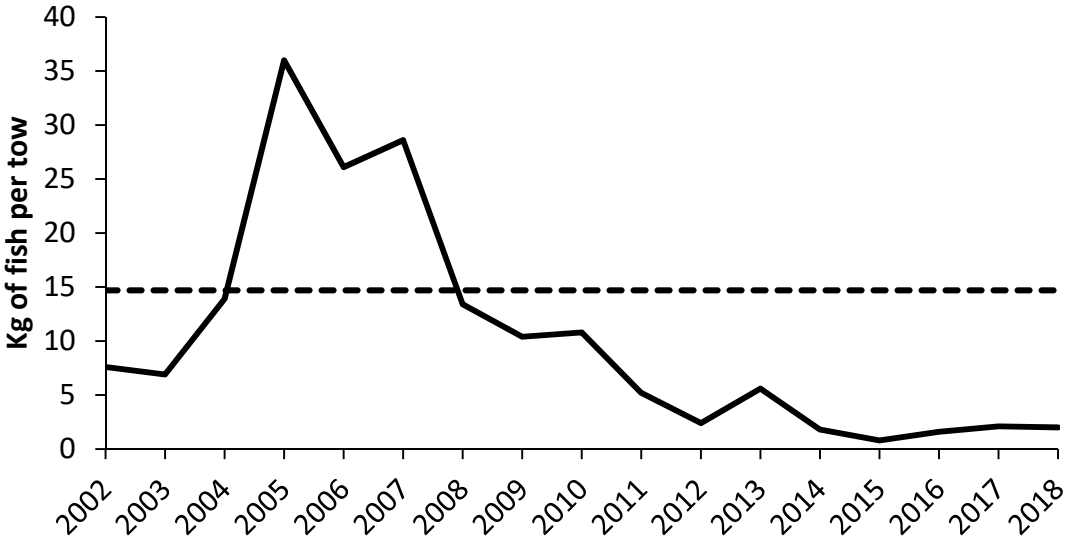


Figure A4. ChesMMAP adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

South Atlantic

The Southeast Area Monitoring and Assessment Program (SEAMAP) adult index has been variable about the LTM over, approximately, the last 25 years.

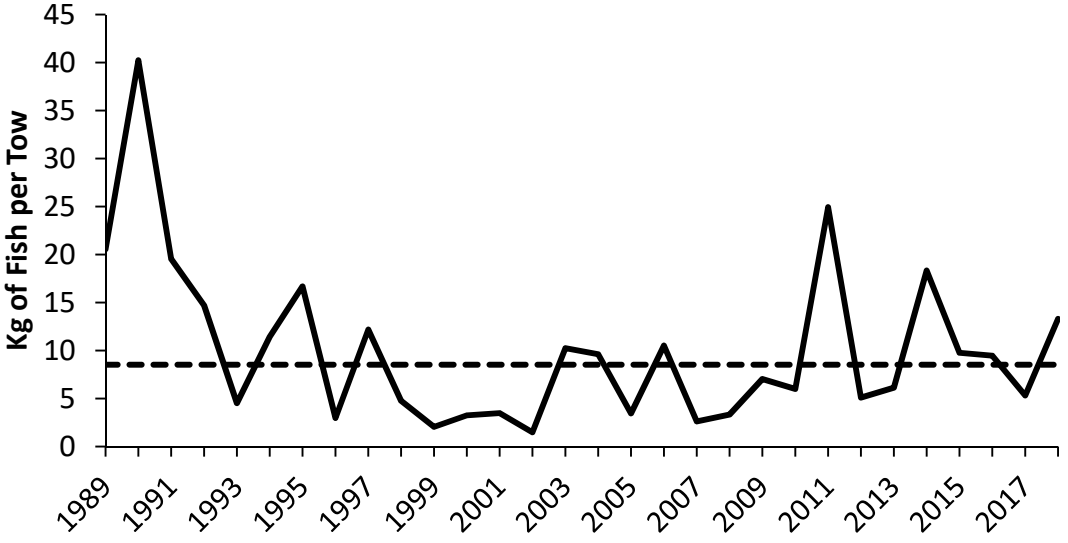


Figure A5. SEAMAP adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

The North Carolina Division of Marine Fisheries (NCDMF) Pamlico Sound Survey index has been below the LTM for most years since its peak in 2005.

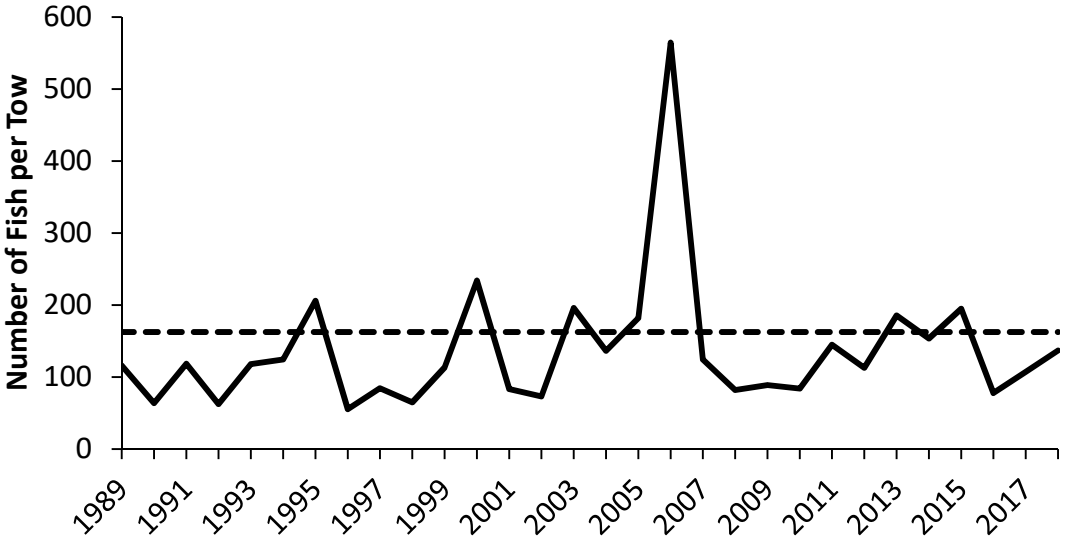
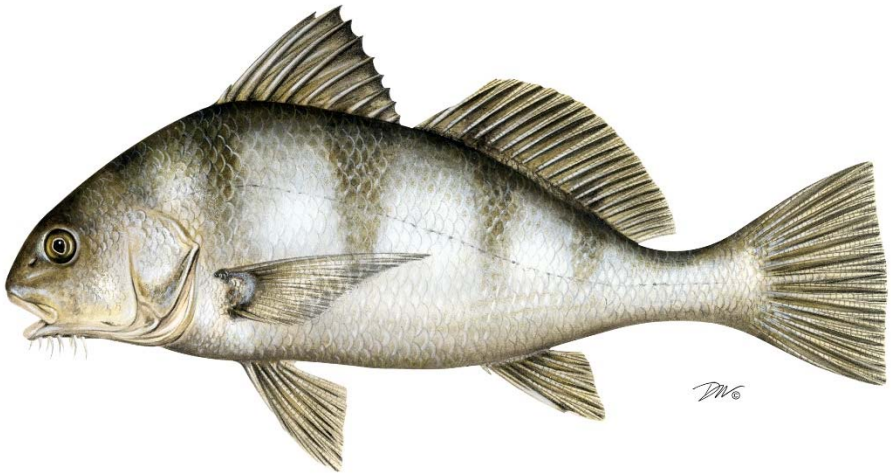


Figure A6. NCDMF adult index (solid line) and the LTM adult index for 2002-2012 (dashed line).

2019 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR

BLACK DRUM (*Pogonias cromis*)

2018 FISHING YEAR



The Black Drum Plan Review Team

Michael Schmidtke, Chair, Atlantic States Marine Fisheries Commission
Jordan Zimmerman, Delaware Division of Fish and Wildlife
Chris Stewart, North Carolina Division of Marine Fisheries
Chris McDonough, South Carolina Department of Natural Resources

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I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – June 2013
Management Areas:	The entire Atlantic coast distribution of the resource from New Jersey through the east coast of Florida
Active Boards/Committees:	South Atlantic State/Federal Fisheries Management Board; Black Drum Technical Committee, Stock Assessment Subcommittee, Plan Review Team; South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an interstate Fishery Management Plan (FMP) for Black Drum in 2013. Prior to the FMP, management was state-specific, from no regulations in North Carolina to various combinations of size limits, possession limits, commercial trip limits, and/or annual commercial quotas from New Jersey to Florida. The Maryland portion of the Chesapeake Bay was closed to commercial fishing in 1998.

The FMP requires all states with a declared interest in the species to have established a maximum possession limit and minimum size limit of at least 12 inches by January 1, 2014, and to have increased the minimum size limit to at least 14 inches by January 1, 2016. The FMP also includes a management framework to adaptively respond to future concerns or changes in the fishery or population.

There are four plan objectives:

- Provide a flexible management system to address future changes in resource abundance, scientific information, and fishing patterns among user groups or area.
- Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the black drum resource and evaluate management efforts.
- Manage the black drum fishery to protect both young individuals and established breeding stock.
- Develop research priorities that will further refine the black drum management program to maximize the biological, social, and economic benefits derived from the black drum population.

The management unit for black drum under the FMP is defined as the range of the species within U.S. waters of the northwest Atlantic Ocean, from the estuaries eastward to the offshore boundaries of the Exclusive Economic Zone (EEZ).

In 2018, Addendum I allowed Maryland to reopen their commercial fishery in the Chesapeake Bay, starting in the 2019 fishing year (ASMFC 2018). Prior to this addendum, a commercial moratorium was in place for these waters due to the FMP's requirement that states maintain measures in place at the time of the FMP's approval.

II. Status of the Stocks

In the 2015 Black Drum Benchmark Stock Assessment, the Stock Assessment Subcommittee (SAS) selected the Depletion-Based Stock Reduction Analysis (DB-SRA; Dick and McCall 2011) as the preferred method for estimating catch reference points. The SAS considered the Depletion-Corrected Average Catch (DCAC; McCall 2009) analysis, but ultimately rejected this method. DCAC did not incorporate removals into a population dynamics process, and uncertainty existed over how changes in the exploitation rate time series may impact the sustainable yield relative to the current stock condition.

Based on the DB-SRA results, black drum life history, indices of abundance, and history of exploitation, the black drum stock is not overfished and not experiencing overfishing (ASMFC 2015). Median biomass exhibited slow and steady decline from 135.2 million pounds in 1900 to 90.78 million pounds in 2012, though the median biomass estimate in 2012 is still well above the necessary level to produce maximum sustainable yield (B_{MSY}; 47.26 million pounds) (Figure 1). The median maximum sustainable yield (MSY) estimate is 2.12 million pounds and provides an annual catch target that can be used to sustainably manage the fishery. The median overfishing limit (OFL) estimate is 4.12 million pounds and provides a catch threshold that indicates overfishing when exceeded. The OFL is the maximum exploitation rate at the current biomass that does not lead to overfishing.

NOTE: In 2018, the Marine Recreational Information Program transitioned from estimating effort using the Coastal Household Telephone Survey (CHTS) to the mail-based Fishing Effort Survey (FES). The 2015 stock assessment used CHTS data to estimate recreational harvest. However, as black drum is not managed by a quota and to accommodate the transition, recreational harvest estimates based on the FES data or calibration are shown in this report. Due to differing estimation methodologies, these harvest data should not be compared to reference points from the 2015 stock assessment. Harvest estimates based on either effort survey can be compared at: https://www.st.nmfs.noaa.gov/st1/recreational/queries/.

III. Status of the Fishery

Total black drum landings from New Jersey through the east coast of Florida are estimated at 5.3 million pounds in 2018, a 20% decrease from total harvest in 2017 (Tables 2 and 3, Figure 2). 2018 harvest is 23% below the previous ten-year (2008-2017) average. The commercial and recreational fisheries harvested 5% and 95% of the 2018 total, respectively.

Commercial landings of black drum in 2018 span from Rhode Island through Florida, although landings from outside the management unit (i.e. north of New Jersey) were less than 1% of the coastwide total. Coastwide commercial landings show no particular temporal trends, ranging from approximately 82,000 to 556,000 pounds annually since 1981 (Figure 2). Black drum commercial landings in 2018 were 239,124 pounds, a 17% decrease from those of 2017. North Carolina led commercial harvest with 46% of the landings, followed by Virginia with 32% (Table 2).

Recreational harvest of black drum peaked by weight in 2008 at 10.7 million pounds (Table 3) and by numbers of fish in 2003 at 2.9 million (Table 4). Since 2000, weight has fluctuated without trend between 3.3 and 10.7 million pounds, and numbers of fish have fluctuated between 890 thousand and 2.9 million fish (Figures 3 and 4).

Average weight (recreational harvest in pounds divided by recreational harvest in numbers) in 2018 was 3.6 pounds per fish, approximately the same as 2017. Years that have shown large increases in coastwide average weight (i.e. increases to recreational harvest in pounds without proportional increase to recreational harvest in numbers) have typically occurred during years when Mid-Atlantic states (Virginia-New Jersey) have caught increased percentages of the coastwide recreational harvest (Tables 3 and 4).

The 2018 recreational harvest (1.4 million fish or 5.1 million pounds) represents a 19% decrease in numbers and a 20% decrease in pounds from 2017. Florida anglers landed the largest share of the coastwide recreational harvest in numbers (65%), followed by South Carolina (13%). Since the beginning of the recreational time series (1981) anglers have released increasing percentages of caught fish, with percentages of recreational fish released exceeding 70% in each of the past 5 years. In 2018, 79% (5.2 million fish) of the recreational catch was released (Figure 3, Table 5). It is worth noting that release rates increased substantially after 2013, when the FMP established minimum sizes in every state and required that undersized drum be released for the first time. Recent high release rates can be attributed to these measures, as well as encouragement of catch and release practices.

IV. Status of Assessment Advice

Current stock status information comes from the 2015 benchmark stock assessment (ASMFC 2015) completed by the ASMFC Black Drum Stock Assessment Subcommittee and Technical Committee, peer reviewed by an independent panel of experts, and approved by the South Atlantic State-Federal Fisheries Management Board for use in management decisions.

The stock assessment could be improved by applying a more complex, data-rich assessment method such as a statistical catch-at-age model. Data limitations that need to be addressed to successfully make this transition are biological sampling (length and age) of recreational and commercial fisheries and a fishery-independent survey to track abundance and age structure of the mature stock. Additionally, information about commercial discards and movement of fish along coast and between water depths would improve the assessment.

V. Status of Research and Monitoring

There are no monitoring or research programs required annually of the states except for the submission of a compliance report. The following fishery-dependent (other than catch and effort data) and fishery-independent monitoring programs were reported in the 2018 reports.

Fishery Dependent Monitoring

- Delaware DFW – Black Drum were sampled from the commercial fishery (2018: 86 fish) and recreational fishery (2018: 42 fish) for total length, weight, sex, and age.
- Maryland DNR – Conducted commercial pound net survey from late spring through summer. (2018: 3 fish).
- Virginia MRC –
    - Conducted a biological monitoring program to sample commercial and recreational harvest (2018 – commercial: 164 samples for length, weight, sex, and age; recreational: 110 samples for length and age, 27 for weight, and 102 for sex).
    - Conducted Virginia Game Fish Tagging Program with volunteer anglers (2018: 113 fish tagged and 2 recaptured).
- North Carolina DMF – Conducted commercial sampling of black drum bycatch (2018: n=658; mean total length=17 in). Recreational sampling through MRIP (2018: n=128; mean total length=16 in).
- South Carolina DNR – Terminated the state finfish survey and took over MRIP intercept sampling in 2013 (information reported through MRIP). Recreational reporting also through South Carolina Charterboat Logbook Program. Charter boat catch and effort (both number of trips and number of anglers) have increased throughout the time series but declined from 2017 to 2018.
- Georgia CRD – Collected age, length, and sex data through the Marine Sportfish Carcass Recovery Project (2018: 91 black drum, mean length 403 mm centerline length).
- Florida FWC – Conducted Florida trip ticket program monitoring commercial catch and effort. Commercial pounds per trip in 2018 decreased from 2017. Recreational catch and effort are monitored through MRIP. Recreational catch per trip in 2018 increased from 2017, and was the highest recorded since 2004.
- NMFS – Collected recreational catch, harvest, release, and effort data, as well as length measurements via MRIP.

Fishery Independent Monitoring

- New Jersey DEP –
    - Ocean Trawl Survey: 31-year time series average is 0.16 (2018: 0.10).
    - Delaware Bay Trawl: 28-year time series average is 0.16 (2018: 0.08)
    - Delaware River Seine: 39-year time series average is 0.07 (2018: 0.003).
- Delaware DFW – Conducted two finfish trawl surveys (16ft for juveniles; 30ft for adults). Older than young-of-year (YOY) black drum are rarely captured, and no long term trend is evident. YOY abundance (0.26 black drum/tow) increased in 2018 and was above the time series median.
- Maryland DNR – Conducted the Coastal Bays Fisheries Seine Survey in Maryland's coastal bay and generally catches juvenile fish. Annual mean catch per haul exhibits no trend and high variation. Annual mean catch per haul in 2018 was just above the time series mean and increased for the third year following a low 2015 value.

- North Carolina DMF – Conducted a gill net survey in Pamlico Sound to characterize size and age distribution, and to produce an abundance index (2018: CPUE=0.42, below the time series average of 0.98).
- South Carolina DNR – Conducted an estuarine trammel net survey for subadult abundance (2018: CPUE=0.204, increase from 2017).
- Georgia CRD –
    - Conducted an estuarine trammel net survey for subadult biological data and abundance index (2017 – Altamaha River: n=22, CPUE=0.17; Wassaw estuary: n=10, CPUE=0.08).
    - Conducted an estuarine gill net survey for YOY biological data and abundance index (2018 – Altamaha River: n=3, CPUE=0.02; Wassaw estuary: n=0, CPUE=0).
    - Conducted Ecological Monitoring Trawl Survey (2018: n=1)
- Florida FWC-FWRI – Conducted two seine surveys monthly in northeast and central southeast Florida to develop annual estimates of adult and juvenile relative abundance. Standardized catch rates indicate a variable but non-directional trend for juveniles and an increasing trend for adults.

VI. Status of Management Measures and Issues

Fishery Management Plan

The Black Drum FMP requires all states with a declared interest in the species to have established a maximum possession limit and minimum size limit of at least 12 inches by January 1, 2014, and to have increased the minimum size limit to no less than 14 inches by January 1, 2016.

De Minimis

The black drum FMP allows states to request *de minimis* status if, for the preceding three years for which data are available, their average combined commercial and recreational landings (by weight) constitute less than 1% of the average coastwide commercial and recreational landings for the same three-year period. A state that qualifies for *de minimis* will qualify for exemption in both their commercial and recreational fisheries.

De Minimis Requests

No state requested *de minimis* status through the annual reporting process.

Recent Changes to State Management

Maryland – Maryland made a regulation change on February 25, 2019 to reopen a commercial fishery within Maryland's portion of Chesapeake Bay, as allowed by Addendum I to the Interstate Fisheries Management Plan for Black Drum. The new regulations allow commercial fishermen in Chesapeake Bay a ten fish per vessel per day limit, with a minimum size limit of 28 inches total length. All other regulations remain unchanged.

Georgia - In 2017, the Georgia General Assembly approved the addition of species endorsements to commercial fishing licenses to replace Letters of Authorization, which was followed by the Board

of Natural Resources implementation in December 2017. Species endorsements, including one for finfish, were issued starting with the 2018-2019 fishing season.
A new seafood dealer license was also implemented April 1, 2018. Seafood dealers are defined as "any person or entity, other than the end-consumer, who purchases seafood products from a harvester unless the harvester is a licensed seafood dealer." Commercial harvesters fishing in Georgia waters and/or unloading seafood products must possess a commercial fishing license and the appropriate species endorsements. A harvester is required to have a dealer's license if they are selling their catch to end consumers.

VII. Implementation of FMP Compliance Requirements for 2018

The PRT finds that all states have implemented the requirements of the Fishery Management Plan.

VIII. Recommendations of the Plan Review Team

Management and Regulatory Recommendations (H) =High, (M) =Medium, (L) =Low

- Supporting the Black Drum Technical Committee's recommendation, postpone scheduling the next stock assessment for three years. When the next assessment is conducted, it should be a benchmark assessment that attempts to modify the DBSRA model and incorporates new information. (H)
- Develop management mechanism (e.g., traffic light analysis) to evaluate annual fishery independent and dependent indices to assess stock status and recommend management action if needed. (H)

Prioritized Research and Monitoring Recommendations (H) =High, (M) =Medium, (L) =Low

Stock Assessment and Population Dynamics

- Update the 2015 stock assessment or conduct a new benchmark stock assessment that includes the recalibrated MRIP recreational harvest estimates based on the new, mail-based FES. (H)
- Age otoliths that have been collected and archived. (H)
- Collect information to characterize the size composition of fish discarded in recreational fisheries. (H)
- Collect information on the magnitude and sizes of commercial discards. Obtain better estimates of black drum bycatch in other fisheries, especially juvenile fish in south Atlantic states. (H)
- Increase biological sampling in commercial fisheries to better characterize the size and age composition of commercial fisheries by state and gear. (H)
- Increase biological sampling in recreational fisheries to better characterize the size and age composition by state and wave. (H)
- Obtain estimates of selectivity-at-age for commercial fisheries by gear, recreational harvest, and recreational discards. (H)

- Continue all current fishery-independent surveys and collect biological samples for black drum on all surveys. (H)
- Develop fishery-independent adult surveys. Consider long line and purse seine surveys. (H)
- Collect age samples, especially in states where maximum size regulations preclude the collection of adequate adult ages. (H)
- Conduct a high reward tagging program to obtain improved return rate estimates. Continue and expand current tagging programs to obtain mortality and growth information and movement at size data. (H)
- Conduct tagging studies using implanted radio tracking tags that are compatible with coastal tracking arrays along the Atlantic coast in order to track movement and migration of adults. (H)
- Conduct studies to estimate catch and release mortality rates in recreational fisheries. (H)
- Conduct reproductive studies, including: age and size-specific fecundity, spawning frequency, spawning behaviors by region, and movement and site fidelity of spawning adults. (H)
- Improve sampling of night time fisheries. (M)
- Collect genetic material (i.e., create “genetic tags”) over a long time span to obtain information on movement and population structure, and potentially estimate population size. (M)
- Obtain better estimates of harvest from the black drum recreational fishery, especially in states with short seasons. (M)

IX. References

ASMFC. 2013. Interstate Fishery Management Plan for Black Drum. Arlington, VA.

ASMFC. 2015. Black Drum Stock Assessment for Peer Review. Atlantic States Marine Fisheries Commission, Stock Assessment Report. 352 p.

ASMFC. 2018. Addendum I to the Black Drum Interstate Fishery Management Plan. Arlington, VA.

Dick, E.J. and MacCall, A.D. 2011. Depletion-Based Stock Reduction Analysis: A catch-based method for determining sustainable yields for data-poor fish stocks. Fisheries Research, 110: 331-341

MacCall, A.D. 2009. Depletion-Corrected Average Catch: a simple formula for estimating sustainable yields in data-poor situations. ICES Journal of Marine Science, 66: 2267-2271.

X. Figures

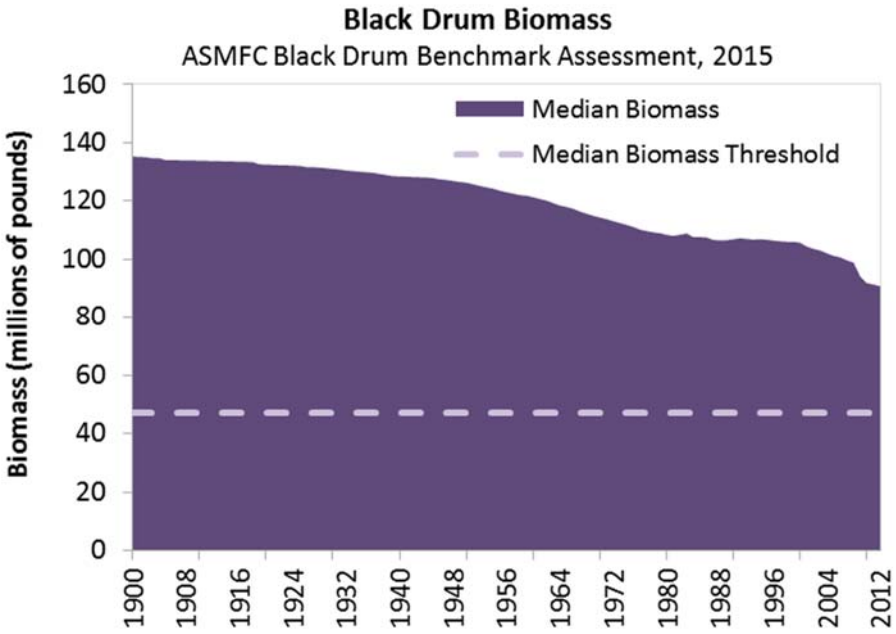


Figure 1. DB-SRA estimates of Median biomass and threshold 1900-2012 (Source: ASMFC 2015).

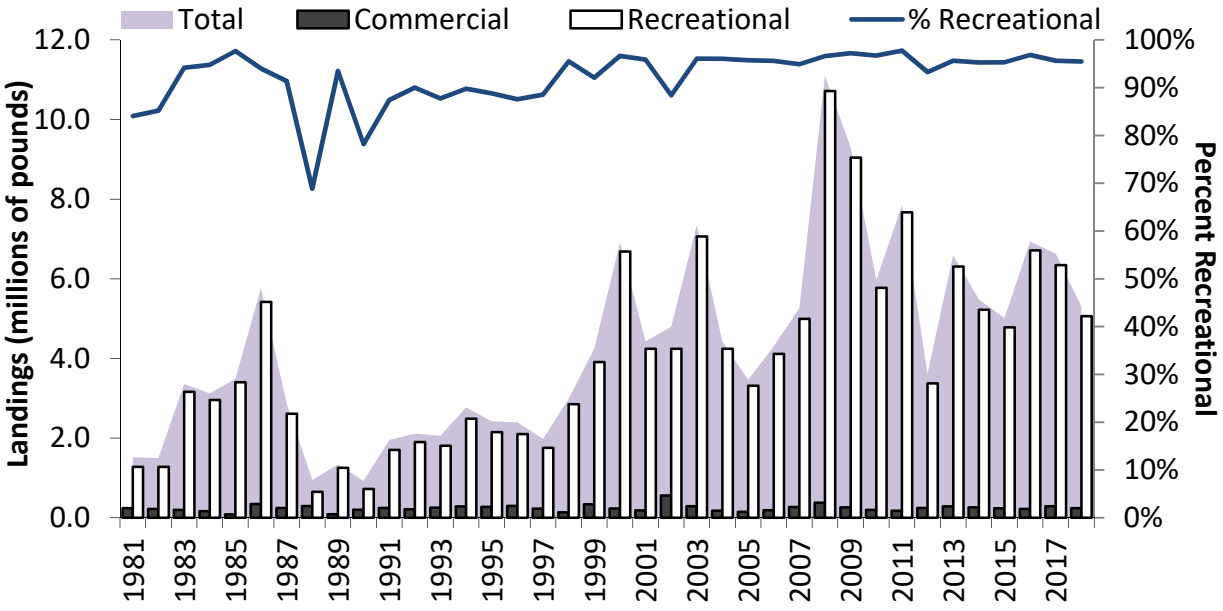


Figure 2. Commercial and recreational landings (pounds) of black drum. See Tables 2 and 3 for values and data sources.

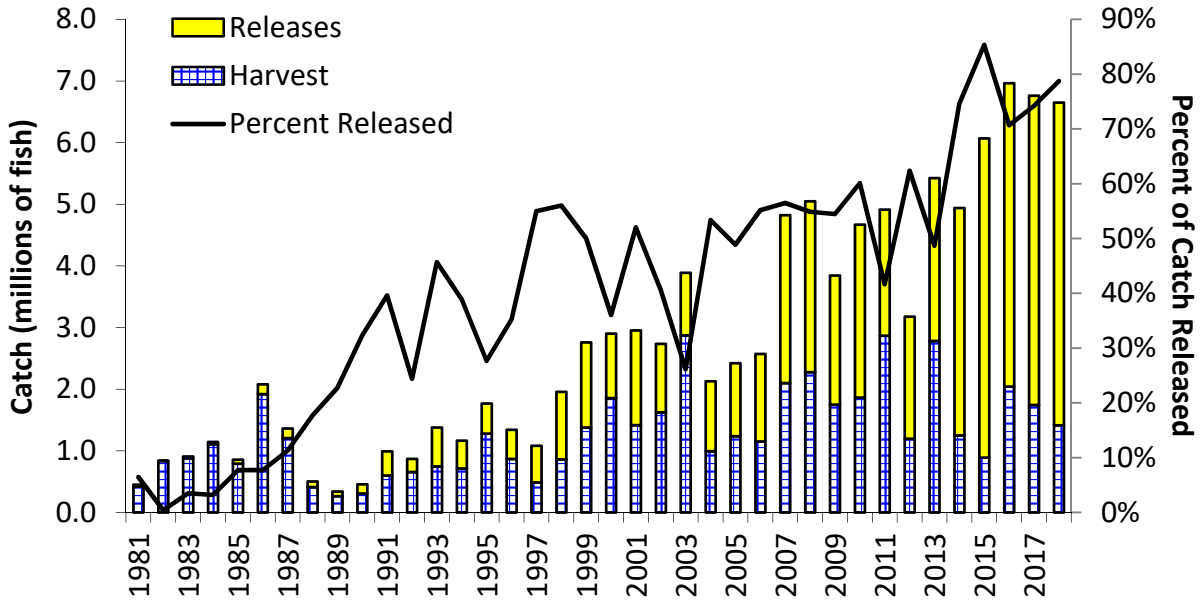


Figure 3. Recreational catch (harvest and alive releases) of black drum (numbers) and the proportion of catch that is released. See Tables 4 and 5 for values and data sources.

XI. Tables

Table 1. Black drum regulations for 2018. The states of New Jersey through Florida are required to meet the requirements in the FMP. All size limits are total length.

State	Recreational		Commercial			Notes
	Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
ME - NY	-	-	-	-	-	
NJ	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
DE	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
MD	16” min	1/person/day 6/vessel (Bay)	16” min		1,500 lbs Atlantic Coast	Chesapeake Bay closed to commercial harvest. Reopened on Feb. 25, 2019, details in Sec. VI.
VA	16” min	1/person/ day	16” min	1/person/ day*	120,000 lbs	*without Black Drum Harvesting and Selling Permit
NC	14” min - 25” max; 1 fish > 25” may be retained	10/person/ day	14” min - 25” max	500 lbs		
SC	14” min - 27” max	5/person/day	14” min - 27” max	5/person/day		Commercial fishery primarily bycatch
GA	14” min	15/person/ day	14” min	15/person/ day		
FL	14” min - 24” max; 1 fish >24” may be retained	5/person/day	14” min - 24” max	500 lbs/day		

Table 2. Commercial landings (pounds) of black drum by state, 2009-2018. (Totals include coastwide landings outside of the management area, NJ-FL. Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with ACCSP, Arlington, VA)

Year	NJ	DE	MD	PRFC	VA
2009	6,408	30,563	158	40	57,249
2010	3,079	49,744	C		58,150
2011	3,130	C	C		44,620
2012	19,017	10,943	571	3	104,234
2013	16,251	24,640	2,145		87,235
2014	9,270	C	C		88,402
2015	6,478	39,282	C		87,011
2016	2,210	49,109	C		49,832
2017	21,248	699	423		42,695
2018	C	32,375	734		76,337

	NC	SC	GA	FL	Total
2009	148,994		C	15,710	259,237*
2010	69,194		C	15,684	196,323
2011	56,083		C	22,295	175,848
2012	94,352	C		14,302	243,527*
2013	127,170	C	C	28,460	286,413
2014	51,217			91,587	259,650
2015	51,073			50,477	234,727*
2016	90,715	C		26,978	219,350
2017	182,882	C		41,280	289,431
2018	109,757			19,465	239,124*

C: Confidential landings

*: Total excludes some state landings due to confidentiality

Table 3. Recreational harvest (pounds) of black drum by state and coastwide average weight, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with NOAA Fisheries, Fisheries Statistics Division)

Year	NJ	DE	MD	VA	NC
2009	2,950,869	39,864		1,704,514	421,788
2010	350,673	172,861	105,096	49,732	812,699
2011	373,639	38,043	0	1,243,692	823,423
2012	37,076	2,844	0	36,195	879,401
2013	94,636	15,668	0	112,139	2,709,269
2014	11,476	22,070	18,684	97,043	230,834
2015	443,907	16,992	16,575	25,216	780,876
2016	159,589	2,180	8,924	77,672	1,322,547
2017	406,068	22,998	3,001	81,275	856,081
2018	814,965	179,071	53,599	29,120	428,273

	SC	GA	FL	Total	Avg Wt
2009	103,384	83,749	3,739,378	9,043,546	5.17
2010	203,796	364,352	3,712,810	5,772,019	3.10
2011	89,482	56,361	5,043,573	7,668,213	2.67
2012	321,734	211,618	1,885,164	3,374,032	2.82
2013	413,455	149,094	2,813,673	6,307,934	2.27
2014	238,616	249,118	4,353,686	5,221,527	4.17
2015	82,484	88,698	3,325,410	4,780,158	5.37
2016	623,449	226,558	4,292,398	6,713,317	3.29
2017	681,976	187,698	4,105,686	6,344,783	3.64
2018	652,179	392,380	2,511,235	5,060,822	3.58

Table 4. Recreational harvest (numbers) of black drum by state, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with NOAA Fisheries, Fisheries Statistics Division)

Year	NJ	DE	MD	VA	NC
2009	69,140	1,112		41,986	449,901
2010	13,421	3,609	6,556	4,846	650,010
2011	22,882	1,196	0	126,964	1,259,216
2012	1,368	110	0	7,555	556,482
2013	11,083	1,851	0	6,170	1,511,995
2014	482	1,052	1,690	10,676	109,307
2015	10,793	462	1,091	1,600	276,126
2016	6,008	138	250	5,807	459,078
2017	18,435	1,214	828	16,700	355,544
2018	40,153	9,211	1,262	3,721	134,624

	SC	GA	FL		Total
2009	45,752	41,853	1,100,618		1,750,362
2010	85,152	138,328	961,627		1,863,549
2011	29,909	25,803	1,401,636		2,867,606
2012	91,318	42,826	496,537		1,196,196
2013	143,662	64,533	1,044,490		2,783,784
2014	96,967	47,807	983,582		1,251,563
2015	37,186	48,229	514,606		890,093
2016	256,158	96,351	1,217,913		2,041,703
2017	241,832	64,240	1,044,752		1,743,545
2018	185,648	114,263	925,794		1,414,676

Table 5. Recreational alive releases (numbers) of black drum by state, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with NOAA Fisheries, Fisheries Statistics Division)

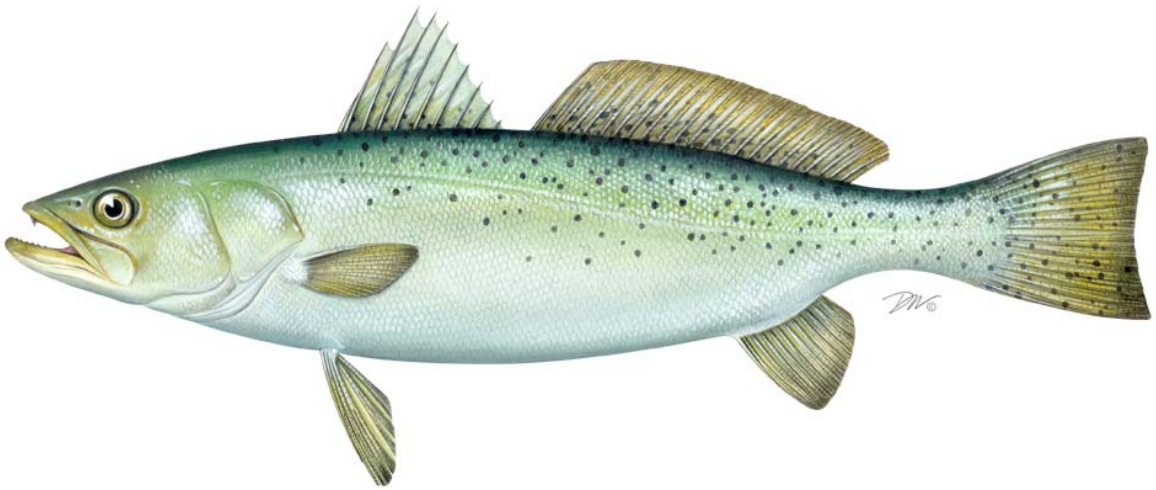
Year	NJ	DE	MD	VA	NC
2009	316,471	2,310		41,215	411,358
2010	47,508	4,251	9,613	64,320	427,577
2011	4,799	4	9,595	319,622	711,755
2012	17,092	1,653	89,193	22,236	397,155
2013	0	57,091	15,868	52,417	497,334
2014	37,364	11,243	0	269,648	1,964,749
2015	545,613	17,109	25,115	164,322	1,791,758
2016	9,399	361	114	46,494	2,530,596
2017	111,739	3,689	2,809	137,987	2,336,352
2018	51,148	15,249	27,849	169,204	1,450,855

	SC	GA	FL		Total
2009	81,423	60,290	1,180,223		2,093,290
2010	66,635	72,870	2,113,308		2,806,082
2011	66,748	20,355	913,567		2,046,445
2012	153,799	52,722	1,246,585		1,980,435
2013	330,528	35,034	1,654,129		2,642,401
2014	335,600	21,581	1,047,833		3,688,018
2015	1,483,956	55,773	1,096,185		5,179,831
2016	1,268,667	54,266	1,012,670		4,922,567
2017	692,616	85,365	1,648,030		5,018,587
2018	1,087,536	167,974	2,265,550		5,235,365

2019 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR

SPOTTED SEATROUT
(Cynoscion nebulosus)

2018 FISHING YEAR



The Spotted Seatrout Plan Review Team
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Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – October 1984
Amendments:	Amendment 1 – November 1991 Omnibus Amendment to Spanish Mackerel, Spot, and Spotted Seatrout -- August 2011
Management Area:	The Atlantic coast distribution of the resource from Maryland through the east coast of Florida
Active Boards/Committees:	South Atlantic State/Federal Fisheries Management Board; Spotted Seatrout Plan Review Team; South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted the Fishery Management Plan (FMP) for spotted seatrout in 1984. The ISFMP Policy Board approved Amendment 1 to the FMP in November 1991. In August 2011, the South Atlantic State/Federal Management Board approved the Omnibus Amendment to the Spanish Mackerel, Spot, and Spotted Seatrout FMPs, bringing the Spotted Seatrout FMP under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (Act, 1993) and the ASMFC Interstate Fishery Management Plan Charter (1995). The management unit is comprised of the states of Maryland through Florida.

The goal of the management plan is "to perpetuate the spotted seatrout resource in fishable abundance throughout its range and generate the greatest possible economic and social benefits from its harvest and utilization over time." Plan objectives include:

1. Attain optimum yield over time.
2. Maintain a spawning potential ratio of at least 20% to minimize the possibility of recruitment failure.
3. Promote conservation of the stocks to reduce inter-annual variation in availability and to increase yield per recruit.
4. Promote collection of economic, social, and biological data required to effectively monitor and assess management efforts relative to the overall goal.
5. Promote research that improves understanding of the biology and fisheries of spotted seatrout.
6. Promote harmonious use of the resource among various components of the fishery through coordination of management efforts among the various political entities having jurisdiction over the spotted seatrout resource.
7. Promote determination and adoption of standards of environmental quality and provide habitat protection necessary for the maximum natural protection of spotted seatrout.

The Omnibus Amendment added the following objectives to support compliance under the Act:

1. Manage the spotted seatrout fishery by restricting catch to mature individuals.
2. Manage the spotted seatrout stock to maintain sufficiently high spawning stock biomass.
3. Develop research priorities that will further refine the spotted seatrout management program to maximize the biological, social, and economic benefits derived from the population.

Management measures include a minimum size limit of 12 inches in total length (TL), with comparable mesh size regulations in directed fisheries, and data collection for stock assessments and monitoring of the fishery. All states with a declared interest in spotted seatrout (NJ-FL) have implemented, at a minimum, the recommended minimum size limit. In addition, each state has either initiated spotted seatrout data collection programs or modified other programs to collect improved catch and effort data. Table 1 provides the states' recreational and commercial regulations for spotted seatrout through 2018.

II. Status of the Stock

A coastwide stock assessment of spotted seatrout has not been conducted, given the largely non-migratory nature of the species and the lack of data on migration where it does occur. Instead, state-specific age-structured analyses of local stocks have been performed by several states. These stock assessments provide estimates of static spawning potential ratio (SPR), a measure of the effect of fishing pressure on the relative spawning power of the female stock. The FMP recommends a goal of 20% SPR. South Carolina and Georgia have adopted this goal while North Carolina and Florida have established a 30% and 35% SPR goal, respectively.

Spotted seatrout stock assessments have been conducted in individual states. Assessments in North Carolina, which included data from 1981-1997, and Georgia, which included data from 1986-1995, both indicated that female SPR was below the 20% goal in the terminal year (Zhao and Burns 2001, Zhao *et al.* 2001). Another assessment was performed in Georgia in 2002; however, it remains unpublished due to questionable results attributed to data deficiencies and changing methodologies.

North Carolina completed a peer reviewed stock assessment, which included data from 1991-2008 and included all spotted seatrout caught in North Carolina and Virginia (Jensen 2009). The assessment indicated that SPR has been below 20% in recent years. Jensen (2009) recommended management measures be implemented to account for recent increases of recreational fishing and discard mortality and to maintain a sufficiently large spotted seatrout population to buffer against future cold stun events. Based on this assessment, North Carolina approved a state FMP for spotted seatrout in April 2012. A new stock assessment for North Carolina is currently in progress.

A peer-reviewed stock assessment of spotted seatrout in Virginia and North Carolina waters was completed in 2014, incorporating data from 1991-2013 (NCDMF 2014). Results suggest that the age structure of this stock expanded during the last decade; however, there was a sharp decline in recruitment after 2010. Similarly, spawning stock biomass (SSB) declined after a peak in 2007. These declines may be attributed to cold stun events. In 2012, SSB exceeded the currently defined threshold, suggesting the stock is not overfished. Additionally, fishing mortality is below the threshold, suggesting the stock is not experiencing overfishing.

The South Carolina Department of Natural Resources packaged several state-specific assessments into a report in 2001, though these were not peer reviewed. The initial assessment covering 1986-1992 indicated that female SPR was just above the 20% goal in the terminal year (Zhao and Wenner 2001), leading to a minimum size limit increase and a creel limit reduction. A more recent assessment was conducted for the period 1981-2004 (de Silva, Draft 2005). Two modeling approaches were used, and both models indicated that the current SSB is below the requirement to maintain 20% SPR.

Florida conducted separate stock assessments for the northern and southern populations on their Atlantic coast. Average transitional SPR estimates during 2007-2009 were 0.67 in the northern region and 0.45 in the southern region (Murphy et al. 2011), leading to some relaxation in Florida's management of the resource (Table 1). A new statewide assessment was completed in 2018 (http://www.myfwc.com/media/4500170/sst-assessment-2016.pdf) (Addis et al. 2018). This assessment includes stock synthesis models constructed for each of Florida's four management regions (NW, SW, NE, and SE). The results indicate that the spotted seatrout stock in northeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring. They also indicate that the stock in southeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring.

III. Status of the Fishery

Spotted seatrout is typically caught both commercially and recreationally from Maryland through the east coast of Florida. In South Carolina, spotted seatrout has been declared a gamefish and can only be taken by recreational means. Landings from states north of Maryland are minimal and/or inconsistent from year to year. In 2018, landings ranged as far north as Rhode Island. State catch estimates in this section include those in the management area only (MD-FL), but coastwide totals include the entire Atlantic coast. Total recreational landings have surpassed total commercial landings every year since recreational landings were first recorded in 1981 (Figure 1). Spotted seatrout, particularly in Virginia-South Carolina, are susceptible to cold stuns that result in sporadic, large amounts of winter mortality, which can then lead to sudden declines in harvest. One of these cold stuns occurred in 2018, prompting in-season changes to management in affected states.

Commercial Fishery

Commercial harvest statistics were obtained from the Atlantic Coastal Cooperative Statistics Program (ACCSP) for years prior to 2018 and from state compliance reports for 2018. Atlantic

coast commercial landings of spotted seatrout (1950-2018) have ranged from 156,000 pounds to 2.3 million pounds (Figure 1). Historically, commercial landings primarily came from North Carolina and Florida, with Virginia, South Carolina, and Georgia accounting for a small portion of the total. From 1950 to 1976, annual commercial landings of spotted seatrout averaged 1.3 million pounds, followed by a decline due to increased regulation and possible declines in abundance. Significant changes to regulations include the 1987 designation of spotted seatrout as a gamefish in South Carolina, and the 1995 prohibition on the use of entangling nets in Florida's coastal waters. From 2008 to 2017, commercial landings averaged approximately 333 thousand pounds. In 2018, commercial landings totaled 168,500 pounds, a 55% decrease from 2017 (Table 2). North Carolina, Florida, and Virginia accounted for 77%, 13%, and 10% of the total commercial landings, respectively.

Recreational Fishery

Recreational harvest statistics were obtained from the Marine Recreational Information Program (MRIP) for years prior to 2018 and from state compliance reports for 2018. These landings have been updated to reflect the calibration and transition to the mail-based, Fishing Effort Survey. Over the last 33 years, recreational catch of spotted seatrout (kept and released) has shown an upward trend, increasing from 4.3 million fish in 1981 to 31.0 million fish in 2018. In 2018, recreational catch totaled 31.0 million fish, a 36% increase from 2017 (Figure 2). Recreational harvest has remained relatively stable throughout the time series with an average of 3.5 million fish. Recreational harvest in 2018 was 4.5 million pounds (a 35% decrease from 2017) or 2.8 million fish (a 31% decrease from 2017) (Tables 3 and 4), with Georgia (39%), Florida (33%), and North Carolina (16%) responsible for the largest shares in numbers of fish. Due in part to recreational size and creel limits and closed seasons, as well as the encouragement of catch and release practices, the percentage of caught fish being released has increased throughout the time series, with the previous 10-year average (2008-2017) at 82%. In 2018, the release percentage increased from the 2017 value (82%) to 91%, resulting in 28.1 million released fish (Figure 2, Table 5). Rod and reel is the primary recreational gear, but some spotted seatrout are taken by recreational nets and by gigging, where these methods are permitted. Most recreational fishing is conducted from private boats and the majority of the catch is taken from nearshore waters.

IV. Status of Assessment Advice

A coastwide stock assessment of spotted seatrout has not been conducted and the Plan Review Team (PRT) does not recommend that one be completed due to the life history of the fish and the availability of data. Several states have performed age-structured analyses on local stocks, and recent stock assessments provide divergent trends on the status of the species. The 2005 stock assessment in South Carolina indicated an increasing population trend but a status level that is still below target spawning stock biomass levels (de Silva 2005). The 2014 North Carolina and Virginia stock assessment showed declines in recruitment since 2010. The 2018 Florida stock assessment indicated that the spotted seatrout stock in northeast Florida is above the biomass threshold but below the biomass target and overfishing is not likely occurring (Addis et al. 2018). It also indicated that the stock in southeast Florida is above the biomass threshold but

below the biomass target and overfishing is not likely occurring. The PRT supports the continuation of state-specific assessments, yet recognizes the difficulty most states face to attain sufficient data of assessment quality and personnel who can perform the necessary modeling exercises.

The lack of biological and fisheries data for effective assessment and management of the resource was recognized in the 1984 FMP and continues to be a hindrance. Some states are increasing their collection of biological and fisheries data, which will provide insight on stock status over time.

V. Status of Research and Monitoring

In addition to commercial and recreational fishery-dependent data collected and/or compiled through the NMFS Fisheries Statistics Division, some states have implemented fishery-independent or additional fishery-dependent monitoring programs.

Maryland
MD DNR samples commercial pound nets weekly in the Potomac River and Chesapeake Bay from May through September (2018 n=0).

A few juvenile spotted seatrout are encountered in the coastal bays seine survey and the Chesapeake Bay blue crab trawl survey, indicating seatrout utilize these areas as nursery habitat (2018 seine n=39, trawl n=52).

Virginia
The VMRC Biological Sampling Program collects commercial and recreational fishery-dependent biological data. In 2018, the VMRC collected 904 commercial lengths, determined the sex of 247 individuals, and aged 206 individuals. In 2018, the VMRC collected lengths of 128 and aged 103 recreationally caught seatrout.

North Carolina
Commercial fish houses are sampled monthly for fishery-dependent length, weight, and age data (2018 n=1,180). Recreational catch is also sampled for length (2018 n=274).

A fishery-independent Estuarine Trawl Survey is conducted to measure annual juvenile recruitment for many species. The Catch per Unit Effort (CPUE) index for the current 10-year time series has not shown significant trends in CPUE over that time span, although CPUE has shown a declining trend since the most recent peak in 2012. The CPUE of age-0 spotted seatrout for 2018 was 2.98 fish per tow, above the time series average of 2.19.

A fishery-independent gill net survey is conducted to measure age composition and develop indices of age 1+ abundance for many species. Spotted seatrout CPUE from Pamlico Sound has remained relatively steady, with a time series high in 2017 and a slight decrease in 2018. River stations observed declines in spotted seatrout in 2018, likely due to mortality from the January 2018 cold stun event.

The NCDMF Age Lab ages otoliths collected from several fishery-dependent and independent sources. A total of 516 spotted seatrout were aged by otoliths in 2018 with a maximum age of 5 and a modal age of 1.

South Carolina

The State Finfish Survey collects fishery-dependent catch, effort, and length data from private boat anglers in January and February. In 2018, 8% of 118 interviewed parties targeted spotted seatrout (2018 n=15, mean catch rate of 0.24 fish per targeted fishing hour).

A mandatory trip reporting system for the charter boat fishery has been in place since 1993. In 2018, 415 reported trips targeted seatrout (2018 mean catch rate of 1.27 fish per targeted fishing hour).

The Freezer Drop-Off and the Fishing Tournament programs gather biological information like size, sex, maturity, and age. In 2018, these programs gathered biological information from 13 spotted seatrout.

South Carolina conducts two fishery-independent data collection programs. The Trammel Net Survey covers 7 monthly and 2 quarterly strata. Spotted seatrout is consistently one of the top three most abundance species encountered. The 2018 statewide mean CPUE was lower than 2017 and below the long-term average. The Electrofishing survey covers 5 monthly strata, and catches relatively low numbers of mostly YOY seatrout. Statewide catch rate by the electrofishing survey have been low since 2010.

Georgia

A Marine Sportfish Carcass Recovery Program collects recreational fishery-dependent size and age data (2018 n=2,573 spotted seatrout, average length of 380 mm CL, 253-516 mm range).

The Marine Sportfish Population Health Study trammel net survey samples monthly from September to November since 2003 in the Wassaw and Altamaha Sounds to collect fishery-independent age- and sex-specific estimates of relative abundance (2018: Wassaw CPUE (geometric mean): 0.25; Altamaha CPUE: 0.73). Gillnet sampling also occurs through this study, often encountering seatrout (2018: Wassaw CPUE: 0.26; Altamaha CPUE: 0.98).

Florida

Fishery-dependent sampling includes commercial trip-ticket information and biostatistical sampling of commercial and recreational catch. A voluntary angler logbook program was implemented in 2002 to record lengths of spotted seatrout released alive by anglers. In 2011, this program changed to a ‘postcard’ program, enlisting anglers encountered during MRIP angler intercept interviews.

A juvenile finfish monitoring program is conducted in the northern Indian River Lagoon (since 1990) and in the estuarine St. Johns, St. Marys, and Nassau Rivers (since 2001). Florida also conducts a 183-m haul seine survey in the Indian River (since 1997) and northeast Florida

(Jacksonville/St. John's River) (since 2001). Northeast coast YOY abundance in 2018 decreased significantly from 2017. Southeast (Indian River/Tequesta) coast YOY abundance in 2018 increased slightly from 2017. Adult abundance (>200 mm SL) in 2018 increased slightly in the northeast but decreased slightly in the southeast from 2017 values.

VI. Status of Management Measures and Issues

Changes to State Regulations
A minor change to spotted seatrout regulations in Virginia was established in August 2018, defining total length.

In response to the cold stun that occurred in 2018, North Carolina closed the spotted seatrout commercial and recreational fisheries from January 5, 2018 – June 15, 2018 by proclamation. South Carolina also implemented a voluntary "Let em' spawn, Let em' live" campaign encouraging the practice of only catch-and-release fishing from January – September 2018.

De Minimis Requests
A state qualifies for *de minimis* status if its previous three-year average combined commercial and recreational catch is less than 1% of the previous three-year average coastwide combined commercial and recreational catch. Those states that qualify for *de minimis* are not required to implement any monitoring requirements, as none are included in the plan.

The states of New Jersey and Delaware request continuation of *de minimis* status. The PRT notes these states meet the requirements of *de minimis*.

VII. Implementation of FMP Compliance Requirements for 2018

The PRT notes that all states have met the compliance requirements.

VIII. Recommendations of Plan Review Team

<u>Management and Regulatory Recommendations</u>

- Consider approval of *de minimis* requests by New Jersey and Delaware.
- Maintain observer coverage in states that have a commercial fishery for spotted seatrout.

<u>Prioritized Research Recommendations</u>
High Priority

- Conduct state-specific stock assessments to determine stock status relative to the plan objective of maintaining a spawning potential of at least 20%.
- Collect data on the size or age of spotted seatrout released alive by anglers and the size or age of commercial discards.
- Research release mortality and how this changes with factors such as season, habitat (e.g., depth, temperature, salinity), fish life history (e.g., size, age) and fishing methods (e.g., gear types).
- Monitor the size, age and reproductive condition of recreationally harvested fish (e.g. freezer drop off and tournament monitoring programs).

- Research into links between spawning activity, environmental conditions, trophic interactions and recruitment.
- Continue work to examine the stock structure of spotted seatrout on a regional basis (e.g., genetics, use of advanced tagging techniques).
- Research effects of winter severity on the population.
- Utilize telemetry technology to better understand life history characteristics.
- Conduct additional research on the significance of age-specific fecundity changes (i.e., environmental impacts on spawning output of population)
- Develop state-specific juvenile abundance indices.

Medium Priority

- Identify essential habitat requirements.
- Initiate collection of social and economic aspects of the spotted seatrout fishery.

IX. References

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X. Figures

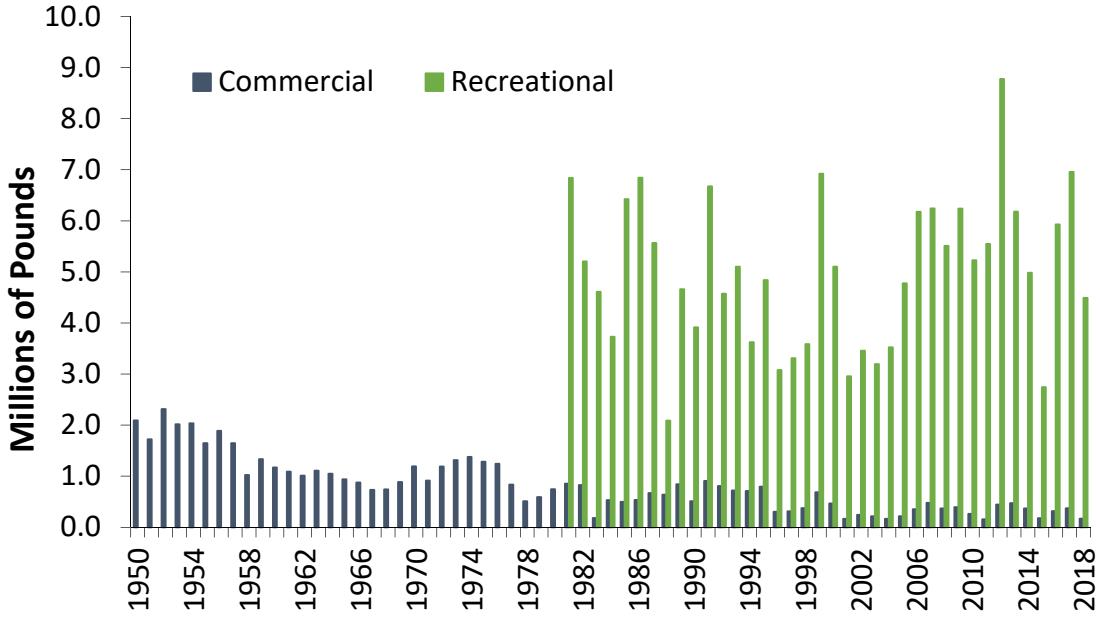

Figure 1. Coastwide commercial landings (1950-2018) and recreational landings (1981-2018), in pounds (See Tables 2 and 4 for values and sources). Recreational data not available prior to 1981.

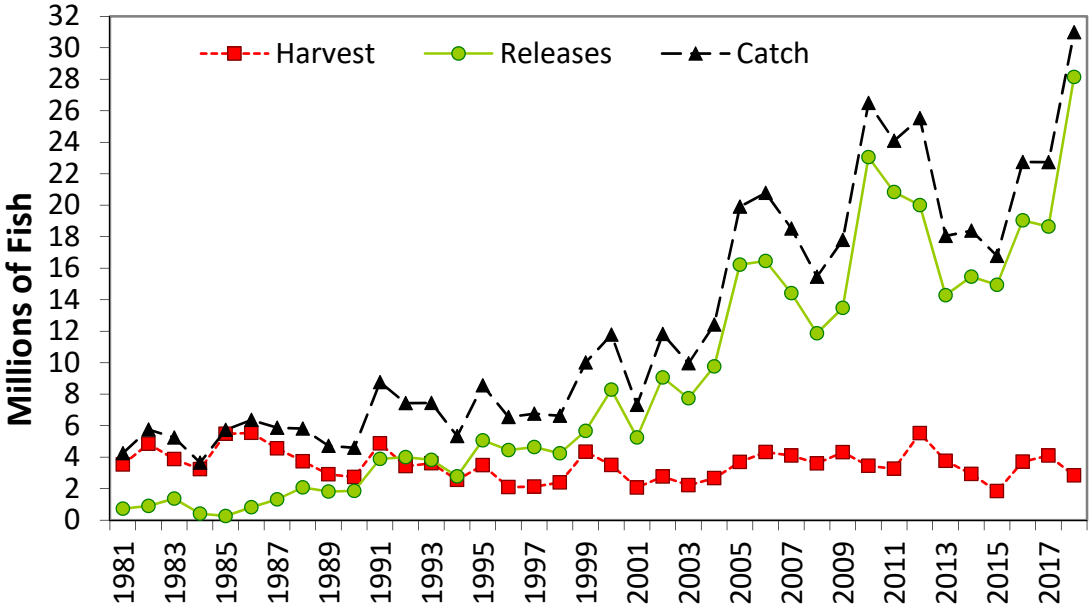

Figure 2. Coastwide recreational catch, harvest, and releases (numbers), 1981-2018 (See Tables 3 and 5 for values and sources).

XI. Tables

Table 1. Summary of state regulations for spotted seatrout in 2018.

State	Recreational	Commercial
New Jersey	13" TL; 1 fish	Gill net, trawl, and pound net: 13"; 100 lb/vessel/day possession and bycatch limit; seasonal closures; monthly reporting. Trawl and gill net mesh size restrictions. Hook & line fishermen must follow rec limits.
Delaware	12" TL	12" TL
Maryland	14" TL; 4 fish	14" TL. 150 lb limit per day or trip (whichever is longer). Trawl and gill net mesh size restrictions.
PRFC	14" TL; 10 fish	14" TL
Virginia	14-24" TL; 1 fish >24" allowed; 5 fish	14" TL; pound nets/seines allowed 5% by weight less than 14". Hook & line fishermen must follow rec limits. Quota: 51,104 lbs (Sept-Aug). After 80% reached, 100 lb/vessel/day possession and bycatch limit.
North Carolina	14" TL; 4 fish Fishery closed by proclamation from January 5, 2018 – June 15, 2018	14" TL; 75 fish limit. Unlawful to possess or sell Friday 12:00am-Sunday 12:00am. Fishery closed by proclamation from January 5, 2018 – June 15, 2018
South Carolina	14" TL; 10 fish. Gig March-Nov.	Gamefish status since 1987; native caught fish may not be sold.
Georgia	14" TL; 15 fish	14" TL; 15 fish. BRD requirement for trawl; gear mesh regulations.
Florida	15-20" TL slot; 1 fish >20" allowed; northeast 6 fish; northwest 5 fish; south 4 fish; hook & line/cast net only.	15-24" TL; Season varies by region; 75 fish limit or 150 fish limit with two or more licensed fishermen on board; hook & line/cast net only.

Note: A commercial fishing license is required to possess spotted seatrout for sale in all states with a fishery.

Table 2. Commercial landings (pounds) of spotted seatrout by state, 2009-2018 (Source: ACCSP for years prior to 2018 and State Compliance Reports for 2018). Totals are for the coastwide fishery and may extend beyond the management unit. "C" represents confidential data.

Year	MD	VA	NC	SC	GA	FL	Total
2009	C	26,350	320,247		C	46,297	392,894
2010	C	20,870	200,822		C	39,374	262,326
2011	640	17,315	75,239		C	63,592	156,787
2012	C	116,767	265,016			61,676	443,747
2013	C	42,086	367,610		C	58,288	471,243
2014	C	90,051	242,245		C	37,710	370,110
2015	C	7,888	128,752			39,226	175,931
2016	C	18,483	274,583	C		23,105	316,412
2017	C	55,219	299,910			16,194	371,590
2018	C	17,526	128,922			21,893	168,500

Table 3. Recreational harvest (numbers of fish) of spotted seatrout using the FES effort calibration, by state, 2009-2018 (Source: MRIP for years prior to 2018 and State Compliance Reports for 2018). Totals are for the coastwide fishery and may extend beyond the management unit.

Year	MD	VA	NC	SC	GA	FL	Total
2009	20,285	67,687	1,857,890	370,370	1,363,056	639,102	4,318,390
2010	9,684	77,068	630,748	406,781	1,135,113	1,187,103	3,446,707
2011	11,042	644,074	723,502	193,487	762,304	931,353	3,265,762
2012	21,323	392,484	1,602,836	622,205	1,206,654	1,682,942	5,528,444
2013	0	153,706	1,107,957	440,751	937,046	1,122,151	3,767,047
2014	21,560	84,537	725,086	260,321	724,411	1,111,177	2,930,606
2015	11,619	23,062	249,260	311,106	740,932	504,137	1,840,155
2016	10,092	163,529	978,624	311,168	1,290,220	962,946	3,717,042
2017	24,255	172,288	1,217,834	647,679	1,060,493	977,797	4,100,346
2018	0	189,537	449,473	175,191	1,096,602	929,155	2,840,302

Table 4. Recreational harvest (pounds of fish) of spotted seatrout using the FES effort calibration, by state, 2009-2018 (Source: See Table 3). Totals are for the coastwide fishery and may extend beyond the management unit.

Year	MD	VA	NC	SC	GA	FL	Total
2009	23,031	132,635	2,878,160	508,657	1,576,285	1,121,118	6,239,886
2010	19,623	137,095	1,277,174	598,963	1,310,371	1,883,653	5,226,879
2011	11,181	1,450,980	1,353,388	327,349	894,796	1,509,893	5,547,587
2012	36,380	690,821	2,720,028	1,002,364	1,231,246	3,097,576	8,778,415
2013	0	379,399	1,881,881	717,402	1,125,802	2,075,929	6,180,413
2014	46,870	166,182	1,451,592	382,155	825,903	2,111,818	4,984,520
2015	23,546	48,477	430,579	462,498	794,861	984,940	2,744,901
2016	20,024	341,977	1,724,492	475,749	1,740,513	1,625,597	5,928,352
2017	48,624	342,463	2,157,198	992,938	1,403,646	2,011,777	6,956,646
2018	0	226,786	658,555	414,442	1,489,609	1,701,275	4,490,667

Table 5. Recreational releases (number of fish) of spotted seatrout using the FES effort calibration, by state, 2009-2018 (Source: See Table 3). Totals are for the coastwide fishery and may extend beyond the management unit.

Year	MD	VA	NC	SC	GA	FL	Total
2009	160,644	549,846	4,462,890	1,001,740	2,125,707	5,177,671	13,480,869
2010	300,919	2,530,405	7,657,503	1,167,472	1,676,201	9,717,723	23,050,609
2011	21,353	3,462,963	7,420,553	743,581	1,348,499	7,839,264	20,836,213
2012	259,437	1,257,157	4,916,356	1,761,694	2,196,920	9,610,576	20,006,019
2013	22,780	738,474	4,278,671	2,190,796	1,320,699	5,722,715	14,282,174
2014	74,250	1,059,287	3,949,284	1,407,310	1,687,540	7,279,660	15,460,257
2015	242,150	834,028	4,824,088	1,147,982	1,763,638	6,131,007	14,943,497
2016	133,223	3,708,969	6,475,193	1,791,072	2,113,253	4,783,644	19,035,843
2017	107,611	3,154,997	5,147,567	1,949,554	2,436,867	5,845,559	18,642,226
2018	54,795	4,455,420	15,245,249	1,062,769	2,022,125	5,306,034	28,146,810

Mike Schmidtke, FMP Coordinator
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Dear Mr. Schmidtle

I normally do not write letters, but I would like to express a concern of mine. This is the basically the letter I send to the Commissioner of Virginia Marine Resource Agency.

On Saturday 8/10/19 I went fishing near the James River Bridge at Newport News. The fishing was horrible. I tried fishing for speckle trout around the bridge piers in my boat. I guess I threw several hundred cast with a Zman Diezel Minnowz , a Mirrow Lure 52M plug and a DOA Shrimp. No hit what so ever and no indication of fish on side scan with my fish finder. In the past I have always caught my limit in no time using these tried methods.

Once I got tired of trying for speckle trout I devoted my attention to croaker fishing. In trying for five hours I only caught six very small croaker, that I immediately threw back, and a pound and a half blue cat fish near the lift span of the James River Bridge, it to went back in the water. My fish finder showed very few hits and no bait balls ever showed up. This is the third year I have tried for croaker with no success.

The water did have a usual color that I have never seen before. I filled an empty water bottle with some of the river water, it had a slight opaque color. In looking at my crude water sample, I did not feel that this was a water quality issue.

There was a guy taking a survey from your agency at the boat ramp, Huntington Park, and I answered his questions. He was very professional polite and courteous. I also talked to one of the police officers and he said there was a definite decline in people using the boat ramp there. The boat ramp appeared to me to be only 1/3 capacity.

My question to you is why the decline in fish or what controls could be place to bring fish population back. Are the days when I could fill up my cooler , cherish and remember my fishing trip while frying fish during the winter months over? Is there any other agency federal or state that I need to write?

As a child I had fond memories of my father and grand father taking me fishing and being able to catch one fish after another. If the present trend continues I feel that I will not be able to take any of my 2 grand sons fishing. I feel that if proper management of our fish resource is to continue, the only fishing I can do with them is on a video game and the only fish they eat might very well be a fish sandwich at McDonald.

In additional comments to your office, I feel that there is a lot of loss to revenue from hotel stays, restaurant and retail sales for this area. On the federal level I am asking what can be done to bring fish population back, for me in in my lifetime and my grandsons.

Thank you for your time

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