Atlantic States Marine Fisheries Commission

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James J. Gilmore, Jr. (NY), Chair *Patrick C. Keliher (ME), Vice-Chair* *Robert E. Beal, Executive Director*

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEMORANDUM

July 31, 2019

TO: Commissioners; Proxies; American Eel Management Board; Atlantic Menhaden Management Board; Atlantic Striped Bass Management Board; Committee on Economics and Social Sciences; Executive Committee; Horseshoe Crab Management Board; ISFMP Policy Board; South Atlantic State/Federal Fisheries Management Board; Spiny Dogfish Management Board; Summer Flounder, Scup, and Black Sea Bass Management Board; Tautog Management Board

FROM: Robert E. Beal
Executive Director

RE: ASMFC Summer Meeting: August 6 – 8, 2019 (TA 19-060)

The Atlantic States Marine Fisheries Commission's Summer Meeting will be held August 6 – 8, 2019 at **The Westin Crystal City** (Telephone: 703.486.1111), located at 1800 South Eads Street, Arlington, VA. Meeting materials are currently available on the Commission website at http://www.asmfc.org/home/2019-summer-meeting and supplemental materials will be posted there on Wednesday, July 31, 2019.

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.

Board meeting proceedings will be broadcast daily via webinar beginning at 10:15 a.m. on Tuesday, August 6th and continuing daily until the conclusion of the meeting (expected to be 5:00 p.m.) on Thursday, August 8th. 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. To register, please go to https://attendee.gotowebinar.com/register/3215930074468838914

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

Enclosures: Final Agenda, Hotel Directions, TA 19-060, and Travel Reimbursement Guidelines

Atlantic States Marine Fisheries Commission

Summer Meeting

August 6 – 8, 2019

The Westin Crystal City

Arlington, Virginia

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 ***July 30, 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, ***July 30, 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.

Tuesday, August 6

8:00 – 10:00 a.m.
Breakfast will be available at 7:30 a.m.

Executive Committee
(A portion of this meeting may be a closed session for Committee members and Commissioners only)
Members: Abbott, Bowman (Bolen), Boyles, Jr. (Bell), Cimino, Clark, Estes (Burgess), Fegley/Luisi, 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 May 2019
3. Public Comment
4. Consider Policy Addressing Non-Payment of State Assessments *(R. Beal)* **Action**
5. Consider Proposed Revision to the Annual Report *(R. Beal)* **Action**
6. Decision on Transitioning the For-hire Telephone Survey to State/ACCSP Conduct *(R. Beal)* **Action**
7. Discuss Commission Involvement in Biosecurity and Bait Sources *(R. Beal)*
8. Other Business/Adjourn

10:15 a.m. – Noon

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, Lynn
Staff: Schmidtke

1. Welcome/Call to Order *(P. Geer)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2019
3. Public Comment
4. Amendment 1 to the Cobia Fishery Management Plan for Final Approval *(M. Schmidtke*) **Final Action**
   - Review Options and Public Comment Summary *(M. Schmidtke)*
   - Review Committee Reports *(M. Schmidtke, A. Giuliano*)
   - Consider Final Approval of Amendment 1 *(P. Geer)*
5. Review 2019 Traffic Light Analyses for Atlantic Croaker and Spot *(C. McDonough)*
6. Consider Approval of 2019 Fishery Management Plan Reviews and State Compliance for Atlantic Cobia and Atlantic Croaker *(M. Schmidtke)* **Action**
7. Other Business/Adjourn

Noon – 1:15 p.m. **Legislators and Governors' Appointees (LGAs) Luncheon**

Noon – 1:15 p.m. **Lunch provided for Commissioners, Proxies, Other Members, Participants and Staff. LGAs should pick up lunch and continue to their meeting.**

1:30 – 2:30 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 October 2018
3. Public Comment
4. Update on Board Working Group Recommendations on Addressing Coastwide Cap Overages *(K. Rootes-Murdy)*
5. Review and Consider Approval of 2020 Aquaculture Proposals *(K. Rootes-Murdy)* **Action**
6. Other Business/Adjourn

2:45 – 3:30 p.m. **Horseshoe Crab Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: PRFC, NMFS, USFWS
Chair: Rhodes
Other Participants: Brunson, Messeck
Staff: Schmidtke

1. Welcome/Call to Order *(M. Rhodes)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2019
3. Public Comment
4. Consider Management Response to the 2019 Horseshoe Crab Benchmark Stock Assessment *(M. Rhodes)* **Possible Action**
5. Other Business/Adjourn

3:45 – 5:15 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 February 2019
3. Public Comment
4. Progress Update on 2019 Menhaden Single-Species and Ecological Reference Point Benchmark Stock Assessments *(K. Anstead, K. Drew)*
5. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(M. Appelman*) **Action**
6. Set 2020 Atlantic Menhaden Specifications *(N. Meserve)* **Final Action**
7. Other Business/Adjourn

Wednesday, August 7

8:30 – 10:30 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 May 2019
3. Public Comment
4. Update from Executive Committee and State Director's Meeting *(J. Gilmore)*
5. Review 2019 Annual Performance of the Stocks *(T. Kerns*)
6. Review and Consider Changes to Commission Guiding Documents *(T. Kerns*)
   - ISFMP Charter **Final Action**
   - Technical Support Group Guidance and Benchmark Stock Assessment Process **Final Action**
   - Working Group Standard Operating Procedures and Policies **Possible Action**
7. Update on American Lobster Enforcement Vessel *(R. Beal)*
8. Atlantic Coastal Fish Habitat Partnership Committee Report *(L. Havel)*
9. Progress Update on the Shad Benchmark Stock Assessment (*J. Kipp)*
10. Review Noncompliance Findings (If Necessary) **Action**
11. Other Business/Adjourn

8:30 a.m. – 4:00 p.m. **Committee on Economics and Social Sciences (CESS)**

Members: Clemetson, Colburn, Hadley, Holzer, Lovell, McPherson, Montanez, Rhodes, Robertson, Scheld, Scott, Shivlani, Sproul, Stemle, Stoll
Chair: Ebbin
Staff: Murray

1. Welcome/Introductions *(S. Ebbin)*
2. Approval of Agenda
3. Updates from CESS Species Representatives *(S. Ebbin)*
4. Discussion of Draft Risk and Uncertainty Policy *(S. Murray)*
5. Overview of ASMFC Processes *(S. Murray)*
6. Discussion of ASMFC Socioeconomic Information Needs *(S. Ebbin, S. Murray)*
7. Recess to Observe Summer Flounder, Scup, and Black Sea Bass Board Meeting
8. Discussion of Committee's Current and Future Role in ASMFC Processes *(S. Ebbin)*
9. Other Business
10. Public Comment
11. Adjourn

10:30 – 10:45 a.m. **Business Session**

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

1. Welcome/Call to Order *(J. Gilmore)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2019
3. Public Comment
4. Consider Approval of Atlantic Cobia Amendment 1 **Final Action**
5. Consider Noncompliance Recommendations (If Necessary) **Final Action**
6. Other Business/Adjourn

11:00 a.m. – Noon **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: O'Reilly
Other Participants: Newlin, Moran
Staff: Rootes-Murdy

1. Welcome/Call to Order *(R. O'Reilly)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from October 2018
3. Public Comment

4. Consider Draft Addendum VI for Public Comment *(K. Rootes-Murdy)* **Action**
5. Other Business/Adjourn

Noon – 1:00 p.m. **Lunch** *(On Your Own)*

1:00 – 3:45 p.m. **Summer Flounder, Scup, and Black Sea Bass Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina
Other Members: NMFS, PRFC, USFWS
Chair: Ballou
Other Participants: Wojcik, Snellbaker, Stevens
Staff: Colson Leaning, Starks

1. Welcome/Call to Order *(R. Ballou)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2019
3. Public Comment
4. Review Potential Black Sea Bass Commercial Management Strategies and Consider Initiating Management Action to Address Commercial Allocation *(C. Starks)* **Possible Action**
5. Update on the Summer Flounder Management Strategy Evaluation: A Recreational Fishery Project *(J. McNamee)*
6. Report from the Atlantic Coastal Fish Habitat Partnership/Mid-Atlantic Fishery Management Council Project: Characterizing Black Sea Bass Habitat in the Mid-Atlantic Bight *(B. Stevens)*
7. Discussion on Discard Mortality *(C. Starks)*
8. Progress Update on the Recreational Management Reform Working Group *(C. Starks)*
9. Other Business/Adjourn

4:00 – 5:00 p.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 October 2018
3. Public Comment
4. Review Implementation Guidelines for the Commercial Harvest Tagging Program *(C. Starks*) **Possible Action**
5. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(K. Rootes-Murdy)* **Action**
6. Elect Vice-Chair **Action**
7. Other Business/Adjourn

Thursday, August 8

8:30 – 11:30 a.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
Staff: Appelman

1. Welcome/Call to Order *(M. Armstrong)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from April 2019
3. Public Comment
4. Consider Draft Addendum VI for Public Comment *(M. Appelman)* **Action**
5. Consider Postponed Motions from April 2019 *(M. Armstrong)* **Action**
   Main Motion: Move to initiate an Amendment to the Atlantic Striped Bass Fishery Management Plan to address the needed consideration for change on the issues of fishery goals and objectives, empirical/biological/spatial reference points, management triggers, rebuilding biomass, and area-specific management. Work on this amendment will begin upon the completion of the previously discussed addendum to the management plan.

   Motion to Amend: Move to amend to add reallocation of commercial quota between states.
6. Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(M. Appelman)* **Action**
7. Other Business/Adjourn

11:30 a.m. – 12:30 p.m. **Lunch** *(On Your Own)*

12:30 – 5:00 p.m. **NOAA Fisheries Wind Power Workshop for New England and Mid-Atlantic Commissioners**

(This Workshop is focused on wind energy activities in New England and the Mid-Atlantic, however, all Commissioners are welcome to participate).

1. Welcome/Introductions *(J. Gilmore/M. Pentony)*
2. Public Comment
3. Fisheries and Wind Power Co-existence: Overview of Issues, Challenges, and Opportunities *(A. Lipsky)*
4. Presentation on NOAA Fisheries Role in Offshore Wind Activities *(M. Pentony)*
5. Questions and Discussion on Projects and Federal Role

6. Presentations on State Level Policy and Research Activities Associated with Offshore Wind Development
    - Massachusetts
    - Rhode Island
    - Connecticut
    - New York
    - New Jersey
7. Fishing Industry Engagement in Research and Development *(A. Hawkins)*
    - Responsible Offshore Development Alliance (RODA)
    - Responsible Offshore Science Alliance (ROSA)
8. Discussion on Coordination of State and Federal Activities
    - Would Increased State Coordination Improve Engagement in Wind Power Development?
    - What is the Best Approach to Ensure State Coordination?
    - What is the Best Approach to Ensure State/Federal/Regional Council Coordination?
    - Is There a Role for ASMFC in State Coordination or State/Federal Coordination?
9. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

South Atlantic State/Federal Fisheries Management Board

August 6, 2019
10:15 a.m. – Noon
Arlington, Virginia

Draft Agenda

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

1.	Welcome/Call to Order (*P. Geer*)	10:15 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from May 2019	10:15 a.m.
3.	Public Comment	10:20 a.m.
4.	Amendment 1 to the Cobia Fishery Management Plan for Final Approval **Final Action** • Review Options and Public Comment Summary (*M. Schmidtke*) • Review Committee Reports (*M. Schmidtke, A. Giuliano*) • Consider Final Approval of Amendment 1 (*P. Geer*)	10:30 a.m.
5.	Review 2019 Traffic Light Analyses for Atlantic Croaker and Spot *(*C. *McDonough*)	11:20 a.m.
6.	Consider Approval of 2019 Fishery Management Plan Reviews and Compliance for Atlantic Cobia and Atlantic Croaker *(M. Schmidtke)* **Action**	11:35 a.m.
7.	Other Business/Adjourn	12:00 p.m.

The meeting will be held at the Westin Crystal City, 1800 S Eads Street, Arlington, VA 22202; 703.486.1111

MEETING OVERVIEW

South Atlantic State/Federal Fisheries Management Board Meeting
Tuesday, August 6, 2019
10:15 a.m. – 12:00 p.m.
Arlington, Virginia

Chair: Pat Geer (VA) Assumed Chairmanship: 02/18	Technical Committee (TC) Chairs: Black Drum: Harry Rickabaugh (MD) Cobia: Angela Giuliano (MD) Atlantic Croaker: Chris McDonough (SC) Red Drum: Vacant	Law Enforcement Committee Representative: Capt. Bob Lynn (GA)
Vice Chair: Robert H. Boyles, Jr.	Advisory Panel Chair: Tom Powers (VA)	Previous Board Meeting: February 6, 2019
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS, SAFMC (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2, 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. Amendment 1 to the Cobia Fishery Management Plan (10:30 a.m. – 11:20 p.m.) Final Action

Background

- In May 2018, the Board initiated Draft Amendment 1 to the Cobia Fishery Management Plan (FMP) to reflect removal of Atlantic cobia from the South Atlantic and Gulf of Mexico Fishery Management Councils' Coastal Migratory Pelagic Resources FMP and establish recommendations for measures in federal waters.
- In October 2018, the Board reviewed public comment on a Public Information Document (PID) and gave direction to the Cobia Plan Development Team (PDT) on options to be included in Draft Amendment 1.
- In May 2019, the Board approved Draft Amendment 1 for Public Comment. Four public hearings were held via webinar and in-person in Virginia, North Carolina, and South Carolina (**Briefing Materials**). Written comments were accepted through July 15, 2019 (**Briefing Materials**).

- The Advisory Panel (**Briefing Materials**) and Cobia Technical Committee (**Supplemental Materials**) met via webinar and have developed or will develop recommendations for Board consideration.

Presentations

- Public Comment Summary for Draft Amendment 1 to the Interstate Fishery Management Plan for Atlantic Migratory Group Cobia by M. Schmidtke.
- Advisory Panel and Cobia Technical Committee Report on Draft Amendment 1 by M. Schmidtke and A. Giuliano.

Board actions for consideration at this meeting

- Review public comment and consider final approval for Draft Amendment 1 to the Cobia FMP.

5. 2019 Traffic Light Analyses for Atlantic Croaker and Spot (11:20 a.m. – 11:35 a.m.)

Background

- Addendum II (2014) of the Atlantic Croaker Fishery Management Plan (FMP) and Addendum II (2014) of the Spot FMP establish the Traffic Light Analyses (TLA) as a new management framework for these species in non-assessment years (**Supplemental Materials**).

Presentations

- 2019 TLA Reports for Atlantic croaker and Spot by C. McDonough.

6. Consider Approval of 2019 Fishery Management Plan Reviews and Compliance for Atlantic Cobia and Atlantic Croaker (11:35 a.m. – 12:00 p.m.) Action

Background

- Atlantic cobia state compliance reports are due on July 1. The Atlantic Croaker Plan Review Team (PRT) has reviewed state reports and compiled the annual FMP Review. New Jersey, Delaware, and Maryland have requested *de minimis* status (**Supplemental Materials**).
- Atlantic croaker state compliance reports are due on July 1. The Atlantic Croaker Plan Review Team (PRT) has reviewed state reports and compiled the annual FMP Review. Delaware (commercial), South Carolina (commercial), Georgia (commercial), and Florida (commercial) have requested *de minimis* status (**Supplemental Materials**).

Presentations

- 2019 FMP Reviews for Atlantic cobia and Atlantic croaker by M. Schmidtke.

Board actions for consideration at this meeting

- Consider approval of the 2019 FMP Reviews, state compliance, and *de minimis* requests for Atlantic cobia and Atlantic croaker.

7. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

Cobia Technical Committee

Call to Review Draft Amendment 1

July 25, 2019

Call Summary

TC Attendees: Shanna Madsen (NJ), Angela Giuliano (MD), Alex Aspinwall (VA), Anne Markwith (NC), Mike Denson (SC), Chris Kalinowsky (GA), Mike Larkin (NOAA-SERO)

ASMFC Staff: Mike Schmidtke

The Cobia Technical Committee (TC) met to review and provide recommendations to the South Atlantic State/Federal Fisheries Management Board on issues and options addressed in Draft Amendment 1.

Mike Schmidtke presented the issues of Draft Amendment 1. Prior to going through the issues, Schmidtke described current management and assessment information for Atlantic cobia. Of note, current management is still being conducted using recreational catch estimates derived using the Marine Recreational Information Program's (MRIP) effort data from the Coastal Household Telephone Survey (CHTS). Following completion of the currently ongoing stock assessment (Southeast Data, Assessment, and Review [SEDAR] 58), future management will use estimates derived using the new, mail-based Fishing Effort Survey (FES).

The issues of Draft Amendment 1 and the TC's recommendation and a summary of discussion for each are listed below:

Issue 1: Edit to Section 2.3 Goal
The TC supports this edit.

Issue 2: Edit to Section 2.4 Objectives
The TC supports this edit.

Issue 3: Edit to Section 2.6 Definition of Overfishing
The TC supports this edit.

Issue 4: Edit to Section 3.1.1 Commercial Landings/Catch Monitoring
The TC supports this edit.

Issue 5: Section 4.1 Harvest Specification Process
The TC supports Option b: The coastwide total harvest quota, vessel limits, possession or bag limits, minimum size limits, and commercial closure triggering mechanism may be specified by

Board action for up to three years. Subsequent harvest specification would occur for implementation after expiration of the previous specification (up to two years apart) or following a completed stock assessment.

- The TC supports this option with recognition that it allows the Board to specify harvest on a timeframe shorter than 3-years, should circumstances in the management or assessment of this fishery necessitate.

Issue 6: Section 4.2 Sector Quota Allocation
The TC supports the section as written (92% recreational, 8% commercial allocations).

Issue 7: Edit to Section 4.3.5 Evaluation of Recreational Landings and Overage Response
The TC supports the edit.

Issue 8: Section 4.3.6 Recreational Units
The TC supports Option b: Recreational landings, quotas, and targets will be evaluated and set in units of numbers of fish.

- Mike Denson asked when the current default conversion average weight (28 lb) would be re-evaluated. Schmidtke commented that if the assessment can convey a quota in numbers of fish in the future, this conversion would not be necessary. Denson noted that this conversion strategy could result in leaving fish "on the table" in some years and dealing with overages in others, as the average weight varies over time. Schmidtke noted that average weight can vary spatially as well, which was considered by the Plan Development Team when writing this option.
- Denson asked how often alternative state data could be brought up for consideration. Schmidtke noted that evaluation of such data could be completed between consecutive Board meetings and applied after approval, so it could be brought to the Board's attention at any time.
- The TC notes that management through numbers of fish removes some steps of catch estimate uncertainty that are specific to the estimation of poundage from numbers.
- Option b also agrees with the TC's memo to the Board discussing recreational landings evaluation from July, 2018.

Issue 9: Section 4.4.1 Commercial Size Limit
The TC supports Option b: All states shall maintain a minimum size limit of 36 inches fork length or the total length equivalent (40 inches).

- The TC noted that biologically the current difference in commercial and recreational size limits does not make much difference, especially since the quotas are managed based on weight. However, if aligning these limits could reduce stakeholder confusion on regulations or improve enforcement, that could be worthwhile.

Issue 10: Section 4.4.3 Commercial Vessel Limit
The TC supports Option a: (Status Quo) All states shall maintain a daily vessel limit, not to exceed 6 fish per vessel.

- Motivation for this issue came primarily from SC recreational fishermen that want cobia to have greater recreational value and possible consideration as a coastwide gamefish.
- Biologically, maintaining or changing the vessel limit would not matter due to the limiting of the commercial fishery by a quota and closures if the quota is reached. The main difference in the options would be in potentially how long into a year the commercial fishery could remain open.
- Some current state regulations already limit the commercial fishery beyond the requirements of the FMP.
- The TC recommends status quo due to no information indicating a need to divert from it.

Issue 11: Section 4.4.4 Commercial Quota Based Management
The TC supports the section as written.

Issue 12: Section 4.5.3.3 Commercial *De Minimis*
The TC supports Option b: States may apply for *de minimis* status for their commercial fishery.

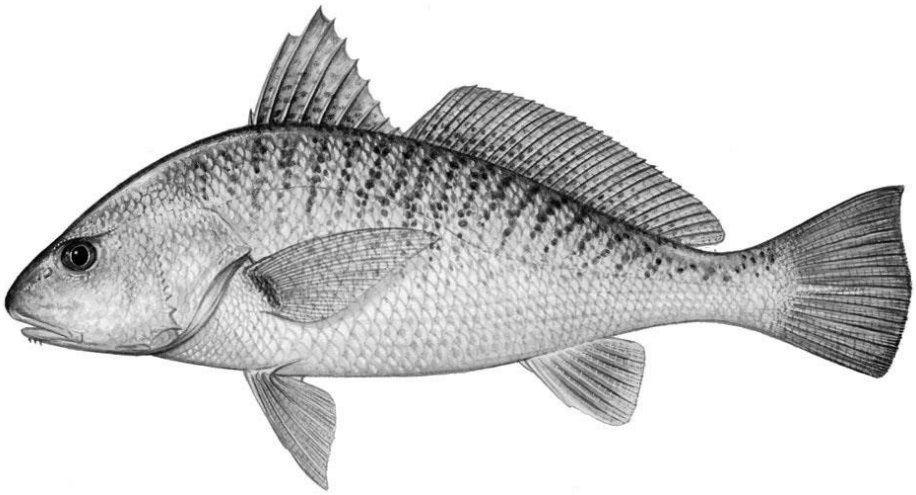
Issue 13: Section 4.9 Recommendation to the Secretary of Commerce for Complementary Actions in Federal Jurisdictions
The TC supports Option b: Recreational regulations in federal waters will be recommended to correspond to the location of catch, with regulations persisting along a latitudinal extension (due directly east) of state boundaries into federal waters. Commercial regulations in federal waters will be recommended to correspond to those of the vessel's permitted or licensed state of landing. If possessing permits or licenses for multiple states with open seasons, regulations for the most restrictive open state shall apply. If possessing permits or licenses for multiple states, only one of which is open, regulations for the state with an open season shall apply.

- Regardless of which option is selected, states with possession or landing limits would still be able to determine how many cobia can be brought into their state. State laws still apply in state waters. The only difference for vessels from such states would be in how regulations are enforced during on-the-water law enforcement stops in federal waters.

The TC also elected Angela Giuliano (MD) as the Chair and Mike Denson (SC) as the Vice Chair.

Traffic Light Analysis of Atlantic Croaker (*Micropogonias undulatus)* for the Atlantic States Marine Fisheries Commission Fishery Management Plan Review.

2018 Fishing Year



Atlantic Croaker Plan Review Team

*****Chris McDonough, South Carolina Department of Natural Resources
Mike Schmidtke, Ph.D., Atlantic States Marine Fisheries Commission, Chair
Ethan Simpson, Virginia Marine Resources Commisison
Daniel Zapf, North Carolina Division of Marine Fisheries

*Prepared Analysis and Report

Introduction

Atlantic croaker are managed under Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker (2005) and Addenda I (2011) and II (2014). The Amendment does not require any specific measures restricting harvest but encourages states with conservative measures to maintain them. It also implemented a set of management triggers, based on an annual review of certain metrics, to respond to changes in the fishery or resource and initiate a formal stock assessment on an accelerated timeline if necessary. Addendum I revised the management program's biological reference points to assess stock condition on a coastwide basis as recommended by the 2010 stock assessment.

In August 2014, the South Atlantic State/Federal Fisheries Management Board (SAB) approved Addendum II to Amendment I to the Atlantic Croaker Fishery Management Plan (FMP). The Addendum established the Traffic Light Approach (or TLA) to evaluate fisheries trends and develop state-specified management actions (i.e., bag limits, size restrictions, time & area closures, and gear restrictions) when harvest and abundance thresholds are exceeded. The most recent benchmark stock assessment for Atlantic croaker was completed in 2017 (ASMFC, 2018) and provided more data for further refinement and modification of the existing TLA, as recommended by the Atlantic Croaker Technical Committee (TC). This report still uses the TLA established in Addendum II, which will be presented to the SAB in August of 2019. The revised TLA will be presented as part of Draft Addendum III, which will be considered by the SAB to be released for public comment in October of 2019.

The TLA is a statistically-robust way to incorporate multiple data sources (both fishery-independent and -dependent) into a single, easily understood metric for management advice. It is often used for data-limited species, or species that are not assessed on a frequent basis. As such, its serves as an excellent management tool for Atlantic croaker. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of indicators on the condition of the fish population (abundance metric) or fishery (harvest metric). For example, as harvest or abundance increase relative to their long-term mean, the proportion of green in a given year will increase, and as harvest or abundance decrease, the amount of red in that year becomes more predominant. Under Addendum II, state-specific management action would be initiated when the proportion of red exceeds specified thresholds (30% or 60%), for both harvest and abundance, over three consecutive years.

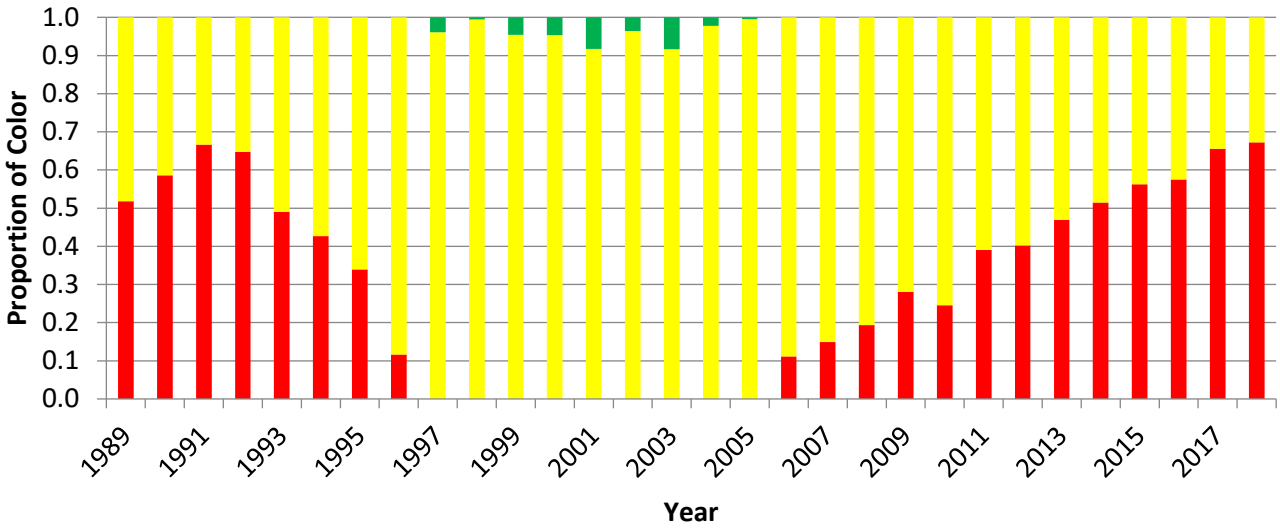
The indices used for the TLA include both commercial and recreational harvest (fishery dependent) and four fishery-independent monitoring surveys that occur in different areas of the Atlantic coast of the United States. The fishery-independent surveys include the Northeast Fisheries Science Center (NMFS) fall ground fish trawl survey, the Virginia Institute of Marine Science (VIMS) trawl survey, the North Carolina Division of Marine Fisheries trawl program 195, and the Southeast Area Monitoring Assessment Program (SEAMAP) trawl survey. The VIMS and NC Program 195 surveys are juvenile surveys that are used to monitor the status of recruitment but do not necessitate management action if tripped.

Traffic Light Analysis (Fishery Dependent)

Commercial Landings

- Commercial landings continued to decline in 2018 (1,619 metric tons) from 2017 (1,845 metric tons) and represented the 13th year of decline in commercial croaker landings.
- The TLA for commercial landings has been above the 30% threshold every year since 2011 (Fig. 1) and 2018 was the 8th year in a row where landings were above the 30% threshold.
- More concerning is that the red proportion has been above the 60% red threshold for the last two years of the series (2017-2018).
- The three year mean red proportion for croaker has exceeded 30% since 2010 and has exceeded 60% for the last three years. The continued steady decline in croaker landings in recent years represent some of the lowest landings levels in the time series.

Figure 1. Annual TLA color proportions for Atlantic croaker commercial landings for the Atlantic coast of the US.

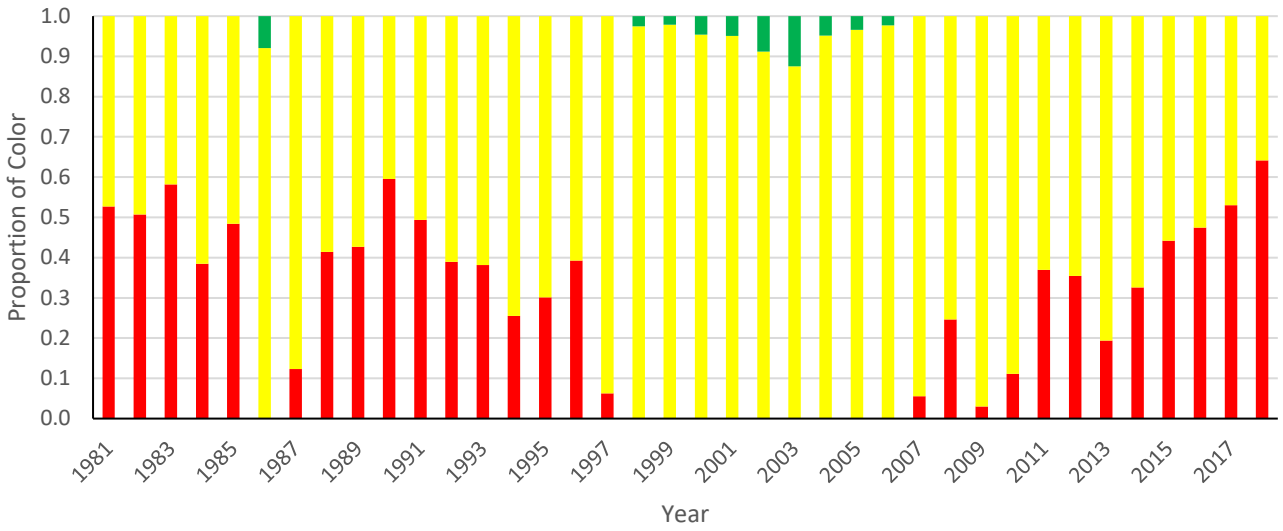


Recreational Harvest

- In July, 2018, the Marine Recreational Information Program transitioned from the catch estimates based on effort information from the Coastal Household Telephone Survey (CHTS) to effort information from the mail-based Fishing Effort Survey (FES). FES estimates are used in this and future reports, so recreational estimates and analyses may be different from previous years that used CHTS estimates.
- The recreational harvest index continued to decline, down 39.8% (2,205 metric tons) in 2017 from harvest levels seen in 2017 (2,205 metric tons).
- The recreational harvest level in 2018 (1,366 metric tons) was the lowest annual harvest in the entire time series (1981-2018).

- The proportion of red in the TLA was 64.1% in 2018 increasing from 53.0% in 2017 (Fig. 2), indicating the recreational index would has reached trigger levels for the last 5 years at the 30% level.
- As with commercial landings, the continued decline in harvest levels for Atlantic croaker in the recreational fishery are also cause for concern.

Figure 2. Annual TLA color proportions for Atlantic croaker from Atlantic coast (NJ-FL) recreational harvest of the U.S. based on a 1996-2008 reference period.

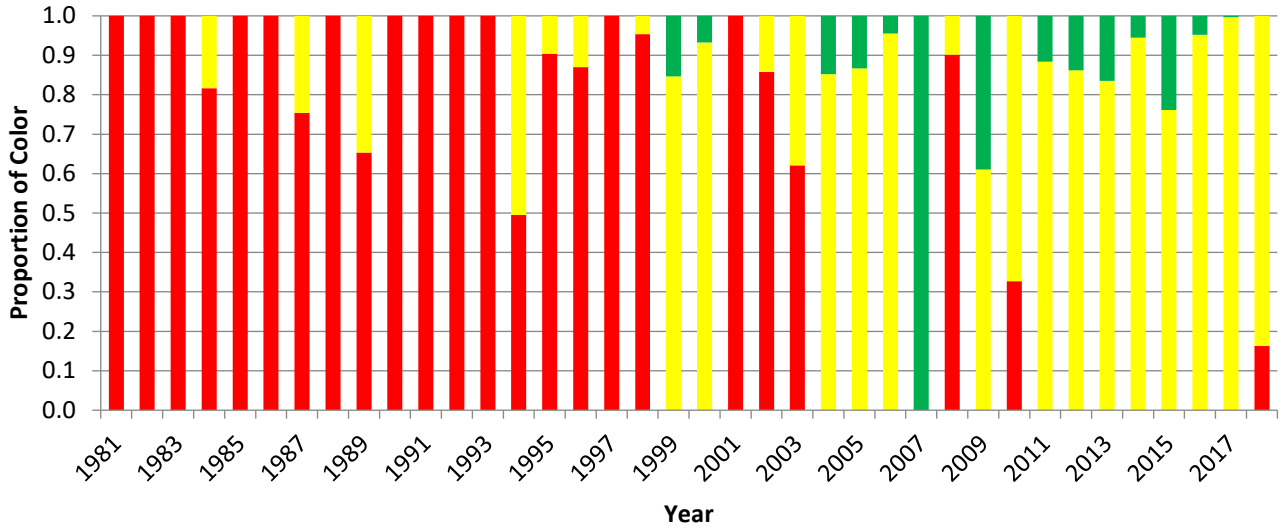


Traffic Light Analysis (Fishery-Independent Surveys)

NEFSC/NMFS Fall Groundfish Survey

- The index value for 2018 was 394.0 fish per tow and represented a 13.9% decrease from 2016 (522.1 fish per tow).
- The NEFSC/NMFS was not carried out in 2017 due to mechanical problems with the RV Bigelow. In the interim, a placeholder index for 2017 was calculated as the mean of 2015-2016 and 2018 (Fig. 3).
- The index was below the long term mean (452.7 fish per tow) for both 2017 and 2018.
- The index has been declining since the series peak in 2007.
- The TLA trigger would not have tripped on the NMFS index in 2018.

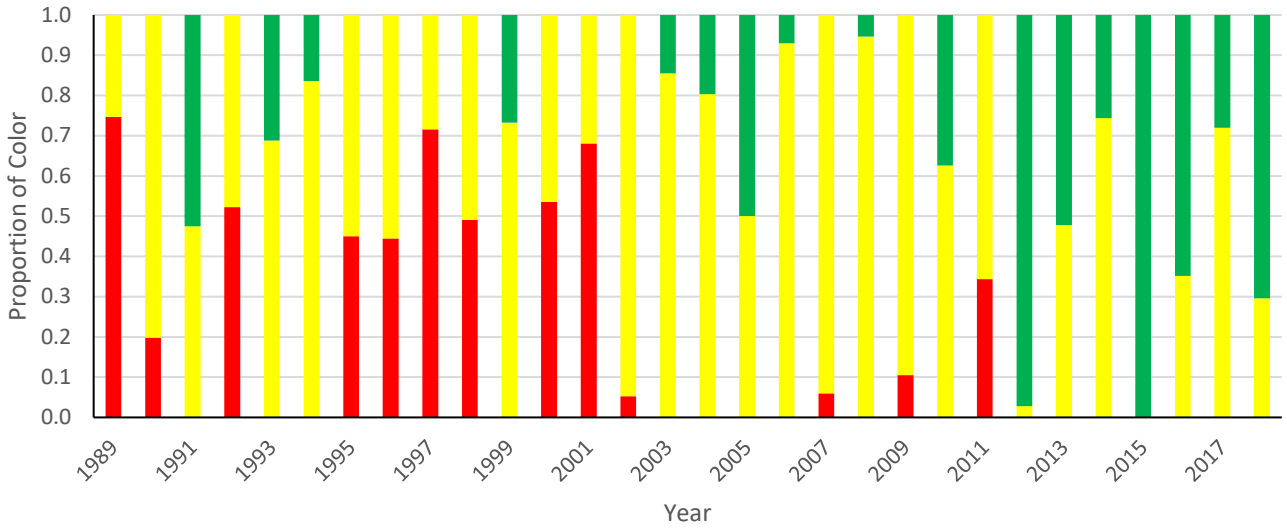
Figure 3. Annual TLA color proportions for Atlantic croaker from NMFS ground-fish trawl survey based on 1996-2008 reference period.



SEAMAP Survey

- The SEAMAP index increased 65% in 2018 (14.7 kg/tow) from 2017 (8.9 kg/tow).
- Index values have remained above the long term mean since 2012 so there was no red in the TLA (Fig. 4).
- The TLA trigger for the SEAMAP survey did not trip in 2018.

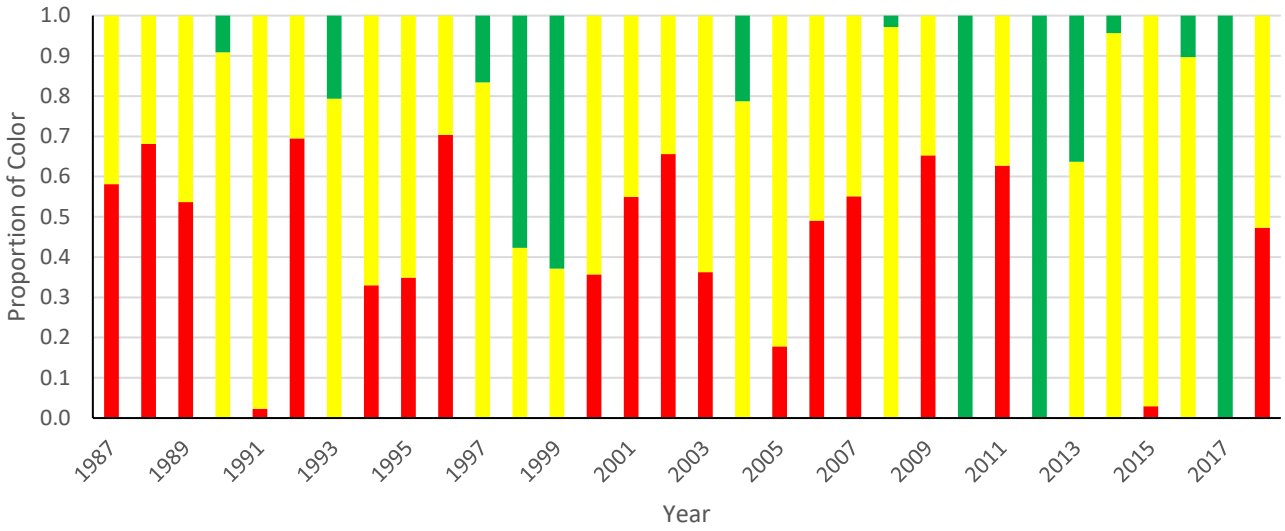
Figure 4. Traffic Light Model for SEAMAP catch data by weight using a 1996-2008 reference period.



North Carolina Program 195

- The North Carolina index decreased in 2018 (88.1%) to 25.9 fish/tow (versus 137.6 fish/tow in 2017) and was below the long term mean (290.3 fish per tow) resulting in an elevated red proportion (47.3%) in the TLA.
- The low catch level in 2018 was a significant decrease from 2017.

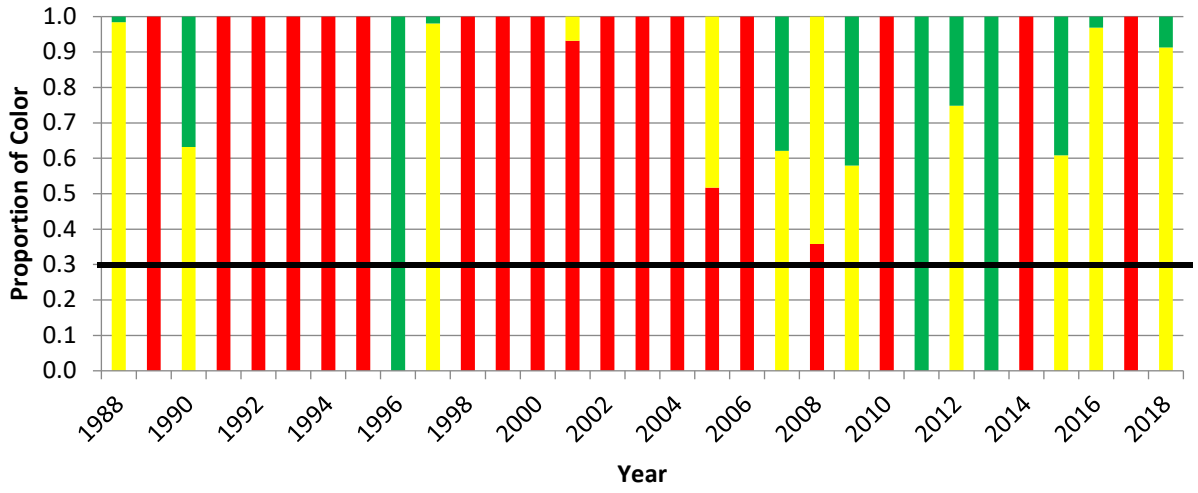
Figure 5. NCDMF Program 195 TLA color proportions for Atlantic croaker using 1996-2008 reference period.



VIMS Survey

- The VIMS index increased significantly (2447%) in 2018 from 2017 going from 0.614 fish per tow in 2017 to 15.64 fish per tow in 2018. The alternating high variability in annual index values was evident in the alternating proportions of red and green in the TLA for the last 6 years (Fig. 6). High variability in the TLA color proportions was likely due to annual recruitment variations, which would not be uncommon for a juvenile index. The index increase in 2018 was above the long term mean for the 1996-2008 reference period (11.9 fish per tow) but still was 74.3% below the recent peak catch years of 2011 and 2013.
- The index value was above the long term mean in 2018 with no red and a green proportion of 8.6%, so the index would not have tripped the TLA trigger in 2018.

Figure 6. Annual TLA color proportions for Atlantic croaker from VIMS spring trawl survey using 1996-2008 reference period.

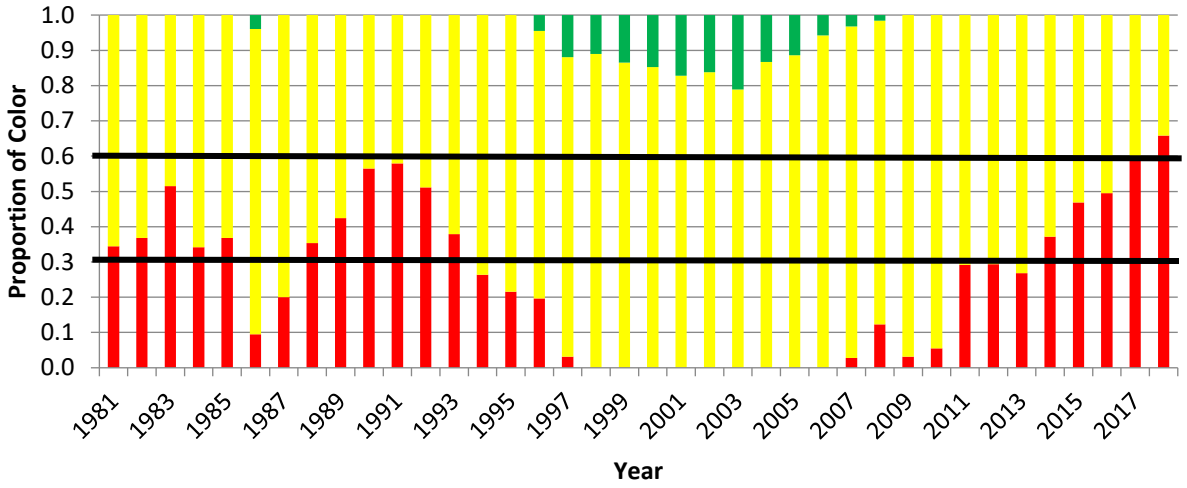


Traffic Light Analysis (Composite Indexes)

Harvest Composite Index

- The harvest composite TLA index indicates that the management response trigger would have been tripped for the fifth year in a row.
- The mean red proportion for the most recent three year time period (2016-2018) was 58.1% with the red proportion being above 60% in 2018 which indicates a significant level of concern.
- The important trend to point out is the continuing decline in recreational and commercial landings for Atlantic croaker with TLA red proportions now exceeding 60%.

Figure 7. Annual color proportions for harvest composite TLA of Atlantic Croaker recreational and commercial landings



Abundance Composite Characteristic Indexes

The abundance composite TLA index was broken into two components based age composition. The adult composite index was generated from the NMFS and SEAMAP surveys since the majority of Atlantic croaker captured in those surveys were ages 1+. The juvenile composite index was generated from the NC program 195 and VIMS surveys because these two captured primarily young-of-the-year Atlantic croaker.

- Three of the four abundance indexes showed increases in red proportions in 2018.
- The adult composite TLA characteristic (Fig. 8) showed a trend of slowly increasing red proportions over the last three years.
- The juvenile composite TLA characteristic (Fig. 9) in 2018 was below the 30% red threshold. Two of the last three years have been below this threshold.

Figure 8. Adult croaker TLA composite characteristic index (NMFS and SEAMAP surveys).

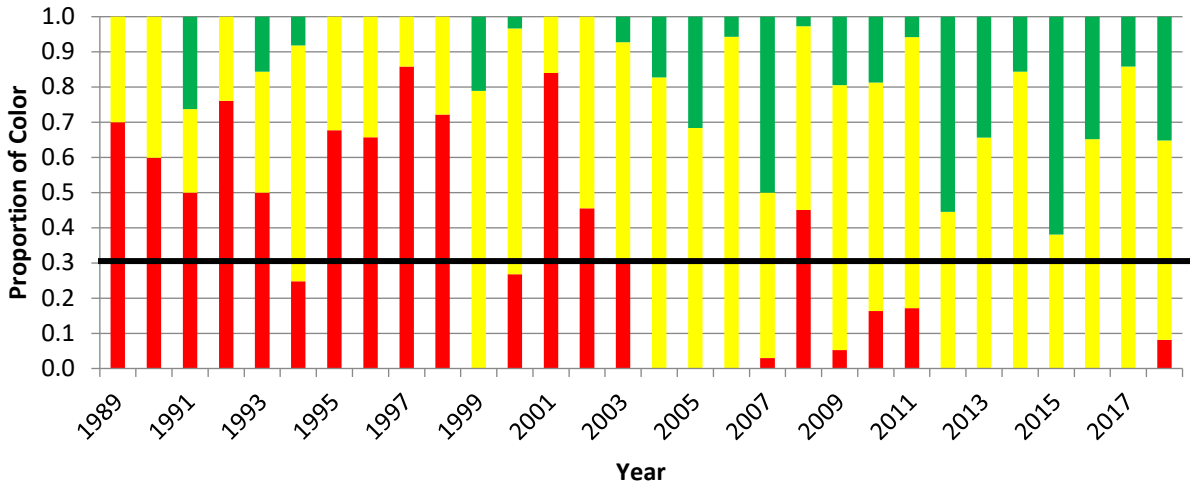
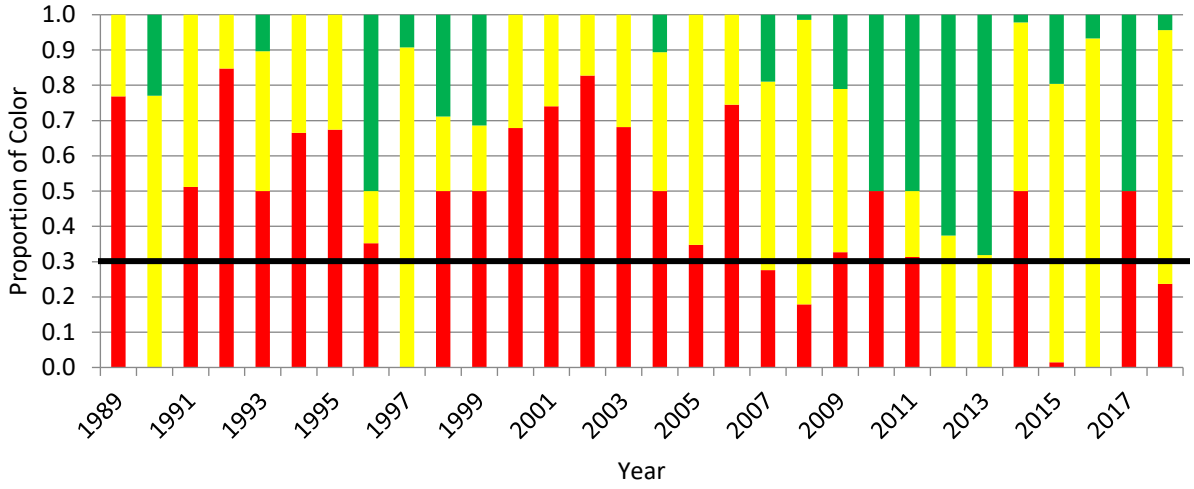


Figure 9. Juvenile croaker TLA composite characteristic index (NC 195 and VIMS surveys).



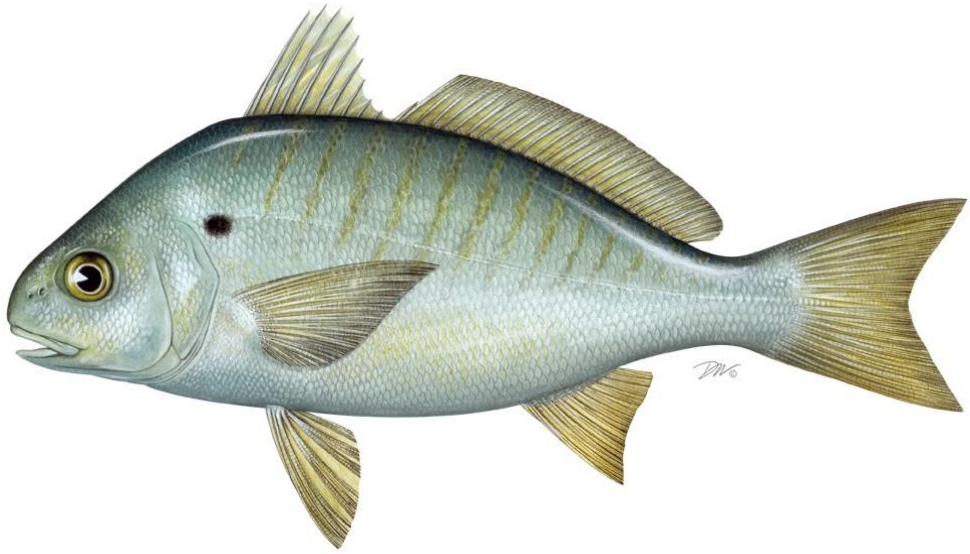
Neither the adult or juvenile composite characteristic index tripped in 2018, with red proportions less than 30% for all of the three terminal years of the adult composite index and two of the three terminal years of the juvenile composite index. The higher annual variability for the different color proportions in the juvenile composite characteristic (compared to the adult composite characteristic) is likely a reflection of annual recruitment variability rather than population trends.

Summary

The harvest composite TLA tripped in 2018 (for the fourth year in a row) while the abundance TLA composite did not trip. The continued declining trend in the commercial and recreational harvests for the Atlantic coast is a concern since the decline has become greater in the last two years. The recently completed Atlantic croaker stock assessment (ASMFC 2017) was not accepted for management use, in part due to the conflicting signals shown by abundance and harvest metrics. The explanation for this discrepancy may lie in differing size and age structures of the different fishery-independent surveys and commercial and recreational landings as well as confounding signals occurring in different regions (mid-Atlantic vs. south Atlantic). Using an age partitioning approach while examining different (and additional) indices on a regional perspective was recommended by the Atlantic croaker Technical Committee for further refinement of the TLA, providing more synchrony between the harvest and landings metrics for adults as well as juveniles. The next section of this report illustrates this point by presenting both an age structured and regional TLA with additional fishery-independent surveys.

2019 Traffic Light Analysis of Spot (*Leiostomus xanthurus)* for the Atlantic States Marine Fisheries Commission Fishery Management Plan Review.

2018 Fishing Year



Plan Review Team

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Mike Schmidtke, Atlantic States Marine Fisheries Commission (Chair)
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Harry Rickabaugh, Maryland Dept. of Natural Resources
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*Prepared analysis and report

Introduction

Spot is managed under the Omnibus Amendment for Spot, Spotted Seatrout, and Spanish Mackerel (2011) and Addendum I (2014). The Omnibus Amendment updates all three species plans with requirements of the Commission's ISFMP Charter. The Benchmark Stock Assessment for spot in 2017 was not recommended for management use due to uncertainty in biomass estimates due to conflicting signals among abundance indices and catch time series, as well as sensitivity of model results to assumptions and model inputs.

Previously, in the absence of a coastwide stock assessment, the South Atlantic Board approved Addendum I to the Spot FMP in 2014. The Addendum establishes use of a Traffic Light Analysis (TLA), similar to that used for Atlantic croaker, to evaluate fisheries trends and develop state-specified management actions (e.g., bag limits, size restrictions, time and area closures, and gear restrictions) when harvest and abundance thresholds are exceeded for two consecutive years. The most recent benchmark stock assessment for spot (ASMFC, 2018) provided more data for further refinement and modification of the existing TLA as recommended by the Spot Plan Review Team (PRT). This report still uses the TLA established by Addendum I, which will be presented to the SAB in August of 2019. The revised TLA will be presented as part of Draft Addendum II, which will be considered by the SAB to be released for public comment in October of 2019.

The TLA is a statistically-robust way to incorporate multiple data sources (both fishery - independent and -dependent) into a single, easily understood metric for management advice. It is often used for data-poor species, or species which are not assessed on a frequent basis. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of indicators on the condition of the fish population (abundance metric) or fishery (harvest metric). For example, as harvest or abundance increase relative to their long-term mean, the proportion of green in a given year will increase and as harvest or abundance decrease, the amount of red in that year becomes more predominant. The TLA improves the management approach as it illustrates long-term trends in the stock and includes specific management recommendations in response to declines in the stock or fishery. Under Addendum I, state-specific management action would be initiated when the proportion of red exceeds specified thresholds (30% or 60%), for both harvest and abundance, over two consecutive years.

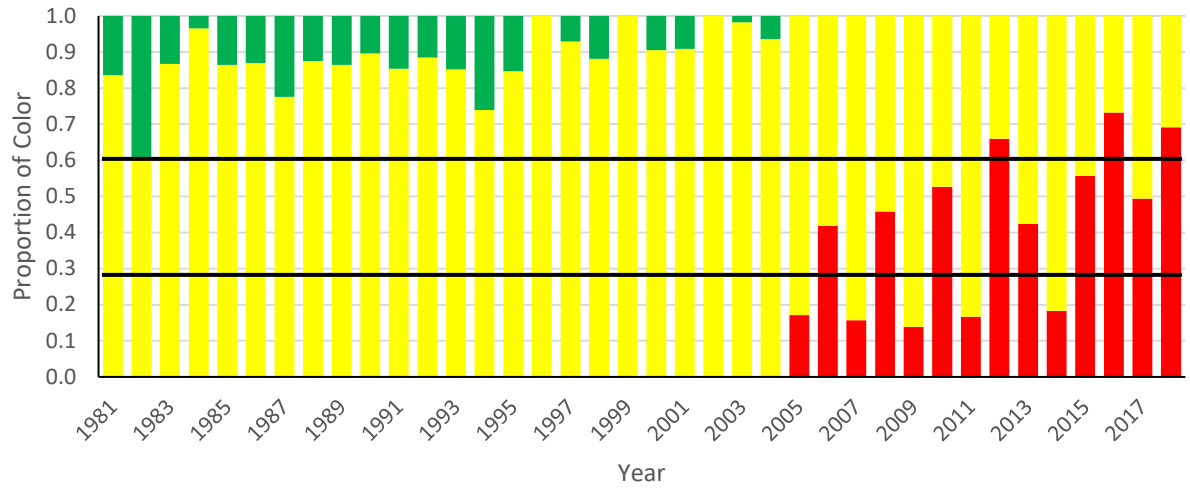
The current management triggers for spot compare annual changes in various indices (e.g. recent landings and survey information) to review trends in the fisheries. The spot Plan Review Team expressed concern that the previous review methodology did not illustrate long-term trends in the stock nor did it include specific management measures to implement in response to declines in the stock or fishery. The indices used for the TLA include both commercial and recreational harvest (fishery dependent) and three fishery independent monitoring surveys that occur in different areas of the Atlantic coast of the United States. The fishery independent surveys include the Northeast Fisheries Science Center (NMFS) fall ground fish trawl survey, the Maryland Department of Natural Resources juvenile striped bass seine survey, and the Southeast Area Monitoring Assessment Program (SEAMAP) trawl survey.

Traffic Light Analysis (Fishery Dependent)

Commercial

- Commercial landings for spot on the Atlantic coast decreased 59.5% in 2018 from 2017. Landings were still well below the long term mean although they were up from the time series low which occurred in 2016. Long term, there is still a declining trend in commercial landings that has been occurring since 2003. Total annual landings have declined 86.7% from 2004 to 2018.
- The TLA for commercial landings had relatively stable proportions of green and yellow throughout the 1980s and 1990s but began declining in the early 2000s as evidenced by increasing proportions of red (Fig. 1). The long term mean for the reference time series (1989-2012) was 5,744,635 pounds per year but the average landings since 2010 have dropped to 2,886,785 pounds, with a total of 878,077 pounds in 2018.
- The TLA commercial index did trip at the 60% level in 2018 and represents the third year since 2012 where this has happened.

Figure 1. Annual TLA color proportions using 1989-2012 reference period for spot from commercial landings for the Atlantic coast of the US.

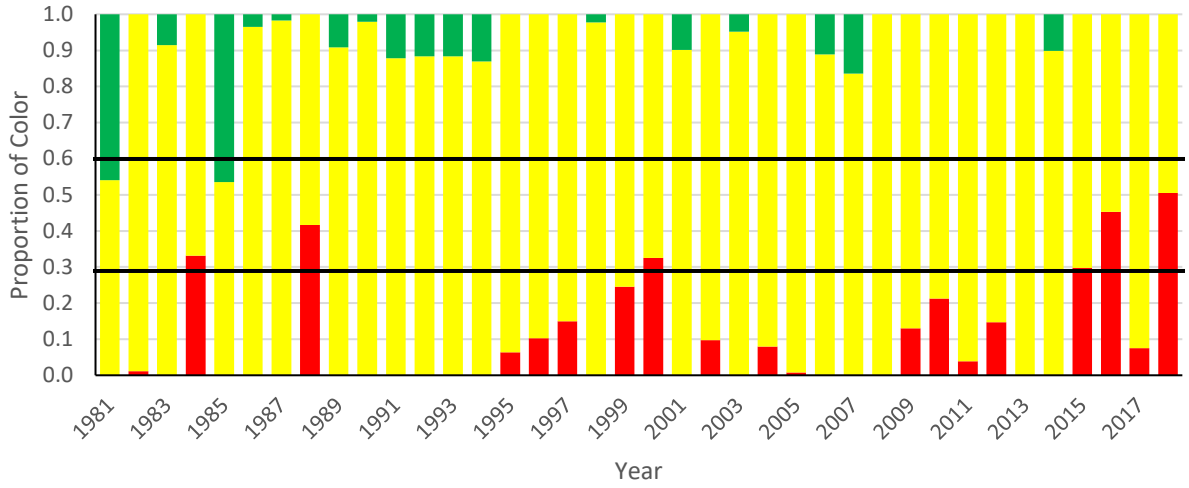


Recreational

- In July, 2018, the Marine Recreational Information Program transitioned from the catch estimates based on effort information from the Coastal Household Telephone Survey (CHTS) to effort information from the mail-based Fishing Effort Survey (FES). FES estimates are used in this and future reports, so recreational estimates and analyses may be different from previous years that used CHTS estimates.

- The recreational harvest for spot on the Atlantic coast decreased 59.7% from 2017 to 2018, with values of 7,636,915 pounds and 3,068,469 pounds, respectively.
- Annual harvest in the recreational fishery has been below the long term mean (LTM) since 2009 (with the exception of one year, 2014) and was still below that threshold in 2018.
- The red proportion of the TLA increased dramatically in 2018 to 50.5%. While the red proportion in 2017 was below the concern threshold, the recreational TLA did not trip in 2018 since it was not above the 30% threshold for both of the previous two years.

Figure 2. Atlantic coast TLA for recreational spot harvest on the Atlantic coast of the United States.

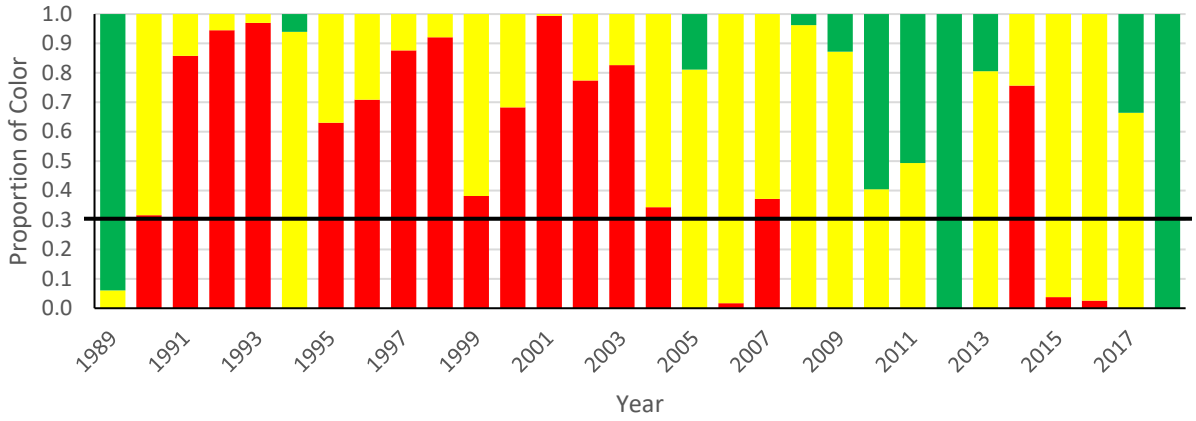


Traffic Light Analysis (Fishery Independent)

NEFSC/NMFS Fall Groundfish Trawl Survey

- The NEFSC/NMFS survey was not carried out in 2017 due to mechanical problems with the RV Bigelow. In the interim, a placeholder index for 2017 was calculated as the mean of 2015-2016 and 2018 (Fig. 3).
- The CPUE for spot in 2018 increased significantly from 2016 and the placeholder value estimated for 2017.
- There was no red in the TLA index for 2018, so this index did not trigger.

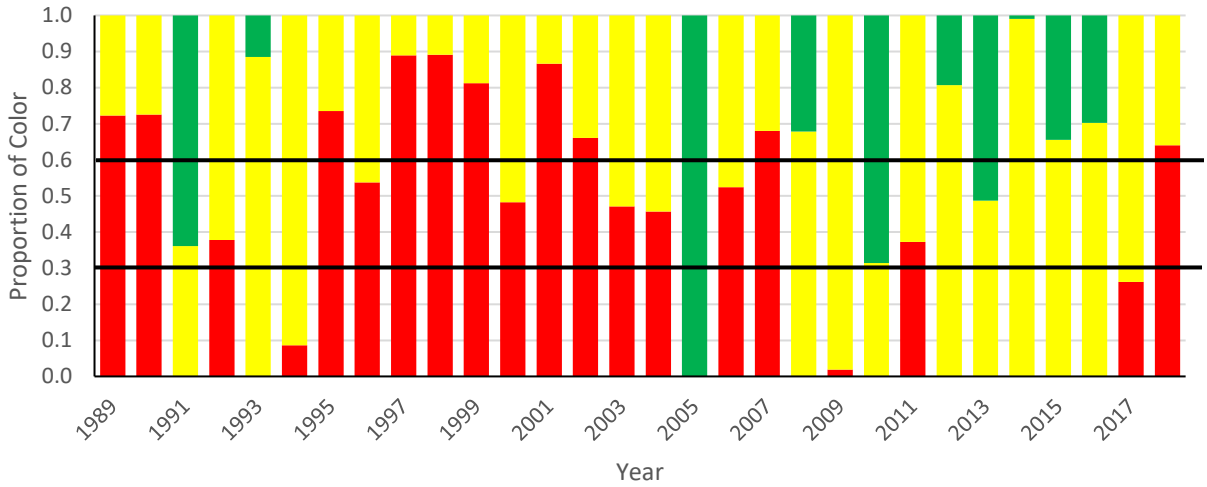
Figure 3. Non-proportioned annual TLA model using 1989-2012 reference time period for Spot from NMFS fall groundfish trawl survey.



SEAMAP Trawl Survey

- The annual CPUE declined 51.2% in 2018 from 2017 and represented two consecutive years below the long term mean (11.3 kg fish per tow).
- The TLA index did trigger in 2018 for the first time since 2007 with a red proportion of 64% (Fig. 4).

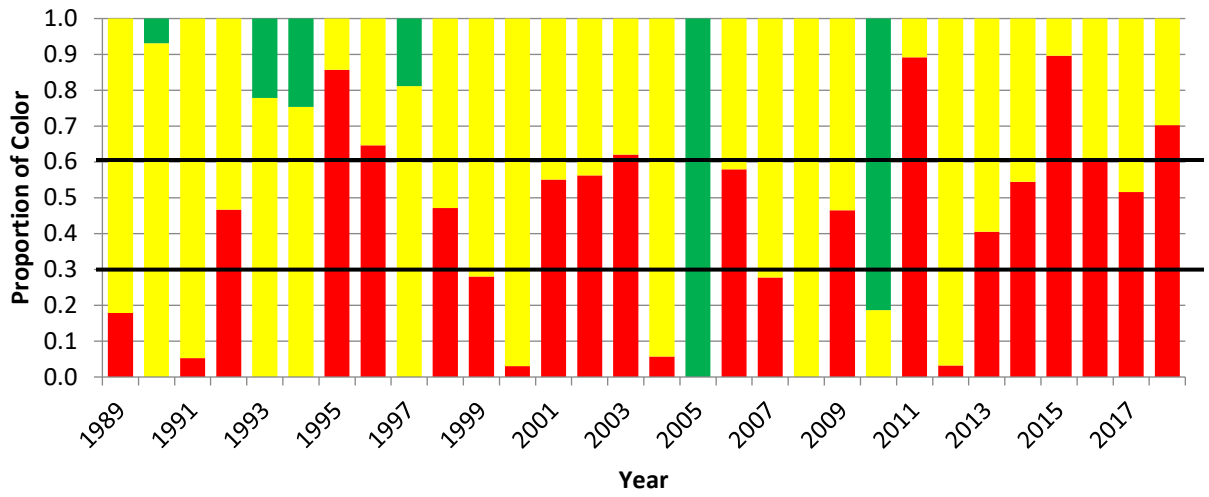
Figure 4. Annual color proportions for spot TLA from the fall SEAMAP survey using a 1989-2012 reference period



Maryland Juvenile Striped Bass Survey

- Since the Maryland survey was the only juvenile index used in the trigger exercise it was used by itself to compare to the other two composite characteristic indices (harvest and abundance).
- The Maryland CPUE declined 41.4% in 2018 from 2017 and remained below the long term mean (0.526 fish per tow) (Fig. 5).
- Mean annual CPUE was below the long term mean for the eighth year in a row, indicating annual recruitment and year-class strength remain poor in the Maryland portion of the Chesapeake Bay.
- The TLA trigger did trip in 2018 for the sixth year in a row with a red proportion of 70.2%.
- The index tripping at both the 30% and 60% levels for 2013-2018 indicates cause for concern as the general decline in this index indicates a decline in spot recruitment in Maryland waters has been occurring.

Figure 5. Annual TLA color proportions for the Maryland seine survey juvenile index using 1989-2012 reference period.



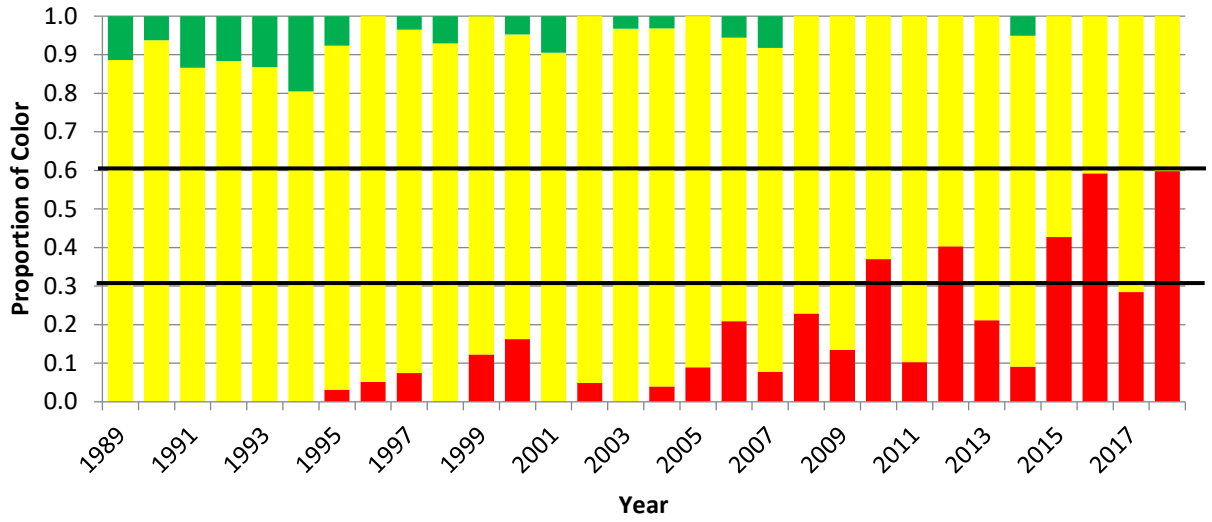
Traffic Light Analysis (Composite Indexes)

Harvest Composite Characteristic Index

- The harvest composite characteristic TLA shows the general decline in landings since 2008, with increasing proportions of red annually (Fig. 6).
- The composite characteristic did trip in 2018 (30% level) but does not trigger a management response because the 2017 proportion red was below 30%.

- The red proportion increased in 2018 from 2017 and approached the 60% threshold. This was likely driven more by the decline in commercial landings rather than the recreational harvest.
- The continued declining trend in spot fishery landings was driven primarily by declining landings in the Mid-Atlantic region where the majority of coastwide landings occur.

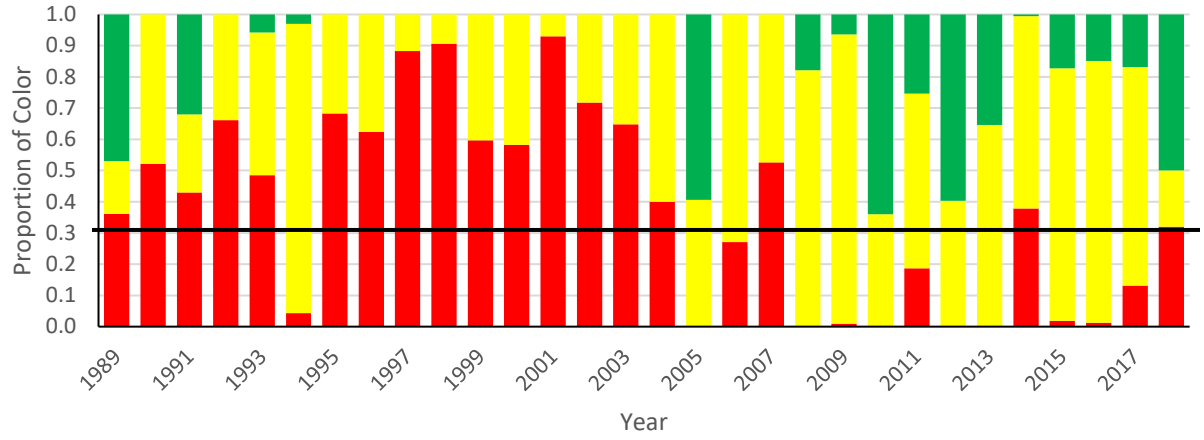
Figure 6. Annual TLA color proportions for harvest composite (commercial and recreational landings) for spot on the Atlantic coast of the US using 1989-2012 reference period.



Abundance Composite Characteristic Index

- The TLA composite characteristic for adult spot (NMFS and SEAMAP surveys) was a bit odd in 2018 in that it showed an increase in both the proportions of red and green (Fig. 7).
- The decline in catch levels in the SEAMAP index (red proportion of 64%) and the increase in the NMFS index (green proportion of 100%) would account for this.
- While the composite characteristic TLA for the abundance indices did have a red proportion greater than 30% from the SEAMAP index, it did not trigger because it represents the first year since 2014 where red values have exceeded the 30% threshold.

Figure 7. Annual TLA for spot for composite characteristic of adult fishery independent surveys (NMFS and SEAMAP) using a 1989-2012 reference period.



Summary

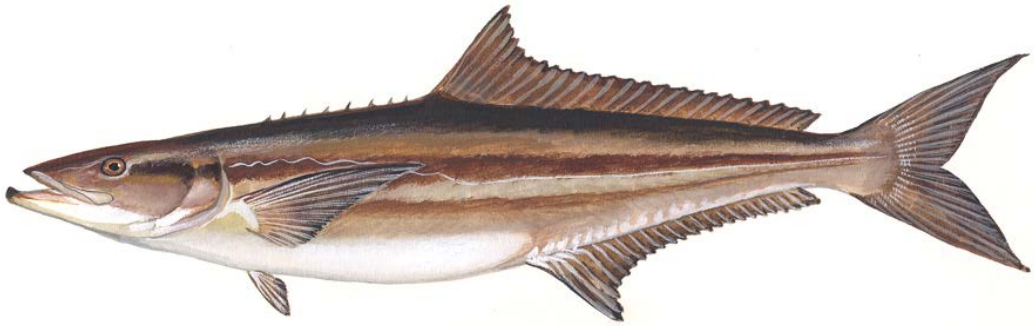
Neither the harvest composite index nor the adult composite index triggered in 2018. However, the TLA characteristic index for juvenile spot did trip in 2018 indicating continued poor recruitment.

The 2017 Spot Stock Assessment utilized age partitioning in the Catch Survey Analysis model (CSA), separating indices into age 0 and age 1+ (pre-recruits and recruits). The PRT suggests considering a similar age partitioning for the TLA as well as a regional approach if it can provide better information on annual changes as well as synchrony between the different indices. These updates will be considered as part of Draft Addendum II.

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

ATLANTIC COBIA (*Rachycentron canadum*)

2018 FISHING YEAR



Cobia Plan Review Team

Dr. Michael Schmidtke, Chair, Atlantic States Marine Fisheries Commission
Angela Giuliano, Maryland Department of Natural Resources
Alex Aspinwall, Virginia Marine Resources Commission
Chris McDonough, South Carolina Department of Natural Resources

Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval: Original FMP – November 2017

Management Areas: The distribution of the Atlantic stock of cobia from Georgia through New York

Active Boards/Committees: South Atlantic State/Federal Fisheries Management Board; Cobia Technical Committee, Plan Development Team, and Plan Review Team; South Atlantic Species Advisory Panel; SEDAR 58 Stock Assessment Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an interstate Fishery Management Plan (FMP) for the Atlantic Migratory Group of cobia (Atlantic cobia) in 2017 (ASMFC, 2017). Prior to the FMP, federal management was through the South Atlantic Fishery Management Council's (SAFMC) Fishery Management Plan for Coastal Migratory Pelagic Resources (CMP FMP), while New York, New Jersey, Delaware, Virginia, North Carolina and South Carolina had regulations for their respective state waters.

The FMP established a complementary management approach between the ASMFC and SAFMC. Under the ASMFC, Atlantic cobia are managed as part of the South Atlantic State/Federal Fisheries Management Board (Board). Through the FMP, regulations for states with a declared interest are now required to reflect several measures established federally through the CMP FMP. These include a 36-inch fork length (or 40 inch total length) recreational minimum size limit, 1 fish per person recreational bag limit, a recreational daily vessel limit not to exceed 6 fish per vessel, a 33-inch fork length (or 37-inch total length) commercial minimum size limit, a commercial possession limit of 2 cobia per person not to exceed 6 cobia per vessel, and a commercial Annual Catch Limit (ACL) of 50,000 pounds. State regulations can be found in Table 1. The FMP also allocates a Recreational Harvest Limit (RHL), derived from the CMP FMP's recreational ACL (620,000 pounds), to non-*de minimis* states, establishing recreational harvest targets. States may set their own seasons and vessel limits (while adhering to the coastwide maximum vessel limit of 6 fish) to achieve their targets. Adherence to the targets is evaluated based on a 3-year average of landings. If a state's 3-year recreational landings average exceeds its target, that state would be required to reduce their season or vessel limit to achieve the target, but the target would not change (i.e. no payback). 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:

1) Provide a flexible management system to address future changes in resource abundance, scientific information, and fishing patterns among user groups or areas.
2) Promote cooperative collection of biological, economic, and social data required to effectively monitor and assess the status of the cobia resource and evaluate management efforts.
3) Manage the cobia fishery to protect both young individuals and established breeding stock.
4) Develop research priorities that will further refine the cobia management program to maximize the biological, social, and economic benefits derived from the cobia population.

During the development of the FMP, the SAFMC initiated Regulatory Amendment 31 to the CMP FMP to remove Atlantic cobia from the CMP FMP (SAFMC, 2018), which would result in management solely through the ASMFC. In May, 2018, the Board initiated Amendment 1 to the FMP to reflect the (at the time, impending) removal of Atlantic cobia from the CMP FMP and establish recommendations for measures in federal waters. Regulatory Amendment 31 was approved and became effective in March, 2019. Draft Amendment 1 has been released for Public Comment and will be considered for final approval at the Board's Summer Meeting in August, 2019.

II. Status of the Stock

SEDAR 28

Atlantic cobia were last assessed by Southeast Data, Assessment, and Review (SEDAR) 28 in 2013. The SEDAR 28 stock assessment determined that the stock is not overfished nor experiencing overfishing (Figures 1 and 2). The primary model used in SEDAR 28 was the Beaufort Assessment Model (BAM), a forward-projecting statistical catch-at-age model (SEDAR, 2013). This model included data from two fishery-dependent surveys and the recreational and commercial fisheries. Results of this assessment are summarized in the following sections.

Stock Structure

SEDAR 28 established the stock boundary between Atlantic and Gulf of Mexico cobia at the FL/GA border, based on tagging and genetic information and applicability to management. Therefore, the stock boundary for the assessment was also established at the FL/GA line. The Atlantic stock extends northward to New York.

Spawning Stock Biomass

Estimated biomass at age showed a slight truncation of the oldest ages compared to the 1980s, but in general there was little obvious change in age structure over time. Total biomass and spawning biomass showed similar trends - generally higher biomass in the 1990s and early 2000s compared to the 1980s and a decline in more recent years. The stock was estimated to be at its lowest point in the late 1980s and was estimated to be at a comparable level in the terminal year.

Estimated time series of stock status (Spawning Stock Biomass [SSB]/ Minimum Stock Size Threshold [MSST], SSB/SSB producing Maximum Sustainable Yield [SSBMSY]) showed a general decline through the 1980s, an increase in the late 1980s and early 1990s, followed by a decline in more recent years. The increase in stock status in the 1990s may have been driven by several strong year classes and perhaps reinforced by the 2-fish per person bag limit implemented in 1990. Base run estimates of spawning biomass have remained above MSST throughout the time series. Current stock status from the base run was estimated to be SSB2011/MSST = 1.75, indicating that the stock is not overfished (Figure 1).

Fishing Mortality

The estimated time series of fishing mortality rates (F) from the BAM was highly variable, with F for fully selected ages varying greater than four-fold since the 1980s. There was a drop in F in the 1990s following the implementation of the 2-fish per person bag limit, but there was a notable increase

since the early 2000s. Since 2003, estimates of F averaged about 0.30. The recreational fleet has been the largest contributor to total F throughout the time series.

The estimated time series of F divided by F producing Maximum Sustainable Yield (FMSY) from the base run suggested that overfishing has not been occurring over the course of the assessment period but with considerable uncertainty, particularly since the mid-2000s. Current fishery status, with current F represented by the geometric mean from 2009-2011, is estimated by the base run to be F2009-2011/FMSY = 0.599, but with much uncertainty in that estimate. As current F is less than FMSY, overfishing is not occurring (Figure 2).

SEDAR 58

Another stock assessment, SEDAR 58, is currently ongoing and scheduled for completion by the beginning of 2020. A Stock Identification Workshop was conducted in 2018 to prepare for this assessment. This Workshop maintained the FL/GA border as the stock boundary, because this border is within a transition zone that occurs from the southern boundary of Brevard County, FL, to Brunswick, GA (SEDAR, 2018). Data that would categorize cobia within the transition zone as belonging to either of the two defined stocks (Atlantic or Gulf) are not available.

III. Status of the Fishery

This report includes updated recreational estimates from the Marine Recreational Information Program's transition to the mail-based Fishing Effort Survey (FES) on July 1, 2018. Figure 3 shows coastwide recreational landings including estimates using both the previous Coastal Household Telephone Survey (CHTS) and FES calibration for comparison, but since management currently uses recreational limits and targets based on the CHTS data, other figures, tables, and text will only be based on this estimation.

Total Atlantic cobia landings are estimated at 1.3 million pounds in 2018, a 129% increase from total harvest in 2017 (Figure 4, Tables 2 and 3). 2018 harvest is 57% above the previous ten-year (2008-2017) average. The commercial and recreational fisheries harvested 4% and 96% of the 2018 total, respectively.

Commercial landings of Atlantic cobia in 2018 span from Rhode Island through Georgia (Table 2). Coastwide commercial landings show an increasing trend since low harvests in the 1970s and early 1980s, but comprise a small portion of the total harvest due, in part, to a current 8% allocation of the total annual catch limit (Figure 4). Coastwide cobia commercial landings in 2018 were estimated at 50,314 pounds, a 4% decrease from those of 2017 and over the commercial ACL of 50,000 pounds. The commercial fishery was projected to meet the ACL and was closed on September 5, 2018, for the remainder of the year. Virginia (51%) and North Carolina (41%) harvested the majority of the commercial landings (Table 2).

Recreational harvest of Atlantic cobia peaked by weight in 2015 at 1.7 million pounds (Figure 4, Table 3) and by numbers of fish in 2018 at 45,442 fish (Figure 5, Table 4). Recreational harvests have fluctuated widely throughout the time series, often through rapid increases and declines. Average

harvests for the time series are 526,508 pounds and 18,517 fish. This fishery has grown noticeably over the time series, with average harvests over the last 10 years of 835,317 pounds and 27,340 fish. The 2018 recreational harvest was 1.2 million pounds or 45,442 fish, the third- and first-highest years on record for those respective metrics. Virginia (67% of pounds, 68% of fish) and North Carolina (28% of numbers, 27% of fish) harvested the majority of recreational landings by pounds and number of fish. Average weight (recreational harvest in pounds divided by recreational harvest in numbers) in 2018 was 27 pounds per fish, a 22% decrease from 2017.

Recreational releases of live fish have generally increased throughout the time series (Figure 5, Table 5). In 2018, 149,520 recreationally-caught fish were released, the highest year on record and 47% greater than 2017 (the second-highest year on record). Increased recreational releases over the last four years are likely attributable to a combination of management actions, including establishment of an ACL, closures of the recreational fishery in federal waters, and newly-introduced state regulations.

In 2018, implementation of the ASMFC's complementary FMP began. The FMP allocates a 613,800 pound recreational harvest limit (RHL) as recreational harvest targets to Virginia, North Carolina, South Carolina, and Georgia (Table 6), and requires these states to enact seasons and vessel limits that would achieve these targets, on average. State harvests are evaluated against targets as 3-year averages, with the next evaluation of these averages scheduled to include years from 2018-2020. In 2018, Virginia exceeded their target by 588,424 pounds (241%) and North Carolina exceeded their target by 104,618 pounds (44%). Coastwide harvest exceeded the recreational ACL previously used from the CMP FMP by 616,016 pounds (99%).

IV. Status of Assessment Advice

Current stock status information comes from SEDAR 28 (SEDAR, 2013), which determined the stock is not overfished and overfishing is not occurring. Results of this assessment were approved for management use by the SAFMC and, as such, have been incorporated into the ASMFC's complementary FMP.

The stock assessment could be improved by developing a fishery-independent sampling program for abundance of cobia and other coastal migratory pelagic species. Currently used fishery-dependent indices cause notable uncertainty in part due to the lack of an effective sampling methodology. The assessment could also benefit from improved characterization of age, reproductive, genetic, and migratory characteristics, tag-based information on natural mortality, and more precise recreational catch estimates.

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

- Maryland DNR – Commercial pound net survey in lower Chesapeake Bay and Potomac River from May through September. 5 fish since 1993 (2018: 1 fish, 734 mm total length (TL)).
- Virginia MRC – Recreational cobia permit that requires reporting of cobia trips and catch to renew harvest in the following year also collects weight and length information.
- North Carolina DMF – Commercial fishery-dependent sampling, 11 lengths in 2018. MRIP length sampling, 60 lengths in 2018. Recreational Carcass Collection Program, 39 lengths in 2018.
- South Carolina DNR – In 1993, the SCDNR initiated a mandatory trip-level logbook reporting system for all charter vessels to collect basic catch and effort data. The charter boat logbook reports include: date, number of fishermen, hours fished, fishing locale (inshore, 0-3 miles, and > 3 miles offshore), fishing location (based on a 10 x 10 mile grid map), fishing method, target species, species caught, catch (number landed versus number released by fish species), and estimated landed pounds per vessel per trip. There were 767 cobia reported in 2018.
- Georgia CRD – Collected age, length, and sex data through the Marine Sportfish Carcass Recovery Project (2018: 0 cobia).
- 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 (1988-2018), total of 21 cobia caught (2018: 1 fish, 40.6 lb).
- Delaware DFW – No cobia caught in either finfish trawl survey (16ft or 30ft) or any other fishery-independent sampling.
- Maryland DNR –Coastal Bays Surveys since 1972; 3 cobia caught in beach seine and 5 in otter trawl for entire time series (0 cobia in either gear in 2018).
- South Carolina DNR – Estuarine trammel net survey (1994-2018) has caught a total of 17 cobia. SEAMAP trawl survey (1989-2018) has caught a total of 354 cobia, with 1.6% positive tows.
- Georgia CRD – Marine Sportfish Population Health Survey, includes summer gillnet survey and fall trammel net survey, 1 cobia caught in 2018.

VI. Status of Management Measures and Issues

Fishery Management Plan

The FMP requires all non-*de minimis* states to have established the following measures:

Recreational Measures

- Minimum Size Limit: 36 in fork length or 40 in total length
- Bag Limit: 1 fish per person
- Vessel Limit: No more than 6 fish per vessel

Commercial Measures

Minimum Size Limit: 33 in fork length or 37 in total length

Possession Limit: 2 cobia per person, not to exceed 6 cobia per vessel

The FMP also requires adherence to a 50,000 pound coastwide, commercial ACL and any associated closures enacted by NOAA Fisheries.

Finally, the FMP requires adherence to state harvest targets, allocated to non-*de minimis* states from a RHL. The RHL is derived from the CMP FMP's former recreational ACL. One percent of the recreational ACL is designated to account for harvest in *de minimis* states.

De Minimis
The FMP allows states to request *de minimis* status if their recreational harvests (in pounds) in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period. If a state qualifies for *de minimis*, the state may choose to match all FMP-related recreational management measures (including seasons and vessel limits) implemented by an adjacent non-*de minimis* state (or the nearest non-*de minimis* state if none are adjacent) or the state may choose to limit its recreational fishery to 1 fish per vessel per trip with a minimum size of 29 inches fork length (or a total length equivalent) with no seasonal restrictions.

De Minimis Requests
New Jersey, Delaware, and Maryland requested *de minimis* status through the annual reporting process. All of these states qualify for *de minimis* status.

VII. Implementation of FMP Compliance Requirements for 2018

Virginia reported 3 issued citations for undersized cobia, 1 for an altered (length cannot be determined) cobia, and 1 for possession of cobia without a permit.

The PRT finds that all states have implemented the requirements of the Fishery Management Plan.

VIII. Recommendations of the Plan Review Team

Management
The PRT recommends that the Board approve the 2019 FMP Review, state compliance, and *de minimis* requests from New Jersey, Delaware, and Maryland.

Research

The following research recommendations are ordered, within each category, from highest to lowest recommended priority.

<u>Biological</u>

1) Obtain more precise and timely estimates of harvest from the cobia recreational fishery.

2) Investigate release mortality and fishing mortality within the commercial and recreational fisheries along the US Atlantic coast.

3) Continue to collect and analyze current life history data from fishery independent and dependent programs, including full size, age, maturity, histology workups and information on spawning season timing and duration. Any additional data that can be collected on any life stages of cobia would be highly beneficial.

4) Increase spatial and temporal coverage of age samples collected regularly in fishery dependent and independent sources. Prioritize collection of age data from fishery dependent and independent sources in all states.

5) Collect genetic material to continue to assess the stock identification and any Distinct Population Segments that may exist within the management unit relative to recommendations made by the SEDAR 58 Stock ID Process.

6) 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.

7) Conduct studies to estimate fecundity-at-age coastwide and to estimate batch fecundity.

8) Obtain better estimates of bycatch and mortality of cobia in other fisheries, especially juvenile fish.

9) Obtain estimates of selectivity-at-age for cobia through observer programs or tagging studies.

10) Define, develop, and monitor adult and juvenile abundance estimates through the expansion of current or development of new fishery independent surveys.

Social

1) Using social impact analysis approaches such as updating applicable recreational and commercial fisheries community profiles and measures of social vulnerability (See Jepson & Colburn, 2013), evaluate the local and regional dependency on cobia resources managed by the Commission.

Economic

1) Obtain better data (e.g. more comprehensive and timely) to estimate the annual economic impacts, net benefits, and economic contributions of recreational and commercial Atlantic cobia fishing on coastal communities and regions.

2) Obtain cost and expenditure data for recreational fishing trips targeting cobia by fishing mode, for different states, and for anglers returning to private sites, who would not be sampled by the MRIP.

3) Estimate willingness-to-pay associated with recreational cobia angling.

Habitat

1) Expand existing fishery independent surveys in time and space to better define and cover cobia habitats.

2) Conduct otolith microchemistry studies to identify regional recruitment contributions.

3) Conduct new and expand existing satellite tagging programs to help identify spawning and juvenile habitat use and regional recruitment sources.

IX. References

ASMFC. 2017. Interstate Fishery Management Plan for Atlantic Migratory Group Cobia. ASMFC, Arlington, VA. 85 p.

SAFMC. 2018. Amendment 31 to the Fishery Management Plan for Coastal Migratory Pelagics Resources in the Gulf of Mexico and Atlantic Region. NOAA Award # FNA10NMF441001. Charleston, SC. 209 pp.

X. Figures

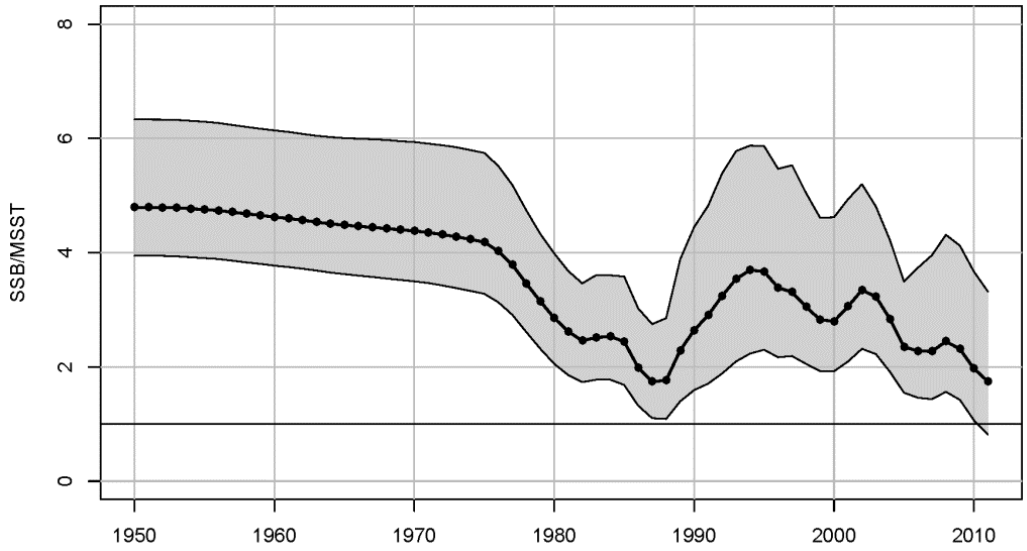


Figure 1. Estimated time series of Spawning Stock Biomass (SSB) relative to the Minimum Stock Size Threshold (MSST) (SEDAR, 2013).

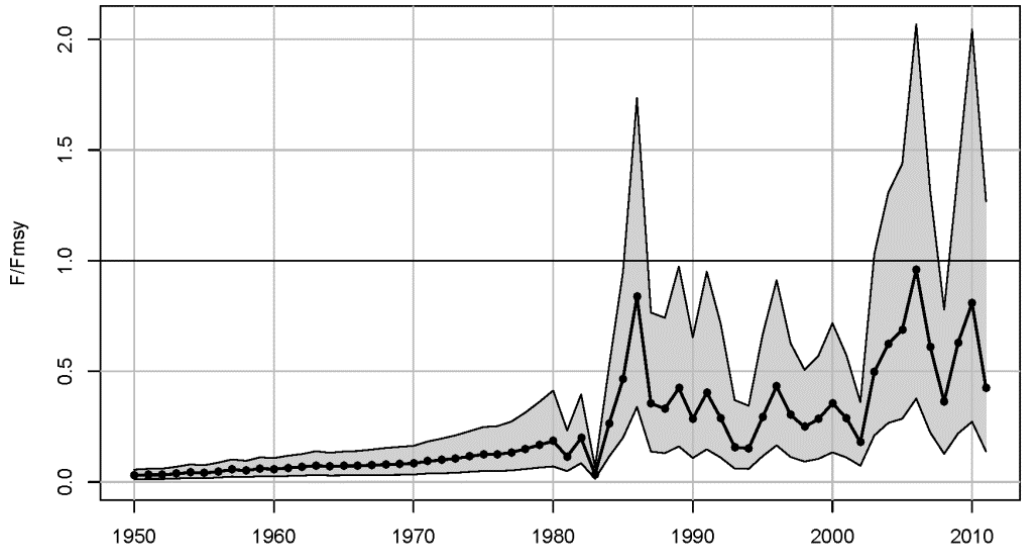


Figure 2. Estimated time series of Fishing Mortality (F) relative to F at Maximum Sustainable Yield (F_{MSY}) (SEDAR, 2013).

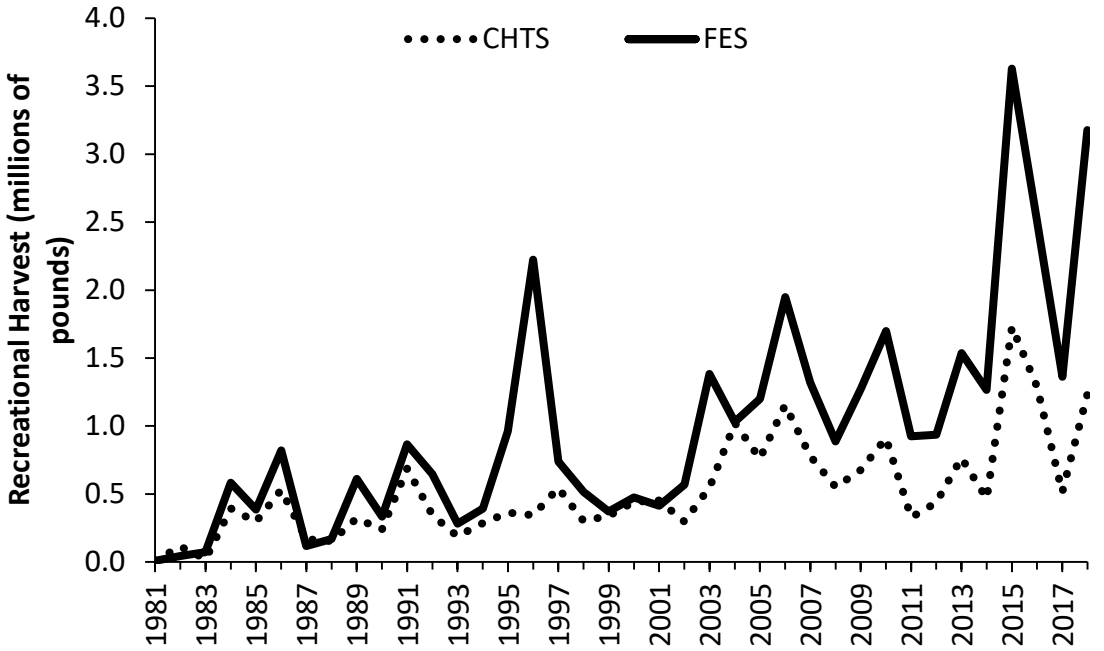


Figure 3. Cobia recreational harvest estimated using the Coastal Household Telephone Survey (CHTS) and the mail-based Fishing Effort Survey (FES). (Source: personal communication with NOAA Fisheries, Fisheries Statistics Division. [05/2019])

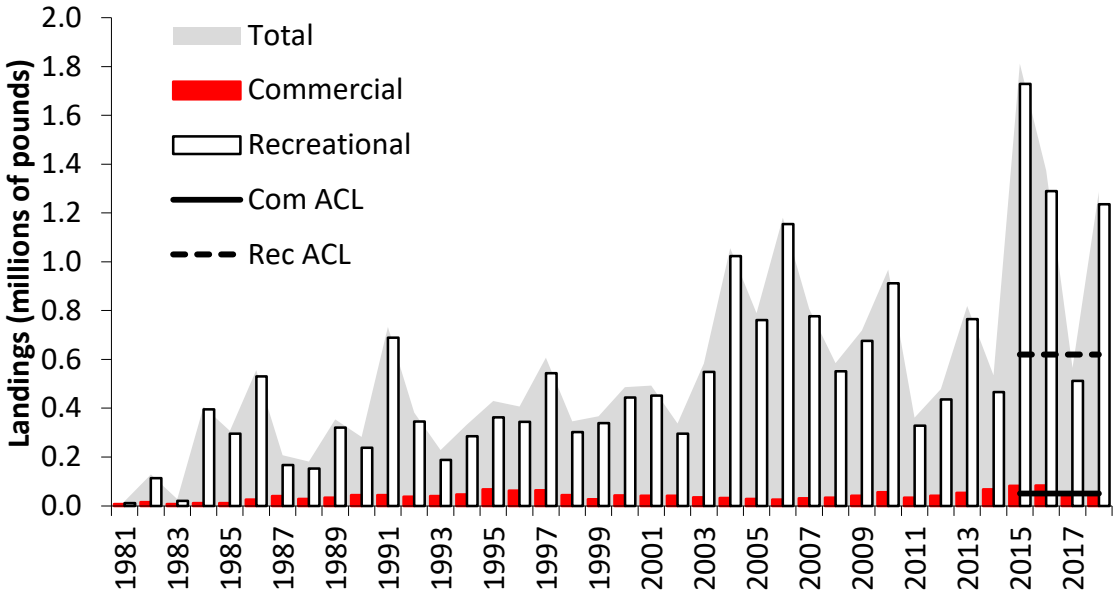


Figure 4. Commercial and recreational landings (pounds) of Atlantic cobia. Recreational data not available prior to 1981. See Tables 2 and 3 for values and data sources.

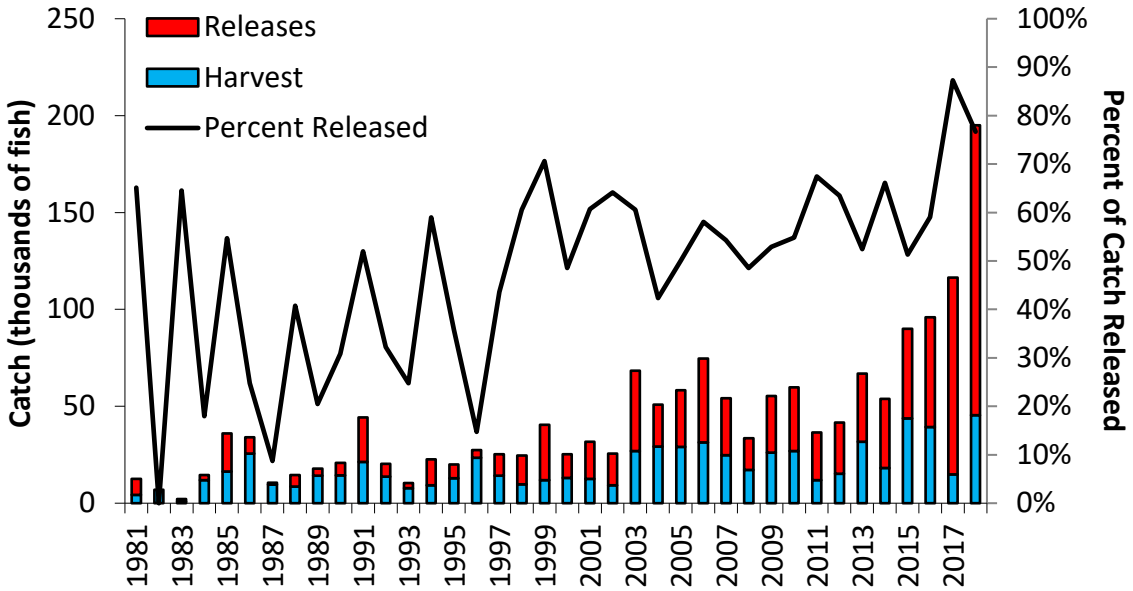


Figure 5. Recreational catch (harvest and live releases) of Atlantic cobia (numbers) and the proportion of catch that is released. See Tables 4 and 5 for values and data sources.

XI. Tables

Table 1. Atlantic cobia regulations for 2018.

State	Recreational Measures	Commercial Measures
NJ	*De minimis*; same as Virginia	Coastwide Possession Limit: 2 fish per person Minimum Size: 33 in fork length or 37 in total length Vessel Limit: 6 fish If commercial fishing in federal waters is closed, commercial fishing in state waters is also closed. Deviations -Virginia possession limit is per licensee rather than per person -No commercial harvest in South Carolina state waters -GA possession limit is 1 fish per person and minimum size is 36 in fork length
DE	*De minimis*; management pending	
MD	*De minimis*; same as Virginia	
PRFC	*De minimis*; same as Virginia	
VA	Bag Limit: 1 fish per person Minimum Size: 40 in total length Vessel Limit: 3 fish Season: June 1-September 30	
NC	Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limits/Seasons: Private May 1-31: 2 fish June 1-Dec 31: 1 fish For-Hire May 1-Dec 31: 4 fish	
SC	Bag Limit: 1 fish per person Minimum Size: 36 in fork length or 40 in total length Vessel Limits: Southern Cobia Management Zone from June 1-April 30: 3 fish Other areas: 6 fish Season: Southern Cobia Management Zone: June 1-April 30 Other Areas: Open year-round -If recreational fishing in federal waters is closed, recreational fishing in all SC state waters is also closed.	
GA	Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limit: 6 fish Season: March 1-October 31	
For all instances when a bag or possession limit is not equal to the vessel limit, the more restrictive rule applies.		

Table 2. Commercial landings (pounds) of Atlantic cobia by state, 1999-2018. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with Atlantic Coastal Cooperative Statistics Program [ACCSP], Arlington, VA [07/16/2019])

Year	N of NJ	NJ	DE	MD	VA	NC	SC	GA	Total
1999	46	1,432		C	5,808	15,491	C	C	27,501
2000	101	1,762		C	7,525	28,754	2,974	C	42,605
2001	475	683		C	C	24,718	C	C	40,900
2002	70	2,086		C	11,445	21,058	5,007	C	41,012
2003	282	621	C	C	7,387	21,313	4,746	C	35,192
2004	758	576		211	6,143	20,162	4,014	705	32,569
2005	C	329		C	6,084	17,886	3,773	C	28,829
2006		C		48	2,705	20,270	2,405	C	25,428
2007	137	1,589		C	5,928	19,005	3,408	245	30,312
2008	C	C		C	6,755	22,047	3,016	C	33,096
2009	134	1,134		196	5,980	31,898	2,078	C	41,900
2010	C	270		C	8,504	43,715	2,499	C	55,755
2011	563	C		C	8,500	19,924	4,019	C	33,394
2012	369	699		C	5,382	31,972	3,359	C	41,781
2013	1,317	885	C	C	10,900	35,456	3,829	C	53,177
2014	311	359		C	21,255	41,798	3,492	C	68,076
2015	235	212		C	25,352	52,684	2,487	C	82,117
2016	297	282	C	C	29,459	48,244	4,064	C	83,583
2017	196	C	C	C	26,748	16,890	4,261	C	52,377
2018	678	707		C	25,713	20,629	2,587	C	50,314

C: confidential landings.

Table 3. Recreational harvest (pounds) of Atlantic cobia by state, 1999-2018. Values shown are Coastal Household (CHTS)-calibrated estimates. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with ACCSP and NOAA Fisheries, Fisheries Statistics Division. [07/16/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	Total
1999			6,787	101,308	47,477	178,753	5,192	339,517
2000				324,562	118,349	763		443,674
2001				367,003	74,757		10,074	451,834
2002				75,489	209,043	10,691	1,172	296,395
2003			0	37,213	84,773	425,939	342	548,266
2004				35,189	294,042	649,803	44,045	1,023,079
2005		818		516,764	239,195	3,130	774	760,680
2006	17,035			898,542	184,300	53,634	1,733	1,155,244
2007				352,071	106,213	271,431	46,729	776,444
2008				116,420	82,566	32,497	320,174	551,657
2009				445,993	166,195	62,332	2,009	676,530
2010			1,069	254,414	498,581	67,946	89,840	911,850
2011				107,424	145,796		74,651	327,871
2012	6,796			26,537	104,106	201,223	97,766	436,427
2013				224,442	506,067	9,873	25,183	765,565
2014				173,772	247,386	26,439	19,079	466,677
2015				882,022	695,842	124,933	26,499	1,729,296
2016			193	915,151	298,090	76,754		1,290,187
2017				252,683	259,737		328	512,748
2018	0	7,289	4,647	832,716	340,934	44,350	6,081	1,236,016

Table 4. Recreational harvest (numbers) of Atlantic cobia by state, 1999-2018. Values shown are Coastal Household Telephone Survey (CHTS)-calibrated estimates. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with ACCSP and NOAA Fisheries, Fisheries Statistics Division. [07/16/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	Total
1999			456	5,352	1,355	4,533	176	11,872
2000				10,224	2,773	31		13,028
2001				9,370	2,700		430	12,500
2002				3,405	5,412	323	47	9,187
2003			1,119	1,923	4,271	19,644	15	26,972
2004				1,161	9,363	17,046	1,696	29,266
2005		44		17,573	11,381	59	44	29,101
2006	822			22,352	4,098	3,931	105	31,308
2007				9,802	3,222	9,456	2,296	24,776
2008				5,069	2,136	1,426	8,592	17,223
2009				16,831	5,754	3,419	71	26,075
2010			38	7,056	15,125	2,102	2,637	26,958
2011				4,119	4,478		3,304	11,901
2012	2,055			1,051	2,050	6,835	3,185	15,176
2013				10,735	19,224	634	1,189	31,782
2014				6,490	9,804	1,137	792	18,223
2015				21,173	16,166	4,182	2,282	43,803
2016			35	27,382	9,293	2,541		39,251
2017				7,469	7,308		16	14,793
2018	0	281	206	30,720	12,459	1,543	233	45,442

Table 5. Recreational live releases (numbers) of Atlantic cobia by state, 1999-2018. Values shown are Coastal Household Telephone Survey (CHTS)-calibrated estimates. (Sources: 2019 state compliance reports for 2018 fishing year; for years prior to 2018, personal communication with ACCSP and NOAA Fisheries, Fisheries Statistics Division. [07/16/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	Total
1999				15,993	6,328	6,233		28,554
2000				7,908	4,249	125	27	12,309
2001				10,448	8,836			19,284
2002				10,450	4,930	1,067		16,447
2003			3,336	14,931	8,720	13,888	514	41,389
2004	40			5,438	5,182	10,178	678	21,516
2005				16,548	9,660	2,993		29,201
2006				22,761	8,389	12,226		43,376
2007				3,353	7,804	18,263	17	29,437
2008	58			3,486	8,008	2,030	2,649	16,231
2009				12,721	16,527	47		29,295
2010	3,032			8,919	19,180	1,580	44	32,755
2011				9,443	12,282	606	2,304	24,635
2012	169		0	8,516	13,917	3,572	195	26,369
2013				16,498	14,638	3,110	841	35,087
2014				15,326	10,530	9,678		35,534
2015	170			25,412	17,409	3,124	89	46,204
2016			515	33,490	14,707	7,371	565	56,648
2017				44,023	51,142	3,775	2,613	101,553
2018	2,699	0	5,833	91,974	28,549	16,811	3,652	149,520

Table 6. State recreational harvest targets, 2018 recreational harvests (pounds; CHTS), and 3-year averages for the next evaluation of non-*de minimis* states. (Source: see Table 3)

State	VA	NC	SC	GA
Harvest Target (pounds)	244,292	236,313	74,885	58,311
2018 Harvest	832,716	340,934	44,350	6,081
2019 Harvest				
2020 Harvest				
Average	832,716	340,934	44,350	6,081

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

ATLANTIC CROAKER
(Micropogonias undulatus)

2018 FISHING YEAR

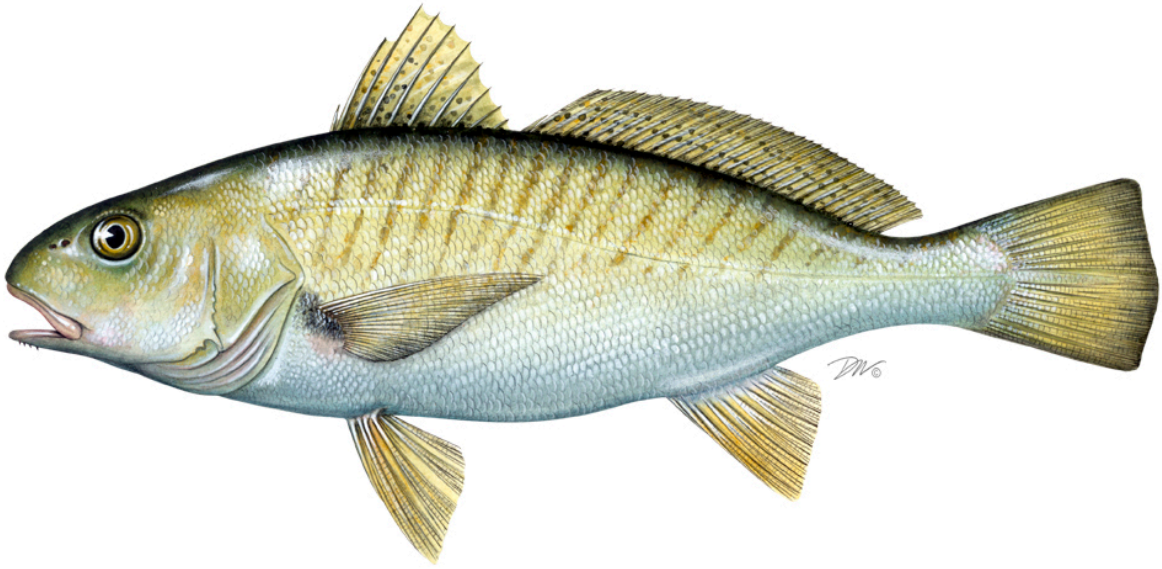


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Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval: Original FMP – October 1987

Amendments: Amendment 1 – November 2005 (implemented January 2006)
Addendum I – March 2011
Addendum II – August 2014

Management Areas: The Atlantic coast distribution of the resource from New Jersey through Florida

Active Boards/Committees: South Atlantic State/Federal Fisheries Management Board; Atlantic Croaker Technical Committee, Stock Assessment Subcommittee, and Plan Review Team; South Atlantic Species Advisory Panel

The Fishery Management Plan (FMP) for Atlantic Croaker was adopted in 1987 and included the states from Maryland through Florida (ASMFC 1987). In 2004, the South Atlantic State/Federal Fisheries Management Board (Board) found the recommendations in the FMP to be vague, and recommended that an amendment be prepared to define management measures necessary to achieve the goals of the FMP. The Interstate Fisheries Management Program Policy Board also adopted the finding that the original FMP did not contain any management measures that states were required to implement.

In 2002, the Board directed the Atlantic Croaker Technical Committee to conduct the first coastwide stock assessment of the species to prepare for developing an amendment. The Atlantic Croaker Stock Assessment Subcommittee developed a stock assessment in 2003, which was approved by a Southeast Data Assessment Review (SEDAR) panel for use in management in June 2004 (ASMFC 2005a). The Board quickly initiated development of an amendment and, in November 2005, approved Amendment 1 to the Atlantic Croaker FMP (ASMFC 2005b). The amendment was fully implemented by January 1, 2006.

The goal of Amendment 1 is to utilize interstate management to perpetuate the self-sustainable Atlantic croaker resource throughout its range and generate the greatest economic and social benefits from its commercial and recreational harvest and utilization over time. Amendment 1 contains four objectives:

1) Manage the fishing mortality rate for Atlantic croaker to provide adequate spawning potential to sustain long-term abundance of the Atlantic croaker population.
2) Manage the Atlantic croaker stock to maintain the spawning stock biomass above the target biomass levels and restrict fishing mortality to rates below the threshold.
3) Develop a management program for restoring and maintaining essential Atlantic croaker habitat.
4) Develop research priorities that will further refine the Atlantic croaker management program to maximize the biological, social, and economic benefits derived from the Atlantic croaker population.

Amendment 1 expanded the management area to include the states from New Jersey through Florida. Consistent with the stock assessment completed in 2004, the amendment defined two Atlantic coast management regions: the south-Atlantic region, from Florida through South Carolina; and the mid-Atlantic region, from North Carolina through New Jersey.

Amendment 1 established biological reference points (BRPs) to define an overfished and overfishing stock status for the mid-Atlantic region only. Reliable stock estimates and BRPs for the South Atlantic region could not be developed during the 2004 stock assessment due to a lack of data. The BRPs were based on maximum sustainable yield (MSY), and included threshold and target levels of fishing mortality (F) and spawning stock biomass (SSB): F threshold = F_{MSY} (estimated to be 0.39); F target = 0.75 X F_{MSY} (estimated to be 0.29); SSB threshold = 0.7 X SSB_{MSY} (estimated to be 44.65 million pounds); and SSB target = SSB_{MSY} (estimated to be 63.78 million pounds). An SSB estimate below the SSB threshold resulted is an overfished status determination, and an F estimate above the F threshold resulted is an overfishing status determination. The Amendment established that the Board would take action, including a stock rebuilding schedule if necessary, should the BRPs indicate the stock is overfished or overfishing is occurring.

Amendment 1 did not require any specific measures restricting recreational or commercial harvest of Atlantic croaker. States with more conservative measures were encouraged to maintain those regulations (Table 1). The Board was able to revise Amendment 1 through adaptive management, including any regulatory and/or monitoring requirements in subsequent addenda, along with procedures for implementing alternative management programs via conservation equivalency.

The Board initiated Addendum I to Amendment I at its August 2010 meeting, following the updated stock assessment, in order to address the proposed reference points and management unit. The stock assessment evaluated the stock as a coastwide unit, rather than the two management units established within Amendment I. In approving Addendum I, the Board endorsed consolidating the stock into one management unit, as proposed by the stock assessment. In addition, Addendum I established a procedure, similar to other species, by which the Board may approve peer-reviewed BRPs without a full administrative process, such as an amendment or addendum.

In August 2014, the Board approved Addendum II to the Atlantic Croaker FMP. The Addendum established the Traffic Light Approach (TLA) as the new precautionary management framework to evaluate fishery trends and develop management actions. The TLA was originally developed as a management tool for data poor fisheries. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of population indicators. When a population characteristic improves, the proportion of green in the given year increases. Harvest and abundance thresholds of 30% and 60% were established in Addendum II, representing moderate and significant concern for the fishery. If thresholds for both population characteristics achieve or exceed a threshold for a three year period, then management action is enacted.

The TLA framework replaces the management triggers stipulated in Addendum I, which dictated that action should be taken if recreational and commercial landings dropped below 70% of the previous two year average. Those triggers were limited in their ability to illustrate long-term declines or increases in stock abundance. In contrast, the TLA approach is capable of better illustrating trends in the fishery through changes in the proportion of green, yellow, and red coloring. A 2018 TC report recommended several updates to the current TLA approach (ASMFC 2018). The Board has initiated an addendum to incorporate these updates.

Addenda I and II did not add or change any management measures or requirements. The only existing requirement is for states to submit an annual compliance report by July 1st of each year that contains commercial and recreational landings as well as results from any monitoring programs that intercept Atlantic croaker.

II. Status of the Stock

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 conclusions of the 2010 stock assessment (ASMFC 2010), which is the most recent assessment that was recommended by peer review for management use, were that Atlantic croaker was not experiencing overfishing and biomass had increased and fishing mortality decreased since the late 1980s. The 2010 assessment was unable to confidently determine stock status, particularly with regards to biomass, due to an inability to adequately estimate removals from discards of the South Atlantic shrimp trawl fishery. 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 discards 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 primary reasons that the 2017 stock assessment did not pass peer review was due to conflicting signals in harvest and abundance metrics. 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. In response to this conflict, the Atlantic Croaker Technical Committee has recommended several changes to the annual TLA such as additional abundance indices and survey length-composition

information so that the TLA abundance metric would more accurately reflect trends in the stock. These changes may be incorporated through an addendum currently being developed.

III. Status of the Fishery

This report includes updated recreational estimates from the Marine Recreational Information Program's transition to the mail-based Fishing Effort Survey (FES) on July 1, 2018. Past recreational estimates have been calibrated to the FES and, therefore, are different from those shown in FMP Reviews and state compliance reports prior to 2018.

Total Atlantic croaker harvest from New Jersey through the east coast of Florida in 2018 is estimated at 6.5 million pounds (Tables 2 and 3, Figure 1). This represents an 86% decline in total harvest since the peak of 47.4 million pounds in 2003 (87% commercial decline, 85% recreational decline). The commercial and recreational fisheries harvested 57% and 43% of the 2018 total, respectively.

Atlantic coast commercial landings of Atlantic croaker exhibit a cyclical pattern, with low harvests in the 1960s to early 1970s and the 1980s to early 1990s, and high harvests in the mid-to-late 1970s and the mid-1990s to early 2000s (Figure 1). Commercial landings increased from a low of 3.7 million pounds in 1991 to 28.6 million pounds in 2001 (Table 2); however, landings have declined every year since 2010 to 3.7 million pounds in 2018, well below the time series (1950-2018) average of 12.5 million pounds. Within the management unit, the majority of 2018 commercial landings came from Virginia (53%) and North Carolina (44%).

From 1981-2018, recreational landings of Atlantic croaker from New Jersey through Florida have varied by count between 7.1 million fish and 36.2 million fish and by weight between 2.8 million pounds and 18.9 million pounds (Tables 3 and 4, Figure 2). Landings generally increased until 2003, after which they showed a declining trend through 2018. The 2018 landings are estimated at 7.1 million fish and 2.8 million pounds, the lowest recreational harvest on record. Virginia was responsible for 68% of the 2018 recreational landings, in numbers of fish, followed by Florida (13%).

The number of recreational releases generally increased over the time series until 2013, after which numbers of releases have generally decreased through 2018 (Figure 2). However, percentage of released recreational catch has shown a slight increasing trend from the 1990s through 2018. In 2018, anglers released 16.8 million fish, a decline from the 23.9 million fish released in 2017. Anglers released an estimated 70% of the recreational croaker catch in 2018, the highest percentage on record (Figure 2).

IV. Status of Assessment Advice

A statistical catch-at-age (SCA) model was used in the 2010 Atlantic croaker stock assessment (ASMFC 2010). This model combines catch-at-age data from the commercial and recreational fisheries with information from fishery-independent surveys and biological information such as growth rates and natural mortality rates to estimate the size of each age class and the

exploitation rate of the population. The assessment was peer reviewed by a panel of experts in conjunction with the Southeast Data, Assessment, and Review (SEDAR) process.

The Review Panel was unable to support some of the 2010 assessment results due to uncertainty regarding the estimation of Atlantic croaker discards in the shrimp trawl fishery, and the application of estimates in modeling. Specifically, model-estimated values of stock size, fishing mortality, and biological reference points are too uncertain for use; however, the trends in model-estimated parameters and ratio-based fishing F reference points are considered reliable. Despite the uncertainty in assessment results caused by shrimp trawl bycatch, the Review Panel concluded that it is unlikely that the stock is in trouble. The stock is not experiencing overfishing, biomass has been trending up, commercial catches are stable, and discards from the shrimp trawl fishery have been reduced.

A benchmark stock assessment was conducted in 2017, but was not recommended for management use due to uncertainty in biomass estimates resulting from conflicting signals among abundance indices and catch time series as well as sensitivity of model results to assumptions and model inputs. Because the most recent assessment was not recommended for management use, current stock status is unknown. One noted improvement in this assessment was in the estimation of Atlantic croaker discards by the shrimp trawl fishery. The Review Panel recommended incorporation of shrimp trawl discard estimates into the annual monitoring of Atlantic croaker through the TLA. The TC has recommended several changes to the TLA that would help resolve some of the conflict between harvest and abundance signals. The Board has initiated an addendum to the Atlantic Croaker FMP to incorporate these changes.

V. Status of Research and Monitoring

There are no research or monitoring programs required of the states except for the submission of an annual compliance report. The following fishery-dependent (other than catch and effort data) and fishery-independent monitoring programs were reported in the 2018 compliance reports.

<u>Fishery-Dependent Monitoring</u>

- New Jersey: initiated biological monitoring of commercially harvested Atlantic croaker in 2006 in conjunction with ACCSP (2018 n=52 lengths, weights, and ages)
- Delaware: collects trip-based information on pounds landed, area fished, effort, and gear type data through mandatory monthly state logbook reports submitted by fishermen.
- Maryland: commercial pound net fishery biological sampling; seafood dealer sampling (121 lengths and weights)
- PRFC: has a mandatory commercial harvest daily reporting system, with reports due weekly.
- Virginia: commercial fishery biological sampling (8,127 length measurements, 8,074 weight measurements, 274 otolith ages, and 419 sex determinations in 2018)
- North Carolina: commercial fishery biological sampling since 1982 for length (2018 n=3,766), weight, otolith, sex determination, and reproductive condition.

- South Carolina: recreational fishery biological sampling via SCDNR State Finfish Survey, MRIP, and a SCDNR-managed mandatory trip reporting system for licensed charter boat operators. In 2013, SCDNR took over its portion of MRIP data collection.
- Georgia: collects biological information, including length, sex, and maturity stage, through the Marine Sportfish Carcass Recovery Project (1 fish in 2018)
- Florida: commercial fishery biological sampling

Fishery-Independent Monitoring

- New Jersey: 3 nearshore ocean (within 12 nm) juvenile trawl surveys (New Jersey Ocean Trawl Survey, 1988-present: 2018 CPUE (0.82) was well below time-series average (1.94); nearshore Delaware Bay juvenile trawl survey, 1991-present: 2018 survey index (0.33) was well below time series average (4.23); Delaware River juvenile seine survey, 1980-present: 2018 survey index (0.02) was well below time series average (0.22).
- Delaware: offshore Delaware Bay adult finfish trawl survey (1990-present; 2017 #/tow = 11.6; 99% increase in relative abundance from 2017 index, below mean for time series); nearshore Delaware Bay juvenile finfish trawl survey (1980-present; 2018 index increased from 0.81 in 2017 to 5.43; Inland Bays index increased from 0.30 in 2017 to 2.41 in 2018).
- Maryland: summer gill net survey was initiated in 2013 on lower Choptank (8 fish were captured in 2018); Atlantic coast bays juvenile otter trawl survey (standardized from 1989-present; 2018 GM of 0.46 fish/hectare is the fifth lowest value of the 30-year time series); Chesapeake Bay juvenile trawl index (standardized from 1989-present; CPUE decreased from 2.35 fish/tow in 2017 to 1.13 in 2018).
- PRFC: Maryland DNR conducts an annual juvenile beach haul seine survey in the Potomac River (1954-present; YOY GM decreased from 0.35 in 2017 to 0.00 in 2018).
- Virginia: Virginia Institute of Marine Science (VIMS) Juvenile Finfish and Blue Crab Trawl Survey (1988-present; 2018 index was FILL WHEN AVAILABLE, which is down from the 2017 value of 15.19).
- North Carolina: Pamlico Sound juvenile trawl survey (1987-present; 2018 juvenile abundance index (mean number of individuals/tow) was 136.8, down from 1,172.3 in 2017); Pamlico Sound gill net survey (2001-present; 2018 CPUE 0.5 fish per sample, below time series mean)
- South Carolina: SEAMAP shallow water (15-30 ft) trawl survey from Cape Hatteras to Cape Canaveral (1989-present; 2018 CPUE increased by 16% from 2017); inshore estuarine trammel net survey for adults (May-September, 1991-present; 2018 CPUE decreased 8.5% from 2017); estuarine electroshock survey for juveniles (2001-present; 2018 CPUE decreased by 76% since 2017, lowest value of time series); SCECAP estuarine trawl survey (1999-present, primarily targets juveniles, 2018: 41.9 #/hectare increased from 2017 by 757%).
- Georgia: Marine Sportfish Population Health Survey (trammel and gill net surveys in the Altamaha River Delta and Wassaw estuary, 2002-present; 2018 trammel net index (GM #/standard net set): 0.1, gill net index: 0.5); Ecological Monitoring Survey (trawl, 2003-present; 2018 index (GM #/standard trawl) was 11.3).

- Florida: YOY seine survey (2002-present; 2018 index increased by 167% from 2017); sub-adult/adult haul seine survey (2001-present; 2018 index value increased by 19% from 2017).

The Northeast Fishery Science Center (NEFSC) performs a randomly stratified groundfish survey along the U.S. east coast. Atlantic croaker are one of the main species caught throughout much of the survey area and, since the surveys started in 1972, it provides a long term data set. Regionally, mean CPUE (catch-per-unit-effort) of Atlantic croaker has increased from north to south. Since 1994, there has been an increase in annual catch variability. The NEFSC survey was not carried out in 2017 due to mechanical issues with the RV Bigelow. Catch levels in 2018 (394.0 fish per tow) declined 24.5% from 2016 (521.9 fish per tow) and dropped below the long term mean (498 fish per tow). The CPUE for 2017 was estimated as the mean of 2015-2016 and 2017 as a place holder in the index. The estimated CPUE for 2017 (457.9 fish per tow) was just below the long term mean. The traffic light analysis (TLA) of annual catch levels also reflected the decrease in CPUE in 2018 with the increasing proportion of yellow and a red proportion of 16.2%. The decline in catch levels in the last several years shows abundance levels just below the long term mean or yellow/green threshold for 2016-2018.

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 1 was fully implemented by January 1, 2006, and provided the management plan for the 2009 fishing year. There are no interstate regulatory requirements for Atlantic croaker. Should regulatory requirements be implemented in the future, all state programs must include law enforcement capabilities adequate for successfully implementing the regulations. Addendum I to Amendment 1 was initiated in August 2010 and approved in March 2011, in order to 1) revise the biological reference points to be ratio-based, and 2) remove the distinction of two regions within the management unit, based on the results of the 2010 stock assessment. Addendum II was approved August 2014 and established the TLA management framework for Atlantic croaker in order to better illustrate long-term trends in the fishery.

Traffic Light Approach

Addendum II established the TLA as the new management framework for Atlantic croaker. Under this management program, if thresholds for both population characteristics (harvest and adult abundance) achieve or exceed the proportion of threshold for the specified three year period, management action will be taken.

Analysis of the harvest composite index for 2018 shows that this population characteristic tripped for a third consecutive year (Figure 3). Recreational harvest was estimated based on MRIP's mail-based Fishing Effort Survey calibration. The mean proportion of red color from 2014-2018 was 55.2%, with a red proportion in 2018 exceeding the 60% threshold. The harvest composite index was comprised of commercial and recreational landings. Both commercial and recreational indices were above the 60% threshold in 2018 with commercial landings exceeding the 60% level for the past two years.

The abundance composite TLA index was broken into two components based on age composition. The adult composite index was generated from the NEFSC and SEAMAP surveys, since the majority of Atlantic croaker captured in those surveys were ages 1+. The juvenile composite index was generated from the North Carolina (NC) Program 195 and VIMS surveys because these two captured primarily young-of-the-year Atlantic croaker.

Two of four TLA abundance indices showed increases in red proportions for 2018. The NEFSC survey was not conducted in 2017 due to mechanical issues with the RV Bigelow but the 2018 index showed an increased red proportion in 2018 from 2016. The SEAMAP index showed increased abundance in the fall and had no red in the index and an increase in the green proportion. The adult composite TLA characteristic (Figure 4) did not trigger in 2018 with a red proportion of 16.3%. The juvenile composite characteristic index (Figure 5) was 24% red and 4% green, due to a large increase in the VIMS index and a large decrease in the NC Program 195 survey. The higher annual variability for the different color proportions in the juvenile composite characteristic, in comparison to the adult composite characteristic, is likely a reflection annual recruitment variability rather than population trends.

Overall, management triggers were not tripped in 2018 since both adult population characteristics (harvest and adult abundance) were not above the 30% threshold for the 2016-2018 time period. This continues a trend of disconnect between the harvest and abundance indices since the mid-2000s, with the harvest metric generally decreasing and abundance metric generally increasing.

De Minimis Requests

States are permitted to request *de minimis* status if, for the preceding three years for which data are available, their average commercial landings or recreational landings (by weight) constitute less than 1% of the coastwide commercial or recreational landings for the same three year period. A state may qualify for *de minimis* in either its recreational or commercial sector, or both, but will only qualify for exemptions in the sector(s) that it qualifies for as *de minimis*. Amendment 1 does not include any compliance requirements other than annual state reporting, which is still required of *de minimis* states, thus *de minimis* status does not exempt states from any measures.

In the annual compliance reports, the following states requested *de minimis* status: Delaware (commercial fishery), South Carolina (commercial fishery), Georgia (commercial fishery), and Florida (commercial fishery). The commercial and recreational *de minimis* criteria for 2018 are based on 1% of the average coastwide 2016-2018 landings in each fishery: 47,066 pounds for the commercial fishery and 45,320 pounds for the recreational fishery. The Delaware commercial fishery qualifies for *de minimis* status, but landings are confidential. The South Carolina commercial fishery qualifies for *de minimis* status, but 2018 landings are confidential (the 2016-2017 average is 279 pounds). The Georgia commercial fishery qualifies for *de minimis* status with a three-year average of zero pounds. The Florida commercial fishery does not qualify for *de minimis* status with a three-year average of 51,660 pounds (1.1% of the coastwide three-year average).

Changes to State Regulations
In 2018, North Carolina enacted several gill net restrictions for coastal waters pertaining to area closures/openings, gear modifications, and attendance rules to avoid interactions with endangered species or bycatch species. These restrictions may indirectly affect the harvest and bycatch of Atlantic croaker and are defined by North Carolina Proclamations: M-10-2018, M-9-2018, M-7-2018, M-6-2018, and FF-48-2018.

Through 2017, Georgia had a general commercial fishing license. License applications had a voluntary survey asking purchasers to check off the species or species groupings they planned to pursue. The check-off was non-binding and the associated participation data were not useful for determining reporting requirements. In 2013, GADNR began issuing Letters of Authorization (LOAs) for several target species to improve the participation data. In 2017, the Georgia General Assembly approved the addition of species endorsements to commercial fishing licenses to replace LOAs (O.C.G.A 27-2-23). In 2017, the Georgia General Assembly approved the addition of species endorsements to commercial fishing licenses to replace LOAs (O.C.G.A. 27-2-23) which was followed by the Board of Natural Resources implementation in December 2017 (Board Rule 391-2-4-.17). 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 (O.C.G.A. 27-2-23 and Board Rule 391-2-4-.09). 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 he is selling his catch to end consumers.

Atlantic Croaker Habitat
In winter of 2017, the ASMFC Habitat Committee released *Atlantic Sciaenid Habitats: A Review of Utilization, Threats, and Recommendations for Conservation, Management, and Research*, which outlines the habitat needs of Atlantic croaker at different life stages (egg, larval, juvenile, adult). This report also highlights threats and uncertainties facing these ecological areas and identifies Habitat Areas of Particular Concern. It can be found online at: http://www.asmfc.org/files/Habitat/HMS14_AtlanticSciaenidHabitats_Winter2017.pdf.

Bycatch Reduction
Atlantic croaker is subject to both direct and indirect fishing mortality. Historically, croaker ranked as one of the most abundant bycatch species of the south Atlantic shrimp trawl fishery, resulting in the original FMP's recommendation that bycatch reduction devices (BRDs) be developed and required in the shrimp trawl fishery. Since then, the states of North Carolina through Florida have all enacted requirements for the use of BRDs in shrimp trawl nets in state waters, reducing croaker bycatch from this fishery (ASMFC 2010). However, bycatch and discard monitoring from the shrimp trawl fishery have historically been inadequate, resulting in a major source of uncertainty for assessing this stock, as well as other important Mid- and

South Atlantic species. Most of the discarded croaker are age-0 and thus likely have not yet reached maturity (ASMFC 2010). The North Carolina Division of Marine Fisheries conducted a two-year study, published in 2015, to collect bycatch data from state shrimp trawlers. It found that Atlantic croaker represent between 34-49% of the total observed finfish bycatch by weight in estuarine waters and between 20-42% in ocean waters. The at-net mortality for Atlantic croaker was found to be 23% (Brown 2015). These data will be valuable for incorporating estimates of removals in future stock assessments.

Atlantic croaker are also discarded from other commercial fishing gears, primarily due to market pressures and few restrictions on croaker harvest at the state level. The National Oceanic and Atmospheric Administration (NOAA) Fisheries Pelagic Observer Program provides data to estimate these discards for use in assessments; however, the time series is limited and only discards from gill nets and otter trawls could be estimated for the 2010 assessment based on the available data. Since 1988, estimated discards have fluctuated between 94 and 15,176 mt without trend, averaging 2,503 mt (ASMFC 2010).

Atlantic croaker is also a major component of the scrap/bait fishery. Landings from this fishery are not reported at the species level, except in North Carolina, which has a continuous program in place to sample these landings and enable estimation of croaker scrap landings for use in the stock assessment. As part of the 2010 stock assessment, North Carolina estimated the scrap/bait landings, which have declined in recent years, from a high of 1,569 mt in 1989 to a low of 84 mt in 2008, primarily due to restrictions placed on fisheries producing the highest scrap/bait landings (ASMFC 2010). Regulations instituted by North Carolina include a ban on flynet fishing south of Cape Hatteras, incidental finfish limits for shrimp and crab trawls in inside waters, minimum mesh size restrictions in trawls, and culling panels in long haul seines.

South Carolina has also begun a state monitoring program to account for scrap landings. The state initiated a bait harvester trip ticket program for all commercial bait harvesters licensed in South Carolina. The impetus for this program is to track bait usage of small sciaenid species (croaker, spot, and whiting) as well as other important bait species.

Several states have implemented other commercial gear requirements that further reduce bycatch and bycatch mortality, while others continue to encourage the use of the BRD devices. NOAA Fisheries published a notice on June 24, 2011 for public scoping in the Federal Register to expand the methods for reducing bycatch interactions with sea turtles, which may have additional effects on the bycatch of finfish like Atlantic croaker in trawls (76 FR 37050). Continuing to reduce the quantity of sub-adult croaker harvested should increase spawning stock biomass and yield per recruit.

Atlantic croaker are also subject to recreational discarding. The percentage of Atlantic croaker released alive by recreational anglers has generally increased over time. Discard mortality was estimated to be 10% for the 2010 stock assessment (ASMFC 2010). The use of circle hooks and appropriate handling techniques can help reduce mortality of released fish.

VII. Implementation of FMP Compliance Requirements for 2019

The PRT finds that all states have fulfilled the requirements of Amendment 1.

VIII. Recommendations

Management and Regulatory Recommendations

- Consider approval of the *de minimis* requests from Delaware, South Carolina, Georgia, and Florida for their commercial fisheries.
- Encourage the use of circle hooks to minimize recreational discard mortality.
- Consider the basic research and monitoring information needed for informed management in light of the budgetary constraints limiting all state governments.

Research and Monitoring Recommendations

<u>High Priority</u>

- Increase observer coverage for commercial discards, particularly the shrimp trawl fishery. Develop a standardized, representative sampling protocol for observers to use to increase the collection of individual lengths and ages of discarded finfish.
- Describe the coast-wide distribution, behavior, and movement of croaker by age, length, and season, with emphasis on collecting larger, older fish.
- Continue state and multi-state fisheries-independent surveys throughout the species range and subsample for individual lengths and ages. Ensure NEFSC trawl survey continues to take lengths and ages. Examine potential factors affecting catchability in long-term fishery independent surveys.
- Investigate environmental covariates in stock assessment models including climate cycles (e.g., Atlantic Multi-decadal Oscillation, AMO, and El Niño Southern Oscillation, El Niño) and recruitment and/or year class strength, spawning stock biomass, stock distribution, maturity schedules, and habitat degradation.
- Continue to develop estimates of length-at-maturity and year-round reproductive dynamics throughout the species range. Assess whether temporal or density-dependent shifts in reproductive dynamics have occurred.
- Re-examine historical ichthyoplankton studies for an indication of the magnitude of estuarine and coastal spawning, as well as for potential inclusion as indices of spawning stock biomass in future assessments. Pursue specific estuarine data sets from the states (NJ, VA, NC, SC, DE, MD) and coastal data sets (MARMAP, EcoMon).
- Investigate the relationship between estuarine nursery areas and their proportional contribution to adult biomass, i.e., are select nursery areas along Atlantic coast ultimately contributing more to SSB than others, reflecting better quality juvenile habitat?

<u>Medium Priority</u>

- Conduct studies of discard mortality for recreational and commercial fisheries by each gear type in regions where removals are highest.
- In the recreational fishery, develop sampling protocol for collecting lengths of discarded finfish and collect otolith age samples from retained fish.

- Encourage fishery-dependent biological sampling, with proportional landings representative of the distribution of the fisheries. Develop and communicate clear protocols on truly representative sampling.
- Quantify effects of BRDs and TEDs implementation in the shrimp trawl fishery by examining their relative catch reduction rates on Atlantic croaker.
- Utilize NOAA Fisheries Ecosystem Indicators bi-annual reports to consider folding indicators into the assessment; identify mechanisms for how environmental indicators affect the stock.
- Encourage efforts to recover historical landings data, determine whether they are available at a finer scale for the earliest years than are currently reported.
- Collect data to develop gear-specific fishing effort estimates and investigate methods to develop historical estimates of effort.
- Develop gear selectivity studies for commercial fisheries with emphasis on age 1+ fish.
- Conduct studies to measure female reproductive output at size and age (fecundity, egg and larval quality) and impact on assessment models and biomass reference points.
- Develop and implement sampling programs for state-specific commercial scrap and bait fisheries in order to monito the relative importance of Atlantic croaker. Incorporate biological data collection into the program.

IX. References

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Kevin Brown. 2015. Characterization of the commercial shrimp otter trawl fishery in the estuarine and ocean (0-3 miles) waters of North Carolina. Morehead City (NC): NCDEQ, Division of Marine Fisheries. Abstract.

X. Figures

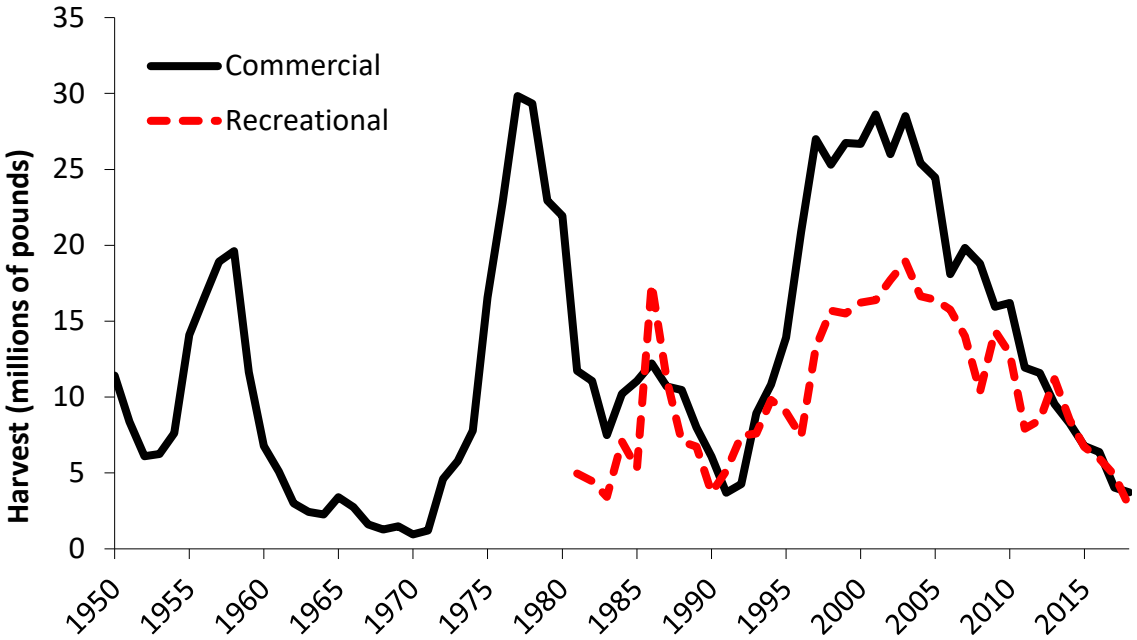

Figure 1. Atlantic croaker commercial and recreational landings (pounds) from 1950-2018. (See Tables 2 and 3 for source information. Commercial landings estimate for 2018 is preliminary. Reliable recreational landings estimates are not available prior to 1981. Recreational landings estimates are based on the mail-based Fishing Effort Survey.)

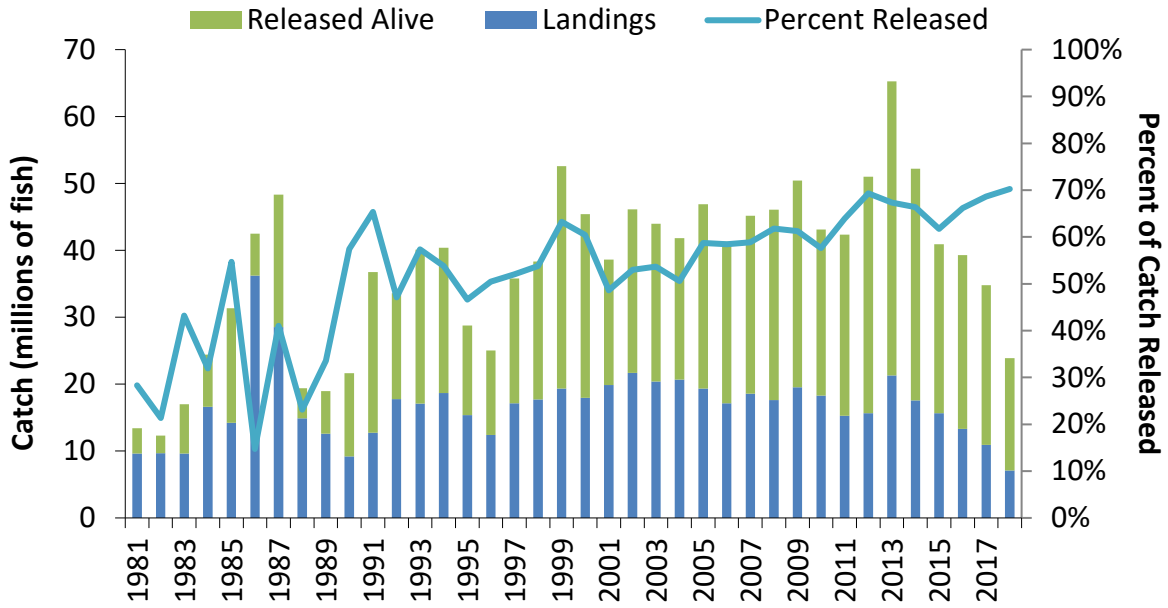

Figure 2. Recreational catch (landings and alive releases, in numbers) and the percent of catch that is released, 1981-2018, based on the mail-based Fishing Effort Survey calibration. (See Tables 4 and 5 for values and source information.)

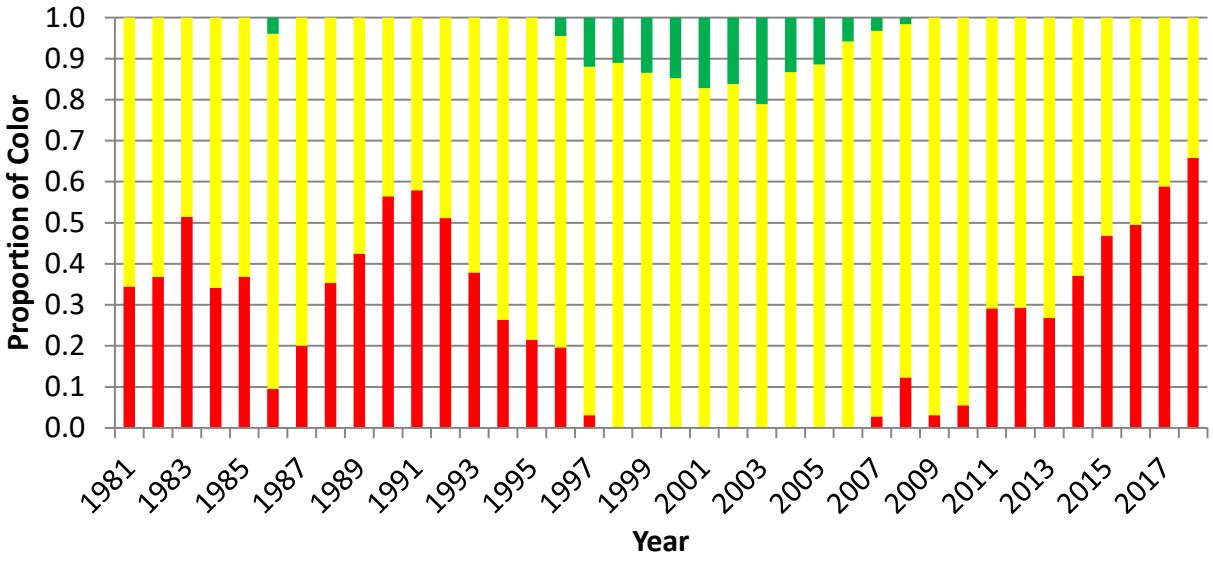

Figure 3. Annual color proportions for the harvest composite TLA of Atlantic croaker recreational and commercial landings.

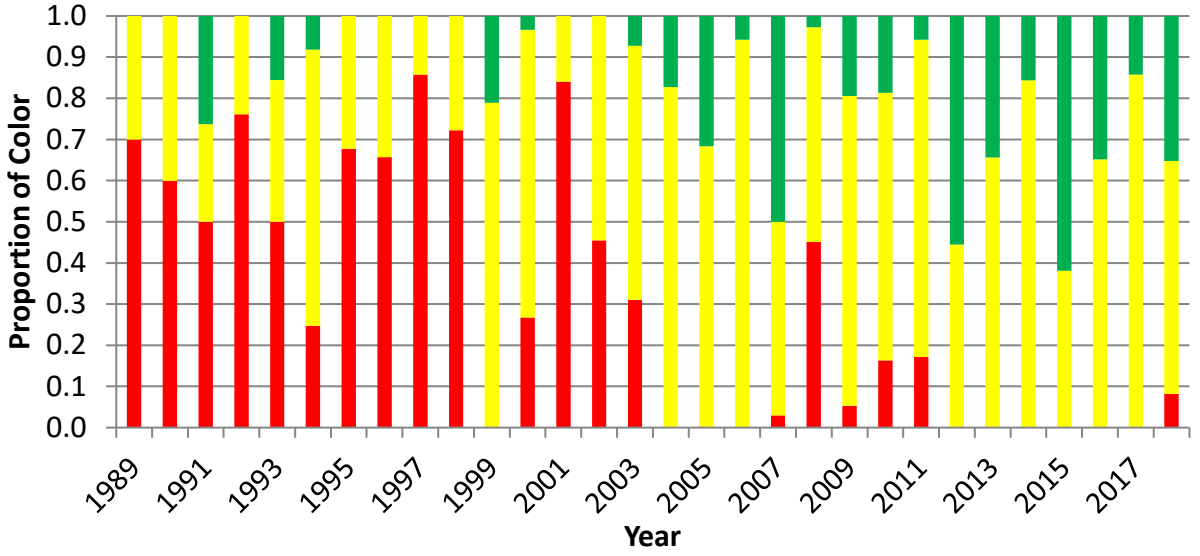

Figure 4. Adult croaker TLA composite characteristic index (NEFSC and SEAMAP surveys). The NEFSC survey was not conducted in 2017 due to mechanical problems with the RV Bigelow. The 3-year average of 2014-2016 values was imputed to estimate the 2017 value for this index.

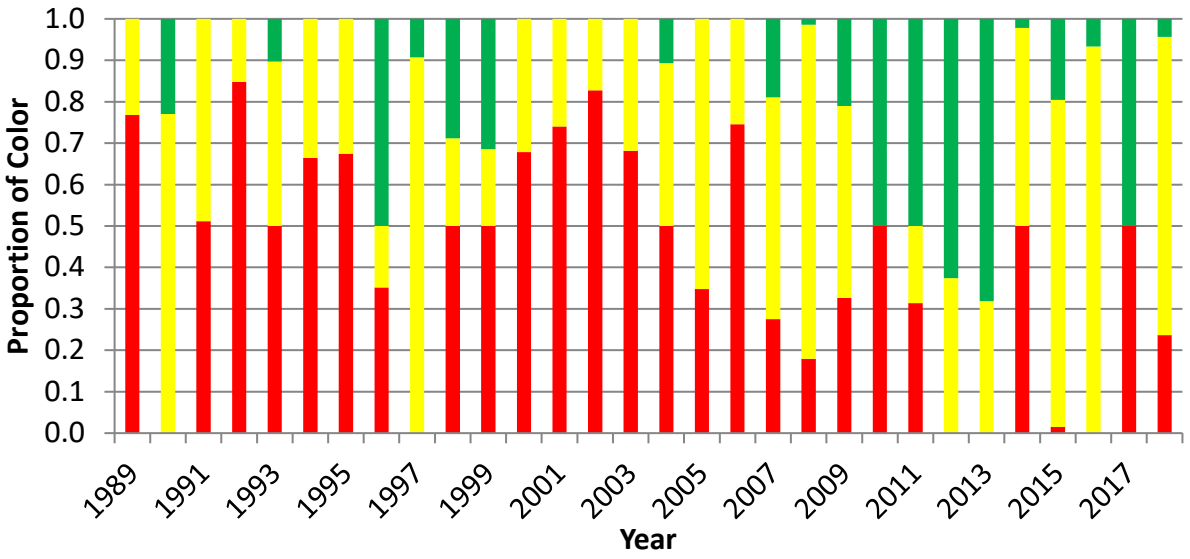

Figure 5. Juvenile croaker TLA composite characteristic index (NC 195 and VIMS surveys).

XI. Tables

Table 1. Summary of state regulations for Atlantic croaker in 2017.

State	Recreational	Commercial
NJ	none	otter/beam trawl mesh restriction for directed croaker harvest (>100 lbs in possession)
DE	8" minimum; recreational gill nets (up to 200 ft.) with license	8" minimum
MD	9" min, 25 fish/day, charter boat logbooks	9" minimum; open 3/16 to 12/31
PRFC	25 fish/day	pound net season: 2/15 to 12/15
VA	none	none
NC	recreational use of commercial gears with license and gear restrictions	
SC	mandatory for-hire logbooks, small Sciaenidae species aggregate bag limit of 50 fish/day	
GA	25 fish/day	25 fish/day limit except for trawlers harvesting shrimp for human consumption (no limit)
FL	none	none

* A commercial fishing license is required to sell croaker in all states with fisheries. For all states, general gear restrictions affect commercial croaker harvest.

Table 2. Commercial harvest (pounds) of Atlantic croaker by state, 2009-2018.
(Estimates for 2018 are preliminary. Sources: 2019 state compliance reports for 2018 fishing year and for years prior to 2018, personal communication with ACCSP, Arlington, VA [07/10/2019], except PRFC [compliance reports only].)

Year	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
2009	585,552	C	448,589	234,101	8,489,772	6,135,437	75		32,151	15,942,018
2010	342,116	C	542,233	162,571	7,796,179	7,312,159	C		37,229	16,198,548
2011	458,397	C	714,347	243,196	5,415,432	5,054,186	C		47,649	11,945,181
2012	363,381	C	915,432	273,849	6,842,005	3,106,616	C		74,527	11,578,682
2013	332,813	C	820,777	130,285	6,237,602	1,927,938	C		76,463	9,532,551
2014	265,166	C	443,661	177,777	4,697,381	2,629,908	247		45,587	8,269,374
2015	81,311	C	294,038	118,996	4,426,957	1,819,067	C		39,096	6,783,689
2016	55,210	C	101,949	168,889	3,825,737	2,164,015	302		57,538	6,374,435
2017	1,068	C	42,958	114,319	2,822,005	1,007,963	256		43,033	4,031,880
2018	C	C	44,305	16,561	1,953,794	1,643,607	C		54,409	3,713,470

C: Confidential data

Table 3. Recreational harvest (pounds) of Atlantic croaker by state, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year and for years prior to 2018, personal communication with ACCSP, Arlington, VA [07/10/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2009	662,763	615,692	3,012,580	8,282,280	359,703	214,212	69,031	1,120,776	14,337,037
2010	79,889	106,268	2,472,032	9,295,413	638,817	27,184	35,593	209,519	12,864,715
2011	50,153	123,487	1,188,916	4,584,599	360,390	583,280	38,219	995,506	7,924,550
2012	259,645	147,737	1,980,417	4,664,264	307,338	30,149	29,815	1,063,337	8,482,702
2013	1,637,516	253,447	1,581,384	6,442,166	453,881	84,248	89,781	642,887	11,185,310
2014	750,580	427,615	1,265,217	4,354,046	758,751	104,434	138,423	712,090	8,511,156
2015	263,749	189,320	871,596	3,514,410	557,735	181,909	248,431	881,185	6,708,335
2016	7,133	10,959	407,010	2,998,022	443,728	81,896	116,313	1,893,203	5,958,264
2017	0	26,429	238,659	3,383,506	237,160	310,621	100,565	555,389	4,852,329
2018	34,125	5,859	191,854	1,935,837	128,011	81,251	82,174	326,265	2,785,376

Table 4. Recreational harvest (numbers) of Atlantic croaker by state, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year and for years prior to 2018, personal communication with ACCSP, Arlington, VA [07/10/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2009	1,059,267	983,173	2,586,887	10,789,517	958,128	733,845	185,129	2,252,473	19,548,419
2010	142,887	207,601	2,994,889	12,961,723	1,280,446	88,399	121,252	470,168	18,267,365
2011	91,014	212,613	1,530,723	8,891,276	873,659	949,132	129,941	2,593,963	15,272,321
2012	830,891	202,283	2,565,599	8,786,350	848,495	132,264	104,944	2,190,268	15,661,094
2013	2,707,410	530,236	2,308,987	12,517,286	1,300,804	336,140	264,984	1,332,465	21,298,312
2014	852,733	806,256	2,197,125	9,533,829	1,935,961	600,482	289,781	1,359,207	17,575,374
2015	339,021	334,676	1,738,576	8,024,381	1,437,019	555,263	790,014	2,429,723	15,648,673
2016	8,236	24,546	659,318	7,276,719	1,109,570	268,470	402,254	3,553,777	13,302,890
2017	0	65,575	425,987	7,637,843	666,930	765,227	371,301	969,146	10,902,009
2018	104,321	12,371	305,469	4,815,585	372,397	335,833	241,957	919,981	7,107,914

Table 5. Recreational releases (number) of Atlantic croaker by state, 2009-2018. (Sources: 2019 state compliance reports for 2018 fishing year and for years prior to 2018, personal communication with ACCSP, Arlington, VA [07/10/2019])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2009	406,639	1,284,262	2,424,818	16,732,646	5,623,278	1,232,519	1,169,782	2,015,296	30,889,240
2010	380,916	1,056,528	3,060,983	13,470,836	4,571,287	621,497	651,984	1,014,552	24,828,583
2011	252,419	214,603	937,220	14,160,124	7,005,152	1,187,686	748,696	2,559,976	27,065,876
2012	3,336,964	1,036,383	7,090,976	15,140,369	3,878,710	1,070,703	781,302	2,999,225	35,334,632
2013	2,980,744	1,811,661	7,557,223	18,480,099	6,729,556	3,754,143	1,361,943	1,265,571	43,940,940
2014	703,031	1,396,970	2,806,693	10,314,405	10,347,332	4,742,718	2,057,898	2,265,961	34,635,008
2015	240,840	309,389	1,236,293	6,815,343	9,632,560	3,236,774	1,320,939	2,451,253	25,243,391
2016	139,085	390,655	726,662	6,993,470	7,254,382	5,233,835	1,178,630	4,073,001	25,989,720
2017	152,540	230,934	2,833,760	8,443,528	4,631,445	4,755,853	1,059,539	1,770,846	23,878,445
2018	144,637	85,424	203,081	4,980,703	3,580,227	5,568,892	1,395,514	816,536	16,775,014

MEETING OVERVIEW

American Eel Management Board
August 6, 2019
1:30 – 2:30 p.m.
Arlington, Virginia

Chair: Marty Gary (PRFC) Assumed Chairmanship: 10/17	Technical Committee Chair: Jordan Zimmerman (DE)	Law Enforcement Committee Representative: Rob Beal
Vice Chair: Lynn Fegley (MD)	Advisory Panel Chair: Mari-Beth DeLucia	Previous Board Meeting: October 22, 2018
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, VA, NC, SC, GA, FL, D.C., PRFC, USFWS, NMFS (19 votes)		

2. Board Consent:

- Approval of Agenda
- Approval of Proceedings from October 2018 Board Meeting

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-up 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 Board Chair will not allow additional public comment. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Update on Board Working Group Recommendations on Addressing Coastwide Cap Overages (1:45 – 1:55 p.m.)

Background

- In 2018, the Board approved Addendum V. To address management of the new Coastwide Cap and removal of state allocations, a Board Working Group was formed to develop a Coastwide Cap Overage Policy.
- The Board Working Group met multiple times from December 2018-July 2019 to develop a draft Coastwide Cap Overage Policy.

Presentation

- Update on Board Working Group Draft Policy on Coastwide Cap Overages by K. Rootes-Murdy

5. Consider 2020 Aquaculture Proposals (1:55 p.m. – 2:30 p.m.) Action
Background • Maine and North Carolina submitted aquaculture proposals for the 2020 fishing season. North Carolina is submitting a two year proposal starting in fall 2019. (**Briefing Materials**) • The Technical Committee met on July 15th to review the proposals (**Briefing Materials**)
Presentations • Overview of Maine and North Carolina aquaculture proposals by K. Rootes-Murdy • Technical Committee Report by K. Rootes-Murdy
Board actions for consideration at this meeting • Approval of Maine and North Carolina aquaculture proposals

6. Other Business/ Adjourn

Atlantic States Marine Fisheries Commission

Horseshoe Crab Advisory Panel Conference Call

Thursday, July 25th, 2019

1:00 – 3:00 p.m.

Meeting Summary

1) **Welcome/Introductions**

Advisory Panel (AP): Allen Burgenson, Benjie Swan, Brett Hoffmeister, George Topping, Jay Harrington, John Turner, Nora Blair

ASMFC Staff: Dr. Kristen Anstead, Dr. Mike Schmidtke

Guests: Dr. James Cooper

- M.Schmidtke assisted with introductions.
- A.Burgenson provided the agenda for the meeting.

2) **Update from Previous Board Meeting**

- M.Schmidtke provided a review of the last Horseshoe Crab Management Board (Board) meeting.
- Adaptive Resource Management (ARM) Subcommittee and Delaware Bay Ecosystem Technical Committee will meet in September in Arlington will discuss how to incorporate Catch Multiple Survey Analysis population estimates into the ARM model.
- Next Board Meeting: Summer Meeting, Aug. 6th, Arlington, VA

3) **Presentation of 2019 Benchmark Stock Assessment**

- Dr. Anstead provided an overview of the 2019 Horseshoe Crab Benchmark Stock Assessment.
    (a) History
    (b) Regional assessments
    (c) Tagging data analysis
    (d) Coast wide bait landings
    (e) Biomedical mortality

(f) Next assessment

- Discards are believed to be a much bigger factor than previously thought.
- There were comments regarding the 15% mortality estimate and how some believed this was still very/too high.
- G. Topping thought the data was not robust as it did not record many juveniles, nor was it done at the times most crabs were available to be caught. Gear used does not catch crabs well.
- G. Topping asked if anyone had considered the impact of windmills on areas like the Carl Schuster reservation or crabs in general.
- J. Harrington made the suggestion of sending video to regulators. He had hours of video of crabs on the beach.
- J. Harrington also mentioned HSC as predators of shellfish.
- B. Swan made mention about wanting to make comments about Stock Assessment, K. Anstead stated that B. Swan's letter was included in the appendix of the Stock Assessment.

4) **Potential Management Responses and Outstanding Items Postponed until Stock Assessment Completion**

- Discussion regarding J. Cooper's memo to the biomedical group.
- General discussion regarding biomedical mortality data.
- B. Hoffmeister questions methods for reporting biomedical data within ARM. M. Schmidtke answers that data would be reported as an aggregate.
- Regarding addendum 8 the group unanimously agreed to keep status quo. Biomedical data should not be included in the ARM and if it were it should be reported as an added source of mortality.
- ARM review. M. Schmidtke presented some options for discussion including "double loop" and a shorter term option. No recommendation was made.

5) **Panel Discussion of Stock Assessment and Potential Management Responses**

- NY and CT have declining trends, but not harvesting near ASMFC quota. Overharvesting is not yet defined. Declining trends are evident.
- The group agreed that action including possible quota reduction, enforcement, lunar closures, and discards be discussed at the Summer Meeting.

- J. Turner asked if ASMFC should reduce NY's HSC quota.

- M. Schmidtke mentioned that that would be a discussion for the Board, one perspective would be that if NY is not overfishing so a reduction would potentially negatively affect the fishery. If already fishing at state quota (about half of ASMFC quota), would a harvest reduction really affect population?

- A. Burgenson stated that the decline may be an effect of crabs not being reported or of poaching.

- M. Schmidtke agreed that poaching would be a problem, suggested if that is the case to communicate with local law enforcement, suggested that environmental impacts may be a factor.

- N. Blair mentioned that bycatch could also be a significant factor, per assessment results.

6) **Panel Discussion of Rich Wong's Request for Use of Biomedical Data**

- There was a brief discussion regarding Richard Wong's desire to publish a paper outlining the Delaware Bay HSC population estimation methodology to include biomedical data.

- M. Schmidtke pointed out that the Rich still needs permission from many sources including all biomedical companies and fishery-independent data sources (Virginia Tech, New Jersey, and Delaware).

- A. Burgenson pointed out it was great to have good news for a change.

- B. Swan suggested that this was a discussion to be held privately among the companies and not an AP call. Most agreed and the discussion ended.

7) **Other Business/Adjourn**

- No other business was discussed.

- Adjourned approx. 3:30pm

From: Robert Beal
To: Tina Berger; Caitlin Starks; Toni Kerns
Subject: FW: Hello from Jim Dawson
Date: Monday, July 29, 2019 2:47:06 PM
Importance: High

Hi All,

Please include the following comments from Jim Dawson in supplemental materials for the Summer Flounder, Scup, and Black Sea Bass Board.

Thanks,
Bob

From: Jim Dawson [mailto:jimdawson1@verizon.net]
Sent: Monday, July 29, 2019 1:58 PM
To: Robert Beal <Rbeal@asmfc.org>
Subject: Hello from Jim Dawson
Importance: High

Hey there Bob, been very busy since the passing of my mother, but we have a few very important items that are approaching quickly:

With respect to black sea bass: If the ASMFC feels that they can take away fish from those of us in the southern regions, I personally request that their be MUCH more of a "thorough" examination based on a "broader" amount of evidence that can and should be added to scientific input. Case in point "VTR records" specify where the fish are caught and in what wave. We also have "quota" information for exactly who caught what and where they caught it in what quantities. We MUST also keep in mind that currently when markets get flooded as they are when Massachussetts opens from July until they close and when certain trawl seasons open, the fishermen who CAN catch a large sum of sea bass, tend to NOT fish during the low market price time frames. This is a VERY serious problem, not from availability of sea bass, but from an economical impact problem forced on the coastal fishermen based from an ASMFC distribution without FULLY understanding market impacts and resulting sets of issues related to exactly how Massachussetts and others decide to spread their own percentage of sea bass quotas. Giving MORE will result in furthering the lengths of time the markets receive a lower priced sea bass which will also destroy how many more fishermen from how many other states? These states SHOULD have an ultimate decision due to the negative impacts this would have on their own fishermen! We who are involved in this fishery 12 months out of each year know and "fully" understand and can assist with a possible solution.

Current prices for black sea bass place "medium, large and jumbo" prices below (2) dollars. As Massachussetts mismanages its sea bass fishery, they create a "coastal problem" whereas they single handedly create a "hardship" for EVERY sea bass fisherman in every other state. One must ask: Is this fair to all the other states fishermen? These "northern" fishermen MUST BE "part-time"

fishermen within this fishery because they ONLY fish for them in small quantities and do NOT supply the markets with fish 12 months. They fish for two months and exactly why is the ASMFC wanting to create more headaches, take away from the real full time fishermen for those who historically have nothing to show nor provide to/for our country. Perhaps we should look into exactly who makes a living from fishing? Place certain protective measures for those of us who's families are "fully dependent" on fisheries and provide the freshest seafood for our own nation? Currently why are we importing so much seafood? PROTECT OUR FULL-TIME FISHERMEN! You guys have the power to help us! Don't help those who just do this for extra side money…my family is TOTALLY dependent on what I harvest!

You all can't justify taking from those of us who have absolutely no problems catching our sea bass quota and who have done so without problems other than market pricing based from giving too much to those states who don't give a damn about anyone! We don't need to give them more without substantial evidences that justify taking away from those who are dependent…what is that called when our government warrants doing this? I'd be REAL careful if I were sitting in a "voting position" and I placed my name voting to "take away" from those of us who have done nothing wrong! Those names will be collected…trust me. This leaves the ONLY option Bob to allow for extra given when a stock level is reached that is "above" a level that was "originally granted". Once the stock reaches a 100% level, it is ONLY then that extra can be granted to the northern states but also at a "fair distribution" which again should look into exactly who is catching and at what levels during what months.

#1) We should attempt to work better between fisheries management and the fishermen who are left, to not only manage the fisheries, but to reach an agreement with everyone based on ALL AVAILABLE factual information, not just a very limited random amount of questionable information.

a.) I have NOT had ANY issue catching my personal state quota of black sea bass with my VTR landings to back up my statements.
b.) ONLY price stops me from having the ability to pay for my expenses, NOT availability of black sea bass. (Currently, northern states negatively impact my ability to catch fish 4 months out of each year by dropping prices below expense levels. Sometimes it is as much as 6 months.)
c.) Southern stocks of black sea bass have also grown larger based on VTR landings/state landings per time/wave period. (Mark Hodges VTR data can be used as well.)

#2) Given the fact that it would be and should be legally unadvisable to "take away" from those of us sea bass fishermen in the southern region based on a very suspect and very limited amount of time based information, perhaps it would be a better solution to allow for these other northern states to receive extra ONLY when stock assessment are at a higher point than a level from where the stock amount was first and originally set to award each state the percentages they received.

a.) Set up a "trigger" at a level the states ALL can agree on, not based on stock expansion, but "overall" stock growth with use of ALL data references.
b.) Develop a new system for information that includes VTR records that date back 20 years now to count for 25% or more of a coordinated stock assessment plan.
c.) Data from the "observer program" shall also be included within ANY assessment

(or that program should not be warranted, forced on the fishermen, nor funded!)

d.) Why are we still ONLY using an outdated and flawed trawl survey for stock assessments when we have so much more information available to us today?

#3) The opening of "wave one" should stop until Virginia has "proven" that ALL landings were in fact reported. I personally have enough evidences to verify that law enforcement was not present nor did they report their state landings according to what was posted "on-line" and within "Facebook" posts. MANY recreational fishermen fished without reporting and/or obtaining the appropriate state permit. I have pictures of the vessels and also reported them with only (1) receiving a supposed fine. Landings MUST be accounted for. It is my 100% belief that I alone can verify that the state landings were three to four times higher or more than what was reported based on my particular evidence sets.

a.) Northern states have watched the negligence of Virginia and now have planned to send more and more of their fishermen to "over-exploit" the resources along our Mid-Atlantic coast during wave one. The sea bass caught were of ALL a certain older class seen ONLY within waves one and two.

b.) Impacts, economical and resource are extremely detrimental to that fishery even more-so as "climate changes" have altered the migratory patterns. (We should address this BEFORE it becomes a further set of problems.) Please close wave one until Virginia can verify all aforementioned truths can result in an accurate accounting of what has been caught…it cannot be justified to allow for discrimination and cheating to occur with open seasons for one state and not for all states. Due to Virginia having so many "private docks" and so little law enforcement to protect against such "cheating", it results in everyone to become extremely agitated at those who allow it to occur.

I'd like to see a result that could accommodate ALL of us and NOT take away from anyone who totally depends on this resource such as myself 12 months out of a year. As it currently stands, Massachussetts totally destroys the market for ALL sea bass fishermen until they close. It is my FIRM belief that federal law enforcement is NOT currently reviewing exactly how many black sea bass are entering EACH market and has NOT enforced current regulatory measures based on what market prices and information the marketplace has stated each dealer and sales market has available….the numbers just do NOT add up at all Bob! Prices do not drop that low even when the trawl fleet lands incredibly large amounts…something is really wrong and nobody is apparently looking? Because nobody looks, they cheat! Landings totals do NOT match what is within the marketplace. Let's see if we can fix this as well.

If the ASMFC attempts to unfairly take away quota from the fishermen who have done nothing wrong and have had no issues with catching their quotas, then perhaps the ASMFC must be reminded that our federal government CAN step in and award the fishermen from the EEZ their own quota based on their catch histories as we had fished based on VTR landings for the past 20 years. It probably would also NOT include such a time frame where there was "limited quarterly quotas", but would represent how fish were caught during time frames. This may not fair the northern states well. Sea Bass is a "federal species" and it is my belief that ASMFC best be extremely careful with

respect to not over-step their boundaries.

I have a lot of years as you know, with no disrespect meant when I speak. Our “leaders” must lead or they don’t deserve their respective positions!

James E. Dawson.

Options for consideration by Black Sea Bass Commercial PDT

CT DEEP
5/13/2019

****Updated 7/28/2019 Table 1****

Option 1: Address Connecticut's disproportionately small allocation of the coastal quota

Connecticut has experienced a substantial increase in abundance of black sea bass in state waters over the last seven years (see Fig. 1 below). This increased resource availability has rendered Connecticut particularly disadvantaged by its current low allocation of the coastal quota (1%). This option addresses the disparity between abundance of black sea bass in Connecticut waters and Connecticut's quota allocation by increasing Connecticut's allocation to 5%, using the following approach:

1) Hold NY and DE allocations constant
    a. NY has experienced a similar substantial increase in black sea bass abundance in state waters; therefore, it would not be appropriate to reduce their allocation.
    b. DE current allocation is 5 %. As a "control rule", this option does not seek to make CT percent allocation larger than any other state.
2) Move 1/2 of ME and NH quotas to CT.
3) Move MA, RI, NJ, MD, VA, and NC allocation to CT. The amount moved from each state is proportional to that state's current percent allocation.

Figure 1 CT Long Island Sound Trawl Survey Spring Black Sea Bass Index.

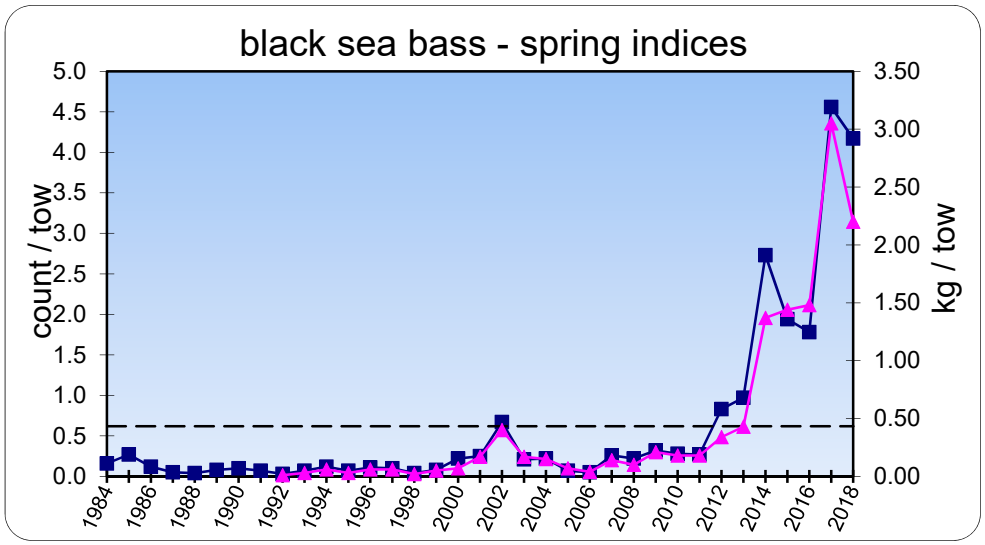

Table 1. Proposed changes in base allocations

State	Current % Allocation	Change in % Allocation	New % Allocation
ME	0.5%	-0.2500%	0.2500%
NH	0.5%	-0.2500%	0.2500%
MA	13.0%	-0.5291%	12.4709%
RI	11.0%	-0.4477%	10.5523%
CT	1.0%	4.0000%	5.0000%
NY	7.0%	0.0000%	7.0000%
NJ	20.0%	-0.8140%	19.1860%
DE	5.0%	0.0000%	5.0000%
MD	11.0%	-0.4477%	10.5523%
VA	20.0%	-0.8140%	19.1860%
NC	11.0%	-0.4477%	10.5523%

Option 2: Trigger option with adjustment of "base" allocations on an annual basis

This option uses a 3 million pound "trigger" while also incorporating the spirit of the TMGC approach (dynamic adjustment of allocations over time with consideration of resource availability and previous allocation regime). This option uses the following decision tree to allocate quota within a given year:

1) If the coastal quota is less than or equal to 3 million pounds:
    a. Allocate quota using the previous year's state allocation percentages.
2) If the coastal quota is greater than 3 million pounds:
    a. Allocate 3 million pounds of quota or "base" quota using the previous year's state allocation percentages.
    b. Allocate the remaining quota or "surplus" (amount above 3 million pounds) as follows:
        i. Split surplus quota to north vs. south region according to proportion of available biomass in each region (ME-NY = north region; NJ-NC = south region).
        ii. Further sub-divide surplus quota within each region according to existing intra-regional proportional allocation.

This option provides the following benefits:

1) By employing a 3 million pound trigger approach, ensures that there will not be substantial decrease to southern region state-by-state allocations in immediate future.
2) This option directly incorporates data on distribution of the resource. The proportions of available biomass in each region could be obtained from a periodic stock assessment, or could be determined annually using fishery-independent survey data.
3) This option allows state-by-state allocations to evolve over time as resource availability shifts (either north to south, or south to north). The rate of allocation shift is accelerated during periods of high resource availability (high quotas), and effectively "pauses" during periods of low resource availability (quotas below 3 million pounds).
4) Overall, year-year changes in state allocations will be moderate – only the "surplus" quota above 3 million pounds will be "shifted" in any one year. The allocation of the "base" quota of 3 million pounds will be the same as the previous year.

The attached Excel spreadsheet can be used to model outcomes during 2021-25 under various scenarios of regional resource distribution, coastal quota, and trigger points. The spreadsheet assumes 2021 implementation of the new regime; the 2020 quota is allocated according the existing state-by-state allocations.

- Use cells I3 through I7 to adjust annual north vs south biomass distribution.
- Use cells K3 through K7 to adjust annual coastwide commercial quota.
- Use cells L3 through L7 to adjust the trigger.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Summer Flounder, Scup and Black Sea Bass Management Board**

FROM: **Caitlin Starks, FMP Coordinator**

DATE: **July 30, 2019**

SUBJECT: **Review of Summer Flounder, Scup, and Black Sea Bass Discard Mortality**

Per an interest expressed by several members of the Summer Flounder, Scup and Black Sea Bass Management Board (Board), the Board will discuss discard mortality at the 2019 ASFMC Summer Meeting. The purpose of the discussion is to review current information on discard mortality rates in the fisheries, and determine if there is a Board desire to address the issue of discard mortality in any particular fisheries. Areas the Board may wish to address are outlined below, though additional areas could be identified.

- Species-specific discard mortality (summer flounder, scup, and/or black sea bass)
    - Sector-specific discard mortality
        - Recreational discard mortality
            - Recreational discards (quantity)
            - Discard mortality rate
        - Commercial discard mortality
            - Commercial discards (quantity)
            - Discard mortality rate
- Gear-specific discard mortality

If the Board chooses to pursue this topic it should define specific focal areas, as well as the preferred approaches for addressing the issue. Potential approaches for addressing discard mortality could include policy or regulatory changes, education, or research. Depending on which approaches are most appropriate for a given issue, the Board should also consider the appropriate committees to task with necessary analyses and/or strategy development.

The following information on commercial and recreational discard mortality is intended to aid the Board's discussion of the issue for all three species, though the examples mainly focus on black sea bass. All recreational information is based on recalibrated data from the Marine Recreational Information Program (MRIP). Commercial information was provided by the Northeast Fisheries Science Center (NEFSC).

Estimation of Dead Discards

A number of factors can effect discard mortality. The actual mortality rate of discarded fish can be impacted by gear type, depth fished, water temperature, handling time, trauma, and fish size, among other potential variables. Estimates of dead discards are a product of assumed discard mortality rates and estimated discards. The methodology for estimating discards differs by species and fishery sector.

As of the most recent Black Sea Bass Stock Assessment (NEFSC 2017) the assumed discard mortality rate for recreational black sea bass is 15%, based on a combination of academic studies evaluated for the

2016 Black Sea Bass Stock Assessment. For the commercial fishery, 100% mortality was assumed for discards from trawls and sink gillnets because of the depths fished and length of tow or soak time. Discard mortalities of 15% were assumed for pot and hand-line discards, with the rationale that depths fished generally resulted in minimal barotrauma and the volume of fish in a pot catch would result in minimal damage to released fish. Hand-line discard mortality was assumed equivalent to recreational discard mortalities. The assumed discard mortality rates for all three species and the average dead discards in each fishery as a proportion of total removals (equal to landings plus dead discards) for 2015-2017 are included in Table 1.

Over the time series of available data on black sea bass landings and discards, there has been a general trend of increased discards in both the commercial and recreational fisheries, relative to total removals (Figure 1, Table 2). In the last few years, the proportion of black sea bass commercial discards has increased, while the proportion of recreational discards has remained relatively steady. For summer flounder, the proportion of total removals comprised of commercial and recreational discards has also increased in the last several years, as total catch has trended downward along with decreasing catch limits (Figure 2).

Table 1. Summer Flounder, Scup and Black Sea Bass Commercial and Recreational Discard Mortality Rates and Recent Estimates. Source: 2019 Data Update for Summer Flounder and Personal Communication with NEFSC.

Species	**Recreational Discard Mortality Rate**	**Recreational Dead Discards as % of Total Removals in Pounds (average 2015-2017)**	**Commercial Discard Mortality Rate**	**Commercial Dead Discards as % of Total Removals in Pounds (average 2015-2017)**
Summer Flounder	10%	14%	80%	7%
Scup	15%	3%	100%	23%
Black Sea Bass	15%	15%	100% trawls/gillnets; 15% pots/hand lines	8%

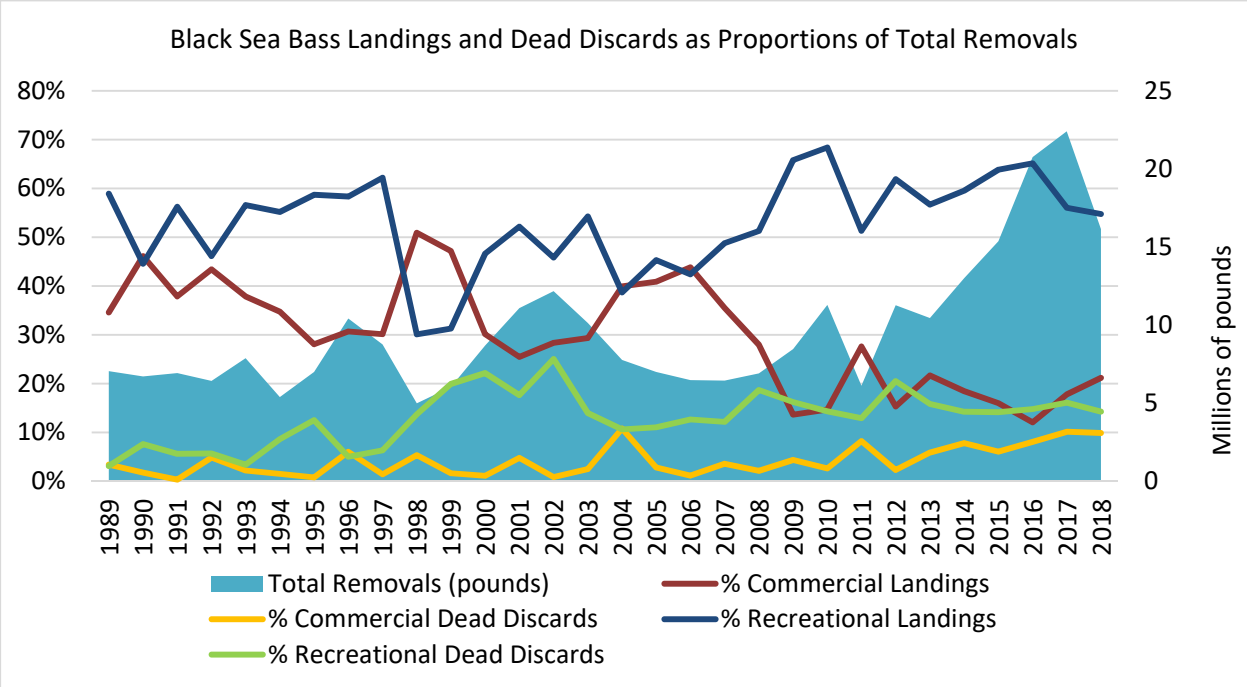

Figure 1. Black sea bass commercial and recreational landings and dead discards as proportions of total removals, compared to quantity of total removals in pounds from 1989-2018. Source: Personal communication with NEFSC, 2019.

Table 2. Black sea bass commercial and recreational landings and dead discards as proportions of total removals from 1989-2018, in pounds. Cells are highlighted on a scale of green to red indicating cell values low to high. All rows sum to 100%. Source: Personal communication with NEFSC, 2019.

	% Commercial Landings	% Commercial Dead Discards	% Recreational Landings	% Recreational Dead Discards
1989	35%	3%	59%	3%
1990	46%	2%	45%	8%
1991	38%	0%	56%	6%
1992	43%	5%	46%	6%
1993	38%	2%	57%	3%
1994	35%	2%	55%	9%
1995	28%	1%	59%	13%
1996	31%	6%	58%	5%
1997	30%	1%	62%	6%
1998	51%	5%	30%	14%
1999	47%	2%	31%	20%
2000	30%	1%	47%	22%
2001	25%	5%	52%	18%
2002	28%	1%	46%	25%
2003	29%	2%	54%	14%
2004	40%	11%	39%	11%
2005	41%	3%	45%	11%
2006	44%	1%	42%	13%
2007	36%	4%	49%	12%
2008	28%	2%	51%	19%
2009	14%	4%	66%	16%
2010	15%	3%	68%	14%
2011	28%	8%	51%	13%
2012	15%	2%	62%	21%
2013	22%	6%	57%	16%
2014	18%	8%	60%	14%
2015	16%	6%	64%	14%
2016	12%	8%	65%	15%
2017	18%	10%	56%	16%
2018	21%	10%	55%	14%

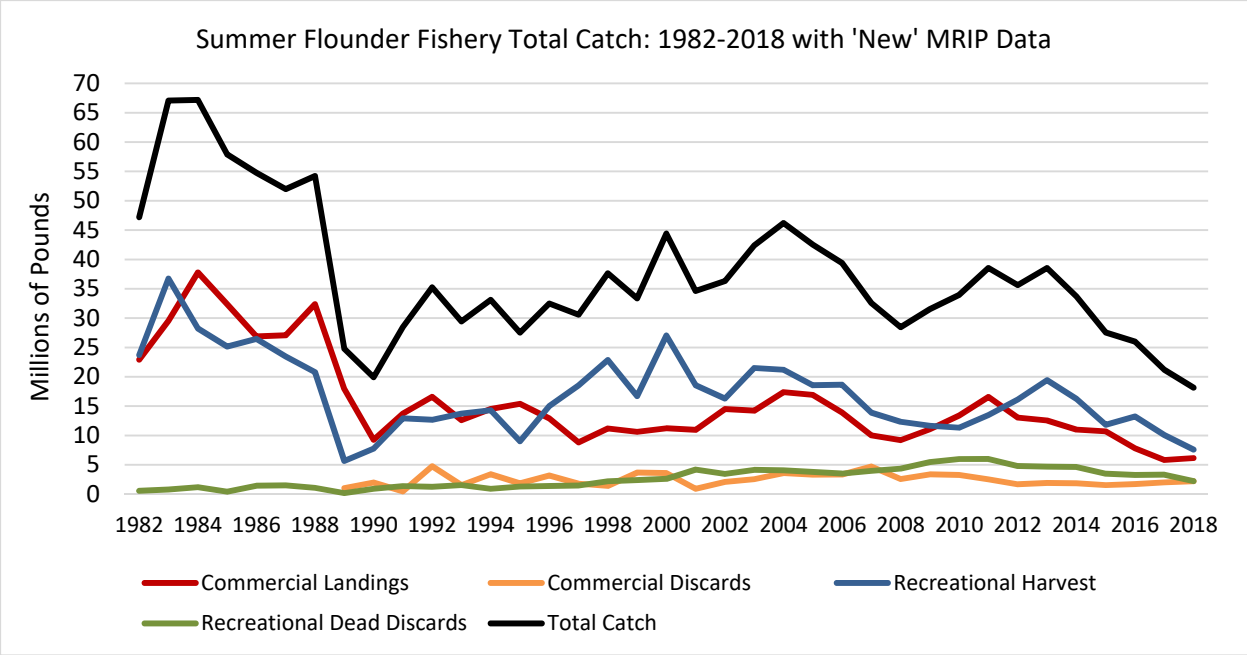

Figure 2. Summer flounder fishery total catch as a sum of discards and landings (millions of pounds; includes 'New' Marine Recreational Information Program [MRIP] estimates of recreational catch). Source: Summer Flounder Data Update for 2019, NEFSC.

Recreational Discards

For black sea bass, recreational harvest in pounds has increased since the beginning of the time series (1989), while harvest in numbers of fish has fluctuated without significant directional change (Figures 3 and 4). The number of fish discarded in the recreational fishery on the other hand, has notably increased over time (Figure 4). This is largely influenced by changes in management including implementation of minimum sizes, possession limits and seasons. Assuming a constant mortality rate of 15%, recreational dead discards have followed a similar trend. However, a recent study suggests that black sea bass hook and line mortality may be higher than 15%; the study estimated mortality rates from 21-52% in 45 meter depths (see report by Jensen et al. provided in the August 2019 Briefing Materials).

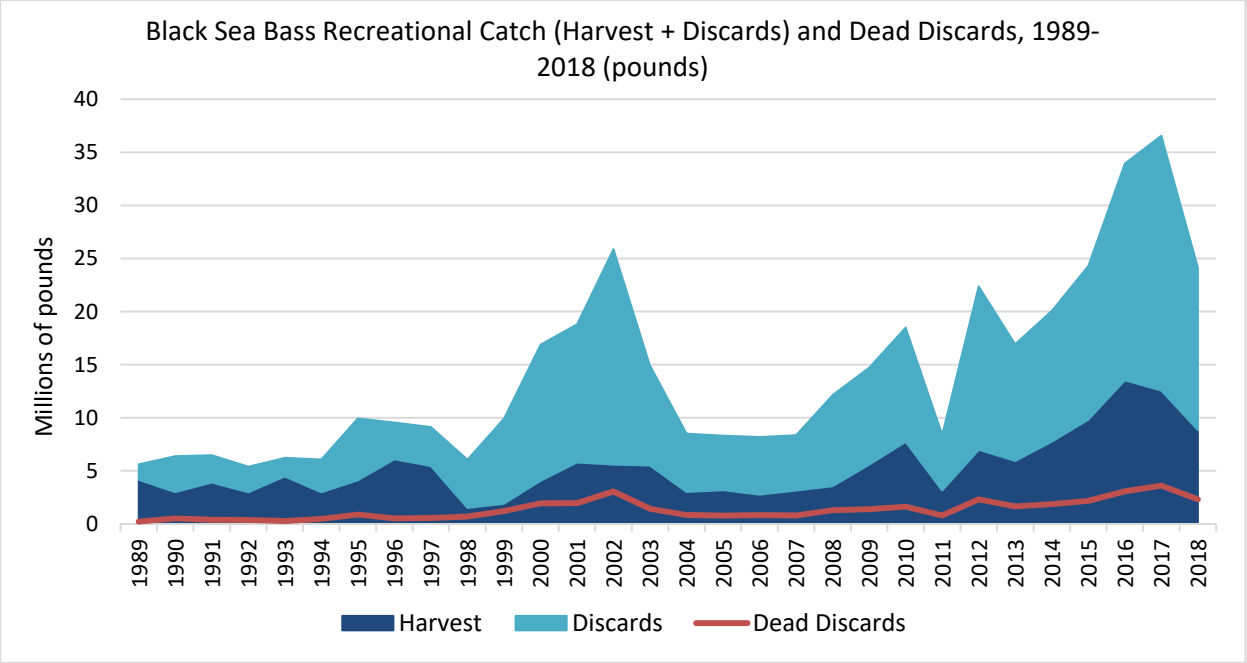

Figure 3. Black Sea Bass Recreational Catch and Discards (pounds), 1989-2018. Source: Personal communication with NEFSC, 2019.

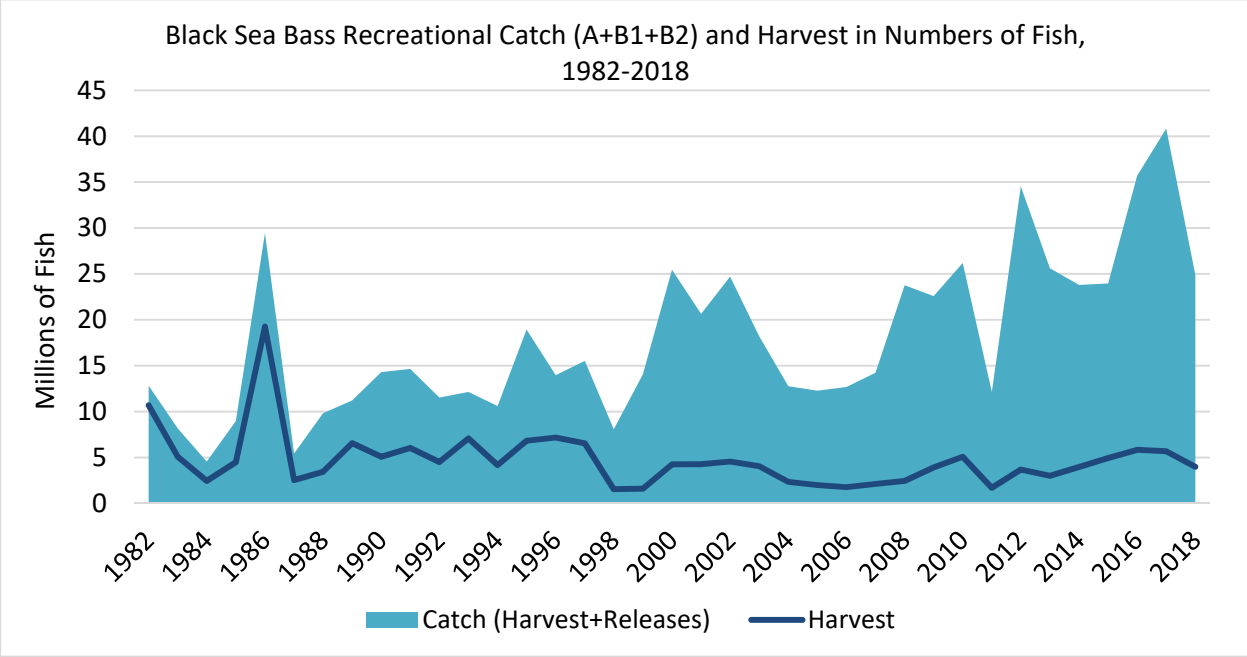

Figure 4. Black Sea Bass Recreational Catch and Harvest (numbers of fish), 1989-2018. Source: MRIP, 2019.

Discards and Fishery Specifications

In the process of setting specifications for summer flounder, scup and black sea bass, expected discards are taken into account when establishing the appropriate annual catch limits (ACLs) for the commercial and recreational fisheries. For black sea bass, expected discards are produced by first dividing the Acceptable Biological Catch (ABC) into expected landings and discards based on the most recent three year average of the relative proportions of landings and discards. Then, the amount of discards is divided between the commercial and recreational sectors using the most recent three year average of the proportion of total discards from each fishery sector. Expected discards for each sector are subtracted from their respective annual catch targets (set equal to or less than the ACLs to account for management uncertainty) to determine the commercial quota and recreational harvest limit (see Figure 5). This approach assumes that the relative proportions of landings and discards, and the relative proportions of commercial and recreational discards will be similar in the future as the past three years. For summer flounder and scup, the stock assessments project landings and discards separately, so projected commercial and recreational discards used to establish harvest limits are derived directly from the stock assessments. Figure 6 shows a flowchart of the 2019 summer flounder specifications including the values used for expected commercial and recreational discards.

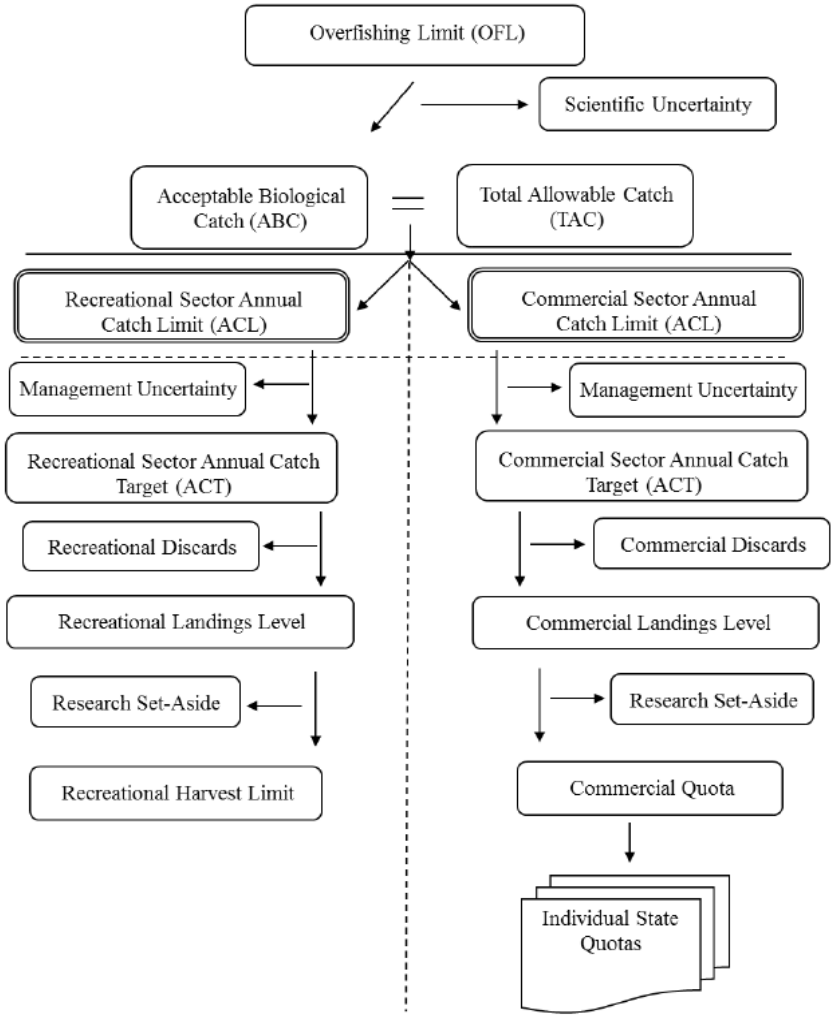

Figure 5. Flowchart for summer flounder and black sea bass catch and landings limits. The research set-aside program was suspended in 2014.

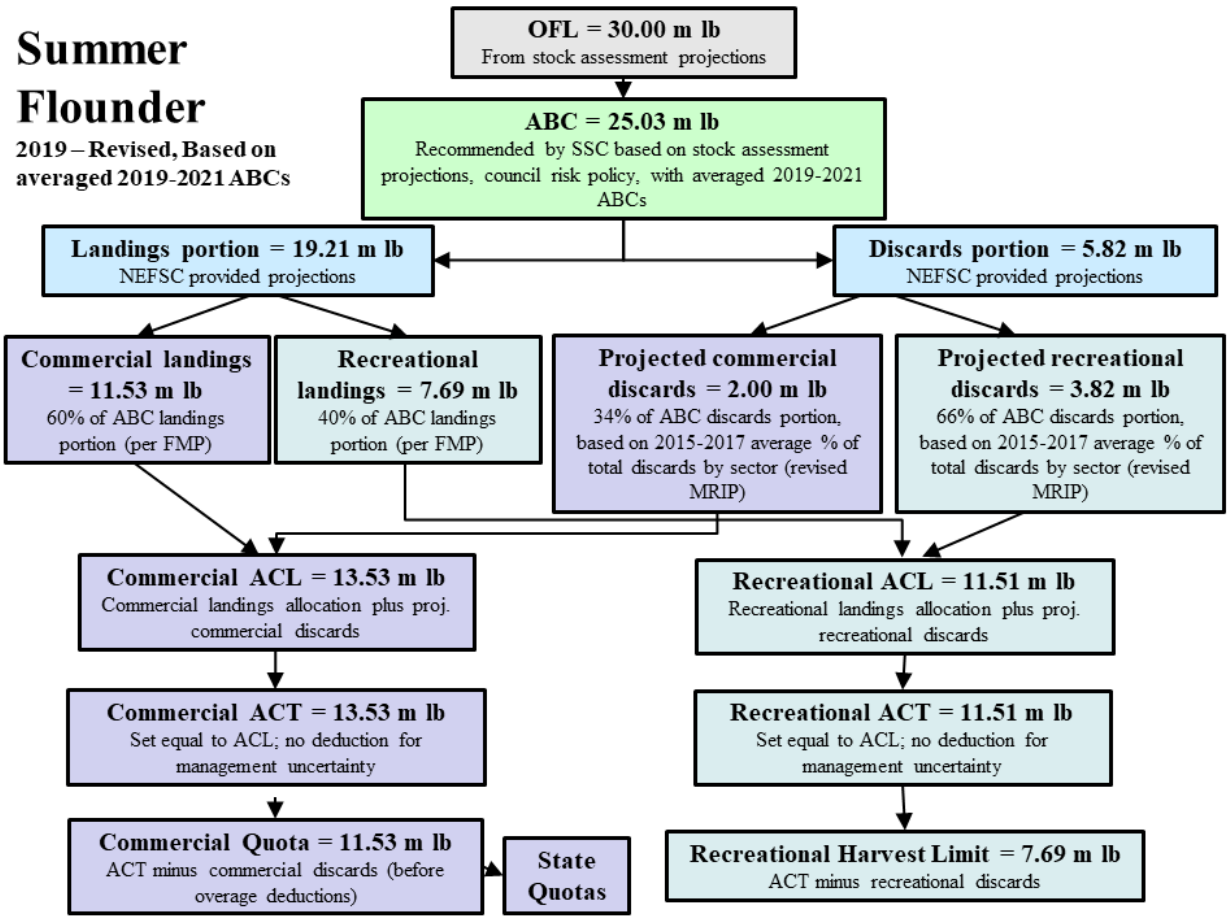

Figure 6. Summer flounder 2019 specifications flowchart.

REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR
TAUTOG
(Tautoga onitis)

2018 Fishing Year
(January 1 – December 31)

Prepared by:
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2019 REVIEW OF THE
ASMFC FISHERY MANAGEMENT PLAN FOR
TAUTOG (*Tautoga onitis*)
2018 Fishing Year

Management Summary

Management Documents:	Fishery Management Plan - March 1996 Addendum I to FMP (May 1997) Addendum II to FMP (November 1999) Addendum III to FMP (February 2002) Addendum IV to FMP (January 2007) Addendum V to FMP (August 2007) Addendum VI to FMP (March 2011, revised March 2012) Amendment 1 to FMP (October 2017)
Management Unit:	US state waters from Massachusetts through Virginia[1].
Declared Interest:	Massachusetts Rhode Island Connecticut New York New Jersey Delaware Maryland Virginia National Marine Fisheries Service U.S. Fish & Wildlife Service
Active Boards/Committees:	Tautog Management Board (Board) Tautog Plan Development Team (PDT) Tautog Plan Review Team (PRT) Tautog Technical Committee (TC) Tautog Stock Assessment Subcommittee (SAS) Tautog Advisory Panel (AP)
Stock Assessments:	Benchmark: 1999, 2005, 2015 Update: 2011 (revised in 2012), 2016

[1] North Carolina was originally included in the management unit, but as of 2017 was removed due to insignificant landings. North Carolina's landings will continue to be monitored.

I. Status of Fishery Management Plan

Fishery Management Plan for Tautog

The original FMP responded to concerns about the vulnerability of tautog to overfishing and increasing fishing pressure in the early 1990s. It established goals and objectives for tautog management, and adopted a fishing mortality rate (F) target of 0.15 to rebuild the stocks and prevent overfishing; however, an interim target of 0.24 was applied for two years (1997–1998). States were required to implement state-specific, Board-approved plans to reduce F from the coastwide average of 0.58 (i.e., a 55% reduction), or an alternative state-specific F, if it could be demonstrated as equivalent. Recreational and commercial minimum size limits of 13" in 1997 and 14" beginning in 1998 were required. Tautog pots and traps were also required to have degradable fasteners on one panel or door.

Addendum I

Addendum I modified the FMP's compliance schedule to allow all states until April 1, 1998 to implement management measures to reach the interim F target. Several states were having difficulty determining a state-specific F to meet the original compliance schedule due to data deficiencies. In addition, the compliance schedule implemented the interim F target one year earlier in the area north of Delaware Bay (April 1, 1997) than further to the south (April 1, 1998). The addendum also delayed the implementation of management measures to achieve the permanent F target from April 1, 1999 to April 1, 2000. Finally, the Addendum included *de minimis* requirements and corrected several typographical errors in the FMP.

Addendum II

Addendum II further extended the compliance schedule to achieve the permanent F target until April 1, 2002 because the effects of the regulations to achieve the interim F target were uncertain. It also listed four issues to be considered in subsequent revisions of the FMP: (1) development of alternative F targets that will allow states to quantify harvest reductions associated with a variety of management approaches, (2) clarification of the F targets to be met by sector or overall state program, (3) monitoring requirements to improve fisheries and biological data collection, and (4) data requirements to analyze management options by fishing modes within commercial and recreational fisheries.

Addendum III and Technical Addendum I

Addendum III addressed the four issues listed in Addendum II. It adopted a new F target based on achieving 40% of the spawning stock biomass ($F_{40\% SSB}$), which was estimated at 0.29 (compared to the coastwide average F estimate of 0.41). The addendum required states to maintain current or more restrictive measures for 2002 and implement measures to achieve the new F target—a 48% reduction through restrictions in the recreational fishery only—by April 1, 2003. It also updated information on tautog habitat and established monitoring requirements to support stock assessments. Technical Addendum 1 corrected a typographical error in Addendum III.

Addendum IV

Addendum IV established SSB target and threshold reference points based on a benchmark stock assessment completed in 2005. The target was set as the average SSB over 1982–1991, and the threshold at 75% of this value. It also set a new F target of 0.20 to initiate rebuilding. States were required to implement recreational management programs to achieve a 28.6% reduction in F relative to 2005 (and maintain existing commercial management programs) by January 1, 2008.

Addendum V

As individual states developed management proposals to comply with Addendum IV's mandated reduction in fishing mortality, it became apparent that commercial harvest of tautog had grown in proportion to the recreational fishery in some states. The Board approved Addendum V to give states flexibility for implementing reductions in their recreational *and/or* commercial fisheries to reach the fishing mortality target rate of F = 0.20 established in Addendum IV by January 1, 2008.

Addendum VI

Based on the 2011 stock assessment update indicating that tautog were still overfished and experiencing overfishing, Addendum VI reduced the F target to 0.15 to rebuild the stock. States were required to implement Board-approved regulations in their commercial and/or recreational fisheries to reduce harvest by 39%. The addendum also allowed for regional considerations if a state or group of states could demonstrate that the local F is below the rates indicated in the stock assessment update.

Amendment 1

Amendment 1 replaced the original FMP, with an implementation date of April 1, 2018 for most measures. Major revisions to the FMP include: new goals and objectives, establishment of four tautog stocks for regional recreational and commercial management, and creation of a commercial harvest tagging program (implementation in 2020).

Goals:

- To sustainably manage tautog over the long-term using regional differences in biology and fishery characteristics as the basis for management.
- To promote the conservation and enhancement of structured habitat to meet the needs of all stages of tautog's life cycle.

Objectives:

- To develop and implement management strategies to rebuild tautog stocks to sustainable levels (reduce fishing mortality to the target and restore spawning stock biomass to the target), while considering ecological and socio-economic impacts.
- To adopt compatible management measures among states within a regional management unit.
- To encourage compatible regulations between the states and the EEZ, which includes enacting management recommendations that apply to fish landed in each state (i.e., regulations apply to fish caught both inside and outside of state waters).

- To identify important habitat and environmental quality factors that support the long-term maintenance and productivity of sustainable tautog populations throughout their range.
- To promote cooperative interstate biological, social, and economic research, monitoring and law enforcement.
- To encourage sufficient monitoring of the resource and collection of additional data, particularly in the southern portion of the species range, that are necessary for development of effective long-term management strategies and evaluation of the management program.
- To work with law enforcement to minimize factors contributing to illegal harvest.

Regional Management: Based on the 2016 regional stock assessment, Amendment 1 delineates the stock into four regions due to differences in biology and fishery characteristics: Massachusetts - Rhode Island (MARI); Long Island Sound (LIS); New Jersey - New York Bight (NJ-NYB); and Delaware - Maryland - Virginia (DelMarVa). The four regions are required to implement measures to achieve the regional fishing mortality target with at least a 50% probability.

The 2016 assessment found that all regions except MARI were overfished, and overfishing was occurring in the LIS and NJ-NYB regions in 2015. As such, Amendment 1 requires the LIS region to reduce harvest by at least 20.3%, and the NJ-NYB region to reduce harvest by at least 2%. The MARI and DelMarVa regions were not required to reduce harvest, but established regional measures.

Commercial Harvest Tagging Program: Amendment 1 also establishes a commercial harvest tagging program to address an illegal, unreported and undocumented fishery. Implementation of the program is scheduled for 2020.

II. Status of the Stocks

Current stock status is based on the 2016 stock assessment update. The assessment evaluates each of the four regions—MARI, LIS, NJ–NYB, and DelMarVa–separately using the ASAP statistical catch-at-age model with landings and index data through 2015. The assessment update indicated that all regions except MARI were overfished in 2015. It also found overfishing was occurring in the LIS and NJ-NYB regions in 2015. Overfishing was not occurring in the MARI nor DelMarVa regions. F was at the target in the DelMarVa region. The current overfishing and overfished definitions for management use are shown in Table 1, and spawning stock biomass (SSB) for each region relative to the respective targets and thresholds are shown in Figures 1-4. It is important to note that the status determinations were made using spawning potential ratio (SPR) reference points for the MARI, NJ-NYB and DelMarVa regions, and maximum sustainable yield (MSY) reference points for the LIS region.

III. Status of Assessment Advice

The current reference points for this fishery are based on a regional stock assessment update that includes data through 2015. The peer review panel in the 2005 and 2015 benchmark stock assessments advised a regional approach for tautog because of the potential for sub-stock structure; this species does not appear to make north-south migrations. The 2015 benchmark stock assessment peer review panel also endorsed the use of estimates from the ASAP regional model and supported use of the new reference points in conjunction with a regional management approach. A regional approach with new reference points has been adopted for management use through Amendment 1.

Since the last assessment, NOAA Fisheries has implemented improvements to the Marine Recreational Information Program's survey methodology for estimating recreational catch. A multi-year transition of the methods was completed in 2018, requiring the catch estimates for 1981–2017 to be calibrated for comparison to all subsequent years' estimates. Changes to the original 1981–2017 catch estimates are significant; for example, annual coastwide harvest (by weight) increased in all years—by 27% to 323%—after calibration. The next tautog stock assessment, tentatively scheduled as an update in 2021, will include the revised time series of recreational catch estimates. ***All recreational catch estimates included in this report reflect the current MRIP survey methodology.***

IV. Status of the Fishery

Total Harvest

Between 1981 and 2018[2], total coastwide tautog harvest (recreational + commercial) peaked at 22.5 million pounds in 1986. Harvest has since significantly declined, even before state regulations were implemented to restrict them. Total harvest during the ASMFC managed period (1997–2018) has averaged 7.5 million pounds per year (Figure 5, Table 2).

Recreational Harvest

Tautog is predominantly taken by the recreational fishery: 95% on average, by weight (Table 2). Coastwide, anglers harvested historic highs of over 21 million pounds of tautog in 1986 and 1992 (Figure 5). Since then, harvest has declined, fluctuating between 3.4 million pounds (in 2018) and 11.8 million pounds (in 2014). Most recreational harvest occurs in September–December (Figure 6). At the state level, Rhode Island and New Jersey anglers harvested the most tautog in 2018 (Tables 4 and 5) though high harvesting states have varied significantly in recent years (Figure 7).

Recreational live discards have generally increased relative to harvest over the time series. Prior to the FMP's implementation in 1996, discards were usually less than harvest, but since then the estimated number of fish discarded annually has been several times greater than the harvested number (Table 4). In 2018, live discards were nine times the estimated harvest. A

[2] Systematic recreational data collection for tautog began in 1981, while commercial data exists back to 1950.

discard mortality rate of 2.5% is assumed for the recreational tautog fishery, resulting in an estimated 239,252 recreational dead discards in 2018. This equates to 18% of recreational removals.

Commercial Landings

Historically, tautog was considered a "trash fish" until the late 1970s, when demand increased, and a directed commercial fishery developed. Landings quickly rose, peaking in 1987 at nearly 1.2 million pounds, then rapidly began to decline. In 1992, states began to implement commercial regulations, which contributed to a decline in landings (Figure 8, Table 2). The price (dollars per pound) for tautog has steadily increased since the late 1970s. In 2018, the coastwide average price reached $3.98 per pound (Figure 8).

Commercial landings accounted for 5% of total coastwide harvest in 2018. In some states commercial landings were more significant, e.g., 25% of New York's total 2018 harvest (Table 3). New York also had the most commercial landings of tautog in 2018, with Massachusetts landing the second greatest amount (Table 6). Data on commercial discards are not available.

V. Status of Research and Monitoring

Addendum III requires all states to collect the following data to continue support of a coast-wide stock assessment: commercial and recreational catch estimates, and 200 age and length samples per state, within the range of lengths commonly caught by the fisheries[3]. Table 9 lists the number and source of samples collected by states in 2018.

Ongoing fishery-independent and fishery-dependent monitoring programs performed by each state are summarized in Tables 10 and 11, respectively. Details of monitoring results are found in the state compliance reports.

VI. Status of Management Measures and Issues

Amendment 1 to the Tautog Fishery Management Plan was approved by the Board in October 2017. All measures within the plan, including regional management programs, have been implemented as of January 2018 with the exception of the commercial tagging program. The commercial tagging program is currently being developed by state and ASMFC staff and has a tentative implementation date of January 1, 2020.

VII. Implementation of FMP Compliance Requirements

A. Submission of Compliance Report

[3] Addendum III also required a suitable time series of fisheries independent indices of abundance as determined by the Tautog Technical Committee; however, the TC has not defined this and as such there are no fishery independent monitoring requirements.

All states in the tautog management unit submitted state compliance reports for the 2018 fishing year.

B. De Minimis Status Requests

A state may apply for *de minimis* status with regards to its commercial fishery. To qualify for *de minimis* status a state must prove that its commercial landings in the most recent year for which data are available did not exceed 10,000 pounds or 1% of the regional commercial landings, whichever is greater. States must request *de minimis* status each year, and requests for *de minimis* status will be reviewed by the PRT as part of the annual FMP review process.

If *de minimis* status is granted, the *de minimis* state is required to implement the commercial minimum size provisions, the pot and trap degradable fastener provisions, and regulations consistent with those in the recreational fishery (including possession limits and seasonal closures). The state must monitor its landings on at least an annual basis. If granted *de minimis* status, a state must continue to collect the required 200 age/length samples. *De minimis* status does not impact a state's compliance requirements in the recreational fishery.

The commercial landings threshold for *de minimis* status for 2018 in each region is 10,000 pounds. The states of Delaware and Maryland have requested and qualify for continued *de minimis status* for the commercial sector. The PRT recommends that the Board approve the states of Delaware and Maryland's requests.

C. Regulatory Requirements: 14" minimum size limit for recreational and commercial fisheries; degradable fasteners on one panel or door in fish pots and traps; and regional management programs to achieve the required regional target F.

State regulations are summarized in Tables 7 and 8. Nearly every state adjusted their commercial and recreational measures to comply with the provisions of Amendment 1.The PRT finds that each state has met the regulatory requirements and recommends the Board find all states in compliance with the regulatory requirements.

D. Biological Sampling Requirements: commercial and recreational catch estimates; and 200 age/length samples (Addendum III)

Nearly all states collected 200 or more age/length samples in 2018 as required by Addendum III (Table 9). New York, Delaware and Virginia fell short of the required number of samples, with 148, 134, and 26 samples, respectively. New York noted difficulty in obtaining samples from fish markets at times because the racks were being sold. In past years, NYSDEC had been able to obtain samples via contractor; however, the agreement ended in June 2017 and has not been renewed. In Virginia, much of samples are collected through a donation freezer as part of the Marine Sportfish Collection program. In 2018, the marina where the donation freezer was located closed and freezer was removed, significantly reducing the number of samples

collected. Delaware indicated they have been challenged to collect 200 samples from the recreational fishery due to less cooperation in receiving donated fish from recreational for-hire trips.

The PRT finds that all states met (or tried to meet) the intent of the sampling requirements and recommends the Board find all states in compliance with the sampling requirements of the FMP. Additionally, the PRT noted the need to maintain the 200 sample requirement as the Technical Committee has indicated this is the minimum number of samples needed.

VIII. Prioritized Research Needs

The Technical Committee identified the following research recommendations to improve the stock assessment and our understanding of tautog population and fishery dynamics. Research recommendations are organized by topic and level of priority. Research recommendations that should be completed before the next benchmark assessment are underlined. The Technical Committee will update these recommendations as part of the next benchmark stock assessment.

8.1 Fishery-Dependent Priorities

High

- Expand biological sampling of the commercial catch for each gear type over the entire range of the stock (including weight, lengths, age, sex, and discards).
- Continue collecting opercula from the tautog catch as the standard for biological sampling in addition to collecting paired sub-samples of otoliths and opercula.
- Increase catch and discard length sampling from the commercial and recreational fishery for all states from Massachusetts through Virginia.
- Increase collection of effort data for determining commercial and recreational CPUE.
- Increase MRIP sampling levels to improve recreational catch estimates by state and mode. Current sampling levels are high during times of the year when more abundant and popular species are abundant in catches, but much lower in early spring and late fall when tautog catches are more likely.

8.2 Fishery-Independent Priorities

High

- Conduct workshop and pilot studies to design a standardized, multi-state fishery independent survey for tautog along the lines of MARMAP and the lobster ventless trap survey.

- Establish standardized multi-state long-term fisheries-independent surveys to monitor tautog abundance and length-frequency distributions, and to develop YOY indices.
- Enhance collection of age information for smaller fish (<20 cm) to better fill in age-length keys

8.3 Life History, Biological, and Habitat Priorities

Moderate

- Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insight into questions of aggregation versus recruitment to artificial reef locations, and to clarify the need for local and regional assessment.
- Assemble regional reference collections of paired operculum and otolith samples and schedule regular exchanges to maintain and improve the precision of age readings between states that will be pooled in the regional age-length keys.
- Calibrate age readings every year by re-reading a subset of samples from previous years before ageing new samples. States that do not currently assess the precision of their age readings over time should do so by re-ageing a subset of their historical samples.

Low

- Evaluate the potential impacts of climate change on tautog range, life history, and productivity.
- Conduct a tag retention study to improve return rates, particularly in the northern region.
- Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species. It is critical to protect these habitats or to stimulate restoration or enhancement, if required.
- Define the specific spawning and pre-spawning aggregating areas and wintering areas of juveniles and adults used by all major local populations, as well as the migration routes used by tautog to get to and from spawning and wintering areas and the criteria or times of use. This information is required to protect these areas from damage and overuse or excessive exploitation.
- Define larval diets and prey availability requirements. This information can be used as determinants of recruitment success and habitat function status. Information can also be used to support aquaculture ventures with this species.
- Define the role of prey type and availability in local juvenile/adult population dynamics over the species range. This information can explain differences in local abundance, movements, growth, fecundity, etc. Conduct studies in areas where the availability of primary prey, such as blue mussels or crabs, is dependent on annual recruitment, the effect of prey recruitment variability as a factor in tautog movements (to find better

prey fields), mortality (greater predation exposure when leaving shelter to forage open bottom), and relationship between reef prey availability/quality on tautog condition/fecundity.

- Define the susceptibility of juveniles to coastal/anthropogenic contamination and resulting effects. This information can explain differences in local abundance, movements, growth, fecundity, and serve to support continued or increased regulation of the inputs of these contaminants and to assess potential damage. Since oil spills seem to be a too frequent coastal impact problem where juvenile tautog live, it may be helpful to conduct specific studies on effects of various fuel oils and typical exposure concentrations, at various seasonal temperatures and salinities. Studies should also be conducted to evaluate the effect of common piling treatment leachates and common antifouling paints on YOY tautog. The synergistic effects of leaked fuel, bilge water, treated pilings, and antifouling paints on tautog health should also be studied.
- Define the source of offshore eggs and larvae (in situ or washed out coastal spawning).
- Confirm that tautog, like cunner, hibernate in the winter, and in what areas and temperature thresholds, for how long, and if there are special habitat requirements during these times that should be protected or conserved from damage or disturbance. This information will aid in understanding behavior variability and harvest availability.

8.4 Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Collect data to assess the magnitude of illegal harvest of tautog and the efficacy of the tagging program.

Low

- Collect basic sociocultural data on tautog user groups including demographics, location, and aspects of fishing practices such as seasonality.

Figures & Tables

Figure 1. Estimated spawning stock biomass, with target and threshold levels, for MARI region.
Source: 2016 ASMFC Tautog Stock Assessment Update.

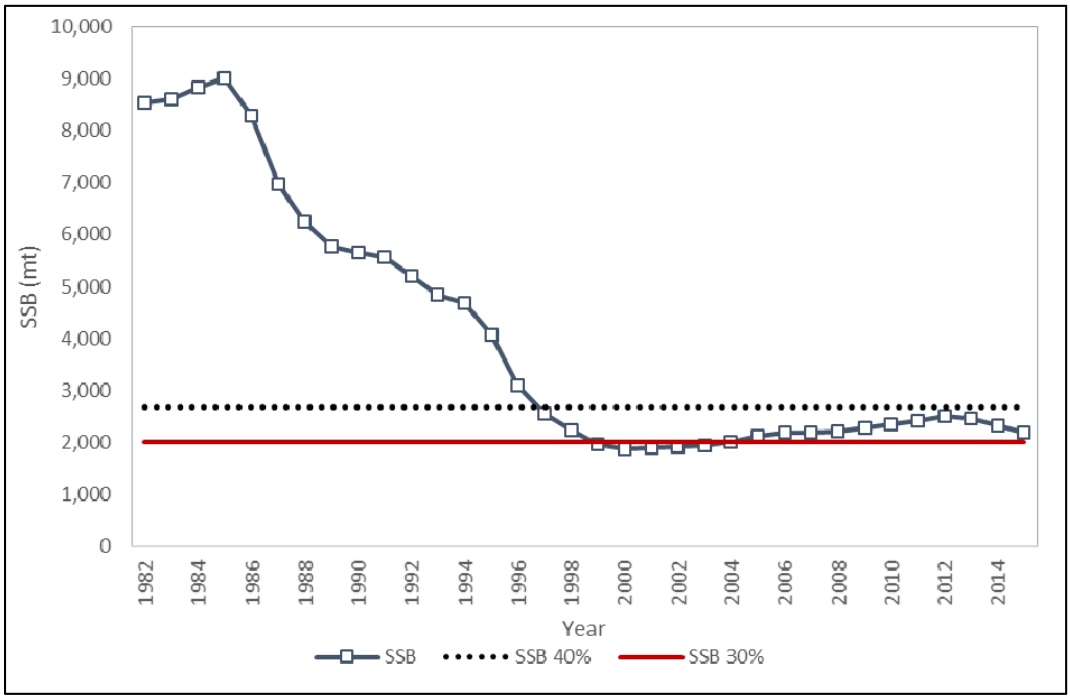

Figure 2. Estimated spawning stock biomass, with target and threshold levels, for LIS region.
Source: 2016 ASMFC Tautog Stock Assessment Update.

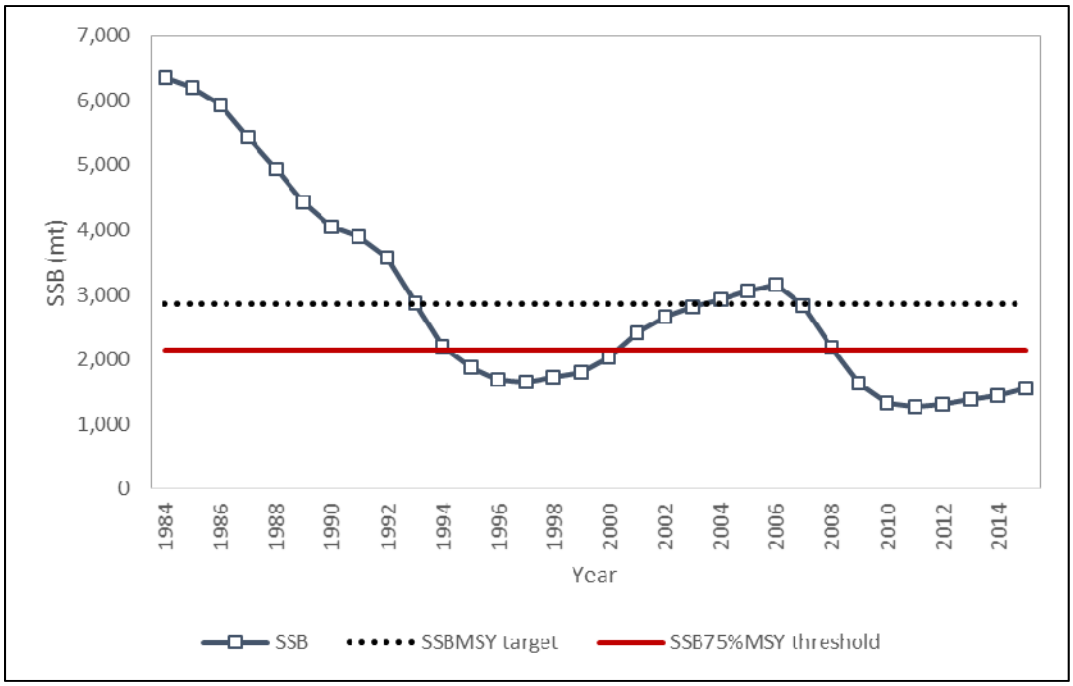

Figure 3. Estimated spawning stock biomass, with target and threshold levels, for NJ-NYB region.
Source: 2016 ASMFC Tautog Stock Assessment Update.

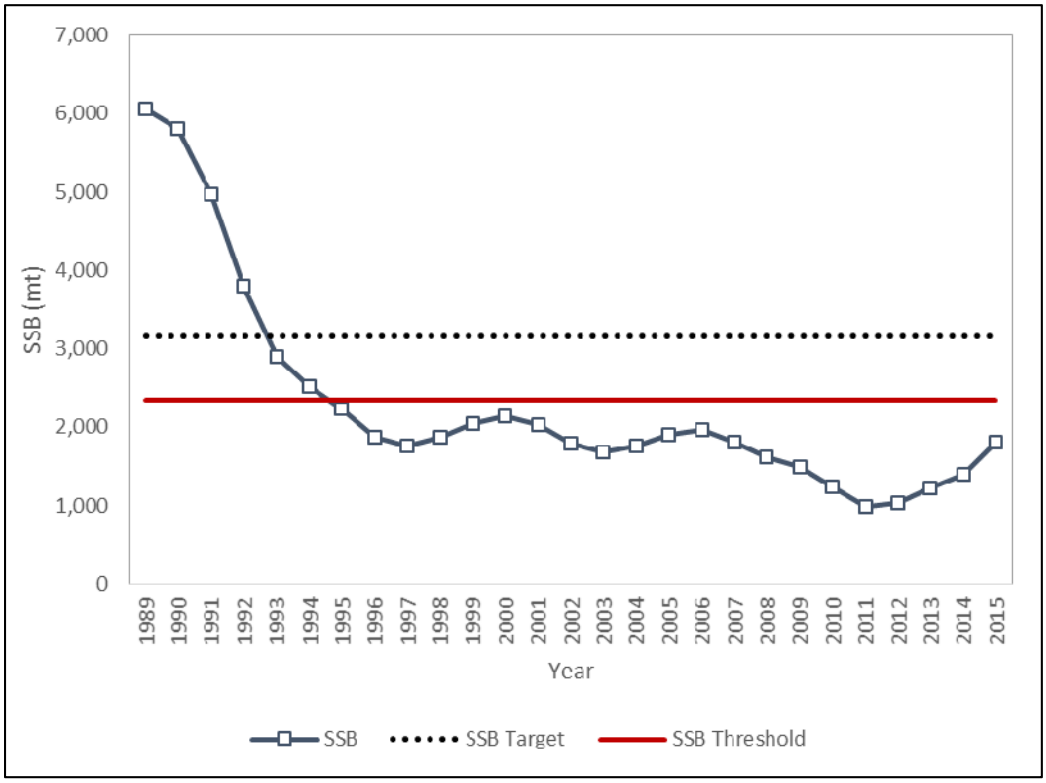

Figure 4. Estimated spawning stock biomass, with target and threshold levels, for DelMarVa region.
Source: 2016 ASMFC Tautog Stock Assessment Update.

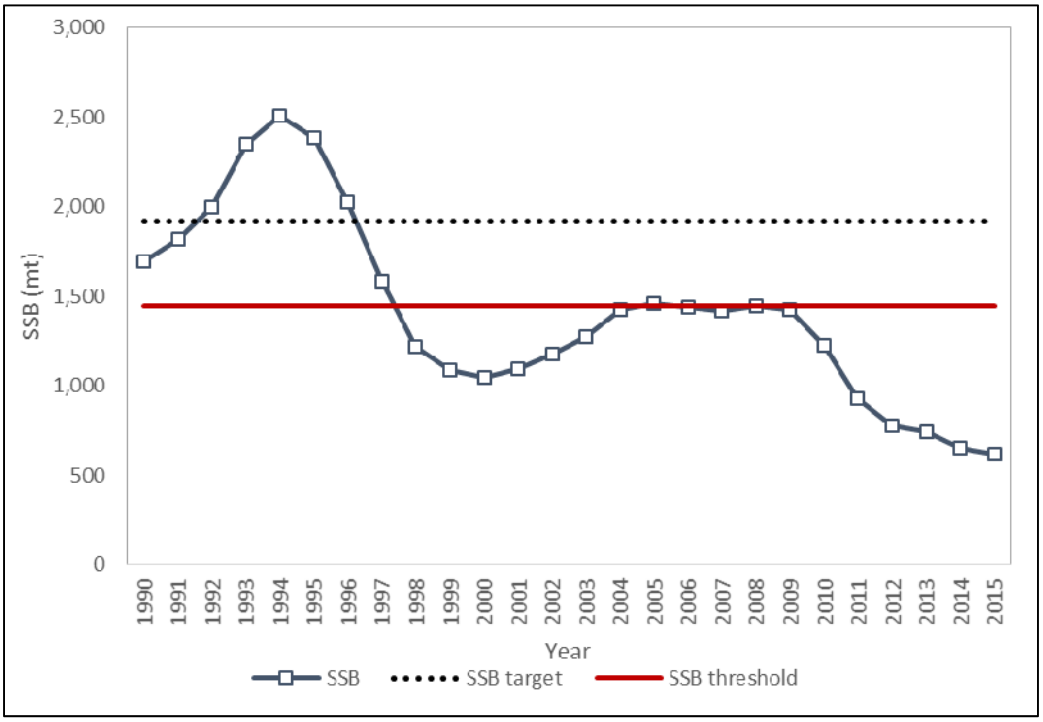

Figure 5. Total tautog harvest (recreational and commercial), 1981–2018.
Source: NMFS, MRIP.

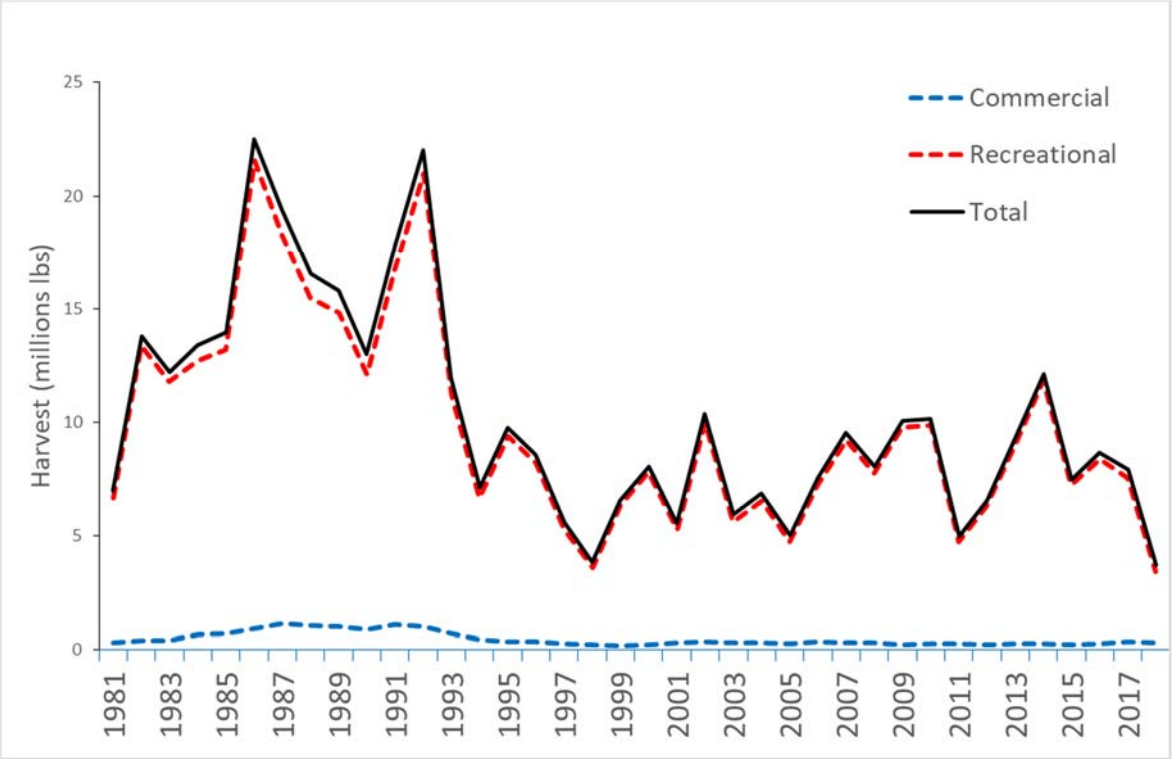

Figure 6. Percent of annual recreational tautog harvest by wave (2016-2018). Source: MRIP.

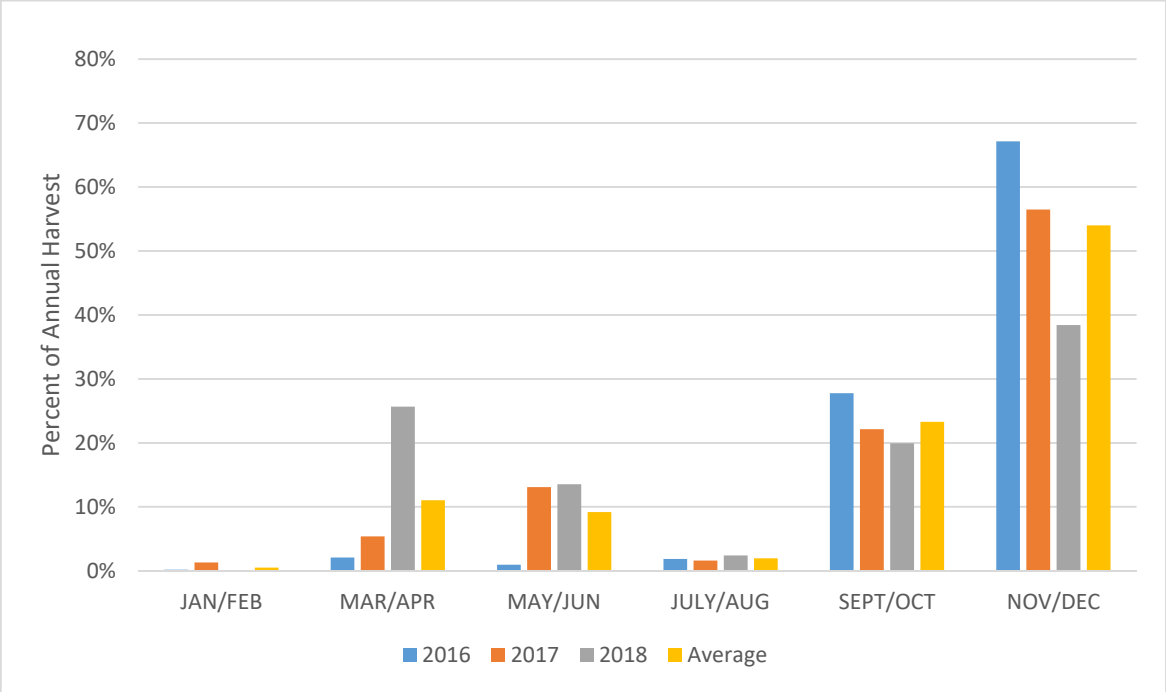

Figure 7. Percent of annual recreational tautog harvest by state (2016-2018). Source: MRIP

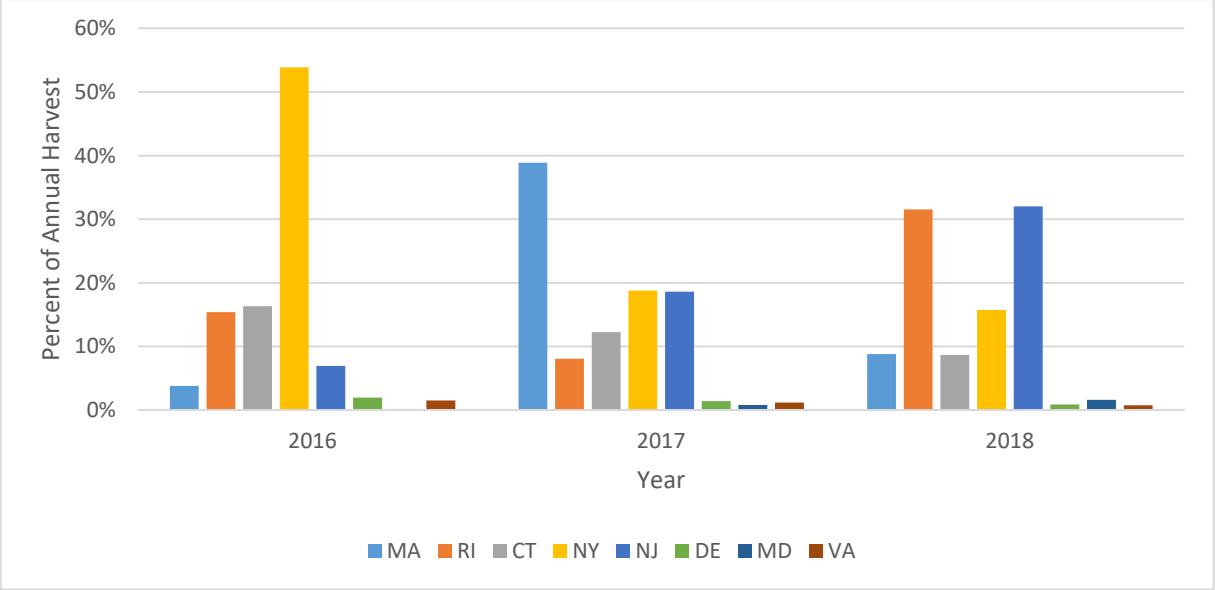

Figure 8. Changes in tautog commercial landings (lbs) and price ($/lb) over time, 1950–2018. Source: NMFS. Price unadjusted for inflation.

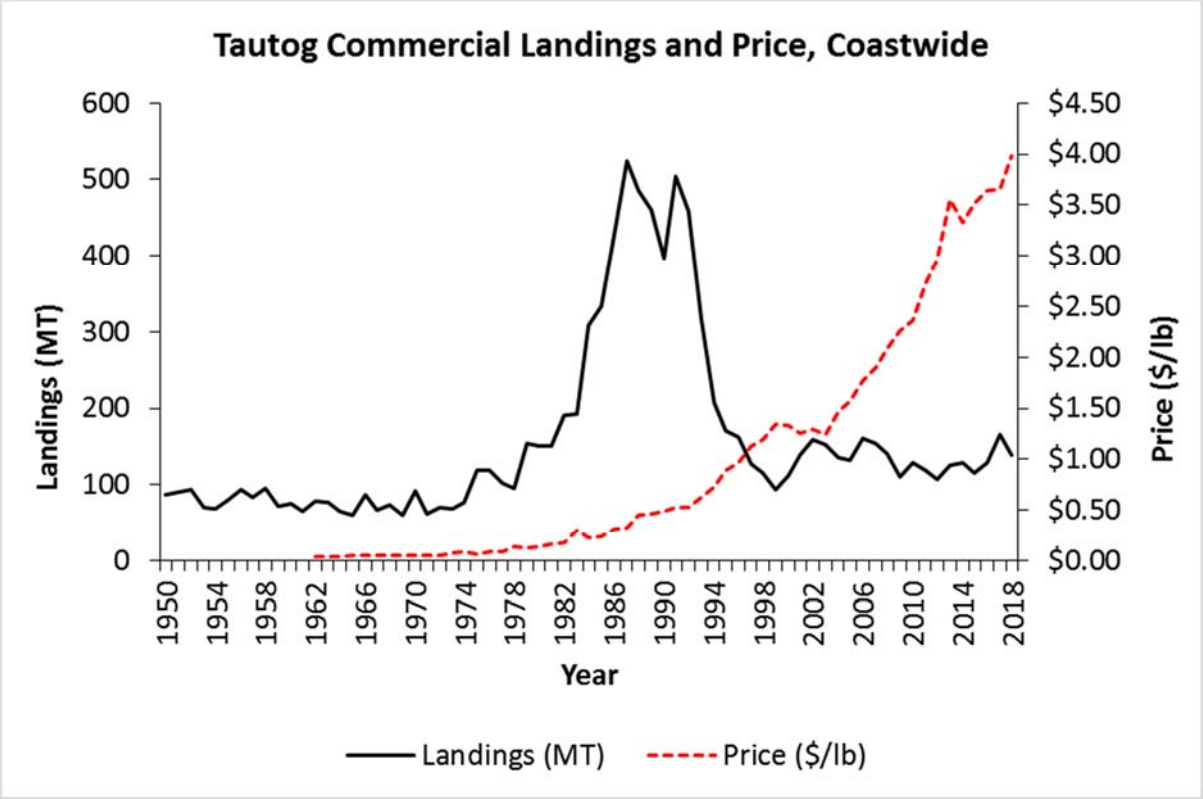

Table 1. Current fishing mortality and biomass targets and thresholds for each region, and stock status in 2015. Source: ASMFC 2016 Tautog Assessment Update.

Region	F_{target}	$F_{threshold}$	F_{3yravg}	SSB_{target}	$SSB_{threshold}$	SSB_{2015}	MSY or SPR	Status
MARI	0.28	0.49	0.23	2,684 mt	2,004 mt	2,196 mt	SPR	Not overfished, overfishing not occurring
LIS	0.28	0.49	0.51	2,865 mt	2,148 mt	1,603 mt	MSY	Overfished, overfishing
NJ-NYB	0.20	0.34	0.54	3,154 mt	2,351 mt	1,809 mt	SPR	Overfished, overfishing
DelMarVa	0.16	0.24	0.16	1,919 mt	1,447 mt	621 mt	SPR	Overfished, overfishing not occurring

Table 2. Tautog recreational and commercial landings, 1981–2018, in pounds.
Source: State Compliance Reports, NMFS, and ACCSP Data Warehouse.

Year	Commercial Landings (lbs)	Recreational Harvest, A + B1 (lbs)	Total Harvest (lbs)	% Recreational
1981	331,900	6,657,814	6,989,714	95.3
1982	419,556	13,352,817	13,772,373	97.0
1983	425,519	11,781,286	12,206,805	96.5
1984	677,615	12,730,550	13,408,165	94.9
1985	734,370	13,214,787	13,949,157	94.7
1986	940,806	21,574,556	22,515,362	95.8
1987	1,157,100	18,245,557	19,402,657	94.0
1988	1,070,814	15,491,783	16,562,597	93.5
1989	1,016,431	14,795,435	15,811,866	93.6
1990	873,505	12,113,635	12,987,140	93.3
1991	1,110,111	16,749,359	17,859,470	93.8
1992	1,012,172	21,005,700	22,017,872	95.4
1993	698,440	11,233,660	11,932,100	94.1
1994	459,490	6,655,117	7,114,607	93.5
1995	375,567	9,398,724	9,774,291	96.2
1996	357,434	8,218,590	8,576,024	95.8
1997	280,912	5,314,384	5,595,296	95.0
1998	254,186	3,611,576	3,865,762	93.4
1999	207,981	6,350,388	6,558,369	96.8
2000	247,177	7,795,564	8,042,741	96.9
2001	305,193	5,249,781	5,554,974	94.5
2002	350,820	9,998,665	10,349,485	96.6
2003	336,685	5,630,853	5,967,538	94.4
2004	300,749	6,546,309	6,847,058	95.6
2005	289,984	4,755,445	5,045,429	94.3
2006	355,504	7,219,077	7,574,581	95.3
2007	340,925	9,189,558	9,530,483	96.4
2008	310,940	7,758,609	8,069,549	96.1
2009	243,644	9,801,365	10,045,009	97.6
2010	286,081	9,863,150	10,149,231	97.2
2011	263,241	4,740,790	5,004,031	94.7
2012	236,974	6,315,699	6,552,673	96.4
2013	275,839	9,017,101	9,292,940	97.0
2014	282,624	11,831,114	12,113,738	97.7
2015	255,915	7,246,071	7,501,986	96.6
2016	283,906	8,392,901	8,676,807	96.7
2017	364,736	7,546,839	7,911,575	95.4
2018	309,568	3,413,926	3,723,494	91.7
Average	474,853	9,758,119	10,232,927	95

Table 3. 2018 tautog landings by sector: percent recreational and commercial by weight.

State	Commercial Landings (%)	Recreational (A+B1) (%)
MA	16.9	83.1
RI	4.6	95.4
CT	2.4	97.6
NY	25.8	74.2
NJ	0.1	99.9
DE	1.0	99.0
MD	0.5	99.5
VA	16.7	83.3
NC	2.2	97.8
Coastwide	8.3	91.7

Table 4. Tautog recreational harvest (A+B1) by state and coastwide discards, in number of fish, 1981-2018.
Source: MRFSS/MRIP (calibrated estimates), queried July 11, 2019. *indicates PSE above 50

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Coastwide Harvest	Live Discards	Dead Discards
1981	102,070*	704,618	178,819	1,221,708	238,233*	9,578*	623*	333,400*	16,236*	2,805,285	682,377	17,059
1982	1,214,730	595,042	402,784	942,912	624,103	194,937	92,693*	391,278	21,023*	4,479,502	509,584	12,740
1983	691,922	730,507	344,717	823,426	1,758,296	13,420	3,929*	968,723	30,009	5,364,949	1,535,496	38,387
1984	629,491	675,421	682,458	837,951	2,747,894*	8,685	26,662*	509,701	NA	6,118,263	1,174,842	29,371
1985	116,723	403,944*	290,547	2,630,603	1,769,597	38,875	631*	681,972*	30,989*	5,963,881	1,696,927	42,423
1986	1,670,662	945,557	681,444	1,704,705	2,490,421	152,270	5,108*	778,796	16,004*	8,444,967	1,650,569	41,264
1987	1,113,866	273,398	604,411	1,424,534	3,275,152*	298,648	187,281*	239,543	4,329*	7,421,162	3,189,571	79,739
1988	1,443,548	495,537	413,126	1,703,617	1,223,636	163,119	31,257*	287,857	7,307*	5,769,004	2,515,852	62,896
1989	501,239	373,955	770,503	898,115	2,045,556	502,012	79,803*	589,848	25,312	5,786,343	2,230,076	55,752
1990	836,670	342,916	198,883	1,723,456	1,596,558	117,163	52,384	429,190*	8,275*	5,305,495	2,839,700	70,993
1991	389,000	1,105,100	276,495	1,467,713	1,713,382	183,576	60,483	558,668*	9,821	5,764,238	4,195,634	104,891
1992	1,533,134	764,459	507,384	791,396	2,198,641	118,276	173,944*	308,968*	11,993*	6,408,195	3,520,928	88,023
1993	475,757	235,964	414,334	633,942	1,521,542	233,449	77,140*	782,635	6,685*	4,381,448	3,803,124	95,078
1994	128,738	174,771	444,155	427,604	307,241	95,735	295,465	324,785	2,107	2,200,601	2,842,223	71,056
1995	148,722	114,142	233,762	195,001*	1,311,043	408,528	127,394*	622,205	5,954	3,166,751	3,815,969	95,399
1996	216,698	143,609	150,523	122,153	1,186,204	116,010	72,805*	636,163	8,714	2,652,879	3,196,688	79,917
1997	78,669	174,516	83,153	156,487	573,479	117,773	193,521	161,549	15,008	1,554,155	2,443,651	61,091
1998	81,038	122,830	110,246	149,594	24,693	149,391	16,252*	183,083	17,145*	854,272	3,030,403	75,760
1999	302,890	191,287	44,581*	407,886	279,728	267,875	23,468*	77,898	9,450	1,605,063	5,413,107	135,328
2000	347,448	152,459	68,080*	203,145*	986,483	188,453	63,231*	40,542	21,359	2,071,200	3,531,333	88,283
2001	246,811*	86,818	51,941	118,267	819,588	69,987	57,984*	39,132	7,702	1,498,230	4,264,960	106,624
2002	232,803	177,095	180,753	1,239,615	501,980	274,966	55,339	69,301	6,812*	2,738,664	6,330,432	158,261
2003	95,969	328,392	337,867	245,762	215,920	100,802	18,223*	126,406	12,647	1,481,988	4,033,017	100,825
2004	39,975*	281,619*	30,930	471,302	238,123	163,916	18,286*	455,060	15,830*	1,715,041	3,854,919	96,373
2005	155,754	311,966	75,848	153,333	110,308	98,542	63,320	165,204	27,090*	1,161,365	3,618,496	90,462
2006	102,739	234,043	361,978	265,746	406,800	169,411	34,482*	207,062	2,389*	1,784,650	5,027,287	125,682
2007	67,432*	234,152	544,712	509,816	624,915	203,846	118,459	155,012	36,673*	2,495,017	6,694,584	167,365
2008	72,171*	288,487	244,689	577,628	440,588	162,604	45,166	208,062	967*	2,040,362	5,771,440	144,286
2009	66,280	396,835	356,881	690,545	420,012	324,157	107,289	196,142	6,467*	2,564,608	7,232,074	180,802
2010	153,978	369,830	274,246	540,667	716,531	182,090	289,634	323,725	11,873*	2,862,574	8,169,876	204,247
2011	173,101	79,060*	42,289	322,704	313,745	117,938	64,295*	153,066	3,010*	1,269,208	6,386,822	159,671
2012	96,356	341,478	411,072	302,811	92,340	95,299	20,018*	66,343*	51,956*	1,477,673	8,150,037	203,751
2013	239,699	539,788	307,409	472,562	442,786	96,733	22,954	19,721*	17,128	2,158,780	10,173,418	254,335
2014	444,332	238,595	515,824	913,413*	533,299	131,857	1,155*	87,315	9,809*	2,875,599	10,958,633	273,966
2015	188,145*	295,674	389,139	581,203	339,357	29,199	12,442*	24,493	5,158	1,864,810	10,664,826	266,621
2016	73,516	343,780	312,313	1,068,979	190,163	46,330	3,775*	39,759*	7,510*	2,086,125	13,456,497	336,412
2017	635,994	140,778	218,506	405,691	568,940	32,315	18,741	22,259*	29,559*	2,072,783	13,652,738	341,318
2018	77,951	330,372*	74,530	163,132	385,282	8,927	18,372*	8,186	2,589*	1,069,341	9,570,073	239,252

Table 5. Tautog recreational harvest (A + B1) by state in pounds, 1981-2018.
Source: MRFSS/MRIP (calibrated estimates), queried July 11, 2019. *indicates PSE above 50

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	316,767	2,253,015	444,759	2,043,511	419,174*	34,430*	1,682*	1,132,094*	12,382
1982	3,469,281	2,484,605	1,041,854	2,553,770	1,332,697	409,244	112,822*	1,926,799	21,745
1983	1,777,207	2,001,692	797,211	1,763,109	2,632,185	31,741*	17,117*	2,744,229	16,795
1984	1,989,329	1,894,842	1,977,960	1,599,703	2,714,442	19,196*	69,496*	2,465,582	
1985	274,730	1,055,517*	776,401	5,533,412	3,504,759	49,312	1,527*	1,994,903*	24,226
1986	6,664,034	2,956,799	1,615,028	4,405,989	3,500,911	274,639*	12,124*	2,123,045	21,987
1987	3,057,036	987,308	2,333,325	3,855,404	5,647,886	987,945	306,013*	1,061,763	8,877
1988	5,091,638	1,314,725	1,104,356	4,302,524	2,208,915	349,799	122,122*	994,443	3,261
1989	2,409,824	948,232	2,058,110	2,001,204	3,442,316	2,081,738	196,281*	1,599,363	58,367
1990	3,033,484	917,651	513,870	4,135,800	2,329,494	319,297	94,109	759,668	10,262
1991	1,762,192	3,755,122	901,432	4,106,211	3,702,498	538,411	221,137	1,724,672*	37,684
1992	7,531,141	2,663,107	1,909,770	2,371,795	5,067,709	411,895	293,519*	733,913	22,851
1993	1,669,945	774,926	1,320,472	1,866,328	2,430,109	767,054	161,814	2,222,192	20,820
1994	529,595	748,608	1,294,708	925,451	397,187	242,964	397,926	2,113,405	5,273
1995	650,506	467,400	803,174	548,974*	3,250,236	1,094,687	491,518*	2,077,822	14,407
1996	1,039,911	659,785	490,239	291,482	2,681,850	350,297	98,324*	2,579,379	27,323
1997	308,098	666,065	215,724	749,252*	1,712,208	440,518	497,161	644,872	80,486
1998	310,600	605,908	391,933	485,810	70,731*	659,866	69,541*	972,295	44,892
1999	1,489,331	788,279	153,339*	1,509,978	895,556	1,049,562	42,003*	402,028	20,312
2000	1,301,437	689,698	256,201*	662,491*	3,756,593	692,466	161,426*	241,231	34,021
2001	1,052,175*	392,503	205,109	506,301	2,502,115	240,770	168,595*	168,103	14,110
2002	994,467	743,409	811,658	4,428,842	1,530,757	948,850	140,672	385,679	14,331
2003	527,044	1,388,657	1,180,217	875,271	639,109	358,999	59,071	573,623	28,862
2004	213,380*	1,590,436*	144,278	1,687,077	639,685	563,332	41,259*	1,624,091	42,771
2005	744,036	1,575,454	290,848	566,375	333,101	357,682	167,633	663,938	56,378
2006	484,094	1,130,146	1,589,614	1,002,049	1,443,680	599,179	106,148*	858,131	6,036
2007	260,548*	1,173,787	2,109,801	1,923,067	2,073,632	598,291	270,530	622,935	156,967
2008	230,549*	1,385,061	1,077,399	2,238,161	1,261,010	575,319	119,209	870,249	1,652
2009	236,974	1,648,614	1,353,957	3,057,551	1,273,529	1,034,484	277,124	892,873	26,259
2010	506,622	1,933,773	1,073,576	1,818,920	1,864,817	464,859	920,773	1,246,454	33,356
2011	803,546	328,959*	137,565*	1,284,037	1,008,756	380,758	189,361*	604,361	3,447
2012	403,108	1,512,425	2,093,847	1,285,933	312,531	341,015	62,097*	252,111*	52,632
2013	860,594	2,602,962	1,290,726	2,207,750	1,530,776	341,896	81,662	75,449*	25,286
2014	1,623,717	1,017,780	2,274,293	4,188,165*	1,849,045	485,332	3,544*	365,657*	23,581
2015	1,041,058*	1,105,259	1,594,233	2,153,150	1,100,117	100,302	45,067*	100,143*	6,742
2016	317,006	1,290,428	1,368,363	4,514,164	582,199	164,887	15,059*	126,135*	14,660
2017	2,883,890	599,424	908,549	1,394,388	1,380,992	103,331	59,901*	88,228*	128,136
2018	300,067	1,075,131*	295,758	536,332	1,091,046	30,240	54,332*	25,766	5,254

Table 6. Commercial landings for tautog in pounds, by state, 1981-2018.

Source: ACCSP Data Warehouse and State Compliance Reports.

*2018 Landings data are preliminary and subject to change.

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC
1981	102,900	69,800	20,500	81,400	54,400	1,000	1,200	700	N/A
1982	69,300	86,300	21,200	90,400	148,200	800	100	2,600	656
1983	57,600	142,600	33,500	88,400	100,600	800	N/A	1,700	319
1984	68,100	334,700	32,700	102,500	129,700	1,400	2,600	1,200	4,715
1985	63,300	403,200	50,100	84,500	125,500	3,200	2,400	1,639	531
1986	165,800	363,100	104,200	201,300	100,700	300	2,600	1,800	1,006
1987	250,000	420,500	159,200	225,200	95,200	500	3,800	2,700	confid
1988	277,100	328,900	112,100	255,000	88,000	600	6,100	2,800	214
1989	352,100	214,800	99,700	285,400	51,900	500	4,000	7,500	531
1990	289,074	211,084	82,008	181,543	99,112	500	3,954	5,151	1,079
1991	354,346	371,597	54,000	226,413	93,022	1,300	3,164	5,058	1,211
1992	292,291	359,767	65,700	169,011	116,332	200	4,058	4,389	424
1993	160,336	201,593	86,064	89,467	153,474	300	1,432	5,423	351
1994	37,062	130,719	43,000	71,375	162,641	400	1,718	11,441	1,134
1995	35,298	94,989	20,466	72,879	115,970	600	4,416	30,020	929
1996	32,579	64,817	33,327	105,466	89,435	1,599	3,622	26,137	452
1997	64,240	39,601	14,519	78,228	49,726	841	7,663	25,471	623
1998	91,319	20,304	6,905	68,892	42,426	1,715	5,682	14,770	2,173
1999	75,619	26,090	12,961	37,886	27,307	confid	6,489	20,901	728
2000	96,001	43,719	8,504	39,953	39,636	confid	3,896	14,794	674
2001	84,330	56,065	22,259	62,795	60,152	confid	4,591	14,587	414
2002	148,073	50,007	26,781	60,805	36,605	confid	5,010	22,834	705
2003	86,205	54,650	40,784	72,264	66,766	confid	5,213	10,705	98
2004	88,192	36,581	26,037	76,606	51,057	3,064	6,049	13,079	84
2005	99,344	42,838	24,053	52,525	61,163	confid	4,338	5,667	56
2006	147,609	47,261	16,841	71,683	58,119	confid	5,411	8,533	47
2007	95,820	63,441	30,002	73,797	62,979	2,814	3,297	8,588	187
2008	73,867	48,027	20,160	88,571	63,958	2,253	2,964	10,946	194
2009	54,703	50,920	21,194	87,289	14,591	2,116	1,638	11,132	61
2010	75,317	44,054	16,948	93,153	49,213	confid	1,285	6,077	34
2011	57,787	47,426	14,784	82,761	45,865	confid	confid	14,590	28
2012	67,870	50,126	6,233	76,373	20,831	1,444	confid	13,870	227
2013	70,157	53,428	5,887	110,849	22,079	confid	1,458	11,776	205
2014	63,191	53,384	5,164	121,538	31,665	confid	confid	7,545	137
2015	61,752	47,140	7,249	111,925	17,538	2,107	1,173	6,937	94
2016	58,095	50,680	7,651	144,650	13,367	2,083	1,098	6,252	30
2017	66,481	52,844	8,485	171,508	confid	confid	confid	5,165	116
2018*	61,055	51,414	7,341	186,109	1,559	306	273	1,402	109

Table 7. State recreational regulations implemented for Tautog in the 2018 fishing year.

STATE	SIZE LIMIT (inches)	POSSESSION LIMITS (fish/person/day)	OPEN SEASONS (dates inclusive)
Massachusetts	16”	3 1 3 5 (10 fish/day/vessel max for private/rental mode)	Apr 1-May 31 Jun 1-Jul 31 Aug 1-Oct 14 Oct 15-Dec 31
Rhode Island	16”	3 3	Apr 15 – May 31 Aug 1 – Oct 14
		5 (10 fish/day/vessel max for private/rental mode)	Oct 15 – Dec 31
Connecticut	16”	2 2 3	Apr 1 – Apr 30 Jul 1 – Aug 31 Oct 10 – Nov 23
New York	16”	LIS: 2 LIS: 3	Apr 1- Apr 30 Oct 11-Dec 9
		NY Bight: 2 NY Bight: 4	Apr 1- Apr 30 Oct 15-Dec 22
New Jersey	15”	4 1 5	Jan 11 – Feb 28 Apr 1 – Apr 30 Aug 1 – Nov 15 Nov 16 – Dec 31
Delaware	16”	4	Jan 1 – May 15 Jul 1 – Dec 31
Maryland	16”	2 4	Jul 1 – Oct 31 Nov 1 – Dec 31
Virginia	16"	3	Jan 1 – Apr 30 Sep 20 – Dec 31

Table 8. State commercial regulations implemented for Tautog in the 2018 fishing year.

STATE	SIZE LIMIT	POSSESSION LIMITS (number of fish)	OPEN SEASONS	QUOTA (pounds)	GEAR RESTRICTIONS
Massachusetts	16"	40	Sept 1 – 100% of Quota	62,945*	Mandatory pot requirements. Limited entry and area/time closures for specific gear types. Fishery permit endorsement
Rhode Island	16"	10	Apr 1 – May 31 Aug 1-Sept 15 Oct 15 – Dec 31	49,888**	Harvest allowed by permitted gear types only.
Connecticut	16"	4 (restricted licenses) 10 (all other)	Apr 1 – Apr 30 Jul 1 – Aug 31 Oct 8 – Dec 24	-	Mandatory pot requirements.
New York	15"	25 (10 fish w/ lobster gear and when 6 lobsters are in possession)	LIS: May 7 – July 31; Sept 1- Nov 23 NY Bight: Apr 18 – Jan 25	-	Mandatory pot requirements. Gill or trammel net is prohibited.
New Jersey	15"	*> 100 lb requires directed fishery permit*	Jan 1 – May 1 Sept 19-Dec 31	103,000	Mandatory pot requirements.
Delaware	16"	4	Jan 1 – May 15 July 1 – Dec 31	-	Mandatory pot requirements.
Maryland	16"	2 4	July 1 – Oct 31 Nov 1- Dec 31	-	Mandatory pot requirements.
Virginia	15"	-	Jan 1 – Jan 21 Mar 1 – May 15 Nov 1 – Dec 31	-	Mandatory pot requirements. Pots prohibited in tidal waters.

* Massachusetts' quota adjusted for overage in 2017 from a base quota of 64,753 lbs.

** Rhode Island's quota of 51,348 lbs is divided equally among the three sub-periods.

Table 9. Number of age/length samples by state in 2018. Addendum III requires all states to collect 200 samples per year. Source: State compliance reports

State	2018 Samples	Sample Sources
MA	1105 lengths; 244 otoliths, 255 spines	Commercial Fishery Market sampling; Fishery independent rod and reel, and trawl surveys, ventless trap survey for Lobster
RI	219 lengths; 217 ages	Recreational fishery sampling, RIDMF Fish Pot Survey, RIDMF Trawl Survey
CT	201 ages	Long Island Sound Trawl Survey
NY	832 lengths; 148 ages	Commercial markets sampling; fishery independent surveys
NJ	359 lengths and ages	Recreational fishery; NJ Ocean Trawl Survey and Artificial Reef Ventless Trap Survey
DE	134 otoliths	Recreational sampling
MD	243 lengths and 211 otoliths	Recreational sampling
VA	26 lengths and ages	Marine Sport Fish Collection Project

Table 10. Ongoing fishery-independent surveys, as of 2018. Shaded cells indicate survey data used in 2016 stock assessment.

State	Areas Surveyed	Survey Type	# of Survey Stations	Dates of Survey	Initial Year
MA	MA territorial waters	Trawl	1 station per 19 square nautical miles	May and September	1978
	Buzzards Bay, south of the Elizabeth Islands, and portions of Rhode Island Sound	Trap	42 stations twice per month	June through September	2015
	Buzzards Bay and Vineyard Sound	Rod & Reel	48 stations per month	Spring (Apr-May) Fall (Sep-Nov)	2016 (fall)
RI	Narragansett Bay	Trawl	13 stations per month	June through October	1990
	Narraganset Bay, Rhode Island Sound and Block Island Sound	Trawl	44 stations	Spring (April-May) Fall (Sept/October)	1979
	Narragansett Bay Beach	Seine	18 stations per month	June through October	1988
	Coastal Ponds	Seine	24 stations in 8 coastal ponds per month	May through October	1994
	Narragansett Bay	Trap	10, 5 pot trawls set per month	April through October	2013
CT	Long Island Sound (CT and NY waters)	Trawl	40 stations per month	Spring (April-June) Fall (Sept-Oct)	1984
NY	Peconic Bay	Trawl	16 stations per week	May through October	1987
	Western Long Island (Little Neck, Manhasset Bay, Jamaica Bay)	Seine	5-10 sites, semimonthly	May through October	1984
	Long Island Sound	Trap	35 stations per week	May through October	2007
NJ	Nearshore ocean waters between Cape May and Sandy Hook	Trawl	30 tows in Jan; 39 tows per month in Apr, Jun, Aug & Oct	Jan, Apr, June, Aug & Oct	August 1988
DE	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA
MD	Maryland Coastal Bays	Trawl	20 stations per	April through October	1989
		Seine	19 stations per month	June, September	1989
	Submerged Aquatic Habitat in Sinepuxent Bay	Seine	5 zones	September only	2015
VA	Fisheries independent surveys do not collect tautog in quantities needed for monitoring purposes				NA

Table 11. Ongoing fishery-dependent monitoring in each state, as of 2018

State	Fishery Sector	Data Collected	Data Source
MA	Commercial	Landings at the trip level	Harvesters and primary buyers
	Commercial	Length	Market sampling
RI	Recreational	Age, Length	Recreational harvest sampling
	Commercial	Age	Fish Pot Survey
CT	Commercial	Monthly landings	Harvesters and dealers
NY	Commercial	Age, Length	Markets and dockside sampling
NJ	Commercial	Age, Length, Weight, Sex	Commercial vessel sampling
	Recreational	Age, Length, Sex	Party/charter boat sampling (retained fish)
DE	Commercial	Landings	Monthly harvester logbooks
	Recreational	Age, Length	Recreational harvest sampling
MD	Recreational	Age, Length, Weight, Sex	Charter boat hook and line sampling
	Commercial	Landings	Harvest reports
VA	Commercial	Age, Length, Weights	Samples from commercial hook-and-line gear, haul seines, pots/traps, pound nets
	Recreational	Age, Length, Weights	VMRC Marine Sport Fish Collection Project
		Tagging data	Game Fish Tagging Program

*Surveys as part of MRIP occur in all states and are not included in the table. Commercial landings monitoring by the Standard Atlantic Fisheries Information System (SAFIS) is also excluded.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

July 18, 2019

To: **Tautog Management Board**

From: **Tautog Technical Committee**

RE: **Review of Commercial Tagging Program and Recommendations for next Stock Assessment**

Attendees: Coly Ares (RI), Lindy Barry (NJ; Chair), Sandy Dumais (NY), Dave Ellis (CT), Alexa Kretsch (VA), Craig Weedon (MD), Bob Glenn (MA)

Staff: Caitlin Starks, Katie Drew, Kirby Rootes-Murdy

The Commission's Tautog Technical Committee met via conference call on Tuesday July 9 to discuss the following items:

1) The Commercial Tagging Program
2) Type and timing of next Stock Assessment

Call Summary and Recommendations

Commercial Tagging Program

The group discussed the tagging program with the objective of reviewing and considering 1) where the tag would be applied to the fish; 2) the biological metric to request annual number of commercial tags and 3) the tag expiration date.

1) Where the tag will be applied on the fish

Staff presented on where and which side of the fish tags could be applied based on feedback from the TC members. Concerns had previously been raised over the tag potentially damaging the operculum and impacting the ability to age the fish. TC members confirmed that the tag does leave a hole in the operculum, however it should not make the operculum unreadable. In considering a preference on which operculum is used for biological sampling, many states indicated they take both opercula for aging, so if one is damaged it would not be an issue.

The TC did not specify which operculum the tag should be applied to, so it would be up to the states to specify on which is side harvesters would be required to place the tags to aid enforcement. The current tagging guidelines are meant to assist the states in writing regulations, but only the language included in Amendment 1 is required of all states.

The group also revisited the rationale for choosing a strap tag applied to the operculum over other tag types and placements. Soft tissue areas were shown to not hold tags well. When considering the application of tags to soft tissue or muscle, there were also concerns that the tags may damage the quality of the fish meat. Lastly, tags placed in soft tissue are also easily removed and re-used, which could create opportunities for cheating the program.

2) Biological Metric to request annual number of commercial tags

As part of Amendment 1, states will need to develop a biological metric to annually estimate the number of tags needed to supply the commercial fishermen in their state. Staff highlighted to TC members that while the methodology and number is not needed yet, they should have a methodology and estimate ready by the end of August or beginning of September.

In discussing potential methodologies, the group focused on 'tag failures' and how to incorporate this into their tag estimate. MA DMF and NYDEC staff who have tested the tags indicated there is a failure rate, related to both the tags not sealing properly and operator error. Tags can also reasonably be lost over the side of the boat when tagging at sea. There was consensus among those who have tested the tag and applicator of roughly a 10% failure rate. The buffer within the guidance document indicated a 20% buffer, so the approximate failure rate would be encompassed within that buffer.

It was also noted that it is unlikely that tags will always be applied in sequential order due to tag loss or failure. The group was in agreement that once the 1st year of the tagging program has been completed, there should be a reevaluation of the appropriate tag loss rate. At that time, it could be determined that continual tag loss on the part of fishermen above a certain level could potentially be an enforcement issue. Given there may be a variety of reasons for a tag being lost or damaged, an important piece of information during first year will be how many tags were applied and returned compared to the total number distributed to each harvester. The group did not express any concerns with using available data to develop a biological metric. Most TC members indicated they would likely be estimating an average fish weight around 4 pounds.

ASMFC staff explained that the Commission plans to order all tags in bulk to distribute to the states later in 2019, and that states must submit a request for the number of tags to order; the states would then reimburse ASMFC for their tags. Regarding applicators, staff indicated that an initial purchase of these could also be included in the bulk order, but it would be another item the states would need to estimate and request. The group agreed that if additional applicators are needed during the fishing year, individual fishermen should be able to purchase them directly from the supplier. During the August meeting the

Board should discuss how to handle an instance where a state underestimates the number of tags needed, and needs more tags mid-season.

3) Expiration date for tags

Next, the TC discussed the expiration date for tags. The draft tagging guidelines indicate the following:

- Tags expire at the end of the fishing year for which they were issued (unless a state determines this would unnecessarily restrict harvest and sale at the end of the year, in which case an alternative expiration date could be determined).
- It will be illegal for any dealer to buy or sell any tautog with an expired tag.
- Tautog with expired tags may be sold only directly to the final consumer.

TC members indicated that some fishermen keep fish caught at the end of the year (November/December) in tanks and sell them later in January/early February. If the fishing season aligns with the calendar year, these fish could have the previous year's tags on them. In these cases, the fish are often caught and held in tanks for around a month.

Given this scenario, tag accounting that requires fishermen to return all tags from the prior year in order to receive the new year's tags may be challenging. For the states in which this situation occurs, an alternate tag expiration date should be requested. Additionally, having clear documentation of when tags are applied may help address this concern.

Due to these challenges, the TC indicated that there should be more clarity written into the guidelines to differentiate between a tag expiration date for fishermen and what the expiration date is for commerce/ or sale of the fish. Additionally, the TC indicated the Law Enforcement Committee should also provide a recommendation on this issue.

<u>There was no clear consensus on a preferred tag expiration date, though some members indicated the end of February may be a suitable time. Staff encouraged TC members to work with their states to determine what would be an appropriate alternate date for their fishery.</u>

Discussion on next Stock Assessment

The TC reviewed the research recommendations and recent updates to MRIP harvest information with the objective of providing recommendations on the timing and type of next Stock Assessment.

ASMFC Staff presented on changes to MRIP that have adjusted the recreational harvest estimates for tautog. The new calibrated estimates for the entire time series indicate increases in annual coastwide harvest ranging from 50% to 313% (harvest in numbers of fish) and 27% to 322% (harvest by weight). The coastwide PSEs are below 50 (greater than 50 indicates high uncertainty in the estimate) for annual harvest estimates in both weight and number of fish, generally ranging from 9-30. State by state harvest increases also vary over time, with the highest increases occurring in the states of Massachusetts through New Jersey.

Staff also presented on progress that has been made relative to research recommendations from the previous stock assessments. Many of the previous research recommendations remain works in progress. One that could have implications for future assessments is a recent genetics study completed by VIMS that may indicate different grouping of stock units relative to the most recent stock assessment. Staff clarified that in considering whether the next assessment should be a benchmark stock assessment or assessment update, the key distinction is that an update would not require peer review, nor could new data sources or models be considered; with a benchmark, everything would be reconsidered and it would go through a peer review process. The incorporation of the new MRIP estimates could be done through an assessment update.

In considering changes to the MRIP data, questions were raised about the PSEs at the state and regional level. Staff noted that the current model can account for the uncertainty of the estimates at the regional levels the resource is assessed at. It is possible changes in MRIP could impact the model converging and operating correctly, but this would not be determined until the process is underway. Additionally, assumptions about harvest in wave 1 (Jan/Feb) may need to be revisited given MRIP does not sample then, but many states do have open fishing seasons during that wave.

The group also discussed the extent of work that would be required for either approach (benchmark or update). Because each region is assessed as a unique stock, there will be four models that would either need to be updated or re-assessed; it would be a significant workload under either approach. The group also briefly discussed whether different modeling techniques could be explored at the regional level; this could be done only through a benchmark assessment.

Given the discussion and information presented, the group was in favor of an assessment update being completed with data through 2020, when available. This would ensure the regulatory changes aimed at conserving tautog that went into effect after Amendment 1 could be evaluated; specifically the average F rate using 3 years of data (2018-2020).

Atlantic States Marine Fisheries Commission

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MEMORANDUM

July 18, 2019

To: **Tautog Management Board**

From: **Tautog Advisory Panel**

RE: **Advisory Panel Review of Commercial Harvest Tagging Program**

Attendees: Greg Jackson (DE; Commercial), Wes Blow (VA; Recreational), John Mihale (NY; Commercial), Craig Weedon (MD DNR; public)

Staff: Caitlin Starks, Dustin Colson Leaning, Kirby Rootes-Murdy

The Commission's Tautog Advisory Panel (AP) met via conference call on Wednesday July 10 to review the draft Commercial Tagging Program Guidelines and provide comments to the Board.

Commercial Tagging Program
ASMFC Staff presented background specific to Amendment 1 and the different parts of the guidelines from the initial biological metric to determine the number of tags through to tag reporting and accounting, as well as tag expiration. The draft guidance document is intended to promote consistency in applying the tagging program across the management unit, while allowing the states flexibility to align their program with the needs of their unique fisheries.

In reviewing the guidance document, AP members had the following comments (organized below by category):

Tag Application

- Concerns were raised about the tags that will be used are based on NY study. In general, concerns centered on how successful applying the tags will be and potential mortality to tagged fish before they are brought to market given the study was conducted in a very controlled environment. For example, all the fish were caught in pots and not by rod and reel, and some contend that stress induced by catching the fish via fishing rod and then tagging may increase mortality rates.
- Trying to apply the tags to fish will be very challenging at sea and there may be many tags broken, damaged, or lost.
- Additionally, in reference to the study, smaller fish from shallower water have a better retention/survival rate; a number of fish used in the study were below the current legal size limit for all states. These smaller fish may have a different survival rate than larger, legal size fish caught in deeper water.

- In some states such as Delaware, Commercial permit holders do occasionally take trips with recreational anglers on their boats and differentiating between commercial caught fish vs recreational caught fish will be important as the current guidelines implies all Tautog on the vessel must be tagged. An AP member recommended that the guidelines be changed to read 'All tautog on the vessel landed for commercial purposes must be tagged'.
- One AP member indicated that applying the tags in sequential order may be too difficult.
- One AP member indicated that state agencies should conduct outreach to demonstrate proper tagging techniques and potentially tag fish for commercial harvesters during the first year of the tagging program.

Tag Accounting and Distribution

- One AP member suggested that partial allocation of tags could be distributed to harvesters for the beginning of the year before the harvester turns in their old tags. The remaining allocation would be distributed to the harvester once they turned in their remaining unused tags.

Tag Expiration

- Some AP members noted that a tag expiration date would not be needed if 1) tag numbering system indicates the year, 2) tags are to be applied in the calendar year and 3) any unused tags as of December 31st should be turned in immediately.
- In NY, the commercial bag limit is 25 fish from April 16-January 25. Harvesters/dealers are holding fish until mid-February. There is more demand in February (bad weather, less fish, higher price) so they hold the fish until then. Tagging fish along the calendar year- starting January 1- will likely create challenges for law enforcement to keep track of fish tagged the previous year vs the current year, especially during these months (January-February).

Penalties

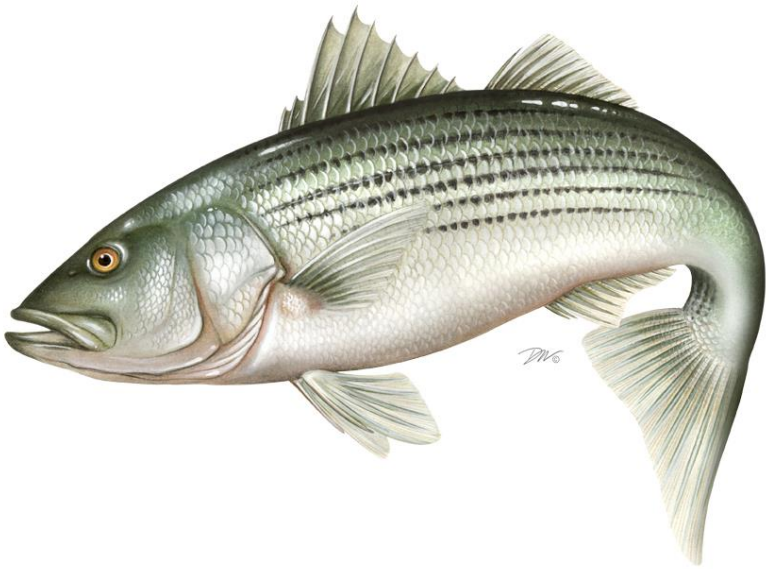
- Regarding penalties, questions were raised on what penalties would be applied to recreational anglers and for-hire captains who attempt to sell their catch without a commercial permits; some AP members expressed concern this sector may attempt to illegally sell Tautog.
- Illegal harvest for sale (by recreational anglers and other unlicensed fishermen) remain an issue in this fishery and while the guidance document outlines how the tagging program will modify the commercial fishery, it doesn't address illegal sale.
- It was recommend that there be severe penalties for recreational and unlicensed sale of untagged fish.

Other

- There is a greater demand in the commercial market for Chinese New Years for fish smaller than the current minimum size limit.
- One AP member suggested that under the tagging program states should consider moving away from bag limit and season closure as the tags could become the limiting factor for the commercial fishery.
- Selling fillets of Tautog to restaurants may be challenging for keeping tags with the fish through to final sale.

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM VI TO AMENDMENT 6 TO THE INTERSTATE FISHERY MANAGEMENT PLAN FOR ATLANTIC STRIPED BASS



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.

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

August 2019

Public Comment Process and Proposed Timeline

In May 2019, the Atlantic Striped Bass Management Board (Board) initiated the development of an addendum to Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass to consider changes to coastwide commercial and recreational regulations to address overfishing. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's (Commission) management of striped bass; 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 [Month Day], 2019 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. Organizations planning to release an action alert in response to this Draft Addendum should contact Max Appelman at 703.842.0740.

Mail: Max Appelman, FMP Coordinator
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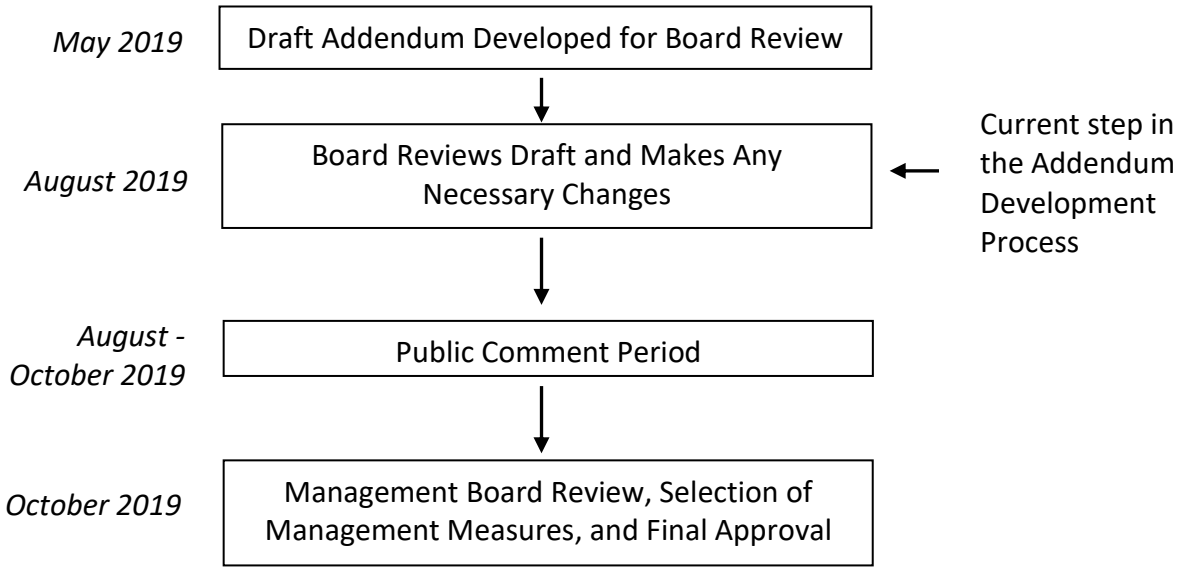

1.0 Introduction

Atlantic striped bass (*Morone saxatilis*) are managed through the Commission in state waters (0-3 miles) and through NOAA Fisheries in federal waters (3-200 miles). The management unit includes the coastal migratory stock between Maine and North Carolina. Atlantic striped bass are currently managed under Amendment 6 (2003a) to the Interstate Fishery Management Plan (FMP) and Addenda I–IV.

At its May 2019 meeting, the Board initiated the development of Draft Addendum VI to Amendment 6 to the Atlantic Striped Bass FMP to consider coastwide changes to commercial and recreational regulations to bring fishing mortality to the target level. The Board's action responds to results of the 2018 benchmark stock assessment for Atlantic striped bass which indicates the stock is overfished and experiencing overfishing.

2.0 Overview

2.1 Statement of the Problem

The 2018 benchmark stock assessment indicates the stock is overfished and experiencing overfishing relative to the updated reference points defined in the assessment. Female spawning stock biomass (SSB) was estimated at 68,476 metric tons (151 million pounds), which is below the SSB threshold of 91,436 metric tons (202 million pounds). Total fishing mortality (F) was estimated at 0.31, which is above the F threshold of 0.24. The benchmark assessment and its single-stock statistical catch-at-age model was endorsed by the Peer Review Panel and accepted by the Atlantic Striped Bass Management Board (Board) for management use.

By accepting the assessment for management use, the reference point management triggers in Amendment 6 have been tripped. In response, the Board initiated the development of Draft Addendum VI to address overfishing status and consider measures to reduce F back to F target. Accordingly, Draft Addendum VI proposes alternative measures for the commercial and recreational fisheries aimed to reduce total removals by 18% compared to 2017 levels in order to achieve F target in 2020. Other management issues including (but not limited to) reference points and rebuilding the biomass, will be addressed in a subsequent management document.

Roughly 90% of annual Atlantic striped bass recreational catch is released alive, of which 9% are estimated to die as a result of being caught (referred to as "release mortality" or "dead releases"). Catch and release fishing has been perceived to have a minimal impact on the population, however a large component of annual striped bass mortality is attributed to release mortality – accounting for roughly 48% of total removals in 2017 (49% in 2018). The current recreational striped bass management program uses bag limits and size limits to limit the number of fish that are harvested. However, these measures are not designed to reduce fishing effort and subsequent release mortality. While the proposed measures herein result in lower overall removals, the majority of them also increase dead releases. In order to address dead releases, effort controls that are better designed to reduce the number of fishing trips that encounter striped bass should be considered (e.g., closed seasons).

2.2 Background

2.2.1 Status of the Stock

The 2018 benchmark stock assessment for Atlantic striped bass is the latest and best information available on the status of the coastwide striped bass stock for use in fisheries management. The assessment was completed and peer-reviewed at the 66th Northeast Regional Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) meeting in November 2018. The accepted model for use in striped bass stock assessment is a forward projecting statistical catch-at-age (SCA) model which uses catch-at-age data and fishery-dependent and -independent survey indices to produce annual estimates of female SSB, F, and recruitment.

The results of the 2018 benchmark indicate that the Atlantic striped bass stock is overfished and overfishing is occurring. Female SSB in 2017 was estimated at 68,576 metric tons (151 million pounds), which is below the SSB threshold of 91,436 metric tons (202 million pounds) (Figure 1). Female SSB peaked in 2003 and has been declining since then; SSB has been below the threshold level since 2013. Total F in 2017 was estimated at 0.31, which is above the F threshold of 0.24 (Figure 2). Total F has been at or above the threshold in 13 of the last 15 years of the assessment (2003-2017). Recruitment in 2017 was estimated at 108.8 million age-1 fish, which is below the time series average of 140.9 million fish (Figure 1). Striped bass experienced a period of lower recruitment from 2005-2011 which contributed to the decline in female SSB that the stock has experienced since 2010. Recruitment was high in 2012, 2015, and 2016 (corresponding to strong 2011, 2014, and 2015 year classes), but estimates of age-1 striped bass were below average in 2013, 2014, and 2017.

The reference points currently used for management are based on female SSB levels during the 1995 reference year. The 1995 reference year is used as the female SSB threshold because many stock characteristics (e.g., an expanded age structure) were reached by this year and the stock was declared rebuilt. The female SSB target is 125% of SSB threshold. To estimate the associated F reference points, population projections are made using a constant F and changing the value until the female SSB threshold and target are achieved. For the 2018 benchmark, the reference point definitions remained the same, but the values have been updated. The 2018 benchmark was the first assessment for striped bass to use the improved Marine Recreational Information Program (MRIP) survey methods to estimate recreational fishery catches. The new MRIP removals estimates are on average 2.3 times higher than recreational removals used in previous stock assessments, resulting in higher estimates of female SSB and, therefore, higher estimates for the SSB reference points.

2.2.2 History of the Fishery Management Plan

The first Interstate FMP for Atlantic Striped Bass was approved in 1981 in response to declining juvenile recruitment and landings occurring along the coast from Maine through North Carolina. The FMP and subsequent amendments and addenda focused on addressing the depleted spawning stock and recruitment failure. Despite these management efforts, the Atlantic striped bass stock continued to decline prompting many states (beginning with

Maryland in 1985) to impose a complete harvest moratorium for several years. State fisheries reopened in 1990 under Amendment 4 which aimed to rebuild the resource rather than maximize yield. The stock was ultimately declared rebuilt in 1995 and as a result, Amendment 5 to the Atlantic Striped Bbass FMP was adopted which relaxed both recreational and commercial regulations along the coast.

The Atlantic striped bass stock is currently managed under Amendment 6 and its subsequent addenda, the most recent being Addendum IV which implemented new commercial and recreational regulations beginning with the 2015 season (ASMFC 2014). The addendum was initiated in response to the findings of the 2013 benchmark stock assessment which triggered management action; female SSB was below the target for two consecutive years and F was above the target in at least one of those years (ASMFC 2003a). Although the stock was not overfished, a steady decline in female SSB had occurred since the mid-2000s. The addendum established new F reference points (target and threshold) and a suite of regulatory measures aimed to bring F back down to the new F target. All states/jurisdictions (hereafter states) were required to implement regulations to achieve a 25% reduction from 2013 removals in the ocean fishery, and Chesapeake Bay fisheries implemented regulations to achieve a 20.5% reduction from 2012 removals. To achieve this, the ocean commercial quota was reduced by 25% and the Chesapeake Bay commercial quota was set at 2012 harvest, less 20.5%. For the recreational fishery, states implemented a 1 fish bag limit with a minimum size of 28 inches in the ocean fishery, and Chesapeake Bay jurisdictions submitted implementation plans to achieve the required reductions. Several states also had conservation equivalency proposals approved which allowed them to adopt different management programs while still achieving the required reductions.

The U.S. Exclusive Economic Zone (EEZ; 3-200 miles) has been closed to the harvest, possession and targeting of striped bass since 1990, with the exception of a defined route to and from Block Island in Rhode Island which allows for the transit of vessels in possession of striped bass legally harvested in adjacent state waters. A recommendation was made in Amendment 6 to re-open federal waters to commercial and recreational fisheries. However, NOAA Fisheries concluded opening the EEZ to striped bass fishing was not warranted at that time. Following the completion of the 2018 benchmark stock assessment, NOAA Fisheries, in consultation with the Commission, is directed to review the federal moratorium on Atlantic striped bass, and to consider lifting the ban on striped bass fishing in the Federal Block Island Transit Zone (Consolidated Appropriations Act, 2018).

2.2.3 Status of the Fishery

Atlantic striped bass is arguably the most iconic finfish on the Atlantic coast and has supported valuable fisheries for centuries. The current fishery is predominantly recreational with the sector accounting for roughly 90% of total harvest by weight since 2004 (commercial and recreational harvest, combined; Table 1). In 2017, total striped bass removals (harvest and dead discards/release mortality from both sectors) were estimated at 7.06 million fish, 90% of which was attributed to the recreational sector (Table 2; Figure 3). In 2018, total removals were estimated at 5.8 million fish, with 88% attributed to the recreational sector.

Commercial Fishery Status

The commercial fishery is managed via a state-specific quota system based on average landings during the 1970s, resulting in relatively stable landings since 2004. From 2004 to 2014, coastwide commercial landings averaged 6.8 million pounds (1 million fish) annually (Table 1; Table 2). From 2015-2018, commercial landings have decreased to an average of 4.8 million pounds (611,000 fish) due to implementation of Addendum IV and a reduction in the commercial quota. In 2017, commercial landings were estimated at 4.8 million pounds (592,670 fish). In 2018, commercial landings were estimated at 4.7 million pounds (622,451 fish). Commercial dead discards (the portion of commercially caught striped bass that are released and assumed to die) account for approximately 13% of total commercial removals in numbers of fish since 2004. In 2017, commercial removals (landings plus dead discards) accounted for 10% of total removals (commercial plus recreational) in numbers of fish, and 12% of total removals in 2018.

The majority of commercial striped bass landings come from Chesapeake Bay; roughly 60% by weight annually since 1990, and 80% in numbers of fish. The differences between landings in weight and in numbers of fish is primarily attributed to availability of smaller fish and lower size limits in Chesapeake Bay relative to the ocean fishery.

Unlike the commercial fishery in Chesapeake Bay, the ocean fishery regularly underutilizes the quota. The ocean quota underage is mainly attributed to designated game fish status in several states including Maine, New Hampshire, Connecticut, and New Jersey which collectively share about 10% of the commercial quota in the ocean region. Furthermore, the underage has increased in recent years since migratory striped bass have not been available to the ocean fishery in North Carolina resulting in zero harvest since 2012 (North Carolina holds 13% of the ocean quota).

Recreational Fishery Status

The Atlantic striped bass recreational fishery is managed via bag limits and minimum size limits in order to constrain fishing mortality. Approximately 90% of recreational catch is released alive (Figure 4) – either due to angler preference (i.e., catch and release fishing) or regulation (e.g., undersized, or the angler already caught the bag limit). The assessment assumes, based on previous studies, that 9% of the fish that are released alive die as a result of being caught.

Total recreational removals (harvested fish plus released fish that died as a result of being caught) increased from a low of 2.7 million pounds (434,665 fish) in 1984 to a high of 75.8 million pounds (7.6 million fish) in 2013. Total removals decreased to an average of 53.5 million pounds (5.8 million fish) since the implementation of Addendum IV in 2015. In 2017, recreational removals were estimated at 53.7 million pounds (6.4 million fish). Of those removals, 37.9 million pounds (2.9 million fish) were harvested. In 2017, 38.0 million striped bass (equivalent to 176 million pounds) were released alive resulting in an estimated 3.4 million dead releases (15.8 million pounds), which accounted for 48% of total striped bass removals in numbers of fish. In 2018, 49% of total removals were attributed to dead releases (2.8 million

fish or 12.3 million pounds). Recreational dead releases make up a large portion of total removals because most of the catch is released.

A large proportion of recreational harvest comes from Chesapeake Bay. From 2004-2014, 33% of recreational harvest in numbers of fish came from Chesapeake Bay. From 2015-2018, that percentage increased to 45%, likely as a result of the strong 2011, 2014, and 2015 year classes moving through the fishery.

2.2.4 Performance of Addendum IV and the Effects of Changes in Effort and the Availability of Strong Year Classes

In 2016, following the first full year under Addendum IV measures, the Striped Bass Plan Review Team compared observed removals in 2015 to the reference period (2013 for the ocean fishery and 2012 for Chesapeake Bay) to evaluate whether the reductions needed to bring F back down to the target had been achieved. The results indicated the overall reduction was nearly the same as the predicted reduction on a coastwide level. The observed commercial reduction was very close to the predicted reductions, but the observed recreational reduction in the ocean and Chesapeake Bay fisheries diverged significantly from the predicted values. Recreational fisheries in the ocean saw a greater reduction than what was predicted, while recreational fisheries in Chesapeake Bay experienced an increase in harvest relative to the reference period. Upon further review, the Technical Committee (TC) identified changes in effort and changes in the size, age structure, and the distribution of the 2011 year class in the ocean relative to the Chesapeake Bay as the most significant variables contributing to the large differences in the observed harvest compared to that predicted by the TC during the development of Addendum IV (ASMFC 2016). At that time, the 2011 year class was the largest recruitment event since the early 2000s. Those fish continued to grow and migrate to the ocean, becoming increasingly available to ocean fisheries and leading to significant increases in removals in 2016 and 2017 under the same management program[1]. It should also be noted that decreased effort in the ocean fishery in 2018 resulted in roughly an 18% reduction in total removals relative to 2017 (and a 5% reduction from 2015 levels) under the same management measures. The decrease in effort was observed across all recreational fisheries, not just effort directed at striped bass. These annual fluctuations in catch (and in fishing mortality) under constant regulations highlight the effect of changes in effort and strong year classes on future catch, and the degree of uncertainty associated with bag and size limit analyses.

It is difficult to account for changes in effort and the impacts of emerging year classes in bag limit and size limit analyses, and harvest reduction calculations. The 2011, 2014, and 2015 year classes (corresponding to the 2012, 2015, and 2016 recruitment estimates) have all been above average with the 2015 year class being the largest recruitment event since 2004. It is expected that the availability of the 2014 and 2015 year classes in 2020 will be similar to what was

[1] A stock assessment update in 2016 also indicated that Addendum IV successfully reduced F below the target in 2015. As a result, the Board initiated Draft Addendum V to consider relaxing coastwide measures to bring F back up to the target level. However, the Board withdrew Draft Addendum V from consideration after preliminary MRIP estimates revealed that 2016 removals increased without changing regulations.

observed for the 2011-year class in 2016 and 2017. These strong year classes become available to the Chesapeake Bay fishery first and become more readily available to the ocean fishery as they grow and begin to migrate to the ocean. While strong year classes are a positive sign for the population, the abundance of undersized striped bass often leads to anglers catching and releasing a larger number of fish, thus driving up the number of recreational releases. When considering management changes, it is important to consider the impact such changes could have on strong year classes and to account for the emergence of strong year classes to the extent possible in supporting analyses.

2.2.5 Socioeconomic Impacts

Overall, there are many potential socioeconomic impacts that could result from striped bass harvest reductions. In general, the reduction in striped bass removals is likely to translate into a short-term negative impact on the regional economy and jobs associated with the fishing industry for this species. However, the positive long-term economic impacts stemming from stock recovery and subsequent catch increases in successive years will likely outweigh the short-term impacts.

The impacts associated with the reduction in removals will be different for the commercial and recreational sectors, primarily because the two sectors do not contribute equally to the local economy. A recent 2019 report from Southwick Associates[2] indicates 97% of total economic contribution associated with striped bass fishing came from the recreational sector in 2016. According to the report, total revenues in the commercial sector (from Maine to North Carolina) were $19.8 million that year, while total expenditures in the recreational sector amounted to $6.3 billion. 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. Importantly, the report acknowledges that it is not intended to be used to set fishery regulations, but rather to demonstrate the economic significance of striped bass to local economies. It should also be noted that these numbers are an average for the entire region and actual economic impacts are expected to vary by state.

The dollar values above refer to economic impacts, not to the economic value (or net economic benefit for society) associated with the recreational and commercial fisheries. While data required to quantify these measures are not currently available, the effects of changes to the striped bass management program approved through this addendum can be qualified as follows: for the recreational sector, increased minimum size limits or other restrictions can lead to decreased availability of legal sized striped bass which can lead to increased effort and an increase in dead releases. Conversely, increased fishing restrictions could result in a reduction in number of recreational trips which could translate into a reduction in angler welfare. For the

[2] While this is a useful source of updated information, it is not peer-reviewed and, therefore, the methods behind the report's figures should be consider accordingly.

commercial sector, a reduction in quota will likely reduce profits and may increase the consumer price of striped bass. However, as in the case of the economic impacts, these effects are expected to be outweighed by the positive effects on anglers', harvesters', and consumers' welfare associated with stock recovery in successive years.

2.2.6 Management Program Equivalency

The use of management program equivalency (hereafter referred to as "conservation equivalency") is an integral component of the Commission's Interstate Fisheries Management Program, particularly for Atlantic striped bass. Conservation equivalency allows states flexibility to develop alternative regulations that address specific state or regional differences while still achieving the goals and objectives of the FMP. Under Amendment 6 to the Striped Bass FMP, a state may submit a proposal for a change to its regulatory program for any mandatory compliance measure. It is the responsibility of the state to demonstrate the proposed management program is equivalent to the measures selected through this addendum. All conservation equivalency proposals are subject to TC review and Board approval.

Several states currently use conservation equivalency. For example, the use of closed seasons have been used as an effective tool to implement smaller size limits or increased bag limits while still achieving the same quantified level of conservation. Note the PDT did not develop closed season options for the ocean or Chesapeake Bay regions because the impacts are expected to vary by state and fishery. While closed seasons could be very effective in regions and seasons when striped bass is the only viable fishing choice, closed seasons may have little or no impact in fisheries that operate as catch and release, or in areas where other species are available for harvest. For example, Atlantic mackerel and bluefish are commonly caught with striped bass, so trips that target those species may still catch striped bass and contribute to striped bass release mortality even if striped bass are not targeted or retained.

States should consult the Commission's Conservation Equivalency Technical Guidance Document before considering the development and submission of conservation equivalency proposals. If this document is approved for public comment, the TC will develop criteria for conservation equivalency with this addendum.

3.0 Proposed Management Options

The striped bass ocean fishery is defined as all fisheries operating in coastal and estuarine areas of the U.S. Atlantic coast from Maine through North Carolina, excluding the Chesapeake Bay and Albemarle Sound-Roanoke River (A-R) management areas. The Chesapeake Bay fishery is defined as all fisheries operating within Chesapeake Bay. This document does not propose changes to the A-R management program.

The proposed recreational management options herein were developed using MRIP catch and harvest estimates. To account for year class strength, the Plan Development Team (PDT) used catch-at-length data from 2016 and 2017 to characterize the catch in 2020. The PDT also assumed the same level of non-compliance observed in 2016 and 2017 will occur in 2020, including undersized fish harvested legally through conservation equivalency. Accordingly,

states do not need to resubmit conservation equivalency proposals to maintain lower minimum size limits or slot limits previously approved through conservation equivalency unless they wish to change said measures. States may voluntarily implement management programs that are more conservative than those required herein. As noted, several states currently implement conservation equivalency programs in order to have management measures that meet the needs of their state's fishery (see *Appendix 1* for a summary of striped bass regulations by state and fishing sector in 2017).

Projecting Harvest Reductions to Achieve the Fishing Mortality Target

The PDT used the same forward projecting methodology that was used in the 2018 benchmark assessment to estimate the removals needed to achieve F target (0.20) in 2020 with a 50% probability, and to identify the percent reduction from 2017 levels. Projections were made using final 2018 landings and dead discard estimates, and average removals from 2016-2018 were used as a proxy for 2019 to account for interannual variability. Results indicate an 18% reduction from 2017 levels is needed to achieve F target in 2020, although additional reductions may be needed to achieve the female SSB target within the timeframe required by the Amendment 6 management triggers (i.e., the stock rebuilding schedule cannot exceed 10 years) (Figure 5).

3.1 Proposed Management Scenarios

The following section outlines three management scenarios (including status quo) that are designed to reduce total removals by 18% relative to 2017 levels in order to reduce F to the target in 2020. These scenarios, which are mutually exclusive, include (1) status quo; (2) an 18% reduction in total removals where the desired percent reductions are applied equally (proportionally) to both the commercial and recreational sectors; and (3) an 18% reduction in total removals where the commercial sector takes a smaller percent reduction than the recreational sector.

***Note for all commercial fishery quota options**: quotas are allocated on a fishing year basis. In the event a jurisdiction exceeds its allocation, any overage of its annual quota will be deducted from the state's allowable quota in the following year. None of the scenarios propose changes to existing commercial size limits or the quota transfer provision.*

***Note for all recreational fishery options:** the options herein are designed to reduce harvest and total removals; they are not designed to address effort, and in effect, release mortality. The proposed measures are projected to increase releases because effort is assumed to be constant (i.e., the same level of fishing trips encountering striped bass in 2016 and 2017 will occur in 2020). Accordingly, to offset the expected increase in releases, larger reductions in harvest are needed in order to achieve the desired overall reduction in total removals. To reduce both harvest and release mortality, additional effort controls should be considered to reduce the number of fishing trips that encounter striped bass. Additionally, the long term conservation benefits of implementing slot limits (i.e., protecting larger, older fish) may not be realized if effort is concentrated on fish within the slot limit, thus reducing the number of fish that survive to grow out of the slot. While the PDT expects fish larger than the slot limit will be protected,*

concentrating effort within the slot limit may reduce the number of fish that are able to grow out of the slot thus potentially reducing the population of larger, older fish over time.

When providing input on this document, please first identify your preferred management scenario (Option 1, 2, or 3) and then select your preferred management measures within that scenario. All three scenarios present management options for each fishery and management area combination (recreational measures for the ocean and Chesapeake Bay fisheries and commercial quotas for the ocean and Chesapeake Bay fisheries). All recreational options assume the same fishing seasons as in 2017, unless otherwise noted. All commercial quota options assume the same commercial size limits as in 2017.

Adopted options (other than status quo) would supersede Addendum IV, Sections 3.1 and 3.2, and replace corresponding sections in Amendment 6.

Option 1: Status Quo

The language of Addendum IV, Sections 3.1 and 3.2 would remain in place. In essence, if Option 1 is selected, Atlantic striped bass fisheries will continue to operate under the provisions of Addendum IV. It should be noted this option does not meet the projected reductions needed from 2017 levels to achieve F target in 2020.

Ocean Recreational Fishery

All coastal fisheries (excluding Chesapeake Bay and the Albemarle Sound-Roanoke River) will be constrained by a one fish bag limit and 28-inch minimum size limit. Any jurisdiction submitting a proposal for conservation equivalency must demonstrate through quantitative analysis that its proposal achieves at least a 25% reduction in harvest (including estimated dead discards) from its ocean recreational fishery. All conservation equivalency proposals are subject to Technical Committee review and Board approval.

Note: the Chesapeake Bay spring trophy fishery is part of the coastal fishery for management purposes.

Chesapeake Bay Management Area Recreational Fishery (Maryland, Potomac River Fisheries Commission and Virginia)

The Chesapeake Bay jurisdictions will submit a management program that achieves at least a 20.5% reduction from 2012 harvest (including estimated dead discards) in the Chesapeake Bay recreational fishery for Technical Committee review and Board approval.

The Chesapeake Bay fisheries reductions were based on 2012 harvest because the Bay-wide quota had already been reduced by 14% in 2013, in keeping with the Bay commitment to raise or lower quotas, with definitive changes in the exploitable stock biomass as approved by the FMP. The commercial Chesapeake Bay fisheries' quota reduction meant harvesters were provided 14% less tags or pounds of harvestable quota in 2013, as compared to 2012 and the 2013 recreational summer and fall quotas were reduced by 14% compared to 2012.

Ocean Commercial Fishery

The table below indicates each states commercial quota in pounds. These quotas reflect a 25% reduction from the previous Amendment 6 quotas.

State	Status Quo Addendum IV Quota (Pounds)	2017 Harvest For Reference
Maine*	188	-
New Hampshire*	4,313	-
Massachusetts	869,813	823,409
Rhode Island^	182,719	175,312
Connecticut**	17,813	-
New York	795,795	701,216
New Jersey**^	241,313	-
Delaware	145,085	141,800
Maryland^	98,670	80,457
Virginia	138,640	133,874
North Carolina	360,360	-
Coastal Total	**2,854,706**	**2,056,068**

* Commercial harvest/sale prohibited, with no re-allocation of quota to the recreational fishery.
** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.
^ Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs)

Chesapeake Bay Management Area Commercial Fishery (Maryland, Potomac River Fisheries Commission and Virginia)

The Chesapeake Bay jurisdictions will submit a management program that achieves at least a 20.5% reduction from 2012 harvest in the Chesapeake Bay commercial fishery for Technical Committee review and Board approval. A 20.5% reduction from 2012 harvest results in a Chesapeake Bay commercial quota of 3,120,247 pounds.

Option 2: Equal Percent Reductions

An 18% reduction in total removals relative to 2017 levels to reduce F to the target in 2020 where the desired percent reduction is applied equally (proportionally) to both the commercial and recreational sectors; both sectors would take an 18% reduction from 2017 levels.

Recreational Fishery Management:

The tables below provide a suite of options for both the ocean and Chesapeake Bay recreational fisheries. Size limits are in total length. Bag limits are per person per day. The Board will choose one option from each table, and all states would be required to implement the selected sub-option for striped bass fisheries in their respective state waters. Under all sub-options, states have the flexibility to develop alternative regulations through conservation equivalency.

Sub-Option 2-A: Ocean Recreational Fishery (All jurisdictions would implement).

Under all sub-options, Delaware does not need to resubmit for conservation equivalency to maintain a 2-fish bag limit at 20"-25" slot (July 1 – Aug 31) in the Delaware Bay, River and tributaries. However, Delaware would be required to adopt the selected sub-option for all other seasons and regions. Additionally, New York would be required to submit a proposal that achieves an 18% reduction in removals relative to 2017 levels for the Hudson River management area, and Pennsylvania would be required to submit a proposal that achieves an 18% reduction in its state waters (catch from Pennsylvania and the Hudson River is not covered by MRIP).

Sub-Option	Bag Limit	Size Limit	Season and Trophy Fish/Season	% reduction from 2017 removals
2-A1	1	35" min	Same seasons and trophy season as 2017 (see *Appendix 1*)	18%
2-A2	1	28"-34" slot		19%
2-A3^	1	32"-40" slot		21%

^Under sub-option 2-A3, ocean trophy fish fisheries would be capped with a 40" maximum size limit.

Sub-Option 2-B: Chesapeake Bay Recreational Fishery (MD, PRFC, DC and VA would implement).

Sub-Option	Bag Limit	Size Limit	Season and Trophy Fish/Season	% reduction from 2017 removals
2-B1	1	18" min	Same seasons and trophy season as 2017 (see *Appendix 1*)	20%
2-B2	2	22" min		18%
2-B3^	2	18"-23" slot	Same seasons as 2017 but *without* trophy fish season	19%
2-B4^	2	20"-24" slot		19%

^Under sub-options 2-B3 and 2-B4, states would be required to submit for conservation equivalency to reinstate a trophy fish season.

Commercial Fishery Management
This option is an 18% reduction from the Addendum IV quotas (in pounds) after accounting for approved conservation equivalency programs.

The following table presents quotas for both the ocean and Chesapeake Bay commercial fisheries. Note this option can achieve an 18% reduction from 2017 levels if active commercial fisheries perform the same as they did in 2017. However, there is potential for commercial removals to increase relative to 2017 if active fisheries fully utilize their quotas in 2020.

State	Addendum IV Quota	2017 Harvest	18% Reduction
Chesapeake Bay Commercial Quota^			
Maryland	1,471,888	1,439,760	1,206,948
PRFC	583,362	472,719	478,357
Virginia	1,064,997	827,848	873,298
Chesapeake Bay Total	**3,120,247**	**2,740,327**	**2,558,603**
Ocean Commercial Quota			
Maine*	188	-	154
New Hampshire*	4,313	-	3,537
Massachusetts	869,813	823,409	713,247
Rhode Island^^	182,719	175,312	148,889
Connecticut**	17,813	-	14,607
New York	795,795	701,216	652,552
New Jersey**^^	241,313	-	177,048
Delaware	145,085	141,800	118,970
Maryland^^	98,670	80,457	74,396
Virginia	138,640	133,874	113,685
North Carolina	360,360	-	295,495
Coastal Total	**2,854,706**	**2,056,068**	**2,312,579**

*Commercial harvest/sale prohibited, *with no* re-allocation of quota to the recreational fishery.
**Commercial harvest/sale prohibited, *with* re-allocation of quota to the recreational fishery.
^Jurisdiction-specific quotas for Chesapeake Bay are based on the 2017 allocation of the Bay-wide quota.
^^Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs). An 18% reduction is calculated relative to these reduced quota.

Option 3: The Commercial Sector Takes a Smaller Percent Reduction

An 18% reduction in total removals relative to 2017 levels to reduce F to the target in 2020 where the commercial sector takes a smaller percent reduction than the recreational sector. In this option, the commercial sector will take a 1.8% reduction in quota [the product of the percent total reductions needed (18%) and the proportion of 2017 removals from the commercial sector (10%)]. The commercial percent reduction in numbers of fish is subtracted from the total reductions needed to achieve F target in 2020 to calculate the reduction the recreational sector must take. This reduction is subtracted from the 2017 recreational removals estimate to calculate the new target percent reduction for recreational removals (20%).

The rationale for this suite of options is the commercial fishery is managed via a static quota system which keeps effort and removals relatively constant from year to year, while the recreational management program does not have a harvest limit. This has allowed recreational effort and, therefore, removals to increase with resource availability and other social and economic factors.

Recreational Fishery Management*:*

The tables below provide a suite of options for both the ocean and Chesapeake Bay recreational fisheries. Size limits are in total length. Bag limits are per person per day. The Board will choose one option from each table, and all states would be required to implement the selected sub-option for striped bass fisheries in their respective state waters. Under all sub-options, states have the flexibility to develop alternative regulations through conservation equivalency.

Sub-Option 3-A: Ocean Recreational Fishery (All jurisdictions would implement).

Under all sub-options, Delaware does not need to resubmit for conservation equivalency to maintain a 2-fish bag limit at 20"-25" slot (July 1 – Aug 31) in the Delaware Bay, River and tributaries. However, Delaware would be required to adopt the selected sub-option for all other seasons and regions. Additionally, New York would be required to submit a proposal that achieves an 18% reduction in removals relative to 2017 levels for the Hudson River management area, and Pennsylvania would be required to submit a proposal that achieves an 18% reduction in its state waters (catch from Pennsylvania and the Hudson River is not covered by MRIP).

Sub-Option	Bag Limit	Size Limit	Season and Trophy fish/season	% reduction from 2017 removals
3-A1	1	36" min	Same seasons and trophy season as 2017 (see *Appendix 1*)	20%
3-A2	1	28"-33" slot		22%
3-A3^	1	32"-40" slot		21%

^Under sub-option 3-A3, ocean trophy fish fisheries would be capped with a 40" maximum size limit.

Sub-Option 3-B: Chesapeake Bay Recreational Fishery (MD, PRFC, DC and VA would implement).

Sub-Option	Bag Limit	Size Limit	Season and Trophy Fish/Season	% reduction from 2017 removals
3-B1^	1	MD: 19" min PRFC, DC, VA: 20" min	Same seasons and trophy season as 2017 (see *Appendix 1*)	29%
3-B2	1	18” min		20%
3-B3	2	23” min	Same seasons as 2017 *except* the trophy season starts no earlier than May 1	20%
3-B4	2	18”-22" slot		21%
3-B5	2	20”-23" slot		20%
3-B6	2	22”-40" slot	Same seasons as 2017; same trophy season and minimum sizes *except* with a 40” max size limit	21%

^Sub-option 3-B1 drops the bag limit to 1-fish but maintains 2018 size limits. The PDT notes that a higher percent reduction is projected relative to 2017 size limits (i.e., when all fisheries were at a 20” minimum).

(COMMERCIAL FISHERY MANAGEMENT OPTION FOR OPTION 3 ON NEXT PAGE)

Commercial Fishery Management
This option is a 1.8% reduction from the Addendum IV quotas (in pounds) after accounting for approved conservation equivalency programs.

The following table presents quotas for both the ocean and Chesapeake Bay commercial fisheries. Note this option can achieve a 1.8% reduction from 2017 levels if active commercial fisheries perform the same as they did in 2017. However, there is potential for commercial removals to increase relative to 2017 if active fisheries fully utilize their quotas in 2020.

State	Addendum IV Quota	2017 Harvest	1.8% Reduction
Chesapeake Bay Commercial Quota^			
Maryland	1,471,888	1,439,760	1,445,394
PRFC	583,362	472,719	572,861
Virginia	1,064,997	827,848	1,045,827
Chesapeake Bay Total	**3,120,247**	**2,740,327**	**3,064,083**
Ocean Commercial Quota			
Maine*	188	-	185
New Hampshire*	4,313	-	4,235
Massachusetts	869,813	823,409	854,156
Rhode Island^^	182,719	175,312	178,304
Connecticut**	17,813	-	17,492
New York	795,795	701,216	781,471
New Jersey**^^	241,313	-	212,026
Delaware	145,085	141,800	142,473
Maryland^^	98,670	80,457	89,094
Virginia	138,640	133,874	136,144
North Carolina	360,360	-	353,874
Coastal Total	**2,854,706**	**2,056,068**	**2,769,454**

*Commercial harvest/sale prohibited, *with no* re-allocation of quota to the recreational fishery.
**Commercial harvest/sale prohibited, *with* re-allocation of quota to the recreational fishery.
^Jurisdiction-specific quotas for Chesapeake Bay are based on the 2017 allocation of the Bay-wide quota.
^^Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912 lbs), and MD (90,727 lbs). A 1.8% reduction is calculated relative to these reduced quota.

3.2 Circle Hook Provision

This section proposes options regarding the use of circle hooks to reduce striped bass discard mortality in recreational fisheries.

Discard mortality accounts for a considerable amount of removals in the Atlantic striped bass fishery along the east coast. The latest assessment assumes 9% of fish that are released alive die as a result of being caught (Diodati and Richards 1996), although there is some evidence it may be higher, particularly in the summer months. Management measures that increase the minimum size limit or reduce bag limits can lead to an increase in the number of striped bass released.

The use of circle hooks by anglers targeting striped bass with bait, live or chunk, has been identified as a method to reduce the discard mortality of striped bass in recreational fisheries. The ASMFC defines circle hooks as "a non-offset hook where the point is pointed perpendicularly back towards the shank" (ASMFC 2003b). The term non-offset circle hook means the point and barb are in the same plane as the shank (e.g. when the hook is laying on a flat surface, the entire hook and barb also lay flat). When a circle hook begins to exit the mouth of a fish, the shape causes the shaft to rotate towards the point of resistance and the barb is more likely to embed in the jaw or corner of the fish's mouth. Circle hooks can reduce rates of "gut-hooking" and lower the likelihood of puncturing internal organs if the hook is swallowed.

Caruso (2000) found discard mortality was reduced by 12.5% by using circle hooks compared to j-hooks in Massachusetts waters and the incidence of potentially lethal wounding was low with circle hooks. Lower discard mortality was also estimated on the Hudson River with circle hook usage when compared to j-hooks (Millard et al. 2005). Within Chesapeake Bay, Lukacovic and Uphoff (2007) collected data on striped bass hooking mortality using natural cut bait on j-hooks and circle hooks. The study found that j-hooks were 3.7 times more likely to result in deep-hooking than circle hooks, and deeply-hooked fish were 17 times more likely to die when released.

While circle hooks have been demonstrated to reduce hooking mortality rates, factors other than hook type can also affect the release mortality rate. These other factors include water temperature (Nelson 1994; Wilde et al. 2000; Millard et al. 2005), air temperature (Lukacovic and Uphoff 2007), salinity (RMC 1990), hook size (ASMFC 2003b), fish length (Lukacovic and Uphoff 2007), and hooking location (Nelson 1994; Millard et al. 2005; Lukacovic and Uphoff 2007). Additionally, it is unknown how many anglers currently use circle hooks, resulting in uncertainty on how many additional fish could be saved if mandatory circle hook measures are put in place. Enforceability and compliance are also concerns depending on how regulations are implemented, specifically depending on which anglers these regulations would apply to (e.g., to only those targeting striped bass, or all bait fishing in a state).

If Option B or Option C is selected, the Board must specify an implementation schedule. The schedule should consider state legislative and regulatory/public outreach development processes, including consultation with its stakeholders and user groups.

Option A. Status Quo
The language from Amendment 6, Section 5.3.1 would remain in place:
The states/jurisdictions are recommended to encourage the use of circle hooks to reduce the mortality associated with hooking and releasing striped bass. A number of studies have been conducted that have demonstrated that release mortality is decreased significantly with the use of circle hooks. In order to promote the use of circle hooks, states are encouraged to develop public relations/education campaigns on their benefits.

Option B. States/jurisdictions would be required to implement regulations requiring the use of circle hooks, as defined above, with the intent of reducing striped bass discard mortality in their recreational fisheries. States have the flexibility to develop regulations that address specific needs of their fisheries. In order to promote the use of circle hooks, states are encouraged to develop public education and outreach campaigns on their benefits.

Option C. States/jurisdictions would be required to promote the use of circle hooks by developing public education and outreach campaigns on their benefits. States/jurisdictions must provide updates on public education and outreach efforts in annual state compliance reports.

4.0 Compliance Schedule

If approved, states must implement Addendum VI according to the following schedule to be in compliance with the Atlantic Striped Bass Interstate FMP:

XXXXXX: States submit proposals to meet requirements of Addendum VI.

XXXXXX: Management Board reviews and takes action on state proposals.

[Month Day, Year]: States implement regulations.

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6.0 Tables and Figures

Table 1. Total removals (harvest and discards/release mortality) of Atlantic striped bass by sector in pounds, 2004-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

Year	Commercial		Recreational		Total Removals
	Harvest	Dead Discards	Harvest	Release Mortality	
2004	7,335,116	1,262,136	54,091,836	14,307,082	76,144,795
2005	7,121,319	1,078,391	53,031,074	14,412,620	79,581,675
2006	6,785,006	1,333,235	57,421,174	16,303,942	74,333,557
2007	7,047,195	1,181,533	50,674,431	12,680,939	63,054,061
2008	7,190,685	953,364	42,823,614	12,436,713	76,637,612
2009	7,216,792	1,076,465	56,665,318	11,236,287	73,903,661
2010	6,996,713	920,564	54,411,389	10,833,398	80,236,228
2011	6,789,792	809,577	61,431,360	7,569,260	74,729,834
2012	6,516,868	1,411,621	59,592,092	8,046,178	69,269,469
2013	5,819,678	901,326	53,256,619	10,731,891	82,432,216
2014	5,937,949	1,167,696	65,057,289	8,177,402	63,484,692
2015	4,830,124	1,031,887	47,948,610	11,621,265	57,294,717
2016	4,831,442	1,085,060	39,898,799	11,655,870	61,229,668
2017	4,803,867	1,110,833	43,671,532	15,818,534	59,392,844
2018	4,714,661	870,348	37,896,549	12,343,941	40,997,978

Table 2. Total removals (harvest and discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 2004-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

Year	Commercial		Recreational		Total Removals
	Harvest	Dead Discards	Harvest	Release Mortality	
2004	879,768	160,196	4,553,027	3,665,234	9,258,224
2005	970,403	145,094	4,480,802	3,441,928	9,038,227
2006	1,047,648	158,260	4,883,960	4,812,332	10,902,201
2007	1,015,226	166,397	3,944,679	2,944,253	8,070,556
2008	1,027,837	108,962	4,381,186	2,391,200	7,909,184
2009	1,049,959	128,191	4,700,222	1,942,061	7,820,433
2010	1,031,430	133,064	5,388,440	1,760,759	8,313,693
2011	944,777	87,924	5,006,358	1,482,029	7,521,088
2012	870,606	191,577	4,046,299	1,847,880	6,956,361
2013	784,379	112,097	5,157,760	2,393,425	8,447,661
2014	750,263	121,253	4,033,747	2,172,342	7,077,604
2015	623,313	101,343	3,085,725	2,307,133	6,117,515
2016	607,084	105,119	3,500,434	2,981,430	7,194,066
2017	592,670	108,475	2,934,293	3,419,651	7,055,089
2018	622,451	90,092	2,244,766	2,826,667	5,783,976

Figure 1. Female spawning stock biomass (SSB) and recruitment (age-1 fish), 1982-2017. Source: 2018 benchmark stock assessment for Atlantic striped bass.

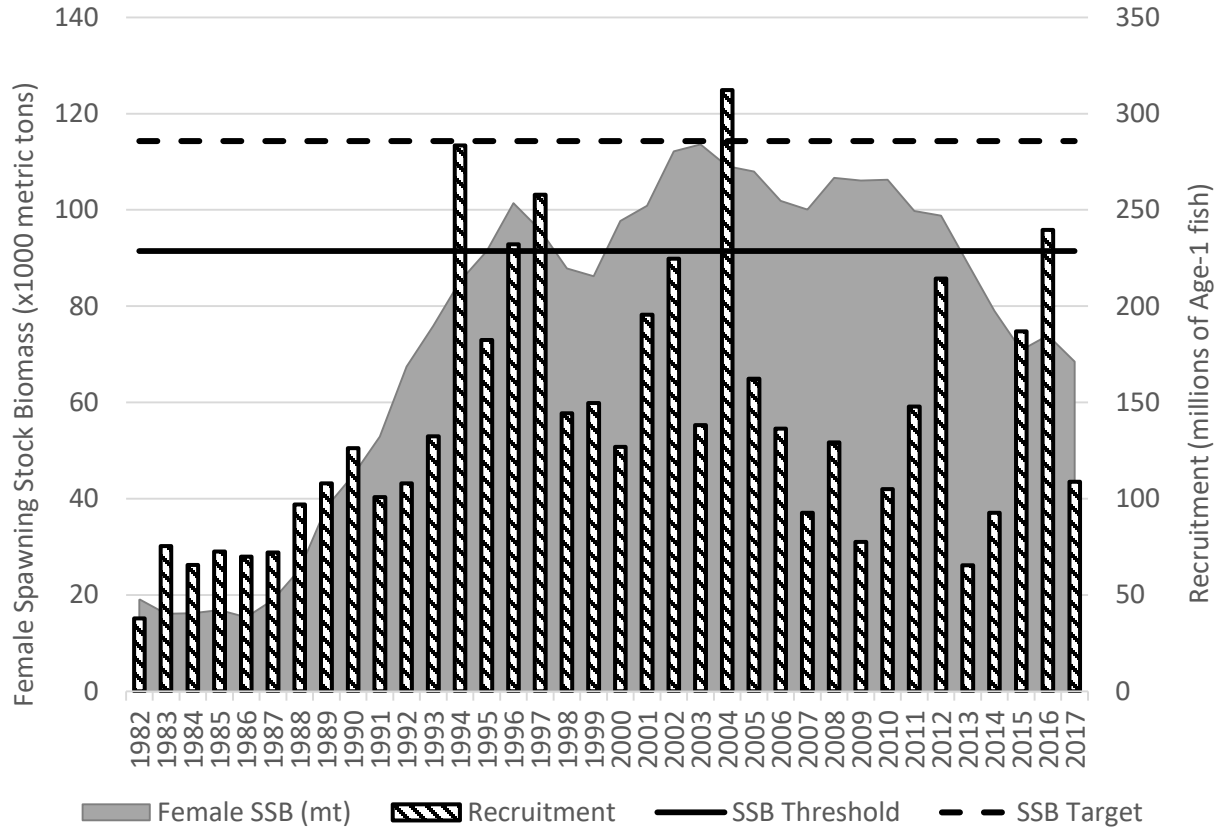


Figure 2. Total fishing mortality (F), 1982-2017. Source: 2018 benchmark stock assessment for Atlantic striped bass.

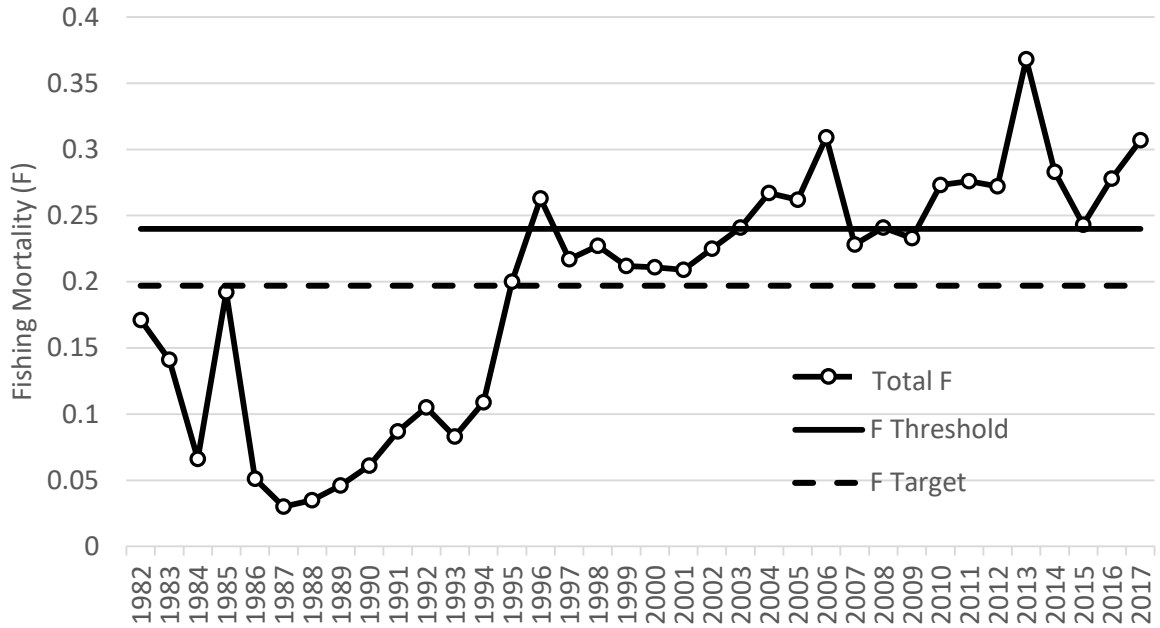


Figure 3. Total striped bass removals by sector in numbers of fish, 1982-2018. Note: Harvest is from ACCSP/MRIP, dead discards and release mortality is from ASMFC. Estimates exclude inshore catch and harvest from North Carolina.

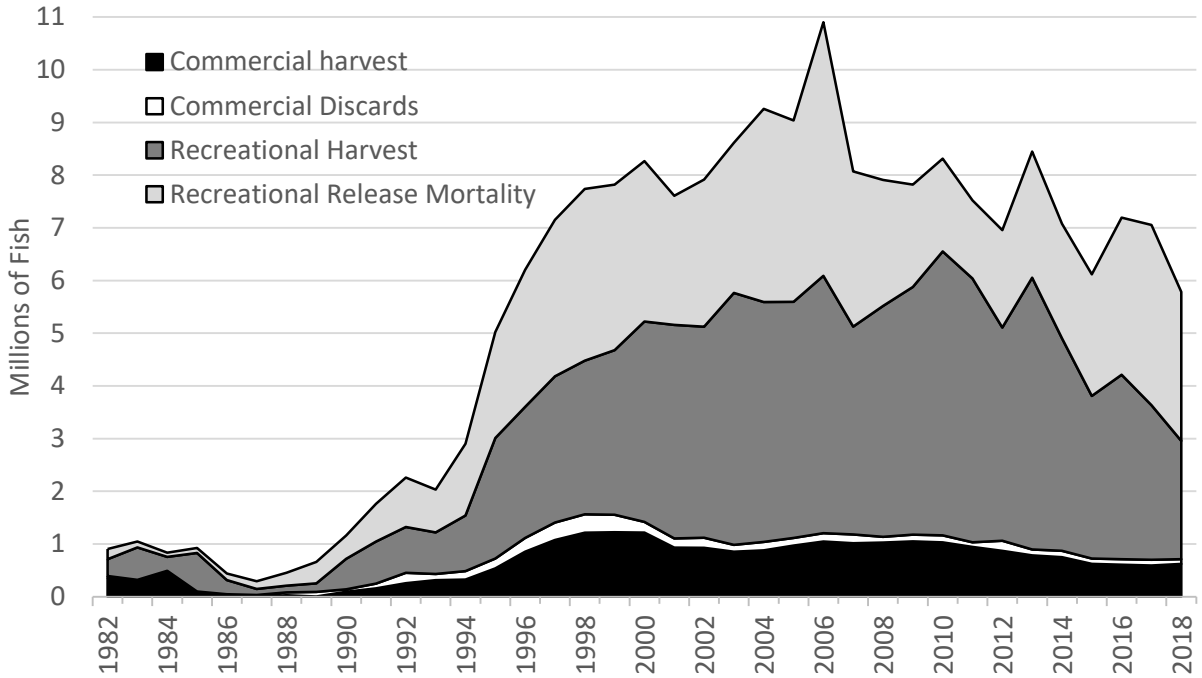


Figure 4. The proportion of recreational fish caught and released alive, 1982-2018. Source: MRIP. Excludes inshore catch from North Carolina.

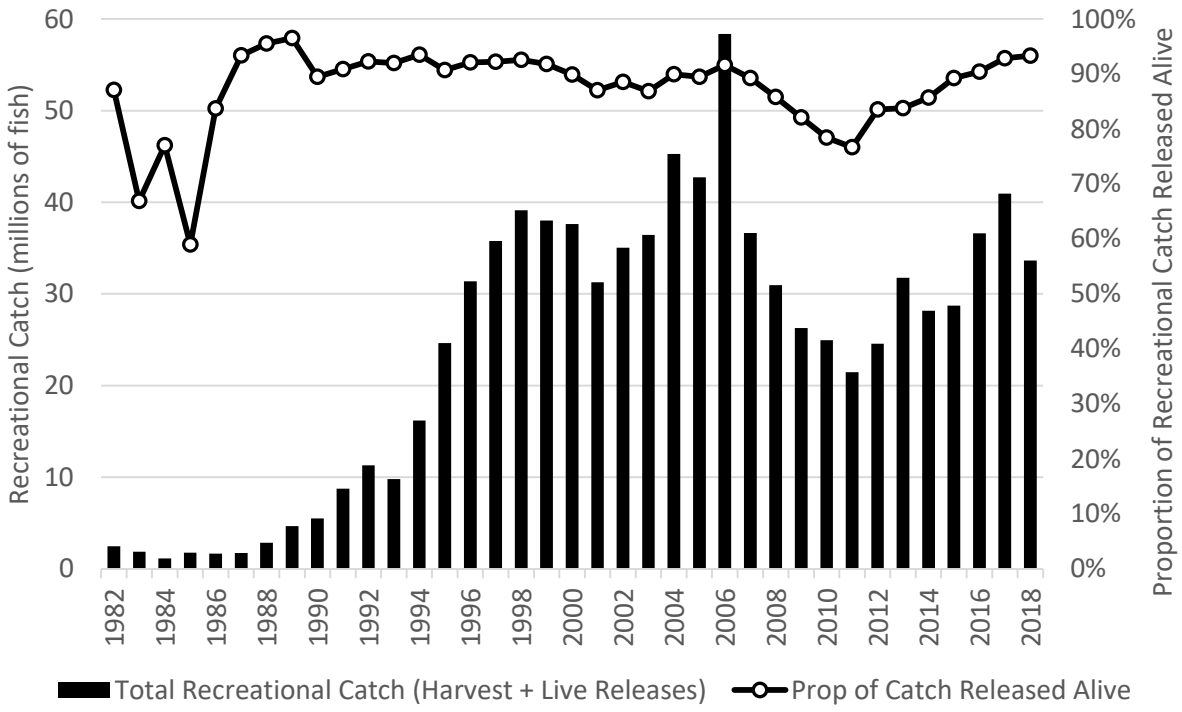
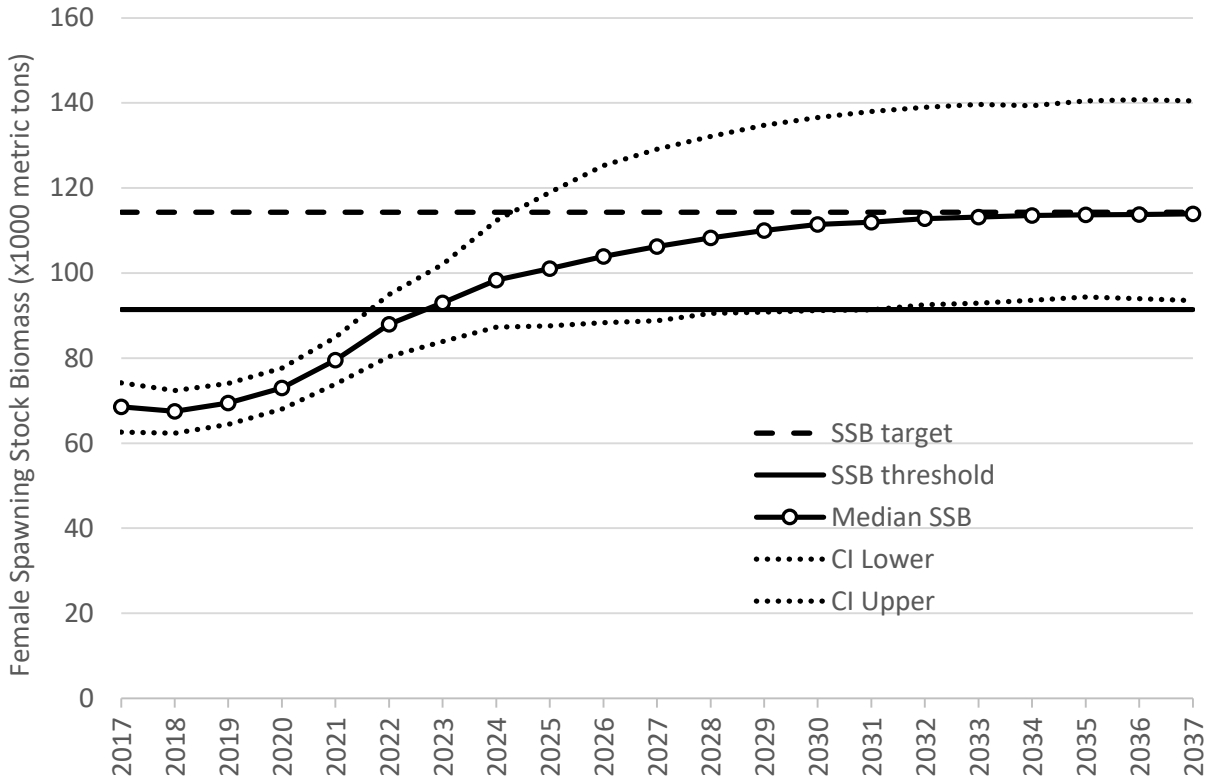


Figure 5. Projecting female spawning stock biomass (SSB) forward until SSB target is achieved while fishing at the fishing mortality target (F = 0.20) beginning in 2020.



Appendix 1. Summary of Atlantic striped bass regulations in 2017. Source: 2018 State Compliance Reports. Minimum size limits and slot size limits are in total length (TL). *commercial quota reallocated to recreational bonus fish program

Commercial regulations in 2017.

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	34" minimum size	869,813 lbs. Hook & line only	6.23 until quota reached, Monday and Thursdays only; 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit (striped bass endorsement required for both permits)
RI	Floating fish trap (FFT): 26" minimum size General category (GC; mostly rod & reel): 34" min.	Total: 181,540 lbs., split 39:61 between the FFT and GC. Gill netting prohibited.	FFT: 4.1 – 12.31, or until quota reached; unlimited possession limit until 70% of quota projected to be harvested, then 500 lbs/day GC: 5.28-8.31, 9.10-12.31, or until quota reached. Closed Fridays and Saturdays during both seasons.
CT*	Commercial fishing prohibited; bonus program: 22 – <28" slot size limit, 5.1 – 12.31 (voucher required)		
NY	28"-38" minimum size (Hudson River closed to commercial harvest)	795,795 lb. Pound nets, gill nets (6-8"stretched mesh), hook & line.	6.1 – 12.15, or until quota reached. Limited entry permit only.
NJ*	Commercial fishing prohibited; bonus program: 1 fish at 24 – <28" slot size limit, 9.1 – 12.31 (permit required)		
PA	Commercial fishing prohibited		
DE	Gillnet: 28" minimum size, except 20" min in Del. Bay and River during spring season. Hook and Line: 28" min	Gillnet: 137,831 lbs. Hook and line: 14,509 lbs.	Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-2.28 & 5.1-5.31; no fixed nets in Del. River. No trip limit. Hook and Line: 4.1–12.31, 200 lbs/day trip limit

Appendix 1, commercial regulations in 2017 (continued).

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
MD	Ocean: 24" minimum CB and Rivers: 18–36"	Ocean: 90,727 lbs. CB and Rivers: 1,471,888 lbs. (part of Bay-wide quota).	Ocean: 1.1-5.31, 10.1-12.31, Mon- Fri Bay Pound Net: 6.1-12.30, Mon-Sat Bay Haul Seine: 6.1-12.29, Mon-Fri Bay Hook & Line: 6.1-12.28, Mon-Thu Bay Drift Gill Net: 1.2-2.28, 12.1-12.29, Mon-Thu
PRFC	18-36" slot size limit 2.15-3.25 and 18" minimum size all other seasons	583,362 lbs. (part of Bay-wide quota). Allocated by gear and season.	Hook & line: 1.1-3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25, 11.13-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15
DC	Commercial fishing prohibited		
VA	Bay and Rivers: 18" min size, and 18-28" slot size limit 3.26–6.15 Ocean: 28" min	Bay and Rivers: 1,064,997 lbs. (part of Bay-wide quota). Ocean: 136,141 lbs. ITQ-system for both areas.	Bay and Rivers: 1.16-12.31 Ocean: 1.16-12.31
NC	Ocean: 28"	360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit.	Seine fishery was open for 120 days, 150 fish/permit Gill net fisher was open for 45 days, 50 fish/permit Trawl fishery was open for 70 days, 100 fish/permit

Appendix 1, recreational regulations in 2017. C&R = catch and release

STATE	SIZE LIMITS	BAG LIMIT	GEAR RESTRICTIONS	OPEN SEASONS
ME	28" minimum size	1 fish/day	Hook & line only; circle hooks only when using live bait	All year, except spawning areas are closed 12.1 – 4.30 and catch and release only 5.1 – 6.30
NH	28" minimum size	1 fish/day	Gaffing and culling prohibited	All year
MA	28" minimum size	1 fish/day	Hook & line only; no high-grading	All year
RI	28" minimum size	1 fish/day	None	All year
CT	28" minimum size	1 fish/day	Spearing and gaffing prohibited	All year
NY	Ocean and Delaware River: 28" minimum size Hudson River: 18"-28" slot limit, or >40"	1 fish/day	Angling only. Spearing permitted in ocean waters. Catch and release only during closed season.	Ocean: 4.15 – 12.15 Hudson River: 4.1 – 11.30 Delaware River: All year
NJ	1 fish at 28" to < 43", and 1 fish ≥ 43"		Circle hooks required while fishing with natural bait during springtime spawning ground closure.	Ocean: All year All other waters: 3.1 – 12.31, except spawning ground closure from 4.1 – 5.31 in the lower Delaware River and tributaries
PA	Upstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, year round Downstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, 1.1 – 3.31 and 6.1 – 12.31 2 fish at 21"-25" slot size limit, 4.1 – 5.31			
DE	28" minimum size, no harvest 38-43" (inclusive)	2 fish/day	Hook & line, spear (for divers) only. Circle hooks required in spawning season.	All year except 4.1-5.31 in spawning grounds (C&R allowed). In Del. River, Bay & tributaries, may only harvest 20-25"slot from 7.1-8.31

Appendix 1, recreational regulations in 2017 (continued). C&R = catch and release

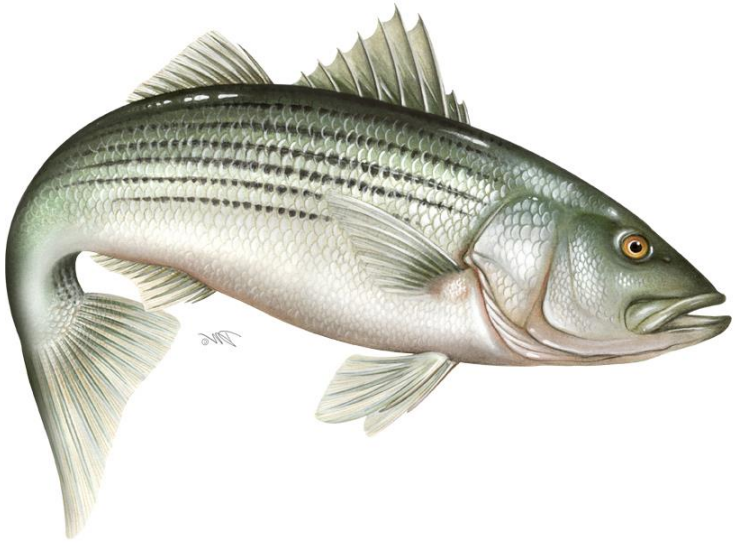
STATE	SIZE LIMITS	BAG LIMIT	OTHER	OPEN SEASON
MD	Ocean: 28”-38” slot limit or ≥44” CB Spring Trophy: 35” minimum CB Summer/Fall^: 20” minimum and only one fish can be >28”	Ocean: 2 fish/day CB Spring Trophy: 1 fish/day CB Summer/Fall^: 2 fish/day	See compliance report for specifics.	Ocean: All year CB: C&R only 1.1-4.14^ CB Spring Trophy: 4.15-5.15 Bay Summer/Fall: 5.16-12.20
PRFC	Spring Trophy: 35” minimum Summer/Fall: 20” minimum and only 1 fish can be >28”	Trophy: 1 fish/day Summer/Fall: 2 fish/day	No more than two hooks or sets of hooks for each rod or line	Spring Trophy: 4.15 -5.15 Summer/Fall: 5.16-12.31
DC	20” minimum and only one fish can be >28”	2 fish/day	Hook & line only	5.16-12.31
VA	Ocean: 28” minimum Ocean Trophy: 36” minimum CB Trophy: 36” minimum CB Spring: 20-28” (with 1 fish >36”) CB Fall: 20” minimum and only one fish can be >28”	Ocean: 1 fish/day Ocean Trophy: 1 fish/day Bay Trophy: 1 fish/day Bay Spring: 2 fish/day Bay Fall: 2 fish/day	Hook & line, rod & reel, hand line only. Gaffing is illegal in Virginia marine waters. No possession in the spawning reaches of the Bay during trophy season	Ocean: 1.1-3.31, 5.16-12.31 Ocean Trophy: 5.1-5.15 Bay Trophy: 5.1-6.15 Bay Spring: 5.16-6.15 Bay Fall: 10.4-12.31
NC	Ocean: 28” minimum	Ocean: 1 fish/day	No gaffing allowed.	Ocean: All year

^in Susquehanna Flats and Northeast River: C&R only from 1.1-5.3 and 1 fish/day at 20-26” slot size limit from 5.16-5.31

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

ATLANTIC STRIPED BASS
(Morone saxatilis)

2018 FISHING SEASON



Atlantic Striped Bass Plan Review Team
Max Appelman, Atlantic States Marine Fisheries Commission, Chair
Charlton Godwin, North Carolina Division of Marine Fisheries
Derek Orner, National Marine Fisheries Service
Gary Shepherd, National Marine Fisheries Service

Drafted July 2019

I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – 1981
Amendments:	Amendment 1 – 1984 Amendment 2 – 1984 Amendment 3 – 1985 Amendment 4 – 1989; Addendum I – 1991, Addendum II – 1992, Addendum III – 1993, Addendum IV – 1994 Amendment 5 – 1995; Addendum I – 1997, Addendum II – 1997, Addendum III – 1998, Addendum IV – 1999, Addendum V – 2000 Amendment 6 – 2003; Addendum I – 2007, Addendum II – 2010, Addendum III – 2012, Addendum IV – 2014
Management Unit:	Migratory stocks of Atlantic striped bass from Maine through North Carolina
States With Declared Interest:	Maine - North Carolina, including Pennsylvania
Additional Jurisdictions:	District of Columbia, Potomac River Fisheries Commission, National Marine Fisheries Service, United States Fish and Wildlife Service
Active Boards/Committees:	Atlantic Striped Bass Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Tagging Subcommittee, Plan Review Team, and Plan Development Team

The Atlantic States Marine Fisheries Commission (Commission) developed a Fisheries Management Plan (FMP) for Atlantic Striped Bass in 1981 in response to poor juvenile recruitment and declining landings. The FMP recommended increased restrictions on commercial and recreational fisheries, such as minimum size limits and harvest closures on spawning grounds. Two amendments were passed in 1984 recommending additional management measures to reduce fishing mortality. To strengthen the management response and improve compliance and enforcement, the Atlantic Striped Bass Conservation Act (P.L. 98-613) was passed in late 1984. The Striped Bass Act[1] mandated the implementation of striped bass regulations passed by the Commission and gave the Commission authority to recommend to the Secretaries of Commerce and Interior that states be found out of compliance when they failed to implement management measures consistent with the FMP.

The first enforceable plan under the Striped Bass Act, Amendment 3, was approved in 1985, and required size regulations to protect the 1982-year class – the first modest size cohort since the previous decade. The objective was to increase size limits to allow at least 95% of the females in the 1982 year class to spawn at least once. Smaller size limits were permitted in producer areas than along

[1] The 1997 reauthorization of the Striped Bass Act also required the Secretaries of Commerce and Interior provide a biennial report to Congress highlighting the progress and findings of studies of migratory and estuarine Striped Bass. The ninth such report was recently provided to Congress (Shepherd et al. 2017).

the coast. Several states, beginning with Maryland in 1985, opted for a more conservative approach and imposed a total moratorium on striped bass landings for several years. The amendment contained a trigger mechanism to relax regulations when the 3-year moving average of the Maryland juvenile abundance index (JAI) exceeded an arithmetic mean of 8.0 – which was attained with the recruitment of the 1989 year class. Also, in 1985, the Commission determined the Albemarle Sound-Roanoke River (A-R) stock in North Carolina contributed minimally to the coastal migratory population, and was therefore allowed to operate under an alternative management program.

Amendment 4, implemented in 1989, aimed to rebuild the resource rather than maximize yield. The amendment allowed state fisheries to reopen under a target fishing morality (F) of 0.25, which was half the estimated F needed to achieve maximum sustainable yield (MSY). The amendment allowed an increase in the target F once spawning stock biomass (SSB) was restored to levels estimated during the late 1960s and early 1970s. The dual size limit concept was maintained (coastal versus producer areas), and a recreational trip limit and commercial season was implemented to reduce the harvest to 20% of that in the historic period of 1972-1979. A series of four addenda were implemented from 1990-1994 to maintain protection of the 1982 year class.

In 1990, to provide additional protection to striped bass and ensure the effectiveness of state regulations, NOAA Fisheries passed a final rule (55 Federal Register 40181-02) prohibiting possession, fishing (catch and release fishing), harvest, and retention of Atlantic striped bass in the Exclusive Economic Zone (EEZ), with the exception of a defined transit zone within Block Island Sound. Atlantic striped bass may be transported through this defined area provided that the vessel is not used to fish while in the EEZ and the vessel remains in continuous transit, and that the fish were legally caught in adjoining state waters.

In 1995, the Atlantic striped bass migratory stock was declared recovered by the Commission (the A/R stock was declared recovered in 1997) and Amendment 5 was adopted to increase the target F to 0.33, midway between the existing F target (0.25) and F_{MSY}. Target F was allowed to increase again to 0.40 after two years of implementation. Regulations were developed to achieve the target F (which included measures to restore commercial harvest to 70% of the average landings during the 1972-1979 historical period) and states were allowed to submit proposals to implement alternative regulations that were deemed conservationally equivalent to the Amendment 5 measures. From 1997-2000, a series of five addenda were implemented to respond to the latest stock status information and adjust the regulatory program to achieve each change in target F.

In 2003, Amendment 6 was adopted to address five limitations within the existing management program: 1) potential inability to prevent the Amendment 5 exploitation target from being exceeded; 2) perceived decrease in availability or abundance of large striped bass in the coastal migratory population; 3) a lack of management direction with respect to target and threshold biomass levels; 4) inequitable effects of regulations on the recreational and commercial fisheries, and coastal and

producer area sectors; and 5) excessively frequent changes to the management program. Accordingly, Amendment 6 completely replaced the existing FMP for Atlantic striped bass.[2]

The goal of Amendment 6 is "to perpetuate, through cooperative interstate management, migratory stocks of striped bass; to allow commercial and recreational fisheries consistent with the long-term maintenance of a broad age structure, a self-sustaining spawning stock; and also to provide for the restoration and maintenance of their essential habitat." In support of this goal, the following objectives are included:

1. Manage striped bass fisheries under a control rule designed to maintain stock size at or above the target female spawning stock biomass level and a level of fishing mortality at or below the target exploitation rate.
2. Manage fishing mortality to maintain an age structure that provides adequate spawning potential to sustain long-term abundance of striped bass populations.
3. Provide a management plan that strives, to the extent practical, to maintain coastwide consistency of implemented measures, while allowing the States defined flexibility to implement alternative strategies that accomplish the objectives of the FMP.
4. Foster quality and economically viable recreational, for-hire, and commercial fisheries.
5. Maximize cost effectiveness of current information gathering and prioritize state obligations in order to minimize costs of monitoring and management.
6. Adopt a long-term management regime that minimizes or eliminates the need to make annual changes or modifications to management measures.
7. Establish a fishing mortality target that will result in a net increase in the abundance (pounds) of age 15 and older striped bass in the population, relative to the 2000 estimate.

Amendment 6 modified the F target and threshold, and introduced a new set of biological reference points (BRPs) based on female SSB, as well as a list of management triggers based on the BRPs. The coastal commercial quotas were restored to 100% of the states' average landings during the 1972-1979 historical period, except for Delaware's coastal commercial quota which remained at the level allocated in 2002[3]. In the recreational fisheries, all states were required to implement a two-fish bag limit with a minimum size limit of 28 inches, except for the Chesapeake Bay fisheries, North Carolina fisheries that operate in the A/R, and states with approved alternative regulations. The Chesapeake Bay and A/R regulatory programs were predicated on a more conservative F target than the coastal migratory stock, which allowed these states/jurisdictions (hereafter states) to implement separate seasons, harvest caps, and size and bag limits as long as they remain under that F target. No minimum size limit can be less than 18 inches under Amendment 6. The same minimum size standards regulate

[2] While NOAA Fisheries continues to implement a complete ban on the fishing and harvest of striped bass in the EEZ, Amendment 6 includes a recommendation to consider reopening the EEZ to striped bass fisheries. In September 2006, NOAA Fisheries concluded that it would be imprudent to open the EEZ to striped bass fishing because it could not be certain that opening the EEZ would not lead to increased effort and an overfishing scenario.

[3] The decision to hold Delaware's commercial quota at the 2002 level is based on tagging information that indicated F on the Delaware River/Bay stock is too high, and uncertainty regarding the status of the spawning stock for the Delaware River/Bay.

the commercial fisheries as the recreational fisheries, except for a minimum 20 inch size limit in the Delaware Bay spring American shad gillnet fishery.

States are permitted the flexibility to deviate from these regulations by submitting conservation equivalency proposals to the Plan Review Team (PRT). All proposals are subject to technical review and approval by the Atlantic Striped Bass Management (Board). It is the responsibility of the state to demonstrate through quantitative analysis that the proposed management program is equivalent to the standards in the FMP, or will not contribute to the overfishing of the resource.

Four addenda to Amendment 6 have been implemented. Addendum I, approved in 2007, established a bycatch monitoring and research program to increase the accuracy of data on striped bass discards and recommended development of a web-based angler education program. Also in 2007, President George W. Bush issued an Executive Order (E.O. 13449) prohibiting the sale of striped bass (and red drum) caught within the EEZ. Addendum II was approved in 2010 and established a new definition of recruitment failure such that each index would have a fixed threshold rather than a threshold that changes annually with the addition of each year's data. Addendum III was approved in 2012 and requires all states with a commercial fishery for striped bass to implement a uniform commercial harvest tagging program. The addendum was initiated in response to significant poaching events in the Chesapeake Bay and aims to limit illegal harvest of striped bass.

Addendum IV, approved in 2014, currently sets the regulatory program for striped bass fisheries. The addendum was initiated in response to the 2013 benchmark assessment which indicated a steady decline in SSB since the mid-2000s. The addendum established new F reference points, as recommended by the 2013 benchmark. In order to reduce F to a level at or below the new target, coastal states are required to implement 1-fish bag limit and 28" minimum size limit to achieve a 25% reduction from 2013 removals in the ocean fishery. Chesapeake Bay fisheries are required to implement regulations to achieve a 20.5% reduction from 2012 removals since their fisheries were reduced by 14% in 2013 based on their management program. The addendum maintains the flexibility to implement alternative regulations through the conservation equivalency process. This practice has resulted in a variety of regulations among states (Table 1 and Table 2). All states promulgated regulations prior to the start of their 2015 seasons.

In February 2017, the Board initiated the development of Draft Addendum V to consider liberalizing coastwide commercial and recreational regulations. The Board's action responded to concerns raised by Chesapeake Bay jurisdictions regarding continued economic hardship endured by its stakeholders since the implementation of Addendum IV and information from the 2016 stock assessment update indicating that F was below target in 2015, and that total removals could increase by 10% to achieve the target F. However, the Board chose to not advance the draft addendum for public comment largely due to harvest estimates having increased in 2016 without changing regulations. Instead, the Board decided to wait until it reviews the results of the 2018 benchmark stock assessment before considering making changes to the management program.

II. Status of the Stocks

The 2018 benchmark stock assessment for Atlantic striped bass was peer-reviewed at the 66th Northeast Regional Stock Assessment Workshop (SAW)/Stock Assessment Review Committee (SARC) meeting in November 2018. The assessment addressed several of the recommendations from the 57th SAW/SARC, including developing new maturity-at-age estimates for the coastal migratory stock and evaluating stock status definitions relative to uncertainty in biological reference points. The assessment also made progress on developing a spatially and temporally explicit catch-at-age model incorporating tag-based movement (migration) information. Although the Peer Review Panel did not accept the migration model for management use, it recommended continued work to improve the model for future assessments.

The accepted model is a forward projecting statistical catch-at-age (SCA) model which uses catch-at-age data and fishery-dependent and -independent survey indices to estimate annual population size and fishing mortality. Indices of abundance track relative changes in the population over time while catch data provide information on the scale of the population size. Age structure data (numbers of fish by age) provide additional information on recruitment (number of age-1 fish entering the population) and trends in mortality.

The biological reference points (BRPs) currently used for management are based on the 1995 estimate of female spawning stock biomass (SSB). The 1995 estimate of female SSB is used as the SSB threshold because many stock characteristics (such as an expanded age structure) were reached by this year and the stock was declared recovered. The SSB target is equal to 125% of SSB threshold. To estimate the associated fishing mortality (F) threshold and target, population projections were made by using a constant F and changing the value until the SSB threshold or target was achieved. For the 2018 benchmark, the BRP values have been updated. The benchmark incorporates the newly calibrated recreational catch estimates based on the Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES), resulting in higher estimates of SSB and therefore higher estimates for the SSB threshold and target (refer to *Section III* for more information). The SSB threshold is estimated at 91,436 metric tons (202 million pounds), with an SSB target of 114,295 metric tons (252 million pounds). The new MRIP estimates did not have a large effect on the estimates of fishing mortality, and the updated F threshold and target values are very similar to the previous F reference points. The F threshold is estimated at 0.24, and the target is estimated at 0.20

Based on the results of the 2018 benchmark, Atlantic striped bass is overfished and experiencing overfishing. In 2017, female SSB was estimated at 68,476 metric tons (151 million pounds) which is below the SSB threshold (Figure 1). Female SSB declined steadily since the time series high in 2003 and has been below threshold since 2013. The recent decline in female SSB appears to be attributed to a period of low recruitment since about 2005 (Figure 1). However, the 2011, 2014, and 2015 year classes (representing the 2012, 2015, and 2016 age-1 recruitment estimates) were above average. Total F was estimated at or above F threshold in 13 of the last 15 years, and was estimated above threshold in 2017 at 0.31 (Figure 2).

III. Status of the Fishery in the Ocean and Chesapeake Bay

In 2018, total Atlantic striped bass removals (commercial and recreational, including harvest, commercial discards and recreational release mortality) was estimated at 5.78 million fish, which is an 18% decrease relative to 2017 (Table 3; Figure 5). The recreational sector accounted for 88% of total removals by number. It should be noted that the recreational catch estimates reported here reflect the new, improved MRIP mail-based survey and are not directly comparable to past FMP Review reports.

The commercial fishery harvested 4.71 million pounds (622,451 fish) in 2018, which is a 2% increase by number but a 2% decrease by weight relative to 2017 (Table 4; Table 5). Harvest from Chesapeake Bay accounted for 65% of the total by weight; Maryland landed 32%, Virginia landed 23%, and PRFC landed 10% (Table 5; Figure 6). Additional harvest came from Massachusetts (16%), New York (13%), Rhode Island (4%), and Delaware (3%). The proportion of total harvest coming from Chesapeake Bay in numbers of fish is much higher; roughly 80% annually since 1990 (Table 6). This is because fish harvested in Chesapeake Bay have a lower average weight per fish than fish harvested in ocean fisheries. Commercial dead discards were estimated at 90,092 fish, and account for 2% of total removals in 2018 (Table 6).

Total recreational catch (harvest and releases) was estimated at 33.7 million fish which is an 18% decrease from 2017 and is likely attributed to the observed decrease in fishing effort for trips targeting striped bass in the ocean (Table 7). Total recreational harvest (A+B1) in 2018 is estimated at 2.24 million fish (23.1 million pounds), and represents a 23% decrease relative to 2017 (39% decrease by weight) (Table 8; Table 9). Maryland landed the largest proportion of recreational harvest in number of fish[4] (44%), followed by New Jersey (21%), Massachusetts (17%), New York (8%), and Connecticut (4%) (Table 9). The proportion of recreational harvest in numbers from Chesapeake Bay has increased in recent years and was estimated at 47% in 2018.

The vast majority (89% on average since 1990) of recreational striped bass catch is released alive either due to angler preference or regulation (i.e., undersized or already caught the bag limit) (Figure 7). The assessment assumes, based on previous studies, that 9% of the fish that are released alive die as a result of being caught. In 2018, recreational anglers caught and released an estimated 31.4 million fish (93% of total catch), 2.8 million of which are were assumed to have died (Table 7). This represents a 17% decrease relative to 2017. The ocean region accounted for majority of the decrease and is likely attributed to the observed decrease in fishing effort in 2018. According to MRIP, the number of fishing trips where the angler identified striped bass as the primary or secondary target species in 2018 was 18.3 million trips which is a 6% decrease relative to 2017 (19.4 million trips) in the ocean region, while effort in Chesapeake Bay remained constant at roughly 2.6 million trips targeting striped bass.

[4] By weight, New Jersey had the largest proportion of harvest (30%), followed by Massachusetts (21%), Maryland (20%), New York (15%), and Connecticut and Rhode Island both at 5% (Table 8).

IV. Albemarle Sound and Roanoke River Management Area

Fishery Management Plan

While striped bass in North Carolina's ocean waters are managed under the Interstate FMP, Addendum IV to Amendment 6 formally defers management of the A/R stock to the state of North Carolina using A/R stock-specific BRPs approved by the Board (NCDMF 2013, 2014).

Estuarine striped bass in North Carolina are currently managed under Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan (FMP) and its subsequent revision and recent supplement (NCDMF 2013, 2014, 2019). It is a joint plan between the North Carolina Marine Fisheries Commission (NCMFC) and the North Carolina Wildlife Resources Commission (NCWRC). Amendment 1, adopted in 2013, lays out separate management strategies for the Albemarle Sound-Roanoke Rive (A-R) stock and the estuarine (non-migratory) Central and Southern striped bass stocks in the Tar-Pamlico, Neuse, and Cape Fear rivers. Management programs in Amendment 1 utilize annual total allowable landings (TAL), daily possession limits, open and closed harvest seasons, gill net mesh size and yardage restrictions, seasonal attendance requirements, barbless hook requirements in some areas, minimum size limits, and slot limits to maintain a sustainable harvest and reduce regulatory discard mortality in all sectors. Amendment 1 also maintains the stocking regime in the central and southern systems and the harvest moratorium on striped bass in the Cape Fear River and its tributaries (NCDMF 2013). Striped bass fisheries in the Atlantic Ocean of North Carolina are managed under ASMFC's Amendment 6 and subsequent addenda to the Interstate FMP for Atlantic Striped Bass. Amendment 6 also requires North Carolina to inform the Commission of changes to striped bass management in the A-R System.

Albemarle Sound-Roanoke River Striped Bass Stocks

The most recent A/R benchmark stock-specific assessment utilized the ASAP3 statistical catch-at-age model. The model was peer reviewed by an outside panel of experts and approved for management use by the Board in October 2014. The benchmark assessment produced new BRPs and annual harvest quota to prevent overfishing. The model was most recently updated in 2016 with catch and index data through 2014 (Flowers and Godwin 2016). Based on results of the 2016 update, and in comparison to the BRPs below, A-R striped bass are not overfished and are not experiencing overfishing.

	F	***Female SSB***	***Total Allowable Landings (TAL)***
Threshold	0.41	785,150 lbs.	275,000 lb (split evenly between recreational and commercial sectors)
Target	0.33	969,496 lbs.	

In 2014, female SSB was estimated at 2,024,583 pounds which is above the peak in 2003 and the highest value in the time series (Figure 3). In 2014, F was estimated at 0.06 which is below both the F threshold and target (Figure 4). Caution should be used, however, when evaluating the estimates of SSB and F in the terminal year. The estimated SSB value in 2014 is likely an overestimate based on past years of retrospective bias exhibited by the model. Subsequent assessments, incorporating additional years of data, and possibly a revised stock-recruit relationship, will likely reduce the magnitude of the 2014 value (Flowers and Godwin 2016). A/R striped bass experienced a period of unusually strong

recruitment (number of age-1 fish entering the population) from 1994-2001 followed by a period of lower recruitment from 2002-2014 (Figure 3).

Overall, the trends in the A/R stock abundance are quite similar to the Atlantic striped bass stocks described above, with a steady decline in female SSB since about 2003. Total stock abundance reached its peak in the early 2000s, declined gradually through about 2009 and increasing slightly beginning in 2011 through the terminal year. A new benchmark A/R stock assessment with data through 2016 is currently underway and scheduled to be completed in late 2019.

Albemarle Sound and Roanoke River Atlantic Striped Bass Fisheries

In 2018, total commercial and recreational harvest in the Albemarle Sound Management Area (ASMA) and the Roanoke River Management Area (RRMA) was 154,617 pounds (39,942 fish). Commercial harvest in the ASMA was 116,057 pounds (27,735 fish). Recreational harvest in the ASMA was 11,763 pounds (3,466 fish), and recreational harvest in the RRMA was 26,797 pounds (8,741 fish).

V. Status of Research and Monitoring

Amendment 6 and its Addenda I-IV set the regulatory and monitoring measures for the coastwide striped bass fishery in 2017. Amendment 6 requires certain states to implement fishery-dependent monitoring programs for striped bass. All states with commercial fisheries or substantial recreational fisheries are required to define the catch and effort composition of these fisheries. Additionally, all states with a commercial fishery must implement a commercial harvest tagging program pursuant to Addendum III to Amendment 6.

Amendment 6 also requires certain states to monitor the striped bass population independent of the fisheries. Juvenile abundance indices are required from Maine (Kennebec River), New York (Hudson River), New Jersey (Delaware River), Maryland (Chesapeake Bay tributaries), Virginia (Chesapeake Bay tributaries), and North Carolina (Albemarle Sound). Spawning stock sampling is mandatory for New York (Hudson River), Pennsylvania (Delaware River), Delaware (Delaware River), Maryland (Upper Chesapeake Bay and Potomac River), Virginia (Rappahannock River and James River), and North Carolina (Albemarle Sound-Roanoke River). Amendment 6 requires NOAA Fisheries, USFWS, Massachusetts, New York, New Jersey, Maryland, Virginia, and North Carolina to continue their tagging programs, which provide data used to determine survivorship and migration patterns.

VI. Status of Management Measures and Issues

Coastal Commercial Quota

In 2018, the coastal commercial quota was 2,823,096 pounds and was not exceeded, however Delaware exceeded its allocation by 9,943 pounds which will be deducted from its 2019 quota. Table 10 contains state-specific quotas and harvest that occurred in 2018, and final 2019 quotas.

Chesapeake Bay Commercial Quota

In 2018, the Chesapeake Bay-wide quota was 3,120,247 pounds and was allocated to Maryland, the PRFC, and Virginia based on historical harvest. In 2017, the Bay-wide quota was not exceeded and all

jurisdictions maintained harvest below its respective quota. Table 10 contains jurisdiction-specific quotas and harvest that occurred in 2017 for the Chesapeake Bay, and final 2018 quotas. In 2018, Commercial harvest from Chesapeake Bay accounted for 52% of total commercial landings by weight, and has averaged 57% since implementation of Addendum IV in 2015.

Chesapeake Bay Spring Harvest of Migrant Striped Bass

Recreational fishermen in the Chesapeake Bay are permitted to take adult migrant fish during a limited seasonal fishery, commonly referred to as the Spring Trophy Fishery. From 1993 to 2007 the fishery operated under a quota. Beginning in 2008, the Board approved non-quota management until stock assessment indicates that corrective action is necessary to reduce F on the coastal stock. The Spring Trophy Fishery is currently managed via bag limits and minimum sizes (see *Appendix 1* for state specific measures). The 2018 estimate of migrant fish harvested during the trophy season was 17,198 fish (17,104 fish in Maryland and 94 fish in Virginia) which is decrease compared to 2017 (22,892 fish) and below the 2006-2018 average of 40,990 fish (Horne 2019).

Wave-1 Recreational Harvest Estimates

Evidence suggests that North Carolina, Virginia, and possibly other states have had sizeable wave-1 (January/February) recreational striped bass fisheries beginning in 1996 (NEFSC 2013b). MRIP, formerly the Marine Recreational Fisheries Statistics Survey (MRFSS), has sampled for striped bass in North Carolina during wave-1 since 2004 (other states are not currently covered during wave-1). For Virginia, harvest in wave-1 is estimated via the ratio of landings and tag returns in wave-6 and regression analysis (refer to the methods described in ASMFC 2016 for more detail).

However, based on fishery-independent data collected by NCDMF, ASMFC and USFWS, striped bass distributions on their overwintering grounds during December through February has changed significantly since the mid-2000s. The migratory portion of the stocks has been well offshore in the EEZ (>3 miles) effecting both Virginia's and North Carolina's striped bass winter ocean fisheries in recent years. Furthermore, North Carolina has reported zero striped bass harvest during wave-1 in the ocean for 2012-2018. Similarly, its commercial fishery has reported zero striped bass landings from the ocean during that time.

Addendum II: Juvenile Abundance Index Analysis

The following states are required to conduct striped bass young-of-year juvenile abundance index (JAI) surveys on an annual basis: Maine for the Kennebec River; New York for the Hudson River; New Jersey for the Delaware River; Maryland for the Maryland Chesapeake Bay tributaries; Virginia for the Virginia Chesapeake Bay tributaries; and North Carolina for the A/R stock.

The PRT annually reviews trends in all required JAIs. The definition of recruitment failure is a value that is below 75% (the first quartile, or Q1) of all values in a fixed time series appropriate to each juvenile abundance index (see *Addendum II* for details). If any survey's JAI falls below their respective Q1 for three consecutive years, appropriate action should be recommended by the PRT to the Management Board.

For the 2019 review of JAIs, the analysis evaluates the 2016, 2017, and 2018 JAI values. No state's JAI met the criteria for recruitment failure (Figure 8). North Carolina's JAI value was the only value below its respective Q1 in 2018. Maine's, New York's and New Jersey's JAI values were at or near the respective time series average in 2018, while Maryland's and Virginia's values were above average in 2018.

Addendum III: Commercial Fish Tagging Program

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. In 2017, all states implemented commercial tagging programs consistent with the requirements of Addendum III. Table 11 describes commercial tagging programs by state.

Law Enforcement Reporting

States are asked to report and summarize law enforcement cases that occurred the previous season in annual compliance reports. In 2018, reported law enforcement cases (e.g., the number of warnings and citations) were similar to those reported in previous years. The most common violations were recreationally harvested fish under the legal size limit and possessing fish in excess of the bag limit.

VII. Annual State Compliance and Plan Review Team Recommendations

In 2018, and based on annual state compliance reports (ASMFC 2019), the PRT determined that each state and jurisdiction implemented a management program consistent with the requirements of Amendment 6 and addenda I-IV (Table 12). Refer to Table 1 and Table 2 for a summary of 2018 striped bass fishing regulations by state. In 2018, Maryland implemented a 19" minimum size limit in the Chesapeake Bay recreational fishery through conservation equivalency. The regulations also require anglers to use non-offset circle hooks when live-lining or chumming, and prohibit the use of treble hooks.

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. The PRT determined that all states with commercial striped bass fisheries implemented a commercial harvest tagging program in 2018 consistent with the requirements of Addendum III. Table 11 describes each state's commercial tag program requirements.

Amendment 6 includes compliance requirements for monitoring programs (summarized in *Section V*). Compliance with these requirements is summarized in Table 12. The PRT determined that each state and jurisdiction carried out the required monitoring programs in the 2018 fishing year. It should be noted that Virginia significantly modified its spawning stock monitoring and tagging program methodologies. Specifically, the pound net component of the spawning stock survey was eliminated and replaced with multi-panel anchor gill nets, while tagging was conducted through electrofishing. Both parts of the new monitoring programs were reviewed by the TC and approved by the Board at its February 2019 meeting. The PRT also notes that while the New York spawning stock monitoring program in the Hudson River does meet the requirements of the FMP, it does not provide an index of relative abundance to characterize the Hudson River stock which was identified as a high priority research recommendation at SAW 66.

Massachusetts reported two new regulatory changes for 2019: 1) a prohibition on the gaffing of non-conforming sized striped bass (i.e., less than 34" in the commercial fishery, and less than 28" in the recreational fishery); and 2) an allowance for non-conforming sized striped bass to be imported during the state's commercial striped bass season (fish previously had to meet the state's commercial minimum size limit during the open season, plus five days after its closure).

VIII. Research Recommendations

The following categorized and prioritized research recommendations were developed by the 2018 Benchmark Stock Assessment Subcommittee and the 66th SARC:

Fishery-Dependent Priorities

High

- Continue collection of paired scale and otolith samples, particularly from larger striped bass, to facilitate development of otolith-based age-length keys and scale-otolith conversion matrices.
- Develop studies to provide information on gear specific (including recreational fishery) discard morality rates and to determine the magnitude of bycatch mortality[5].
- Conduct study to directly estimate commercial discards in the Chesapeake Bay.
- Collect sex ratio information on the catch and improve methods for determining population sex ratio for use in estimates of female SSB and biological reference points.

Moderate

- Improve estimates of striped bass harvest removals in coastal areas during wave 1 and in inland waters of all jurisdictions year round.

Fishery-Independent Priorities

High

- Develop and index of relative abundance from the Hudson River Spawning Stock Biomass survey to better characterize the Delaware Bay/Hudson River stock.
- Improve the design of existing spawning stock surveys for Chesapeake Bay and Delaware Bay.

Moderate

- Develop a refined and cost-efficient, fisheries-independent coastal population index for striped bass stocks.
- Collect sex ratio information from fishery-independent sources to better characterize the population sex ratio.

Modeling/Quantitative Priorities

High

- Develop better estimates of tag reporting rates; for example, through a coastwide tagging study.
- Investigate changes in tag quality and potential impacts on reporting rate.
- Explore methods for combining tag results from programs releasing fish from different areas on different dates.

[5] Literature search and some modeling work completed

- Develop field or modeling studies to aid in estimation of natural mortality and other factors affecting the tag return rate.
- Compare M and F estimates from acoustic tagging programs to conventional tagging programs.

Moderate

- Examine methods to estimate temporal variation in natural mortality.

Low

- Evaluate truncated matrices to reduce bias in years with no tag returns and covariate based tagging models to account for potential differences from size or sex or other covariates.

Life History and Biology

High

- Continue in-depth analysis of migrations, stock compositions, sex ratio, etc. using mark-recapture data[6].
- Continue evaluation of striped bass dietary needs and relation to health condition.
- Continue analysis to determine linkages between the Mycobacteriosis outbreak in Chesapeake Bay and sex ratio of Chesapeake spawning stock, Chesapeake juvenile production, and recruitment success into coastal fisheries.

Moderate

- Examine causes of different tag based survival estimates among programs estimating similar segments of the population.
- Continue to conduct research to determine limiting factors affecting recruitment and possible density implications.
- Conduct study to calculate the emigration rates from producer areas now that population levels are high and conduct multi-year study to determine inter-annual variation in emigration rates.

Striped Bass Research Priorities Identified as Being Met or Well in Progress

- Evaluate to what extent rising natural mortality among Chesapeake Bay striped bass affects the existing F and female SSB thresholds, which are based on a fixed M assumption (M = 0.15).
- Develop simulation models to look at the implications of overfishing definitions relative to development of a striped bass population that will provide “quality” fishing. Quality fishing must first be defined.
- Evaluate the stock status definitions relative to uncertainty in biological reference points.
- Develop a method to integrate catch-at-age and tagging models to produce a single estimate of F and stock status[7].
- Develop a spatially and temporally explicit catch-at-age model incorporating tag based movement information[8].
- Develop maturity ogives applicable to coastal migratory stocks.

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[6] Ongoing through Cooperative Winter Tagging Cruise and striped bass charter boat tagging trips. See Cooperative Winter Tagging Cruise 20 Year Report.

[7] Model developed, but the tagging data overwhelms the model. Issues remain with proper weighting

[8] Model developed with Chesapeake Bay and the rest of the coast as two stocks. External analysis of tagging data is used to inform the model but is not explicitly incorporated.

IX. References

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X. Tables and Figures

Table 1. Summary of Atlantic Striped bass commercial regulations in 2018. Source: 2019 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL). *commercial quota reallocated to recreational bonus fish program

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	34" minimum size	869,813 lbs. Hook & line only	6.23 until quota reached, Monday and Thursdays only. Fishing prohibited on July 3, July 4, and Labor Day.
RI	Floating fish trap: 26" minimum size	Total: 181,572 lbs., split 39:61 between the trap and general category. Gill netting prohibited.	Trap: 4.1 – 12.31, or until quota reached; unlimited possession limit until 70% of quota projected to be harvested, then 500
	General category (mostly rod & reel): 34" min.		General Category: 5.20-8.04, 8.05-12.31, or until quota reached. Closed Fridays and Saturdays. 5 fish/vessel/day possession limit.
CT*	Commercial fishing prohibited; bonus program: 1 fish at 22" – <28" slot size, 5.1 – 12.31 (voucher required)		
NY	28"-38" minimum size (Hudson River closed to commercial harvest)	795,795 lb. Pound nets, gill nets (6"-8"stretched mesh), hook & line.	6.1 – 12.15, or until quota reached. Limited entry permit only.
NJ*	Commercial fishing prohibited; bonus program: 1 fish at 24" – <28" slot size limit, 5.1 – 12.31 (permit required)		
PA	Commercial fishing prohibited		
DE	Gillnet: 28" minimum size, except 20" min in Del. Bay and River during spring season. Hook and Line: 28" min	Gillnet: 137,831 lbs. Hook and line: 14,509 lbs.	Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-28 & 5.1-31; no fixed nets in DE River. No trip limit.

(Table 1 continued – Summary of commercial regulations in 2018)

STATE	SIZE LIMITS	SEASONAL QUOTA	OPEN SEASON
MD	Ocean: 24" minimum CB and Rivers: 18"–36"	Ocean: 90,727 lbs. CB and Rivers: 1,471,888 lbs. (part of Bay-wide quota).	Ocean: 1.1-5.31, 10.1-12.31, Mon- Fri Bay Pound Net: 6.1-11.30, Mon-Sat Bay Haul Seine: 6.1-11.30, Mon-Fri Bay Hook & Line: 6.4-12.29, Mon-Thu Bay Drift Gill Net: 1.1-2.28, 12.3-12.31, Mon-Fri
PRFC	18"-36" slot limit 2.15-3.25 and 18" minimum size all other seasons	583,362 lbs. (part of Bay-wide quota). Allocated by gear and season.	Hook & line: 1.1-3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25, 11.13-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15
DC	Commercial fishing prohibited		
VA	Ocean: 28" min CB and Rivers: 18" minimum and 18"-28" slot	Ocean: 136,141 lbs. CB and Rivers: 1,064,997 lbs. (part of Bay- wide quota). ITQ- system for both areas.	Ocean: 1.16-12.31 CB and Rivers: 1.16-12.31
NC	Ocean: 28"	360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit.	Seine fishery was open for 120 days, 150 fish/permit Gill net fisher was open for 45 days, 50 fish/permit Trawl fishery was not opened due to lack of striped bass presence.

Table 2. Summary of Atlantic Striped bass recreational regulations in 2018. Source: 2019 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

STATE	SIZE LIMITS	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
ME	≥ 28" minimum size	1 fish/day	Hook & line only; circle hooks only when using live bait	All year, except spawning areas are closed Dec 1 – April 30 and catch and release only May 1 – June 30
NH	≥ 28" minimum size	1 fish/day	Gaffing and culling prohibited	All year
MA	≥ 28" minimum size	1 fish/day	Hook & line only; no high-grading	All year
RI	≥ 28" minimum size	1 fish/day	None	All year
CT	≥ 28" minimum size	1 fish/day	Spearing and gaffing prohibited	All year
NY	Ocean and Delaware River: ≥ 28" minimum size	1 fish/day	Angling only. Spearing permitted in ocean waters. Catch and release only during closed season.	Ocean: April 15 – Dec 15 Delaware River: All year
	Hudson River: 18-28" slot limit, or ≥40"			Hudson River: April 1 – Nov 30
NJ	1 fish at 28 to < 43", and 1 fish ≥ 43"			Closed Jan 1 – Feb 28 in all waters except in the Atlantic Ocean, and April 1 – May 31 in the lower Delaware River and tributaries (spawning ground closure)
PA	Upstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size			
	Downstream from Calhoun St Bridge: 1 fish at ≥ 28" minimum size, from 4.1 – 5.31, a 2 fish at 21-25" slot size limit			
DE	28" minimum size, no harvest 38-43" (inclusive).	2 fish/day	Hook & line, spear (for divers) only. Circle hooks required in spawning season.	All year. Catch and release only April 1 - May 31 in spawning grounds. In Del. River, Bay & tributaries, may only harvest 20-25"slot from July 1 - Aug 31

(Table 2 continued – Summary of recreational regulations in 2018).

STATE	SIZE LIMITS	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
MD^	Ocean: 28”-38" slot, or >44"	2 fish/day		All year
	CB: Catch and Release Only	C&R only	no eels	Jan 1 - Feb 28, March 1 – April 20 (mainstem only, tributaries closed)
	CB Spring Trophy: 35" minimum	1 fish/day	mainstem only from Baltimore to VA line	April 21 - May 15
	CB Summer and Fall: 19” minimum, only 1 fish can be >28”	2 fish/day	non-offset circle hooks when live-lining or chumming, no treble hooks when bait fishing	May 16 - 31, mainstem Bay only, Baltimore to VA line; June 1 - Dec 15 all Bay and Tributaries open
PRFC	Spring Trophy: 35” minimum	1 fish/day	Downstream of Rt. 301 Bridge - No more than two hooks or sets of hooks per rod or line. No high-grading allowed and no live eel.	April 20 - May 15
	Summer and Fall: 20” minimum and only 1 fish can be >28”	2 fish/day	No more than two hooks or sets of hooks for each rod or line	May 16 - Dec 31
DC	20” minimum size and only one fish can be >28”	2 fish/day	hook and line only	May 16 - Dec 31
VA	Ocean: 28” minimum size	1 fish/day	Hook & line, rod & reel, hand line only. Gaffing is illegal in Virginia marine waters.	Jan 1 - March 31 and May 16 - Dec 31
	Ocean Spring Trophy: 36” min	1 fish/day		May 1 - May 15
	CB Trophy: 36” minimum	1 fish/day	No possession of striped bass in the Spawning Reaches	May 1 - June 15
	Chesapeake Bay Spring: 20”-28”	2 fish/day	One fish can be greater 36" during the trophy season only	May 16 - June 15
	CB Fall: 20” minimum	2 fish/day	size and only one fish can be >28”	Oct 4 - Dec 31
NC	Ocean: ≥ 28” minimum size	1 fish/day	No gaffing allowed	All year

^ Susquehanna Flats: C&R only Jan 1 – May 3; 1 fish at 19”-26” slot May 16 – May 31. Northeast River: C&R only May 16 – May 31

Table 3. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2018. Note: Harvest is from ACCSP/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

Year	Commercial		Recreational		Total Removals
	Harvest	Discards	Harvest	Release Mortality	
1990	93,888	46,630	578,897	442,811	1,162,226
1991	158,491	90,439	798,260	715,478	1,762,667
1992	256,476	197,240	869,779	937,611	2,261,106
1993	314,483	116,921	789,037	812,404	2,032,844
1994	325,401	160,198	1,055,523	1,360,872	2,901,993
1995	537,412	187,185	2,287,578	2,010,689	5,022,865
1996	854,094	261,022	2,487,421	2,600,526	6,203,063
1997	1,076,460	331,383	2,774,981	2,969,781	7,152,605
1998	1,215,219	348,852	2,915,390	3,259,133	7,738,594
1999	1,223,572	332,101	3,123,495	3,140,905	7,820,072
2000	1,216,812	203,084	3,802,477	3,044,203	8,266,575
2001	931,412	174,926	4,052,474	2,449,599	7,608,411
2002	928,085	191,099	4,005,084	2,792,200	7,916,468
2003	854,326	129,813	4,781,402	2,848,445	8,613,986
2004	879,768	160,196	4,553,027	3,665,234	9,258,224
2005	970,403	145,094	4,480,802	3,441,928	9,038,227
2006	1,047,648	158,260	4,883,960	4,812,332	10,902,201
2007	1,015,226	166,397	3,944,679	2,944,253	8,070,556
2008	1,027,837	108,962	4,381,186	2,391,200	7,909,184
2009	1,049,959	128,191	4,700,222	1,942,061	7,820,433
2010	1,031,430	133,064	5,388,440	1,760,759	8,313,693
2011	944,777	87,924	5,006,358	1,482,029	7,521,088
2012	870,606	191,577	4,046,299	1,847,880	6,956,361
2013	784,379	112,097	5,157,760	2,393,425	8,447,661
2014	750,263	121,253	4,033,747	2,172,342	7,077,604
2015	623,313	101,343	3,085,725	2,307,133	6,117,515
2016	607,084	105,119	3,500,434	2,981,430	7,194,066
2017	592,670	108,475	2,934,293	3,419,651	7,055,089
2018	622,451	90,092	2,244,766	2,826,667	5,783,976

Table 4. Total harvest of Atlantic striped bass by sector, 1990-2018. Note: Harvest is from ACCSP/MRIP. Estimates exclude inshore harvest from North Carolina.

Year	Numbers of Fish			Pounds		
	Commercial	Recreational	Total	Commercial	Recreational	Total
1990	93,888	578,897	672,785	715,951	8,207,515	8,923,466
1991	158,491	798,260	956,751	962,833	10,640,601	11,603,434
1992	256,476	869,779	1,126,255	1,510,276	11,921,967	13,432,243
1993	314,483	789,037	1,103,520	1,787,741	10,163,767	11,951,508
1994	325,401	1,055,523	1,380,924	1,872,374	14,737,911	16,610,285
1995	537,412	2,287,578	2,824,990	3,775,586	27,072,321	30,847,907
1996	854,094	2,487,421	3,341,515	4,822,874	28,625,685	33,448,559
1997	1,076,460	2,774,981	3,851,441	6,077,751	30,616,093	36,693,844
1998	1,215,219	2,915,390	4,130,609	6,552,111	29,603,199	36,155,310
1999	1,223,572	3,123,495	4,347,067	6,474,290	33,564,988	40,039,278
2000	1,216,812	3,802,477	5,019,289	6,719,521	34,050,817	40,770,338
2001	931,412	4,052,474	4,983,886	6,266,769	39,263,154	45,529,923
2002	928,085	4,005,084	4,933,169	6,138,180	41,840,025	47,978,205
2003	854,326	4,781,402	5,635,728	6,806,583	54,091,836	60,898,419
2004	879,768	4,553,027	5,432,795	7,335,116	53,031,074	60,366,190
2005	970,403	4,480,802	5,451,205	7,121,319	57,421,174	64,542,493
2006	1,047,648	4,883,960	5,931,608	6,785,006	50,674,431	57,459,437
2007	1,015,226	3,944,679	4,959,905	7,047,195	42,823,614	49,870,809
2008	1,027,837	4,381,186	5,409,023	7,190,685	56,665,318	63,856,003
2009	1,049,959	4,700,222	5,750,181	7,216,792	54,411,389	61,628,181
2010	1,031,430	5,388,440	6,419,870	6,996,713	61,431,360	68,428,073
2011	944,777	5,006,358	5,951,135	6,789,792	59,592,092	66,381,884
2012	870,606	4,046,299	4,916,905	6,516,868	53,256,619	59,773,487
2013	784,379	5,157,760	5,942,139	5,819,678	65,057,289	70,876,967
2014	750,263	4,033,747	4,784,010	5,937,949	47,948,610	53,886,559
2015	623,313	3,085,725	3,709,038	4,830,124	39,898,799	44,728,923
2016	607,084	3,500,434	4,107,518	4,831,442	43,671,532	48,502,974
2017	592,670	2,934,293	3,526,963	4,803,867	37,896,549	42,700,416
2018	622,451	2,244,766	2,867,217	4,714,661	23,069,028	27,783,689

Table 5. Commercial harvest by region in pounds (x1000), 1990-2018. Source: ACCSP. ^Estimates exclude inshore harvest.

Year	Ocean								Chesapeake Bay				Grand Total
	MA	RI	NY	DE	MD	VA	NC^	Total	MD	PRFC	VA	Total	
1990	159.7	4.0	81.9	6.5	0.0	10.1	9.8	272.0	3.6	169.1	271.3	444.0	716.0
1991	235.2	28.0	105.2	21.1	19.8	4.6	6.2	420.1	113.9	216.8	212.0	542.7	962.8
1992	237.1	39.0	226.6	17.8	18.4	17.2	27.7	583.8	590.9	127.4	208.2	926.5	1,510.3
1993	266.6	40.0	109.4	28.0	4.8	11.3	36.5	496.5	945.4	143.5	202.4	1,291.2	1,787.7
1994	200.0	39.8	171.3	33.9	17.9	30.2	139.7	632.7	915.9	149.9	173.9	1,239.6	1,872.4
1995	751.5	113.5	500.8	38.5	79.3	46.2	344.6	1,874.3	1,185.0	198.5	517.8	1,901.3	3,775.6
1996	695.9	122.6	504.4	120.5	75.7	165.9	58.2	1,743.2	1,487.7	346.8	1,245.2	3,079.7	4,822.9
1997	784.9	96.5	460.8	166.0	94.0	179.1	463.1	2,244.4	2,119.2	731.1	983.0	3,833.4	6,077.8
1998	810.1	94.7	485.9	163.7	84.6	375.0	273.0	2,287.0	2,426.7	726.2	1,112.2	4,265.1	6,552.1
1999	766.2	119.7	491.8	176.3	62.6	614.8	391.5	2,622.9	2,274.8	653.3	923.4	3,851.4	6,474.3
2000	796.2	111.8	542.7	145.1	149.7	932.7	162.4	2,840.5	2,261.8	666.0	951.2	3,879.0	6,719.5
2001	815.4	129.7	633.1	198.6	113.9	782.4	381.1	3,054.1	1,660.9	658.7	893.1	3,212.6	6,266.8
2002	924.9	129.2	518.6	146.2	93.2	710.2	441.0	2,963.2	1,759.4	521.0	894.4	3,174.9	6,138.2
2003	1,055.5	246.3	753.3	191.2	103.9	166.4	201.2	2,717.8	1,721.8	676.6	1,690.4	4,088.7	6,806.6
2004	1,214.2	232.3	741.7	176.5	134.2	161.3	605.4	3,265.5	1,790.3	772.3	1,507.0	4,069.6	7,335.1
2005	1,102.2	215.5	689.8	174.0	46.9	185.2	604.5	3,018.0	2,008.7	533.6	1,561.0	4,103.3	7,121.3
2006	1,322.3	221.1	688.4	184.2	91.1	195.0	74.2	2,776.3	2,116.3	673.5	1,219.0	4,008.7	6,785.0
2007	1,039.3	240.6	731.5	188.7	96.3	162.3	379.5	2,838.1	2,240.6	599.3	1,369.2	4,209.1	7,047.2
2008	1,160.3	245.9	653.1	188.7	118.0	163.1	288.4	2,817.6	2,208.0	613.8	1,551.3	4,373.1	7,190.7
2009	1,134.3	234.8	789.9	192.3	127.3	140.4	190.0	2,809.0	2,267.3	727.2	1,413.3	4,407.8	7,216.8
2010	1,224.5	248.9	786.8	185.4	44.8	127.8	276.4	2,894.7	2,105.8	683.2	1,313.0	4,102.0	6,996.7
2011	1,163.9	228.2	855.3	188.6	21.4	158.8	246.4	2,862.5	1,955.1	694.2	1,278.1	3,927.3	6,789.8
2012	1,218.5	239.9	683.8	194.3	77.6	170.8	7.3	2,592.0	1,851.4	733.8	1,339.6	3,924.8	6,516.9
2013	1,004.5	231.3	823.8	191.4	93.5	182.4	0.0	2,526.9	1,662.2	623.8	1,006.8	3,292.8	5,819.7
2014	1,138.5	216.9	531.5	167.9	120.9	183.7	0.0	2,359.4	1,805.7	603.4	1,169.4	3,578.5	5,937.9
2015	866.0	188.5	516.3	144.1	34.6	138.1	0.0	1,887.6	1,436.9	538.0	967.6	2,942.5	4,830.1
2016	938.7	174.7	575.0	136.5	19.7	139.2	0.0	1,983.9	1,425.5	519.8	902.3	2,847.5	4,831.4
2017	823.4	175.3	688.7	141.8	80.5	133.9	0.0	2,043.5	1,439.8	492.7	827.8	2,760.3	4,803.9
2018	753.7	176.6	591.1	155.0	79.8	134.2	0.0	1,890.5	1,424.3	448.8	951.0	2,824.2	4,714.7

Table 6. Commercial harvest and discards by region in numbers of fish (x1000), 1990-2018. Source: harvest is from ACCSP, discards is from ASMFC. ^excludes inshore harvest.

Year	Ocean								Chesapeake Bay				Discards			Grand Total Removals
	MA	RI	NY	DE	MD	VA	NC^	Total	MD	PRFC	VA	Total	Ocean	Bay	Total	
1990	6.6	0.8	11.8	0.7	0.0	0.3	0.8	21.0	0.8	0.0	72.1	72.9	38.0	8.6	46.6	140.5
1991	10.8	3.6	15.1	3.1	1.2	0.4	0.4	34.6	30.8	44.5	48.6	123.9	39.2	51.3	90.4	248.9
1992	11.2	9.1	20.4	2.7	1.1	0.6	1.7	46.8	133.4	23.3	53.0	209.7	56.2	141.1	197.2	453.7
1993	13.3	6.3	11.2	4.3	0.3	1.0	3.4	39.8	211.0	24.6	39.2	274.7	41.8	75.1	116.9	431.4
1994	10.0	4.5	15.4	4.9	0.9	2.3	8.0	45.9	223.1	25.2	31.2	279.5	94.9	65.3	160.2	485.6
1995	39.9	19.7	43.7	5.6	4.0	9.9	23.4	146.1	267.0	29.3	95.0	391.3	144.4	42.8	187.2	724.6
1996	37.3	18.6	40.5	20.7	9.0	14.1	3.3	143.5	486.2	46.2	178.2	710.6	169.6	91.4	261.0	1,115.1
1997	44.0	7.1	37.6	33.2	8.4	17.3	25.8	173.4	620.3	87.6	195.2	903.1	248.8	82.6	331.4	1,407.8
1998	44.3	8.8	45.1	31.4	10.3	41.1	14.2	195.2	729.6	93.3	197.1	1,020.1	312.7	36.2	348.9	1,564.1
1999	40.9	11.6	49.9	34.8	10.2	48.7	21.1	217.2	776.0	90.6	139.8	1,006.3	298.0	34.1	332.1	1,555.7
2000	42.1	9.4	54.9	25.2	13.3	54.5	6.5	205.8	787.6	91.5	132.0	1,011.0	170.9	32.2	203.1	1,419.9
2001	45.8	10.9	58.3	34.4	11.1	42.3	25.0	227.7	538.8	87.8	77.1	703.7	136.5	38.4	174.9	1,106.3
2002	49.8	11.7	47.1	30.4	10.2	38.8	23.2	211.3	571.7	80.3	64.7	716.8	144.9	46.2	191.1	1,119.2
2003	56.4	15.5	68.4	31.5	11.6	10.5	5.8	199.6	427.9	83.1	143.7	654.7	95.0	34.8	129.8	984.1
2004	63.6	16.0	70.4	28.4	14.1	10.4	31.0	233.9	447.0	92.6	106.3	645.9	110.0	50.2	160.2	1,040.0
2005	60.5	14.9	70.6	26.3	6.1	11.3	27.3	217.1	563.9	80.6	108.9	753.3	86.2	58.9	145.1	1,115.5
2006	70.5	15.4	73.6	30.2	10.9	11.5	2.7	214.9	645.1	92.3	95.4	832.7	98.6	59.6	158.3	1,205.9
2007	54.2	13.9	78.5	31.1	11.6	10.6	16.8	216.7	587.6	86.6	124.3	798.5	96.9	69.5	166.4	1,181.6
2008	61.1	16.6	73.3	31.9	14.0	10.8	13.4	221.0	580.7	82.0	144.1	806.8	65.7	43.2	109.0	1,136.8
2009	59.4	16.8	82.6	21.6	12.5	8.9	9.0	210.9	605.6	89.7	143.8	839.1	63.5	64.7	128.2	1,178.1
2010	60.4	15.7	82.4	19.8	5.4	9.4	13.7	206.7	579.2	90.6	154.9	824.7	43.6	89.5	133.1	1,164.5
2011	58.7	14.3	87.4	20.5	2.1	12.2	10.9	206.0	488.9	96.1	153.7	738.7	37.8	50.1	87.9	1,032.7
2012	61.5	15.0	67.1	15.7	6.9	10.8	0.3	177.3	465.6	90.6	137.0	693.3	27.8	163.7	191.6	1,062.2
2013	58.6	13.8	76.2	17.7	7.6	10.0	0.0	183.8	391.5	78.0	131.0	600.5	41.9	70.2	112.1	896.5
2014	58.0	10.5	52.9	14.9	8.5	10.0	0.0	154.8	362.2	81.5	151.8	595.5	53.4	67.8	121.3	871.5
2015	42.3	12.7	45.6	11.0	2.6	7.7	0.0	121.8	298.3	71.0	132.2	501.5	37.6	63.7	101.3	724.7
2016	48.0	12.9	51.0	8.8	1.2	7.6	0.0	129.5	284.9	70.7	122.0	477.6	45.3	59.9	105.1	712.2
2017	41.2	10.1	61.6	9.5	3.5	7.6	0.0	133.5	263.6	67.5	128.0	459.2	84.4	24.1	108.5	701.1
2018	37.8	11.5	52.2	11.4	3.5	6.9	0.0	123.3	286.4	64.3	148.4	499.2	56.7	33.4	90.1	712.5

Table 7. Total recreational catch, releases, and release mortality in numbers of fish by region (x1000), 1990-2018. Source: MRIP. Estimates exclude inshore harvest from North Carolina.

Year	Harvest (A+B1)			Releases (B2)			Total Catch (A+B1+B2)			Release Mortality (9% of B2)		
	Ocean	Bay	Total	Ocean	Bay	Total	Ocean	Bay	Total	Ocean	Bay	Total
1990	234.8	344.1	578.9	3,094.5	1,825.6	4,920.1	3,329.3	2,169.7	5,499.0	278.5	164.3	442.8
1991	431.7	366.6	798.3	4,683.2	3,266.5	7,949.8	5,114.9	3,633.1	8,748.0	421.5	294.0	715.5
1992	517.4	352.4	869.8	6,932.1	3,485.8	10,417.9	7,449.5	3,838.2	11,287.7	623.9	313.7	937.6
1993	457.2	331.9	789.0	6,093.9	2,932.9	9,026.7	6,551.0	3,264.7	9,815.8	548.4	264.0	812.4
1994	495.3	560.3	1,055.5	10,446.9	4,673.9	15,120.8	10,942.2	5,234.2	16,176.3	940.2	420.7	1,360.9
1995	1,259.8	1,027.7	2,287.6	16,586.8	5,754.2	22,341.0	17,846.7	6,781.9	24,628.6	1,492.8	517.9	2,010.7
1996	1,362.0	1,125.5	2,487.4	22,384.2	6,510.6	28,894.7	23,746.1	7,636.0	31,382.2	2,014.6	586.0	2,600.5
1997	1,514.1	1,260.8	2,775.0	22,819.1	10,178.4	32,997.6	24,333.3	11,439.3	35,772.6	2,053.7	916.1	2,969.8
1998	1,647.0	1,268.4	2,915.4	29,294.5	6,918.1	36,212.6	30,941.5	8,186.5	39,128.0	2,636.5	622.6	3,259.1
1999	1,757.8	1,365.7	3,123.5	26,139.3	8,759.7	34,898.9	27,897.0	10,125.4	38,022.4	2,352.5	788.4	3,140.9
2000	2,198.3	1,604.2	3,802.5	25,090.4	8,734.0	33,824.5	27,288.7	10,338.3	37,627.0	2,258.1	786.1	3,044.2
2001	2,758.1	1,294.4	4,052.5	21,072.6	6,145.2	27,217.8	23,830.7	7,439.6	31,270.2	1,896.5	553.1	2,449.6
2002	2,756.1	1,249.0	4,005.1	23,653.3	7,371.2	31,024.4	26,409.4	8,620.2	35,029.5	2,128.8	663.4	2,792.2
2003	3,123.8	1,657.6	4,781.4	20,678.5	10,970.9	31,649.4	23,802.3	12,628.5	36,430.8	1,861.1	987.4	2,848.4
2004	3,078.1	1,474.9	4,553.0	27,868.1	12,856.7	40,724.8	30,946.2	14,331.7	45,277.8	2,508.1	1,157.1	3,665.2
2005	3,182.2	1,298.6	4,480.8	28,663.2	9,580.4	38,243.6	31,845.4	10,879.0	42,724.4	2,579.7	862.2	3,441.9
2006	2,789.0	2,094.9	4,884.0	41,238.5	12,231.8	53,470.4	44,027.6	14,326.7	58,354.3	3,711.5	1,100.9	4,812.3
2007	2,327.1	1,617.6	3,944.7	25,135.4	7,578.5	32,713.9	27,462.4	9,196.2	36,658.6	2,262.2	682.1	2,944.3
2008	3,025.4	1,355.8	4,381.2	21,878.2	4,690.7	26,568.9	24,903.6	6,046.5	30,950.1	1,969.0	422.2	2,391.2
2009	2,897.7	1,802.5	4,700.2	16,740.0	4,838.5	21,578.5	19,637.7	6,641.0	26,278.7	1,506.6	435.5	1,942.1
2010	3,905.9	1,482.6	5,388.4	13,606.5	5,957.5	19,564.0	17,512.4	7,440.0	24,952.4	1,224.6	536.2	1,760.8
2011	3,617.1	1,389.3	5,006.4	12,643.8	3,823.1	16,467.0	16,260.9	5,212.4	21,473.3	1,137.9	344.1	1,482.0
2012	3,071.5	974.8	4,046.3	11,242.0	9,290.0	20,532.0	14,313.5	10,264.8	24,578.3	1,011.8	836.1	1,847.9
2013	3,723.2	1,434.5	5,157.8	19,463.0	7,130.6	26,593.6	23,186.2	8,565.2	31,751.4	1,751.7	641.8	2,393.4
2014	2,275.5	1,758.2	4,033.7	15,106.6	9,030.6	24,137.1	17,382.1	10,788.8	28,170.9	1,359.6	812.8	2,172.3
2015	1,770.1	1,315.7	3,085.7	15,419.0	10,215.9	25,634.8	17,189.0	11,531.5	28,720.5	1,387.7	919.4	2,307.1
2016	1,817.2	1,683.2	3,500.4	17,794.0	15,333.0	33,127.0	19,611.2	17,016.2	36,627.4	1,601.5	1,380.0	2,981.4
2017	1,732.3	1,201.9	2,934.3	28,951.5	9,044.6	37,996.1	30,683.8	10,246.6	40,930.4	2,605.6	814.0	3,419.7
2018	1,194.6	1,050.1	2,244.8	22,738.7	8,668.7	31,407.4	23,933.3	9,718.9	33,652.2	2,046.5	780.2	2,826.7

Table 8. Recreational harvest by region in pounds (x1000), 1990-2018. Source: MRIP. ^Estimates exclude inshore harvest.

Year	Ocean												Chesapeake Bay			Grand total
	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC^	Total	MD	VA	Total	
1990	79	21	400	146	209	1,653	2,531	26	0	0	0	5,066	6	3,135	3,141	8,208
1991	30	8	866	350	162	4,221	2,047	134	0	0	10	7,828	718	2,095	2,813	10,641
1992	134	89	4,096	643	240	1,691	2,190	90	0	0	0	9,173	1,182	1,566	2,748	11,922
1993	28	110	1,909	416	636	2,883	1,360	284	0	84	6	7,716	858	1,590	2,448	10,164
1994	143	82	3,683	267	452	5,000	947	134	0	2	90	10,800	1,443	2,495	3,938	14,738
1995	83	127	2,739	1,049	1,331	5,594	8,587	301	0	141	232	20,184	3,115	3,773	6,889	27,072
1996	95	183	2,983	1,626	1,405	10,739	3,959	795	0	812	392	22,990	2,789	2,847	5,636	28,626
1997	223	538	5,133	1,997	2,263	8,543	2,179	374	0	1,096	865	23,211	3,203	4,203	7,405	30,616
1998	305	262	7,359	1,544	1,807	4,889	4,182	645	579	545	636	22,754	3,023	3,826	6,849	29,603
1999	196	181	4,995	1,904	1,327	7,414	9,473	312	4	110	339	26,256	2,323	4,986	7,309	33,565
2000	347	109	4,863	2,008	890	7,053	9,768	925	0	416	277	26,656	3,503	3,892	7,395	34,051
2001	446	334	7,188	2,044	1,101	5,058	12,314	695	314	382	1,082	30,959	2,928	5,376	8,304	39,263
2002	775	322	10,261	2,708	1,251	5,975	9,621	589	0	1,135	998	33,634	2,643	5,563	8,206	41,840
2003	458	466	10,252	4,052	2,666	10,788	12,066	763	14	392	966	42,882	5,246	5,964	11,210	54,092
2004	554	268	9,329	2,460	2,229	6,437	13,303	870	57	1,067	6,656	43,230	4,860	4,941	9,801	53,031
2005	546	384	7,541	3,155	3,133	11,637	14,289	680	8	487	3,947	45,808	7,753	3,860	11,614	57,421
2006	610	244	6,787	1,569	2,854	9,845	12,716	586	3	921	2,975	39,109	6,494	5,071	11,565	50,674
2007	422	93	7,010	2,077	2,786	10,081	8,390	207	0	516	1,965	33,547	5,249	4,027	9,277	42,824
2008	607	182	8,424	970	2,273	18,000	12,407	847	0	1,690	750	46,150	5,639	4,877	10,515	56,665
2009	781	222	9,410	2,185	1,458	7,991	17,040	940	138	48	187	40,399	8,672	5,340	14,012	54,411
2010	218	238	9,959	2,102	2,323	18,190	17,454	895	107	206	1,198	52,891	6,482	2,059	8,541	61,431
2011	245	659	11,953	3,066	981	13,151	15,715	605	9	308	4,467	51,157	6,220	2,214	8,435	59,592
2012	152	432	14,941	2,096	1,835	13,096	11,551	644	21	2	0	44,768	3,819	4,670	8,488	53,257
2013	331	831	9,025	4,428	4,236	16,819	19,451	1,073	1,051	67	0	57,313	5,137	2,607	7,744	65,057
2014	423	203	7,965	3,402	2,665	13,998	8,886	381	159	0	0	38,083	8,877	989	9,866	47,949
2015	132	202	7,799	1,394	2,585	8,695	9,982	340	28	0	0	31,156	7,786	957	8,743	39,899
2016	189	191	3,731	1,776	912	12,053	12,790	86	7	0	0	31,735	10,912	1,024	11,936	43,672
2017	318	394	5,666	1,652	1,557	8,825	10,880	666	0	2	0	29,960	7,309	627	7,937	37,897
2018	142	130	4,925	1,121	1,165	3,453	7,012	33	0	0	0	17,982	4,683	404	5,087	23,069

Table 9. Recreational harvest by region in numbers of fish (x1000), 1990-2018. Source: MRIP. ^Estimates exclude inshore harvest.

Year	Ocean												Chesapeake Bay			Grand Total
	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC^	Total	MD	VA	Total	
1990	6.2	0.5	20.5	6.3	7.6	68.0	123.0	2.7	0.0	0.0	0.0	234.8	1.5	342.6	344.1	578.9
1991	10.5	0.5	51.1	16.6	7.8	203.1	131.1	9.9	0.0	0.0	1.0	431.7	117.9	248.7	366.6	798.3
1992	10.6	4.4	229.2	40.0	11.7	76.7	134.6	7.6	0.0	0.0	2.7	517.4	177.9	174.4	352.4	869.8
1993	1.3	5.0	116.4	26.9	35.8	140.5	100.9	19.2	0.0	10.7	0.5	457.2	113.6	218.3	331.9	789.0
1994	6.9	8.9	159.6	13.7	23.3	200.3	67.1	8.4	0.0	0.5	6.5	495.3	228.7	331.6	560.3	1,055.5
1995	4.0	7.4	124.3	70.9	75.8	250.3	671.4	25.8	0.1	13.4	16.5	1,259.8	491.1	536.7	1,027.7	2,287.6
1996	4.1	11.0	156.6	100.6	95.9	511.6	301.2	59.7	0.0	89.6	31.7	1,362.0	564.2	561.3	1,125.5	2,487.4
1997	43.0	29.9	365.6	124.7	149.0	450.5	171.2	29.1	0.0	91.1	60.1	1,514.1	552.4	708.4	1,260.8	2,775.0
1998	65.3	14.8	500.9	91.1	114.1	383.8	289.2	51.0	24.3	71.3	41.2	1,647.0	596.2	672.2	1,268.4	2,915.4
1999	37.5	9.9	327.1	116.6	88.2	450.9	657.1	28.3	1.6	14.1	26.4	1,757.8	530.9	834.8	1,365.7	3,123.5
2000	77.3	6.0	306.2	156.8	84.0	494.6	939.8	88.3	0.0	27.2	18.1	2,198.3	810.9	793.3	1,604.2	3,802.5
2001	91.9	23.5	551.0	149.8	78.2	364.2	1,267.5	70.6	64.1	36.7	60.7	2,758.1	513.3	781.1	1,294.4	4,052.5
2002	135.2	28.1	723.5	181.5	92.5	439.3	957.6	65.7	0.0	76.4	56.3	2,756.1	464.4	784.6	1,249.0	4,005.1
2003	99.7	41.3	797.2	226.4	181.7	678.4	942.8	75.7	0.9	29.3	50.4	3,123.8	816.0	841.6	1,657.6	4,781.4
2004	118.3	22.1	666.7	159.6	134.5	458.1	1,042.1	66.6	11.0	75.9	323.2	3,078.1	657.5	817.4	1,474.9	4,553.0
2005	118.3	35.5	536.1	195.6	202.6	854.6	958.1	48.8	3.6	34.2	194.9	3,182.2	815.5	483.1	1,298.6	4,480.8
2006	140.9	20.9	483.2	129.3	168.3	614.8	972.2	44.5	0.4	80.6	134.2	2,789.0	1,342.0	753.0	2,094.9	4,884.0
2007	95.5	8.1	471.9	135.8	163.9	602.8	722.2	17.2	0.0	28.0	81.8	2,327.1	1,127.3	490.3	1,617.6	3,944.7
2008	133.4	11.9	514.1	73.4	132.8	1,169.9	791.0	67.7	0.0	94.4	36.9	3,025.4	779.7	576.1	1,355.8	4,381.2
2009	146.5	17.3	695.0	138.4	100.3	574.2	1,141.5	64.8	10.2	3.0	6.5	2,897.7	1,094.4	708.1	1,802.5	4,700.2
2010	37.3	21.4	808.2	162.0	170.2	1,449.0	1,091.4	61.4	12.5	25.3	67.1	3,905.9	1,139.3	343.2	1,482.6	5,388.4
2011	48.5	54.2	873.5	202.2	91.1	1,005.3	1,038.9	43.7	0.8	51.2	207.6	3,617.1	1,112.1	277.2	1,389.3	5,006.4
2012	31.4	37.3	1,010.6	130.7	137.1	927.5	742.4	51.3	2.9	0.3	0.0	3,071.5	716.7	258.1	974.8	4,046.3
2013	73.3	63.2	658.7	308.3	269.6	902.5	1,324.2	70.6	48.4	4.4	0.0	3,723.2	1,136.7	297.9	1,434.5	5,157.8
2014	86.4	16.5	523.5	172.0	131.8	804.5	501.9	26.2	12.6	0.0	0.0	2,275.5	1,627.0	131.2	1,758.2	4,033.7
2015	14.4	10.0	485.3	67.0	140.8	406.8	600.3	41.9	3.5	0.0	0.0	1,770.1	1,108.0	207.7	1,315.7	3,085.7
2016	14.2	17.6	230.1	128.4	63.3	697.7	659.6	5.9	0.5	0.0	0.0	1,817.2	1,545.1	138.1	1,683.2	3,500.4
2017	22.0	37.7	392.3	59.6	94.5	472.3	625.9	27.8	0.0	0.1	0.0	1,732.3	1,091.6	110.3	1,201.9	2,934.3
2018	16.0	13.4	389.5	39.2	85.5	181.7	465.3	4.2	0.0	0.0	0.0	1,194.6	993.3	56.8	1,050.1	2,244.8

Table 10. Results of 2018 Commercial Quota Accounting in pounds. Source: 2019 state compliance reports.

State	Add IV Quota	2018 Quota	2018 harvest	overage	2019 Quota
Ocean					
Maine*	188	188	-		188
New Hampshire*	4,313	4,313	-		4,313
Massachusetts	869,813	847,290	753,731		869,813
Rhode Island†	182,719	181,572	176,639		181,572
Connecticut**	17,813	17,813	-		17,813
New York	795,795	795,795	591,092		795,795
New Jersey**	241,313	241,313	-		241,313
Delaware	145,085	145,085	155,028	9,943	135,142
Maryland†	98,670	90,727	79,836		90,727
Virginia	138,640	138,640	122,929		138,640
North Carolina	360,360	360,360	0		360,360
Ocean Total	**2,854,709**	**2,823,096**	**1,879,255**	**9,943**	**2,835,676**
Chesapeake Bay					
Maryland	1,471,888	1,471,888	1,424,303		1,471,888
Virginia	1,064,997	1,064,997	951,092		1,064,997
PRFC	583,362	583,362	448,815		583,362
Bay Total	**3,120,247**	**3,120,247**	**2,824,210**		**3,120,247**

* Commercial harvest/sale prohibited, with no re-allocation of quota.

** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

† Ocean commercial quota reduced through conservation equivalency for MD (90,727 lbs) and RI (181,572 lbs)

Table 11. Status of Commercial Tagging Programs by state for 2018.

State	Number of Participants	Number of Tags Issued	Number of Tags Used	Point of Tag (sale/harvest)	[1]Biological Metric (Y/N)	Year, State and Unique ID on Tag (Y/N)	Size Limit on Tag (Y/N)	Tag Colors	Annual Tag Color Change (Y/N)
MA	92	53,100	37,777	Sale	Y	Y	Y	one tag color	Y
RI	23	15,390	10,121	Sale	Y	Y	N	two tag colors by gear	Y
NY	436	76,605	52,218	Harvest	Y	Y	N	One tag color	Y
DE*	260	19,155	11,356	Both	Y	Y	N	Harvest: two tag colors by gear Sale: one color	Y
MD	862	454,356	295,348	Harvest	Y	Y	N	Three tag colors by gear and permit	Y
PRFC	339	79,158	64,346	Harvest	Y	Y	N	Five tag colors by gear	N
VA	388	155,254	151,250	Harvest	Y	Y	Y	two tag colors by area	Y
NC^	88	36,766	31,147	Sale	Y	Y	Y	Three tag colors by area	N

[1] States are required to allocate commercial tags to permit holders based on a biological metric. Most states used the average weight per fish from the previous year, or some variation thereof. Actual biological metric used is to be included in State Annual Commercial Tag Reports.

* The number of tags issued represent the combined total from tags used by harvesters and weigh stations, such that each fish has two tags

^ All commercial tags were used in the internal waters of North Carolina

Table 12. Status of compliance with monitoring and reporting requirements in 2018. JAI = juvenile abundance index survey, SSB = spawning stock biomass survey, tag = participation in coastwide tagging program, Y = compliance standards met, N = compliance standards not met, NA = not applicable, R = recreational, C = commercial

Jurisdiction	Fishery-independent monitoring		Fishery-dependent monitoring		Annual reporting
	Requirement(s)	Status	Requirement(s)	Status	Status
ME	JAI	Y	composition, catch and effort (R)	NA	Y
NH	NA	NA	composition, catch and effort (R)	NA	Y
MA	tag	Y	composition, catch & effort (C&R), tag program	Y	Y
RI	NA	NA	composition (C&R), catch & effort (R), tag program	Y	Y
CT	NA	NA	composition, catch & effort (R)	Y	Y
NY	JAI, SSB, tag	Y	composition, catch & effort (C&R), tag program	Y	Y
NJ	JAI, tag	Y	composition, catch & effort (R)	Y	Y
PA	SSB	Y	composition, catch and effort (R)	NA	Y
DE	SSB, tag	Y	composition, catch & effort (C), tag program	Y	Y
MD	JAI, SSB, tag	Y	composition, catch & effort (C&R), tag program	Y	Y
PRFC	NA	NA	composition, catch & effort (C&R), tag program	Y	Y
DC	NA	NA	composition, catch and effort (R)	NA	Y
VA	JAI, SSB, tag	Y	composition, catch & effort (C&R), tag program	Y	Y
NC	JAI, SSB, tag	Y	composition, catch & effort (C&R), tag program	Y	Y

Figure 1. Atlantic striped bass female spawning stock biomass and recruitment, 1982-2017. Source: 2018 Benchmark Stock Assessment

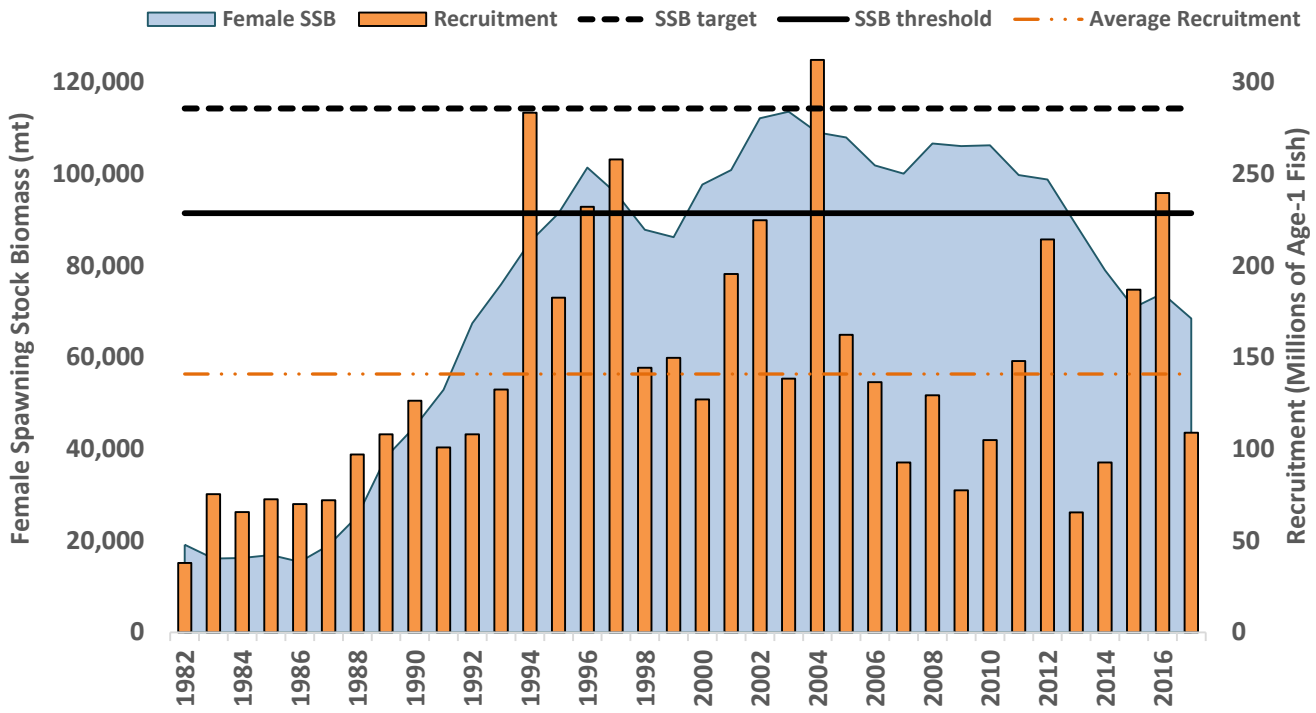


Figure 2. Atlantic striped bass fishing mortality, 1982-2017. Source: 2018 Benchmark Stock Assessment

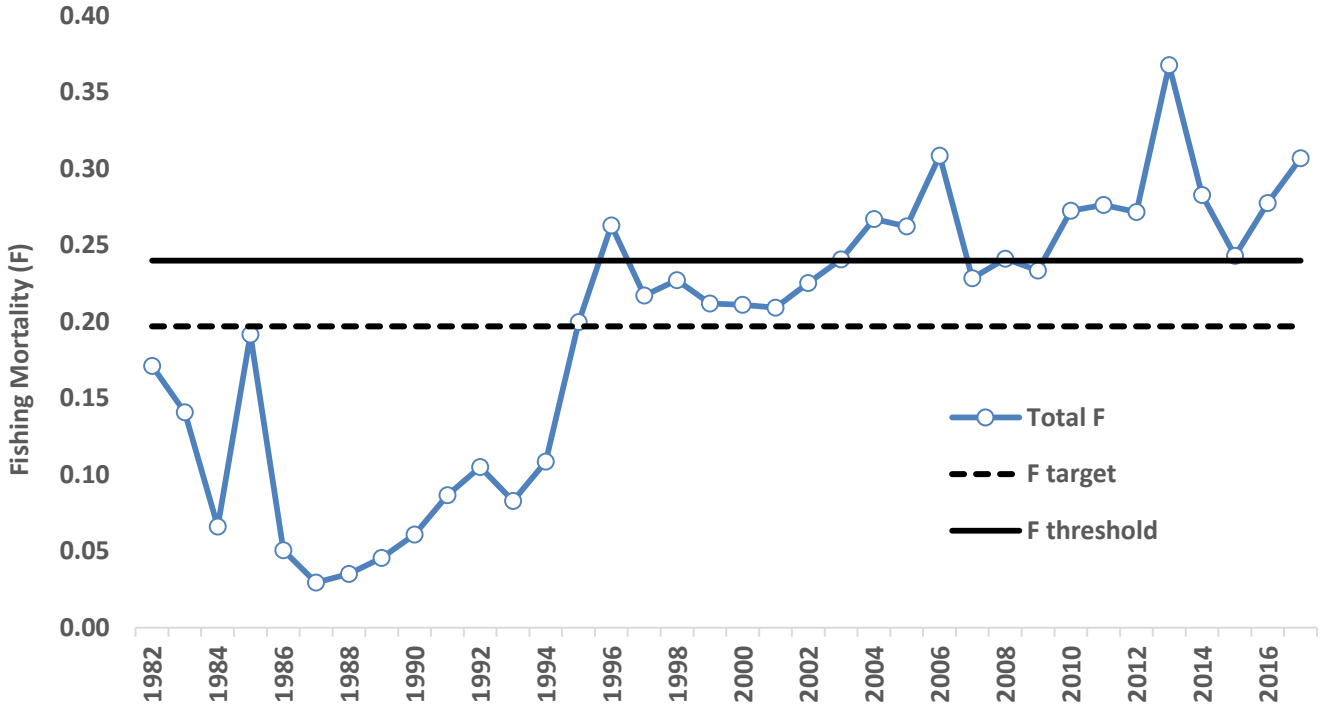


Figure 3. Albemarle Sound-Roanoke River striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1982-2014. Source: Stock Status of Albemarle Sound-Roanoke River Striped bass, 2016

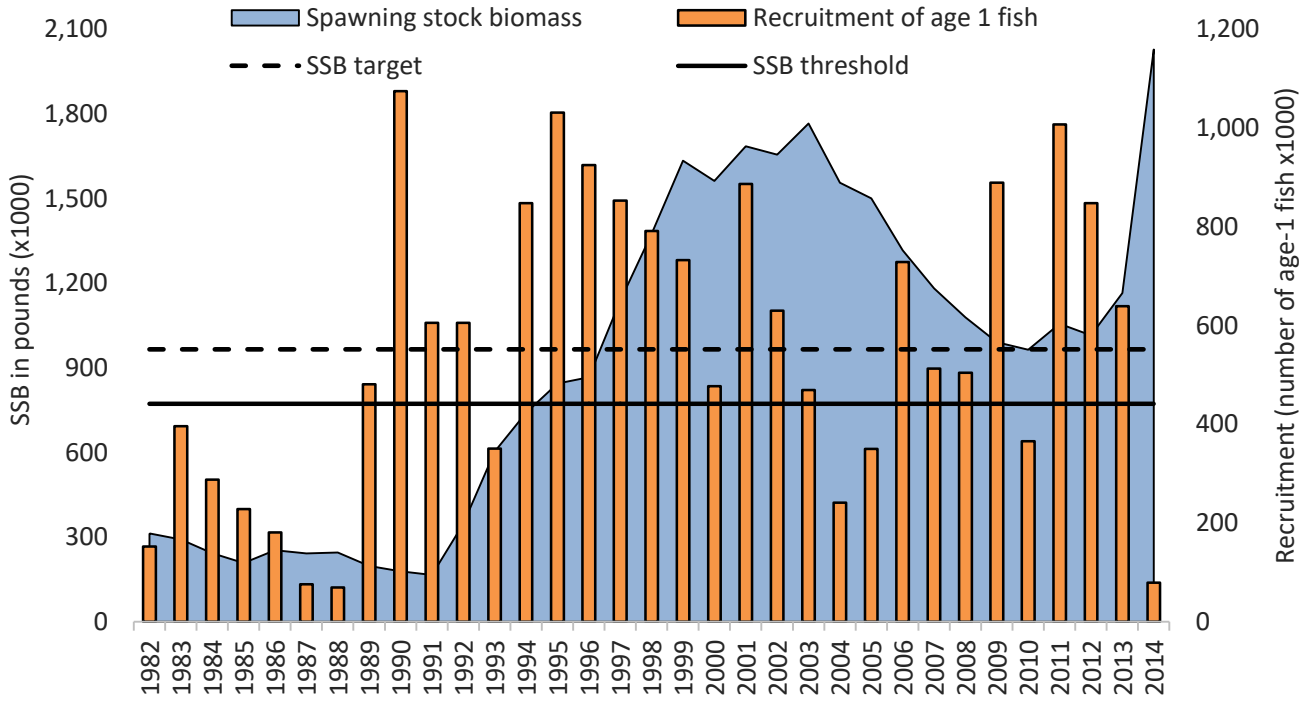


Figure 4. Albemarle Sounds-Roanoke River striped bass fishing mortality (F) estimates, and biological reference points, 1982-2014. Source: Stock Status of Albemarle Sound-Roanoke River Striped bass, 2016.

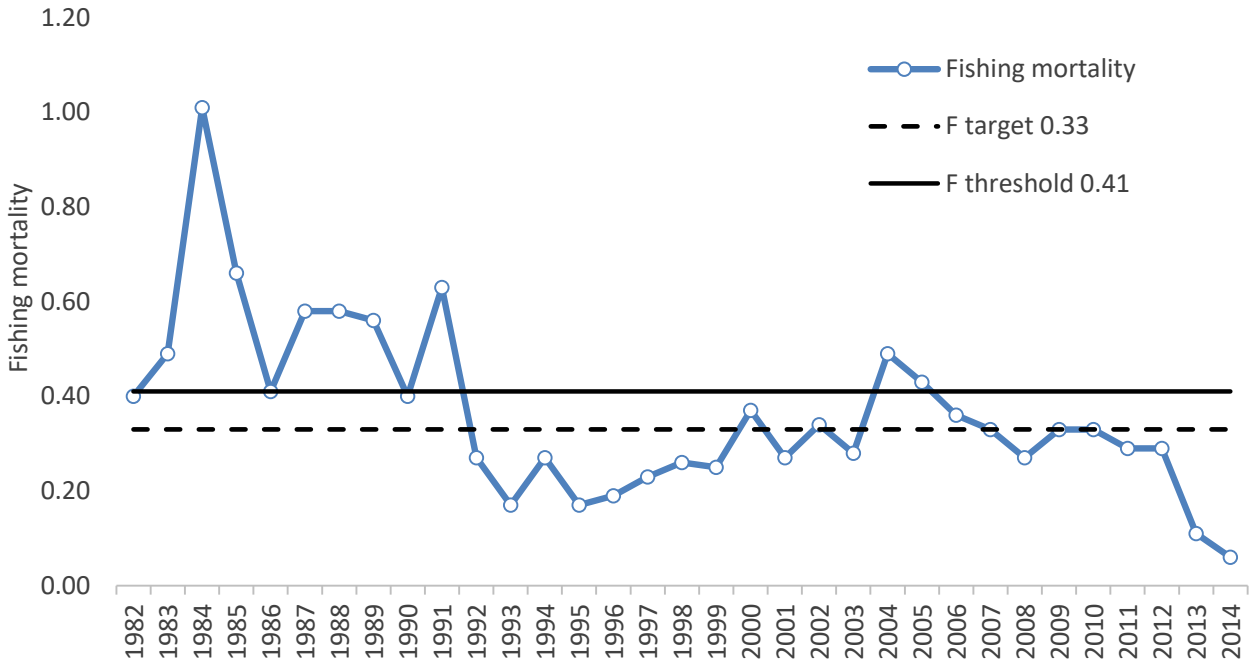


Figure 5. Total striped bass removals by sector in numbers of fish, 1982-2018. Note: Harvest is from ACCSP/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from A/R.

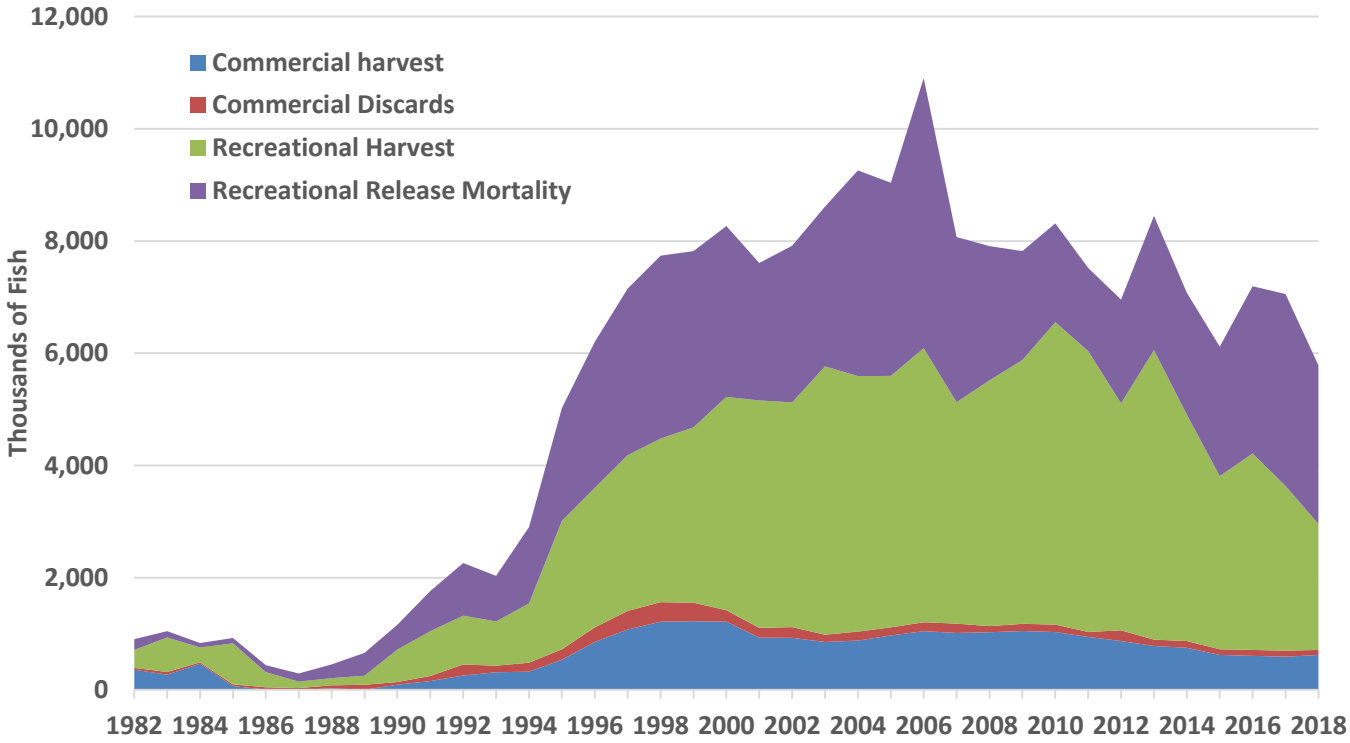


Figure 6. Commercial Atlantic striped bass landings by state in pounds, 1990-2018. Source: ACCSP. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

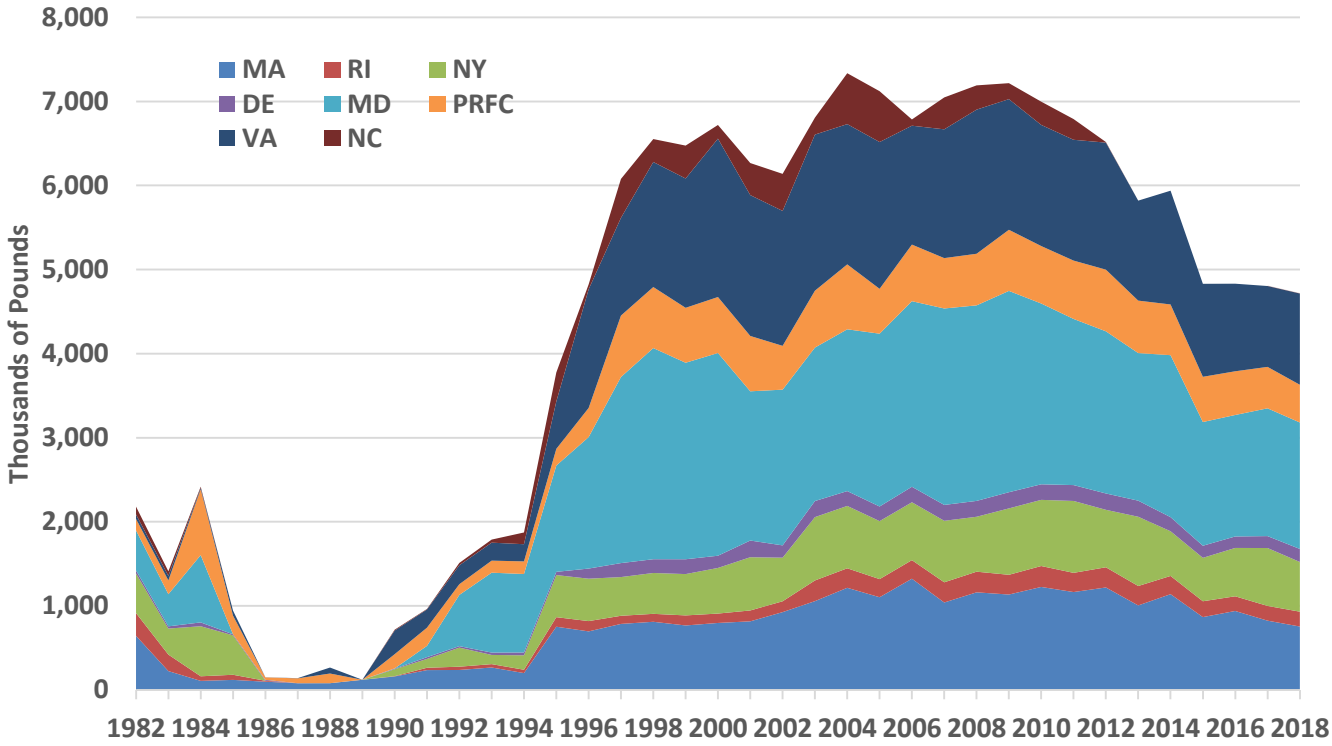


Figure 7. Total recreational catch and the proportion of fish released alive, 1982-2018. Source: MRIP/ASMFC. Estimates exclude inshore harvest from A/R.

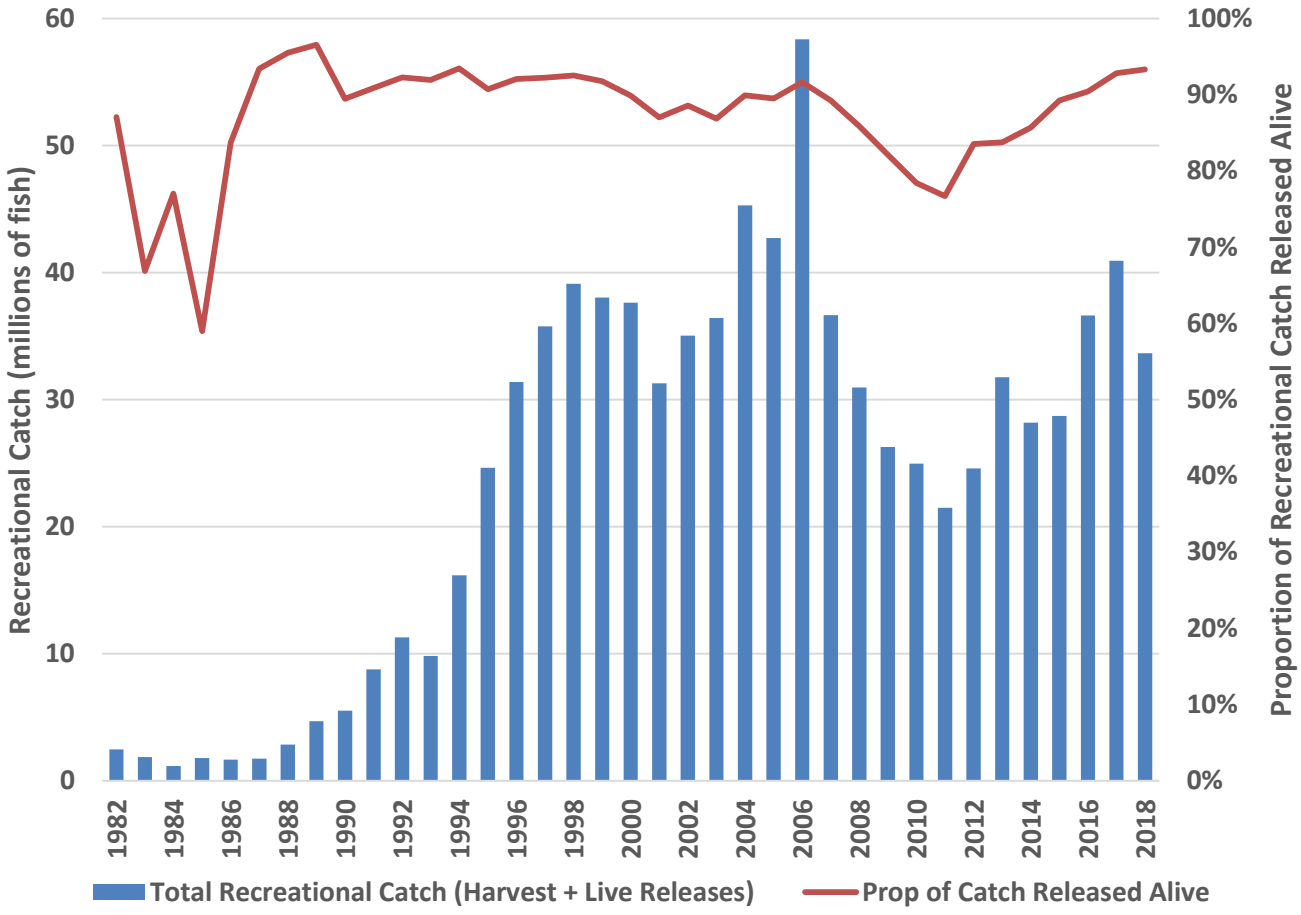
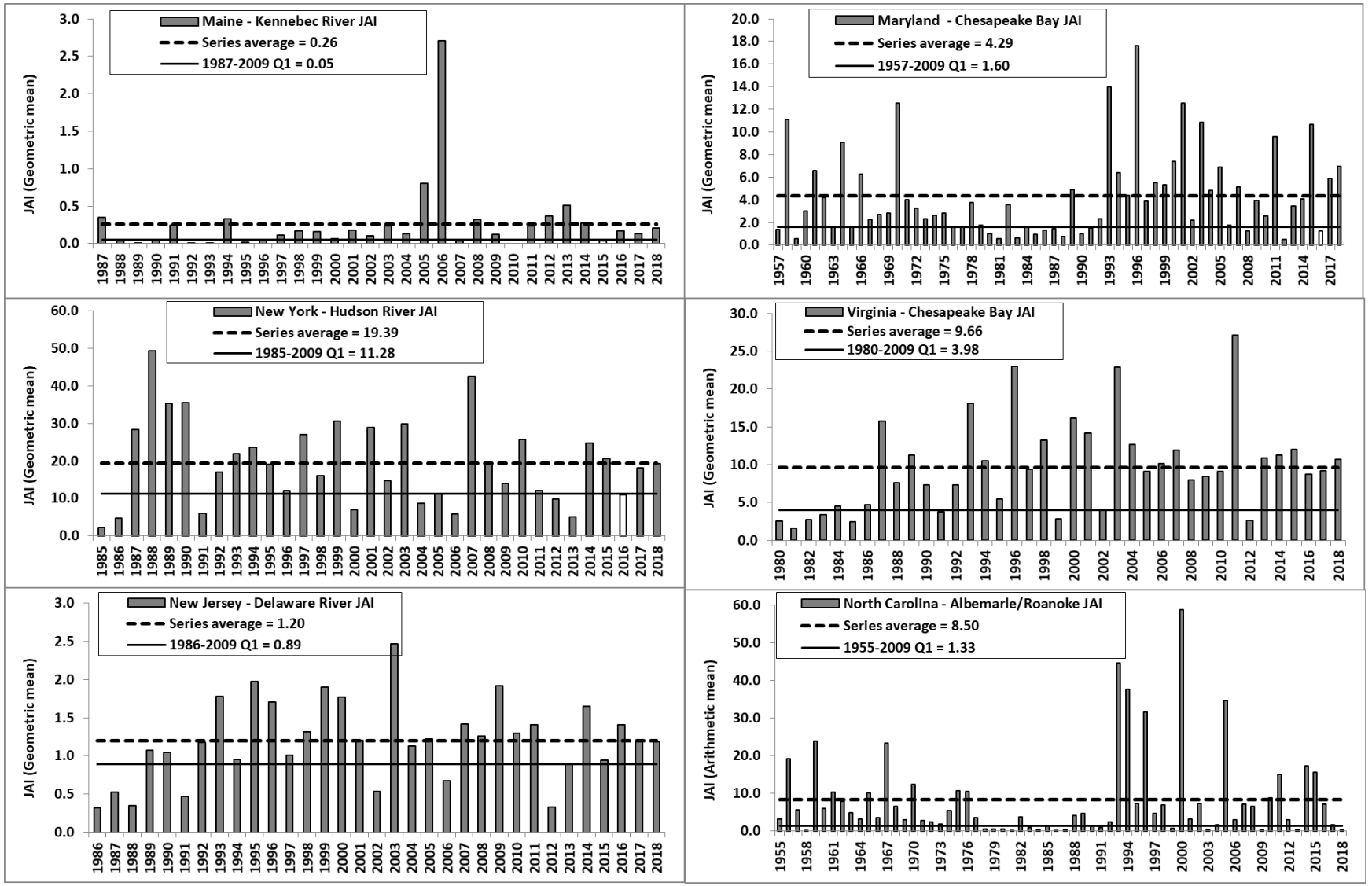


Figure 8. Juvenile abundance index analysis for Maine, New York, Jew Jersey, Maryland, Virginia, and North Carolina. Source: Annual State Compliance Reports. Q1 = first quartile. An open bar in the last three years indicates a value below the Q1 threshold.



From: wfdjr@verizon.net
To: Comments
Subject: Striped Bass Regulations
Date: Thursday, July 25, 2019 8:09:53 PM

I am greatly saddened, as I know you are, in the declining Striped Bass population. I have been fishing for Striped Bass for over 30 years from New York to Virginia. In my experience one of the most grievous actions that I believe is decimating the Striped Bass population is the harvesting of egg laden Striped Bass—to me it does not make sense. Most states do not allow the harvesting of crabs with eggs, so why do many states allow the harvesting striped bass with eggs?

If the harvesting of striped bass from say January 1 to May 1 was eliminated, I believe that we would see a rapid increase in the coastal Striped Bass population. Alternatively I believe that catch and release with in line circle hooks should be encouraged. Back in the 90s Maryland did a Striped Bass catch and release mortality study on the Susquehanna Flats on pre spawn and post spawn fish, and the mortality rate was found to be extremely low—I think about 2% or less, and that was without the use of circle hooks.

Thus if you eliminated the harvesting of egg laden Striped Bass, and encourage catch and release, I believe we would see Striped Bass populations rebound, enhance fishing opportunities, and would eventually lead to greater harvest opportunities at other times of the year. Another effective way to increase Striped Bass populations would be of course to give it game fish status.

Thank you for your consideration of these matters.

Sincerely
William DePace

Max Appelman

From: Jules <julienfrank@gmail.com>
Sent: Friday, July 26, 2019 11:16 AM
To: joseph.myers@asmfc.org; Katie Drew; Max Appelman
Subject: 2020 Striped Bass Regulations / ASFMC August Meeting

Hello Max, Katie, Joseph,

I hope this finds you all well, I'm writing you today ahead of the 08/08/19 Atlantic Striped Bass Management Board meeting with hopes that these comments will contribute to the overall process used to arrive at regulation proposals that put the needs of the stock above the wants of the "user groups".

Striped Bass are overfished and overfishing is occurring. Under the current Striped Bass management plan the ASFC has committed to end overfishing within one year, and rebuild the stock within 10 - ideally these two endeavors will not be treated as items independent of each other.

It's my understanding that the "government shutdown" amongst other issues played a role in delaying action for 2019 but it is critical that we implement new measures for 2020 to better protect the spawning stock biomass - and more specifically our BOFFF's (big old fat fecund female fish).

It is also important that any new regulations be applied as uniformly as possible across the spectrum of interested parties. To do otherwise would fuel what is already a healthy amount of finger-pointing and infighting - we all played our part in arriving where we are at today.

Additionally, many conservation-minded anglers are rightfully fuming at the notion of redefining targets and thresholds. I don't know personally if there have been any official internal proposals for redefining targets but to do so would be unacceptable - hopefully you can share some insight here.

An angler's personal experiences tend to be written off as anecdotal, and that makes sense when dealing with a single angler. However, through participation with the NYSFC (New York Surf Fishing Contest), membership with the High Hill Striper Club, and countless hours on the beach/water it's been collectively evident amongst some of the most accomplished recreational anglers in the state that the Striped Bass are in trouble and we needed new regulations at least 3-4 seasons ago

In closing, I'm aware of some of the proposed regulations: 35" minimum, slot fish, circle hooks with bait, emergency closures, etc. I sincerely plead that you deploy as many of these option necessary to get this truly iconic fish back on track.

Please let the needs of these fish be the loudest voice in the room this August.

I sincerely thank you all for your time and consideration. Have a fantastic weekend.

Kind regards,

Julien Frank

Max Appelman

From: kris magnotti <gloryhorse78@gmail.com>
Sent: Sunday, July 28, 2019 10:00 PM
To: Max Appelman
Subject: Striped bass management

To Whom This May Concern,
Hello I'm writing this email to voice my concerns over the upcoming ASMFC meeting in August on the management of striped bass. I am a Long Island resident and Surfcaster of 16 years. I know the information on the overfishing of striped bass has finally surfaced and I hope the commission will initiate an addendum to lower the fish mortality rate as well as rebuild the stock for the years to come. This needs to happen NOW. These regulations should come ASAP so that they can be in place for the 2020 season and an amendment should NOT be implemented to change current threshold numbers. I know the ASMFC has a plan to end overfishing within a year and to rebuild the stock within the next ten. Please, we want them to honor this management requirement. As a fisherman that is part of a club that releases 99.9% of our catches I want only the best for the fishery. I would love to share the experience of catching these wonderful fish with my son for years to come.
Thank you for your time.
Kris Magnotti

Sent from my iPhone

Max Appelman

From: Adam Sotiryadis <adamsotiryadis@yahoo.com>
Sent: Wednesday, July 24, 2019 7:39 PM
To: Max Appelman
Subject: August ASFMC meeting

Dear Mr. Appleman,

I am writing to you as a life long fisherman from Long Island. I am a 3rd generation fisherman, I fish over 160 dis per year. I urge you to take steps to save our fishery. This is by far the worst season I have had since 1982 the period before a moratorium was needed. *Striped Bass are overfished and overfishing is occurring. Commissioners must address this situation by voting to initiate an addendum at the August Commission Meeting. Such addendum should lower fishing mortality to the point where it would not only end overfishing, but put the stock on track to rebuild within a reasonable time-frame. While it's too late for new regulations to be in place for the 2019 fishing season, they MUST be in place for 2020. Reference points SHOULD NOT BE ADJUSTED*
THEY CAN NOT DECIDE ON AN AMENDMENT which would delay any new regulations until 2021 at the earliest, and would open the door to lowering the "goal posts" on what a healthy stack would look like
Under the current striped bass management plan, ASMFC is committed to end overfishing in one year and rebuild the stock within ten years. It is critical that the stock is rebuilt to target not threshold levels. It is also critical that ASMFC honors this management requirement.

When I was the same age as my son Danny is now, the striped bass fishing was abysmal, it was 1982. Like my son I fished every day before or after school, that's the BEST part of being a Long Islander! When the fish disappeared I focused on High School sports because fishing was NOT worth my time. My son Danny has won the NY State fishing contest in 2016 in the children's division for blue fish, in 2015 he finished 3rd. Today he says they are no fish & he chooses to also focus on his HS sports. What does that say about fisheries management if every generation faces a striped bass crisis.

Your decisions at the August ASFMC meeting can very well dictate the the future for the striped bass we can either relive the mismanagement of the mid 80's or take preemptive steps to craft regulations that will be beneficial for everyone associated with striped bass fishing.

Thank you for your time & I trust you will take steps to help these fish rebuild!

Adam Sotiryadis
917-371-8854

Max Appelman

From: Pete Utschig <pgz52@yahoo.com>
Sent: Wednesday, July 24, 2019 9:50 AM
To: Max Appelman
Subject: Letter to the ASMFC from concerned anglers

Please include this letter in the upcoming supplemental board meeting materials for August.

I am an avid Striped Bass fisherman and outdoorsman and my family, friends and I spend tens of thousands of dollars every year fishing for Striped Bass. This Money is spent on gas, food, hotels, and fishing tackle all to target the striped bass and helps fuel local economy. Nearly all the fish we catch are released and we do our best to practice catch and release to help protect the striped bass fishery.

Over the past couple of fishing seasons, I have seen a drastic decline in the population of the Striped Bass and the amount of effort it takes to catch a striped bass is now more than double of what it was just a few years ago. The amount of time I spend on the water fishing, speaking with fellow anglers and reading fishing reports gives this testimonial legitimacy.

The ASMFC 2018 Striped bass stock assessment shows that striped bass are being overfished and overfishing is occurring. Action must be taken now to reduce fishing mortality below the threshold and closer to the target by 2020. The ASMFC needs to honor the commitment they made when they adopted Amendment 6 and rebuild the striped bass stock within ten years. The abundance of striped bass is critical to local communities, the tackle trade, and recreational fisherman.

The Striped bass should be regulated so the stock can be enjoyed by all, Commercial, for Hire, and the Recreational communities.The recreational community needs an abundant striped bass population so that there's a reasonable expectation that you can catch a fish or we'll continue losing anglers that support the fishing community.

The majority of striped bass in the migratory population spawn in the Southern most portion of its range and the Chesapeake Bay is experiencing water quality issues, destruction of spawning areas, and depletion of its food sources making the importance of more stringent regulations important to bring SSB above the threshold and closer to the target. We all understand the importance of an abundant Striped Bass fishery and what it means to the recreational and commercial fishing industry and local communities. We need to act today to rebuild the stocks for tomorrow and eliminate the downward trend of the population.

Thank You for your time
Pete Utschig
Sent from my iPhone

July 26, 2019

Dr. Mike Armstrong, Chairman
Atlantic Striped Bass Management Board
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, Virginia 22201

RE: Ending Overfishing and Rebuilding Striped Bass through Addendum VI

Dear Dr. Armstrong and Members of the Atlantic Striped Bass Management Board,

Founded by anglers in 1973,[1] *Wild Oceans* is the nation's oldest conservation group dedicated to marine fishery resources. Our organization was heavily involved in the successful recovery of striped bass along the Atlantic seaboard, working with the Atlantic States Marine Fisheries Commission as far back as 1978 and with Congress on the Atlantic Striped Bass Conservation Act of 1984. Years of sacrifice and dedication on the part of fishermen up and down the East Coast led to the full recovery of striped bass by 1995. Striped bass became the "poster fish" for successful, collaborative interstate conservation.

The newly-published striped bass stock assessment alarmingly concludes that striped bass are once again overfished and overfishing is occurring,[2] We urge the Management Board to act swiftly to end overfishing and reduce fishing mortality to the target level, *with a greater than 50% chance of success*, as soon as possible and no later than 2020. In addition, we strongly support rebuilding the striped bass population in less than 10 years as required by Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass.[3] Both of these objectives should be addressed in Addendum VI to Amendment 6 prior to the addendum being released for public comment. Furthermore, Addendum VI options should be consistent with

[1] As the National Coalition for Marine Conservation (NCMC)

[2] Northeast Fisheries Science Center (NEFSC). 2019. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 19-08; 1170 p. Available from: https://www.nefsc.noaa.gov/publications/crd/crd1908/

[3] The stock rebuilding schedule in Amendment 6 (Section 2.6.2) explicitly states that "if at any time the Atlantic striped bass population is declared overfished and rebuilding needs to occur, the Management Board will determine the rebuilding schedule at that time. The only limitation imposed under Amendment 6 is that the rebuilding schedule is not to exceed 10 years."

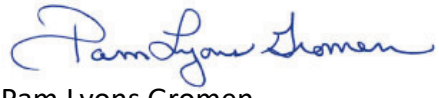
the management goals and objectives listed in Amendment 6, which we fully support – in particular, the emphasis on "long-term maintenance of a broad age structure." The abundance of older striped bass, the most productive spawners, is crucial to maintaining a healthy and stable stock.

Wild Oceans believes that the goals, objectives, reference point definitions and actions specified in Amendment 6 offer the best and most expedient path forward for ending overfishing and rebuilding a healthy and resilient striped bass population. Therefore, we strongly oppose the postponed motion from the April 2019 meeting that would initiate an amendment to alter this course, potentially causing undue delays and weakening conservation measures.

Finally, we remind the Management Board of the important work underway to develop ecological reference points for Atlantic menhaden, arguably the most critical component of the striped bass diet. It is impossible to sustain a healthy striped bass population for the long term if management does not account for its ecological needs, especially the needs of a population undergoing recovery. The Atlantic menhaden ecosystem-based benchmark assessment and the models supporting the assessment must remain a high priority for the Commission and must stay on schedule for completion in 2020.

Thank you for your consideration.

Sincerely,



Pam Lyons Gromen
Executive Director

1075 Tooker Avenue
West Babylon, NY 11704
July 30, 2019

James J. Gilmore Jr.
New York State Department of Environmental Conservation
Division or Marine Resources
200 North Belle Meade Road, Suite 1
East Setauket, NY 11733-3400

Sen. Todd Kaminsky
55 Front St., Room 1
Rockville Centre, NY 11570-4040

Emerson Hasbrouck
Cornell Cooperative Extension
Marine Program
423 Griffing Av, #100
Riverhead, NY 11901-3071

Dear ASMFC Commissioner:

I am contacting you with respect to actions that are scheduled to be taken when the Atlantic States Marine Fisheries Commission's Atlantic Striped Bass Management Board (the "Management Board) meets on August 8, 2019, more particularly, the vote to approve an addendum to the striped bass management plan for public comment, and the vote on a motion to initiate a new amendment to the striped bass management plan.

The benchmark striped bass stock assessment that was completed in 2018 and formally released in February 2019 (the "2018 Assessment") revealed that the striped bass stock is experiencing overfishing, and has become overfished.[1] In response to that finding, I ask that you support actions to reduce striped bass fishing mortality to the target level within one year, and to rebuild the striped bass biomass to the target level within ten years, both as required by *Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass* ("Amendment 6").

To better assure that any measures adopted achieve such goals, I further ask that the addendum contain provisions that 1) prohibit the transfer of striped bass between sectors, 2) limit the use of conservation equivalency to situations where there is a compelling biological argument for doing so, 3) hold recreational fishermen accountable, at the fleet level, for not achieving mandated fishing mortality reductions, and 4) hold states that opt for conservation-equivalent measures accountable should such allegedly equivalent management measures fail to meet mandated fishing mortality reductions.

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[1] Northeast Fisheries Science Center, *66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report*, April 2019, p. 564, available at https://www.nefsc.noaa.gov/publications/crd/crd1908/crd1908.pdf

I also ask that you oppose the motion to initiate a new amendment to the striped bass management plan.

My rationale for such requests is set forth below.

I

FISHING MORTALITY MUST BE REDUCED TO THE TARGET LEVEL WITHIN ONE YEAR

Amendment 6 contains a "management trigger" that states "If the Management Board determines that the fishing mortality threshold is exceeded in any year, the Board must adjust the striped bass management program to reduce the fishing mortality rate to a level that is at or below the target within one year."[2] At its May 2019 meeting, the Management Board initiated an addendum process intended to satisfy that requirement.[3]

Reducing fishing mortality to the target level is an essential element of the striped bass management program, as the fishing mortality target was calculated to be the level of fishing mortality that would maintain striped bass abundance at the female spawning stock biomass target.[4] Allowing fishing mortality to remain above the fishing mortality target makes it highly unlikely that such biomass target could be attained; should fishing mortality be allowed to remain above the fishing mortality threshold, the biomass is likely to remain overfished, and even to continue to decline.

The addendum that was initiated at the Management Board's May meeting will probably consider a number of alternatives intended to reduce fishing mortality to the target level. Which of those alternatives is ultimately chosen is less important than assuring that, whichever alternative is chosen, fishing mortality will be reduced to the target level. To that end, there are some issues that should be considered.

A

A 50% probability of success is not enough

The use of a 50% probability of success as a management standard arose out of the appellate court's decision in *Natural Resources Defense Council v. Daley.*[5] There, the court found that any lesser standard would not satisfy the legal requirement that a federal fishery management action must offer a "fairly high level of confidence" that it will succeed.

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[2] Atlantic States Marine Fisheries Commission, *Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass*, 2003, p. 31, available at http://www.asmfc.org/uploads/file/sbAmendment6.pdf

[3] Atlantic States Marine Fisheries Commission, "Atlantic Striped Bass Benchmark Stock Assessment Finds Resource Overfished and Overfishing Occurring," May 1, 2019, available at http://www.asmfc.org/uploads/file/5cc9dafdpr14AtlStripedBassAssmt.pdf

[4] Northeast Fisheries Science Center, 2018 Assessment, p. 462

[5] 209 F. 3rd 747 (DC Circuit, 2000)

While the Atlantic States Marine Fisheries Commission ("ASMFC") is not bound by such federal ruling, it is still worth noting that a 50% probability of success is viewed as a *minimum* standard for federal management plans, and not as the target, or optimum, probability level. Federal management plans, particularly in the Mid-Atlantic region,[6] typically see allowances made for scientific, and sometimes for management, uncertainty; while a 50% probability of success might barely meet the acceptable standards in the unheard-of case where all conceivable uncertainty has been resolved, that 50% probability is quickly called into doubt once uncertainty is added to the equation.

Unfortunately, the impacts of uncertainty were well illustrated in the 2018 Assessment's findings, which seem to have caught a number of Management Board members by surprise, and were certainly far more pessimistic than the results of the previous benchmark assessment that was completed in 2013[7] (the "2013 Assessment").

Since the ASMFC does not have a formalized risk policy, it should better assure the efficacy of its management plans by adopting measures that don't have a 50% probability of failure.

B

Circle hooks should be required for all bait fishing

Recreational release mortality was the greatest single contributor to striped bass fishing mortality in 2017.[8] Any successful effort to reduce such release mortality would both reduce dead discards in the fishery and make a significant contribution to reducing the fishing mortality level.

The easiest way to reduce release mortality is to require the use of circle hooks in all bait fisheries for striped bass. Maryland took that step in 2018; its report on the first year of that program indicates that the circle hook mandate has significantly decreased release mortality of striped bass in that state.[9] There is no reason to believe that a universal circle hook requirement, if included in the addendum now being contemplated, would be any less effective.

Certainly, such requirement would be beneficial in New York, where anglers still frequently employ not only traditional J-hooks, but also treble hooks, in the bait fishery for striped bass. I was reminded of that twice in recent weeks, as I walked into tackle shops to find anglers purchasing small (perhaps #4/0 or #5/0) treble hooks that they intended to use when live-lining menhaden and other live baits. At certain

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[6] Mid-Atlantic Fishery Management Council, "Mid-Atlantic Fishery Management Council ABC Control Rule Framework and Risk Policy," available at http://archive.nefmc.org/press/risk_policy_workshop/tab%205/3_MAFMC%20ABC%20Control%20Rule%20framework.pdf

[7] Northeast Fisheries Science Center, 57th *Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Report,* December 2013.

[8] Celestino, M., "2018 Stock Assessment of Atlantic Striped Bass" (Power Point presentation), February 2019, available at http://www.asmfc.org/files/Meetings/2019WinterMeeting/AtlStripedBassBoardPresentations_Feb2019.pdf

[9] Maryland Department of Natural Resources, "Maryland's Conservation Equivalency Effectiveness Report," January 2019, available at http://www.asmfc.org/files/Meetings/2019WinterMeeting/AtlanticStripedBassBoardSupplemental.pdf

times during the year, New York also sees many anglers employ the "snag-and-drop" technique, in which large, weighted treble hooks are used to foul-hook menhaden, which are then allowed to drop below the school where they are often eaten by a striped bass.

The damage that such treble hooks can cause when they embed themselves in the gills, gut or gullet of a striped bass is a good reason, in itself, to impose a universal circle hook requirement.

II
THE MANAGEMENT BOARD MUST NOT IGNORE AMENDMENT 6'S REQUIREMENT THAT IT REBUILD THE STOCK TO TARGET WITHIN TEN YEARS

The language of Amendment 6 is perfectly clear: "If the Management Board determines that the biomass has fallen below the threshold in any given year, the Board must adjust the striped bass management program to rebuild the biomass to the to the target level within the timeline established by *Section 2.6.2*."[10]

Section 2.6.2, in turn, reads "If at anytime the Atlantic striped bass population is declared overfished and rebuilding needs to occur, the Management Board will determine the rebuilding schedule at that time. The only limitation imposed under Amendment 6 is that ***the rebuilding schedule is not to exceed 10 years***. [emphasis added]"[11]

Yet, despite what appears to be a clear and unambiguous requirement to rebuild the striped bass stock within a time certain, when the Management Board voted to begin the addendum process at its May 2018 meeting, it did not direct the Plan Development Team to address rebuilding at all. Although Max Appelman, the Fishery Management Plan Coordinator, expressly informed the Management Board that "The Board is required to adjust the management program to return F to a level at or below target within one year, and to rebuild biomass to the target, and that rebuilding schedule cannot exceed a ten year period...its very important that the Board provide good direction to the Development Team on which issues to consider, and also on how those issues should be approached or explored,"[12] the Management Board seems to have intentionally ignored the mandatory rebuilding language.

The most that the Management Board was willing to do was accede to the request of Capt. John McMurray, the proxy for New York's legislative representative, to task the Atlantic Striped Bass Technical Committee (the "Technical Committee") to determine what measures would be needed to timely rebuild the stock, and report back at the upcoming August meeting.[13]

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[10] ASMFC, *Amendment 6,* p. 31
[11] ASMFC, *Amendment 6*, p. 22
[12] Atlantic States Marine Fisheries Commission, Draft Proceedings of the Atlantic Striped Bass Management Board Meeting April 2019, p. 25, available at http://www.asmfc.org/files/Meetings/2019SummerMtg/AtlanticStripedBassBoard.pdf
[13] ASMFC, Draft Proceedings of the April 2019 meeting, p. 39

Once that report is provided, the Management Board will be effectively committing management malpractice if it fails to include rebuilding measures in the proposed amendment for public consideration.

A

Uncertainty is not an excuse for inaction

This is not the first time that the Management Board has ignored the clear mandate of Amendment 6, and failed to take action to rebuild the stock when required to do so.

In 2014, after the 2013 Assessment revealed that remedial action was needed, the Management Board was faced with two relevant management triggers. One, management trigger 3, required that when fishing mortality rose above the target level for two consecutive years, and biomass fell below target in one of those years, management action had to be taken to reduce fishing mortality to or below the target level within one year. The Management Board complied with that mandate by adopting *Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan* ("Addendum IV") in October 2014.[14]

However, a second management trigger, management trigger 4, expressly stated that "If the Management Board determines that the female spawning stock biomass falls below the target for two consecutive years and the fishing mortality rate exceeds the target in either of those years, the Management Board must adjust the striped bass management program to rebuild the biomass to a level that is at or above the target in the timeframe established in *Section 2.6.2*."[15]

Despite the mandatory language of that provision, the Management Board chose to ignore the rebuilding requirement, probably because Michael Waine, who was then the Fishery Management Plan Coordinator, advised the Management Board that

> Management Trigger 2 [sic] in Amendment 6 says that you need to rebuild the [spawning stock biomass] back to target over a specified timeframe that should not exceed ten years. I think there is a sort of a combination of things happening. The Board is acting to reduce [fishing mortality]. Through that action we see the projection that [spawning stock biomass] will start increasing towards its target, but we're uncomfortable with projecting out far enough to tell you when it will reach its target because the further on the projections we go the more uncertainty that is involved. Therefore, I think the trend is to get back towards the target, but we can't tell you how quickly that will happen.[16]

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[14] Atlantic States Marine Fisheries Commission, *Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan*, October 2014, available at http://www.asmfc.org/uploads/file/54d2aa96AtlStripedBassAddendumIV_Oct2014.pdf

[15] ASMFC, *Amendment 6*, p. 31

[16] Atlantic States Marine Fisheries Commission, *Proceedings of the Atlantic Striped Bass Management Board Meeting August 2014*, p. 10, available at http://www.asmfc.org/uploads/file/5522c64fAtlStripedBassProceedings_Aug2014.pdf

It was strange and very dubious advice, and not only because it is probably not the role of the Fishery Management Plan Coordinator to recommend that the Management Board ignore explicit provisions of its own management plan.

While it's certainly true that uncertainty increases as population projections are extended out in time, such uncertainty is hardly so daunting that it militates against the creation of ten-year rebuilding plans. The Magnuson-Stevens Fishery Conservation and Management Act, which governs all fishing in federal waters, sets ten years as its default rebuilding timeline, and allows plans to be extended out longer when biology or other factors render a ten-year rebuild impossible.[17]

Thus, it is clearly feasible to address the uncertainty inherent in a 10-year rebuilding plan, both by creating buffers for scientific and management uncertainty, and by performing periodic stock assessment updates every two or three years, which provide managers to adjust a rebuilding plan should the recovery veer off course.

The ASMFC has already demonstrated that it can rebuild the striped bass biomass to the target level within ten years, even when the stock is at far lower levels of abundance than where it stands today. When *Amendment 3 to the Interstate Management Plan for Atlantic Striped Bass*[18] ("Amendment 3") was adopted in 1985, the female spawning stock biomass stood at roughly 40 million pounds, roughly one-fourth of where it stands today.[19] Yet only ten years after Amendment 3 was adopted, the stock had been completely rebuilt.[20] There is no reason why the Management Board shouldn't find equal success rebuilding the stock today.

Finally, the Management Board must realize that uncertainty is unavoidable, and even exists when no action is taken. Mr. Waine ignored that fact in 2014, when he recommended against a rebuilding plan but confidently advised that "the trend is to get back towards target." Unfortunately, that wasn't the case; as the 2018 Assessment has revealed, in reality, "the trend" was really for further decline.

If the Management Board had initiated a rebuilding plan as part of Addendum IV, that decline might have been detected earlier, and action might have been taken to prevent the biomass from sinking to the level where it stands today.

B

A rebuilding plan better assures that rebuilding will actually occur

The ASMFC has had little success in rebuilding overfished stocks. While its record can be measured from a number of different starting points, including the ASMFC's creation in 1942, the passage of the Atlantic

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[17] 16 U.S.C. 1854 (e)(4)(A)(ii)

[18] Atlantic States Marine Fisheries Commission, *Amendment 3 to the Interstate Management Plan for Atlantic Striped Bass*, October 1985, available at http://www.asmfc.org/uploads/file/StripedBassAmendment3.pdf

[19] *See* Atlantic States Marine Fisheries Commission, "Atlantic Striped Bass," available at http://www.asmfc.org/species/atlantic-striped-bass

[20] *Ibid.*

Striped Bass Conservation Act[21] in 1984 or the passage of the Atlantic Coastal Fisheries Cooperative Management Act[22] in 1993, the fact remains that in all of its history, the ASMFC has never successfully rebuilt and maintained a single fish stock. The one stock that it has managed to rebuild, Atlantic striped bass, is again languishing at an overfished level, with little reason to believe that it will recover in the foreseeable future.

The ASMFC's dismal record stands in stark contrast to that of federal fishery managers who, as of June 30, 2019, have successfully rebuilt 45 stocks of fish,[23] and have placed a number of other, once-overfished stocks solidly on the road to recovery.

While such direct comparison doesn't account for some unique challenges faced by the ASMFC, such as the impact of dams on anadromous species,[24] much of the federal managers' success can be attributed to a law that require overfished stocks to be rebuilt within a time certain, and gives managers no discretion to ignore rebuilding or delay the rebuilding deadline. [25]

The ASMFC's failure to create and actively oversee a ten-year rebuilding plan for Atlantic striped bass will virtually assure that the striped bass, like all other depleted species managed solely by the ASMFC, will not soon recover.

C

A failure to initiate a rebuilding plan will seriously damage the ASMFC'S credibility

When the ASMFC adopted Amendment 6 and the management triggers therein, it entered into a covenant with striped bass stakeholders and with the general public that it would take action when such management triggers were tripped.

I make that statement not on a theoretical level, but as someone who was actively involved in the striped bass debate when Amendment 6 was being developed. At that time, I was among the many striped bass anglers who believed that, based on the best available science then available, Amendment 6's target fishing mortality rate of 0.31 was too high to develop a broad age structure in the striped bass spawning stock.

We argued for a fishing mortality target that was set no higher than 0.25. Although we lost that fight, we were assured by members of the Management Board that we had little to worry about, because the management triggers in Amendment 6 provided a firewall, that would guarantee action if the biomass fell low enough to trip the relevant management triggers.

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[21] 16 U.S.C. 5151 *et seq*

[22] 16 U.S.C. 5101 *et seq*

[23] National Marine Fisheries Service, "Fishery Stock Status Updates," available at https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates#2019-quarterly-updates

[24] *See* Atlantic States Marine Fisheries Commission, "Shad & River Herring," available at http://www.asmfc.org/species/shad-river-herring

[25] 16 U.S.C. 1854(e)

That wasn't what happened when trigger 4 was tripped five years ago, and there is little reason to believe that the tripped trigger 2 will lead to meaningful management action today. The Management Board's decision to ignore the very clear language of Amendment 6, stating that it "must" act, provides stakeholders little reason to believe that the ASMFC will stand by its commitments to manage and conserve any fish stock, including the Atlantic striped bass.

The ASMFC's failure to take action to rebuild the stock within ten years, as expressly provided in Amendment 6, makes it appear all too likely that many Management Board are trying to avoid living up to their responsibilities as stewards of a public-trust resource, and making the hard decisions that are necessary to assure the long-term health of fish stocks.

The ASMFC's failure to adopt a ten-year rebuilding plan will also confirm the belief, which is spreading through the striped bass angling community, and through the broader angling community as well, that the only way to rehabilitate the ASMFC's credibility and its effectiveness as a management body is to pass legislation that will hold the ASMFC to the same standards, including standards for legal review, that currently apply to federal fishery managers.

Many members of the Management Board would strongly prefer not to see that happen. However, their failure to comply with the clear language of the striped bass management plan will merely serve to convince more people that such legislation is badly needed.

III
MISCELLANEOUS CONSIDERATIONS RELATED TO THE ADDENDUM

A
Transfer of striped bass between sectors should not be permitted

The striped bass stock is overfished and experiencing overfishing. So long as those conditions exist, the sole priority of fishery managers should be reducing fishing mortality to a level that will end overfishing and rebuild the overfished stock.

Managers need not impose draconian measures. Each state's commercial quota is set in Addendum IV,[26] and the commercial fishery can be adequately managed by reducing such state quotas by whatever percentage is deemed necessary achieve the management plan's conservation goals. Interstate transfers of commercial quotas, in order to erase one state's overage with another state's unused quota, is a routine remedy that need not be discontinued, as even with such transfers, the legitimate commercial harvest would not exceed the permitted level.

However, some state legislatures have outlawed commercial striped bass fishing. Traditionally, such so-called "gamefish legislation" has been promoted as a conservation measure,[27] but the conservation

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[26] ASMFC, *Addendum IV*, p. 9

[27] See Coastal Conservation Association Texas, "President Orders Gamefish Status for Striped Bass, Red Drum," *Texas Saltwater Fishing Magazine*, December 2007, available at

benefits of any such legislation are diluted, if not altogether dissipated, when a state's unused commercial quota is transferred for use by the recreational sector, something that is currently being done in at least two states, Connecticut and New Jersey.[28]

If the transfer of commercial quota to the recreational sector was prohibited, fishing mortality could be reduced by a modest amount, without causing undue harm to anglers in the affected states, who would merely be placed on an equal footing with anglers elsewhere on the coast who share the same coastwide set of regulations.

At the same time, transfers of catch from the recreational to the commercial sector should also be banned. While such transfers are harder to quantify, given that anglers fish under a "soft" fishing mortality target rather than against a hard-poundage quota, it is conceivable that some states might attempt to craft allegedly conservation-equivalent regulations that minimize commercial landings reductions in exchange for more restrictive angling regulations.

No such effort should be permitted. The current commercial quotas are based on each state's commercial landings during the period 1972-1979,[29] and thus have a rational basis that would be disrupted by arbitrary changes initiated by any individual state. There is no conservation purpose served by making such change.

B

Limit the use of conservation equivalency

Consistent, coast-wide regulations benefit the striped bass stock and the management process by providing more accurate recreational harvest data, that can be collected on a coast-wide basis. Because the Marine Recreational Information Program ("MRIP") survey used to estimate recreational landings provides more precise data when the sample size is larger,[30] coastwide estimates are more precise than data obtained at a state-by-state level, and the impact of regulations on recreational landings can thus be better discerned.

Because state-level estimates are less precise than coastwide estimates, the data used to craft conservation equivalent regulations is less reliable than that used to craft coast-wide regulations, increasing the risk that supposedly equivalent regulations will not achieve the required harvest reductions. Thus, the use of conservation equivalency should be limited to states and/or regions where it is justified by the biology/life history of the striped bass (e.g., regulations adopted for Chesapeake Bay) rather than out of a mere desire to permit anglers to take home more fish on any given trip (e.g., New Jersey's 2-fish bag limit).

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https://www.texassaltwaterfishingmagazine.com/fishing/education/conservation/president-orders-game-fish-status-red-drum-striped-bass

[28] ASMFC, *Addendum IV*, p. 9

[29] ASMFC, *Amendment 6*, p. 32

[30] National Marine Fisheries Service, "Recreational Fishing Data, Survey Statistics Overview," available at https://www.fisheries.noaa.gov/recreational-fishing-data/survey-statistics-overview#accounting-for-errors

While the ASMFC considers conservation equivalency to be "an integral part of the Commission management process,"[31] it also advises that "The [Plan Development Team] should consider stock status, stock structure, data availability, range of the species, socio-economic information, and the potential for more conservative management when stocks are overfished or overfishing is occurring when making a recommendation on conservation equivalency."[32]

Given that the current status of the striped bass is "overfished," that the stock is composed of fish from three primary spawning grounds that migrate all along the New England and Mid-Atlantic coast,[33] and that conservative management is indicated given that the striped bass stock is currently both overfished and experiencing overfishing, the ASMFC's Conservation Equivalency policy would militate against the use of conservation equivalency in the striped bass fishery at this time, for all but the most compelling, biologically-driven situations.

C

The recreational sector should be held accountable if it fails to meet the mandated reductions

1

Such accountability should be imposed at the fleet, not state, level

Federal fishery management plans require that annual catch limits be established for virtually all managed fisheries, and that fishermen be held accountable when those limits are exceeded.[34] The ASMFC has imposed similar limits and accountability measures on the commercial striped bass fishery, and requires that "In the event that a state/jurisdiction exceeds its quota, the amount in excess of its annual quota will be deducted from the state's allowable quota in the following year."[35]

No such strictures are placed on the recreational fishery. Such fishery is managed by means of a "soft" fishing mortality target, rather than by a hard quota, and when recreational fishermen exceed that mortality target, they face no consequences.

The most egregious example of that situation occurred in Chesapeake Bay, where Addendum IV required both commercial and recreational fishermen to reduce fishing mortality by 20.5%, compared to the 2012 base year.[36] However, a stock assessment update performed after the close of the 2015 season, the first season subject to Addendum IV regulations, revealed that while the commercial fishery achieved the mandated reduction, the recreational fishery in Chesapeake Bay not only failed to adequately reduce its harvest, but actually *increased* fishing mortality by more than 58 percent.[37]

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[31] Atlantic States Marine Fisheries Commission, *Conservation Equivalency: Policy and Technical Guidance Document*, October 2016, p. 1

[32] ASMFC, *Conservation Equivalency*, p. 2

[33] Northeast Fisheries Science Center, 66th SAW, pp. 471-472

[34] 16 U.S.C. 1853(a)(15)

[35] ASMFC, *Addendum IV*, p. 9

[36] ASMFC, *Addendum IV*, p. 8

[37] Atlantic States Marine Fisheries Commission Atlantic Striped Bass Technical Committee, "Memorandum: Performance Evaluation of Addendum IV Regulatory Measures in 2015," October 5, 2015, p. 5, available at http://www.asmfc.org/files/Meetings/2016AnnualMeeting/AtlanticStripedBassBoard.pdf

Despite such a severe overage, the Management Board took no action to rein in excessive recreational harvest in Chesapeake Bay, while one state fishery manager from the Chesapeake region defended his state's overage, essentially arguing that the overage was, in reality, a "kind of a likely reduction" because, given the abundant 2011 year class available to Chesapeake Anglers, the overage would have been even higher if regulations hadn't been changed at all.[38]

The fact that such arguments can be successfully made before the Management Board partially explains why the striped bass stock is overfished and experiencing overfishing today. The best management plan ever conceived is worthless if its provisions are not enforced. Yet recreational overharvest continues in the Chesapeake today.

In the 2012 base year, anglers harvested an estimated 716,742 striped bass in the inland water of the State of Maryland; if they had complied with Addendum IV's supposedly required 20.5% reduction, annual harvest in the years 2015-2018 should have been somewhere around 570,000 fish. Instead, the actual harvest was estimated to be 1,107,991 fish in 2015 (194% of target), 1,545,086 fish in 2016 (271% of target), 1,091,645 fish in 2017 (192% of target) and 993,304 fish in 2018 (174% of target).[39]

While such overages certainly weren't the primary cause of the current, distressed state of the stock, it's difficult to argue that they didn't at least contribute to the situation.

Nonetheless, striped bass are a migratory species, and are appropriately managed on a coast-wide basis. It would probably counterproductive to try to manage recreational harvest at the state level. However, given that striped bass are managed with two sets of recreational regulations, one applied to the coast and one applied to Chesapeake Bay (I'm leaving the Albemarle-Roanoke stock out of this discussion given its limited impact on the migratory population), it would be entirely appropriate to hold anglers accountable for overages at the fleet level. Such an approach would mandate more restrictive levels at any time that anglers along the entire coast, or throughout Chesapeake Bay, failed to meet the mandated harvest reductions.

2

Accountability measures should be applied at the state level if conservation-equivalent measures don't meet the mandated reduction

Every sector, and every state, will benefit if overfishing is ended and the striped bass stock is rebuilt; accordingly, every sector and every state should share the conservation burden required to meet such goals.

In the ideal situation, anglers along the entire coast would share a single set of regulations, while a second set would govern all anglers who fish in Chesapeake Bay. However, history informs us that at

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[38] Atlantic States Marine Fisheries Commission, *Atlantic Striped Bass Management Board Proceedings October 2016*, p. 0, available at http://www.asmfc.org/uploads/file/589a31bfAtlStripedBassBoardProceedings_Oct2016.pdf

[39] Data on which such calculations were based obtained from personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, July 30, 2019

least one state will probably try to adopt conservation-equivalent regulations in order to allow a higher bag limit, a lower minimum size or some combination of such measures.

As noted in an earlier section, there is always some level of error in MRIP estimates, and such error inevitably increases when such estimates are made at the state, rather than the coast-wide, level. That error is incorporated into conservation equivalency calculations, and can result in supposedly "equivalent" measures that fail to meet the mandated harvest reduction.

In such cases, the state that rejected coastwide measures in favor of conservation equivalency should be held accountable for such failure, be required to adopt more restrictive regulations that will adequately constrain harvest and, if such failure continues in consecutive years,be subject to payback provisions. The success of any ASMFC management program hinges on cooperative management; when one state opts for conservation equivalent management measures, in an effort to confer an advantage on its anglers and angler-related businesses, such state must still be held responsible for shouldering its full share of the conservation burden.

Conservation-equivalent states will undoubtedly complain that MRIP estimates aren't precise enough to permit the imposition of accountability measures. That may, in fact, be true. However, if such data is deemed to be adequate for conservation equivalency purposes, it is should be deemed equally adequate for the purpose of imposing accountability. It is inconsistent, and somewhat hypocritical, to deem it good for one of those purposes and not the other.

IV
THERE SHOULD BE NO NEW AMENDMENT TO THE MANAGEMENT PLAN

At the February 2019 Management Board meeting, Fishery Management Plan Coordinator Max Appelman told the Management Board that "there is a lot of flexibility in the Adaptive Management Section of Amendment 6. I was just reviewing this prior to the Board meeting. Almost everything is covered in the addendum process, *except the management objectives and goals*. Just about anything else can be done through an addendum, including reference points. [emphasis added]"[40]

That being the case, the current effort to initiate a new amendment to the management plan should be setting off red flags in stakeholders' and managers' minds.

The management plan's current goal is both simple and appropriate: "To perpetuate, through cooperative interstate fisheries management, migratory stocks of striped bass; to allow commercial and recreational fisheries consistent with the long-term maintenance of a broad age structure, a self-sustaining spawning stock; and also to provide for the restoration and maintenance of their essential habitat."[41]

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[40] Atlantic States Marine Fisheries Commission, *Proceedings of the Atlantic Striped Bass Management Board February 2019*, p. 17, available at http://www.asmfc.org/uploads/file/5cd5d83cAtlStripedBassBoardProceedingsFeb2019.pdf

[41] ASMFC, *Amendment 6*, p. iv

The most notable part of the goal is its commitment to "fisheries consistent with the long-term maintenance of a broad age structure," because such age structure is critically important to a stock that sees recruitment fluctuate widely from year to year, and which is dependent upon occasional and irregularly-timed large year classes to maintain a healthy abundance.[42]

Yet to maintain such a broad age structure, fishing mortality must be constrained. Higher levels of fishing mortality tend to sharply reduce the number of older, larger females in a population. Such situation creates serious risk to the long-term health of the striped bass stock, which may experience low recruitment levels for a number of consecutive years. In such a situation, where most of the older females have been removed from the spawning stock, and few young females are recruiting in to replace them, the stock can experience a serious decline in abundance that will be very difficult to reverse. It was just such a situation that led the striped bass stock to collapse in the 1970s.[43]

Ms. Nicole Lengyel, a member of the Technical Committee, advised the Management Board nearly two years ago that

> There is a tradeoff between preserving spawning stock biomass and allowing fishing. As we just heard, the Board has raised concern that the current biological reference points may be too conservative, for various biological, ecological, and socio-economic reasons, and may be restricting fishing unnecessarily. The current management objectives and acceptable risk levels were laid out in Amendment 6 to the striped bass [fishery management plan] back in 2003. The [Technical Committee] and [Stock Assessment Subcommittee] posed to the Board several questions. Is the Board satisfied with the current management objectives, and acceptable risk levels, as laid out in Amendment 6? Does the Board want to manage the stock to maximize yield, maximize catch rates, maximize the availability of trophy fish, and what is the acceptable level of risk when it comes to preventing stock collapse?[44]

Having experienced a striped bass stock collapse once, I can state with certainty that I don't want to experience the same thing again. I note that even under current management, striped bass abundance has fallen sharply, and suggest that increasing the level of risk to the long-term health of the stock, and so increasing the risk of a stock collapse, is an ill-advised action that should be avoided.

Thus, I ask that you oppose initiating a new amendment.

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[42] *See* Maryland Department of Natural Resources, Juvenile Striped Bass Survey, available at https://dnr.maryland.gov/fisheries/Pages/striped-bass/juvenile-index.aspx

[43] *See* Rago, Paul J., Richards, R. Anne, and Shepherd, Gary R., "Restoration of Atlantic Striped Bass Populations: 1985-1989," *A Chronicle of Striped Bass Population Restoration and Conservation in the Northwest Atlantic, 1989-2016,* National Marine Fisheries Service, September 2018, pp. 16-17

[44] Atlantic States Marine Fisheries Commission, Proceedings of the Atlantic Striped Bass Management Board October 2017, p. 9, available at http://www.asmfc.org/uploads/file/5a95db21AtlStripedBassBoardProceedings_Oct2017.pdf

While I realize that the motion to initiate such amendment lists a number of issues to be considered, in addition to addressing the goals and objectives of the management plan, I note Mr. Appelman's advice that all of those issues, other than the goals and objectives, can be addressed through an addendum process.

Thus, it appears that changing the goals and objectives of the plan, in a way that increases risk to the health of the stock, would be a likely result of a new amendment process.

Such a change would not be in the long-term interests of the striped bass, or of striped bass fishermen, and should be opposed.

Thank you for considering my views on these matters.

Sincerely,

Charles A. Witek, III

cc: Capt. John McMurray
Maureen Davidson
Max Appelman

Date: July 30, 2019

Comments to:
Atlantic States Marine Fisheries Commission,
– please distribute to Striped Bass Management Board for consideration

Subject: Restoration & Protection of Atlantic Striped Bass

To Whom It May Concern:
The Atlantic Striped Bass Management Board is currently considering actions to reduce total removals and restore the Striped Bass biomass to long-term sustainable levels. We submit these comments for your consideration and charts for reference.

With regard to Addendum VI, in broad terms the Management Board seeks to implement a plan to achieve a 17% reduction in total removals, with a 50% confidence level. With respect, we believe that given the variables and uncertainties of natural effects, stock assessment methods, and the lack of accountability and disregard for quotas that has been exhibited in segments of the recreational sector, a plan starting with a 50/50 chance of success is a plan that's near-certain to miss the mark.
We respectfully request the Management Board consider revising the proposed measures to increase the chance of success to 2-Sigma (94%) confidence measure and double the reduction percentage to 34%. Increasing the confidence and reduction levels will provide more statistically relevant measures in an uncertain environment. Considering the lack of success in past performance restoration efforts and poor compliance in various states, this approach will allow room for the inevitable variability in natural response, angler compliance, and assessment science.

With regard to the motion to Amend the Atlantic Striped Bass Fishery Management Plan, please consider tabling this motion. In the event an Amendment may be deemed appropriate by the Management Board, please postpone consideration of the Amendment process until three years after the Striped Bass stock has been assessed as fully recovered under the metrics in the existing plan, and various Addendum based on the recent 66th Stock Assessment Workshop.
In plain fact, the motion under consideration seeks to change well-established and proven metrics and to shift the baseline to favor a narrow constituency that has exhibited a flagrant and wholesale disregard for the management efforts of the ASMFC and its member states.

For your consideration, **we submit three charts:**
(Chart 1) includes a yearly account of recreational harvest, by state, for the years 2015 through 2018 as compared to the quotas set forth in Addendum IV to Amendment 6. All data from MRIP.
(Chart 2) uses the same MRIP data and ASMFC quotas as in Chart 1, with the yearly amounts aggregated to a 4-year total of harvest which is then compared to the Addendum IV quotas. In addition, the percentage of 'quota attained' over the four years by a particular state is included. Please note that based on these data, Maryland is exhibiting an egregious and flagrant disregard for the ASMFC quota. In fact, given the assessment data from the 66th SAW Report and year-class inventory data obtained from the Maryland DNR, it appears Maryland recreational anglers have decimated the 2011-year class before the majority of these young fish had an opportunity to spawn.

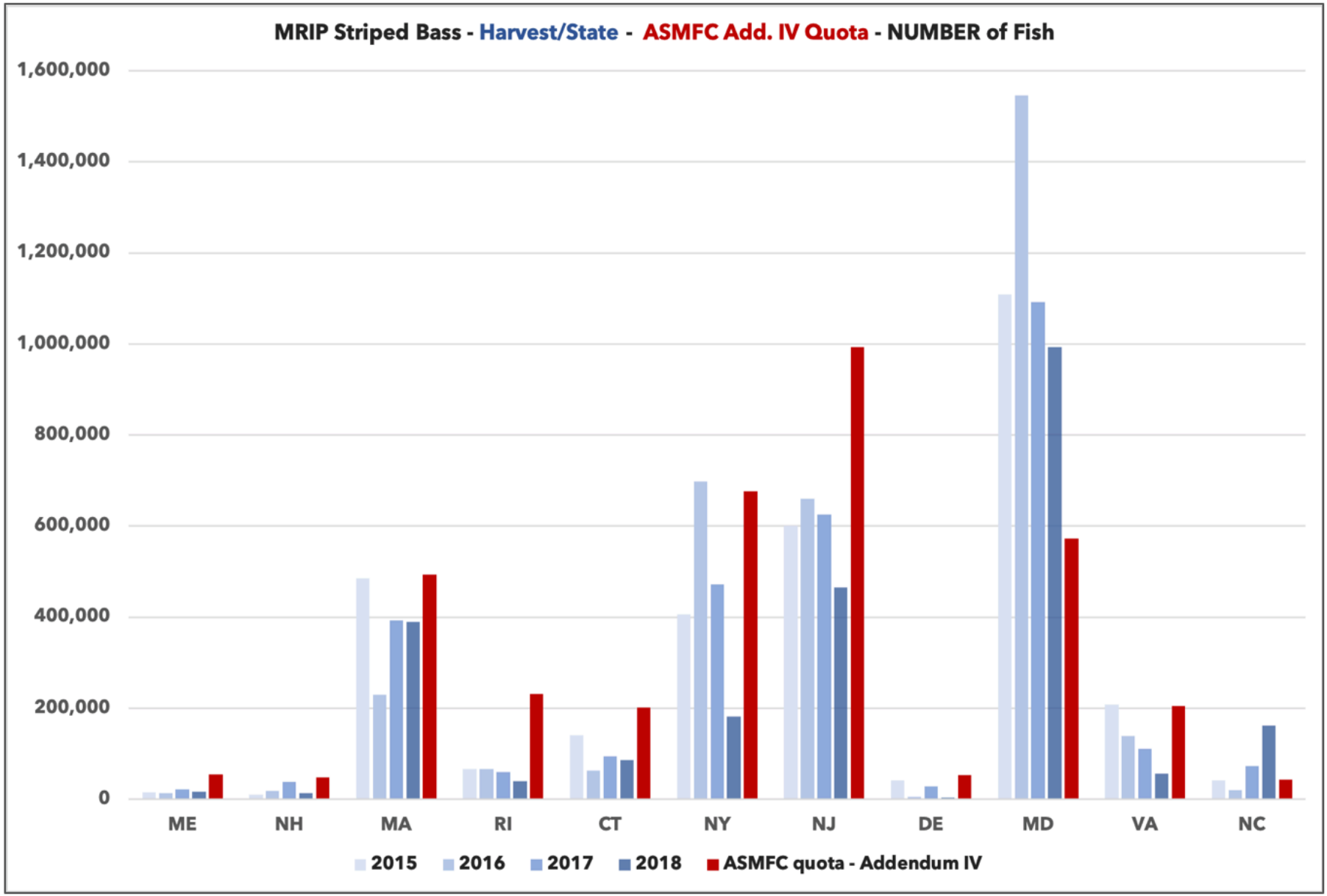
(Chart 3) displays data from the Maryland DNR Young of Year survey, plotted with yearly harvest data from Table B6:29 in the 66th SAW Striped Bass report. Note removals have increased substantially as recruitment shows a general decline over time, leading up to the recent overall decline in harvests. Given the low minimum size limit for Striped Bass in the Chesapeake Bay, the data readily shows Maryland recreational anglers are removing the 2011-year class as they age into the limits. The contemporary MRIP data also show the decline in MD harvests for the 2017 and 2018 seasons.

Based on these data, the increasing concentration of angler effort in the Chesapeake Bay, the willful disregard for science-based catch reductions and lack of enforcement by the State, Maryland is contributing an outsized proportion of damage to the stock overall. Coupled with the overall decline in ecosystem health in the areas critical to 70-90% of the overall Striped Bass recruitment effort, a viable case could be made to **initiate a moratorium on Striped Bass fishing in the Chesapeake until such time as the stock is able to rebuild itself.**

Sincerely,

Mark Eustis,
Managing Director.

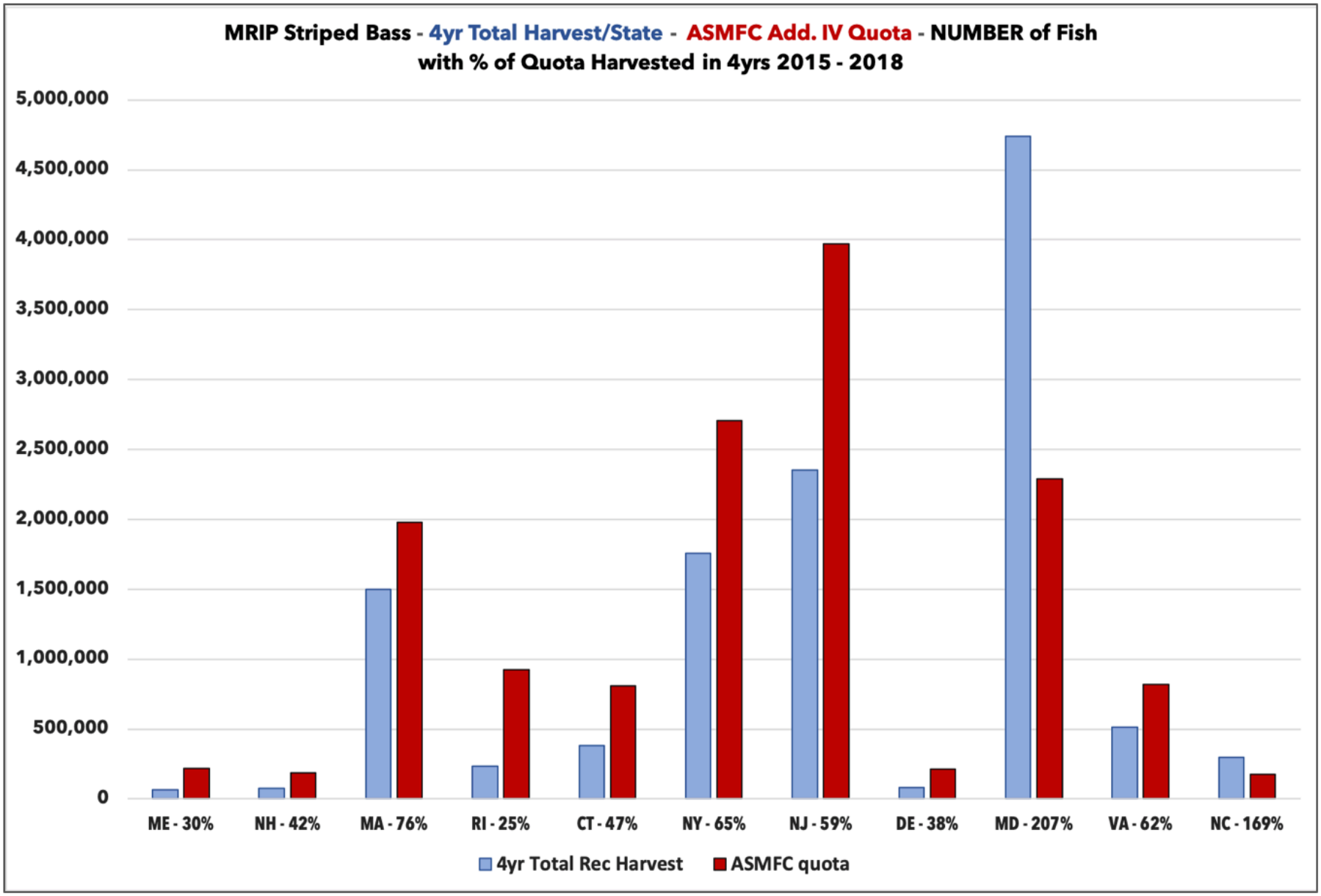
Chart 1



Statistical data (Numbers of Fish) from:
NOAA Fisheries Service, MRIP Catch Time Series Database
Quota information from:
ASMFC Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan

Compiled by Grey Owl Analytics

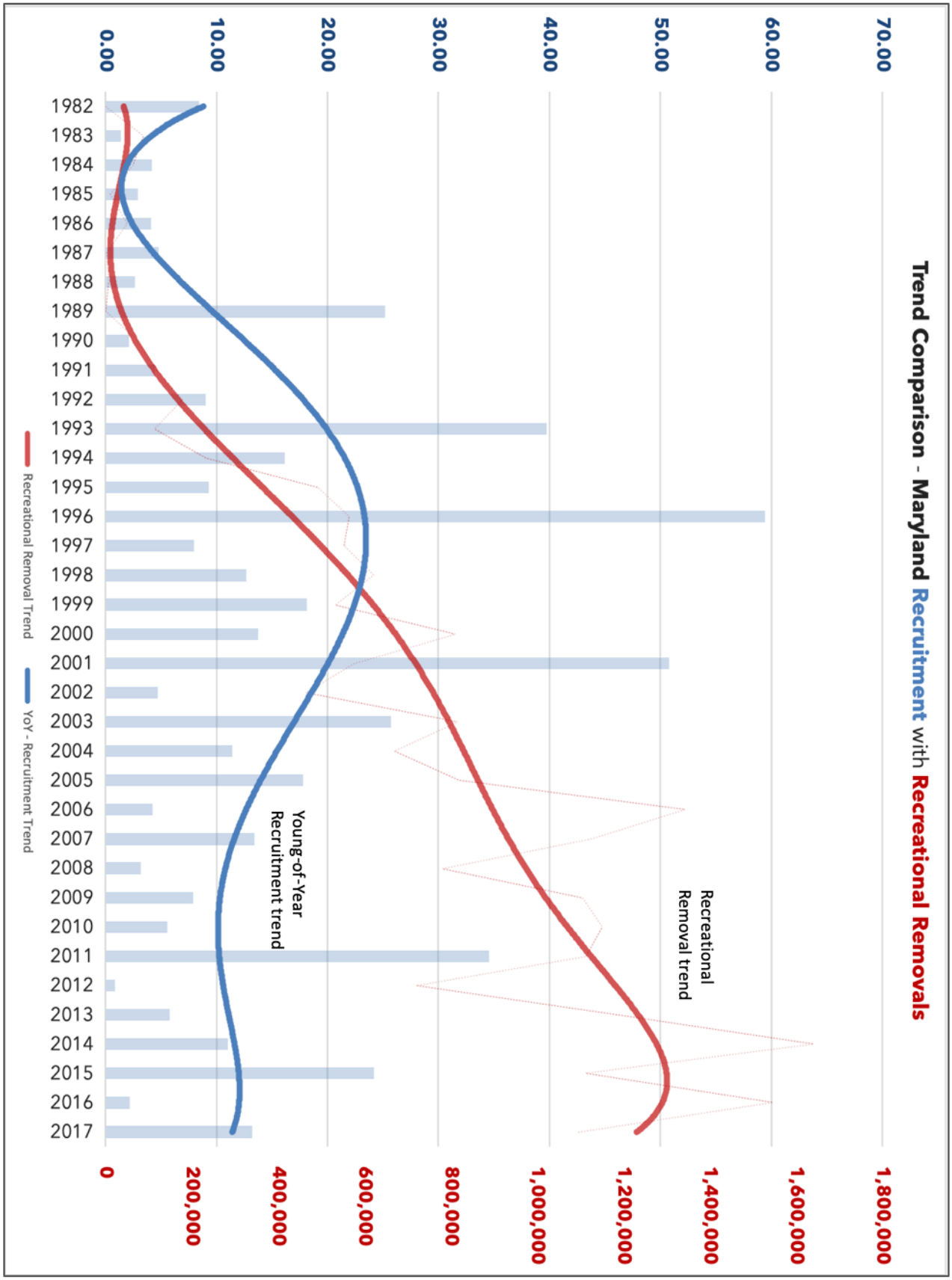
Chart 2



Statistical data (Numbers of Fish) from:
NOAA Fisheries Service, MRIP Catch Time Series Database
Quota information from:
ASMFC Addendum IV to Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan

Compiled by Grey Owl Analytics

Chart 3



Authoritative Data from:
Maryland DNR Fisheries, Young of Year study; ASMFC 2019 *Striped Bass Assessment - Table B6.29 - 66th SAW Final Report*

Compiled by Grey Owl Analytics

Atlantic States Marine Fisheries Commission

Wind Power Workshop for New England and Mid-Atlantic Commissioners and NOAA Fisheries

(Note: This Workshop is focused on wind energy activities in New England and the Mid-Atlantic, however, all Commissioners are welcome to participate.)

August 8, 2019
12:30 p.m. – 5:00 p.m.
Arlington, Virginia

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/Introductions (*J. Gilmore/M. Pentony*)	12:30 p.m.
2.	Public Comment	12:35 p.m.
3.	Fisheries and Wind Power Co-existence: Overview of Issues, Challenges, and Opportunities (*A. Lipsky*)	12:45 p.m.
4.	Presentation on NOAA Fisheries Role in Offshore Wind Activities (*M. Pentony*)	1:15 p.m.
5.	Questions and Discussion on Projects and Federal Role (*J. Gilmore/M. Pentony*)	1:45 p.m.
6.	Presentations on State Level Policy and Research Activities Associated with Offshore Wind Development • Massachusetts • Rhode Island • Connecticut • New York • New Jersey	2:05 p.m.
7.	Break	2:45 p.m.

The meeting will be held at the Westin Crystal City, 1800 S. Eads Street, Arlington, Virginia 22202; 703.486.1111

8. Fishing Industry Engagement in Research and Development (*A. Hawkins*) 2:55 p.m.
    - Responsible Offshore Development Alliance (RODA)
    - Responsible Offshore Science Alliance (ROSA)

9. Discussion on Coordination of State and Federal Activities 3:20 p.m.
    - Would Increased State Coordination Improve Engagement in Wind Power Development?
    - What is the Best Approach to Ensure State Coordination?
    - What is the Best Approach to Ensure State/Federal/Regional Council Coordination?
    - Is There a Role for ASMFC in State Coordination or State/Federal Coordination?

10. Other Business/Adjourn 4:45 p.m.