Atlantic States Marine Fisheries Commission

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Patrick C. Keliher (ME), Chair *Spud Woodward (GA), Vice-Chair* *Robert E. Beal, Executive Director*

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEMORANDUM

July 21, 2021

TO: Commissioners; Proxies; American Lobster Management Board; Atlantic Coastal Cooperative Statistics Program Coordinating Council; Atlantic Menhaden Management Board; Atlantic Striped Bass Management Board; Executive Committee; Interstate Fisheries Management Program Policy Board; Mid-Atlantic Fishery Management Council; Sciaenids Management Board; Summer Flounder, Scup, and Black Sea Bass Management Board; Tautog Management Board

FROM: Robert E. Beal REB
Executive Director

RE: ASMFC Summer Meeting Webinar: August 2-5, 2021

The Atlantic States Marine Fisheries Commission's Summer Meeting Webinar will be held August 2-5, 2021. Meeting materials are now available on the Commission website at http://www.asmfc.org/home/2021-summer-meeting-webinar. Supplemental materials will be posted to the website on Wednesday, July 28.

Board meeting proceedings will be broadcast daily via webinar beginning Monday, August 2 at 1:30 p.m. and continuing daily until the conclusion of the meeting (expected to be 3 p.m.) on Thursday, August 5. The webinar will allow registrants to listen to board deliberations and view presentations and motions as they occur. To register for the webinar go to https://attendee.gotowebinar.com/register/1268548762865393678 (Webinar ID: 606-517-315).

Each day, the webinar will begin 30 minutes prior to the start of the first meeting so that people can troubleshoot any connectivity or audio issues they may encounter. If you are having issues with the webinar (connecting to or audio related issues), please contact Chris Jacobs at 703.842.0790.

If you are joining the webinar but will not be using VoIP, you can may also call in at 415.655.0052. A PIN will be provided to you after joining the webinar; see webinar instructions for details on how to receive the PIN. For those who will not be joining the webinar but would like to listen in to the audio portion only, you can do so by dialing 415.655.0052 (access code: 904-450-431).

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

Enclosure: Public Comment Guidelines and Final Agenda

Atlantic States Marine Fisheries Commission

Summer Meeting Webinar

August 2-5, 2021

Public Comment Guidelines

To provide a fair opportunity for public input, the ISFMP Policy Board approved the following guidelines for use at management board meetings. **Please note these guidelines have been modified to adapt to meetings via webinar**:

For issues that are not on the agenda, management boards will continue to provide an opportunity to the public to bring matters of concern to the board's attention at the start of each board meeting. Board chairs will ask members of the public to raise their hands to let the chair know they would like to speak. Depending upon the number of commenters, the board chair will decide how to allocate the available time on the agenda (typically 10 minutes) to the number of people who want to speak.

For topics that are on the agenda, but have not gone out for public comment, board chairs will provide limited opportunity for comment, taking into account the time allotted on the agenda for the topic. Chairs will have flexibility in deciding how to allocate comment opportunities; this could include hearing one comment in favor and one in opposition until the chair is satisfied further 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 the webinar (July 12) will be included in the briefing materials.
2. Comments received by 5:00 PM on Tuesday, July 27 will be included in the supplemental materials.
3. Comments received by 10:00 AM on Friday, July 30 will be distributed electronically to Commissioners/Board members prior to the meeting.

Comments should be submitted via email at comments@asmfc.org. All comments must clearly indicate the commenter's expectation from the ASMFC staff regarding distribution.

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. It is our intent to begin at the scheduled start time for each meeting, however, if meetings run late the next meeting may start later than originally planned.

Monday, August 2

1:30 – 4:00 p.m. **American Lobster Management Board**
Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia
Other Members: NMFS
Chair: McKiernan
Other Participants: Reardon, Perry, Beal
Staff: Starks

1. Welcome/Call to Order *(D. McKiernan)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2021
3. Public Comment
4. Progress Report on Development of Draft Addendum XXVII on Gulf of Maine/Georges Bank Resiliency *(C. Starks)*
5. Review Work Group Report on Vessel Tracking Devices in Federal Lobster and Jonah Crab Fisheries *(C. Starks)* **Possible Action**
6. Review Jonah Crab Pre-assessment Report and Consider Initiation of a Stock Assessment *(D. Perry)* **Possible Action**
7. Consider Development of a Management Strategy Evaluation of the American Lobster Fisheries *(J. Kipp)* **Possible Action**
8. Other Business/Adjourn

4:15 – 5:15 p.m. **Atlantic Large Whale Take reduction Team (ALWTRT) Update** *(C. Coogan)*
NOAA Fisheries will provide an update on efforts to collect information for the ALWTRT to develop recommendations to modify the Atlantic Large Whale Take Reduction Plan to reduce risk to North Atlantic right whales in coastwide gillnet and Atlantic mixed species trap/pot fisheries and Mid-Atlantic lobster fisheries

Tuesday, August 3

9:00 a.m. – 12:30 p.m. **Atlantic Striped Bass Management Board**
Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina
Other Members: DC, NMFS, PRFC, USFWS
Chair: Borden
Other Participants: Sullivan, Blanchard, Hoffman
Staff: Franke

1. Welcome/Call to Order *(D. Borden)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from March and May 2021
3. Public Comment
4. Consider Fishery Management Plan Review and State Compliance for the 2020 Fishing Year *(E. Franke)* **Action**
5. Review Juvenile Abundance Index for the Albemarle Sound/Roanoke River
   - Technical Committee Report *(C. Hoffman)*
6. Progress Report for Draft Amendment 7
   - Plan Development Team (PDT) Report *(E. Franke)*
   - Provide Guidance to the PDT for Draft Amendment 7
7. Review Options for Addressing Commercial Quota Allocation in a Future Management Document *(E. Franke)* **Possible Action**
8. Review and Populate Advisory Panel Membership *(T. Berger)* **Action**
9. Other Business/Adjourn

12:30 – 1:30 p.m. **Lunch Break**

1:30 – 3:00 p.m. **Tautog Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia
Other Members: NMFS
Chair: Hyatt
Other Participants: Ares, Snellbaker
Staff: Rootes-Murdy

1. Welcome/Call to Order *(W. Hyatt)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from September 2020
3. Public Comment
4. Progress Report on 2021 Stock Assessment Update *(K. Drew)*
5. Review and Discuss Risk and Uncertainty Decision Tool for Tautog *(S. Murray)*
6. Consider Fishery Management Plan Review and State Compliance for the 2020 Fishing Year *(K. Rootes-Murdy)* **Action**
7. Review Implementation of Commercial Tagging Program *(K. Rootes-Murdy)*
8. Other Business/Adjourn

3:15 – 5:15 p.m. **Sciaenids Management Board**

Member States: New Jersey, Delaware, Maryland, Virginia, North Carolina South Carolina, Georgia, Florida
Other Members: NMFS, PRFC
Chair: Fegley
Other Participants: Franco, Giuliano, Paramore, Rickabaugh, Hodge
Staff: Lewis

1. Welcome/Call to Order *(L. Fegley)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from March 2021
3. Public Comment
4. Review Traffic Light Analysis (TLA) for Spot and Atlantic Croaker and Technical Committee Recommendations *(D. Franco, H. Rickabaugh)*
5. Review Technical Committee Recommendations for Black Drum TLA and Benchmark Stock Assessment *(H. Rickabaugh)* **Action**
6. Consider Atlantic Croaker and Red Drum Fishery Management Plan Reviews and State Compliance for 2020 Fishing Year *(S. Lewis)* **Action**
   - Consider State Implementation Plan from Florida for its Commercial Atlantic Croaker Fishery
7. Update on Red Drum Modeling Process and 2022 Simulation Stock Assessment *(J. Kipp)*
8. Other Business/Adjourn

Wednesday, August 4

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

(A portion of this meeting may be a closed session for Commissioners and Committee members only)
Members: Abbott, Anderson, Batsavage, Bell, Bowman, Burgess, Cimino, Clark, Davis, Gilmore, Keliher, Kuhn, McKiernan, McNamee, Miller, Patterson, Woodward
Chair: Keliher
Staff: Leach

1. Welcome/Call to Order *(P. Keliher)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Meeting Summary from May 2021
3. Public Comment
4. CARES "The Act" Update *(R. Beal)*
5. Report from the Administrative Oversight Committee *(S. Woodward)*
6. Discuss Annual Meeting Attendance and Future Meeting Formats *(R. Beal)*
7. Discuss Pending Shark Finning Legislation *(R. Beal)*
8. Other Business/Adjourn

10:15 a.m. – 12:15 p.m. **Summer Flounder, Scup, and Black Sea Bass Management Board Concurrent with the Mid-Atlantic Fishery Management Council**
Member States: New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina
Other Members: NMFS, PRFC
ASMFC Chair: Nowalsky
Other Participants: Wojcik, Snellbaker
Staff: Colson Leaning, Lewis

1. Welcome/Call to Order *(A. Nowalsky)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from February 2021
3. Public Comment
4. Consider ISFMP Policy Board Directive for Changes to Addendum XXXIII: Black Sea Bass Commercial Allocation **Final Action**
5. Consider Fishery Management Plan Reviews and State Compliance for the 2020 Fishing Year for Summer Flounder, Scup, and Black Sea Bass *(D. Colson Leaning/S. Lewis)* **Action**
6. Other Business/Adjourn

12:15 – 1:15 p.m. **Lunch Break**

1:15 – 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: Woodward
Other Participants: Newhard, Kersey, LaFrance
Staff: Rootes-Murdy

1. Welcome/Call to Order *(S. Woodward)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2021
3. Public Comment
4. Review Data Needs for Spatially Explicit Management of Atlantic Menhaden in the Chesapeake Bay *(J. Newhard)*
5. Review Work Group Report on Commercial Quota Re-allocation and Other Provisions of Amendment 3 *(R. LaFrance)*
6. Consider Initiation of Addendum on Commercial Fishery Measures *(K. Rootes-Murdy)* **Action**
7. Other Business/Adjourn

Thursday, August 5

9:00 – 10:30 a.m. **Wind Energy Development Workshop** *(A. Kipsky/P. Burns)*
Updates on the roles of NOAA Fisheries' Greater Atlantic Regional Fisheries Office and Northeast Fisheries Science Center in the offshore wind development process including data exchange, regulatory process, survey mitigation and research on interactions of offshore wind on NOAA trust resources

10:45 – 11:45 a.m. **Atlantic Coastal Cooperative Statistics Program Coordinating Council**
Partners: ASMFC, Connecticut, Delaware, District of Columbia, Florida, Georgia, MAFMC, Maine, Maryland, Massachusetts, NEFMC,
New Hampshire, New Jersey, New York, NMFS, North Carolina, Pennsylvania, PRFC, Rhode Island, SAFMC, South Carolina, USFWS, Virginia
Chair: Carmichael
Staff: White

1. Welcome/Call to Order *(J. Carmichael)*
2. Council Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2021
   - Approval of Program Update Document
3. Public Comment
4. Review ACCSP Funding Projections and 2022 Proposals Summary *(G. White)*
5. Accountability Subgroup Report *(J. Simpson)*
6. Discuss Atlantic Recreational Implementation Plan Priorities *(G. White)*
7. Other Business/Adjourn

11:45 a.m. – 12:15 p.m. **Lunch Break**

12:15 – 2:45 p.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
ASMFC Chair: Keliher
Other Participants: Cody
Staff: Kerns

1. Welcome/Call to Order *(P. Keliher)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from May 2021
3. Public Comment
4. Update on Marine Recreational Information Program (MRIP) *(R. Cody)*
   - 2020 Catch Estimate Methodology Review
   - MRIP Survey Data Standards and Future Presentation Changes
5. Reports from the Executive Committee and State Directors Meeting *(P. Keliher)*
6. Update on East Coast Climate Change Scenario Planning Initiative *(T. Kerns)*

7. Update on the Mid-Atlantic Fishery Management Council's Research Steering Committee to Evaluate Restarting the Research Set-Aside Program *(R. Beal)*
8. Committee Reports
   - Assessment Science Committee *(S. Murray)* **Action**
   - Habitat Committee *(L. Havel)*
   - Atlantic Coastal Fish Habitat Partnership *(L. Havel)*
9. Review Noncompliance Findings (if Necessary) **Action**
10. Other Business/Adjourn

2:45 – 3:00 p.m. **Business Session**

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

1. Welcome/Call to Order *(P. Keliher)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Proceedings from October 2020
3. Public Comment
4. Consider Approval of the Bluefish Allocation and Rebuilding Amendment **Final Action**
5. Consider Noncompliance Recommendations (if Necessary) **Final Action**
6. Other Business/Adjourn

MEETING OVERVIEW

American Lobster Management Board
May 3, 2021
1:30 p.m. – 4:00 p.m.
Webinar

Chair: Daniel McKiernan (MA) Assumed Chairmanship: 02/20	Technical Committee Chair: Kathleen Reardon (ME)	Law Enforcement Committee Representative: Rob Beal
Vice Chair: Dr. Jason McNamee	Advisory Panel Chair: Grant Moore (MA)	Previous Board Meeting: May 3, 2021
Voting Members: ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, NMFS, NEFMC (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 3, 2021

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

4. Progress Report on Development of Draft Addendum XXVII on Gulf of Maine/Georges Bank Resiliency (1:45-2:20 p.m.)

Background

- Addendum XXVII was initiated in 2017 to proactively increase resilience of the GOM/GBK stock but stalled due to the prioritization of Atlantic right whale issues. After accepting the 2020 Benchmark Stock Assessment for American lobster, the Board reinitiated work on the draft addendum in February 2021, with a focus on developing a trigger mechanism that would automatically implement management measures to improve the biological resiliency of the GOM/GBK stock if the trigger is reached. Since then the Plan Development Team (PDT) and Technical Committee (TC) have met a number of times to discuss the development of the addendum and analyze potential management options.
- The TC was tasked by the PDT to analyze possible changes to minimum and maximum gauge size for the management areas within the GOM/GBK stock. Due to competing TC workloads this analysis was delayed.
- The PDT has provided additional guidance on the structure of the management document, and is seeking additional guidance from the Board, with the intention of providing a draft addendum for consideration for public comment in October 2021. **(Briefing Materials)**.

Presentations

- Update on the Development of Draft Addendum XXVII by C. Starks

Board Actions for Consideration at the Meeting

- Provide guidance to PDT on draft management options

5. Review Workgroup Report on Vessel Tracking Devices in Federal Lobster and Jonah Crab Fisheries (2:20-2:50 p.m.) Possible Action

Background

- In May 2021, the Board discussed electronic vessel tracking in the federal lobster and Jonah crab fisheries. They received presentations from state partners on recent work that has expanded upon the Commission's 2020 pilot project on vessel tracking initiated through Addendum XXVI; these projects have tested additional tracking devices, integrated cell-based tracking with ACCSP's SAFIS eTRIPS mobile trip reporting application, and created trip viewers within SAFIS eTRIPS online.
- As in previous discussions, the Board emphasized the critical need for high-resolution spatial and temporal data to characterize effort in the federal lobster and Jonah crab fleet in order to address a number of challenges facing the fisheries, including Atlantic right whale risk reduction efforts, marine spatial planning discussions, and offshore enforcement.
- The Board formed technical work group including representatives from NOAA Fisheries, state and federal law enforcement, and members of the Board to develop objectives, technological solutions, and system characteristics for vessel tracking devices in the federal lobster and Jonah crab fisheries. The work group and technical staff from ASMFC, ACCSP and the states have met several times since the May meeting to develop recommendations for implementing tracking requirements in the federal fleet **(Supplemental Materials)**.

Presentations

- Work Group Report on Electronic Vessel Tracking Requirements by C. Starks

Board Actions for Consideration at the Meeting

- Initiate addendum to consider requiring electronic vessel tracking for federal lobster and Jonah crab vessels

6. Review Jonah Crab Pre-Assessment Report and Consider Initiation of a Stock Assessment (2:50-3:30 p.m.) Possible Action

Background

- The Board tasked the TC in August 2020 with conducting a pre-assessment workshop for Jonah crab and providing a report on available data and recommended assessment approaches. Webinars were held November 16-18, 2020, February 11, 2021, June 3, 2021, and June 29, 2021 to review and discuss available Jonah crab data sets, potential assessment approaches, and remaining data limitations. From these discussions the TC produced a Jonah Crab Pre-Assessment Data Workshop Report. The report includes descriptions of available data and limitations, assessment approaches, and research recommendations (**Briefing Materials**).

- The TC recommends moving forward with a stock assessment to be completed in 2023, consistent with current Northeast Region Coordinating Council and ASMFC assessment schedules (**Briefing Materials**).

Presentations

- Jonah Crab Pre-Assessment Data Workshop Report by D. Perry

Board Actions for Consideration at the Meeting

- Consider initiating a stock assessment for Jonah Crab

7. Consider Development of a Management Strategy Evaluation of the American Lobster Fisheries (3:30-4:00 p.m.) Possible Action

Background

- In May 2021 the Board reviewed TC recommendations on a Management Strategy Evaluation (MSE) for the lobster fishery. The TC recommended the Board pursue a two-phase MSE focused on the GOM/GBK stock, with the goal of providing short-term management guidance at the stock-wide scale while concurrently building the framework to expand the MSE to provide long-term, spatially-explicit management advice. As next steps, the TC recommended a formal process to develop management goals and objectives for the future of the lobster fishery, and forming a steering committee for additional scoping and work plan development **(Briefing Materials)**.
- The Board expressed interest in pursuing an MSE but postponed any action on development of an MSE until the August meeting in order prioritize work on Draft Addendum XXVII.

Presentations

- Review of MSE Options and TC recommendations by J. Kipp

Board Actions for Consideration at the Meeting

- Consider forming a steering committee to develop lobster management goals and objectives and an MSE work plan

8. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **American Lobster Management Board**

FROM: **Caitlin Starks, FMP Coordinator**

DATE: **July 28, 2021**

SUBJECT: **Recommendation for Implementing Requirements for Electronic Vessel Tracking for Federal Lobster and Jonah Crab Fleet**

Background

Over the last few years the American Lobster Management Board (Board) has continually expressed interest in implementing requirements to collect high resolution spatial and temporal effort data in the federal lobster and Jonah crab fisheries, and has supported efforts to investigate systems and technology for collecting these data. At its May 2021 meeting, the Board agreed to create a technical work group including representatives from NOAA Fisheries, state and federal law enforcement, and members of the Board to identify objectives, technological solutions, and system characteristics for vessel tracking devices in the federal lobster and Jonah crab fisheries. The work group, as well as technical staff from state and federal partners, has developed recommendations on implementing tracking requirements which are summarized below.

Board Action for Consideration

Based on discussions among state and federal representatives in the work group, as well as leadership at the Commission and NOAA Fisheries, the work group recommends the Board initiate an addendum to consider implementing electronic tracking requirements for federally permitted vessels in the lobster and Jonah crab fishery. Implementing fishery dependent tracking data collection under the authority of the Atlantic Coastal Fishery Cooperative Management Act provides the needed process and information collection and sharing flexibility that would not be allowed under the NOAA Fisheries Vessel Monitoring Systems. More specifically, operating under ACFCMA allows data to be stored directly to ACCSP, as opposed to federal VMS data which is first sent to OLE. This should provide greater access to the data by state fishery management agencies which often find it difficult to obtaining VMS data.

The work group recommends the addendum consider the following specifications to ensure the data collected meet the needs for stock assessment, protected species risk reduction efforts, offshore enforcement, and marine spatial planning discussions:

- Vessel track data should be reported at a minimum rate of one ping per minute for at least 90% of the fishing trip. This rate is necessary to distinguish lobster fishing activity from transiting activity, and allows the calculation of number of traps per trawl.
- Cellular tracking devices are the preferred technology over satellite systems. Testing of cellular devices has shown the devices are simple to install and cost significantly less

than satellite devices. Reporting data at the recommended rate of one ping per minute using a satellite device would incur prohibitive costs.

- Minimum technological standards defined by ACCSP and its partners should be observed for tracking devices to ensure data needs are consistently met, while providing flexibility for technology to evolve and improve. For example, devices should have power systems capable of running the device at the specified ping rate. Further, at a minimum, precision and accuracy requirements for VMS should be met by cellular tracking devices. Finally, tracking systems should allow for a distinction to be made between a tracker unit and a vessel/permit. This distinction is necessary so that if a tracker is reassigned to a new vessel or a vessel requires a replacement tracker data integrity and confidentiality will be maintained.

Objective of Electronic Vessel Tracking

The objective of implementing electronic tracking requirements is to collect high-resolution spatial and temporal data to characterize effort in the federal American lobster and Jonah crab fisheries for management and enforcement needs. These data will improve stock assessments, inform management decisions related to protected species and marine spatial planning, and enhance offshore enforcement.

A number of challenges the fishery is currently facing pose an acute need for electronic tracking in the offshore fishery. Enhanced spatial information on effort in federal waters is needed to address these issues, including:

- Stock assessment: Size composition data for lobster catch are generated by matching statistical area-specific total harvest data and biosampling data, as statistical area is currently the finest spatial resolution for harvest data. Preliminary work has indicated size composition varies at a finer spatial scale than statistical area. Improved spatial resolution of total harvest data from vessel tracking will improve size composition data used in the stock assessment models to ultimately estimate exploitation and reference abundance.
- Right whales and protected resources: The current models used to assess the location of vertical lines in the fishery and their associated risk to right whale could be significantly improved with data collected through vessel tracking. The recently released Biological Opinion outlines additional risk reductions in the US lobster fishery starting in 2025 and it is important to update this data and the associated risk reduction models ahead of this timeline.
- Marine Spatial Planning (including protected areas): It is critically important to record the footprint of the US lobster fishery as spatial allocation discussions occur as a result of emerging ocean uses such as aquaculture, marine protected areas, and offshore energy development. For example, in January 2021, President Biden issued an Executive Order on Tackling the Climate Crisis at Home and Abroad. Included in this Executive Order is a goal of protecting 30% of US waters by 2030. Given this goal, documentation of the US lobster fishery footprint is essential for consideration in future discussions and decisions.

- Offshore enforcement: It has long been recognized that enforcement efforts in the offshore federal lobster fishery need to be improved. As a result, there are ongoing efforts to enhance enforcement capabilities, including discussions around an offshore enforcement vessel capable of hauling and re-setting long trawls. However, even with an enforcement vessel, it can be hard to locate gear, particularly in LCMA 3. Vessel tracking could improve the efficiency and efficacy of offshore enforcement efforts by directing enforcement personnel to where gear is located.

Additional Considerations for Electronic Vessel Tracking Requirements

The work group highlighted some additional considerations that should be further discussed and addressed during the addendum development process. First, the Law Enforcement Committee should be consulted on several issues, including requirements for when tracking devices would need to remain active, dockside communication (i.e. should the device recognize when it is in port allowing for the ping rate to be automatically slowed), and tamper-proof features (i.e., affixing the device to the vessel). They also noted that additional discussion is needed to determine how tracking should be applied to the mobile gear fleet, as a different ping rate may be more appropriate for these vessels which already have VMS requirements. Additionally, technical staff from the states and ACCSP should draft data reporting, management, and dissemination processes and standards for vessel track data collected under the proposed requirements. Important data collection fields identified by the work group included the type of device, date/time, lat/long, horizontal accuracy of lat/long, and vessel ID. Lastly, the addendum should address a process to approve devices for use in the fishery.

Alongside these considerations, attention needs to be paid to the implementation timeline and budgetary implications. Launching a technological program like this will require significant lead time prior to implementation—likely at least one year. Additionally, there are budgetary and personnel considerations for all partners. Staff time will be needed for harvester support and data analysis. Finally, potential costs to industry for the devices and data plans will need to be communicated clearly.

Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

August 3, 2021
9:00 a.m. – 12:30 p.m.
Webinar

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 (*D. Borden*)	9:00 a.m.
2. Board Consent • Approval of Agenda • Approval of Proceedings from March 2021 and May 2021	9:00 a.m.
3. Public Comment	9:05 a.m.
4. Consider Fishery Management Plan Review and State Compliance for the 2020 Fishing Year *(E. Franke)* **Action**	9:15 a.m.
5. Review Juvenile Abundance Index for the Albemarle Sound/Roanoke River • Technical Committee Report *(C. Hoffman)*	10:00 a.m.
6. Progress Report for Draft Amendment 7 • Plan Development Team (PDT) Report *(E. Franke)* • Provide Guidance to the PDT for Draft Amendment 7	10:20 a.m.
7. Review Options for Addressing Commercial Quota Allocation in a Future Management Document *(E. Franke)* **Potential Action**	12:00 p.m.
8. Review and Populate Advisory Panel Membership *(T. Berger)* **Action**	12:25 p.m.
9. Other Business/Adjourn	12:30 p.m.

The meeting will be held via webinar, click here for details
Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEETING OVERVIEW

Atlantic Striped Bass Management Board
August 3, 2021
9:00 a.m. – 12:30 p.m.
Webinar

Chair: David Borden (RI) Assumed Chairmanship: 02/20	Technical Committee Chair: Kevin Sullivan (NH)	Law Enforcement Committee Rep: Kurt Blanchard (RI)
Vice Chair: Martin Gary (PRFC)	Advisory Panel Chair: Louis Bassano (NJ)	Previous Board Meeting: May 5, 2021
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from March 2021 and May 2021

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. Fishery Management Plan Review (9:15 – 10:00 a.m.) Action

Background

- State Compliance Reports were due on June 15, 2021.
- The Plan Review Team reviewed each state report and compiled the annual FMP Review.

Presentations

- Overview of the FMP Review Report by E. Franke **(Supplemental Materials)**

Board Actions for Consideration

- Accept 2020 FMP Review and State Compliance Report.

5. Review Juvenile Abundance Index for Albemarle Sound/Roanoke River (10:00 – 10:20 a.m.)

Background

- The juvenile abundance index (JAI) for the Albemarle Sound/Roanoke River (A-R) in North Carolina showed recruitment failure for three consecutive years (2018, 2019, 2020), which tripped the recruitment-based management trigger established through Amendment 6.
- The Technical Committee (TC) met on July 15, 2021 to review potential factors contributing to A-R recruitment declines and consider recommending action to the Management Board if appropriate **(Supplemental Materials).**
- Considering North Carolina's recent management action to reduce striped bass total allowable landings and analysis of the relationship between river flow and striped bass recruitment, the TC recommends no action by the Board at this time.

Presentations

- TC Report by C. Hoffman

6. Progress Report for Draft Amendment 7 (10:20 a.m. – 12:00 p.m.)

Background

- The status and understanding of the striped bass stock and fishery has changed considerably since implementation of Amendment 6 in 2003, which has raised concerns that the existing management program may no longer reflect current fishery needs and priorities.
- Accordingly, the Board initiated development of Draft Amendment 7 to consider addressing a number of important issues that have been facing striped bass management for a long time.
- In May 2021, the Board approved the following four issues for development in Draft Amendment 7: recreational release mortality, conservation equivalency, management triggers, and measures to protect the 2015 year class.
- The Plan Development Team (PDT) and the TC met multiple times between May and July 2021 and are requesting specific guidance from the Board on the type of options that should be further developed for some of the issues **(Briefing Materials).**
- Board guidance at this time is important to ensure the draft options and analyses meet the Board's intent and objectives for this amendment.

Presentations

- PDT Report by E. Franke

Board Actions for Consideration

- Provide Guidance to the PDT for Draft Amendment 7.

7. Review Options for Addressing Commercial Quota Allocation (12:00 – 12:25 p.m.) Potential Action

Background

- In May 2021, the motion to include the commercial quota allocation issue in Draft Amendment 7 failed for lack of a majority. Many Board members recognized that Delaware has raised this issue for some time and Delaware has been asking for a more equitable allocation. In addition there were some individuals that expressed an interest in reviewing more recent data to consider in the allocations.

- Although many Board members recognized these concerns, some Board members noted the Draft Amendment process is not the right time to address this because allocation discussions could make the process significantly longer and more complex. Some Board members suggested addressing quota allocation in a separate management document after Amendment 7 is complete.
- The Board Chair requested staff from the Commission and the State of Delaware prepare options and timelines for how this issue could be addressed moving forward **(Supplemental Materials).**

Presentations

- Overview of options by E. Franke

Board Actions for Consideration

- Consider options for addressing commercial quota allocation in a future management document.

8. Review and Populate Advisory Panel Membership (12:25 – 12:30 p.m.) Action

Background

- There are two new nominations to the Atlantic Striped Bass Advisory Panel – Chris Dollar, an outdoor columnist and fishing guide from Maryland; and Charles Green, a for-hire captain from Maryland **(Supplemental Materials).**

Presentations

- Nominations by T. Berger

Board Actions for Consideration

- Approve Atlantic Striped Bass Advisory Panel nominations.

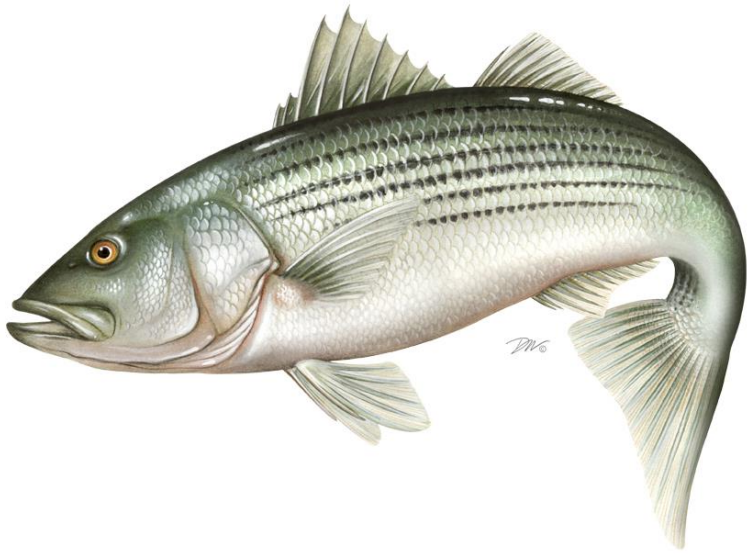
9. Other Business/Adjourn (12:30 p.m.)

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC STRIPED BASS
(Morone saxatilis)

2020 FISHING YEAR



Prepared by the Plan Review Team

Draft for Board Review – July 27, 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Table of Contents

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, Addendum VI -2019
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

[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.

size limit can be less than 18 inches under Amendment 6. The same minimum size standards regulate 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.

Five 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 was triggered 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, and changed commercial and recreational measures to reduce F to a level at or below the new target. Chesapeake Bay fisheries were required to implement lower reductions than coastal states (20.5% compared to 25%) since their fisheries were reduced by 14% in 2013 based on their management program. The addendum maintained 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.

Addendum VI was initiated in response to the 2018 benchmark assessment which indicates the stock is overfished and experiencing overfishing[4]. Approved in October 2019, the Addendum aims to reduce total removals by 18% relative to 2017 levels in order to achieve F target in 2020. Specifically, the Addendum reduces all state commercial quotas by 18%, and implements a 1 fish bag limit and a 28"to less than 35" slot limit for ocean fisheries and a 1 fish bag limit and an 18" minimum size limit in Chesapeake Bay to reduce total recreational removals by 18% in both regions. The Addendum's

[4] In February 2017, the Board initiated 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.

measures are designed to apply the needed reductions proportionally to both the commercial and recreational sectors, although states were permitted to submit alternative regulations through conservation equivalency that achieve an 18% reduction in total removals statewide. The Board reviewed and approved management options for 2020 on a state-by-state basis in February, and all states promulgated regulations by April 1.

Addendum VI also requires the mandatory use of circle hooks when fishing with bait to reduce release mortality in recreational striped bass fisheries. States are encouraged to promote the use of circle hooks through various public outreach and education platforms to garner support and compliance with this important conservation measure. In October 2020, the Board approved state implementation plans for circle hook requirements, with the caveat that no exemptions to Addendum VI mandatory circle hook requirements will be permitted. Circle hook regulations were required to be implemented no later than January 1, 2021. In March 2021[5], the Board approved a clarification on the definition of bait and methods of fishing[6] that require circle hooks, which must be implemented by states as part of Addendum VI compliance. Per Commission standards, states can implement more restrictive measures. The Board also approved guidance[7] on how to address incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. This guidance is not a compliance criterion since incidental catch was not originally part of Addendum VI.

Under Development: Draft Amendment 7

In August 2020, the Board initiated development of Amendment 7 to the FMP. The purpose of the amendment is to update the management program in order to reflect current fishery needs and priorities given the status and understanding of the resource and fishery has changed considerably since implementation of Amendment 6 in 2003. The Board intends for the amendment to build upon the Addendum VI action to end overfishing and initiate rebuilding. In February 2021, the Board approved for public comment the Public Information Document (PID) for Draft Amendment 7. As the first step in the amendment process, the PID was a broad scoping document seeking public input on a number of important issues facing striped bass management. After the PID public comment period that included 11 virtual public hearings and more than 3,000 submitted comments, the Board approved in May 2021 the following issues for development in Draft Amendment 7: recreational release mortality, conservation equivalency, management triggers, and measures to protect the 2015 year class. The Plan Development Team (PDT) is currently developing options for these four issues for inclusion in a draft amendment document. The Board will meet in August 2021 to review the PDT's progress on the Draft Amendment and recommend any further changes to the document. Based on progress made on the Draft Amendment, the Board's next opportunity to meet and consider possible approval of the document for public comment will be in October 2021.

[5] See the March 2021 meeting summary for more details.

[6] Definition of Bait and Methods of Fishing: Circle hooks are required when fishing for striped bass with bait, which is defined as any marine or aquatic organism live or dead, whole or parts thereof. This shall not apply to any artificial lure with bait attached.

[7] Guidance on Incidental Catch: Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.

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 (NEFSC 2018a). 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 (NEFSC 2018b). 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 2020, total Atlantic striped bass removals (commercial and recreational, including harvest, commercial discards and recreational release mortality) was estimated at 5.1 million fish, which is a 7% decrease relative to 2019 (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 FMP Review reports published prior to 2019.

The commercial fishery harvested 3.39 million pounds (531,240 fish) in 2020, which is a 20% decrease by weight relative to 2019 (19% decrease by number; Table 4; Table 5). This decrease aligns with the 18% reduction in commercial quotas implemented through Addendum VI in 2020, although some states implemented a different level of reduction in their commercial quotas through approved state conservation equivalency plans. The ocean quota utilization was about the same in 2020 (53%) as in 2019 (51%), while the Chesapeake Bay quota utilization decreased to 71% in 2020 from 89% in 2019. Despite the coastwide decrease in commercial harvest, ocean fishery conditions for some states may have improved from 2019 to 2020, which could be attributed to the increased availability of year classes moving through certain areas. The impacts of COVID-19 on the striped bass commercial fishery likely varied among states and varied depending on timing within the season. Some states heard from industry that restaurant closures and low prices had negative impacts on the commercial season, particularly during the early part of the pandemic.

Commercial harvest from Chesapeake Bay accounted for 62% of the total commercial harvest by weight; Maryland landed 35%, Virginia landed 20%, and NY landed 14% (Table 5; Figure 6). Additional harvest came from PRFC (12%), Massachusetts (11%), Delaware (4%), and Rhode Island (3%). The proportion of commercial harvest coming from Chesapeake Bay is much higher in numbers of fish; roughly 84% in 2020 (Table 6). This is because fish harvested in Chesapeake Bay have a lower average weight than fish harvested in ocean fisheries. Coastwide commercial dead discards were estimated at 65,319[8] fish, which accounts for <2% of total removals in 2020 (Table 3).

Total recreational catch (harvest and live releases) was estimated at 32.4 million fish in 2020, which is a 5% increase from 2019 (Table 7). Total recreational harvest (A+B1) in 2020 is estimated at 1.71 million fish (14.8 million pounds), and represents a 21% decrease relative to 2019 (37% decrease by weight) (Table 8; Table 9). Maryland landed the largest proportion of recreational harvest in number of fish[9] (43%), followed by New Jersey (30%), New York (12%), and Massachusetts (4%), and Connecticut (4%) (Table 9). The proportion of recreational harvest in numbers from Chesapeake Bay was estimated at 46% in 2020, compared to 38% in 2019.

[8] Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added.

[9] By weight, New Jersey had the largest proportion of harvest (44%), followed by Maryland (23%), New York (15%), Connecticut (6%), and Massachusetts (5%) (Table 8).

The vast majority 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 fish that are released alive die as a result of being caught. In 2020, recreational anglers caught and released an estimated 30.7 million fish, of which 2.8 million are assumed to have died (Table 7). This represents a 7% increase relative to 2019.

The PRT noted that the ocean and Chesapeake Bay regions had different levels of recreational harvest reductions in 2020. The ocean region saw a 31% decrease in recreational harvest in numbers of fish, while the Bay experienced only a 3% decrease compared to 2019 (Table 7). According to MRIP, the overall number of trips directed at striped bass (primary and secondary target) were similar from 2019 to 2020 (~2% increase) on a coastwide scale (Table 11). However, the Chesapeake Bay fishery experienced a 36% increase in targeted trips (711,535 more trips) from 2019 to 2020. The number of targeted trips in the Chesapeake Bay in 2020 was similar to the number in 2017 and 2018. The PRT noted that COVID-19 may have impacted recreational sectors differently in 2020. For-hire trips may have been limited due to restrictions on the number of people permitted on vessels; however, anecdotally, shore and private trips may have increased. It is important to recognize that impacts from COVID-19 were likely not uniform across states or sectors.

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 River (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 small mesh gill net attendance requirements, single barbless hook requirements in some areas, minimum size limits, and a no-harvest slot limit in the Roanoke River to maintain a sustainable harvest and reduce regulatory discard mortality in all sectors. 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 stock assessment a forward-projecting fully-integrated, age-structured statistical model to estimate population parameters and reference points for the A-R striped bass stock for 1991-2017. The model was peer reviewed by an outside panel of experts and approved for management use

by the Board in May 2021. The A-R stock is managed using reference points for female spawning stock biomass (SSB) and fishing mortality (F) with threshold values based on 35% spawning potential ratio and target values based on 45% spawning potential ratio. The 2020 assessment estimated female SSB in 2017 (terminal year) was 78,576 pounds (35.6 metric tons), which is below the SSB threshold of 267,390 pounds (121 metric tons). The assessment estimated *F* in 2017 was 0.27, which is above the F threshold of 0.18. These results show that the stock is overfished and overfishing is occurring.

	Target	***Threshold***	***Terminal Year (2017) Estimate***
Female SSB	350,371 lbs.	267,390 lbs.	78,576 lbs.
Fishing Mortality (F)	0.13	0.18	0.27

Based on the assessment results, North Carolina implemented a 2020 Revision to Amendment 1 that lowers the annual TAL for Albemarle Sound and Roanoke River management areas for 2021 and 2022 in order to reduce F to the target level. The new TAL is 51,216 pounds, which is a 57% reduction from 2017 landings (NCDMF 2020).

Albemarle Sound and Roanoke River Atlantic Striped Bass Fisheries

In 2020, total commercial and recreational harvest in the Albemarle Sound Management Area (ASMA) and the Roanoke River Management Area (RRMA) was 167,161 pounds (40,090 fish). Commercial harvest in the ASMA was 124,385 pounds (26,900 fish). Recreational harvest in the ASMA was 25,450 pounds (7,656 fish), and recreational harvest in the RRMA was 17,326 pounds (5,534 fish). However, due to COVID-19 restrictions, the recreational creel survey in the ASMA ended March 27 instead of April 30 and the creel survey in the RRMA ended March 18 instead of ending in Mid-May. No attempt was made to develop harvest or release estimates for the remainder of the season in either management area.

V. Status of Research and Monitoring

Amendment 6 and its Addenda I-VI set the regulatory and monitoring measures for the coastwide striped bass fishery in 2020. 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 surveys 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 2020, the ocean commercial quota was 2,411,154 pounds and was not exceeded. Table 10 contains final 2020 quotas per Addendum VI and approved conservation equivalency programs and harvest that occurred in 2020.

Chesapeake Bay Commercial Quota

In 2020, the Chesapeake Bay-wide quota was 2,998,374 pounds and was allocated to Maryland, the PRFC, and Virginia based on historical harvest. In 2020, the Bay-wide quota was not exceeded. Table 10 contains jurisdiction-specific quotas and harvest that occurred in 2020 for Chesapeake Bay [10]. In 2020, commercial harvest from Chesapeake Bay accounted for 62% of total commercial landings by weight, and averaged 61% annually under Addendum IV (2015-2019).

Chesapeake Bay Spring Harvest of Migrant Striped Bass

Historically, recreational fishermen in 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. The Commonwealth of Virginia closed the spring trophy season beginning in 2019.

The 2020 estimate of migrant fish harvested during the Maryland trophy season was 6,947 fish (1,395 fish by charter boats; 5,552 fish by private anglers), which is a 49% decrease compared to 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 2018b). 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). Virginia harvest in wave-1 is estimated for stock assessment via the ratio of landings and tag returns in wave-6 and regression analysis (refer to the methods described in NEFSC 2018a 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 recreational striped bass harvest during wave-1

[10] Maryland indicated that due to COVID-19, an internal audit of 2020 commercial landings has not been completed, therefore, landings are considered preliminary. Any changes to the final estimate will be reported to ASMFC.

in the ocean for 2012-2020, and Virginia has reported zero ocean harvest for six of the last seven years. Similarly, North Carolina's 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 and the Striped Bass Technical Committee (TC) annually review 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 TC to the Management Board.

For the 2021 review of JAIs, the analysis evaluates the 2018, 2019, and 2020 JAI values. One state (North Carolina) met the criteria for recruitment failure in 2020 (Figure 8). North Carolina's JAI values for 2018 (0.40), 2019 (1.20), and 2020 (0.02) were below its respective Q1 (1.33). Maine's JAI was below its respective Q1 value in 2019 and 2020 and Maryland's JAI value was below its respective Q1 value in 2020. Although New York's JAI value was below its respective Q1 in 2019, its value in 2020 was almost double its long-term average. Virginia's JAI value in 2020 was also above its respective long-term average (Figure 8). New Jersey was unable to conduct its juvenile abundance survey due to COVID-19 so a 2020 JAI value for New Jersey is not available.

The 2020 assessment for the A-R stock recognized the declining recruitment trend and noted that harvest does not appear to be the only factor contributing to the decline (Lee et al. 2020). The assessment's peer reviewers identified other factors, specifically flow conditions and predation by blue catfish, which could be impacting recruitment. The TC met in July 2021 to review potential factors contributing to A-R recruitment declines and to consider recommending action to the Management Board. Considering North Carolina's recent management action to reduce striped bass total allowable landings for the Albemarle Sound and Roanoke River management areas (NCDMF 2020) as well as ongoing monitoring and analysis of river flow impacts on recruitment, the TC recommended no action by the Board at this time.

Addendum III: Commercial Fish Tagging Program

Addendum III to Amendment 6 includes compliance requirements for monitoring commercial fishery harvest tagging programs. In 2020, all states implemented commercial tagging programs consistent with the requirements of Addendum III. Table 17 describes commercial tagging programs by state. The PRT notes that in multiple states, only about half, or less than half in some cases, of issued commercial tags were reported used. The PRT emphasizes the importance of tag accounting to account for unused tags at the end of each fishing year. In Maryland, although unused tags are normally required to be returned in order for an audit to be conducted, this was not possible due to COVID-19. Maryland noted this audit may be revisited as conditions allow. Maryland reported 250,736 tags used out of 497,820

issued. The PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to regularly follow-up with all states on tag accounting and other questions about state commercial tagging programs as needed.

Addendum VI: 18% Reduction in Removals

2020 was the first implementation year of Addendum VI, which implemented measures to reduce total striped bass removals by 18% relative to 2017 levels in order to achieve the fishing mortality target in 2020. Tables 12a-12c list total removals (harvest plus discards/release mortality for commercial and recreational) in numbers of fish for 2017 and 2020. In 2020, a 28% reduction in total removals coastwide (numbers of fish) was realized relative to total removals coastwide in 2017. For the ocean region, a 33% reduction in total removals (numbers of fish) was realized relative to 2017 removals. For the Chesapeake Bay, a 20% reduction in total removals (numbers of fish) was realized relative to 2017 removals.

Tables 13 and 14 list the realized change for recreational removals (in numbers of fish) and commercial harvest (in pounds) by state from 2017 to 2020. Table 13 also includes the predicted reduction in recreational removals from state conservation equivalency plans, where applicable. The PRT notes that differences in performance are influenced by many factors, including changes in effort, fish availability/year classes, and environmental factors. The TC has discussed the challenge of trying to evaluate performance since the effects of different management measures cannot be isolated from the effects of effort changes and fish availability. There is a lot of year-to-year variability even under consistent regulations due to different year classes moving through the stock and variability in effort and angler behavior. During the TC's review of Addendum VI conservation equivalency proposals, the TC noted there is a high level of uncertainty in the percent reductions calculated due to the effect of changes in angler behavior (effort) and the size structure and distribution of the population (availability of legal and sub-legal fish), and these changes are difficult to account for and cannot be accurately quantified.

Note on 2020 MRIP Data

The component of the Marine Recreational Information Program (MRIP) that samples dockside catch rate data (Access Point Angler Intercept Survey - APAIS) was interrupted by the pandemic. Due to this interruption, catch rate data were imputed as needed from 2018 and 2019 to generate total catch estimates in 2020. The contribution of imputed data for Atlantic striped bass recreational harvest and release estimates by state ranged from 0-100% (Table 15).

Addendum VI: Circle Hook Requirement

Addendum VI circle hook regulations were required to be implemented by the states in January 2021. In March 2021, the Board approved a clarification on the definition of bait and methods of fishing that require circle hooks, which must be implemented by states as part of Addendum VI compliance. The PRT notes differences among the definitions of bait implemented by the states (Table 16) with some definitions being more restrictive than the Board-approved definition. A few states have not defined bait, which could be considered more restrictive (per Commission standards, states can implement more restrictive measures). Additionally, some state regulations are more restrictive by not specifying any exemptions, as compared to the Board-approved exemption for bait on artificial lures.

In March 2021, the Board also approved guidance on how to address incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. Although this guidance is not a compliance criterion since incidental catch was not originally part of Addendum VI, several states have already implemented this guidance (Table 16).

The PRT notes that New Jersey's rule to implement the circle hook requirements has been delayed in the regulatory process and is expected to be fully implemented by October 4, 2021. New Jersey was unable to implement the circle hook requirement through the timelier Notice of Administrative Change (NOAC) process, which is typically used to maintain compliance with FMPs, because recreational gear modifications are not authorized to be completed through the NOAC process. Therefore, New Jersey added the circle hook requirement to an existing rulemaking proposal that was published in the NJ Register on March 1, 2021 for a public comment period that ended April 30, 2021. The rulemaking adoption formally launched Friday, July 9, 2021 and includes 30 review days for each the NJDEP Commissioner and the Governor's Office, and projects a target filing date of September 10, 2021, in the NJ Register, with a final adoption upon publication on October 4, 2021.

Law Enforcement Reporting

States are asked to report and summarize law enforcement cases that occurred the previous season in annual compliance reports. In 2020, 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. Plan Review Team Comments and Recommendations

- Based on annual state compliance reports (ASMFC 2021), the PRT determined that all states in 2020 implemented a management and monitoring program consistent with the provisions of Amendment 6 and Addenda I – VI, with one inconsistency noted below.
- As identified in last year's FMP Review (ASMFC 2020), the PRT notes one inconsistency with 2020 implementation of the Addendum VI slot limit. New York's recreational regulations for 2020 (and for 2021) state a slot limit of "*28" to 35" TL*". This does not explicitly indicate whether the upper limit is inclusive or not.
- The PRT notes that Maryland's 2021 summer closure period (no targeting July 16-31) is different from their approved 2020 summer closure period (no targeting August 16-31).
- A summary of 2020 fishery regulations by state is provided in Table 1 and Table 2. Each state's commercial tag monitoring program is described in Table 17, and state compliance with fishery-independent and –dependent monitoring requirements are summarized in Table 18.
- As described in the commercial tagging section, the PRT notes that in multiple states, only half or less than half of issued commercial tags were reported used. The PRT emphasizes the importance of tag accounting to account for unused tags at the end of each fishing year. In Maryland, although unused tags are normally required to be returned in order for an audit to be conducted, this was not possible due to COVID-19. Maryland noted this audit may be revisited as conditions allow. Maryland reported 250,736 tags used out of 497,820 issued. The

PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to regularly follow-up with all states on tag accounting and other questions about state commercial tagging programs as needed.

- As described in the Addendum VI section, the PRT notes the following about the circle hook requirements implemented in 2021:
    - There are differences among the definitions of bait implemented by the states (Table 16), with some more restrictive than others.
    - Several states have implemented the guidance on incidental catch, which is not a compliance criterion since incidental catch was not originally part of Addendum VI.
    - New Jersey's rule for the circle hook requirements has been delayed in the regulatory process and is expected to be fully implemented by October 4, 2021.
- The PRT notes that while the New York spawning stock monitoring program in the Hudson River does meet the FMP's fishery-independent monitoring requirements, 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.
- Finally, the PRT notes that many fishery monitoring efforts in 2020 have been impacted due to the COVID-19 pandemic, including fishery-independent surveys, APAIS interviews, and sampling of commercial and recreational catch. Table 16 notes which 2020 programs were impacted by COVID-19, as identified by state compliance reports. The PRT recognizes that these impacts may continue into 2021 for some monitoring programs.

VIII. Research Recommendations

Research recommendations were developed by the 2018 Benchmark Stock Assessment Subcommittee and the 66th SARC and are listed in the final stock assessment report starting on report page 569.

IX. References

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X. Tables

Table 1. Summary of Atlantic striped bass commercial regulations in 2020. Source: 2021 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 (TL) and TRIP LIMITS	SEASONAL QUOTA	OPEN SEASON
ME	Commercial fishing prohibited		
NH	Commercial fishing prohibited		
MA	≥35" minimum size; no gaffing undersized fish. 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit.	735,240 lbs. Hook & Line only.	6.24 until quota reached, Mondays and Wednesdays only. (In-season adjustment added Tuesdays effective Sept 1.) July 3rd, July 4th and Labor Day closed. Cape Cod Canal closed to commercial striped bass fishing.
RI	Floating fish trap: 26" minimum size unlimited possession limit until 70% of quota reached, then 500 lbs. per licensee per day	Total: 148,889 lbs., split 39:61 between the trap and general category. Gill netting prohibited.	4.1 – 12.31
	General category (mostly rod & reel): 34" min. 5 fish/vessel/day limit.		5.20-6.30, 7.1-12.31, or until quota reached. Closed Fridays, Saturdays, and Sundays during both seasons.
CT	Commercial fishing prohibited; bonus program in CT suspended indefinitely in 2020.		
NY	26"-38" size; (Hudson River closed to commercial harvest)	640,718 lbs. 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" to <28" slot size	215,912 lbs.	5.15 – 12.31 (permit required)
PA	Commercial fishing prohibited		
DE	Gill Net: 20" min in DE Bay/River during spring season. 28" in all other waters/seasons.	Gillnet: 135,350 lbs. No fixed nets in DE River.	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 trip limit.
	Hook and Line: 28" min	Hook and line: 7,124 lbs.	Hook and Line: 4.1–12.31, 200 lbs./day trip limit

(Table 1 continued – Summary of commercial regulations in 2020).

STATE	SIZE LIMITS (TL) and TRIP LIMITS	SEASONAL QUOTA	OPEN SEASON
MD	Chesapeake Bay and Rivers: 18–36” Common pool trip limits: Hook and Line - 250 lbs./license/week Gill Net - 300 lbs./license/week	1,445,394 lbs. (part of Bay-wide quota) – Initial quota 1,442,120 lbs. – Adjusted quota due to 2019 overage	Bay Pound Net: 6.1-12.31 Bay Haul Seine: 6.1-12.31 Bay Hook & Line: 6.4-12.31 Bay Drift Gill Net: 1.1-2.28, 12.1-12.31
	Ocean: 24” minimum	Ocean: 89,094 lbs.	1.1-5.31, 10.1-12.31
PRFC	18” min all year; 36” max 2.15–3.25	572,861 lbs. (part of Bay-wide quota)	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, 11.9-12.31 Misc. Gear: 2.15-3.25, 6.1-12.15
VA	Bay and Rivers: 18” min; 28” max size limit 3.15–6.15	983,393 lbs. (part of Bay-wide quota)	1.16-12.31
	Ocean: 28” min	125,034 lbs.	
NC	Ocean: 28” min	295,495 lbs. (split between gear types).	Seine fishery was not opened Gill net fishery was not opened Trawl fishery was not opened

Table 2. Summary of Atlantic striped bass recreational regulations in 2020. Source: 2021 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

STATE	SIZE LIMITS (TL)/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
ME	≥ 28" and <35"	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 C&R only 5.1-6.30
NH	≥ 28" and <35"	1 fish/day	Gaffing and culling prohibited; Use of corrodible non-offset circle hooks required if angling with bait	All year
MA	≥ 28" and <35"	1 fish/day	Hook & line only; no high-grading; gaffs and other injurious removal devices prohibited. Private angler circle hook requirement when fishing with natural bait (exception for artificial lures).	All year
RI	≥ 28" and <35"	1 fish/day	The use of circle hooks is required by any vessel or person while fishing recreationally with bait for striped bass	All year
CT	≥ 28" and <35"	1 fish/day	Inline circle hooks only when using whole, cut or live natural bait (Dec 1st, 2020). Spearing and gaffing prohibited	All year
NY	Ocean and DE River: Slot Size: 28 -35	1 fish/day	Angling only. Spearing permitted in ocean waters. C&R only during closed season.	Ocean: 4.15-12.15 Delaware River: All year
	HR: Slot Size: 18 -28	1 fish/day	Angling only.	Hudson River: 4.1-11.30
NJ	1 fish at 28 to < 38" (effective 4/1/2020)	1 fish/day	Non-offset circle hooks must be used when using bait with a #2 sized hook or larger in Delaware River & tributaries from 4.1-5.31.	Closed 1.1 – Feb 28 in all waters except in the Atlantic Ocean, and closed 4.1-5.31 in the lower DE River and tributaries
PA	Upstream from Calhoun St Bridge: 1 fish at ≥ 28" to <35"			
	Downstream from Calhoun St Bridge: 1 fish at ≥ 28" to <35, and 2 fish at 21-24" slot size limit from 4.1 – 5.31			

(Table 2 continued – Summary of recreational regulations in 2020).

STATE	SIZE LIMITS/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
DE	≥ 28" and <35"	1 fish/day	Hook & line, spear (for divers) only. Circle hooks required in spawning season.	All year. C&R only 4.1-5.31 in spawning grounds. 20”-25”slot from 7.1-8.31 in DE River, Bay & tributaries
MD	Ocean: ≥ 28" and <35"	1 fish/day		All year
	Chesapeake Bay and tribs^	C&R only	no eels; no stinger hooks; barbless hooks when trolling; circle or J-hooks when using live bait; max 6 lines when trolling	1.1-2.28, 3.1-3.31, 12.11-12.31
	Chesapeake Bay: 35" min	1 fish/day	Geographic restrictions apply.	5.1-5.15
	Chesapeake Bay: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28"		Geographic restrictions apply; circle hooks if chumming or live-lining; no treble hooks when bait fishing.	5.16-5.31
	Chesapeake Bay and tribs: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28"		All Bay and tribs open; circle hooks if chumming or live-lining; no treble hooks when bait fishing.	6.1-8.15, 9.1-12.10
PRFC	Spring Trophy: 1 fish/day, 35” minimum size		No more than two hooks or sets of hooks for each rod or line; no live eel; no high-grading	5.1-5.15
	Summer and Fall: 2 fish/day, 20” min		No more than two hooks or sets of hooks for each rod or line.	5.16-7.6 and 8.21-12.31; closed 7.7-8.20 (No Direct Targeting)

^ Susquehanna Flats: C&R only Jan 1 – March 31 (no treble hooks when bait fishing); 1 fish at 19”-26” slot May 16 – May 31.

(Table 2 continued – Summary of recreational regulations in 2020).

STATE	SIZE LIMITS/REGION	BAG LIMIT	GEAR/FISHING RESTRICTIONS	OPEN SEASON
DC	18” minimum size	1 fish/day	Hook and line only	5.16-12.31
VA	Ocean: 28”-36” slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	1.1-3.31, 5.16-12.31
	Ocean Spring Trophy: NO SPRING TROPHY SEASON			
	Chesapeake Bay Spring Trophy: NO SPRING TROPHY SEASON			
	Bay Spring: 20”-28” slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	5.16-6.15
	Bay Fall: 20 - 36” slot limit	1 fish/day	Hook & line, rod & reel, hand line only. No gaffing. Circle hooks required if/when fishing with live bait (as of July 2020).	10.4-12.31
NC	≥ 28" and <35"	1 fish/day	No gaffing allowed. Circle hooks required when fishing with natural bait.	All year

Table 3. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2020. Note: Harvest is from state compliance reports/MRIP (July 8, 2021), 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	47,859	578,897	442,811	1,163,455
1991	158,491	92,480	798,260	715,478	1,764,709
1992	256,476	193,281	869,779	937,611	2,257,147
1993	314,483	115,859	789,037	812,404	2,031,783
1994	325,401	166,105	1,055,523	1,360,872	2,907,900
1995	537,412	188,507	2,287,578	2,010,689	5,024,186
1996	854,094	257,749	2,487,422	2,600,526	6,199,792
1997	1,076,460	325,998	2,774,981	2,969,781	7,147,220
1998	1,215,219	347,343	2,915,390	3,259,133	7,737,085
1999	1,223,572	337,036	3,123,496	3,140,905	7,825,008
2000	1,216,812	209,329	3,802,477	3,044,203	8,272,820
2001	931,412	182,606	4,052,474	2,449,599	7,616,091
2002	928,085	199,770	4,005,084	2,792,200	7,925,139
2003	854,326	131,319	4,781,402	2,848,445	8,615,492
2004	879,768	157,724	4,553,027	3,665,234	9,255,753
2005	970,403	146,126	4,480,802	3,441,928	9,039,259
2006	1,047,648	158,808	4,883,961	4,812,332	10,902,750
2007	1,015,226	160,728	3,944,679	2,944,253	8,064,886
2008	1,030,874	106,791	4,381,186	2,391,200	7,910,050
2009	1,047,073	130,200	4,700,222	1,942,061	7,819,556
2010	1,036,525	134,817	5,388,440	1,760,759	8,320,541
2011	944,869	85,503	5,006,358	1,482,029	7,518,759
2012	860,836	198,911	4,046,299	1,847,880	6,953,926
2013	785,668	114,009	5,157,760	2,393,425	8,450,862
2014	739,873	111,753	4,033,746	2,172,342	7,057,713
2015	624,023	84,463	3,085,725	2,307,133	6,101,344
2016	606,547	88,171	3,500,434	2,981,430	7,176,582
2017	592,719	98,343	2,937,911	3,421,110	7,050,084
2018	625,568	100,646	2,244,765	2,826,667	5,797,646
2019	652,189	84,013	2,150,936	2,589,045	5,476,183
2020	531,240	65,319	1,709,973	2,760,231	5,066,763

* Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added.

Table 4. Total harvest of Atlantic striped bass by sector, 1990-2020. Note: Harvest is from state compliance reports/MRIP (Query July 8, 2021). 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	715,902	8,207,515	8,923,417
1991	158,491	798,260	956,751	966,096	10,640,601	11,606,697
1992	256,476	869,779	1,126,255	1,508,064	11,921,967	13,430,031
1993	314,483	789,037	1,103,520	1,800,176	10,163,767	11,963,943
1994	325,401	1,055,523	1,380,924	1,877,197	14,737,911	16,615,108
1995	537,412	2,287,578	2,824,990	3,775,586	27,072,321	30,847,907
1996	854,094	2,487,422	3,341,516	4,822,874	28,625,685	33,448,559
1997	1,076,460	2,774,981	3,851,441	6,078,566	30,616,093	36,694,659
1998	1,215,219	2,915,390	4,130,609	6,552,111	29,603,199	36,155,310
1999	1,223,572	3,123,496	4,347,068	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	6,750,491	54,091,836	60,842,327
2004	879,768	4,553,027	5,432,795	7,317,897	53,031,074	60,348,971
2005	970,403	4,480,802	5,451,205	7,121,492	57,421,174	64,542,666
2006	1,047,648	4,883,961	5,931,609	6,568,970	50,674,431	57,243,401
2007	1,015,226	3,944,679	4,959,905	7,104,741	42,823,614	49,928,355
2008	1,030,874	4,381,186	5,412,060	7,235,878	56,665,318	63,901,196
2009	1,047,073	4,700,222	5,747,295	7,183,192	54,411,389	61,594,581
2010	1,036,525	5,388,440	6,424,965	7,052,526	61,431,360	68,483,886
2011	944,869	5,006,358	5,951,227	6,793,173	59,592,092	66,385,265
2012	860,836	4,046,299	4,907,135	6,417,998	53,256,619	59,674,617
2013	785,668	5,157,760	5,943,428	5,821,465	65,057,289	70,878,754
2014	739,873	4,033,746	4,773,619	5,849,413	47,948,610	53,798,023
2015	624,023	3,085,725	3,709,748	4,848,526	39,898,799	44,747,325
2016	606,547	3,500,434	4,106,981	4,833,795	43,671,532	48,505,327
2017	592,719	2,937,911	3,530,630	4,797,357	37,952,581	42,749,938
2018	625,568	2,244,765	2,870,333	4,773,643	23,069,028	27,842,671
2019	652,189	2,150,936	2,803,125	4,224,120	23,556,287	27,780,407
2020	531,240	1,709,973	2,241,213	3,392,393	14,858,984	18,251,377

Table 5. Commercial harvest by region in pounds (x1000), 1995-2020. Source: state compliance reports. ^Estimates exclude inshore harvest.

Year	Ocean								Chesapeake Bay				Grand Total
	MA	RI	NY	DE	MD	VA	NC^	Total	MD	PRFC	VA	Total	
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	731.9	983.0	3,834.2	6,078.6
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	190.2	753.3	191.2	103.9	166.4	201.2	2,661.7	1,721.8	676.6	1,690.4	4,088.7	6,750.5
2004	1,214.2	215.1	741.7	176.5	134.2	161.3	605.4	3,248.3	1,790.3	772.3	1,507.0	4,069.6	7,317.9
2005	1,102.2	215.6	689.8	174.0	46.9	185.2	604.5	3,018.2	2,008.7	533.6	1,561.0	4,103.3	7,121.5
2006	1,322.3	5.1	688.4	184.2	91.1	195.0	74.2	2,560.2	2,116.3	673.5	1,219.0	4,008.7	6,569.0
2007	1,039.3	240.6	731.5	188.7	96.3	162.3	379.5	2,838.1	2,240.6	656.8	1,369.2	4,266.6	7,104.7
2008	1,160.3	245.9	653.1	188.7	118.0	163.1	288.4	2,817.6	2,208.0	659.0	1,551.3	4,418.3	7,235.9
2009	1,134.3	234.8	789.9	192.3	127.3	140.4	190.0	2,809.0	2,267.3	693.6	1,413.3	4,374.2	7,183.2
2010	1,224.5	248.9	786.8	185.4	44.8	127.8	276.4	2,894.7	2,105.8	739.1	1,313.0	4,157.8	7,052.5
2011	1,163.9	228.2	855.3	188.6	21.4	158.8	246.4	2,862.5	1,955.1	697.5	1,278.1	3,930.7	6,793.2
2012	1,218.5	239.9	683.8	194.3	77.6	170.8	7.3	2,592.0	1,851.4	634.9	1,339.6	3,826.0	6,418.0
2013	1,004.5	231.3	823.8	191.4	93.5	182.4	0.0	2,526.9	1,662.2	625.6	1,006.8	3,294.5	5,821.5
2014	1,138.5	216.9	531.5	167.9	120.9	183.7	0.0	2,359.4	1,805.7	514.9	1,169.4	3,490.0	5,849.4
2015	866.0	188.3	516.3	144.1	34.6	138.1	0.0	1,887.5	1,436.9	556.5	967.6	2,961.1	4,848.5
2016	938.7	174.7	575.0	136.5	19.7	139.2	0.0	1,983.9	1,425.5	522.2	902.3	2,849.9	4,833.8
2017	823.4	175.3	701.2	141.8	80.5	133.9	0.0	2,056.1	1,439.8	473.7	827.8	2,741.3	4,797.4
2018	753.7	176.6	617.2	155.0	79.8	134.2	0.0	1,916.6	1,424.3	481.7	951.0	2,857.0	4,773.6
2019	584.7	144.2	358.9	132.6	82.8	138.0	0.0	1,441.2	1,475.2	356.6	951.1	2,782.9	4,224.1
2020+	386.9	115.9	473.5	138.0	82.0	77.239	0.0	1,273.5	1,092.3	414.9	611.7	2,118.9	3,392.4

+MD indicated that due to COVID-19, an internal audit of 2020 commercial landings has not been completed, therefore, landings are considered preliminary. Any changes to the final estimate will be reported to ASMFC.

Table 6. Commercial harvest and discards by region in numbers of fish (x1000), 1995-2020. Source: harvest is from state compliance reports, discards is from ASMFC. ^Estimates exclude 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	
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	141.7	46.8	188.5	725.9
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	168.8	89.0	257.7	1,111.8
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	249.7	76.3	326.0	1,402.5
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	313.9	33.5	347.3	1,562.6
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	305.2	31.9	337.0	1,560.6
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	176.9	32.5	209.3	1,426.1
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	140.5	42.2	182.6	1,114.0
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	151.2	48.6	199.8	1,127.9
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	98.8	32.5	131.3	985.6
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	111.4	46.3	157.7	1,037.5
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	87.2	58.9	146.1	1,116.5
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	99.0	59.8	158.8	1,206.5
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	94.3	66.4	160.7	1,176.0
2008	61.1	16.6	73.3	31.9	14.0	10.8	13.4	221.0	580.7	85.0	144.1	809.8	63.6	43.1	106.8	1,137.7
2009	59.4	16.8	82.6	21.6	12.5	8.9	9.0	210.9	605.6	86.8	143.8	836.2	60.5	69.7	130.2	1,177.3
2010	60.4	15.7	82.4	19.8	5.4	9.4	13.7	206.7	579.2	95.7	154.9	829.8	40.4	94.5	134.8	1,171.3
2011	58.7	14.3	87.4	20.5	2.1	12.2	10.9	206.0	488.9	96.2	153.7	738.8	35.0	50.5	85.5	1,030.4
2012	61.5	15.0	67.1	15.7	6.9	10.8	0.3	177.3	465.6	80.8	137.0	683.5	25.5	173.4	198.9	1,059.7
2013	58.6	13.8	76.2	17.7	7.6	10.0	0.0	183.8	391.5	79.3	131.0	601.8	36.5	77.5	114.0	899.7
2014	58.0	10.5	52.9	14.9	8.5	10.0	0.0	154.8	362.2	71.1	151.8	585.1	46.3	65.5	111.8	851.6
2015	42.3	11.3	45.6	11.0	2.6	7.7	0.0	120.4	298.3	73.1	132.2	503.6	33.8	50.7	84.5	708.5
2016	48.0	11.7	51.0	8.8	1.2	7.6	0.0	128.3	284.9	71.2	122.2	478.3	41.3	46.8	88.2	694.7
2017	41.2	10.1	61.6	9.5	3.5	7.6	0.0	133.5	263.6	67.6	128.0	459.2	78.1	20.2	98.3	691.1
2018	37.8	10.1	52.2	11.4	3.5	6.9	0.0	121.9	286.4	68.9	148.4	503.7	61.4	39.3	100.6	726.2
2019	29.6	7.3	29.6	8.2	3.3	6.9	0.0	84.9	356.7	61.0	149.6	567.3	19.4	64.6	84.0	736.2
2020+	19.6	5.0	44.1	8.4	3.3	4.4	0.0	84.9	251.5	68.9	125.9	446.4	18.6	46.7	65.3	596.6

* Commercial dead discard estimates are derived via a generalized additive model (GAM), and are therefore re-estimated for the entire time series when a new year of data is added. +MD indicated that due to COVID-19, an internal audit of 2020 commercial landings has not been completed, therefore, landings are considered preliminary. Any changes to the final estimate will be reported to ASMFC.

Table 7. Total recreational catch, releases, and release mortality in numbers of fish by region (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). 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
1995	1,260	1,028	2,288	16,587	5,754	22,341	17,847	6,782	24,629	1,493	518	2,011
1996	1,362	1,125	2,487	22,384	6,511	28,895	23,746	7,636	31,382	2,015	586	2,601
1997	1,514	1,261	2,775	22,819	10,178	32,998	24,333	11,439	35,773	2,054	916	2,970
1998	1,647	1,268	2,915	29,294	6,918	36,213	30,941	8,187	39,128	2,637	623	3,259
1999	1,758	1,366	3,123	26,139	8,760	34,899	27,897	10,125	38,022	2,353	788	3,141
2000	2,198	1,604	3,802	25,090	8,734	33,824	27,289	10,338	37,627	2,258	786	3,044
2001	2,758	1,294	4,052	21,073	6,145	27,218	23,831	7,440	31,270	1,897	553	2,450
2002	2,756	1,249	4,005	23,653	7,371	31,024	26,409	8,620	35,030	2,129	663	2,792
2003	3,124	1,658	4,781	20,678	10,971	31,649	23,802	12,628	36,431	1,861	987	2,848
2004	3,078	1,475	4,553	27,868	12,857	40,725	30,946	14,332	45,278	2,508	1,157	3,665
2005	3,182	1,299	4,481	28,663	9,580	38,244	31,845	10,879	42,724	2,580	862	3,442
2006	2,789	2,095	4,884	41,239	12,232	53,470	44,028	14,327	58,354	3,711	1,101	4,812
2007	2,327	1,618	3,945	25,135	7,579	32,714	27,462	9,196	36,659	2,262	682	2,944
2008	3,025	1,356	4,381	21,878	4,691	26,569	24,904	6,046	30,950	1,969	422	2,391
2009	2,898	1,803	4,700	16,740	4,838	21,578	19,638	6,641	26,279	1,507	435	1,942
2010	3,906	1,483	5,388	13,606	5,957	19,564	17,512	7,440	24,952	1,225	536	1,761
2011	3,617	1,389	5,006	12,644	3,823	16,467	16,261	5,212	21,473	1,138	344	1,482
2012	3,071	975	4,046	11,242	9,290	20,532	14,314	10,265	24,578	1,012	836	1,848
2013	3,723	1,435	5,158	19,463	7,131	26,594	23,186	8,565	31,751	1,752	642	2,393
2014	2,276	1,758	4,034	15,107	9,031	24,137	17,382	10,789	28,171	1,360	813	2,172
2015	1,770	1,316	3,086	15,419	10,216	25,635	17,189	11,532	28,721	1,388	919	2,307
2016	1,817	1,683	3,500	17,794	15,333	33,127	19,611	17,016	36,627	1,601	1,380	2,981
2017	1,738	1,200	2,938	28,963	9,050	38,012	30,701	10,249	40,950	2,607	814	3,421
2018	1,195	1,050	2,245	22,739	8,669	31,407	23,933	9,719	33,652	2,046	780	2,827
2019	1,342	809	2,151	21,131	7,636	28,767	22,473	8,445	30,918	1,902	687	2,589
2020	923	787	1,710	22,710	7,959	30,669	23,633	8,746	32,379	2,044	716	2,760

Table 8. Recreational harvest by region in pounds (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^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	
1995	83	127	2,739	1,049	1,331	5,594	8,587	301	0.0	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	0.0	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	0.0	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	3.8	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	0.0	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	0.0	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	7.7	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	2.8	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	0.0	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	0.0	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	8.6	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	1.7	0.0	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	0.0	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	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	0.0	31,156	7,786	957	8,743	39,899
2016	189	191	3,731	1,776	912	12,053	12,790	86	7.2	0.0	0.0	31,735	10,912	1,024	11,936	43,672
2017	318	394	5,664	1,655	1,560	8,885	10,886	666	0.0	1.8	0.0	30,030	7,309	613	7,922	37,953
2018	142	130	4,925	1,121	1,165	3,453	7,012	33	0.0	0.0	0.0	17,982	4,683	404	5,087	23,069
2019	415	291	2,698	2,300	685	7,072	6,674	44	7.3	0.0	0.0	20,187	3,145	224	3,370	23,556
2020	180	29	776	483	830	2,202	6,584	16	0.0	0.0	0.0	11,100	3,480	280	3,759	14,859

Table 9. Recreational harvest by region in numbers of fish (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^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	
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	59.8	94.9	477.3	626.4	27.8	0.0	0.1	0.0	1,738.3	1,091.6	108.0	1,199.6	2,937.9
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
2019	38.0	14.7	195.6	104.1	67.1	498.0	412.9	10.9	1.0	0.0	0.0	1,342.2	764.1	44.6	808.7	2,150.9
2020	19.0	3.2	67.2	36.9	71.2	203.7	520.1	1.6	0.0	0.0	0.0	922.9	734.8	52.2	787.0	1,710.0

Table 10. Results of 2020 commercial quota accounting in pounds. Source: 2021 state compliance reports. 2020 quota was based on Addendum VI and approved conservation equivalency programs.

State	Add VI (base)	2020 Quota^	2020 Harvest	Overage
Ocean				
Maine*	154	154	-	-
New Hampshire*	3,537	3,537	-	-
Massachusetts	713,247	735,240	386,924	0
Rhode Island	148,889	148,889	115,891	0
Connecticut*	14,607	14,607	-	-
New York	652,552	640,718	473,461	0
New Jersey**	197,877	215,912	-	-
Delaware	118,970	142,474	137,986	0
Maryland	74,396	89,094	81,969	0
Virginia	113,685	125,034	77,239	0
North Carolina	295,495	295,495	0	0
Ocean Total	**2,333,409**	**2,411,154**	**1,273,470**	**0**
Chesapeake Bay				
Maryland	**2,588,603**	1,442,120	1,092,321	0
Virginia		983,393	611,745	0
PRFC		572,861	414,856	0
Bay Total		**2,998,374**	**2,118,922**	**0**

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

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

^ 2020 quota changed through conservation equivalency for MA (735,240 lbs), NY (640,718 lbs), NJ (215,912 lbs), DE (142,474 lbs), MD (ocean: 89,094 lbs; bay: 1,445,394 lbs), PRFC (572,861 lbs), VA (ocean: 125,034 lbs; bay: 983,393 lbs).

Note: Maryland's Chesapeake Bay quota for 2020 was adjusted to account for the overage in 2019.

Table 11. Number of directed trips for Atlantic striped bass (primary and secondary target) for 2017-2020. Source: MRIP (Query July 8, 2021).

Year	Ocean	Chesapeake Bay	Coastwide Total
2017	16,794,554	2,634,244	19,428,798
2018	15,686,903	2,650,311	18,337,214
2019	16,189,653	1,967,387	18,157,040
2020	15,859,277	2,678,922	18,538,199

Tables 12a-12c. Total removals in numbers of fish (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish for 2017 and 2020. Harvest is from state compliance reports/MRIP (Query July 8, 2021), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

Table 12a. Coastwide removals in numbers of fish for 2017 and 2020.

	Commercial		**Recreational**		**Total**	
	Commercial Removals	**% Change from 2017**	**Recreational Removals**	**% Change from 2017**	**Total Removals**	**% Change from 2017**
2017	691,062	-14%	6,359,021	-30%	7,050,084	**-28%**
2020	596,559		4,470,204		5,066,763	

Table 12b. Ocean removals in numbers of fish for 2017 and 2020.

	Commercial		**Recreational**		**Total**	
	Commercial Removals	**% Change from 2017**	**Recreational Removals**	**% Change from 2017**	**Total Removals**	**% Change from 2017**
2017	211,608	-51%	4,344,953	-32%	4,556,562	**-33%**
2020	103,439		2,966,848		3,070,286	

Table 12c. Chesapeake Bay removals in numbers of fish for 2017 and 2020.

	Commercial		**Recreational**		**Total**	
	Commercial Removals	**% Change from 2017**	**Recreational Removals**	**% Change from 2017**	**Total Removals**	**% Change from 2017**
2017	479,454	3%*	2,014,068	-25%	2,493,522	**-20%**
2020	493,120		1,503,357		1,996,477	

*Commercial harvest in Chesapeake Bay decreased by 3% in numbers of fish from 2017 (459,237 fish) to 2020 (446,380 fish). When accounting for total commercial removals (harvest plus discards), Chesapeake Bay commercial removals increased by 3% from 2017 to 2020, as noted here in Table 11c.

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data.

Note: Some states chose a less than 18% commercial quota reduction in exchange for a greater than 18% reduction in recreational removals in their CE plans.

Table 13. Realized percent change in recreational removals in numbers of fish (harvest plus release mortality) of Atlantic striped bass by state from 2017 to 2020 and predicted percent change in recreational removals from approved conservation equivalency plans (where applicable). Harvest is from MRIP (Query July 8, 2021), release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina. NA = Percent reduction not calculated if implementing Addendum VI measure.

State	Realized % Change Recreational Harvest	Realized % Change Recreational Release Mortality	Realized % Change Rec. Removals (Harvest + Release Mortality)	Predicted % Change in Rec. Removals from CE Plan
Maine	-14%	-21%	**-21%**	NA
New Hampshire	-92%	-37%	**-49%**	NA
Massachusetts	-83%	-60%	**-66%**	NA
Rhode Island	-38%	-17%	**-23%**	NA
Connecticut	-25%	-45%	**-41%**	NA
New York	-57%	142%	**11%**	-23.8%
New Jersey	-17%	43%	**-2%**	-25%
Delaware	-94%	80%	**-16%**	-20%
Maryland	-33%	-10%	**-24%**	-20.6%
Virginia	-52%	-31%	**-41%**	-23.4%
North Carolina^	-	-100%	**-100%**	NA
Coastwide Total	**-42%**	**-19%**	**-30%**	

^Offshore recreational harvest for North Carolina was 0 fish in 2017 and 2020. Offshore estimated release mortality for North Carolina was 463 fish in 2017 and 0 fish in 2020.

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data.
Note: Increased recreational releases in NY, NJ, and DE contributed to realized reductions in total recreational removals being less than predicted for those states.

Table 14. Percent change in commercial harvest by weight of Atlantic striped bass by state from 2017 to 2020 and percent change in commercial quota from 2017 to 2020. Note: Harvest is from state compliance reports. Estimates exclude inshore harvest from North Carolina.

State	% Change in Commercial Harvest by weight	% Change in Commercial Quota[+]
Ocean		
Maine		
New Hampshire		
Massachusetts	-53%	-18%[*]
Rhode Island	-34%	-18%
Connecticut		
New York	-32%	-18%[*]
New Jersey		
Delaware	-3%	-1.8%
Maryland (ocean)	2%	-1.8%
Virginia (ocean)	-42%	-9.8%
North Carolina[^]	-	-18%
Ocean Total	**-38%**	
Chesapeake Bay		
Maryland (Ches. Bay)	-24%	-1.8%
PRFC (Ches. Bay)	-12%	-1.8%
Virginia (Ches. Bay)	-26%	-7.7%
Chesapeake Bay Total	**-23%**	
Coastwide Total	**-29%**	

+ 2020 quota changed through conservation equivalency for MA, NY, NJ, DE, MD, PRFC, VA.

*MA and NY 2020 quotas were based on an 18% reduction from 2017 quota and spawner-per-recruit (SPR) analysis that accounted for changing the commercial size limits.

^North Carolina reported no offshore commercial harvest in 2017 and 2020.

Note: Some states chose a less than 18% commercial quota reduction in exchange for a greater than 18% reduction in recreational removals in their CE plans.

Table 15. Contribution of imputed data to 2020 MRIP estimates for Atlantic striped bass by state. Source: MRIP (Query July 8, 2021).

State	Contribution of Imputed Data to Observed Harvest (A) Rate	Contribution of Imputed Data to Reported Harvest (B1) Rate	Contribution of Imputed Data to Released Alive (B2) Rate
Maine	0%	0%	0%
New Hampshire	12%	100%	7%
Massachusetts	4%	2%	3%
Rhode Island	1%	0%	13%
Connecticut	87%	28%	56%
New York	69%	13%	9%
New Jersey	57%	36%	32%
Delaware	59%	0%	13%
Maryland	9%	8%	7%
Virginia	7%	4%	36%
North Carolina	42%	84%	73%

Note from MRIP: Due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent gaps in catch records, 2020 catch estimates are based in part on imputed data. Columns labeled 'Contribution of Imputed Data to {ESTIMATE} rate' represent the weighted percentage of catch rate information that can be attributed to imputed catch data.

Table 16. State circle hook requirements (excerpt from state regulations as of July 2021) as compared to the Board-approved bait definition and incidental catch guidance (listed below) for Addendum VI. Source: State regulations (linked in table).
Y = state adopted Board-approved bait definition, exemption for artificial lure with bait attached, and/or incidental catch guidance;
MR = state regulations are more restrictive than the bait definition and/or exemption for artificial lure with bait attached;
N = state has not adopted incidental catch guidance.

Definition of Bait and Methods of Fishing: Circle hooks are required when fishing for striped bass with bait, which is defined as any marine or aquatic organism live or dead, whole or parts thereof. This shall not apply to any artificial lure with bait attached.

Guidance on Incidental Catch: Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
ME	It is unlawful to use any hook other than a circle hook when using bait…Striped bass incidentally caught on any unapproved hook type must be returned to the water immediately without unnecessary injury. For the purposes of this section, *bait is defined as any marine or freshwater organism live or dead, whole or parts thereof, and earthworms, including but not limited to, night crawlers (Lumbricus terrestris).* **Exception**: Rubber or latex tube rigs will be exempt from the circle hook restriction as long as they conform with the following: the lure must consist of a minimum of 8" of latex or rubber tubing with a single hook protruding from the end portion of the tubing where bait may be attached. Use of treble hooks is not allowed with these rigs	MR	MR	Y
NH	Non-offset, corrodible circle hooks required if angling with bait.	MR*	MR	N
MA	Mandatory Use of Circle Hooks. Recreational fishermen shall use circle hooks when fishing for striped bass with whole or cut natural baits. This shall not apply to any artificial lure. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury. *Bait means any marine or aquatic organism, live or dead, whole or parts thereof.*	Y	Y	Y

(Table 16 continued – Summary of circle hook regulations).

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
RI	F. Circle hooks: 1. The use of circle hooks is required by any person while fishing recreationally with bait for striped bass. a. *Bait is defined as any marine or aquatic organism live or dead, whole or parts thereof.* b. The circle hook requirement shall not apply to any artificial lure with bait attached. 2. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.	Y	Y	Y
CT	No person shall engage in angling for striped bass with natural bait unless such person uses an inline circle hook. Any striped bass taken incidentally by use of natural bait on a hook other than an inline circle hook shall be returned immediately to the waters from which taken. The provisions of this subsection (h) shall not apply to any artificial lure with bait attached, or to the use of a fly…*For purposes of this subsection, "natural bait" means any organism, in whole or in part, that is live or dead*	MR	Y	Y
NY	Recreational anglers are required to use a non-offset (inline) circle hook when fishing for striped bass when using *any marine or aquatic organism or terrestrial invertebrate, live or dead, whole or parts thereof*. This requirement shall not apply to any artificial lure with any marine or aquatic organism or terrestrial invertebrate, live or dead, whole or parts thereof attached. Striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury.	MR	Y	Y
NJ	***Pending (expected 10/4/2021) N.J.A.C. 7:25-18.1:*** Hook and line fishermen are restricted to the use of non-offset circle hooks while fishing with bait. *Bait is defined as any marine or aquatic organism live or dead, whole or parts thereof.* This restriction shall not apply to an artificial lure with bait attached. A circle hook is a non-offset hook where the point is pointed perpendicularly back towards the shank. Non-offset means that the point and barb are in the same plane as the shank. Striped bass caught using an unapproved method of take must be returned to the water immediately without unnecessary injury.	Pending	Pending	Pending
PA	It is unlawful to fish with bait for any species of fish in the tidal Delaware Estuary, including tributaries from the mouths of the tributaries upstream to the limit of tidal influence using any hook type other than non-offset (in-line) circle hooks.	MR*	MR	N

(Table 16 continued – Summary of circle hook regulations).

STATE	CIRCLE HOOK REQUIREMENT	BAIT DEFINITION	METHOD EXEMPT	INCIDENTAL CATCH GUIDANCE
DE	It is unlawful for any recreational fisherman to fish for striped bass with bait using any hook other than a non-offset circle hook. This shall not apply to any artificial lure with bait attached. *"Bait" means any marine or aquatic organism live or dead, whole or parts thereof.*	Y	Y	Y
MD	Chesapeake Bay and Tributaries: (2) When fishing for striped bass, a person recreationally angling in the Chesapeake Bay or its tidal tributaries shall only use a circle hook when *using fish, crabs, or worms as bait, or processed bait.* Atlantic Ocean: When fishing for striped bass, a person recreationally angling in the Atlantic Ocean, its coastal bays, or their tributaries shall only use a circle hook when *using fish, crabs, or worms as bait, or processed bait.* *"Fish" means finfish, crustaceans, mollusks, and amphibians and reptiles which spend the majority of their life cycle in water, and any part, egg, offspring, or dead body of any of these species.*	MR	MR	N
PRFC	Non-offset (inline) Circle Hooks are required to be used when using cut or whole natural bait.	MR*	MR	N
DC	The mandatory use of non-offset circle hooks will be required when fishing for striped bass with bait to reduce release mortality in recreational fisheries. In addition to anglers targeting striped bass, a non-offset circle hook will be required regardless of the targeted species when recreationally fishing with *bait of any kind (e.g., fish, worms, shrimp, chicken livers, corn, dough balls)* and using a hook size of number two (#2) or greater. *Bait – does not include artificial lures (bucktails, crankbaits, rigged soft plastics, etc.), but does include any other fresh, frozen, live, cut, scented moldable offering used to attract fish.*	MR	Y	N
VA	Any person fishing recreationally shall use non-offset, corrodible, non-stainless steel circle hooks when fishing with bait. *"Bait" means any whole or part of any marine or aquatic organism, live or dead.*	Y	MR	N
NC	It is unlawful to fish for or possess striped bass from the Atlantic Ocean for recreational purposes using hook and line gear with natural bait unless using a non-stainless steel, non-offset (inline) circle hook, regardless of tackle or lure configuration. *Natural bait is defined as any living or dead organism (animal or plant) or parts thereof.*	MR	MR	N

*The PRT assumes that if bait is not specifically defined, the regulation would be considered more restrictive since circle hooks would be required for any type of bait.

Table 17. Status of Commercial Tagging Programs by state for 2020.

State	Total Participants	Tags Issued	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	170	46,520	19,605	Sale	Y	Y	Y	one tag color	Y
RI	26	13,760	5,037	Sale	Y	Y	N	two tag colors by gear	Y
NY	407	62,430	44,073	Harvest	Y	Y	N	One tag color	Y
DE*	238	17,396	8,439	Both	Y	Y	N	Harvest: two tag colors by gear Sale: one color	Y
MD±	762	497,820	250,736	Harvest	Y	Y	N	Three tag colors by fishery and area	Y
PRFC	313	81,525	68,939	Harvest	Y	Y	N	Five tag colors by gear	N
VA	374	185,350	130,373	Harvest	Y	Y	Y	two tag colors by area	Y
NC^	46	33,560	26,895	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 use the average weight per fish from the previous year, or some variation thereof. Actual biological metric used is reported in Annual Commercial Tag Monitoring 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.
± Unused tags are normally required to be returned to MDDNR to allow a thorough audit of tag use. This was not possible again in 2021 due to ongoing COVID-19 shutdowns. This audit may be revisited in the future as conditions allow.
^ All commercial tags were used in the internal waters of North Carolina.

Table 18. Status of compliance with monitoring and reporting requirements in 2020. 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 Status
	Requirement(s)	Status	Requirement(s)	Status	
ME	JAI	Y	-	NA	Y
NH	-	NA	-	NA	Y
MA	TAG*	Y	composition, catch & effort (C&R), tag program	Y	Y
RI	-	NA	composition (C&R), catch & effort (R), tag program	Y	Y
CT	-	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	-	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	composition, catch & effort (C&R), tag program	Y	Y
DC	-	NA	-	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

*Part or all of the monitoring program could not be conducted due to COVID-19.

XI. Figures

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

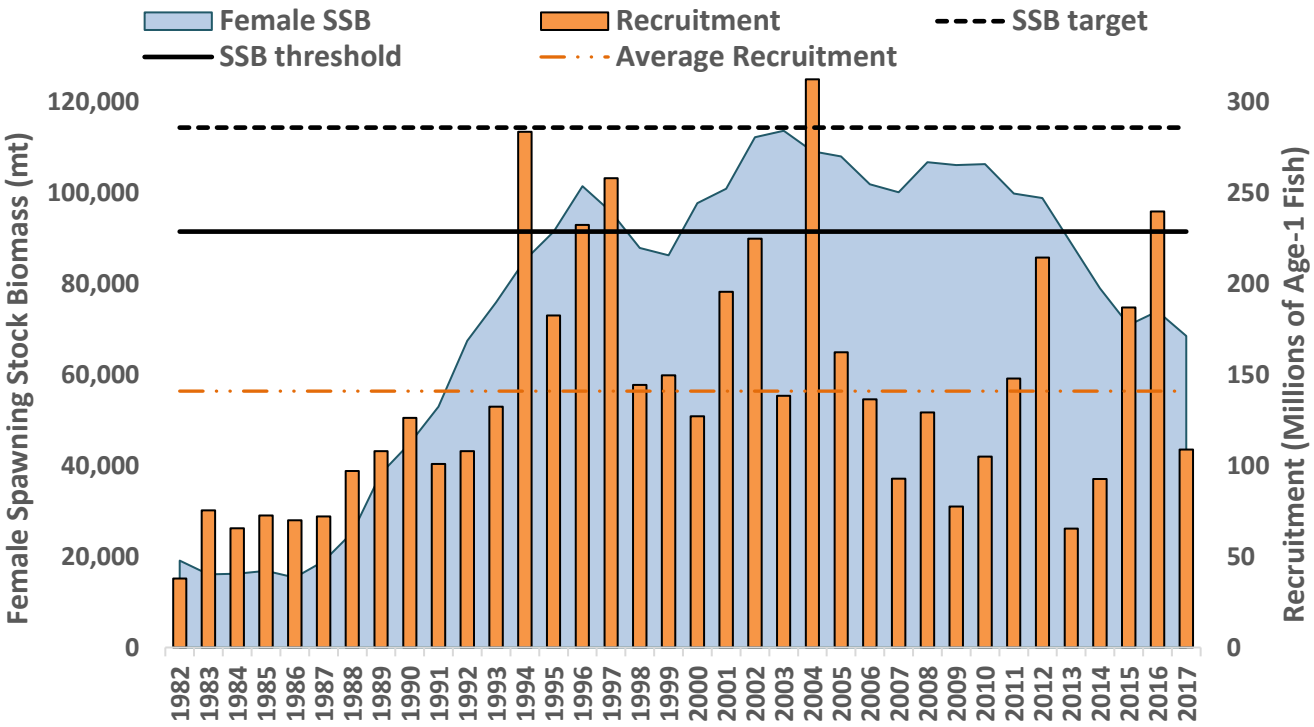


Figure 2. Atlantic striped bass fishing mortality, 1982-2017. Source: 2018 Benchmark Stock Assessment.

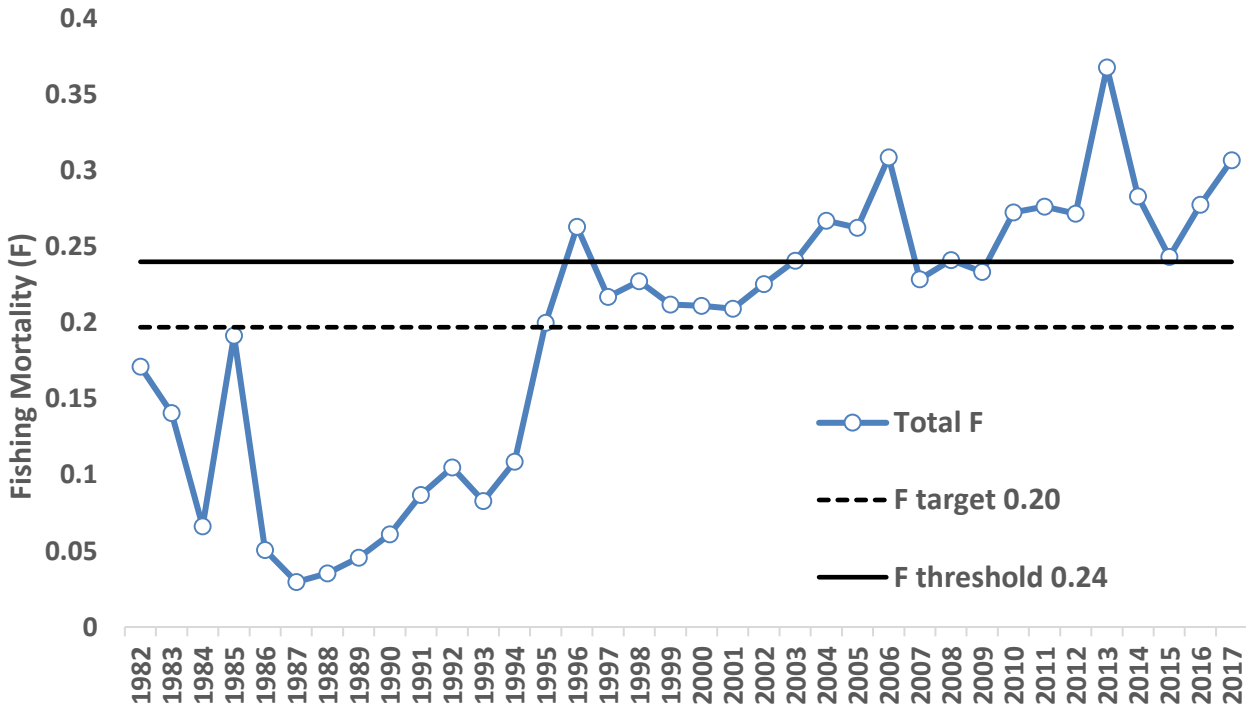


Figure 3. Albemarle Sound-Roanoke River striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1991-2017. Source: 2020 A-R Stock Assessment (Lee et al. 2020).

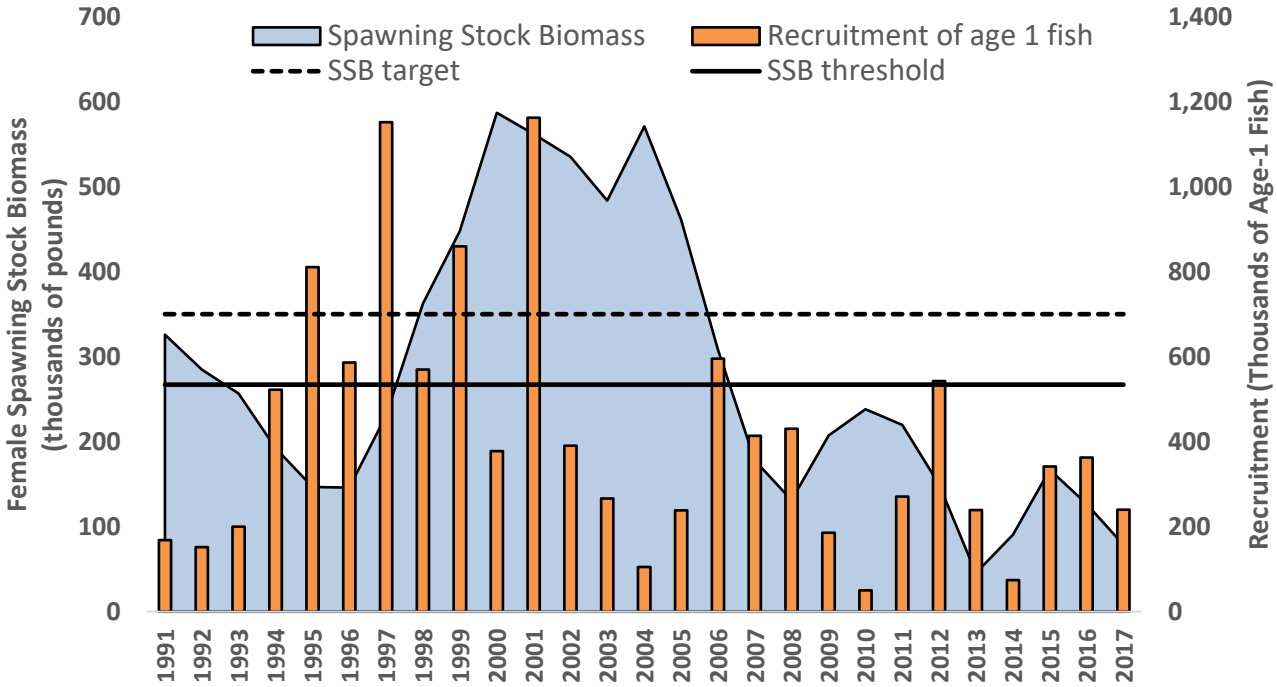


Figure 4. Albemarle Sounds-Roanoke River striped bass fishing mortality (F) estimates, and biological reference points, 1991-2017. Source: 2020 A-R Stock Assessment (Lee et al. 2020).

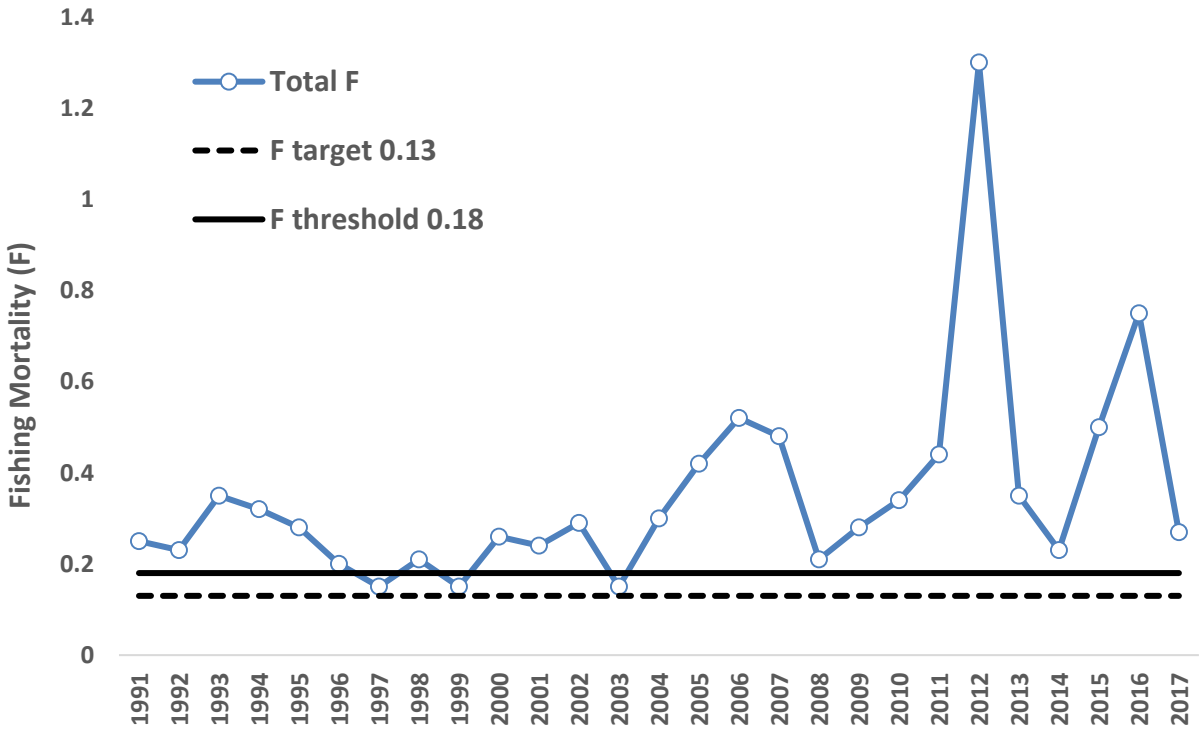


Figure 5. Total Atlantic striped bass removals by sector in numbers of fish, 1982-2020. Note: Harvest is from state compliance reports/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from A-R.

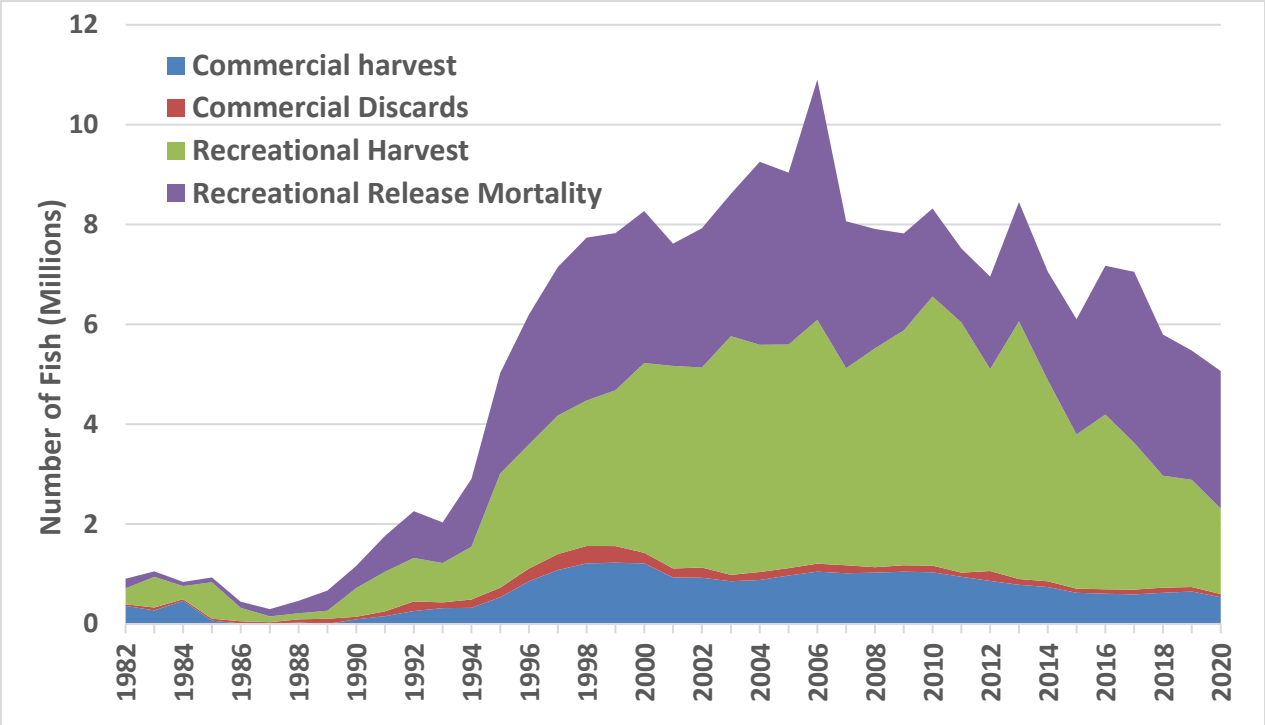


Figure 6. Commercial Atlantic striped bass landings by state in pounds, 1990-2020. Source: State compliance reports. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

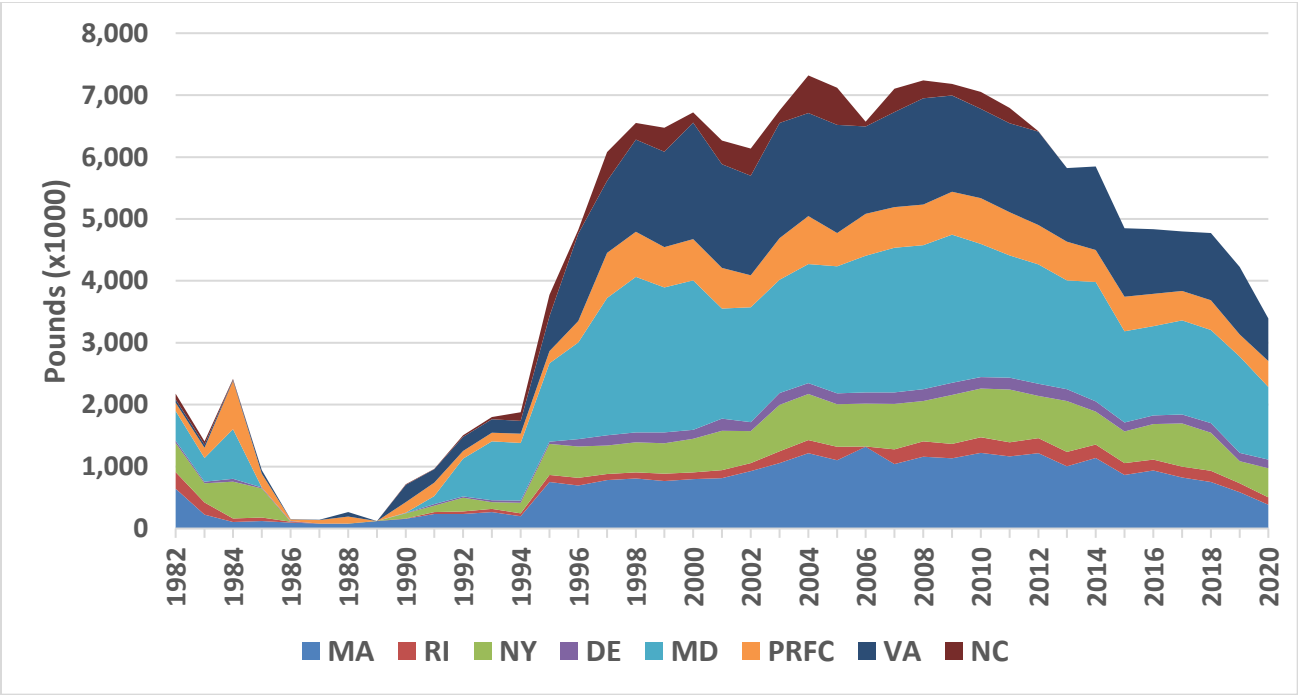


Figure 7. Total recreational catch and the proportion of fish released alive, 1982-2020. Source: MRIP/ASMFC. Estimates exclude inshore harvest from A-R.

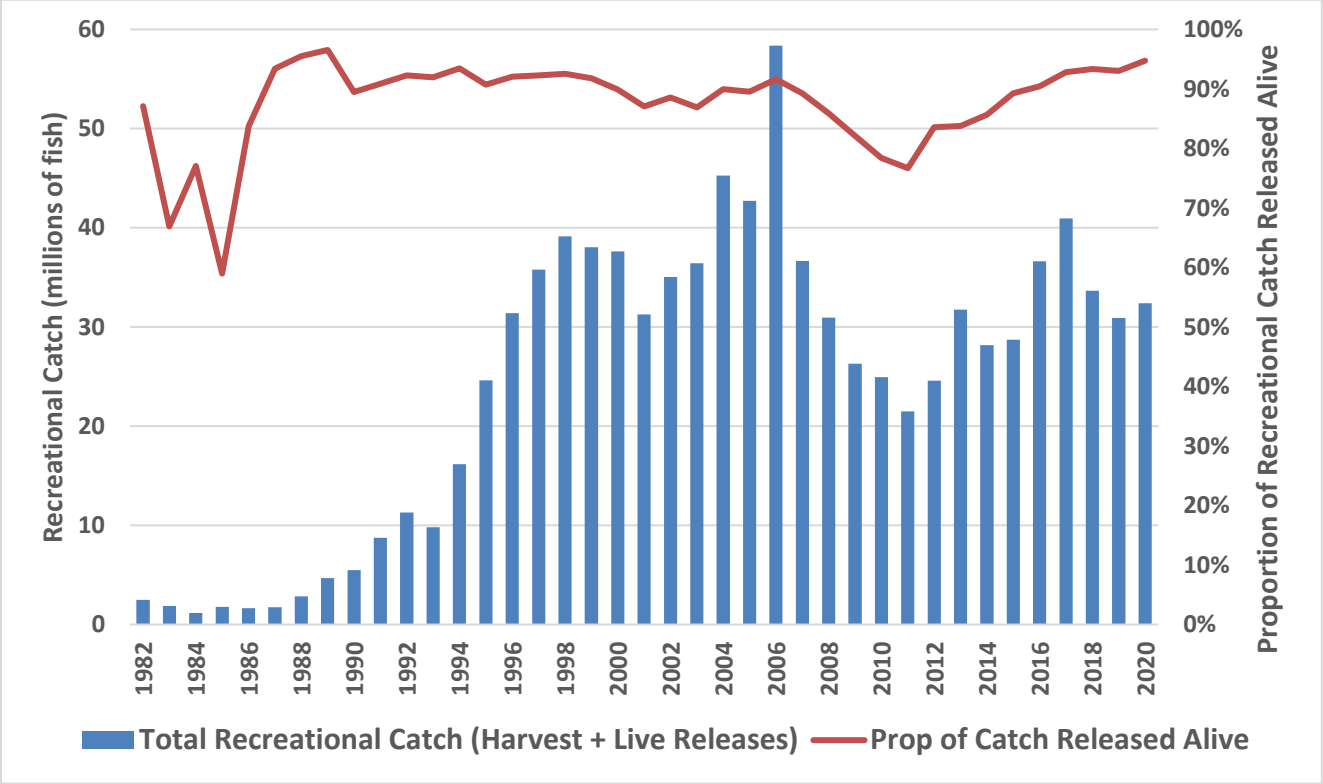
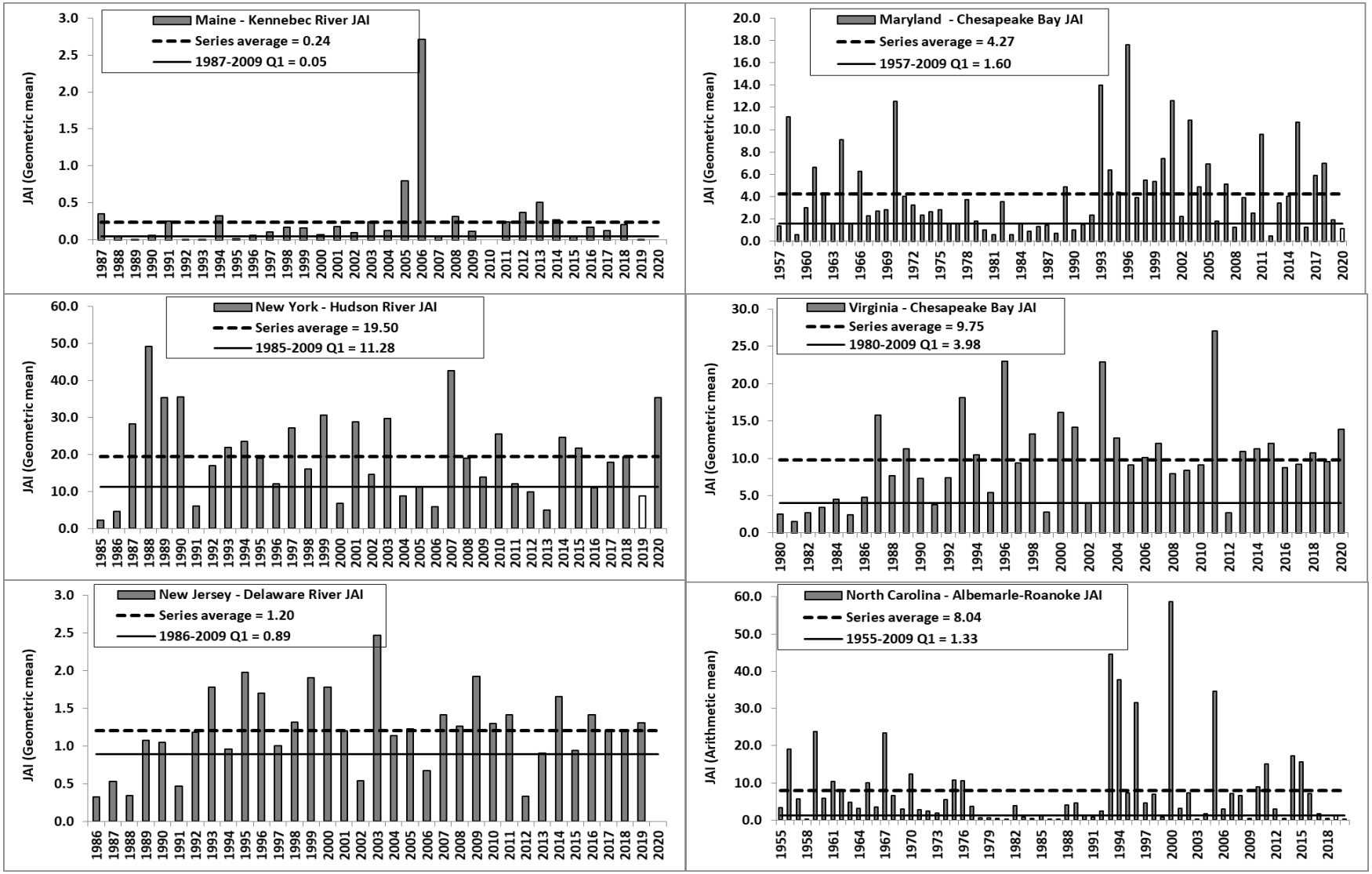


Figure 8. Juvenile abundance index analysis for Maine, New York, Jew Jersey, Maryland, Virginia, and North Carolina, 2020. Source: Annual State Compliance Reports. Q1 = first quartile. An open bar in the last three years indicates a value below the Q1 threshold.



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Atlantic Striped Bass Management Board**

FROM: **Atlantic Striped Bass Technical Committee**

DATE: **July 26, 2021**

SUBJECT: **Review of Albemarle Sound-Roanoke River Juvenile Abundance Index**

The juvenile abundance index (JAI) for the Albemarle Sound-Roanoke River (A-R) striped bass stock in North Carolina showed recruitment failure for three consecutive years (2018, 2019, 2020), which tripped the recruitment-based management trigger established through Amendment 6 to the Atlantic Striped Bass Interstate Fishery Management Plan (FMP). 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 JAI, as defined through Addendum II to Amendment 6. If any survey's JAI falls below their respective Q1 for three consecutive years, the Technical Committee (TC) should recommend appropriate action to the Management Board (Board).

The TC met on July 15, 2021 to review potential factors contributing to A-R recruitment declines and consider recommending action to the Board. North Carolina's JAI values for 2018 (0.40), 2019 (1.20), and 2020 (0.02) were below its respective Q1 (1.33; Figure 1). Staff from the North Carolina Division of Marine Fisheries (NCDMF) provided an overview of the JAI trawl survey and trends, results from analysis of river flow and striped bass year-class strength, and a summary of management action in response to the 2020 A-R stock assessment.

Considering North Carolina's recent management action to reduce striped bass total allowable landings for the Albemarle Sound and Roanoke River management areas as well as ongoing monitoring and analysis of river flow impacts on recruitment, **the TC recommends no action by the Board at this time.**

Flow Analysis

NCDMF conducted an analysis of river flow in the Roanoke River and its relationship to young-of-year recruitment in Albemarle Sound for 1987–2020 (Lee et al. 2021). The results suggest that as flow increases above the upper recommended flow range, year-class strength decreases, and that high May flows (>20,000 ft^3/s) are associated with poor striped bass year classes. The low JAI values from 2017–2020 align with high flow rates (at or above 20,000 ft^3/s) observed during those years which exceeded the upper bound of flow that provides the greatest chance of successful striped bass spawns (Figure 2).

Prior to this analysis, a stocking adaptive management contingency plan had already been established based on flow rates. If flows from Roanoke Rapids Dam meet or exceed 12,000 ft^3/s for a continuous period of at least 14 days during the critical spawning and transport period (May 1–June 10), 100,000-300,000 Phase I A-R striped bass will be stocked in the western Albemarle Sound nursery area.

A-R Management Action

Under Addendum IV of the FMP, the A-R striped bass stock is managed by the State of North Carolina using reference points from the latest A-R stock assessment which is reviewed by the Striped Bass Technical Committee and approved for management use by the Board. In May 2021, the Board accepted the 2020 Albemarle Sound-Roanoke River Stock Assessment and Peer Review Report (Lee et al. 2020) for management use. In response to the 2020 assessment results showing the A-R stock is overfished and overfishing is occurring, North Carolina took management action to reduce the total allowable landings (TAL) for Albemarle Sound and Roanoke River management areas for 2021 and 2022 from 275,000 pounds to 51,216 pounds in order to reduce F to the target level (NCDMF 2020).

References

Lee, L.M., T.D. Teears, Y. Li, S. Darsee, and C. Godwin (editors). 2020. Assessment of the Albemarle Sound-Roanoke River striped bass (*Morone saxatilis*) in North Carolina, 1991-2017. North Carolina Division of Marine Fisheries, NCDMF SAP-SAR-2020-01, Morehead City, North Carolina. 171 p.

Lee, L.M., Y. Li, and T.D. Teears. 2021. Examining the relationship between flow and year class strength of striped bass in the Roanoke River, North Carolina. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 8 p.

North Carolina Division of Marine Fisheries (NCDMF). 2020. November 2020 Revision to Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan. North Carolina Department of Environment and Natural Resources. North Carolina Division of Marine Fisheries. Morehead City, NC. 12 p.

Figure 1. Juvenile abundance index for the Albemarle Sound-Roanoke River striped bass stock, North Carolina. Source: Annual State Compliance Report. Q1 = first quartile.

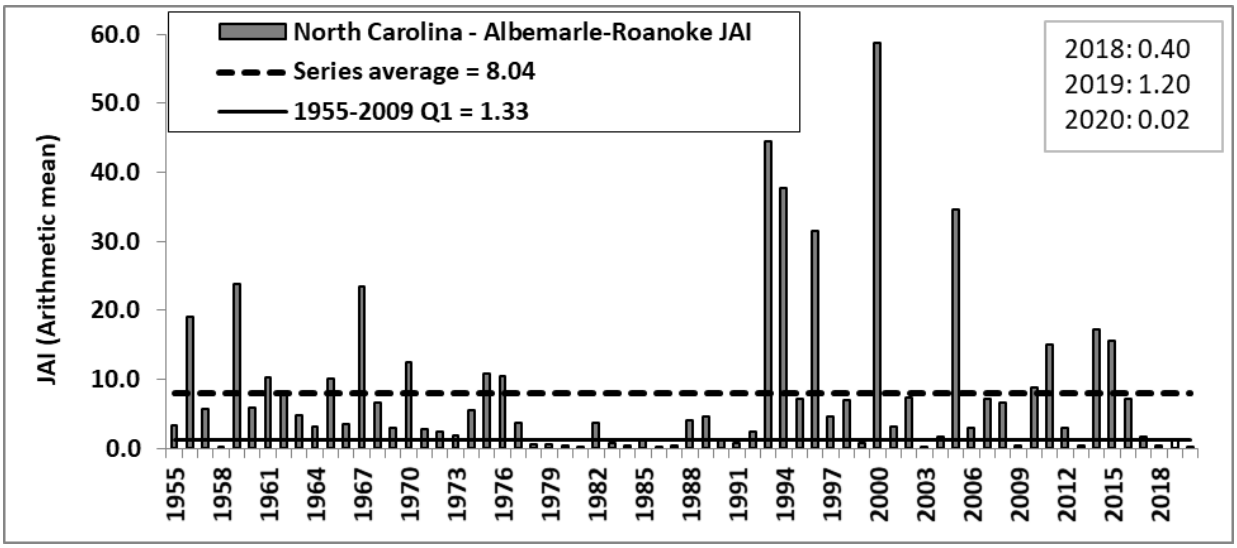
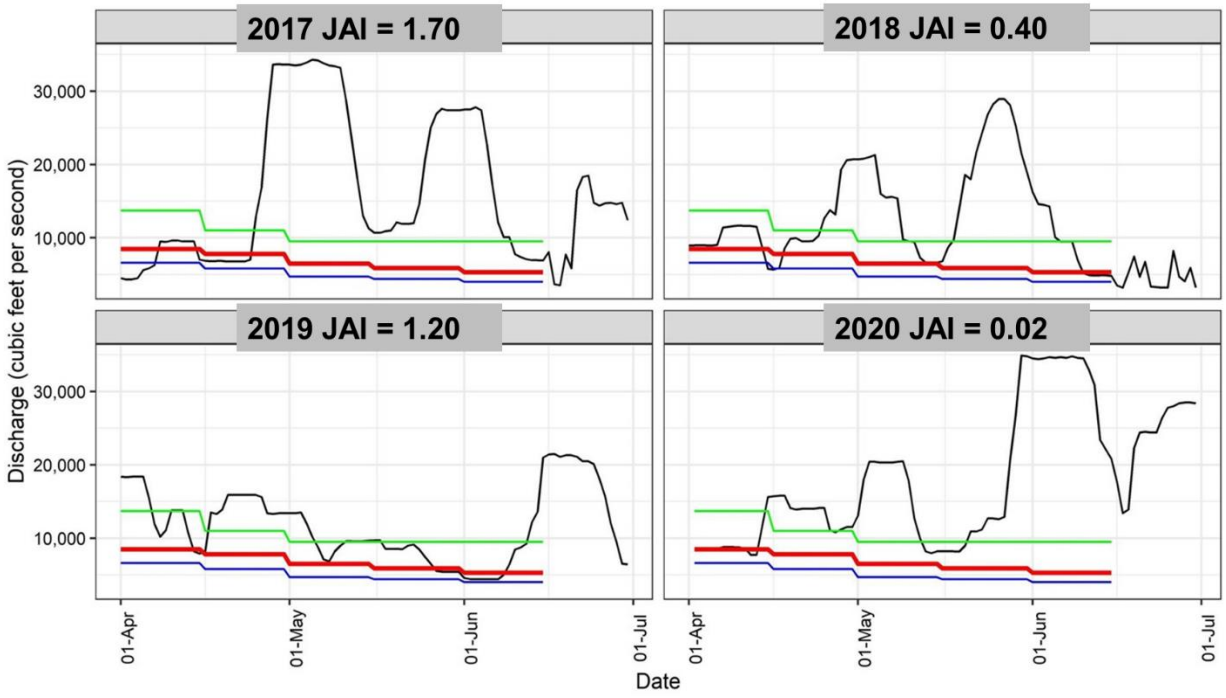


Figure 2. Mean daily flow (black line) for Roanoke River at Roanoke Rapids for 2017–2020 with corresponding Albemarle Sound-Roanoke River JAI values. Source: NCDMF and NCWRC. Green line is the upper bound of flow providing the greatest chance for successful striped bass spawns; blue line is the lower bound of flow providing the greatest chance for successful striped bass spawns; red line is the median flow providing the greatest chance for successful striped bass spawns.



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: **Atlantic Striped Bass Management Board**

FROM: **Toni Kerns, ISFMP Director**

DATE: **July 26, 2021**

SUBJECT: **Potential Options and Timelines to Address Commercial Quota Allocation**

At the May 2021 Board meeting, the motion to include the commercial allocation issue in Draft Amendment 7 failed for lack of a majority. Many Board members recognized that Delaware has raised this issue for several years now and Delaware asserts their current allocation is not equitable. In addition, some individuals expressed an interest in reviewing more recent data to consider in the allocations. Although many Board members recognized these concerns, some Board members noted the Draft Amendment process is not the right time to address this because allocation discussions could make the process significantly longer and more complex. Some Board members suggested addressing quota allocation in a separate management document after Amendment 7 is complete.

The Board Chair requested staff from the Commission and the State of Delaware prepare options and timelines for how this issue could be addressed moving forward. In response to the request, Commission staff and Commissioners from the State of Delaware prepared this memorandum for Board discussion at the August meeting.

Timeline and Process

Commissioners from the State of Delaware developed the following options to address their concerns about the status quo commercial quota allocation (a full description of each option is provided in the following section):

- Option A: Status Quo
- Option B: Allow commercial quota transfer.
    - Sub-option 1: Allow states to voluntarily transfer surplus quota to other states that have commercial quota.
    - Sub-option 2: Allow states to voluntarily transfer surplus quota, but only to other states that filled their commercial quota during the previous year.
- Option C: Reallocate commercial quotas among states based on Amendment 6 historical quotas, commercial fishery management, and recent fishery performance.
- Option D: Amendment 6 quotas are adjusted based on contribution of spawning estuary to the coastal stock.

Commission staff reviewed the proposed options from the perspective of process and timeline considering the ongoing development of Draft Amendment 7. If the Board decides to pursue

the proposed option to allow voluntary quota transfers (Option B, sub-option 1), this option could potentially be developed as an Addendum to Amendment 6 concurrent with the development of Draft Amendment 7 with caveats. Commission staff would not be available to conduct individual state public hearings but could conduct up to 3 webinar hearings. States could hold hearings on their own and provide summaries of those hearing to Commission staff. It would be preferred to collect public comment using a survey to streamline comment analysis/summaries (this would still include the ability to provide open comments). Under this scenario it could be possible to implement transfers for the 2022 fishing year.

Alternatively, since this potential option for quota transfers would not have the complexity associated with a full reallocation, the Board could also consider including an option allowing quota transfer (Option B, sub-option 1), in Draft Amendment 7 to streamline the development of that option with the current Amendment 7 process. The estimated implementation date for Amendment 7 is 2023.

For all other options proposed, the complexity of these options would require considerable staff time and it would not be possible to conduct the addendum process while the Amendment 7 process is ongoing. If the Board decides to pursue options that are more complex than the quota transfer option (Option B, sub-option 1) those options could be developed as an Addendum to Amendment 7 after final action is taken on Draft Amendment 7.

Options Proposed by the State of Delaware

The coastal area can be defined as the entire management unit (i.e., all coastal and estuarine areas of all states and jurisdictions from Maine through North Carolina) excluding the Chesapeake Bay and Albemarle Sound/Roanoke River management areas. While some of the following options will increase the allocation to some states, all states currently allocated coastal commercial quotas, which are a percentage of their average coastal commercial landings during the 1972 through 1979 base period (Section 3.1.2 of Addendum VI to Amendment 6), will retain all or part of their current quota. Several states currently implement conservation equivalency programs for their commercial fisheries in order to have management measures to meet the needs of their state's fishery and those programs will not be affected.

Proposed Management Scenarios

Option A: Status Quo

Transfers between states are prohibited as per Addendum IV Section 3.3 Commercial Quota Transfers (2014).

Option B: Allow commercial quota transfer.

Sub-option 1: Allow states to voluntarily transfer surplus quota to other states that have commercial quota. Transfers are for one year only.

Sub-option 2: Allow states to voluntarily transfer surplus quota, but only to other states that filled their commercial quota during the previous year. Transfers are for one year only.

Option C: Reallocate commercial quotas among states based on Amendment 6 historical quotas, commercial fishery management, and recent fishery performance.

The Amendment 6 quotas, as modified by subsequent Addenda, may be adjusted for each state based on the following fishery performance measures during the past five years (these measures will not apply to states that used Conservation Equivalency to transfer their commercial quota to the recreational sector):

1. State landed at least 50% of its quota in each of the past five years
2. Striped Bass accounted for at least 50% of the state's finfish landings in each of the past five years
3. The state requires both the fishers and weigh stations/dealers to tag and report all landed striped bass.

States that do not meet any of these measures may have up to 50% of their commercial quota reallocated.

States meeting one of the measures may keep 100% of their commercial quota.

States meeting two of the measures may be reallocated quota to 150% of their commercial quota.

States meeting all three measures may be reallocated quota to 200% of their commercial quota.

Option D: Amendment 6 quotas are adjusted based on contribution of spawning estuary to the coastal stock.

Amendment 6 considered the Chesapeake Bay and its commercial striped bass fisheries separately from the commercial fisheries of the other states in the management unit due to the Chesapeake Bay's unquestionable status as the major striped bass spawning and production area for the coastal stock. However, previous Amendments recognized that other estuaries also make important contributions to coastal stock, notably the Delaware and Hudson Rivers, and gave those estuaries producer area status. Producer area states could manage their commercial fisheries similarly to the Chesapeake Bay under Amendment 5. The producer area designation was eliminated in Amendment 6, but the contributions of these other estuaries to the coastal migratory stock became ever more apparent over the almost 20 years that Amendment 6 has been in effect. A recent study of the coastal migratory striped bass spawning stock sampled during the summer in Massachusetts found that this stock, while comprised mostly of Chesapeake-origin striped bass (55-67%), had substantial contributions from Delaware-origin striped bass (14-20%) (Kneebone et al. 2014). While the Delaware and Hudson may no longer be recognized as producer areas by ASMFC, they have similar characteristics to the Chesapeake: large spawning aggregations of migratory striped bass, strong production of juvenile striped bass, and large populations of resident striped bass. States bordering the Delaware and Hudson should be allowed the commercial management flexibility afforded to the Chesapeake.

This option would allow states with commercial fisheries that border the Delaware or Hudson to increase their commercial quotas based on the scale of their quotas relative to the Chesapeake commercial quota. The scale of the quota would be evaluated by the contribution

to the coastal migratory striped bass stock. For example, based on the contribution of Chesapeake and Delaware-origin fish to the coastal migratory stock referenced in the previous paragraph, the average contribution from the Chesapeake is 61% and the Addendum VI quota for the Chesapeake is 2,588,603 lbs. The average contribution from the Delaware is 17% or approximately 28% of the Chesapeake contribution, thus a Delaware quota scaled to the Chesapeake quota would be over 700,000 lbs. The Addendum VI commercial quota allocated to the Delaware estuary includes Delaware's quota of 142,147 lbs. and a portion of New Jersey's 241,313 lbs. (NJ does not have a commercial fishery), which combined is much lower than the estimate based on the Chesapeake quota, so this simple estimate would be an upper bound and a cautious approach to increasing quota will be taken. However, this estimate suggests the commercial quota for a state bordering the Delaware can be increased without jeopardizing the striped bass population. Under this option, Delaware, the only state bordering the Delaware River with an active commercial striped bass fishery, may request a quota increase of up to 100,000 lbs., a cautious increase that will allow the Delaware's commercial fishery to survive while minimizing impacts to the striped bass population. The Board will decide whether to add the increase to Delaware's quota to the coastal quota or offset the increase by decreasing the quota allocated to other states.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

July 27, 2021

To: **Atlantic Striped Bass Management Board**

From: **Tina Berger, Director of Communications**

RE: **Advisory Panel Nominations**

Please find attached two nominations to the Atlantic Striped Bass Advisory Panel – Chris Dollar, an outdoor columnist and fishing guide from Maryland, and Charles Green, a for-hire captain from Maryland. Both nominees fill vacant seats on the Panel. Please review these nominations for action at the next Board meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: Emilie Franke

ATLANTIC STRIPED BASS ADVISORY PANEL

Bolded names await approval by the Atlantic Striped Bass Management Board July 27, 2021

Maine
Vice-Chair - David Pecci (rec)
144 Whiskeag Road
Bath, ME
04530

Phone (o): (207) 442-8581
Phone (c): (207) 841-1444
FAX: (207) 442-8581
dave@obsessioncharters.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/10

Bob Humphrey (comm. rod and reel/for-hire)
727 Poland Range Road
Pownal, ME 04069
Phone (day): 207.688.4966
Phone (eve): 207.688.4854
bob@bobhumphrey.com
Appt. Confirmed 2/18/20

New Hampshire
Peter Whelan (rec)
100 Gates Street
Portsmouth, NH 03801
Phone (o): (603) 205-5318
Phone (h): (603) 427-0401
pawhelan@comcast.net
Appt. Confirmed 2/24/03
Appt Reconfirmed 5/10

Massachusetts
Douglas M. Amorello (comm. rod & reel)
68 Standish Street
Pembroke, MA 02359
Cell: (774)766-8781
sashamysportfishing@gmail.com
Appt. Confirmed 3/23/11
Appt. Reconfirmed 8/18

Patrick Paquette (rec/for-hire/comm)
61 Maple Street
Hyannis, MA 02601
Phone: (781)771.8374
Email: basicpatrick@aol.com
Appt. Confirmed 8/16

Rhode Island
Andrew J. Dangelo (for-hire)
1035 Liberty Lane
West Kingston, RI 02892
Phone: 401.788.6012
Maridee2@gmail.com
Appt. Confirmed 2/3/21

Michael Plaia (comm/rec/for-hire)
119 Currituck Road
Newtown, CT 06470
Phone: 203.512.4280
Makomike3333@yahoo.com
Appt. Confirmed 2/3/21

Connecticut
Kyle Douton (rec/tackle shop owner)
5 Rockwell Street
Niantic, CT 06357
Phone (day): (860)739-7419
Phone (eve): (860)739-8899
FAX: (860)739-9208
kyle@jbtackle.com
Appt. Confirmed 5/13/14

Vacancy (rec)

New York
Bob Danielson (rec)
86 Balin Avenue
South Setauket, NY 11720
Phone: 631.974.8774
Bdan93@optonline.net
Appt. Confirmed 10/22/20

Nathaniel Howard Miller (comm)
95 Church Lane
East Hampton, NY 11937
Phone: 631.702.5374
Miller_nat@yahoo.com
Appt. Confirmed 2/3/21

New Jersey
C. Louis Bassano, Chair
1725 West Central Avenue
Ortley Beach, New Jersey 08751
Phone (c): (908) 241-4852
FAX: (908) 241-6628
lbassano@comcast.net
Appt. Confirmed 10/15/01
Appt. Reconfirmed 2/9/06; 5/17/10; 4/14/14

Capt. Al Ristori (charterboat)
1552 Osprey Court
Manasquan Park, NJ 08736
Phone: (732) 223-5729
FAX: (732) 528-1056
cristori@aol.com
Appt. Confirmed 10/17/94
Appt. Reconfirmed 9/15/98; 9/15/02; 2/9/06; 5/17/10

Pennsylvania
Vacancy (rec)

Delaware
Leonard Voss, Jr. (com)
2854 Big Oak Road
Smyrna, DE 19977
Phone: (302) 653-7999
Appt. Confirmed 4/21/94
Appt. Reconfirmed 7/27/99; 7/03 and 7/07

Steven Smith (rec)
59 Burnham Lane
Dover, DE 19901
Phone (day): (302)744-9140
Phone (eve): (302)674-5186
smithbait@verizon.net
Appt. Confirmed 10/23/18

Maryland
Chris Dollar (outdoor columnist and fishing guide)
PO Box 367
Queenstown, MD 21658
Phone: 410.991.8486
cdollarchesapeake@gmail.com

Charles E. Green Jr. (for –hire)
7327 Woodshire Avenue
Chesapeake Beach, MD 20732
Phone: 301.233.0377
greeneddie@verizon.net

Virginia
Kelly Place (comm; reappted chair 10/2010)
213 Waller Mill Road
Williamsburg, VA 23185
Phone (h): (757) 220-8801
Phone (c): (757) 897-1009
FAX: (757) 259-9669
kelltron@aol.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/06 and 5/10

William Edward Hall Jr. (rec)
PO Box 235
26367 Shoremain Drive
Bloxom, VA 23308
Phone (day): (757)854-1519
Phone (eve): (757)894-0416
FAX: (757)854-0698
esangler@verizon.net
Appt. Confirmed 5/13/14

North Carolina
Riley W. Williams (com)
336 Selwin Road
Belvidere, NC 27919
Phone: (252) 312-8457
Appt. Confirmed 11/10/04
Appt Reconfirmed 11/08; 8/18

Jon Worthington (rec)
405 Japonica Drive
Camden, NC 27921
Phone: (252) 562-2914
ncpierrat@gmail.com
Appt Confirmed 5/5/21

District of Columbia
Joe Fletcher (rec)
1445 Pathfinder Lane
McLean, VA 22101
Phone: (703) 356-9106
Email: jmfletcher@verizon.net

Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/15/99; 9/03 and 9/07

Potomac Fisheries River Comm.
Dennis Fleming (fishing guide; seafood processor/dealer)
P.O. Box 283
Newburg, MD 20664
Phone: 240.538.1260
captaindennisf@gmail.com
Appt. Confirmed 2/3/21

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Michael Luisi State: Maryland
(your name)

Name of Nominee: Chris Dollar

Address: PO Box 367

City, State, Zip: Queenstown MD 21658

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 410-991-8468 Phone (evening): 410-991-8468

FAX: _____ Email: cdollarchesapeake@gmail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Striped Bass
   2. _____
   3. _____
   4. _____
2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   yes _____ no X
3. Is the nominee a member of any fishermen's organizations or clubs?

   yes _____ no X

   If "yes," please list them below by name.

CCA-MD

Virginia Anglers Club

National Association of Charter Boat C

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Stripers

bluefish

spotted sea trout

cobia

red drum

white perch/oysters

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

Stripers

Bluefish

Spanish mackerel

red drum

blue crabs

oysters

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? _____ years
2. Is the nominee employed only in commercial fishing? yes_____ no_____
3. What is the predominant gear type used by the nominee?_____
4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)?_____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years
2. Is the nominee employed only in the charter/headboat industry? yes _____ no_____

   If "no," please list other type(s)of business(es) and/occupation(s):_____

   _____
3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

   _____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 30 years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes X no _____

   If "yes," please explain.

Fishing guide; Fishing Outfitter/Kayak Fishing Store Owner

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____years

2. Is the nominee employed only in the business of seafood processing/dealing?

   yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management? yes X no X

   If "no," please list other type(s) of business(es) and/or occupation(s):

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Captain Chris D. Dollar is an outdoors columnist, fishing guide/outfitter and conservationist. Since 1

He's owner/operator of Tacklecove.com and a life member of the CCA Maryland who serves on its

Captain Chris D. Dollar is an outdoors columnist, fishing outfitter and conservationist. Since 1995, h

He's owner/operator of Tacklecove.com and a life member of the CCA Maryland who serves on its

Nominee Signature: Christopher D. Dollar 7/26/2021 Date:

Name: Chris D. Dollar
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

_____
State Director

_____
State Legislator

_____
Governor's Appointee

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Michael Luisi State: MD
(your name)

Name of Nominee: Charles E. Green Jr.

Address: 7327 Woodshire Ave

City, State, Zip: Chesapeake Beach MD. 20732

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 301-233-0377 Phone (evening): Same

FAX: _____ Email: greeneddie@verizon.net

. . . . . .

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Striped Bass
   2. _____
   3. _____
   4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   yes_____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

   yes X no_____

   If "yes," please list them below by name.

Maryland Charter Boat Association
Rod n Reel Captain ASSC.
Southern Bay Charter Boat Assc.

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Striped Bass
Blue fish
Spanish Mackerel
Tuna
Spot
White Perch
Cobia
Marlin

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

Tuna
Marlin
Sea trout
Sea Bass
Flounder

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? _____ years

2. Is the nominee employed only in commercial fishing? yes_____ no_____

3. What is the predominant gear type used by the nominee?_____

4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)?_____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? 45 years

2. Is the nominee employed only in the charter/headboat industry? yes ✓ no_____

If "no," please list other type(s)of business(es) and/occupation(s):_____

3. How many years has the nominee lived in the home port community? 45 years

If less than five years, please indicate the nominee's previous home port community.

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 55 years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes _____ no X

   If "yes," please explain.

_____

_____

_____

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing?
   _____years

2. Is the nominee employed only in the business of seafood processing/dealing?

   yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

_____

3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

_____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
   yes _____ no _____

   If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

_____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Part vice president of Maryland Charter Boat Assc.
Treasurer Rod n Reel Captain Assc.
Commissioner Maryland SportFish
Advisory Commission

Nominee Signature: _____ Date: 7/24/2021

Name: Charles E Green Sr
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

_____ State Director

_____ State Legislator

_____ Governor's Appointee

Tina Berger

Subject: FW: [External] Striped bass need help

From: tim johnson <ballalldaysports@gmail.com>
Sent: Saturday, July 24, 2021 6:26 PM
To: Robert Beal <Rbeal@asmfc.org>
Subject: [External] Striped bass need help

Hello Mr Beal I am a commercial fisherman from Delaware I have been fishing since the 70s through the moratorium up until now and let me tell you sir I am very concerned about the striped bass fishery right now. I know fisherman both commercial and recreational from Delaware to Maine and we are all growing concerned about the populations of striped bass heading towards the mid 80s population levels to the point were we are contemplating taking our own measures and not fishing commercially for a few seasons although me and my buddies alone cannot help is a drastic measure.

My friends who shore cast are telling me from multiple states that the amount of poaching going on primarily from non English speaking people here in the states is off the charts and getting worse by the season, I am sure the covid unemployment times did not help in decreasing the number of people who got into fishing as well as the Biden administration being extra friendly to open border stances the situation will it get worse as a lot of these people either don't care or do not understand sustainable fishing.

We are seeing a drastic decline that we believe can only be solved by another moratorium on striped bass followed by extremely strict measures after it is lifted.

We are not suggesting the banning of targeting these fish by charter captains and Surfcasters but suggesting a temporary investment in canceling all harvest of these fish. The time is overdue for another drastic measure and needs to be done soon before it is to late. Some will be angry and others happy, you can never please everyone, but the compounding of natural elements, poachers and us commercial fisherman taking many breeders as well as the mortality of catch and release fisherman who gut hook the fish or keep them out of water and do a 15 minute photoshoot is getting to an overwhelming unnatural level of stress for these fish and we must invest into their future now.

Thank you for your time.

-Tim

Atlantic States Marine Fisheries Commission

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703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: Tautog Management Board

FROM: Kirby Rootes-Murdy, Senior FMP Coordinator

DATE: July 27, 2021

SUBJECT: Industry feedback on Tautog Commercial Harvest Tagging Program

A Tautog Advisory Panel (AP) meeting was scheduled for June 21 to provide information on the commercial harvest tagging program implemented last year. Only one AP member was in attendance on the call and declined to provide comments. Staff reached out to AP members by email and phone, and received feedback from the following industry members:

Industry Members:
Jim Dawson (Virginia), Captain Mel True (Massachusetts), Denise Wagner (New Jersey), Greg Jackson (Delaware)

Staff recommends that jurisdictions revisit their current AP membership in order to improve attendance and participation. The following are summarized comments provided by industry members who are also Tautog AP members.

How has the commercial harvest tagging program gone so far in your state?

Jim Dawson (VA): Virginia has ignored the request from the commercial fishery and its few fishermen to allow us to fish within the months tautog are available due to climate change issues changing migratory tautog patterns. VMRC staff has held no meetings related to Tautog which is problematic. The current VMRC staff may be great people but they need to do more for commercial fishermen in Virginia. Our season is just Nov 1st until Jan. 22nd and then from March 1st through May 15th. We (commercial harvesters) have constantly requested for our state to review this situation, only to have them give the recreational sector more days without even one day given to our commercial fishery. Commercial harvesters are not the problem. We would like to fish and have the same seasons along with a (60) day closure to protect the "spawning biomass" and have requested this for 10 years + and have the written records to verify this, yet nothing has happen. If VMRC would take away 15 days back from the recreational closure, then the two seasons (commercial and recreational) could be equal, help save spawning tautog for 15 more days, as well as reduce catch by a large amount which also will benefit the overall stock biomass. Virginia should have a closure for a minimum of (60) days starting May 1st ending June 30th for both commercial and recreational fisheries

Greg Jackson (DE): It is going well as far as I know.

Capt. Mel True (MA): There has been a lot of mixed reviews- some harvesters caught on quick and learned how to apply to tags correctly, others did not and there was steep learning curve, handling the fish. Those challenges likely caused some mortality for fish they were hoping to get to a live market.

Any change in the number of commercial tautog commercial harvesters following implementation of the tagging program?

Jim Dawson: I am currently unable to answer this question due to the lack of VMRC participation with advisors at this time. The VMRC staff has not held meetings nor telephone conversations with tautog commercial fishermen and has ignored the requests to do so.

Greg Jackson: I believe DNREC told me fisherman who never reported tautog signed up for the tags.

Capt. Mel True: In Massachusetts, they revoked a whole bunch of permits that weren't being used, but the guys that do it for a living were fine.

Were there enough tags in your state in 2020?

Greg Jackson: Yes

Denise Wagner (NJ): No. they only gave us 50 tags based on our landings…in some instances I could use 50 tags in a half hour of fishing.

Capt. Mel True: Yes. They started me off with 200 tags increased to 500, so I went through a lot of tags

Challenges with applying the tags? Were there any issues with tags adhering to the fish?

Jim Dawson: "Live tautog" tagging during rough weather is a serious problem, especially for those who work either by themselves or with a small crew. Having rules are important, but perhaps there could be a "safe harbor" provision- that allows boats to dock without tagging the fish (still must be tagged before leaving the vessel) but a much higher penalty for those who leave the docks without tagging the fish? In a calm water situation, applying a tag is not an issue, it is just when the waters are rough on a boat that put captains and crew in unsafe situations due to decompression time to prevent barotrauma in tautog intended to be sold in the live market.

Greg Jackson: They were easily applied with just a knife and pliers.

Denise Wagner: it is very time consuming, it really requires an additional crew member to help, without (additional help) it's a very slow process.

Capt. Mel True: Yes, it can be tricky to apply the tags, especially if you have a bigger fish. But after a bit of a learning curve and you a get a routine down, most seemed to stay on the fish well. Still, some do still fall off. Anecdotally, heard of reports of some harvesters waiting until they returned to the dock and applied the tags at the fish house.

Any observed mortality associated with tagged fish?

Jim Dawson: Not enough time nor tags used to this point to give a valuable opinion. We used to keep thousands of fish live, but since the market has been so devastated for multiple reasons, these kinds of questions cannot be answered at this time.

Capt. Mel True: Yes. As mentioned there was a learning curve to reduce mortality.

Was there any change in the market price compared to previous years? If so, what would you attribute the price change was caused by?

Jim Dawson: Prices have gone down due to "invasive species" being shipped in from other countries, primarily species that have been aqua cultured. This has lowered prices below $3/pound! Commercial harvesters cannot fish for less than $6/pound due to expenses over the last 6 years ago. The COVID-19 pandemic further reduced available markets. At the highest point for tautog we once achieved as much as $12/pound before the Chinese New Year, but since then Virginia closed seasons that did not allow us to participate which we feel was unfair and have expressed this at length.

Again the commercial fishery is not the issue, it is the illegal marketing that remains the issue and those that are "invasive" with no enforcement "willing" to be done by those within a position to do so.

Greg Jackson: I couldn't sell hardly any fish last year due to the COVID-19 pandemic. The dealers offered extremely low prices for any fish, restaurants I sold to were closed and my only limited market was basically to a few private people.

Capt. Mel True: The COVID-19 pandemic was an issue, so it's hard to judge anything last year. It wasn't a normal season. In the live market offers a better price than the fresh market, but prices for both were lower than they had been in previous years.

Do you think the tagging program has reduced, or will eventually reduce, the illegal harvest sold into commercial markets?

Jim Dawson: Those making the rules and regulations need to listen to those in the industry, which not happened to date. The tagging program is problematic because the tags can be easily removed. Related there should be more enforcement to accomplish the goal of eliminating illegal harvest. If I were in charge, I would eliminate the importation and sale of invasive species and then start by actually "tracking" the tagged fish. The issue is not simply the illegal harvest, but markets that's are willing to buy illegally harvested fish; that is a big problem that needs to be addressed.

Separately, VMRC cut our commercial season to basically Winter fishing in nothing but bad weather and limiting what kinds of bait we could use…nothing bait wise is available during our season…no crabs! No fishermen fishing for them either! It is terrible in Virginia! I have been forced to stop fishing by too many regulatory measures for something our state doesn't even land? Can we get some help? I am calling for "hardship" 100% at this point! Nobody will listen and nobody seems to care.

Denise Wagner: Finds it hard to believe that tagging program is preventing or stopping the illegal market; if you are a law abiding citizen, you're doing the right thing and for those that want to illegally harvest tautog, tagging won't prevent them from selling to certain markets.

Capt. Mel True: I think the people who are going to poach are still going to poach regardless of whether there is a tagging program or not. Because of this, more law enforcement is needed. If no one's at the dock, there's little deterrent to keep people from applying the tags after the fish have left the boat.

Personally, (Capt. Mel True) doesn't see the value in tagging a fish after its been in the live well. Waiting to tag may further stress the fish out and induce mortality; just apply the tag while your at sea.

What was the level of enforcement or monitoring of commercial harvesters and live fish markets (for those states that have them)?

Jim Dawson I did see a few law enforcement officers check recreational fishermen, but they did not go far enough. Fish kept "live" are contained and retained in "live wells". There should be no reason to keep fish "live" on a "recreational" fishing vessel.

Fish found "live" on a recreational fishing vessel should be fined immensely to stop 100% of the "illegal" tautog market. Live tautog are for "commercial sales ONLY"! We commercial fishermen have been stating this for 20 years on record which can be checked! We MUST also have a "federal tautog permit" to go along with our state permits or the "transport clause" will in fact supersede ANY state laws according to Jack Travelstead ages ago. Having a "state quota" he stated would not work due to tautog being landed totally legal by a federal trawl vessel since there are no current laws that can stop a trawler from landing federally caught tautog within the EEZ. He stated that "legally there would be nothing that Virginia could do and ANY quota Virginia may have, could be caught "legally" without enforcement having the ability to stop them because that is NOT within their own jurisdiction, it would be thrown out of court". This ALSO means that whatever the ASMFC may wish to impose, does NOT apply to federally caught fish "when transport laws" allow a fishing vessel to land as long as they do not stop to fish within state waters. Same goes for fish caught in Virginia waters can be landed in Maryland even though Maryland may be closed, they were "legally" caught in Virginia, "transport laws" allow a fisherman to land in a port as long as they do not stop. This again came from a person of the highest status within each council and committee, so I believe what he said…correct me and prove to me that is not true here in Virginia. One thing for sure is: We NEED to discuss EVERYTHING in far greater detail if we wish to help the species as well as the issues of "illegal marketing"!

Greg Jackson: Unknown I was not checked at the dock or on the water last year. I usually am checked several times at the dock or on the water. This may have been related to the COVID-19 pandemic.

Capt. Mel True: Law Enforcement knows who to keep an eye on in terms of any suspicious harvesters or behavior, but in general, the not tagging the fish immediately opens up opportunities for fish to be sold to illegal harvest and markets. Once a fish gets sold to a fish house, its hard to keep track of where the fish go to unless the fish had been tagged and the tag stays on. Points out that there was a definitely a percentage of fish where after they were tagged, the tag came off in the tank; during transport; etc.

Any recommendations or considerations for managers in continuing the tagging program?

Jim Dawson: VMRC staff should continue to engage with commercial tautog harvesters-keeping "in touch" would go a long way and be appreciated. We in the industry see a lot of what happens on the water it's important for collaborative partnerships between managers and industry to make fisheries management work better.

Greg Jackson: I would like to see an individual quota in DE for those that previously reported fish prior to some date in the 1990s when they started managing tautog. I was nominated for the advisory panel back then because I had reported around 400 lbs one year and that was 85% of the fish reported in DE for that year. I know for a fact that DE did not get credit for

commercially harvested tautog. I used to buy lobsters from the pot fisherman and they had several hundred lbs of tautog on board each time I met with them at the dock. Basically the fish weren't reported and DE didn't get the commercial % of the coast wide quota we should have. I know this is a different issue but DE should have several % of the coast wide quota and not be considered *de minimis* for commercial purposes for tautog. Tautog fisherman in DE with an individual quota should not be limited to the recreational creel limit and only be limited by their quota and applicable size limit.

Capt. Mel True: I am curious how (managers and law enforcement) feel about the tagging program. Is the hassle worth the management effort? The applicators are definitely an additional expense, but to stay compliant and do what is needed to stay legal, I'd do whatever I need to do.

If there are undersized fish being caught they (law enforcement) likely won't see it at the port, they will turn up in the market. And I think there will always be some legal of poaching/illegal harvest occurring.

The mortality associated with tagging is a real concern, given the price difference between the live and fresh market; if 10% of your catch dies from tagging, that could make a significant impact to your revenue given the lower price in fresh markets.

Other comments

Jim Dawson: Our country MUST find a way to "work together" without each one of us being "divided" because we honestly HAVE the same goals…True fishermen want to save the fish for their fishing families, but ALL SCIENCE must be used in evaluating and those of us left must make it understood that as expenses keep rising; limits and seasons along with losing markets to illegal markets and under-the-table recreational fishermen willing to fish for just gas money or illegal live fish from other countries have driven the tautog fishermen to fishing for other species currently that are far more profitable.

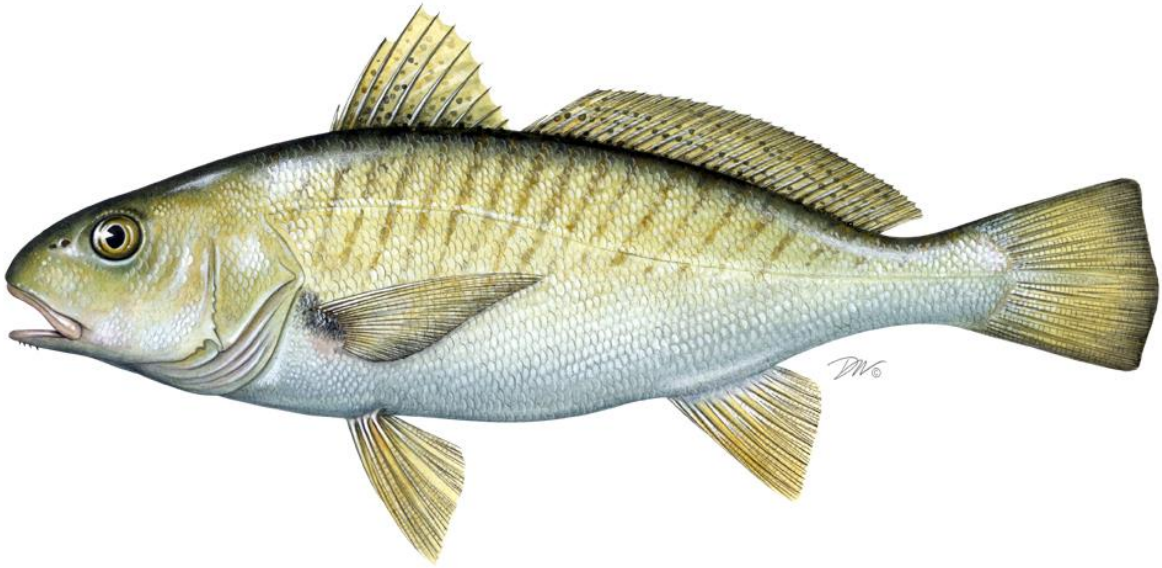
I would like to request that each item that I have gone over will get the time necessary to actually do something and not just discussed by managers. I have understood what ASMFC and others are about, but they also MUST understand what "actually" goes on and what we commercial fishermen are actually witnessing! We NEED that respect and things will flow and we can achieve a GREAT working relationship as long as the corruption can be removed. We are honestly on the SAME wavelength if we can understand and compromise "together"!

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC CROAKER
(Micropogonias undulatus)

2020 FISHING YEAR



Prepared by the Plan Review Team
Drafted July 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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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 Addendum III – February 2020
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 (TC) 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 was 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 initiated an Addendum III to incorporate these updates.

In February 2020 the Board approved Addendum III to Amendment 1 of the Atlantic Croaker FMP. This addenda adjusted the TLA to incorporate additional fishery-independent indices, age information, use of regional characteristics, and changes to the management triggering mechanisms. Management triggers and responses include bag limits for the recreational fishery and percentage harvest reductions from a 10 year average for the commercial fishery. The response will be defined by which percent threshold (30% or 60%) that was exceeded in any of the 3 out of 4 terminal years.

Addenda III did not add or change any management measures or requirements, unless management-triggering mechanisms are tripped. The only pre-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. The Peer Review Panel did not indicate problems in the Atlantic croaker fishery that would require immediate management action but 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 recent abundance indices have shown increases while harvest has declined to some of the lowest levels on record. One factor thought 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, the Atlantic Croaker TC recommended several changes to the annual TLA through Addendum III. The addendum added indices from the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and the South Carolina Department of Natural Resources (SCDNR) Trammel Net Survey into the adult composite characteristic index. In addition, all surveys used revised adult abundance indices and not have an established reference period of 2002-2012. Regional metrics where also used to characterize the fisheries north and south of the Virginia-North Carolina state line. The ChesMMAP and the NEFSC surveys will be used to characterize abundance north of the state line, and SCDNR Trammel Net and SEAMAP surveys will be used to characterize abundance south of the state line.

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 2020 is estimated at 5 million pounds (Tables 2 and 3, Figure 1). This represents a 30% increase in total harvest from 2019 (3.8 million pounds). The commercial and recreational fisheries harvested 16% and 83% of the 2020 total, respectively. This represents a large shift from the previous 10 year average spilt, of 52% and 47%, respectively, from 2010 to 2019. For 2020 recreational harvest data, many states had to have some data imputed from prior years due to interruptions in sampling from COVID-19 (Table 4).

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; however, landings have declined every year since 2010 to 806,000 pounds in 2020, the lowest of the time series (1950-2020). This represents a 58% decrease from 2019. Within the management unit, the majority of 2019 commercial landings came from North Carolina (70%) and Virginia (18%).

From 1981-2020, recreational landings of Atlantic croaker from New Jersey through Florida have varied by count between 5.6 million fish and 36.2 million fish and by weight between 1.8

million pounds and 18.9 million pounds (Tables 5 and 6, Figure 2). Landings generally increased from 1990 until 2003, after which they showed a declining trend through 2019. The 2020 landings are estimated at 10.6 million fish and 4.1 million pounds, a 91% increase in number of fish and a 121% in fish weight. Virginia was responsible for 58% of the 2020 recreational landings, in numbers of fish, followed by Florida (25%). It is important to note that due to the COVID-19 pandemic, some MRIP data was imputed to fill in missing data. The percent contribution of imputed data ranged from 0% for Maryland up to 70% for New Jersey (Table 4).

The number of recreational releases generally increased over the time series until 2013 when releases steadily declined, until reaching a five year high in 2020 (Figure 2). The percentage of released recreational catch has shown a slight increasing trend from the 1990s until 2020. In 2020, anglers released 31.7 million fish, an increase from the 19.6 million fish released in 2019 but slightly less than 2019 of the overall percentage of total fish caught. Anglers released an estimated 75% of the recreational croaker catch in 2020, slightly lower than the highest percentage on record in 2019 at 78% (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 benchmark stock assessment conducted in 2017 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. 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. Currently, a Traffic Light Approach (TLA) is used to monitor the stock and make management decisions in lieu of an approved stock assessment. The TLAs can be found here.

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. New Jersey, Delaware, Maryland, Potomac River Fisheries Commission (PRFC), Virginia, North Carolina, South Carolina, and Georgia conduct fishery-dependent (other than catch and effort data) monitoring programs. All states and jurisdictions conduct fishery-independent monitoring programs along the Atlantic coast from New Jersey to Florida.

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. Since 1994, there has been an increase in annual catch variability. The NEFSC survey was not carried out in 2020 due to the COVID-19 pandemic.

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. Addendum III was approved February 2020 and adjusted management though the TLA by incorporating additional fishery-independent indices, age information, use of regional characteristics, and changes to the management-triggering mechanisms.

Traffic Light Approach

2020 Harvest Metrics

The Mid-Atlantic harvest metric has triggered at 60% red threshold in three of the four terminal years (2018-2020; Figure 3) and the South Atlantic harvest metric has triggered at 30% red threshold in all four terminal years (2017-2020; Figure 4). This is the second consecutive year the harvest metric in both region has triggered at least at the 30% threshold. Due to the impacts of COVID-19 and survey recalibration, there were significant impacts on data availability. See the 2020 TLA report for a more detailed discussion.

2020 Abundance Metrics

While the adult abundance metrics could not be accurately calculated due to missing 2020 data, Addendum III specifies TLA trigger based on the four terminal years so assumptions can still be made regarding abundance. For the Mid-Atlantic, two of the four terminal years triggered at 30% red (2017-2018) while two of the four are unknown (2019-2020; Figure 5). The Mid-Atlantic adult abundance metric did trigger at the 30% threshold during the 2019 TLA. For the South Atlantic, three of the four terminal years (2017-2019) did not trigger at any level and therefore the 2020 data would not change status regardless of its value (Figure 6). The South-Atlantic adult abundance metric did not trigger during the 2019 TLA.

Conclusions

The harvest triggered in both the Mid-Atlantic (60% threshold) and South Atlantic (30% threshold) in 2020 indicating continued concern. The abundance did not trigger at any level for

the South Atlantic and although the last two years are undetermined for the Mid-Atlantic due to missing 2020 data; the two years that are available are below the 60% threshold. Regardless, the previous TLA indicated that the Mid-Atlantic triggered at 30%. Addendum III requires management action taken in 2021 to remain in place for a minimum of three years (through and including the 2023 season). The Atlantic croaker remains triggered at the 30% threshold and the TC recommended maintaining management enacted in 2021.

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. Addendum III, depending on the level of management action triggered, has exemptions for *de minimis* states when measures a triggered at the 30% level (see above for the TLA description). If the TLA tigers at the 60% level, then all states, including *de minimis*, must implement management measures.

In the annual compliance reports, the following states requested *de minimis* status: New Jersey (commercial and recreational), Delaware (recreational and commercial fishery), South Carolina (commercial fishery), Georgia (commercial fishery). The commercial and recreational *de minimis* criteria for 2020 are based on 1% of the average coastwide 2017-2019 landings in each fishery. The Delaware, South Carolina, and Georgia commercial fisheries all qualify for *de minimis* status, but landings are confidential.

Changes to State Regulations

In 2020, the TLA triggered management measures at the 30% level, or moderate concern. Non *de minimis* states were required to implement management measures that instituted a 50 fish recreational bag limit and reduce the commercial harvest by 1% of the average state commercial harvest from the previous 10 years. If the state had more restrictive measures in place, they did not need to make any changes. All proposed management changes were reviewed by the Technical Committee and approved by the Board. Below is a list of states that are implementing measures in 2021:

- Virginia: 50 fish bag limit, charter allowance, and commercial fishery season closure from January 1 to January 15. Approved on March 23, 2021.
- North Carolina: 50 fish bag limit and a commercial fishery season closure from December 16 to December 31. Proclamation authority.
- Florida: 50 fish bag limit and a commercial vessel limit of 1,200 pounds in state waters. Will be voted on in August 2021.

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 (Figure 7). 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 bait 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 2020

The PRT found no inconsistences among states with regard to the requirements of Amendment 1 and Addendum III.

VIII. Recommendations

Management and Regulatory Recommendations

- Consider approval of the *de minimis* requests from New Jersey, Delaware, South Carolina, and Georgia for their commercial fisheries.
- Consider approval of the *de minimis* requests from New Jersey and Delaware for their recreational fisheries.
- Research into the impacts of climate change on the range of the species.

Research and Monitoring Recommendations

Additional research and monitoring recommendations can be found in the 2016 Atlantic Croaker Stock Assessment Peer Review Report here under Term of Reference 8.

IX. References

Atlantic States Marine Fisheries Commission (ASMFC). 1987. Fishery Management Plan for Atlantic Croaker. Washington (DC): ASMFC. Fishery Management Report No. 10. 90 p.

ASMFC. 2005a. Atlantic Croaker Stock Assessment & Peer Review Reports. Washington (DC): ASMFC. 370 p.

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

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

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

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

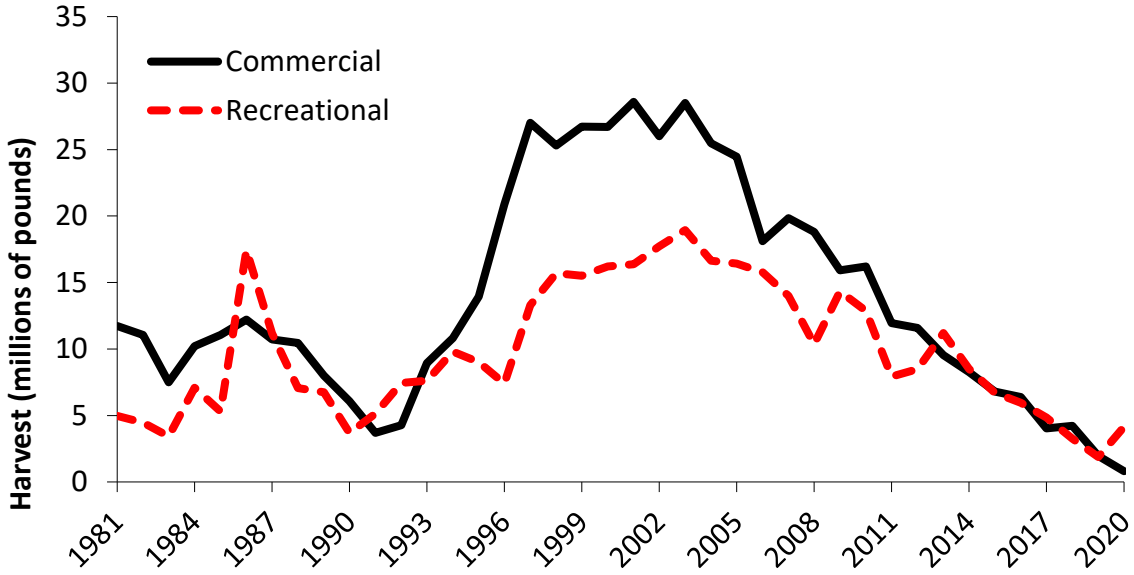

Figure 1. Atlantic croaker commercial and recreational landings (pounds) from 1981-2020. (See Tables 2 and 3 for source information. Commercial landings estimate for 2020 is preliminary. Reliable recreational landings estimates are not available prior to 1981. Recreational landings estimates are based on the mail-based Fishing Effort Survey.)

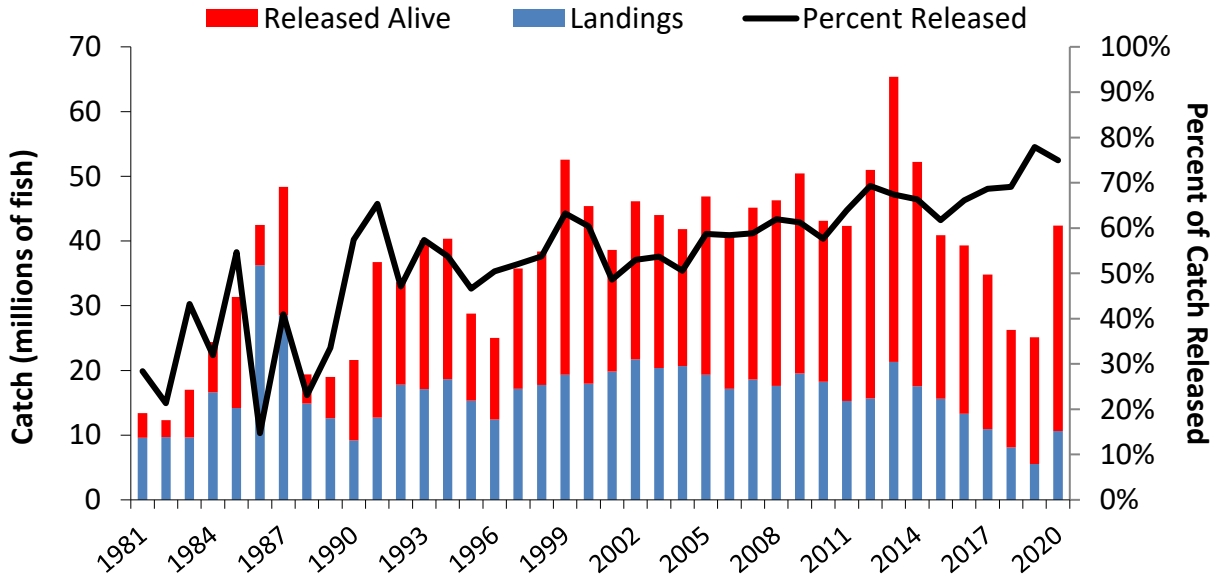

Figure 2. Recreational catch (landings and alive releases, in numbers) and the percent of catch that is released, 1981-2020, based on the mail-based Fishing Effort Survey calibration. (See Tables 4 and 5 for values and source information.)

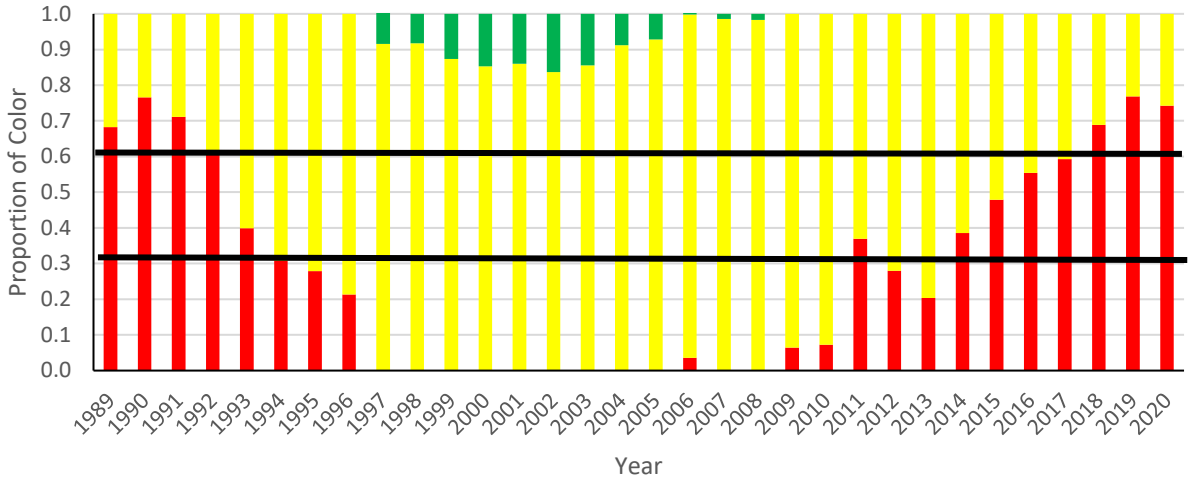

Figure 3. Annual color proportions for harvest composite TLA of Mid-Atlantic region (NJ-VA) for Atlantic croaker recreational and commercial landings using a 2002-2012 reference period

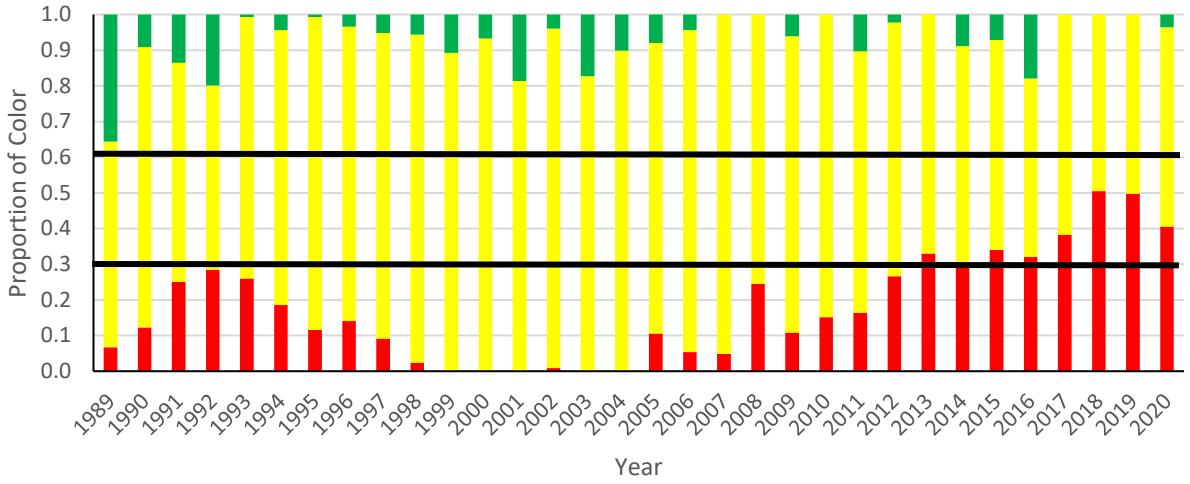

Figure 4. Annual color proportions for harvest composite TLA of South Atlantic region (NC-FL) for Atlantic croaker recreational and commercial landings using a 2002-2012 reference period

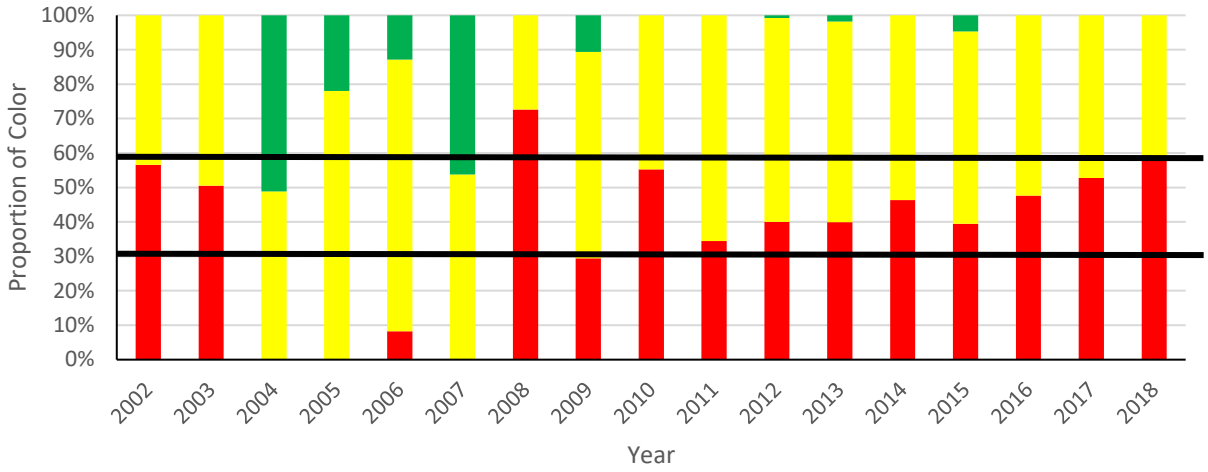

Figure 5. Adult (age 2+) Atlantic croaker TLA composite characteristic index for the Mid-Atlantic (NJ-VA; NEFSC and ChesMMAP surveys). This figure is unchanged from last year due to the recalibration effort of ChesMMAP.

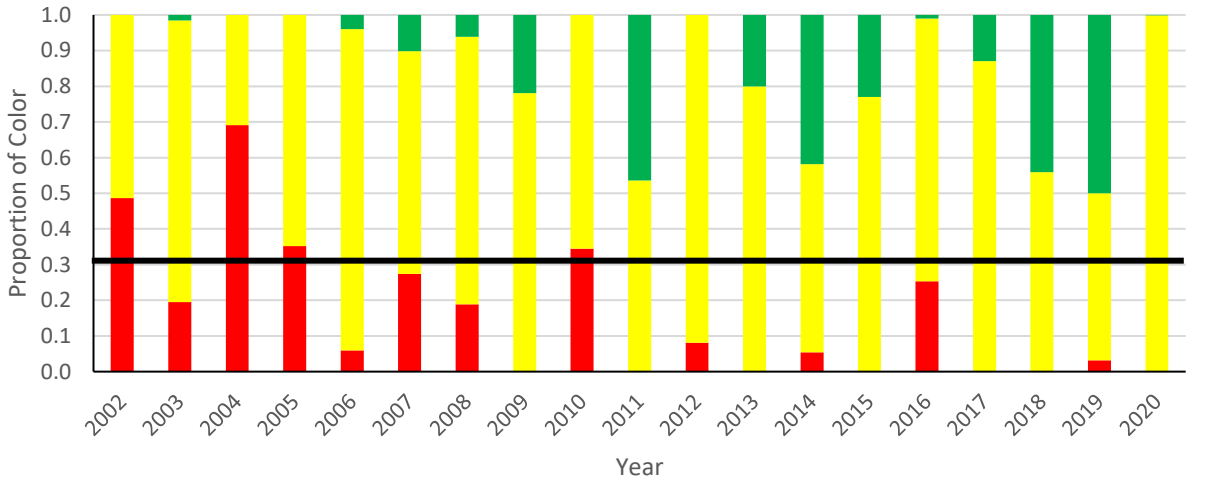

Figure 6. Adult (age 2+) Atlantic croaker TLA composite characteristic index for the South Atlantic (NC-FL; SEAMAP and SCDNR trammel survey)

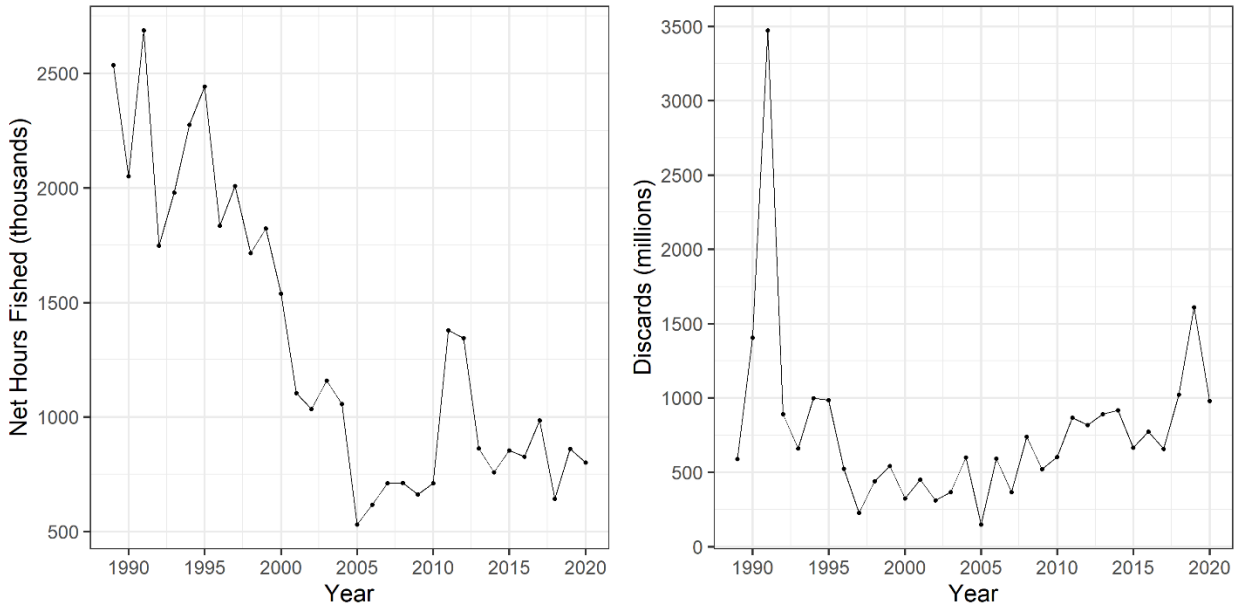

Figure 7. Total net hours fished (left) and discards of Atlantic croaker (right) in the South Atlantic Shrimp Trawl Fishery.

XI. Tables

Table 1. Summary of state regulations for Atlantic croaker in 2020.

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	none
SC	mandatory for-hire logbooks, small Sciaenidae species aggregate bag limit of 50 fish/day	none
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, 2011-2020.
(Estimates for 2020 are preliminary. Sources: 2021 state compliance reports for 2020 fishing year and for years prior to 2020, personal communication with ACCSP, Arlington, VA, except PRFC [compliance reports only].) Note that Georgia does not have a commercial fishery for Atlantic croaker.

Year	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
2011	C	C	714,347	243,196	5,415,432	5,054,186	C		47,649	11,933,396
2012	C	C	915,432	273,849	6,842,005	3,106,616	C		74,527	11,582,978
2013	C	C	820,777	130,285	6,237,602	1,927,938	C		76,463	9,538,901
2014	265,166	C	443,661	177,777	4,697,381	2,629,908	C		45,587	C
2015	C	C	294,038	118,996	4,426,957	1,819,007	C		39,096	6,784,146
2016	C	C	101,949	168,889	3,825,737	2,092,287	C		57,538	6,302,799
2017	C	C	42,958	114,319	2,822,005	1,008,015	C		43,033	4,032,993
2018	C	C	44,306	16,561	2,450,984	1,643,646	C		54,409	4,210,715
2019	C	C	2,865	C	595,434	1,278,340	C		68,179	1,945,723
2020	C	C	1,857	601	147,026	570,453	C		84,906	806,781

C: Confidential data

Table 3. Recreational harvest (pounds) of Atlantic croaker by state, 2011-2020. (Sources: 2021 state compliance reports for 2020 fishing year and for years prior to 2020, personal communication with ACCSP, Arlington, VA)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
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	11,200,818
2014	750,580	427,615	1,265,217	4,354,046	758,751	104,434	138,423	712,090	8,511,554
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	26,441	238,659	3,383,057	237,160	310,621	100,565	555,389	4,851,892
2018	34,125	5,859	191,854	2,245,518	164,644	81,251	83,258	445,663	3,252,172
2019	973	23,973	38,895	995,491	224,337	133,227	97,791	358,941	1,873,628
2020	16,358	21,870	91,047	2,410,612	223,685	230,205	77,876	1,072,714	4,144,367

Table 4. Contribution of imputed harvest rate data from 2018 and 2019 for 2020 MRIP harvest estimates of Atlantic croaker.

State	2020 Harvest (A+B1) Total Weight (lb)	PSE	Contribution of Imputed Data to Total Harvest Rate
NEW JERSEY	16,358	60.6	70%
DELAWARE	21,870	26.8	33%
MARYLAND	91,047	36.9	0%
VIRGINIA	2,410,612	20.2	50%
NORTH CAROLINA	223,685	20.6	21%
SOUTH CAROLINA	230,205	19.1	2%
GEORGIA	77,876	41.4	13%
FLORIDA	1,072,714	27.5	3%

Table 5. Recreational harvest (numbers) of Atlantic croaker by state, 2011-2020. (Sources: 2021 state compliance reports for 2020 fishing year and for years prior to 2020, personal communication with ACCSP, Arlington, VA)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
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	21,328,324
2014	852,733	806,256	2,197,125	9,533,829	1,935,961	600,482	289,781	1,359,207	17,576,096
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	65,606	423,790	7,644,516	666,930	765,227	371,301	969,146	10,906,516
2018	104,321	12,370	305,469	5,472,329	472,917	335,833	241,382	1,176,999	8,121,620
2019	3,031	53,048	69,771	3,055,510	651,268	593,475	332,073	801,751	5,559,927
2020	58,097	54,193	244,788	6,529,494	673,377	827,904	232,535	2,010,168	10,630,556

Table 6. Recreational releases (number) of Atlantic croaker by state, 2011-2020. (Sources: 2021 state compliance reports for 2020 fishing year and for years prior to 2020, personal communication with ACCSP, Arlington, VA)

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
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	35,334,824
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	44,025,744
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	230,455	2,829,255	8,464,305	4,631,445	4,755,853	1,059,539	1,770,846	23,894,238
2018	144,637	85,424	203,081	5,359,179	4,311,368	5,568,892	1,403,560	1,072,381	18,148,522
2019	33,333	101,523	1,243,785	6,642,685	3,634,211	3,768,288	1,893,287	2,259,705	19,576,817
2020	147,494	286,780	2,870,268	6,223,025	5,560,605	12,921,019	1,696,852	2,057,158	31,763,201

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June 21, 2021

Ms. Savannah Lewis
Fishery Management Plan Coordinator, Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201

RE: Florida FWC Commercial Atlantic Croaker Implementation Plan Proposal

Dear Ms. Lewis:

This letter serves to provide you with the Florida Fish and Wildlife Conservation Commission (FWC) Division of Marine Fisheries Management's (DMFM) plan to implement provisions of Addendum III to Amendment I to the Interstate Fishery Management Plan for Atlantic Croaker. It is our understanding that Florida will be asked to implement commercial reductions for Atlantic croaker in the upcoming year based on Florida no longer qualifying for *de minimis* status for this fishery. We offer this proposal in advance to supplement the spot and Atlantic croaker implementation plan previously approved (enclosed). For Atlantic croaker on Florida's Atlantic coast, FWC proposes to implement a commercial vessel limit to achieve the 1% commercial landings reduction in the same manner as previously approved for spot. The following text provides more details and justification for the proposed implementation plan, including data used in the analyses. Please contact Derek Cox (derek.cox@myfwc.com or (561) 882-5727) with any questions.

Commercial Reduction

Florida does not currently have species-specific regulations for commercial harvest of Atlantic croaker on the Atlantic coast.

To reduce commercial landings by 1% of Florida's 2010-2019 average commercial landings from both state and federal waters, DMFM will propose FWC establish a vessel limit for Atlantic croaker in state waters along Florida's Atlantic coast from the Florida-Georgia border through Miami-Dade County. DMFM determined a vessel limit to be the most appropriate management action as commercial landings of Atlantic croaker vary dramatically from year to year and often a handful of trips with very large landings make up a considerable proportion of the annual landings.

These regulations should achieve the total landings reduction, and applying these regulations in state waters only will help prevent dead discards that would result if extended into federal waters where the predominate gears used on trips with large landings are gill nets and trawls.

Specifically, DMFM will propose FWC establish a commercial vessel limit of 1,200 pounds for Atlantic croaker in Atlantic state waters.

The justifications for the proposed vessel limits based on FWC analyses follow:

Annual commercial landings from 2010-2019 averaged 53,696 pounds. To meet the 1% reduction, annual commercial landings need to decrease by 537 pounds (Table 1). Applying a 1,200-pound vessel limit for harvest in state waters to the 10 years of

landings data results in an average annual reduction of 567.5 pounds (Table 2), exceeding the 1% reduction specified under Addendum III to Amendment I to the Interstate Fishery Management Plan for Atlantic Croaker.

Table 1: Annual commercial landings of Atlantic croaker from Florida's Atlantic coast, 2010-2019, with the average and 1% of the average calculated for the reduction.

Year	Atlantic croaker Commercial Landings (lbs.)
2010	36,960
2011	44,977
2012	74,023
2013	71,448
2014	45,321
2015	37,115
2016	55,154
2017	42,394
2018	54,437
2019	75,130
Total	536,958
10-year average	53,696
1% of 10-year average	**537**

Table 2: Expected reduction to average annual Florida Atlantic coast landings of Atlantic croaker under varying commercial vessel limits. Highlighted row indicates the proposed limit.

Proposed Vessel Limit (lbs.)	Average Annual Reduction (lbs.)	Average Annual Reduction (%)
1,000	784.7	1.46
1,200	**567.5**	**1.06**
1,500	345.1	0.64

Timeline for Implementation

Once approved by ASMFC, FWC DMFM will propose the changes outlined above, as well as those previously approved, at the August 2021 FWC Commission meeting as the means to comply with provisions of the Spot and Atlantic Croaker interstate fishery management plans. If approved by FWC Commissioners, the rule could go into effect January 1, 2021. A copy of draft rule language is enclosed.

Sincerely,

Erika A Burgess

Erika Burgess
Section Leader, Division Marine Fisheries Management

Enclosures:

1. Florida FWC Spot and Atlantic Croaker Implementation Plan Proposal, February 18, 2021
2. Draft rule language for Atlantic croaker

DRAFT FOR BOARD REVIEW

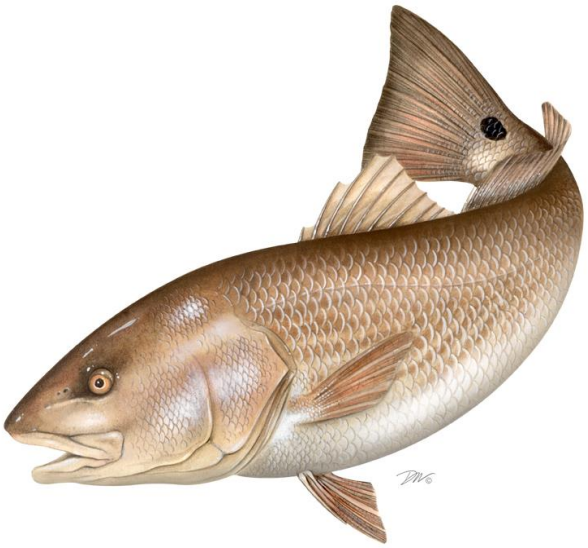
ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR

RED DRUM
(*Sciaenops ocellatus*)

2020 FISHING YEAR



Prepared by the Plan Review Team
Drafted July 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT FOR BOARD REVIEW

Table of Contents

I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – October 1984
Amendments & Addenda:	Amendment 1 – October 1991 Amendment 2 – June 2002 Addendum 1 – August 2013
Management Areas:	The Atlantic coast distribution of the resource from New Jersey through Florida Northern: New Jersey through North Carolina Southern: South Carolina through the east coast of Florida
Active Boards/Committees:	Sciaenids Management Board, Red Drum Technical Committee, Stock Assessment Subcommittee, Plan Development Team, Plan Review Team, South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an Interstate Fishery Management Plan (FMP) for Red Drum in 1984. The original management unit included the states from Maryland to Florida. In 1988, the Interstate Fisheries Management Program (ISFMP) Policy Board requested that all Atlantic coastal states from Maine to Florida implement the plan's recommended management regulations to prevent development of northern markets for southern fish. The states of New Jersey through Florida are now required to follow the FMP, while Maine through New York (including Pennsylvania) are encouraged to implement consistent provisions to protect the red drum spawning stock.

In 1990, the South Atlantic Fishery Management Council (Council) adopted a FMP for red drum that defined overfishing and optimum yield (OY) consistent with the Magnuson Fishery Conservation and Management Act of 1976. Adoption of this plan prohibited the harvest of red drum in the exclusive economic zone (EEZ), a moratorium that remains in effect today. Recognizing that all harvest would take place in state waters, the Council FMP recommended that states implement measures necessary to achieve the target level of at least 30% escapement.

Consequently, ASMFC initiated Amendment 1 in 1991, which included the goal to attain optimum yield from the fishery over time. Optimum yield was defined as the amount of harvest that could be taken while maintaining the level of spawning stock biomass per recruit (SSBR) at or above 30% of the level which would result if fishing mortality was zero. However, a lack of information on adult stock status resulted in the use of a 30% escapement rate of sub-adult red drum to the off-shore adult spawning stock.

Substantial reductions in fishing mortality were necessary to achieve the escapement rate; however, the lack of data on the status of adult red drum along the Atlantic coast led to the adoption of a phase-in approach with a 10% SSBR goal. In 1991, states implemented or maintained harvest controls necessary to attain the goal.

As hoped, these management measures led to increased escapement rates of juvenile red drum. Escapement estimates for the northern region of New Jersey through North Carolina (18%) and the southern region of South Carolina through Florida (17%) were estimated to be above the 10% phase-in goal, yet still below the ultimate goal of 30% (Vaughan and Carmichael 2000). North Carolina, South Carolina, and Georgia implemented substantive changes to their regulations from 1998-2001 that further restricted harvest.

The Council adopted new definitions of OY and overfishing for red drum in 1998. Optimum yield was redefined as the harvest associated with a 40% static spawning potential ratio (sSPR), overfishing as a sSPR less than 30%, and an overfishing threshold as 10% sSPR. In 1999, the Council recommended management authority for red drum be transferred to the states through the Commission's Interstate Fishery Management Program (ISFMP) process. This was recommended, in part, due to the inability to accurately determine an overfished status, and therefore stock rebuilding targets and schedules, as required under the revised Sustainable Fisheries Act of 1996. The transfer necessitated the development of an amendment to the interstate FMP in order to include the provisions of the Atlantic Coastal Fisheries Cooperative Management Act.

ASFMC adopted Amendment 2 to the Red Drum FMP in June 2002 (ASMFC 2002), which serves as the current management plan. The goal of Amendment 2 is to achieve and maintain the OY for the Atlantic coast red drum fishery as the amount of harvest that can be taken by U.S. fishermen while maintaining the sSPR at or above 40%. There are four plan objectives:

- Achieve and maintain an escapement rate sufficient to prevent recruitment failure and achieve a sSPR at or above 40%.
- Provide a flexible management system to address incompatibility and inconsistency among state and federal regulations which minimizes regulatory delay while retaining substantial ASMFC, Council, and public input into management decisions; and which can adapt to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups or by area.
- Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the red drum resource and evaluate management efforts.
- Restore the age and size structure of the Atlantic coast red drum population.

The management area extends from New Jersey through the east coast of Florida, and is separated into a northern and southern region at the North Carolina/South Carolina border. The sSPR of 40% is considered a target; a sSPR below 30% (threshold level) results in an overfishing determination for red drum. Amendment 2 required all states within the management unit to implement appropriate recreational bag and size limit combinations needed to attain the target sSPR, and to maintain current, or implement more restrictive, commercial fishery regulations. All states were in compliance by January 1, 2003. See Table 1 for state commercial and recreational regulations in 2020.

Following the approval of Amendment 2 in 2002, the process to transfer management authority to ASMFC began, including an Environmental Assessment and public comment period. The final rule became effective November 5, 2008. It repeals the federal Atlantic Coast Red Drum Fishery Management Plan and transfers management authority of Atlantic red drum in the exclusive economic zone from the South Atlantic Fishery Management Council to the Atlantic States Marine Fisheries Commission.

The Board approved Addendum I to Amendment 2 in August 2013. The Addendum revised the habitat section of Amendment 2 to include current information on red drum spawning habitat and life-stages (egg, larval, juvenile, sub-adult, and adult). It also identified and described the distribution of key habitats and habitats of concern.

II. Status of the Stocks

The 2017 Red Drum Stock Assessment and Peer Review Report indicate overfishing is not occurring for either the northern or southern stock of red drum (ASMFC 2017). The assessment was unable to determine an overfished/not overfished status because population abundance could not be reliably estimated due to limited data for the older fish (ages 4+). Currently, a simulation assessment is ongoing, with a planned benchmark assessment to follow; all work will be completed in 2024.

Northern Region (NJ-NC)

Recruitment (age 1 abundance) has varied annually with a large peak occurring in 2012 (Figure 1). The trend in the three-year average sSPR indicates low sSPR early in the time series with increases during 1991 – 1997 and fluctuations thereafter (Figure 2). The average sSPR has been above the overfishing threshold ($F_{30\%}$) since 1994, and at or above the target ($F_{40\%}$) since 1996, except during one year (2002). Fishing pressure and mortality appear to be stabilized near the target fishing mortality. The average sSPR is also likely above the target benchmark.

Southern Region (SC-FL)

Recruitment (age 1 abundance) has fluctuated without apparent trend since 1991 (Figure 1). A high level of uncertainty exists around the three-year average sSPR estimates for the southern region. While the 3-year average sSPR estimate in 2013 was above both the target ($F_{40\%}$) and the overfishing threshold ($F_{30\%}$), indicating that overfishing is not occurring, the high level of uncertainty around this estimate indicates that this conclusion should be considered with extreme caution (Figure 2).

NOTE: In 2018, the Marine Recreational Information Program (MRIP) transitioned from estimating effort using the Coastal Household Telephone Survey (CHTS) to the mail-based Fishing Effort Survey (FES). The 2017 stock assessment used CHTS data to estimate recreational harvest. However, as red drum is not managed by a quota and to accommodate the transition, recreational harvest estimates based on the FES data or calibration are shown in this report. Due to differing estimation methodologies, these harvest data should not be compared to reference points from the 2017 stock assessment. Harvest estimates based on

either effort survey can be compared at:
https://www.st.nmfs.noaa.gov/st1/recreational/queries/.

III. Status of the Fishery

Red drum landings from New Jersey through the east coast of Florida in 2020 are estimated at 6 million pounds (Tables 3 and 4, Figure 3). In 2020, 56% of the total landings came from the southern region where the fishery is exclusively recreational, and 44% from the northern region (Figure 4). These shifts are a significant change from the 2019 regional landings split, which were 20% from the northern region and 80% from the southern region.

Northern Region (NJ-NC)

Red drum landings in the northern region totaled 2.7 million pounds. This is roughly a 1.7 million increase, or 170%, compared to 2019 landings (Table 2). There was an increase in both commercial and recreational landings. Commercial landings totaled 173,659 or 7% of the combined commercial and recreational harvest in the northern region, with 95% of commercial landings coming from North Carolina (Figure 5). This is a 199% increase in commercial landings from 2019; it is important to note that 2019 landings were the lowest commercial landings on record since 2004. In North Carolina, a daily commercial trip limit and an annual cap of 250,000 pounds with payback of any overage constrained the commercial harvest. Unique to this state, the red drum fishing year extends from September 1 to August 31. In 2008, the Board approved use of this fishing year to monitor the cap. During the 2019/2020 fishing year, North Carolina landed 54,175 pounds of the 250,000 pound annual landings cap.

Recreational landings were estimated to be 2.5 million pounds in the northern region, a 173% increase from 2019 estimates (Table 4). North Carolina is estimated to have 1.8 million pounds of recreational landings, followed by Virginia with 610,000 lbs. The number of fish caught in the recreational fishery was 672,956 fish, up 120% from 2019 (Table 5). The number of fish released was similar to 2019 at 3.6 million fish released in the northern region (Figure 6). It is estimated that 8% of released fish die as a result of being caught, resulting in an estimated 289,611 dead discarded fish in 2020 (Table 6). Recreational removals from the fishery are thus estimated to be 962,000 fish in 2020 (Figure 6 & 7).

Southern Region (SC-FL)

The southern region had no commercial landings; Florida commercial harvest has been prohibited since January 1988. South Carolina and Georgia designated red drum as a gamefish, banning commercial harvest and sale since 1987 and 2013, respectively.

Recreational landings were estimated to be 3.3 million pounds in the southern region, a 13% decrease from 2019 estimates (Table 4). Florida is estimated to have 2.1 million pounds of recreational landings, followed by South Carolina with 671,000 lbs. The number of fish caught in the recreational fishery was 1 million fish, down 14% from 2019 (Table 4). The number of fish released also declined compared to those in 2019 with 5.3 million fish released in the southern region in 2020 (Figure 6). It is estimated that 8% of released fish die as a result of being caught,

resulting in an estimated 420,234 dead discarded fish in 2020 (Table 6). Recreational removals from the fishery are thus estimated to be 1.5 million fish in 2020 (Figure 6 & 7).

IV. Status of Assessment Advice

Current stock status information comes from the 2017 stock assessment (ASMFC 2017) completed by the ASMFC Red Drum Stock Assessment Subcommittee (SAS) and Technical Committee (TC), peer reviewed by an independent panel of experts through ASMFC's desk review process, and approved by the South Atlantic State-Federal Fisheries Management Board for use in management decisions. Previous interstate management decisions were based on the last coastwide assessment, SEDAR 18 (SAFMC 2009), and prior to 2009, decisions were based on regional assessments conducted by Vaughan and Helser (1990), Vaughan (1992, 1993, 1996), and Vaughan and Carmichael (2000) that reflected the current stock structure, two stocks divided at the North Carolina-South Carolina border. Several states have also conducted state-specific assessments (e.g., Murphy and Munyandorero 2009; Takade and Paramore 2007 [update of Vaughan and Carmichael 2000]).

In 2017, a state-specific stock assessment was completed by South Carolina, which indicated that the South Carolina population of red drum was experiencing overfishing (Murphy 2017). This assessment result prompted new state management regulations, which went into effect on July 1, 2018 (Table 1).

In 2020, Florida completed a stock assessment for red drum in Florida state waters[1], and found that the Atlantic Coast red drum stock was not overfished and overfishing was not occurring. The northeast region (Flagler through Nassau counties) exceeded the Commission's target escapement rate of 40%. The southeast region (Miami-Dade-Volusia counties) exceeded the escapement rate in the terminal year (2019), but does not meet the current escapement rate target. Overall, the state of Florida has an escapement rate higher than the Commission's goal of 40%.

At the Winter meeting of ASMFC in 2019, the management Board reviewed a proposal from the SAS that recommended a population simulation model be developed to simulate the full red drum population. The simulated population would be used to test a variety of assessment modeling techniques to determine which model would be the most applicable for the next benchmark stock assessment. Due to the work and modeling expertise needed for the simulation assessment, the benchmark assessment has be postponed until 2024. The simulation population modeling is scheduled to be completed in 2022.

V. Status of Research and Monitoring

No monitoring or research programs are annually required of the states except for the submission of a compliance report. Fishery-dependent (other than catch and effort data) monitoring programs are conducted from Maryland to Florida, with biological and sportfish carcass recovery programs collecting age, length, and sex data. Virginia, North Carolina and

[1] Addis, D. 2020. The 2020 stock assessment of Red Drum, *Sciaenops ocellatus*, in Florida. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute In-House Report IHR2020-002: 129 p.

South Carolina also conduct sportfish tagging programs. Fishery-independent monitoring programs that directly target or may encounter red drum are conducted in New Jersey, Delaware, North Carolina, South Carolina, Georgia, and Florida. Data collected includes CPUE, biological data, YOY indices, and mark-recapture data. See Table 2 for details on the fishery independent indices and ongoing-surveys.

VI. Status of Management Measures and Issues

Fishery Management Plan

Amendment 2 was fully implemented by January 1, 2003, providing the management requirements for 2018. Requirements include: recreational regulations designed to achieve at least 40% sSPR, a maximum size limit of 27 inches or less, and current or more stringent commercial regulations. States are also required to have in place law enforcement capabilities adequate to successfully implement their red drum regulations. In August 2013, the Board approved Addendum I to Amendment 2 of the Red Drum FMP. The Addendum revises the habitat section of Amendment 2 to include the most current information on red drum spawning habitat for each life stage (egg, larval, juvenile, sub-adult, and adult). It also identifies the distribution of key habitats and habitats of concern, including potential threats and bottlenecks.

De Minimis Requests

New Jersey and Delaware requested *de minimis* status through the annual reporting process. While Amendment 2 does not include a specific method to determine whether a state qualifies for *de minimis*, the PRT chose to evaluate an individual state's contribution to the fishery by comparing the two-year average of total landings of the state to that of the management unit. New Jersey and Delaware each harvested zero percent of the two-year average of total landings. *De minimis* status does not exempt either state from any requirement; it may exempt them from future management measures implemented through addenda to Amendment 2, as determined by the Board.

VII. Implementation of FMP Compliance Requirements for 2020

The PRT found no inconsistences among states with the requirements of Amendment 2 and no inconsistences were found.

VIII. Recommendations of the Plan Review Team

Management and Regulatory Recommendations

Consider approval of the *de minimis* requests by New Jersey and Delaware.

Research Recommendations

Additional research recommendations can be found in the most recent stock assessment found here. The PRT had the additional research recommendations:

- Implement surveys (e.g. logbooks, electronic methods, etc.) to determine the length composition (and age data, if possible) of recreational discards (B2) of red drum. This information has been highlighted as the single largest data gap in previous assessments.

- Continue sampling and expansion of adult red drum surveys to determine abundance, size, age, sex composition, and maturity of the adults. Additionally, investigate the possibility of senescence in female red drum. Investigate how targeting of adult red drum spawning and post-spawning aggregations via catch-and-release hook-and-line fisheries by anglers is affecting the reproductive potential of the stock due to both direct lethal and sub-lethal effects.
- Assess the effects of environmental factors on stock density/year class strength. Determine whether natural environmental perturbations affect recruitment and modify relationships with spawning stock size.
- Support and conduct applied research to evaluate the social and economic value of this important, primarily recreational fishery. Accomplishing this includes continued support of the Marine Recreational Fishing Expenditures Survey that is conducted every three to five years by NOAA fisheries as well as conducting applied research on projecting social and/or economic estimated impacts associated with this fishery.

IX. References

Atlantic States Marine Fisheries Commission (ASMFC). 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. ASMFC, Washington, DC, Fishery Management Report No. 38, 141 p.

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Vaughan, DS and TE Helser. 1990. Status of the red drum stock of the Atlantic coast: Stock assessment report for 1989. NOAA Tech. Mem. NMFS-SEFC-263. 117 p.

X. Figures

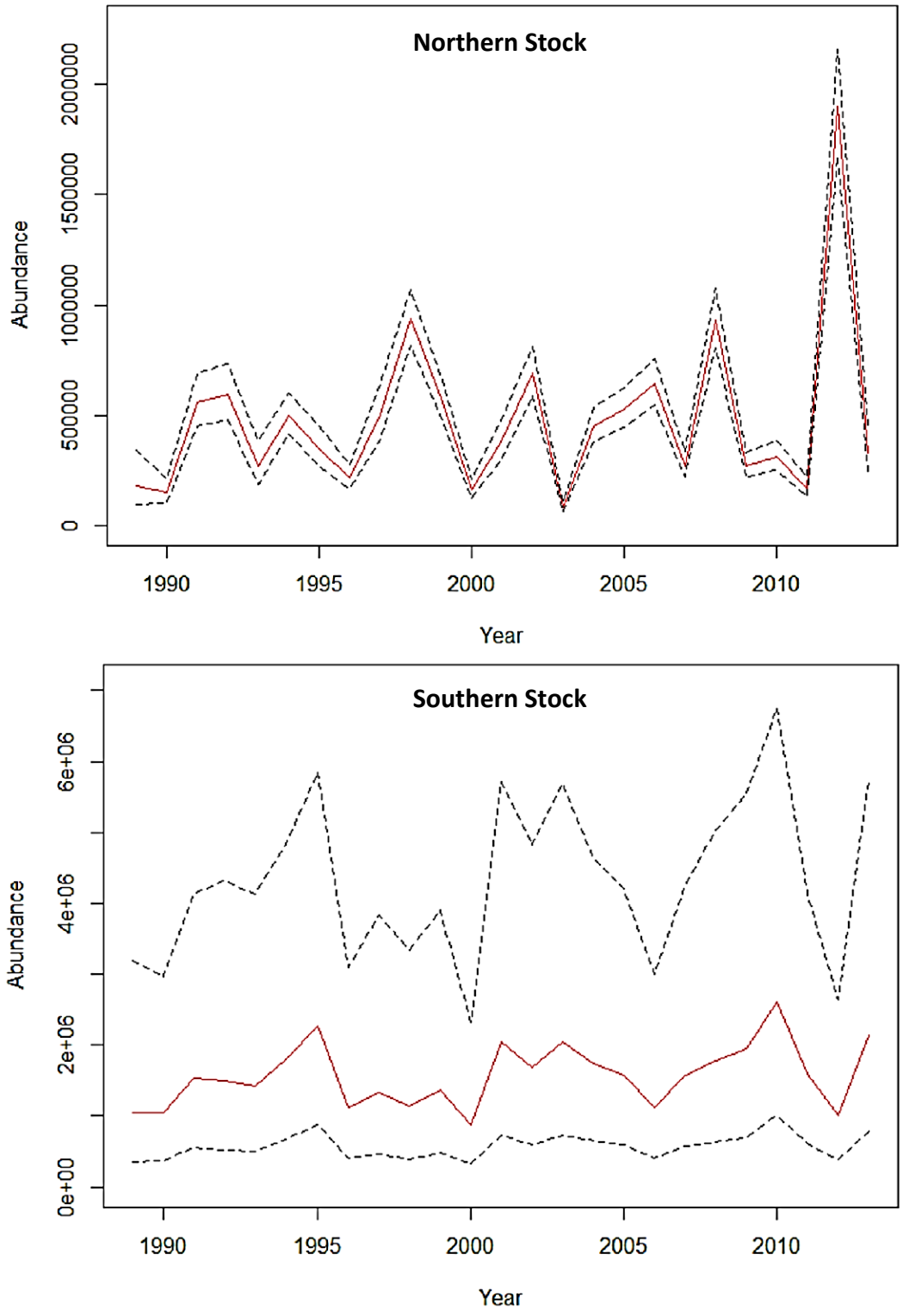


Figure 1. Predicted recruitment (age-1 abundance, red lines) with 95% confidence intervals (dashed black lines) for the northern (top) and southern (bottom) regions (Source: ASMFC 2017).

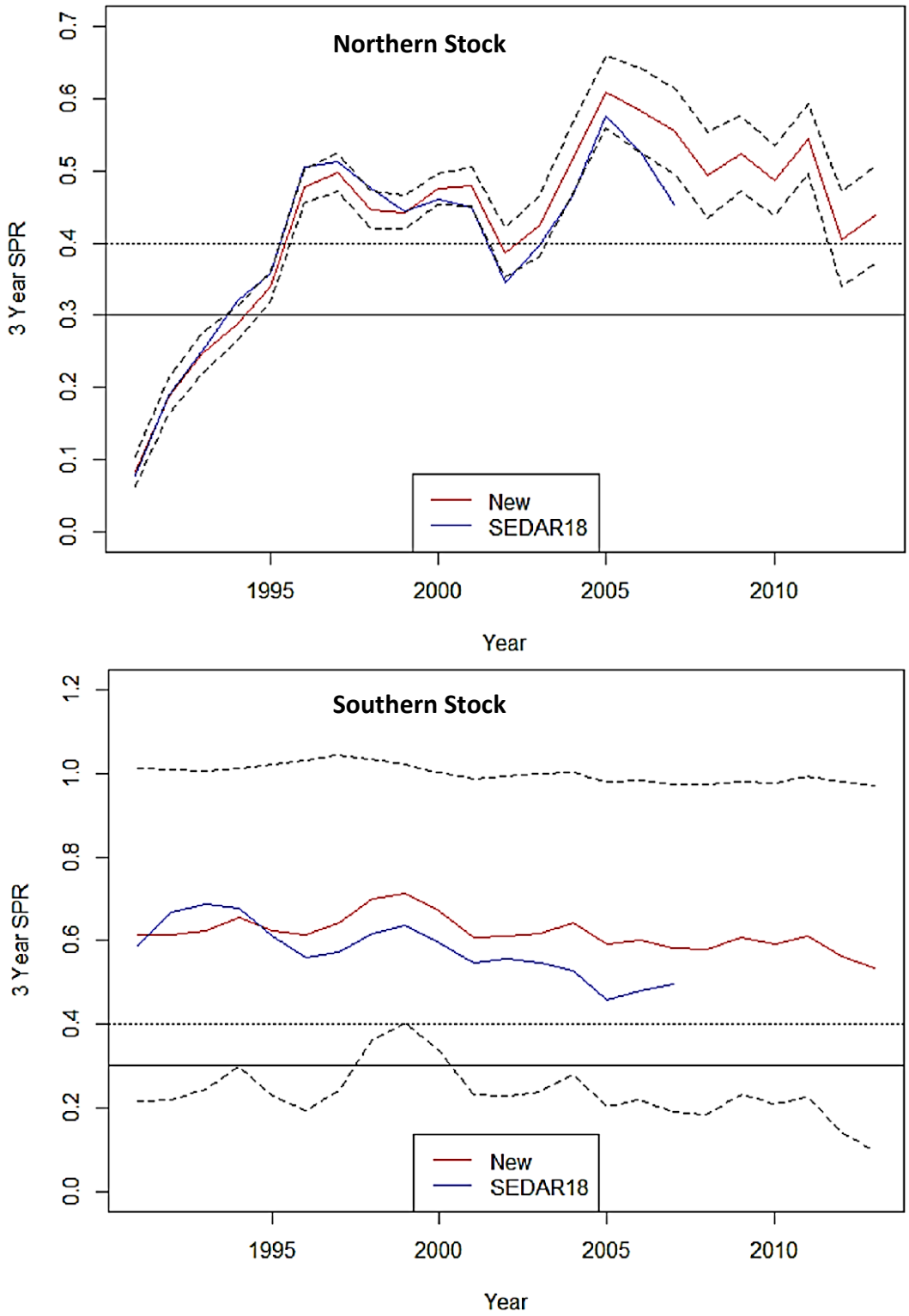


Figure 2. Three year average sSPR (red lines) for the northern (top) and southern (bottom) stocks with 95% confidence intervals (dashed black lines). Point estimates from the previous benchmark assessment (SEDAR18) are included for comparison. The target sSPR (dotted black line) is 40% and the threshold sSPR (solid black line) is 30% (Source: ASMFC 2017)**.**

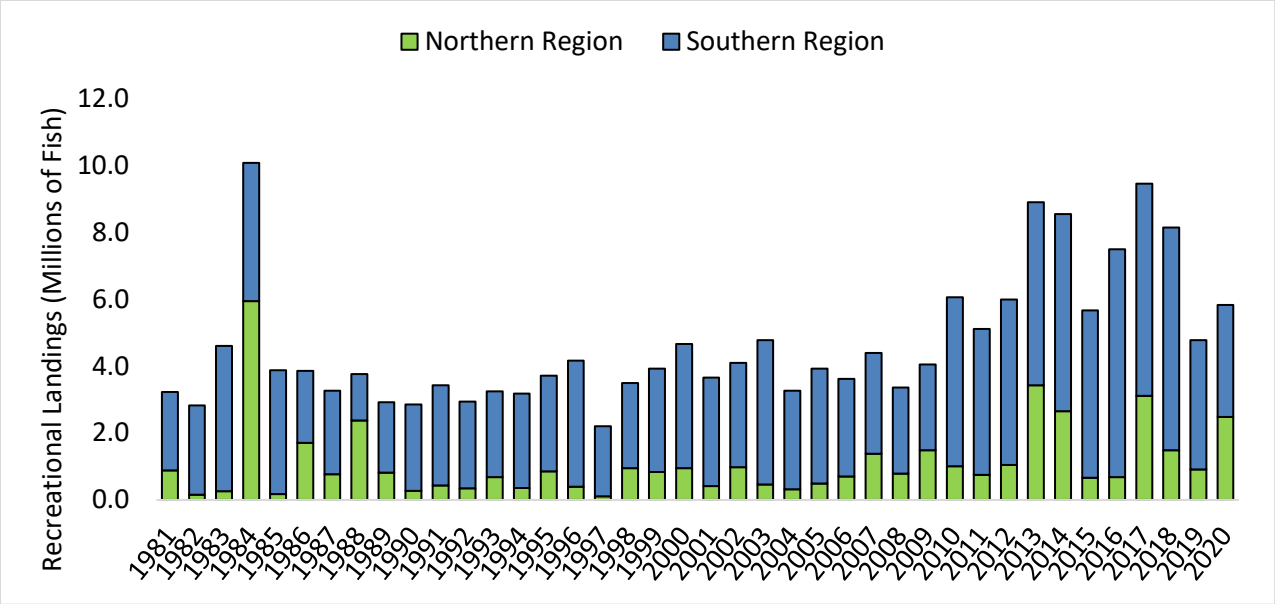


Figure 3. Recreational landings of red drum by region (1981-2020). See Table 3 for values and data sources.

*Recreational weight data for NC-FL in 1988 is unavailable. Recreational harvests in pounds were estimated for these states in this year by multiplying each state's 1988 harvest in numbers of fish by its time series average weight.

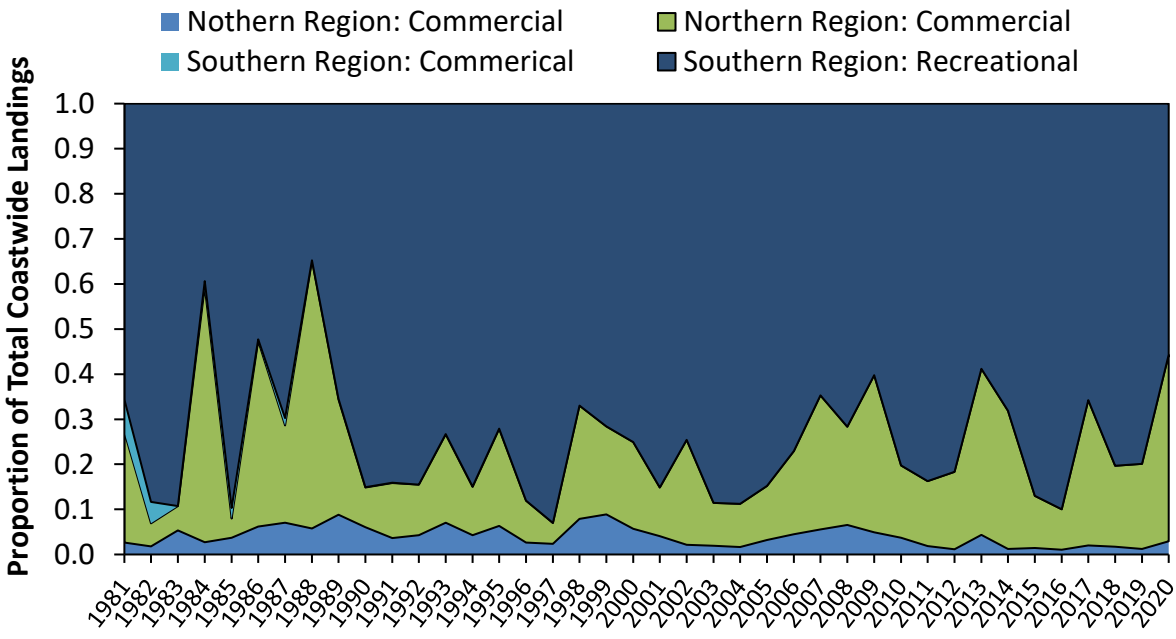


Figure 4. Proportion of regional, sector-specific landings to total coastwide landings (pounds). See Tables 2 and 3 for data sources.

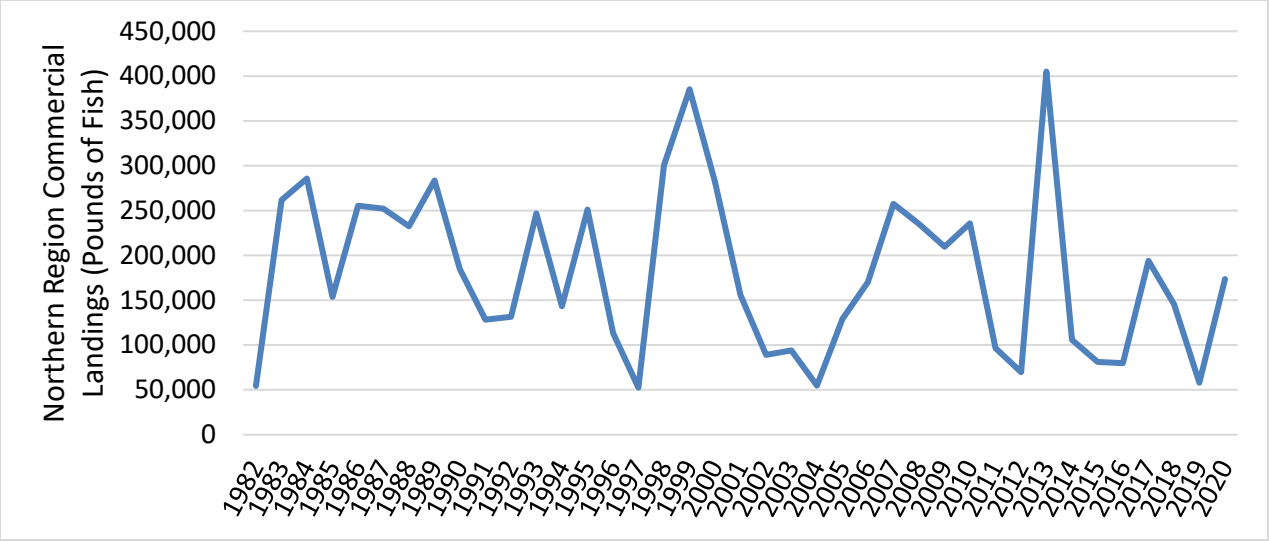


Figure 5. Commercial landings of red drum from the Northern Region (1981-2020). See Table 2 for values and data sources.

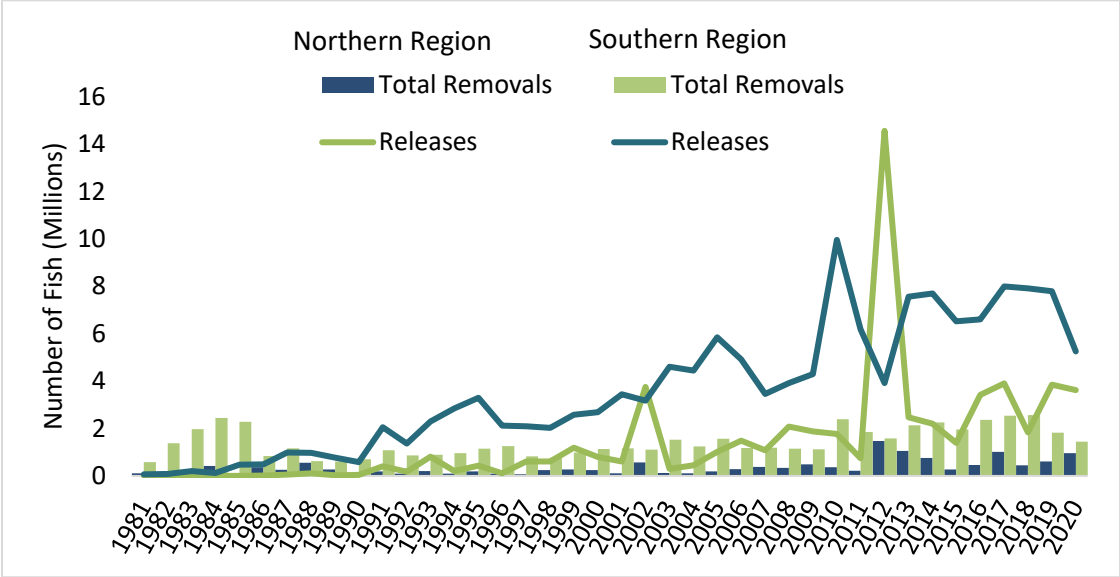


Figure 6. Total recreational removals (numbers) compared to recreational releases of red drum (numbers). See Tables 5 and 6 for values and data sources.

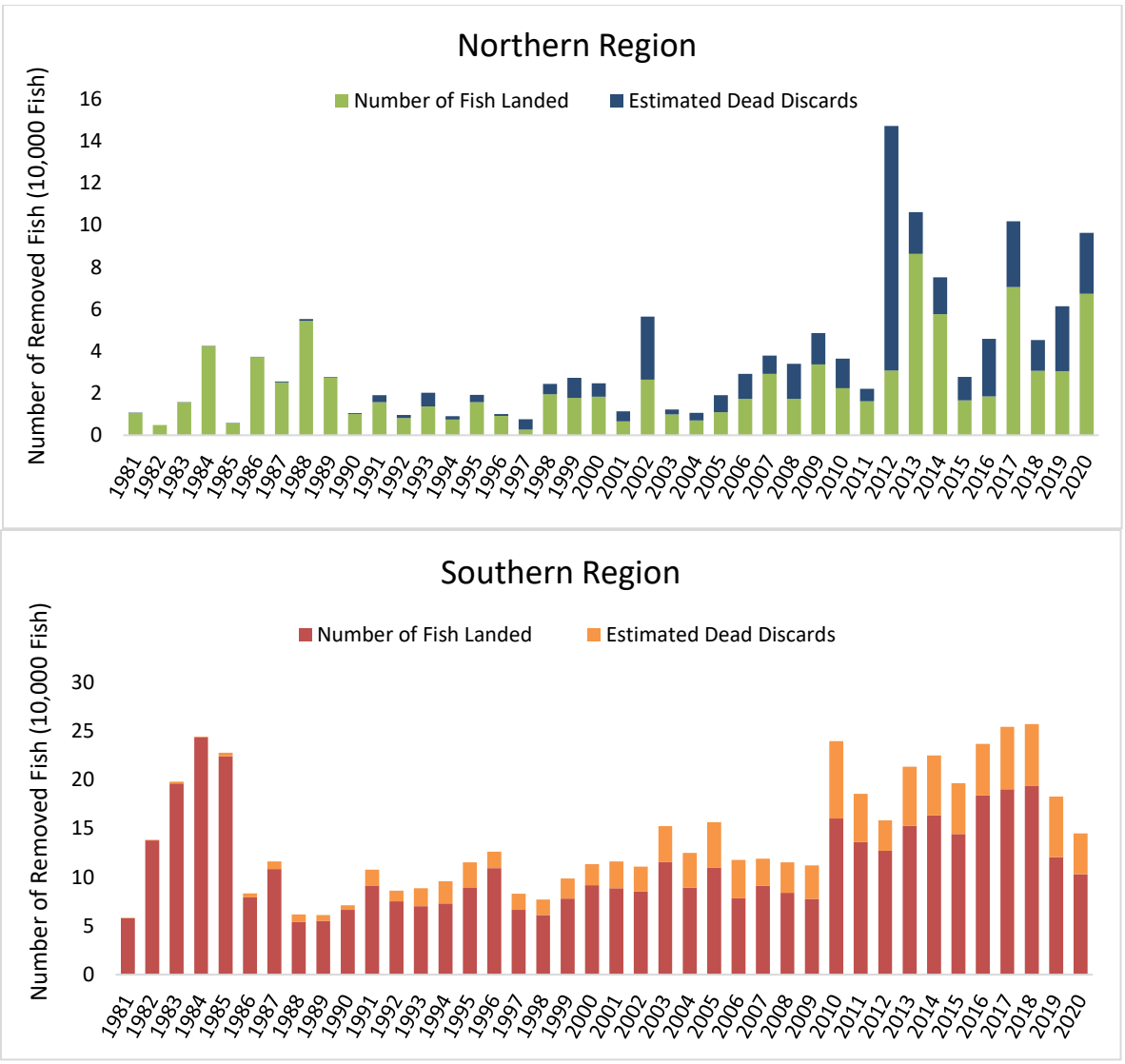


Figure 7. Recreational removals (landings and dead discards) of red drum (numbers) by region. Dead discards are estimated by applying an 8% discard mortality rate to alive releases. See Tables 5 & 6 for values and data sources.

XI. Tables

Table 1. Red drum regulations for 2020. The states of New Jersey through Florida are required to meet the requirements in the FMP; states north of New Jersey are encouraged to follow the regulations. All size limits are total length.

State	Recreational	Commercial
NJ	18" - 27", 1 fish	18" - 27", 1 fish
DE	20" - 27", 5 fish	20" - 27", 5 fish
MD	18" - 27", 1 fish	18" - 25", 5 fish
PRFC	18" - 25", 5 fish	18" - 25", 5 fish
VA	18" - 26", 3 fish	18" - 25", 5 fish
NC	18" - 27", 1 fish	18" - 27"; 250,000 lb harvest cap with overage payback (150,000 lbs Sept 1- April 30; 100,000 lbs May 1-Aug 31); harvest of red drum allowed with 7 fish daily trip limit; red drum must be less than 50% of catch (lbs); small mesh (<5" stretched mesh) gill nets attendance requirement May 1 - November 30. Fishing year: September 1 – August 31.
SC	15" - 23", 2 fish per person per day bag limit and 6 fish per boat per day boat limit	Gamefish Only
GA	14" - 23", 5 fish	Gamefish Only
FL	18" - 27"; Northern Region – 2 fish per person per day, 8 fish vessel limit, Southern Region – 1 fish per person day bag limit, 8 fish vessel limit	Sale of native fish prohibited

Table 2. Overview of each state's fishery independent surveys.

State	Fishery Independent Monitoring Details
New Jersey	Five annual nearshore trawl surveys conducted since 1988, in January/February, April, June, August, and October. Length and weight data, and catch per unit effort (CPUE) in number of fish per tow and biomass per tow recorded for all species.
Delaware	30-ft bottom trawl survey and 16-ft bottom trawl survey. Neither survey has ever captured red drum.
North Carolina	Seine survey since 1991 produces age-0 abundance index. Gill net survey in Pamlico Sound since 2001 characterizes size and age distribution, produces abundance index, improves bycatch estimates, and studies habitat usage. Longline survey since 2007 produces adult index of abundance and tags fish
South Carolina	Estuarine trammel net survey for subadults. Electrofishing survey in low salinity estuarine areas for juveniles/subadults. Inshore and coastal bottom longline survey for biological data and adult abundance index. Genetic sub-sampling and tagging conducted during these three surveys.
Georgia	Estuarine trammel net survey for subadult biological data and abundance index. Estuarine gill net survey for young-of-year (YOY) biological data and abundance index. Bottom longline survey for adult biological data and abundance index.
Florida	Seine surveys characterizing young-of-year (YOY) (<40 mm standard length) and sub-adult (>299 mm) abundance along the northeast (NE) and southeast (SE) Florida coasts.

Table 3. Commercial landings (pounds) of red drum by state, 2011-2020. (Source: personal communication with ACCSP, Arlington, VA, for years prior to 2020 and state compliance reports for 2020, except as noted below.) Note that SC, GA, and FL do not have commercial red drum fisheries, and years with incidental landings are included in the total.

Year	NJ to PRFC	VA	NC	Total
2011	0	4,397	91,980	96,607
2012	8,318	2,786	66,519	77,691
2013	3,176	30,137	371,949	405,262
2014	353	14,733	90,647	105,732
2015	421	814	80,282	81,516
2016	197	1,898	77,833	79,927
2017	644	6,971	186,411	194,032
2018	C	885	144,464	145,501
2019	32	1,650	56,393	58,107
2020	104	7,989	165,670	173,867

*C indicates confidential landings, and totals have been rounded to protect confidentiality.

Table 4. Recreational landings (pounds) of red drum by state, 2011-2020. (Source: personal communication with MRIP for data prior to 2020; state compliance reports for 2020)

Year	NJ	DE	MD	VA	NC	Northern Region Total
2011	15,567				737,853	753,420
2012		9,948	158,313	225,732	648,342	1,042,335
2013		13,536	12,086	1,185,572	2,214,045	3,425,239
2014				979,388	1,674,595	2,653,983
2015				98,329	567,730	666,059
2016				45,451	633,496	678,947
2017			6,782	1,628,692	1,475,852	3,111,326
2018				31,566	1,452,358	1,483,924
2019	4,107		2,113	470,940	436,219	913,379
2020		1,544	115,181	610,001	1,758,789	2,485,515

Year		SC	GA	FL	Southern Region Total
2011		1,058,774	433,306	2,871,989	4,364,069
2012		1,007,542	221,044	3,727,020	4,955,606
2013		682,544	452,283	4,341,545	5,476,372
2014		921,971	387,367	4,582,561	5,891,899
2015		656,747	394,787	3,949,000	5,000,534
2016		536,550	586,235	5,694,370	6,817,155
2017		1,048,249	826,857	4,470,905	6,346,011
2018		643,213	1,186,306	4,829,344	6,658,863
2019		862,124	630,294	2,372,773	3,865,191
2020		671,004	535,674	2,135,588	3,342,073

Table 5. Recreational landings (numbers) of red drum by state, 2011-2020. (Source: personal communication with MRIP for data prior to 2020; state compliance reports for 2020)

Year	NJ	DE	MD	VA	NC	Northern Total
2011	5,432				156,484	161,916
2012		2,256	62,444	90,856	152,005	307,561
2013		3,734	4,766	333,590	520,758	862,848
2014				251,501	324,303	575,804
2015				22,102	143,876	165,978
2016				15,866	169,195	185,061
2017			4,943	347,145	353,716	705,804
2018				6,334	299,577	305,911
2019	1,331		1,258	205,824	97,186	305,599
2020		493	44,975	214,069	413,419	672,956

Year	SC	GA	FL		Southern Total
2011	373,083	200,521	787,958		1,361,562
2012	296,380	96,354	877,569		1,270,303
2013	282,688	236,760	1,007,729		1,527,177
2014	393,424	212,193	1,027,980		1,633,597
2015	258,493	201,049	981,685		1,441,227
2016	241,224	289,928	1,309,505		1,840,657
2017	455,887	467,522	978,520		1,901,929
2018	262,725	606,836	1,069,604		1,939,165
2019	333,315	271,970	599,348		1,204,633
2020	239,874	230,026	560,382		1,030,282

Table 6. Recreational alive releases (numbers) of red drum by state, 2011-2020. (Source: personal communication with MRIP for data prior to 2020; state compliance reports for 2020)

Year	NJ	DE	MD	VA	NC	Northern Region Total	Northern Region Dead Discards
2011				156,584	587,369	743,953	59,516
2012		42,738	1,250,726	8,323,032	4,939,534	14,556,030	1,164,482
2013		1,325	7,125	576,743	1,892,171	2,477,364	198,189
2014		264	659	1,108,646	1,086,967	2,196,536	175,723
2015			1,456	78,590	1,308,072	1,388,118	111,049
2016		2,598	47,908	164,575	3,203,452	3,418,533	273,483
2017			14,148	1,722,618	2,165,656	3,902,422	312,194
2018	4,715		21,384	85,338	1,729,260	1,840,697	147,256
2019		474	5,740	865,957	2,976,601	3,848,772	307,902
2020			217,710	716,277	2,686,150	3,620,137	289,611

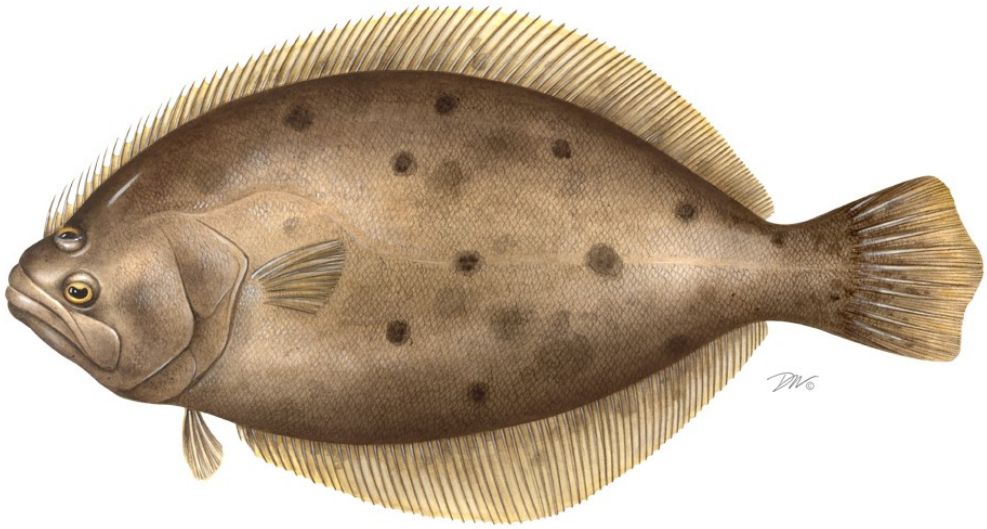
Year	SC	GA	FL		Southern Region Total	Southern Region Dead Discards
2011	1,617,509	370,451	4,191,567		6,179,527	494,362
2012	1,083,096	220,312	2,614,554		3,917,962	313,437
2013	1,864,510	504,759	5,196,513		7,565,782	605,263
2014	1,874,809	750,619	5,074,602		7,700,030	616,002
2015	1,432,754	961,277	4,132,461		6,526,492	522,119
2016	1,266,931	601,153	4,734,303		6,602,387	528,191
2017	2,094,199	1,176,524	4,727,411		7,998,134	639,851
2018	1,493,803	1,045,570	5,375,011		7,914,384	633,151
2019	2,911,653	1,206,707	3,673,651		7,792,011	623,361
2020	1,705,054	393,368	3,154,500		5,252,922	420,234

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR SUMMER FLOUNDER
(Paralichthys dentatus)

2020 FISHING YEAR



Prepared by the Plan Review Team

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

2021 Review of the ASMFC Fishery Management Plan for Summer Flounder

I. Status of the Fishery Management Plan

The summer flounder (*Paralichthys dentatus*) fishery of the Atlantic Coast is managed jointly by the Atlantic States Marine Fisheries Commission (ASMFC) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) and the Mid-Atlantic Fishery Management Council (MAFMC or Council). The original ASMFC Fishery Management Plan (FMP), established in 1982, recommended a 14" minimum size limit. The 1988 joint MAFMC-ASMFC Plan established a 13" minimum size limit. Since then, twenty-one amendments have been developed and approved; it should be noted, most but not all amendments have been implemented jointly by the Commission and Council.

The Council and Board approved revised FMP goals and objectives in March 2019 to reflect modern management priorities for summer flounder:

- Goal 1: Ensure the biological sustainability of the summer flounder resource in order to maintain a sustainable summer flounder fishery.
    - Objective 1.1: Prevent overfishing, and achieve and maintain sustainable spawning stock biomass levels that promote optimum yield in the fishery.
- Goal 2: Support and enhance the development and implementation of effective management measures.
    - Objective 2.1: Maintain and enhance effective partnership and coordination among the Council, Commission, Federal partners, and member states.
    - Objective 2.2: Promote understanding, compliance, and the effective enforcement of regulations.
    - Objective 2.3: Promote monitoring, data collection, and the development of ecosystem-based science that support and enhance effective management of the summer flounder resource.
- Goal 3: Optimize economic and social benefits from the utilization of the summer flounder resource, balancing the needs and priorities of different user groups to achieve the greatest overall benefit to the nation.
    - Objective 3.1: Provide reasonable access to the fishery throughout the management unit. Fishery allocations and other management measures should balance responsiveness to changing social, economic, and ecological conditions with historic and current importance to various user groups and communities.

The management unit includes summer flounder in US waters in the western Atlantic Ocean from the southern border of North Carolina northward to the US - Canada border. States and jurisdictions with a declared interest in the summer flounder FMP include all those from North Carolina through Massachusetts except Pennsylvania and the District of Columbia, as well as the National Marine Fisheries Service (NOAA Fisheries) and the US Fish and Wildlife Service (USFWS). An ASMFC Plan Review Team, Technical Committee, Plan Development Team/Fishery Management Action Team, Management Board, and the MAFMC are actively working on this plan.

Amendment 2 (approved in August 1993) provided a strategy for reducing fishing mortality to the fishing mortality threshold, while avoiding unreasonable impacts on fishermen and women. Commercial management measures included a moratorium on federal commercial permits, vessel and dealer permitting and reporting requirements, an annual commercial quota, minimum mesh requirements with a possession threshold that triggers the minimum mesh requirements and an exemption program. Recreational fishery measures include open access for-hire permit requirements, minimum size limits, possession limits, and seasonal closures.

The management system established under Amendment 2 has been modified by the following amendments, framework actions, and addenda. Amendment 3 (approved in July 1993) revised the mesh requirement exemption program and modified the poundage thresholds for the mesh requirements (change to two seasonal thresholds instead of year-round 100 pounds). Amendment 4 (approved in September 1993) revised the state-specific shares of the coastwide commercial quota allocation in response to a reporting issue in Connecticut. Amendment 5 (approved in December 1993) allows states to transfer or combine their commercial quota shares. Amendment 6 (approved in May 1994) allows properly stowed nets with a codend mesh size less than that stipulated in the plan to be aboard vessels in the summer flounder fishery. Amendment 7 (approved May 1995) adjusted the stock rebuilding schedule and capped the 1996-1997 commercial quotas at 18.51 million pounds. The Commission and the Council adopted the Scup and Black Sea Bass Fishery Management Plans into the Summer Flounder FMP through Amendment 8 (approved March 1996) and Amendment 9 (approved October 1996), respectively.

Amendment 10, approved by the Board in August 1997, initially sought to examine the commercial quota management system. Its scope was expanded to address a number of federal and state issues in the fishery, including: 1) allow framework adjustments to the minimum mesh size for any portion of the net; 2) require 5.5” diamond or 6” square mesh in the entire net of trawls; 3) continue the federal moratorium on commercial entry; 4) remove the requirement that federally permitted vessels must land summer flounder every year; 5) modify the federal vessel replacement criteria; 6) implement state *de minimis* criteria; 7) prohibit transfer at sea; 8) require states to report summer flounder landings from state waters to NOAA Fisheries; and 9) allow states to implement a summer flounder fillet at sea permit system. The amendment also considered alternative commercial quota schemes, including 1) a trimester quota with state-by-state shares during summer, 2) a trimester coastwide quota of equal periods, and 3) a revision to the existing state-by-state allocation formula. Ultimately, the Board and Council decided to maintain the current state-by-state quota allocation system.

Amendment 11, approved by the Board August 1998, modified provisions related to vessel upgrades and replacements, fishing history and permit transfer, establishment of vessel baselines, and voluntary relinquishment of permit eligibility, permit splitting, and permit renewal.

Amendment 12, approved by the Board in October 1998, was developed to bring the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan into compliance with the new and revised National Standards and other required provisions of the Sustainable Fisheries Act. Specifically, the amendment revised the overfishing definitions (National Standard 1) for summer flounder, scup and black sea bass and addressed the new and revised standards relative to the existing management measures (National Standard 8-consider effects on fishing communities, National Standard 9-reduce bycatch, National Standard 10-promote safety at sea). The Amendment also identified essential habitat for summer flounder, scup and black sea bass. Finally, Amendment 12 added a framework adjustment procedure that allows the Council to add or modify management measures through a streamlined public review process. Amendment 12 was partially approved by NOAA Fisheries on April 28, 1999, with the disapproved measures mostly relating to concerns with essential fish habitat measures that were later addressed.

Framework Adjustment 2 to the Summer Flounder, Scup and Black Sea Bass FMP, adopted by the Council in January 2001, provided the information and analyses necessary to implement a system of conservation equivalency based upon the RHL for the recreational summer flounder fishery. Addendum III (approved by the Board in January 2001) corresponds with Framework 2, and allows states to customize summer flounder recreational management measures to address issues associated with the availability of summer flounder on spatial and temporal scales. Addendum III established specifications for the 2001 recreational summer flounder fishery.

In August 2002, the Board approved Amendment 13. Although there were some management alternatives included in public hearing drafts of the document that could have resulted in changes to summer flounder management measures, none were approved for implementation. As a result, Amendment 13 had no impact on the summer flounder fishery.

The Board approved Addendum VIII in December of 2003. Under this addendum, state-specific targets for recreational landings are derived from the coastwide harvest limit based on each state's proportion of landings reported in 1998, which was the last year in which states were under a common set of management measures.

The Board approved Addendum XIII in August of 2004. This addendum modifies the FMP such that, within a given year, landings limits for the summer flounder, scup, and/or black sea bass can be specified for up to three years. Multi-year limits do not have to be constant from year to year, but instead are based upon expectations of future stock conditions as indicated by the best available scientific information during the year in which specifications are set.

The Board approved Addendum XV in December of 2004. The addendum was developed to allow for a change in the allocation scheme for the increased commercial quota from 2004 to 2005, approximately 1.3 million pounds, as well as the additional quota from 2004 to 2006, approximately 1.6 million pounds. For the fishing years 2005 and 2006, the associated quota increases were allocated to the following states as a bycatch allocation: 75,000 pounds of

summer flounder were allocated each to Maryland, New York, Connecticut, and Massachusetts; 15,000 pounds were allocated to Delaware, 5,000 pounds to Maine, and 90 pounds to New Hampshire.

The Board approved Addendum XVII in August of 2005. Addendum XVII established a program wherein the Board could combine state-by-state recreational allocations into voluntary regions. This is an additional management tool in the management toolbox. This addendum also allowed the averaging or combining of multiple years of data (i.e. landings-per-angler, length-frequency distributions) in analyses to determine the impacts of proposed recreational management programs. The programs also included minimum fish sizes, possession limits, and fishing seasons. The averaging of annual harvest estimates is not allowed if the regional approach is used (i.e. the 1998 based allocations cannot be averaged across multiple years to create new allocations; multi-year averaging can be used to assess management measures).

The Board approved Addendum XVIII in February of 2006. The addendum sought to stabilize recreational fishing rules close to those that existed in 2005, in part, to minimize the drastic reductions that the three states were facing at the time. The addendum allowed the three states (NY, CT, and MA) facing large reductions in their harvest targets to capitalize on harvest opportunities that were foregone by states that chose to maintain their 2005 recreational fishing rules in 2006.

Addendum XIX, approved in August 2007, broadened the descriptions of stock status determination criteria contained within the Summer Flounder, Scup, and Black Sea Bass FMP to allow for greater flexibility in those definitions, while maintaining objective and measurable status determination criteria for identifying when stocks or stock complexes covered by the FMP are overfished. It established acceptable categories of peer-review for stock status determination criteria. When these specific peer-review metrics are met and new or updated information is available, the new or revised stock status determination criteria may be incorporated by the Board directly into the annual management measures for each species, rather than requiring a modification to the FMP.

The Board approved Addendum XXV in February of 2014. The addendum implemented regional conservation equivalency for the 2014 fishing year, and sought to respond to the unintended consequence of using conservation equivalency (e.g., state-specific recreational management measures) such as different measures between neighboring states and across the coast. The addendum established new regional measures that in combination would constrain harvest to coastwide recreational harvest limit. For 2014, the regions were the following: Massachusetts; Rhode Island; Connecticut through New Jersey; Delaware through Virginia; and North Carolina. All states within a region have the same minimum size, bag limit, and season length. A continuation of Addendum XXV was codified in Addendum XXVI by the Board in February 2015. Addendum XXVI continued the regional management measures established in 2014 through 2015.

The Board approved Addendum XXVII in February 2016. The addendum addressed 2016 recreational summer flounder and black sea bass fisheries management, continuing regional management measures for 2016 and addressing discrepancies in summer flounder management measures within Delaware Bay. The 2016 recreational fishery was divided into six management regions, the same five regions as under Addendum XXV and XXVI, but with New Jersey separated out from New York and Connecticut into its own region, with states within the same region required to implement the same bag, size limits, and season length. By separating New Jersey into its own region, the addendum allowed the state to make regulations different in Delaware Bay than in the rest of the state. Outside of the Delaware Bay, New Jersey regulations stayed consistent with those in New York and Connecticut. Within the Bay, New Jersey regulations consisted of a similar size limit as in Delaware, the same possession limit as Delaware, and the same season as the rest of New Jersey. The line of demarcation for regulation implementation was the COLREGS Demarcation Line.

In February 2017, ASMFC's Summer Flounder, Scup and Black Sea Bass Management Board approved Addendum XXVIII, maintaining regional management for the recreational summer flounder fishery through 2017. This Addendum required a one-inch increase in size limit and lowered possession limits to 4 fish or less to reduce fishing pressure on the stock, which was experiencing overfishing.

After New Jersey submitted a conservation equivalency proposal which was not accepted, the Commission found New Jersey to be out of compliance with Addendum XXVIII in June 2017. ASMFC passed on its recommendation of noncompliance to the Secretary of Commerce. However, the Secretary of Commerce did not agree with the Commission's recommendation and found New Jersey to be in compliance with Addendum XXVIII. This is the first time that the Secretary of Commerce has not agreed with the Commission's recommendation for noncompliance.

Addendum XXXI was approved by the Board in December 2018. Coupled with the Council's complementary Framework 14, this Addendum adds to the suite of tools available for managing summer flounder, scup and black sea bass, and enhances the compatibility of state and federal regulations. The Commission recommended NOAA Fisheries implement transit provisions in Block Island Sound, allowing non-federally permitted recreational and commercial vessels to transit federal waters while in possession of summer flounder, scup, and black sea bass legally harvested from state waters.

The Council's Framework 14 also allows for the use of maximum sizes in addition to minimum sizes, commonly referred to as slot limits, to control catch in the summer flounder and black sea bass recreational fisheries.

Approved by the Board in December 2018, Addendum XXXII established an annual specifications process for developing recreational management measures for summer flounder and black sea bass. In relation to summer flounder, the Board will approve regional measures in early spring each year, based on technical committee analysis of stock status, resource

availability, and harvest estimates. Public input on specifications will be gathered by states through their individual public comment processes. The specifications process will provide the Board more flexibility in adjusting measures, if necessary, to constrain harvest to the annual coastwide RHL. Further, the process will enable the Board to consider a host of factors, including: regional equity; regulatory stability; species abundance and distribution; and late-breaking recreational harvest estimates.

In March 2019, the Board and Council approved the Summer Flounder Commercial Issues Amendment. The Amendment revises the management program's goals and objectives specific to summer flounder and implements new state-specific commercial allocations. The new state commercial allocations are based upon a 9.55 million pound trigger point. When the annual coastwide commercial quota is at or below 9.55 million pounds, the formula for allocating the quota to the states will remain status quo, i.e., the same state-specific percentages that have been in effect since 1993. When the annual coastwide quota exceeds 9.55 million pounds, the first 9.55 million pounds is distributed according to the status quo allocations, and the additional quota above 9.55 million pounds will be distributed as follows: 0.333% to the states of Maine, New Hampshire and Delaware and 12.375% to the remaining states (Table 1). As a result, state allocations will vary over time based on overall stock status and the resulting coastwide commercial quotas. These changes were implemented by the National Marine Fisheries Service on December 14, 2020, and took effect on January 1, 2021.

While this FMP overview pertained to joint and Board actions only, there are additional Council only actions that are summarized at https://www.mafmc.org/sf-s-bsb.

The Board and MAFMC developed a joint amendment to consider an adjustment to the allocations between the commercial and recreational fisheries for summer flounder, scup and black sea bass. The commercial and recreational allocations for all three species are currently based on historical proportions of landings (for summer flounder and black sea bass) or catch (for scup) for each sector. Recent changes in how recreational harvest is estimated have resulted in a discrepancy between the current levels of estimated recreational harvest and the allocations of summer flounder, scup and black sea bass to the recreational sector. Some changes have also been made to commercial catch data since the allocations were established. This amendment considers whether modifications to the allocations are needed in light of these and other changes in the fisheries. The amendment also considers options that would allow a portion of landings to be transferred between the commercial and recreational sectors each year, in either direction, based on the needs of each sector. At the April 2021 meeting of the Board and MAFMC, final action was postponed to allow for further development of the Recreational Reform Initiative. The Council and Board are now scheduled to take final action on the commercial/recreational allocation amendment at a joint meeting in December 2021. Additional information and updates on this amendment are available at: http://www.mafmc.org/actions/sfsbsb-allocation-amendment.

II. Status of the Stock

The 2021 Summer Flounder Management Track Stock Assessment is the most recent stock assessment information that will be utilized for specifications for the 2022-2023 fishing years.

The stock was neither overfished nor was overfishing occurring in 2019 relative to the updated biological reference points. Spawning stock biomass (SSB) was estimated to be 47,397 mt in 2019, 86% of the updated biomass target reference point SSBMSY proxy = SSB35% = 55,217 mt (Figure 1). Fishing mortality on the fully selected age 4 fish was 0.340 in 2019, which is 81% of the updated fishing mortality threshold reference point FMSY proxy = F35% = 0.422.

The average recruitment from 1982 to 2019 is 53 million fish at age 0. Recruitment was below average during 2011-2017, ranging from 31 to 45 million and averaging 36 million fish. The 2018 year class estimated at 61 million fish is above average and the largest since 2009, while the 2019 year class is below average at 49 million fish (Figure 1).

The next management track stock assessment is scheduled for 2023.

III. Status of the Fishery

Commercial landings peaked in 1984 at 37.77 million pounds, and declined to 8.81 million pounds in 1997. Since then, commercial landings have been variable, with two peak years (17.26 million pounds in 2005 and 15.89 million pounds in 2011) that have been followed by steady declines. After 2011, landings declined in part due to annual quota limits set in response to the condition of the resource. The decline continued until 2017 reaching a time series low of 5.86 million pounds of landings. 2019 and 2020 landings increased to 9.06 and 9.14 million pounds, largely due to an increase in the commercial quota following the 2018 benchmark stock assessment. Table 2 displays state by state commercial landings from 2011-2020. Table 3 displays the 2020 quota, landings, transfers, and Connecticut's overage, which at this point is based on preliminary landings. GARFO will follow up with Connecticut once the landings values are validated. States with the largest share of commercial landings in 2020 were New Jersey (21.0%), North Carolina (19.4%), Rhode Island (18.6%), and Virginia (17.2%). The principal gear used in the fishery is the bottom otter trawl. Commercial discard losses in the otter trawl and scallop dredge fisheries are estimated from observer data, and an 80% commercial discard mortality rate is assumed.

Recreational harvest peaked in 1983 at 36.74 million pounds, and declined to a time series low of 5.66 million pounds in 1989. A more recent review of recreational fishery performance from 2011 to present reveals an average of 12.59 million pounds with a high of 19.41 million pounds in 2013 and a low of 7.60 million pounds in 2018. Recreational harvest in 2020 was 10.06 million pounds, a significant increase from the prior year's harvest of 7.80 million pounds (Table 4). However, it is worth noting that the pandemic caused some significant challenges in data collection, which are described in greater detail in the section below. The total recreational catch (harvest plus live and dead releases) of summer flounder in 2020 were 33.32 million fish, slightly lower than the time series average of 34.46 million fish (Table 5). The assumed discard mortality rate in the recreational fishery is 10%. In 2020, an estimated 80.2% of the harvest (in

numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 17.9% and 1.9% of the harvest, respectively (Figure 2). In addition, 61.3% of summer flounder harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 38.7% in federal waters (Figure 3).

IV. Status of Research and Monitoring

COVID-19 impacted several aspects of fishery dependent and independent monitoring. All New England and Mid-Atlantic states suspended the Access Point Angler Intercept Survey (APAIS) sampling starting in late March or April 2020. APAIS sampling resumed between May and August 2020, depending on the state. However, NOAA Fisheries was able to fill gaps in 2020 catch data with data collected in 2018 and 2019. These imputed data—also known as proxy, or replacement, data—match the time, place, and fishing mode combinations that would have been sampled had the APAIS continued uninterrupted. Imputed data were combined with observed data to produce catch estimates using MRIP's standard estimation methodology. To ensure imputed data weren't over-represented against observed data, the original sample weights for the 2018 and 2019 catch records were down-weighted. The use of imputed catch data had minimal impact on the effort estimates, as the mail and telephone surveys that collect effort data continued largely uninterrupted.

While commercial effort and markets were impacted to various degrees, data collection for commercial landings from seafood dealers continued uninterrupted. However, 2020 commercial discard estimates will be affected by missing observer data. Commercial discard estimates are developed using Standardized Bycatch Reporting Methodology approaches that rely heavily on observer data. On March 20, 2020, NOAA Fisheries temporarily waived the requirement for vessels with Greater Atlantic fishing permits to carry a fishery observer or at-sea monitor. This waiver was extended several times before observers were redeployed on August 14, 2020. At this time it is not clear whether alternative methodologies will be developed to generate 2020 commercial discard estimates for summer flounder and other species.

Several states and NOAA Fisheries conduct seasonal sampling cruises using an otter trawl to assess the condition of summer flounder populations inshore and in the Exclusive Economic Zone (EEZ). Several states fishery independent monitoring efforts were affected as indicated below.

- Massachusetts collects age and maturity samples and local abundance indices from spring and fall otter trawl surveys, as well as young of the year information in its winter flounder juvenile seine survey. The COVID-19 pandemic caused cancellations of the trawl surveys in 2020, but the seine survey was able to be completed. Massachusetts collects trip-level commercial landings data from both harvesters and primary buyers, and the commercial quota is monitored via weekly reports of dealer transactions by the Division of Marine Fisheries Statistics Program.
- Rhode Island monitors the commercial quota for summer flounder using the SAFIS reporting system to monitor landings. In addition, RIDEM Marine Fisheries operates a spring and fall

seasonal trawl survey, as well as a monthly trawl survey, which produce mean number and weight per tow for summer flounder.

- Connecticut collects indices of abundance from its spring and fall otter trawl survey in Long Island Sound, which were suspended in 2020 due to COVID-19. Connecticut monitors commercial summer flounder landings through monthly commercial fishing logbooks and weekly and monthly dealer reports.
- New York conducts a survey of recreational anglers on open boats throughout the marine district to collect additional data on size composition of kept and discarded fish. New York also conducts port/market sampling trips gathering sex and length data. New York maintains both a small mesh otter trawl survey in the Peconic Bays that samples summer flounder, and a nearshore trawl survey from Breezy Point to Block Island Sound in the winter, spring, summer and fall. Due to the COVID-19 pandemic, sampling season did not start until June (a 2-month delay). New York requires trip level reporting from all of its commercial industry participants and monitors quota through a combination of trip reports and dealer reports.
- New Jersey monitors landings relative to the commercial quota for summer flounder using the SAFIS reporting system. New Jersey collects data from the commercial trawl fishery and conducts an ocean trawl survey from which age, length and sex data on summer flounder are collected and catch-per-unit-of-effort and distribution information are generated for juveniles and adults. Due to restrictions in response to COVID-19, the survey sampling did not take place in 2020.
- Delaware's commercial landings are monitored through a mandatory monthly harvest report from all state-licensed fishermen and women. Additionally, two trawl surveys are conducted annually in Delaware's estuarine waters to assess relative abundance of both adult and juvenile finfish.
- Maryland constructs a juvenile index from trawl and beach seine data collected in coastal bays and also collects length data from commercial trawlers in near shore coastal waters. A statewide voluntary angler survey is conducted that records location, time spent fishing, number of fish caught, number kept, and lengths of the first 20 fish caught.
- The Virginia Marine Resources Commission Biological Sampling Program collects length and weight data from Virginia's commercial and recreational fisheries. A sub sample provides scales for aging. Virginia also prepares a young-of-the-year index from data collected from beach seine and trawl surveys. The Northeast Area Monitoring and Assessment Program (NEAMAP) Trawl Survey was cancelled in the spring of 2020 due to COVID-19.
- North Carolina annually conducts two otter trawl surveys to sample juvenile fluke in the Pamlico Sound, which were both suspended in 2020 due to COVID-19. North Carolina also collects information on age and growth and catch-per-unit-of-effort for the winter trawl fishery, estuarine gill net fishery, pound net fishery, the ocean gill net fishery, commercial gig, and the long haul seine fishery.

V. Status of Management Measures and Issues

COMMERCIAL FISHERY

Management measures imposed upon harvesters of summer flounder include an annual commercial quota and recreational harvest limit, minimum sizes, minimum mesh requirements for trawls, permits and administrative fees for dealers and vessels, a moratorium on entry into the commercial fishery, mandated use of sea samplers, monitoring of sea turtles and the use of turtle excluder devices in a portion of the southern part of the management unit, and collection of data and record keeping by dealers and processors. In 2020, the commercial quota was allocated to each state based on landings during a baseline period (1980-1989), and any overages are subtracted from a state's quota for the following year. The state allocations of the commercial quota are included in Table 3. Table 1 reflects the state commercial allocations according to the Summer Flounder Commercial Issues Amendment that were implemented for 2021.

The following measures may change annually. The 2020 measures are indicated.

Minimum size: 14"

Minimum mesh and threshold: 5.5" diamond, 6" square
Thresholds: 200 pounds in the winter (Nov 1-Apr 30) and 100 lb in the summer (May 1-October 31)

Regulation of mesh beyond the codend: 5.5" diamond or 6" square throughout the mesh

2020 Commercial quota: 11.53 million pounds

The following measures are not subject to annual adjustment.

Quota management provisions: States are required to adopt appropriate measures to manage their quota shares. States may transfer or combine their quota shares as specified in Amendment 5. States must document through a vessel and dealer reporting system all landings that are not otherwise included in the federal monitoring of permit holders. States are required to forward all landings information to NOAA Fisheries for inclusion in quota reporting.

Transfer at Sea: States must prohibit permitted summer flounder vessels from transferring summer flounder from one vessel to another at sea. (As specified in Amendment 10)

De minimis status: States having commercial landings less than 0.1% of the coastwide total will be eligible for *de minimis* status. (As specified in Amendment 10). Delaware has requested de minimis status and meets the requirements (Table 3).

RECREATIONAL FISHERY

The Management Board chose to adopt regional management through conservation equivalency for the 2020 recreational fishery under the provisions of Framework 2 (see **Table 6** for state measures)[1]. As such, the Federal recreational bag limit and minimum fish size were waived and the fishing season and vessel owners were subject only to the regulations in their states.

2020 recreational harvest limit: 7.69 million pounds.

OTHER MEASURES

Fillet at sea permit: Party or charter vessels in state waters will be allowed to fillet at sea if they obtain a state issued permit allowing such activity. (As specified in Amendment 10)

Reporting: States must submit an annual compliance report to the Chair of the Summer Flounder Plan Review Team by June 1 of each year. The report must detail the state's management program for the current year and establish proof of compliance with all mandatory management measures and all framework changes specified for the current year. It should include landings information from the previous year, and the results of any monitoring or research program.

This summary of compliance criteria is intended to serve as a quick reference guide. It in no way alters or supersedes compliance criteria as contained in the Summer Flounder FMP and Amendments thereto.

1993 - 2020 Summer Flounder FMP Compliance Criteria Timeline

COMMERCIAL:

14" minimum size	3/1/97
Ability to regulate mesh in any portion of the net	1/1/98
5.5" diamond or 6" square mesh throughout entire net	6/3/98
Prohibition of transfer at sea	1/1/98
Mandatory reporting to NMFS of landings from state waters	1/1/98
Small mesh exemption program	1/21/93
Flynet minimum mesh size exemption	1/21/93

RECREATIONAL:

Regional Management Measures under conservation equivalency	2/2017

GENERAL

[1] Past FMP Reviews are available on the Commissions' summer flounder webpage, which contain prior year's recreational measures.

Submission of annual commercial management plan thereafter	10/1/97, annually
Submission of annual landings and compliance report thereafter	6/1/98, annually

VI. Plan Review Team Comments and Recommendations

- The PRT notes that after reviewing state compliance reports, most states' regulations are consistent with the FMP requirements with only a few issues identified. New Jersey, Delaware, and Virginia did not include in their state compliance report regulations outlining prohibition of transfers at sea.
    - New Jersey currently has provisions in place that mandate state permitted vessels can only transfer catch to a licensed a dealer, and are only able to transfer the daily trip limit; a vessel that lands above the trip limit is subject to an over the limit infraction. Federal permit holders landing summer flounder in New Jersey are prohibited from transfers at sea. The state of New Jersey has begun the process of applying the same language to regulations pertaining to state permit holders.
    - Delaware currently prohibits trawling within state waters, and also maintains a commercial possession limit of 4 summer flounder. While the PRT recognizes that this may not be a priority issue, the PRT thought that Delaware's regulations on transfers at sea should be made consistent with the summer flounder FMP. That being said, the PRT also noted that the ISFMP Policy Board is currently reviewing *de minimis* status with the potential to expand the policy to allow for states to apply for exemptions from specific regulations, which could potentially resolve this issue. However, as the policy currently stands, *de minimis* status does not exempt any state from implementing prohibitions of transfers at sea.
    - The PRT again recognizes that this may not be a priority issue for Virginia given its prohibition of trawling within state waters. However, the PRT has come to the same conclusion that Virginia should implement the regulation to prohibit transfers at sea to remain consistent with the summer flounder FMP. In addition, Virginia technical staff has indicated that updating the regulations would be possible without too much administrative burden.
- With the three exceptions noted above, the PRT determined that all states have implemented regulations consistent with the FMP requirements.
- Delaware requested *de minimis* status and meets the requirements for 2020.

VII. Research Recommendations

Research recommendations were identified during the 2019 Summer Flounder Benchmark Stock Assessment at the 66th SAW (pg. 106)

VIII. References

Northeast Fisheries Science Center. 2019a. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report. US Dept Commerce, Northeast Fish Science Center Ref Doc. 19-08; 1170 p.

Northeast Fisheries Science Center. 2021. Prepublication copy of the June 2021 management track stock assessment report prepared for the Council and the SSC. Available at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2021_summer_flounder_MTA_report.pdf

Table 1. 2021 State-Specific Shares of Commercial Summer Flounder Quota.

State	Allocation of baseline quota ≤ 9.55 mil lb	Allocation of <u>additional</u> quota beyond 9.55 mil lb	2021 Initial Quota
ME	0.05%	0.33%	14,342
NH	0.00%	0.33%	9,844
MA	6.82%	12.38%	1,015,179
RI	15.68%	12.38%	1,861,550
CT	2.26%	12.38%	579,376
NY	7.65%	12.38%	1,094,113
NJ	16.72%	12.38%	1,961,062
DE	0.02%	0.33%	11,499
MD	2.04%	12.38%	558,559
VA	21.32%	12.38%	2,399,576
NC	27.45%	12.38%	2,984,903
Total	100%	100%	12,490,003

Table 2. Summer Flounder Commercial Landings by State (2011-2020) in Pounds.

Source: Commercial Landings Summaries for 2011-2020 – Non-confidential; using ACCSP Data Warehouse, Arlington, VA. & State Compliance Reports for 2020 data (June 2021)

State	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020***
MA	1,132,191	891,497	859,384	696,029	748,432	582,779	420,714	428,609	551,300	700,390
RI	2,824,028	2,409,445	2,192,542	2,056,037	1,716,095	1,306,386	896,048	1,022,616	1,662,132	1,703,401
CT	401,490	315,497	284,174	253,441	286,890	191,133	134,612	177,443	290,486	415,149
NY	1,517,021	1,237,821	1,033,287	832,557	829,929	603,522	491,433	462,673	875,331	856,149
NJ	2,830,735	2,268,593	2,004,188	1,825,611	1,681,961	1,296,914	961,842	1,045,566	1,588,135	1,917,832
DE	837	959	913	1,687	1,349	2,236	1,438	677	1,260	608
MD	259,408	165,273	193,543	192,049	187,811	158,996	137,470	143,372	155,915	201,106
VA	4,064,521	4,122,085	4,794,032	2,049,209	2,274,403	1,663,218	1,253,804	1,254,422	1,913,865	1,567,244
NC	2,854,296	1,089,969	541,939	2,906,821	2,878,549	2,124,231	1,563,221	1,654,651	2,026,509	1,776,143
Total	15,884,527	12,501,139	11,904,002	10,813,441	10,605,419	7,929,415	5,860,582	6,190,029	9,064,933	9,138,022

*2020 Landings are preliminary.

Table 3. 2020 State-Specific Shares of Commercial Summer Flounder Quota and Harvest by Weight (lb).
Source: 2020 State Compliance Reports.

State	2020 % Share of Federal Quota	2020 Initial Quota	2020 Transfers	2020 Final Quota	2020 Landings	Overages	% Quota Used	% Coastwide Total
ME	0.04756%	5,484		5,484	0		0.0%	0.0%
NH	0.00046%	53		53	0		0.0%	0.0%
MA	6.82046%	786,399	16,150	802,549	700,390		87.3%	7.7%
RI	15.68298%	1,808,248	6,417	1,814,665	1,703,401		93.9%	18.6%
CT	2.25708%	260,241	90,000	350,241	415,149*	64,908*	118.5%	4.5%
NY	7.64699%	881,698		881,698	856,149		97.1%	9.4%
NJ	16.72499%	1,928,391		1,928,391	1,917,832		99.5%	21.0%
DE	0.01779%	2,051		2,051	608		29.6%	<0.1%
MD	2.03910%	235,108		235,108	201,229		85.6%	2.2%
VA	21.31676%	2,457,822	25,622	2,483,444	1,569,333		63.2%	17.2%
NC	27.44584%	3,164,505	-138,189	3,026,316	1,776,143		58.7%	19.4%
TOTAL^	**100**	**11,530,000**		**11,530,000**	**9,138,022**		**85%**	

^ totals in table may not match listed quotas due to rounding

*SAFIS/ders database lists a preliminary landings value of 370,064 for 2020, which is lower than Connecticut's self-reported landings value

Table 4. Recreational Summer Flounder Harvest by State (2011-2020) in Weight (pounds).

Source: Personal Communication with NOAA Fisheries, Statistics Division June 2021

State	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
MA	547,366	655,903	161,396	575,285	385,987	239,844	171,922	142,540	145,203	175,590
RI	1,277,110	641,805	646,927	1,112,412	790,640	340,528	596,905	603,752	837,107	479,590
CT	377,004	457,523	1,808,379	935,458	998,509	1,023,887	402,529	549,268	292,453	387,741
NY	2,990,715	3,513,714	5,170,966	3,995,846	5,010,599	5,744,430	4,214,222	2,385,310	2,441,732	2,389,690
NJ	5,570,783	8,309,420	9,649,950	7,526,962	3,245,895	4,717,501	3,601,688	3,154,540	3,229,057	5,491,680
DE	399,982	305,600	319,942	449,033	270,174	435,174	253,703	205,380	224,528	534,247
MD	153,872	259,198	236,911	281,911	251,325	98,357	171,499	121,760	206,373	187,228
VA	1,855,447	1,702,566	1,223,570	1,142,384	719,288	528,706	528,350	345,064	368,955	381,165
NC	311,573	287,522	196,002	215,294	157,437	110,392	147,426	92,032	52,872	37,935
Total	13,483,852	16,133,251	19,414,043	16,234,585	11,829,854	13,238,819	10,088,244	7,599,646	7,798,280	10,064,866

Table 5. Estimated Summer Flounder Recreational Harvest, Releases, Dead Releases, Total Catch, and Total Removals in Numbers of Fish by Marine Recreational Anglers, 2011 to 2020. Source: Personal Communication with NOAA Fisheries, Statistics Division June 2021.

Year	Total Catch (A+B1+B2)	Harvest (A+B1)	Released (B2)	Dead Releases (10% of B2)	Total Removals (Harvest + Dead Releases)
2011	56,086,601	4,364,169	51,722,432	5,172,243	9,536,412
2012	44,726,435	5,757,709	38,968,726	3,896,873	9,654,582
2013	44,986,409	6,624,777	38,361,632	3,836,163	10,460,940
2014	44,587,219	5,372,855	39,214,364	3,921,436	9,294,291
2015	34,192,004	4,051,390	30,140,614	3,014,061	7,065,451
2016	31,254,673	4,304,152	26,950,521	2,695,052	6,999,204
2017	28,148,049	3,236,709	24,911,340	2,491,134	5,727,843
2018	23,568,261	2,427,186	21,141,075	2,114,108	4,541,294
2019	30,801,411	2,438,566	28,362,845	2,836,285	5,274,851
2020	33,323,616	3,556,983	29,766,633	2,976,663	6,533,646
10 YR AVG	**37,167,468**	**4,213,450**	**32,954,018**	**3,295,402**	**7,508,851**

Table 6. Summer Flounder State-by-State Recreational Management Measures for 2020 & 2021

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	17	5 fish	May 23-October 9
Rhode Island	19	6 fish	May 3-December 31
7 designated RI shore sites	19	4 fish*	
	17	2 fish*	
Connecticut	19	4 fish	May 4-September 30
41 designated CT shore sites	17		
New York	19	4 fish	May 4-September 30
New Jersey	18	3 fish	May 22-September 19
NJ Pilot shore program 1 site	16	2 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish	
Delaware	16.5	4 fish	All year
Maryland			
PRFC			
Virginia			
North Carolina	15	4 fish	August 16-Sept. 30

*Combined possession limit of 6 fish; no more than 2 fish at 17 inch minimum size limit

Figure 1. Summer Flounder Spawning Stock Biomass and Recruitment
Source: Summer Flounder Management Track Stock Assessment, 2021

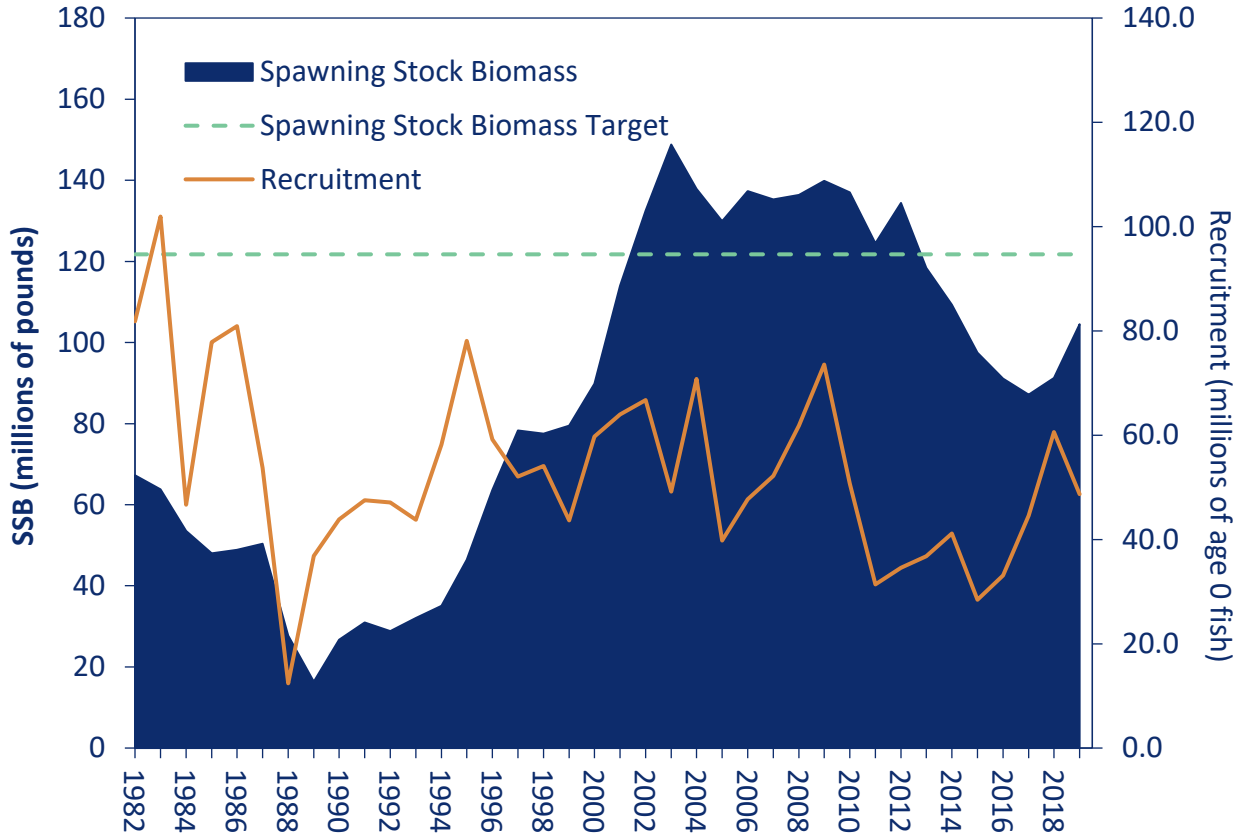


Figure 2. The Percent of Summer Flounder Harvested by Recreational Fishing Mode in Numbers of Fish, Maine through North Carolina, 2011-2020.

Source: Personal Communication with NOAA Fisheries, Fisheries Statistics Division, June 2021.

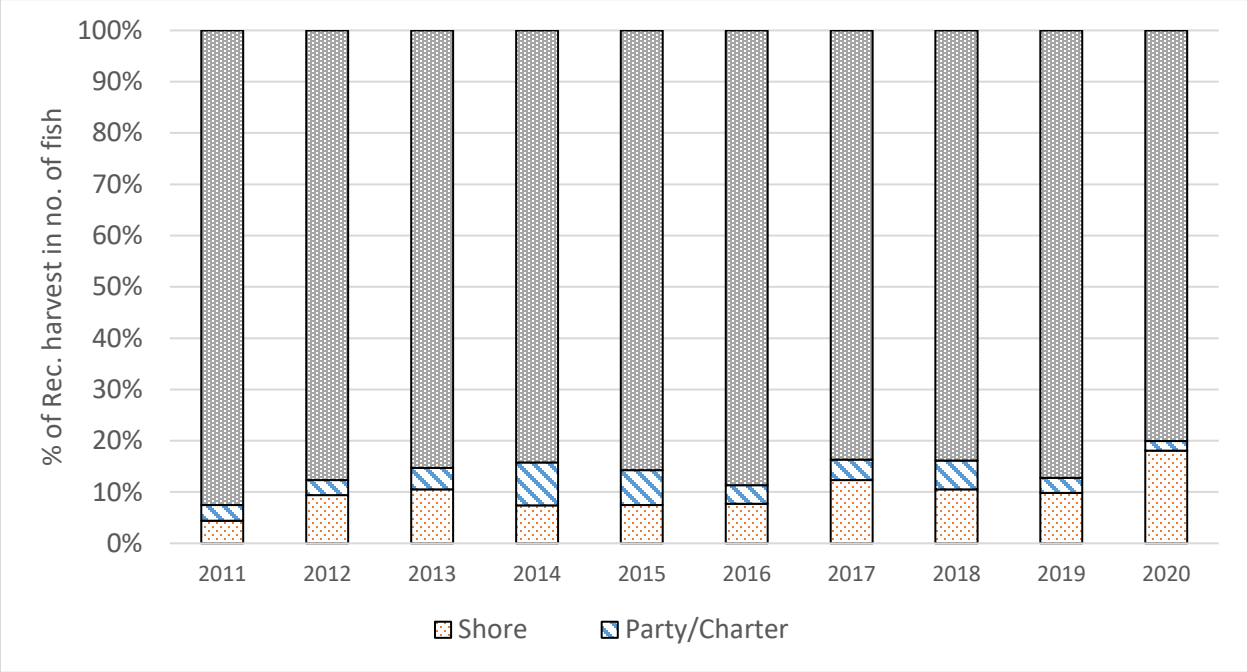
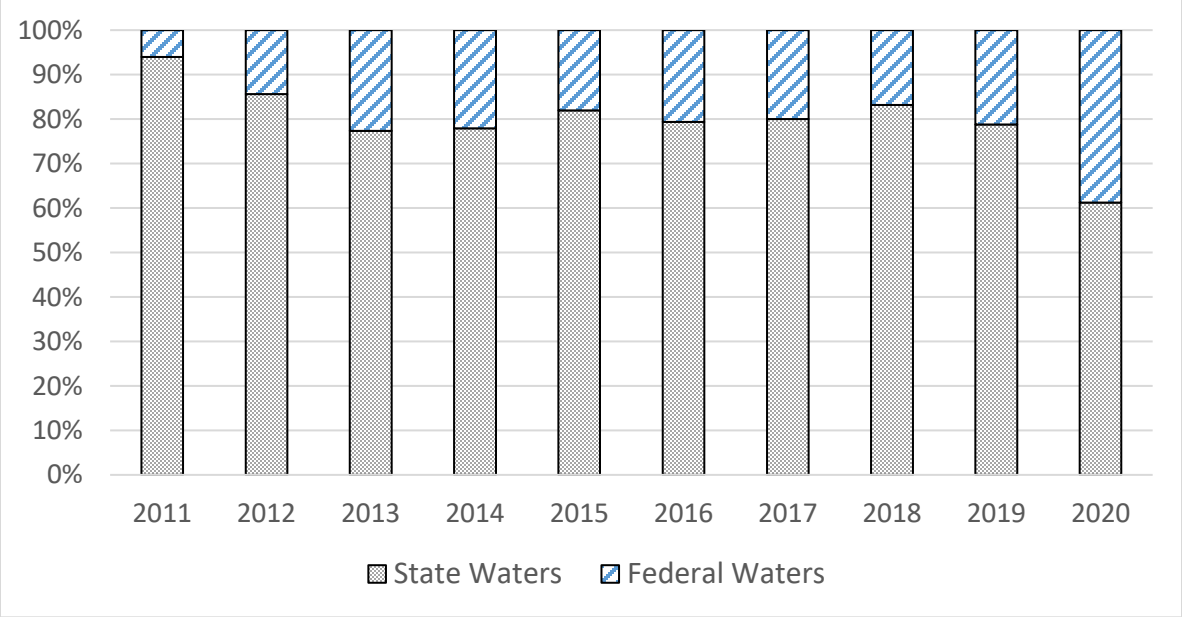


Figure 3. The Percent of Summer Flounder Recreational Landings (numbers of fish) in State vs. Federal Waters, Maine through North Carolina, 2011-2020.

Source: Personal Communication with NOAA Fisheries, Fisheries Statistics Division, June 2021.

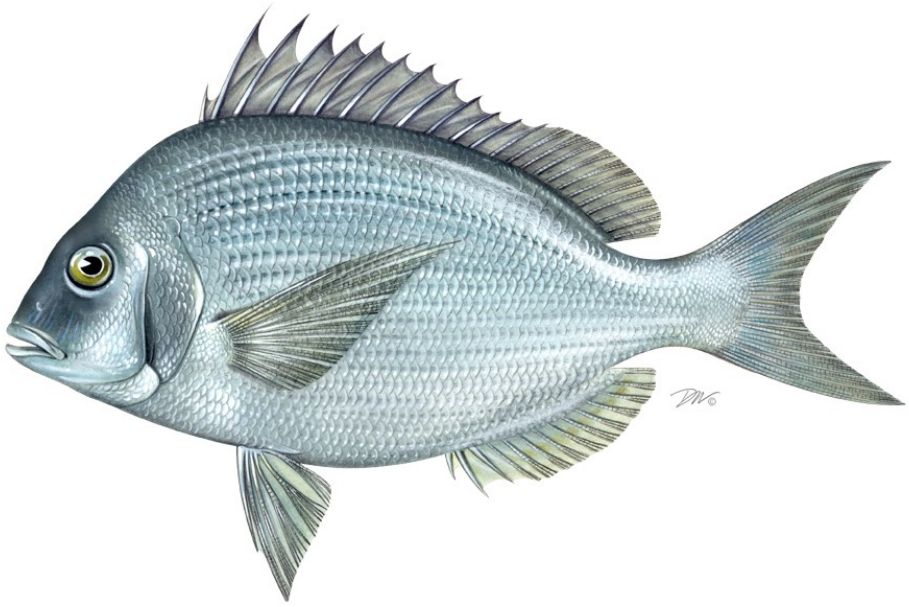


ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR SCUP
(Stenotomus chrysops)

2020 FISHING YEAR



Prepared by the Plan Review Team

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

2021 Review of the ASMFC Fishery Management Plan for Scup

I. Status of the Fishery Management Plan

States with a declared interest in the Scup FMP are Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The Commission's Summer Flounder, Scup, and Black Sea Bass Management Board and the Mid-Atlantic Fishery Management Council (Council) guide plan development. The Summer Flounder, Scup, and Black Sea Bass Technical Committee addresses technical issues. Industry advice is solicited through the Summer Flounder, Scup, and Black Sea Bass Advisory Panel, and annual review and monitoring is the responsibility of the Scup Plan Review Team.

Atlantic States Marine Fisheries Commission (ASMFC or Commission) management of scup was initiated as one component of a multi-species Fishery Management Plan (FMP) addressing summer flounder, scup, and black sea bass. The Commission approved the FMP for scup in March 1996. Amendment 12 to the FMP, which established revised overfishing definitions, identification and description of essential fish habitat, and defined the framework adjustment process, was approved by the Commission in October 1998. The management unit for scup in US waters is the western Atlantic Ocean from Cape Hatteras North Carolina northward to the US-Canadian border.

The FMP included a seven-year plan for reducing fishing effort and restoring the stock. The primary concerns were excessive discarding of scup and near collapse of the stock. Management measures implemented in the first year of the plan (1996) included: dealer and vessel permitting and reporting, 9-inch commercial minimum size, 4-inch mesh restriction for vessels retaining over 4,000 pounds of scup, and a 7-inch recreational minimum size. The biological reference point to define overfishing when the plan was initially developed was F_{MAX}, or F=0.25. To allow flexibility in addressing unforeseen conditions in the fishery, the plan contained provisions that allow implementation of time and area closures. The plan also specified the option for changes in the recreational minimum size and bag limit, or implementation of a seasonal closure on an annual basis. The original FMP also implemented an annual coastwide Total Allowable Catch (TAC) limit, effective in 1997, from which an annual commercial quota and recreational harvest limit would be derived.

Addendum 1 to the FMP established the quota management procedure for management and distribution of the annual coastwide commercial quota. Addendum 1 details the state-by-state quota system for the summer period (May through October) that was implemented in 1997. Each state receives a share of the summer quota based on historical commercial landings from 1983-1992. This Addendum also established *de minimis* status. A state is granted *de minimis* status if the commercial scup summer period landings for the last preceding calendar year are less than 0.1 % of the summer period's quota. *De minimis* status allows for minimal allocations equal to 0.1 % of the quota for the summer period to these states. The total amount of quota allocated to these *de minimis* states is subtracted from the summer quota before the remainder is allocated to the other states.

In June 1997, the Commonwealth of Massachusetts filed a lawsuit against the Secretary of Commerce stating that the historical data used to determine the quota shares underestimated

the commercial landings of scup. Massachusetts also stated that the resulting quota share discriminated against Commonwealth of Massachusetts residents. On April 27, 1998, the U.S. District Court voided the state-by-state quota allocations for the summer quota period in the federal FMP, and ordered the Secretary of Commerce to promulgate a regulation that sets forth state-by-state quotas in compliance with the National Standards. The Management Board developed three Emergency Rules to address the quota management during the summer quota period during 1999, 2000 and 2001.

Amendment 12 established a biomass threshold for scup based on the maximum value of the 3-year moving average of the Northeast Fisheries Science Center spring bottom trawl survey index of spawning stock biomass. The Amendment stipulated that the scup stock was considered overfished when the spawning stock biomass index fell below this value. Amendment 12 also defined overfishing for scup to occur when the fishing mortality rate exceeded the threshold fishing mortality. Subsequent addenda modified the reference points.

In 2002, the Board developed Addendum V to avoid the necessity of developing annual Emergency Rules for summer period quota management. Addendum V established state shares of the summer period quota based on historical commercial landings from 1983-1992, including additional landings from Massachusetts added to the NOAA Fisheries database in 2000. State shares implemented by this addendum will remain in place until the Board takes direct action to change them.

Another significant change to scup management occurred with the approval of Addendum VII in February 2002. This document established a state specific management program for Massachusetts through New York for the 2002 recreational scup fishery based on the average landings (in number of fish) for 1998-2001. Due to the extremely limited data available, the Board developed specific management measures for the states of New Jersey, Delaware, Maryland, Virginia, and North Carolina. The addendum had no application after 2002. The same addendum language was used verbatim to set management measures for the states of Massachusetts through New York for 2003 through Addendum IX.

Addendum XIX, approved in August 2007, broadened the descriptions of stock status determination criteria contained within the Summer Flounder, Scup, and Black Sea Bass FMP to allow for greater flexibility in those definitions, while maintaining objective and measurable criteria for identifying when stocks are overfished. It established acceptable categories of peer-review for stock status determination criteria. When these specific peer-review metrics are met and new or updated information is available, the new or revised stock status determination criteria may be incorporated by the Commission directly into the annual management measures for each species.

Addendum XX sets policies to reconcile quota overages to address minor inadvertent quota overages. It was approved in November 2009. It streamlines the quota transfers process and establishes clear policies and administrative protocols to guide the allocation of transfers from states with underages to states with overages. It also allows for quota transfers to reconcile quota overages after the year's end.

Addendum XXIX was approved by the Board in May 2017. The Addendum shortens the length of the commercial scup summer period and extends the length of the winter II period. The addendum was developed to allow for the better utilization of the commercial quota, which was under-harvested from 2011-2016. Specifically, the change in quota period length allows for higher possession limits for a longer period of time each year, thus increasing the likelihood the commercial fishery will fully harvest the quota. The quota allocation for each period remains unchanged. While Addendum XXIX is a Commission specific document, the Council also took the same action through Framework 10. The new quota periods are the following and were implemented for the 2018 fishing season: Winter 1, January 1-April 30 (120 days); Summer, May 1-September 30 (153 days); Winter II, October 1-December 31 (92 days).

In December 2018, the Commission approved Addendum XXXI through a joint action with the Council. The Board recommended NOAA Fisheries implement regulations to allow transit through federal waters in Block Island Sound for non-federally permitted vessels in possession of summer flounder, scup and black sea bass.

While this FMP overview pertained to joint and Board actions only, there are additional Council only actions that are summarized at https://www.mafmc.org/sf-s-bsb.

The Board and MAFMC developed a joint amendment to consider an adjustment to the allocations between the commercial and recreational fisheries for summer flounder, scup and black sea bass. The commercial and recreational allocations for all three species are currently based on historical proportions of landings (for summer flounder and black sea bass) or catch (for scup) for each sector. Recent changes in how recreational harvest is estimated have resulted in a discrepancy between the current levels of estimated recreational harvest and the allocations of summer flounder, scup and black sea bass to the recreational sector. Some changes have also been made to commercial catch data since the allocations were established. This amendment considers whether modifications to the allocations are needed in light of these and other changes in the fisheries. The amendment also considers options that would allow a portion of landings to be transferred between the commercial and recreational sectors each year, in either direction, based on the needs of each sector. At the April 2021 meeting of the Board and MAFMC, final action was postponed to allow for further development of the Recreational Reform Initiative. The Council and Board are now scheduled to take final action on the commercial/recreational allocation amendment at a joint meeting in December 2021. Additional information and updates on this amendment are available at: http://www.mafmc.org/actions/sfsbsb-allocation-amendment.

II. Status of the Stock

The 2021 Scup Management Track Stock Assessment is the most recent stock assessment information that will be utilized for specifications for the 2022-2023 fishing years.

The stock was neither overfished nor was overfishing occurring in 2019 relative to the updated biological reference points. Spawning stock biomass (SSB) was estimated to be 176,404 mt in 2019, at 196% of the updated biomass target reference point SSB_{MSY} proxy = $SSB_{40\%}$ = 90,019 mt

(Figure 1). Fishing mortality on the fully selected age 4 fish was 0.136 in 2019, which is 68% of the updated fishing mortality threshold reference point F_{MSY} proxy = $F_{40\%}$ = 0.200. $F_{40\%}$ is the rate of fishing that will result in 40% of the spawning potential of an unfished stock.

The average recruitment from 1984 to 2019 is 136 million fish at age 0. The 2015 year class was the largest recorded at 415 million fish. However, recruitment has been below average 2017-2019 with the 2019 year class being the smallest within the time series at 34 million fish (Figure 1). SSB is expected to decrease back down to the target unless more above average year classes recruit to the fishery in the short term.

The next management track stock assessment is scheduled for 2023.

III. Status of the Fishery

Commercial scup landings experienced a general declining trend from the peak of 49 million pounds in 1960 to the time series low of 2.66 million pounds in 2000. Since 2001, commercial landings increased nearly every year to about 17.81 million pounds in 2013. Commercial landings have declined slightly since, subsiding to 13.68 million lb. in 2020, about 62% of the commercial quota. During the period 2011-2020, the northern states have comprised 95% of the landings with Rhode Island at 39%, New York at 26%, New Jersey at 14%, Massachusetts at 10%, and Connecticut at 6%. Otter trawl is the principal gear, accounting for 40%-90% of commercial landings since 1979 (Table 1).

The recreational fishery for scup is significant, with the greatest proportion of the catches taken in states of Massachusetts through New York. Since 2011, recreational harvest has averaged 43% of total landings (commercial and recreational). From 2011 to 2020, recreational harvest has ranged from 8.27 million lb. in 2012 to 14.12 million lb. in 2019. In 2020, recreational harvest was 12.91 million lb., approximately 49% of total landings (Table 2). The total catch (harvest plus releases) of scup in 2020 were 27.27 million fish, slightly higher than the ten year average of 27.07 million fish (**Error! Reference source not found.**). The assumed discard mortality rate in the recreational fishery is 15%. In 2020, an estimated 61.6% of the harvest (in numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 27.9% and 10.5% of the harvest, respectively (Figure 2). In addition, 90.2% of scup harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 9.8% in federal waters (Figure 3).

IV. Status of Research and Monitoring

Commercial landings data are collected by the NOAA Fisheries Vessel Trip Report system and by state reporting systems. The Northeast Fisheries Science Center (NEFSC) sea sampling program collects commercial discard information. Biological samples (age, length) from the commercial fishery are collected through the NEFSC weighout system, the observer program, and by the state of North Carolina. Recreational landings and discard information is obtained through the Marine Recreational Information Program (MRIP). Fishery-independent abundance indices are available from surveys conducted by the NEFSC, Massachusetts, Rhode Island, Connecticut,

New York, New Jersey, Delaware, and the Virginia Institute of Marine Science. All surveys, with the exception of Delaware's, are included in the species stock assessment.

COVID-19 impacted several aspects of fishery dependent and independent monitoring. All New England and Mid-Atlantic states suspended the Access Point Angler Intercept Survey (APAIS) sampling starting in late March or April 2020. APAIS sampling resumed between May and August 2020, depending on the state. However, NOAA Fisheries was able to fill gaps in 2020 catch data with data collected in 2018 and 2019. These imputed data—also known as proxy, or replacement, data—match the time, place, and fishing mode combinations that would have been sampled had the APAIS continued uninterrupted. Imputed data were combined with observed data to produce catch estimates using MRIP's standard estimation methodology. To ensure imputed data weren't over-represented against observed data, the original sample weights for the 2018 and 2019 catch records were down-weighted. The use of imputed catch data had minimal impact on the effort estimates, as the mail and telephone surveys that collect effort data continued largely uninterrupted.

While commercial effort and markets were impacted to various degrees, data collection for commercial landings from seafood dealers continued uninterrupted. However, 2020 commercial discard estimates will be affected by missing observer data. Commercial discard estimates are developed using Standardized Bycatch Reporting Methodology approaches that rely heavily on observer data. On March 20, 2020, NOAA Fisheries temporarily waived the requirement for vessels with Greater Atlantic fishing permits to carry a fishery observer or at-sea monitor. This waiver was extended several times before observers were redeployed on August 14, 2020. At this time it is not clear whether alternative methodologies will be developed to generate 2020 commercial discard estimates for scup and other species.

Several fishery independent surveys were also affected by the pandemic in 2020. New Jersey's Ocean Stock Assessment Survey was suspended. The Massachusetts semiannual trawl survey's spring and fall components were cancelled. Connecticut's spring and fall Long Island Sound Trawl Survey sampling was suspended. The spring Northeast Area Monitoring and Assessment Program aggregated age index of abundance for 2020 is also unavailable due to COVID-19.

V. Status of Management Measures and Issues

COMMERCIAL FISHERY

The following management measures are for 2020 and may change annually.

Minimum size of possession: 9" Total Length

Minimum mesh: Otter trawls must have a minimum mesh size of 5" for the first 75 meshes from the terminus of the net and a minimum mesh size of 5" throughout the net for codends constructed with fewer than 75 meshes.

Threshold to trigger minimum mesh requirements: Trawl vessels are subject to the minimum mesh requirements if possessing 1,000 pounds or more of scup from October 1 through April

14, 2,000 pounds or more of scup from April 15 through June 15, and 200 pounds or more of scup from June 16 through September 30.

Maximum roller rig trawl roller diameter: 18”

Pot and trap escape vents: 3.1” round, 2.25” square

Pot and trap degradable fastener provisions: a) untreated hemp, jute, or cotton string 3/16” (4.8 mm) or smaller; b) magnesium alloy timed float releases or fasteners; c) ungalvanized, uncoated iron wire of 0.094” (2.4mm) or smaller

2020 Commercial quota: 22.23 million pounds

ASMFC Summer Quota: 8,658,277 lbs (State by State Shares in Table 4)

Winter I and II Quotas and landing limits: Winter I = 10,027,597 lbs; 50,000 lb trip limit, 1,000 lbs trip limits when the quota reaches 80%; Winter II = 3,543,336 lbs, 24,000 pounds trip limit (both increased from initial amounts by rollover of unused quota from Winter I;

Table 5)

The following required measures are not subject to annual adjustment:

Vessel and dealer permitting requirements: States are required to implement a permit for fishermen fishing exclusively in state waters, and for dealers purchasing exclusively from such fishermen. In addition, states are expected to recognize federal permits in state waters, and are encouraged to establish a moratorium on entry into the fishery.

Vessel and dealer reporting requirements: States are required to implement reporting requirements for state permitted vessels and dealers and to report landings from state waters to NOAA Fisheries.

Scup pot or trap definition: A scup pot or trap will be defined by the state regulations that apply to the vessels principal port of landing.

Quota management requirements:
Winter I and II: States are required to implement landing limits as specified annually. States are required to notify state and federal permit holders of initial period landing limits, in-period adjustments, and closures. States are required to prohibit fishing for, and landing of, scup when a period quota has been landed, based on projections by NOAA Fisheries. States must report landings from state waters to NOAA Fisheries for counting toward the quota

Summer: States are required to implement a plan of trip limits or other measures to manage their summer share of the scup quota. States are required to prohibit fishing for, and landing of, scup when their quota share is landed. States may transfer or combine quota shares. States must report all landings from state waters to NOAA Fisheries for counting toward the state shares.

RECREATIONAL FISHERY

Addendum IX (2003) established a state-specific management program for Massachusetts through New York (inclusive), and specific management measures for the states of New Jersey, Delaware, Maryland, Virginia, and North Carolina. The states have continued this approach since 2004.

The following measures may change annually: **Recreational Measures[1]**

2020 & 2021 Minimum size, possession limits and seasonal closure: Table 6

2020 Recreational Harvest Limit: 6.51 million pounds

OTHER MEASURES

Reporting: States are required to submit an annual compliance report to the Chair of the ASMFC Scup Plan Review Team (PRT) by June 1 of each year. This report should detail the

[1] Past FMP Reviews are available on the Commissions' scup webpage, which contain prior year's recreational measures.

state's management program for the current year and establish proof of compliance with all mandatory management measures. It should include landings information from the previous year, and the results of any monitoring or research programs.

De minimis: A state is granted *de minimis* status if the commercial scup landings for the last preceding calendar year for which data are available for the summer period are less than 0.1% of the summer period's quota. *De minimis* status allows for minimal allocations equal to 0.1 % of the quota for the summer period to these states. The total amount of quota allocated to these *de minimis* states is subtracted from the summer quota before the remainder is allocated to the other states. States desiring *de minimis* classification must make a formal request in writing through the Plan Review Team for review and consideration by the Scup Management Board.

This summary of compliance criteria is intended to serve as a quick reference guide. It in no way alters or supersedes compliance criteria as contained in the Scup FMP and any Amendments thereto.

Scup FMP Compliance Schedule

Commercial Fishery

Management Measures	
Ability to implement and enforce period landing limits	1/1/97
Ability to notify permit holders of landing limits and closures	5/1/97
Ability to close the summer fishery once the state share is harvested	5/1/97
Ability to close the winter fisheries once the period quota is harvested	5/1/97
9" total length minimum size limit	6/30/96
Minimum mesh size of 5" diamond mesh throughout codend	1/1/05
Pot and trap escape vents (min 3.1" square/rectangular; each side at least 2.25" in length), degradable fasteners	6/30/96
Roller diameter restriction (maximum of 18")	6/30/96
Vessel permit and reporting requirements, state	1/1/97
Dealer permit and reporting requirements, state	1/1/97

Recreational Fishery

Management Measures	
Size limit	6/30/96

Possession limit	6/30/96

General

States submit annual monitoring and compliance report	6/1 annually

Annual Specifications

Commercial		
Winter I Landing Limits	11/1/05	1/1/16
Winter II Landing Limits	11/1/05	11/1/16

Recreational

Massachusetts– New York (inclusive)	
State specific minimum size, possession limit and season	3/16
New Jersey – North Carolina (inclusive)	
Federal coastwide minimum size, possession limit and season	12/15

VI. Plan Review Team Comments and Recommendations

- The PRT notes that after reviewing state compliance reports, most states are compliant with the FMP requirements with only one issue identified: Delaware's regulations regarding pot and trap escape vents are consistent with the requirements in the black sea bass FMP, but not consistent with the large escape vent requirement under the scup FMP. In 2021, Delaware staff informed Commission staff that Delaware's management section decided against making any changes to their pot regulations since Delaware has no directed scup fishery with minimal incidental landings. Additionally, the Delaware management section said that larger scup escape vent requirements would interfere with their lobster pot regulations.
- The PRT discussed Delaware's escape vent regulations, and didn't highlight this as a high priority compliance issue for two reasons. 1) The PRT recognizes that Delaware has very minimal landings of less than 0.1% of annual coastwide landings. 2) In addition, the PRT noted that the current *de minimis* status does not exempt a state from specific gear regulations within the FMP. However, the ISFMP Policy Board is currently reviewing *de minimis* status with the potential to expand the policy to allow for states to apply for specific gear exemptions, which could potentially resolve this issue.
- With the one exception noted above, the PRT determined that all states have implemented regulations consistent with the FMP requirements.
- Delaware has requested *de minimis* status and meets the requirements for 2020.

VII. Research Recommendations

Research recommendations are summarized on page 4 of the 2021 Scup Management Track Stock Assessment

VIII. References

Northeast Fisheries Science Center. 2021. Prepublication copy of the June 2021 management track stock assessment report prepared for the Council and the SSC. Available at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2021_scup_MTA_report.pdf

Table 1 Scup Commercial Landings by State 2011-2020 in Pounds.

Source: ACCSP. 2011-2020. Commercial Landings Summaries; generated by Dustin Colson Leaning; using ACCSP Data Warehouse, Arlington, VA. State Compliance Reports for 2020 data (May 2020).

State	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020**
MA	1,243,808	2,005,267	1,402,830	1,187,763	1,380,263	1,535,946	2,560,120	1,486,676	1,247,961	788,612
RI	6,335,920	6,310,689	7,345,771	6,948,870	6,793,854	6,808,917	5,973,305	4,713,742	4,583,835	4,302,325
CT	644,443	906,821	1,194,761	811,106	983,042	941,532	748,285	792,737	1,141,067	1,353,411
NY	3,728,937	4,306,996	4,574,421	3,174,867	4,050,297	3,504,265	3,464,504	3,348,867	4,067,582	4,795,794
NJ	1,966,479	978,531	2,035,138	2,351,643	2,981,573	2,336,172	1,841,315	2,475,986	1,836,807	1,977,938
DE	C	C	C	C	C	C	C	C	C	C
MD*	C	C	C	C	C	C	C	C	C	C
VA	620,479	339,862	902,063	694,281	509,334	447,203	559,187	441,160	461,965	327,739
NC*	C	C	C	C	C	C	C	C	C	C
Total	14,903,210	14,860,387	17,810,202	15,859,804	16,953,958	15,739,531	15,433,704	13,380,927	13,778,273	13,675,608

C= Confidential

*MD & NC landings are not confidential; they were marked as such in order to comply with the rule of three for maintaining confidentiality for other state commercial landings totals

**2020 Landings are still preliminary

Table 2 Recreational Scup Harvest by State (2011-2020) in Pounds.

Source: "Personal Communication with NOAA Fisheries, Statistics Division June 2021."

State	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
MA	3,670,012	2,752,114	3,949,812	3,238,337	1,955,270	2,156,731	2,363,921	3,021,959	1,924,202	1,174,791
RI	1,269,888	1,119,378	2,622,654	2,650,482	1,370,141	1,552,395	1,113,035	2,030,258	2,856,459	1,330,398
CT	2,581,001	1,887,141	2,228,809	1,245,734	1,148,402	1,373,235	1,712,421	2,574,308	2,242,548	2,951,959
NY	2,630,105	2,244,903	3,535,433	3,085,237	7,607,418	4,252,716	6,626,060	4,906,043	6,970,873	6,253,478
NJ	154,089	259,235	292,315	49,283	87,658	480,660	1,708,355	443,700	118,832	1,200,941
DE	32	393	0	30	674	0.9	119	362	0	316
MD	7	0	0	0	207	147	6	370	444	578
VA	16,817	3,851	6,344	0	4081	183,405	0	0	229	0
NC	690	2280	515	1340	405	0	508	420	2637	1346
Total	10,322,641	8,269,295	12,635,882	10,270,443	12,174,256	9,999,290	13,524,425	12,977,420	14,116,224	12,913,807

Table 3 Estimated Scup Recreational Harvest, Releases, Dead Releases, Total Catch, and Total Removals in Numbers of Fish by Marine Recreational Anglers, 2011 to 2020.
Source: Personal Communication with NOAA Fisheries, Statistics Division June 2021.

Year	Total Catch (A+B1+B2)	Harvest (A+B1)	Released (B2)	Dead Releases (10% of B2)	Total Removals (Harvest + Dead Releases)
2011	18,520,338	7,598,242	10,922,096	1,638,314	9,236,556
2012	21,237,852	7,334,846	13,903,006	2,085,451	9,420,296
2013	25,878,520	11,547,028	14,331,492	2,149,724	13,696,752
2014	20,886,569	9,493,668	11,392,901	1,708,935	11,202,603
2015	25,154,964	11,498,780	13,656,184	2,048,428	13,547,208
2016	31,493,863	9,143,576	22,350,287	3,352,543	12,496,119
2017	41,203,847	13,825,024	27,378,823	4,106,823	17,931,847
2018	30,376,757	14,546,552	15,830,205	2,374,531	16,921,083
2019	28,666,419	14,954,156	13,712,263	2,056,839	17,010,995
2020	27,274,159	14,498,805	12,775,354	1,916,303	16,415,109
10 YR AVG	**27,069,329**	**11,444,068**	**15,625,261**	**2,343,789**	**13,787,857**

Table 4 State by State Summer Period Quota for 2020

State	Share	2020 ASMFC Final Quota
ME	0.12101	10,477
MA	21.58729	1,869,087
RI	56.19456	4,865,481
CT	3.15399	273,081
NY	15.82466	1,370,143
NJ	2.91667	252,533
MD	0.0119	1,030
VA	0.16502	14,288
NC	0.0249	2,156
Total	100	8,658,277

Table 5 Scup Landings by Period.

Source: ACCSP Data Warehouse May 2021.

Year	Period	Commercial Quota	Trip Limits	Landings (lbs)	Date Closed	% of Quota Landed
2011	Winter I	6,897,648	30,000/1,000*	5,685,724	--	82.4
	Summer	7,930,504	--	5,159,370	--	65.1
	Winter II	3,245,500	2,000/1,000	4,058,117	--	125.0
2012	Winter I	12,589,558	50,000/1,000*	5,395,403	--	42.9
	Summer	10,870,390	--	5,114,705	--	47.1
	Winter II	11,635,321	8,000	4,350,279	--	37.4
2013	Winter I	10,613,157	50,000/1,000*	7,420,568	--	69.9
	Summer	9,163,877	--	6,713,261	--	73.3
	Winter II	6,932,998	8,000	3,676,386	--	53.0
2014	Winter I	9,900,000	50,000/1,000*	6,107,429	--	61.7
	Summer	8,548,364	--	6,402,229	--	74.9
	Winter II	7,232,471	12,000	3,350,155	--	46.3
2015	Winter I	9,578,008	50,000/1,000*	7,400,159	--	77.3
	Summer	8,269,322	--	6,426,593	--	77.7
	Winter II	5,468,726	12,000	3,127,206	--	57.2
2016	Winter I	9,232,987	50,000/1,000*	6,079,576	--	65.8
	Summer	7,972,176	--	5,950,690	--	74.6
	Winter II	3,262,554	18,000	3,709,271	--	113.7
2017	Winter I	8,291,190	50,000/1,000*	5,916,146	--	71.4
	Summer	7,458,013	--	6,547,858	--	87.8
	Winter II	5,160,914	18,000	2,969,709	--	57.5
2018	Winter I	10,820,000	50,000/1,000*	4,854,809	--	44.9
	Summer	9,340,986	--	5,743,433	--	61.5
	Winter II	3,822,816	28,500	2,782,690	--	72.8
2019	Winter I	10,820,000	50,000/1,000*	5,547,739	--	51.3
	Summer	9,340,986	--	5,119,736	--	54.8
	Winter II	3,822,816	27,000	3,110,798	--	81.4
2020	Winter I	10,027,597	50,000/1,000*	5,176,489	--	51.6
	Summer	8,658,277	--	5,616,534	--	64.9
	Winter II	3,543,336	24,000	2,799,449	--	79.0

*The first number indicates the trip limit until 80% of the quota is caught; the second number is the trip limit after that threshold is exceeded.

** Scup landings by period pulled from the ACCSP Data Warehouse may differ from compliance reports and federal dealer data records. All 2020 data listed in this report are preliminary.

Table 6 Scup State-by-State Recreational Management Measures for 2020 & 2021

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts (Private Vessel & Shore)	9	30 fish; 150 fish/vessel with 5+ anglers on board	January 1-December 31
Massachusetts (Anglers aboard For-hire Vessels)	9	30 fish	January 1-April 30; July 1-December 31
		50 fish	May 1-June 30
Rhode Island (Private Vessel & Shore)	9	30 fish	January 1-December 31
RI Shore Program (7 designated shore sites)	8		
RI (Anglers aboard For-hire Vessels)	9	30 fish	January 1-August 31; November 1-December 31
		50 fish	September 1-October 31
Connecticut (Private Vessel & Shore)	9	30 fish	January 1-December 31
CT Shore Program (45 designed shore sites)	8		
CT (Anglers aboard For-hire Vessels)	9	30 fish	January 1-August 31; November 1-December 31
		50 fish	September 1-October 31
New York (Private Vessel & Shore)*	9	30 fish	January 1-December 31
NY* (Anglers aboard For-hire Vessels)	9	30 fish	January 1-August 31; November 1-December 31
		50 fish	September 1- October 31
New Jersey	9	50 fish	January 1- December 31
Delaware	8	50 fish	January 1-December 31
Maryland	8	50 fish	January 1-December 31
Virginia	8	30 fish	January 1-December 31
North Carolina, North of Cape Hatteras (N of 35° 15'N)	8	50 fish	January 1-December 31

Figure 1. Scup Spawning Stock Biomass and Recruitment
Source: Scup Management Track Stock Assessment, 2021.

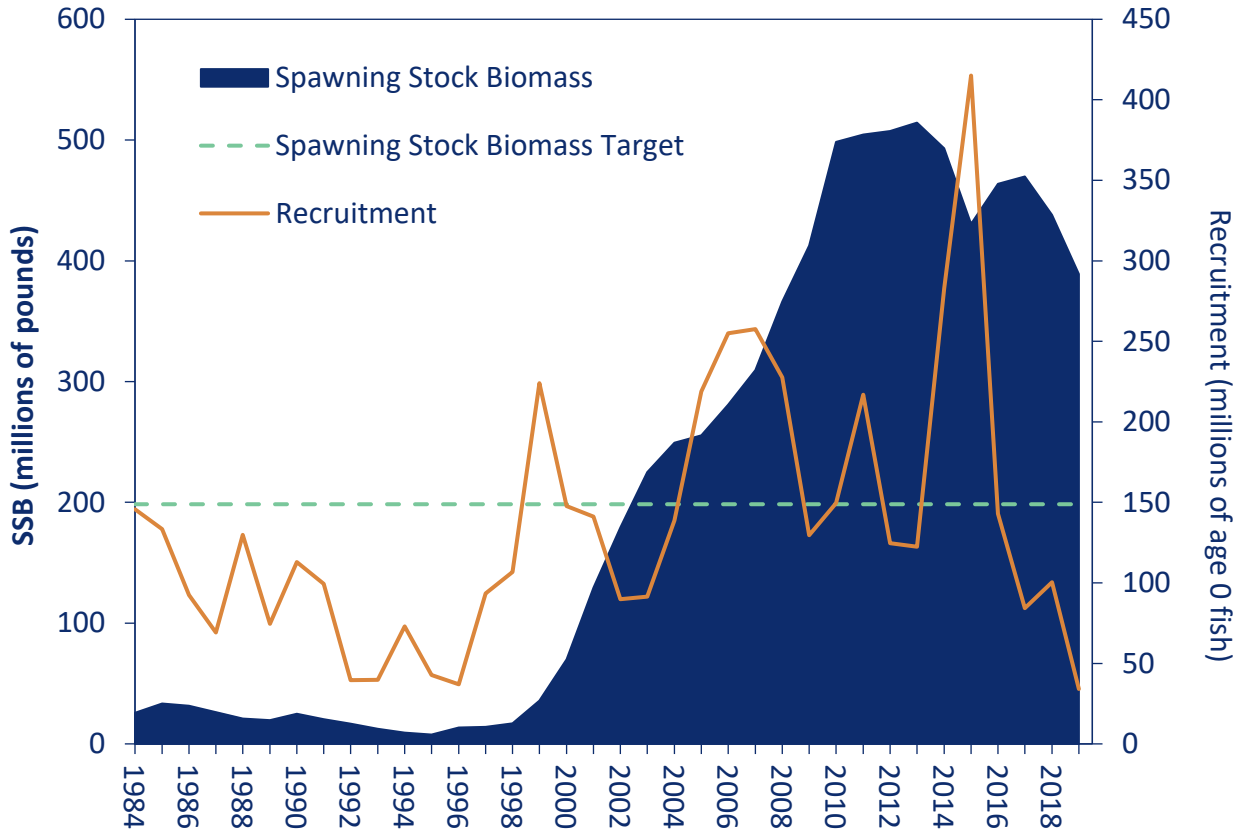


Figure 2. The Percent of Scup Harvested by Recreational Fishing Mode in Numbers of Fish, Maine through North Carolina, 2011-2020.
Source: Personal Communication with NOAA Fisheries, Fisheries Statistics Division, June 2021.

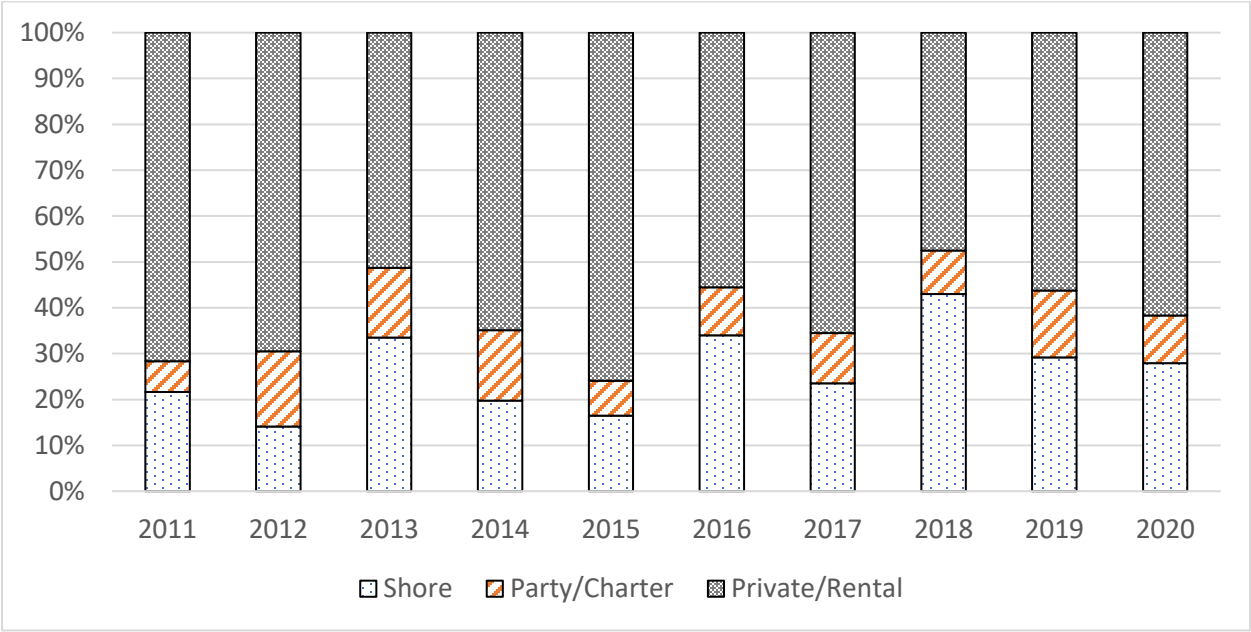
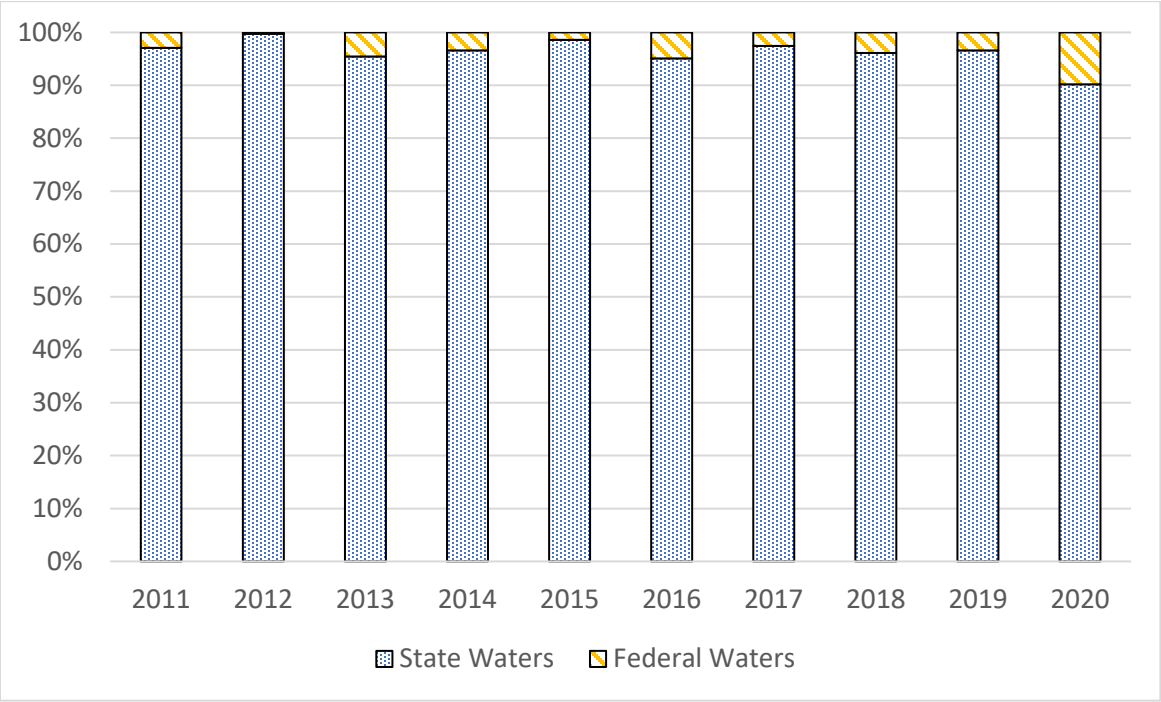


Figure 3. The Percent of Scup Recreational Landings (numbers of fish) in State vs. Federal Waters, Maine through North Carolina, 2011-2020.

Source: Personal Communication with NOAA Fisheries, Fisheries Statistics Division, June 2021.



DRAFT FOR BOARD REVIEW

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR BLACK SEA BASS
(Centropristis striata)

2020 FISHING YEAR

Prepared by the Plan Review Team
Drafted June 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

2020 Review of the ASMFC Fishery Management Plan for Black Sea Bass

I. Status of the Fishery Management Plan

Atlantic States Marine Fisheries Commission (ASMFC or Commission) management of black sea bass was initiated as one component of a multi-species fishery management plan (FMP) addressing summer flounder, scup, and black sea bass. In 1990, summer flounder was singled out for immediate action under a joint ASMFC and Mid-Atlantic Fishery Management Council (MAFMC or Council) plan. Further action on the scup and black sea bass plan was delayed until 1992 to expedite the summer flounder FMP and subsequent amendments. The joint Black Sea Bass FMP was completed and approved in 1996. The MAFMC approved regulations for black sea bass as Amendment 9 to the Summer Flounder FMP in May 1996.

The management unit of the Black Sea Bass FMP includes all black sea bass in U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina north to the Canadian border. The Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (or Board) and the MAFMC guide development of the FMP. New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina have declared an interest in black sea bass; Maine and New Hampshire declared interest in 2014, then declined interest in the fishery in 2017 and 2018, respectively. New Hampshire re-declared an interest in 2020 and rejoined the Board in 2021. The Black Sea Bass Plan Review Team conducts annual reviews and monitors compliance, and the Summer Flounder, Scup and Black Sea Bass Advisory Panel provides industry input and advice. Technical issues are addressed through the Summer Flounder, Scup, and Black Sea Bass Technical and Monitoring Committees.

The objectives of the FMP are to reduce fishing mortality to ensure overfishing does not occur, reduce fishing mortality on immature black sea bass to increase spawning stock biomass, improve yield from the fishery, promote compatible regulations among states and between federal and state jurisdictions, promote uniform and effective enforcement, and minimize regulations necessary to achieve the stated objectives. The initial black sea bass FMP (1996) aimed to reduce fishing mortality using a coastwide commercial quota allocated into quarterly periods beginning in 1998, and a recreational harvest limit constrained through the use of minimum size, possession limit, and seasonal closures.

Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass FMP was approved by the Commission and MAFMC in October 1998. The Amendment revised overfishing definitions, identified and described essential fish habitat, and defined the framework adjustment process.

Addendum IV, approved in 2001, provides that upon the recommendation of the relevant monitoring committee and joint consideration with the Council, the Board will decide state regulations rather than forward a recommendation to NMFS. Addendum IV also made the states responsible for implementing the Board's decisions on regulations.

Starting in 1998, the fishery was subject to lengthy closures and had some significant quota overages in the commercial sector. Fishery closures occurring as a result of exceeded quotas resulted in increased discards of legal sized black sea bass in mixed fisheries for the remainder of the closed period. A significant financial hardship for the fishing industry resulted from a decrease in market demand caused by a fluctuating supply. To address these issues, the Board enacted a series of Emergency Rules in 2001 that established initial possession limits, triggers, and adjusted possession limits. These measures helped reduce the length of fishery closures, but the rapidly changing regulations confused fishermen and added significant administrative burden to the states. To simplify the process for all parties, the Board approved Addendum VI to provide a mechanism for initial possession limits, triggers, and adjusted possession limits to be set during the annual specification setting process without the need for further Emergency Rules.

Amendment 13, approved by ASMFC and MAFMC in 2002, implemented a federal, annual coastwide commercial quota that is managed in state waters by ASMFC using a state-by-state allocation system. The Amendment was implemented for 2003 and 2004. State-specific commercial shares are listed in Table 1. Amendment 13 also removed the necessity for fishermen who have both a Northeast Region (NER, now referred to as the Greater Atlantic Region) Black Sea Bass permit and a Southeast Region (SER) Snapper Grouper (S/G) permit to relinquish their permits for a six-month period prior to fishing south of Cape Hatteras during a northern closure.

Addendum XII, approved in 2004, continued the use of an annual coastwide commercial quota managed by the ASMFC through a state-by-state allocation system.

Addendum XIII and the MAFMC's complementary Framework 5, approved in 2004, modified the FMP so that Total Allowable Landings (TALs) for the summer flounder, scup, and/or black sea bass can be specified for up to three years.

Addendum XIX, approved in 2007, continued the state-by-state black sea bass commercial management measures, without a sunset clause. This addendum, and the MAFMC's complementary Framework 7, also broadened the descriptions of stock status determination criteria contained within the Summer Flounder, Scup, and Black Sea Bass FMP to allow for greater flexibility in those definitions, while maintaining objective and measurable status determination criteria for identifying when stocks or stock complexes covered by the FMP are overfished. It established acceptable categories of peer-review for stock status determination criteria. When these specific peer-review metrics are met and new or updated information is available, the new or revised stock status determination criteria may be incorporated by the Commission directly into the annual management measures for each species, rather than requiring a modification to the FMP.

Addendum XX, approved in 2009, set policies to reconcile commercial quota overages to address minor inadvertent quota overages. It streamlined the quota transfers process and established clear policies and administrative protocols to guide the allocation of transfers from

states with underages to states with overages. It also allowed for commercial quota transfers to reconcile quota overages after the year's end.

Beginning in 2011 due to concerns about equitable access to the resource, a series of addenda replaced the use of uniform coastwide measures to manage the recreational fishery. Addendum XXI established state shares of the recreational harvest limit (RHL) for 2011. Addenda XXII, XXIII, XXV, and XXVII implemented an ad hoc regional management approach for 2012-2017, whereby the northern region states of Massachusetts through New Jersey individually crafted state measures aimed at liberalizing or reducing harvest by the same percent to achieve the RHL, while the southern region states of Delaware through North Carolina largely set regulations consistent with the measures set for federal waters.

For 2018, Addendum XXX established a regional allocation of the coastwide RHL to address state concerns regarding equity and accountability in recreational black sea bass management. Based on a combination of exploitable biomass information from the latest stock assessment and historical harvest, the RHL was allocated to three regions: 1) Massachusetts through New York, 2) New Jersey as a state-specific region, and 3) Delaware through North Carolina. The 2018 state recreational measures were then revised in May 2018 following an appeal of the Addendum to the ISFMP Policy Board by Massachusetts, Rhode Island, Connecticut and New York.

In December 2018, the Board approved Addendum XXXI (and the Council approved corresponding Framework 14), which modified the FMP to allow federal conservation equivalency (i.e., waiving federal waters measures in favor of state waters measures) as an option for the recreational black sea bass fishery beginning in 2020, and implemented transit provisions for Block Island Sound for recreational and commercial fisheries for summer flounder, scup, and black sea bass in the same area as the existing striped bass transit zone. The Council's framework action also modified the Council's FMP to allow a maximum size limit to be used in the recreational fisheries for summer flounder and black sea bass.

Addendum XXXII, approved in December 2018, established a new process for developing recreational management measures for black sea bass and summer flounder whereby measures will be set annually through a specifications process, rather than addenda. The Board will approve measures in early spring each year, based on Technical Committee analysis of stock status, resource availability, and harvest estimates. To further aid in setting specifications, the Addendum established standards and guiding principles intended to structure the development of recreational measures on a regional basis. Public input on specifications will be gathered by states through their individual public comment processes.

In February 2021, the Board approved Addendum XXXIII jointly with the Council making changes to black sea bass commercial state allocations. These changes have not been implemented. Connecticut's baseline allocation increased to 3% of the coastwide quota. State allocations will be calculated by allocating 75% of the coastwide quota according to new, adjusted baseline quotas after the increase to Connecticut. The other 25% of quota will be

allocated to three regions (Maine-New York, New Jersey, and Delaware-North Carolina) based on the most recent regional biomass distribution from the stock assessment. The Council approved a complementary amendment to include the state specific commercial allocations in the Council FMP, along with modifications to regulations for federal in-season closures; this amendment has not yet undergone NOAA Fisheries review. Currently, the baseline quotas are undergoing an appeal from the state of New York, and will change pending a review by the Board.

In April 2021, the Commission and Council considered final action on the Summer Flounder, Scup and Black Sea Bass Commercial/Recreational Allocation Amendment which considers potential modifications to the allocations of catch or landings between the commercial and recreational sectors for the three species. The current commercial and recreational allocation percentages for all three species do not reflect the current understanding of the recent and historic proportions of catch and landings from the two sectors. This amendment will consider whether changes to these allocations are warranted. The Commission and Council postponed final action on the amendment until December 2021 to allow for further development of the recreational reform initiative.

II. Status of the Stock

The most recent benchmark stock assessment for black sea bass was peer reviewed in December 2016 (SAW-62). The assessment found black sea bass was not overfished nor experiencing overfishing in 2015, the terminal year of the assessment. The assessment used an age-structured assessment model (ASAP) that partitioned the resource into two spatial sub-units separated at approximately Hudson Canyon. This approach was accepted as the best scientific information available for determining stock status for black sea bass; however, it should be noted that the two sub-units were not considered separate stocks by the stock assessment working group, peer review panel, nor the MAFMC Scientific and Statistical Committee.

A management track assessment that incorporated fishery-dependent and -independent data through 2019, including revised recreational estimates from MRIP, was peer reviewed in July 2021[1]. The management track assessment was limited to data through 2019 due to the COVID-19 pandemic. Data from 2020 was either not available or limited. Based on the prepublication version of the July 2021 Management Track Assessment Report, the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2019 relative to the revised reference points. Spawning stock biomass (SSB) in 2019 was 65.63 million pounds (adjusted for retrospective bias), 2.1 times the updated biomass reference point (i.e., $SSB_{MSY\ proxy}$ = $SSB_{40\%}$ = 31.84 million pounds). To account for the fact that black sea bass are protogynous hermaphrodites, changing sex from female to male, the assessment defines SSB as the combined male and female mature biomass. The average fishing mortality on fully selected ages 6-7 fish in 2019 was 0.39 (adjusted for retrospective bias), 85% of the updated fishing

[1] The prepublication report for the 2021 Operational Assessment can be found here: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/BSB_Operational_assessment_2021-iii.pdf

mortality threshold reference point (i.e., $F_{MSY\ proxy} = F_{40\%} = 0.46$). Recruitment (R) of the 2018 year class as age 1 in 2019 was estimated at 4.62 million (79.4 million with the retrospective adjustment), above the 1989-2018 time series average of 39 million fish. The 2011 year class was estimated to be the largest in the time series at 170.4 million fish and the 2015 year class was the second largest at 93.8 million fish. The 2019 estimates of SSB, F, and R were adjusted for internal model retrospective error.

III. Status of the Fishery

The commercial fishery is allocated 49% of the total allowable landings (TAL) for black sea bass, loosely based on the proportion of recreational to commercial landings from 1983-1992. The principal gears used in the fishery are otter trawls, fish pots (or traps), and handlines. After peaking at 21.8 million pounds in 1952, commercial landings markedly decreased in the 1960s and have ranged from 1.14 to 3.9 million pounds since 1981. In 1998, a commercial quota system was incorporated into management and state-by-state shares were introduced in 2003. From 2006-2016 commercial landings ranged between 1.14 million pounds in 2009 to 2.53 million pounds in 2016 (Tables 2 and 3). In 2018 and 2019, higher quotas resulted in commercial landings of approximately 3.33 million pounds, and 3.52 million pounds, respectively. The 2020 landings were under the coastwide quota of 5.58 million pounds by approximately 25% (Tables 2 and 3) [1].

The recreational fishery is allocated 51% of the TAL for black sea bass, loosely based on the proportion of recreational to commercial landings from 1983-1992. In 2018, recreational harvest estimates from the Marine Recreational Information Program (MRIP) were recalibrated based on the new Fishing Effort Survey (FES). In general the recalibration resulted in higher harvest estimates throughout the time series, with more divergence in recent years. After a drastic peak in 1986 at 11.19 million pounds, recreational harvest averaged 5.02 million pounds annually from 1987 to 1997. Recreational harvest limits were put in place in 1998 and harvest generally increased from 1.92 million pounds in 1998 to 9.06 million pounds in 2015 (Table 4). In 2016 and 2017 harvest jumped up to 12.05 and 11.48 million pounds, respectively; however the 2016 and 2017 estimates are regarded as implausibly high outliers by the Technical Committee. In 2020, recreational harvest was estimated at 9.12 million pounds, a 5% increase from 2019. Recreational live discards as a proportion of total catch have generally increased over the time series, averaging 46% in the 1980s, and 85% over the last decade. According to MRIP, total live recreational discards from Maine to Virginia were 29.79 million fish in 2020. Assuming 15% hook and release mortality, estimated recreational discard losses were projected to be 4.47 million fish, equal to 51% of the total recreational removals (harvest plus dead discards) in 2020. However, it is worth nothing that due to COVID-19 pandemic, shore-side sampling was interrupted and some MRIP values contain imputed data.

Starting in 2018, the Council and Commission have provided states the opportunity to open their recreational black sea bass fisheries during the month of February under specific

[1] Commercial landings for 2020 are preliminary and are derived from state compliance reports.

conditions. States must opt into this fishery. Participating states are required to have a 12.5 inch minimum fish size limit and a 15 fish possession limit during February (identical to the federal recreational measures during May 15 - December 31). Participating states are required to adjust their recreational management measures during the rest of the year to account for expected February harvest to help ensure that the participation in this optional opening does not increase the total annual harvest. Expected February harvest by state is pre-defined based on an analysis of vessel trip report data from federally permitted for-hire vessels in February 2013, the last year that the recreational fishery was open in February prior to 2018. Only Virginia and North Carolina participated in 2020. Estimated February 2020 harvest was 14,236 pounds for Virginia and 50,692 pounds for North Carolina. As part of the 2020 conservation equivalency (CE) proposal, Virginia forfeited 14 days from wave-3 (May/June) and North Carolina forfeited 31 days from wave 6 (November/December) to account for the recreational landings that occurred in February of that year.

IV. Status of Assessment Advice

A management track stock assessment was peer reviewed in June 2021, and may be accepted for management use in July 2021. According to the assessment, the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2019 compared to the revised reference points. The next stock assessment will be a research track assessment that will be peer reviewed in late 2022.

V. Status of Research and Monitoring

Commercial landings information is collected by the Vessel Trip Reporting system and dealer reports. States are also required to collect and report landings data. The Northeast Fisheries Science Center (NEFSC) uses observer data to estimate discards for the trawl and gill net fisheries, and VTR data is used to estimate discards from pots and hand lines if observer data are insufficient. The NEFSC weigh-out program provides commercial age and length information. Recreational landings and discards were estimated through the Marine Recreational Fisheries Statistics Survey (MRFSS) until it was replaced by MRIP, which has provided recreational landings and discards from 2008 to present. In 2018, MRIP released recalibrated harvest estimates derived from a new mail-based fishing effort survey (FES), rather than the Coastal Household Telephone Survey. Recreational discards in weight are estimated by the NEFSC. New York conducts fishery-dependent surveys of the recreational and commercial fishery, and North Carolina conducts dockside commercial sampling.

Fishery-independent surveys are conducted by Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, and Virginia. The Virginia Game Fish Tagging Program has targeted black sea bass since 1997. Recruitment and stock abundance data are also provided by the NEFSC spring, autumn, and winter trawl surveys.

VI. Status of Management Measures and Developing Issues

To address broad management issues for the recreational fishery, the Board and Council formed a joint work group in March 2019. The Board and Council identified the development of a Harvest Control Rule for the recreational fishery as their top priority, and a joint PDT/FMAT is currently working on revisions. Updates on ongoing recreational reform work can be found on here.

VII. Black Sea Bass Compliance Criteria

2020 Commercial Fishery Requirements

Minimum size of possession: 11”
Minimum mesh: Nets must possess a minimum of 75 meshes of 4.5” diamond mesh in the codend, or the entire net must have a minimum mesh size of 4.5” throughout; for codends with fewer than 75 meshes, the entire net must have 4.5” diamond mesh or larger throughout
Threshold to trigger minimum mesh requirements: 500 lbs for January-March and 100 lbs for April-December
Maximum roller rig trawl roller diameter: 18”
Pot and trap escape vents: 2 ½” for circular, 2” for square, and 1-3/8 x 5-3/4” for rectangular. Must be 2 vents in the parlor portion of the trap.
Pot and trap degradable fastener provisions: a) untreated hemp, jute, or cotton string 3/16” (4.8 mm) or smaller; b) magnesium alloy timed float releases or fasteners; c) ungalvanized, uncoated iron wire of 0.094” (2.4mm) or smaller. The opening covered by a panel affixed with degradable fasteners is required to be at least 3” x 6”.
Commercial quota: 5.58 million lbs
Pot and trap definition: A black sea bass pot or trap is defined as any pot or trap used by a fisherman to catch and retain black sea bass.

2020 Recreational Fishery Requirements

Recreational harvest limit: 5.81 million lbs
2020 recreational measures were held status quo from 2019. See Table 5 for 2020 state recreational measures.

Other Measures

Reporting: States are required to submit an annual compliance report to the Chair of the Black Sea Bass Plan Review Team by June 1st. The report must detail the state’s management program for the current year and establish proof of compliance with all mandatory management measures. It should include landings information from the previous year and the results of any monitoring or research programs.

Black Sea Bass FMP Compliance Schedule*

Commercial	
11" Size Limit	1/1/02
4.5" diamond minimum mesh throughout codend and threshold provisions	1/1/02
Pot and trap escape vents and degradable fasteners	1/1/97
Maximum 18" roller diameter restriction	1/1/97
States must report to NMFS all landings from state waters	1/1/98
Recreational	
Size Limit	1/1/97
Harvest Limit	1/1/98
Ability to implement possession limits and seasonal closures	1/1/98
General	
Annual compliance report	Annually, 6/1

*This summary of compliance criteria is intended to serve as a quick reference guide. It in no way alters or supersedes compliance criteria as contained in the Black Sea Bass FMP and any Amendments thereto. Management measures may change annually.

VIII. Status of Implementation of FMP Requirements

For 2020, states and jurisdictions required to comply with the provisions of the Black Sea Bass FMP are: New Hampshire, Massachusetts**,** Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Potomac River Fisheries Commission, Virginia, and North Carolina. New Hampshire did not, but they were not on the Board until 2021. Therefore, they will be required to be in compliance for the 2021 fishing year review.

Most states appear in compliance with the FMP provisions for fishing year 2020; however, the following issues were noted:

- Massachusetts regulations do not specify that the opening covered by the panel affixed with biodegradable fasteners must be at least 3" x 6". This was adopted prior to the start of the 2021 pot fishery season.
- Rhode Island regulation does not specifically state that the opening covered by the panel affixed with biodegradable fasteners must be at least 3" x 6". This will be rectified during the regulatory cycle leading up to the November 2021 public hearing.
- New Hampshire was new to the SFSBSB Board in 2021, and were not subject to the same compliance requirements in 2020. The PRT notes that they would be out of compliance with the FMP regarding several commercial regulations in the 2021 fishing year review.

Therefore, the PRT determined that all states have made a good faith effort to implement regulations in compliance with the requirements approved by the Board.

In addition, the PRT made the following recommendations to improve compliance reports:

- State compliance reports should explicitly list all required regulations and whether they are in compliance with the FMP.
- State compliance reports should either include a web link to current regulations, or a copy of the regulations in effect for the relevant fishing year to facilitate the review process. Not all states provided their regulations. When regulations encompass multiple species, the portions that apply to black sea bass should be highlighted in some way.
- Pots/traps should be separated from other types of gear in the commercial harvest by gear tables included in compliance reports.

IX. Research Recommendations

Research recommendations were identified during the 2016 Black Sea Bass Benchmark Stock Assessment at the 62nd SAW (pg. 65)

X. References

NEFSC (Northeast Fisheries Science Center). 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-03; 822 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/.

NEFSC. 2021. Prepublication copy of the July 2021 operational stock assessment report prepared for the Council and the SSC. Available at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/BSB_Operational_assessment_2021-iii.pdf

Table 1. State by state allocation of annual commercial quota for 2020 fishing year.

State	% Allocation
Maine	0.50%
New Hampshire	0.50%
Massachusetts	13%
Rhode Island	11%
Connecticut	1%
New York	7%
New Jersey	20%
Delaware	5%
Maryland	11%
Virginia	20%
North Carolina	11%

Table 2. Black Sea Bass Commercial Landings by State (2011-2020) in pounds. Source: State Compliance Reports & ACCSP (June 2021).

Year	ME	NH	MA	RI	CT	NY	NJ	DE & MD	VA	NC*	**TOTAL**
2011		49	287,662	211,597	20,496	183,420	293,609	267,787	274,699	98,505	**1,637,823**
2012			292,010	204,360	18,158	153,338	310,842	226,525	392,332	61,187	**1,658,752**
2013			328,393	265,691	23,066	180,694	421,310	342,619	495,938	88,242	**2,145,954**
2014			307,046	267,703	26,957	223,677	493,775	354,003	387,518	212,488	**2,273,167**
2015			347,820	238,647	24,591	151,409	468,248	347,691	422,333	241,538	**2,242,277**
2016			354,031	294,343	29,236	184,529	525,647	368,306	553,491	225,405	**2,534,987**
2017			541,932	458,153	43,798	301,774	898,665	527,046	745,087	388,858	**3,888,660**
2018			481,146	371,948	39,408	270,680	698,665	599,614	606,240	317,565	**3,391,484**
2019			530,770	399,075	78,023	297,472	718,360	542,245	590,526	279,008	**3,473,933**
2020**			722,415	553,750	81,367	385,130	1,074,957	620,373	521,691	217,847	**4,154,762**

** Landings from NC are from north of Cape Hatteras*

***2020 landings are preliminary from state compliance reports*

Delaware and Maryland landings have been combined to protect confidentiality.

Table 3. 2019 Commercial Landings and 2020 Black Sea Bass State by State Quotas (pounds). Source: State Compliance Reports, June 2021

State	% Allocation	2020 ASMFC Initial Quota	2020 Quota After Transfers	Preliminary 2020 Landings
Maine	0.005	27,900	7,900	0
New Hampshire	0.005	27,900	2,900	0
Massachusetts	0.13	725,400	743,565	722,415
Rhode Island	0.11	613,800	613,800	553,750
Connecticut	0.01	55,800	85,800	91,198
New York	0.07	390,600	390,600	385,130
New Jersey	0.2	1,116,000	1,116,000	1,074,957
Delaware	0.05	279,000	279,000	C
Maryland	0.11	613,800	613,800	C
Virginia	0.2	1,116,000	1,116,839	521,691
North Carolina	0.11	613,800	609,796	217,847
Coastwide Total	100%	5,580,000	5,580,00	4,164,593

* Landings from North Carolina are from North of Cape Hatteras

Table 4. Black Sea Bass Recreational Harvest Estimates by State (2011-2020) in pounds.

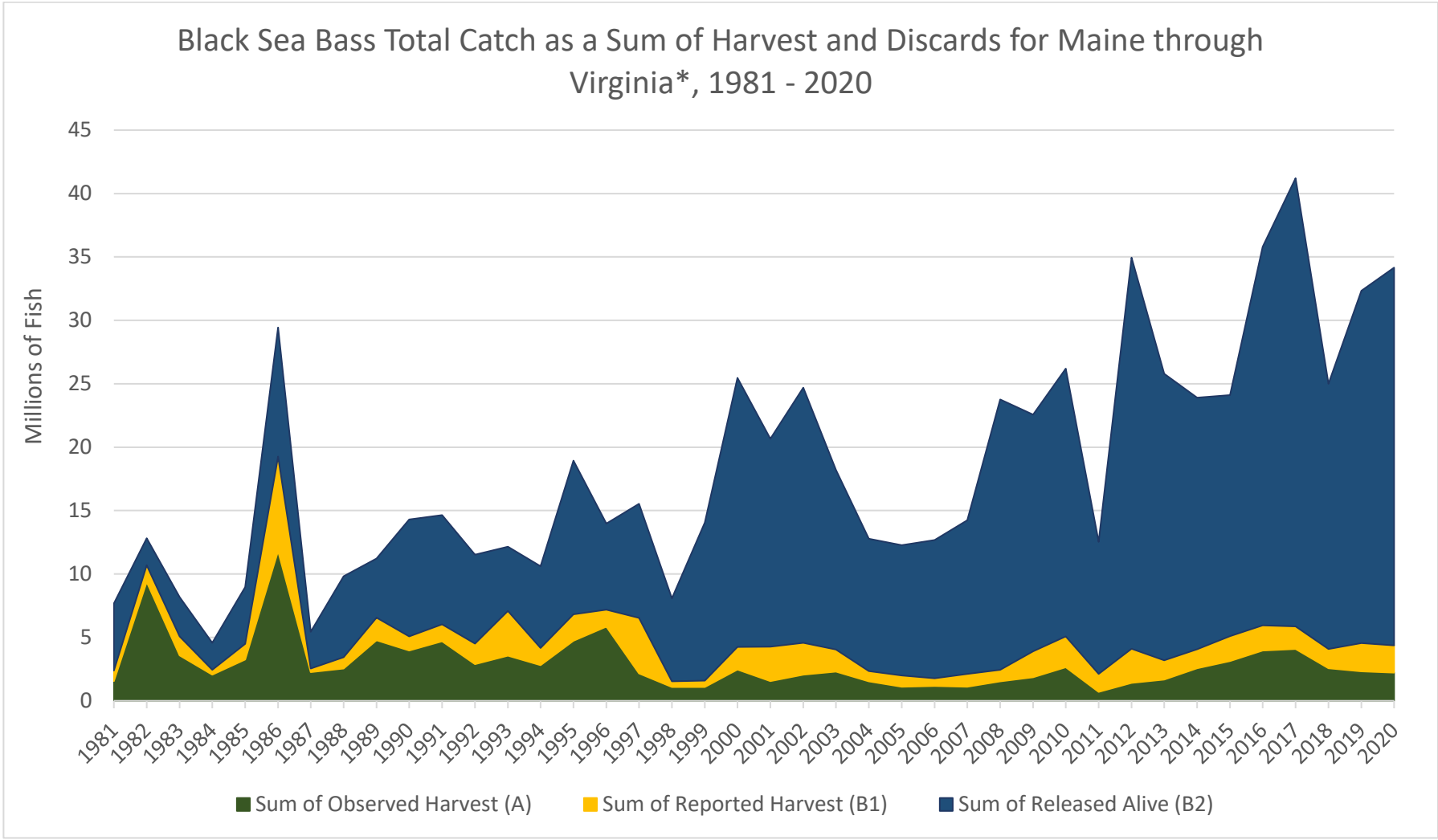
Source: MRIP, 2020. NC estimates for North of Cape Hatteras from Personal communication with NOAA Fisheries, June 2021

State	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC*	Coastwide
2011			1,251,169	236,607	41,727	855,115	423,606	131,177	171,402	48,340	111,538	**3,270,681**
2012		19,130	2,839,821	645,039	429,493	936,640	1,778,079	173,628	198,815	11,278	8,231	**7,040,154**
2013		64,478	1,228,732	313,316	413,558	2,106,973	1,389,868	56,384	35,802	58,919	21,617	**5,689,647**
2014			2,148,079	659,562	1,063,682	2,224,755	892,307	62,504	79,659	109,054	1,269	**7,240,871**
2015			1,629,169	807,840	1,011,926	4,722,098	596,811	59,710	118,061	104,944	6,224	**9,056,782**
2016			1,765,705	1,124,414	1,364,242	6,547,541	693,808	127,182	274,441	148,818	1,591	**12,047,742**
2017			1,444,180	749,965	1,102,722	5,515,386	2,088,631	150,530	239,715	156,810	33,421	**11,481,361**
2018			1,818,682	1,628,875	873,055	1,726,555	1,440,761	109,365	189,711	123,937	9,494	**7,920,435**
2019			1,361,112	1,225,057	1,180,400	3,126,473	1,117,658	61,974	156,986	371,523**	11,639**	**8,612,821**
2020		3,388	1,537,990	1,480,782	905,145	2,808,726	1,147,599	188,978	103,461	796,053**	74,150**	**9,199,643**

*Harvest is from north of Hatteras.

**These states participated in the February 2018-2020 black sea bass recreational fishery, and the February harvest estimate is not included in the state total for 2019 and 2020.

Figure 1. Black Sea Bass Total Recreational Catch, Harvest, and Discards. Source: MRIP, June 2021. Note that this figure includes live and dead discards. It is assumed that 15% of all recreational black sea bass discards later die.



*Discard estimates for NC north of Cape Hatteras are not yet available.

Table 5. 2020 Black Sea Bass Recreational Management Measures by State

State	Minimum Size (inches)	Possession Limit	Open Season
Maine	13	10 fish	May 19-September 21; October 18-December 31
New Hampshire	13	10 fish	January 1-December 31
Massachusetts	15	5 fish	May 18-September 8 (private & shore); May 25-September 21 (for-hire only)
Rhode Island	15	3 fish	June 24-August 31
		7 fish	September 1-December 31
Connecticut (Private & Shore)	15	5 fish	May 19-December 31
CT (Authorized party/charter monitoring program vessels)	15	5 fish	May 19-August 31
		7 fish	September 1-December 31
New York	15	3 fish	June 23-August 31
		7 fish	September 1-December 31
New Jersey	12.5	10 fish	May 15-June 22
		2 fish	July 1-August 31
		10 fish	October 8-October 31
	13	15 fish	November 1-December 31
Delaware	12.5	15 fish	May 15 – September 21; October 22 – December 31
Maryland	12.5	15 fish	May 15-December 31
Virginia	12.5	15 fish	February 1-29
	12.5	15 fish	May 29-December 31
North Carolina, North of Cape Hatteras (N of 35° 15'N)	12.5	15 fish	February 1-29
	12.5	15 fish	May 17-November 30
Minimum Federal Measures	**12.5**	**15 fish**	**February 1-28 May 15-December 31**

Atlantic States Marine Fisheries Commission

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MEMORANDUM

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

FROM: **Toni Kerns, Fisheries Policy Director**

DATE: **July 26, 2021**

SUBJECT: **Upcoming Board Action**

Summary

In February 2021, the Summer Flounder, Scup and Black Sea Bass Board (Management Board) approved Addendum XXXIII, which made modifications to the state allocations of the commercial black sea bass quota. The Mid-Atlantic Fishery Management Council (Council) took the same action via a separate management document. One of the allocation changes was to increase Connecticut's baseline allocation from 1% to 3% of the coastwide quota to address its disproportionally low allocation compared to the increased availability of black sea bass in state waters. The allocations for all states are then calculated by allocating 75% of the coastwide quota according to the new baseline allocations (i.e., the historical allocations modified to account for Connecticut's increase to 3%) and 25% to three regions based on the most recent regional biomass distribution information from the stock assessment.

In March, the State of New York appealed the allocation changes approved by the Management Board. The appeal argued that New York's baseline quota should increase similarly to that of Connecticut as it too had experienced a significant disparity between allocation and abundance/availability of black sea bass in Long Island Sound, which is shared by New York and Connecticut.

The Interstate Fisheries Management Program Policy Board (Policy Board) considered the appeal and found it was justified. The Policy Board has remanded section 3.1.1 of Addendum XXXIII (which addresses only baseline allocations) back to the Management Board for corrective action to address impacts to New York's baseline allocation in a manner comparable to the consideration given to Connecticut. The Policy Board specified the Management Board's corrective action should not result in a decrease in Connecticut's 3% baseline allocation nor decrease the percentage of quota allocated according to regional biomass distribution (i.e., 25%).

The Policy Board's action specifies the Management Board must increase New York's baseline allocation by up to 2%, while maintaining Connecticut's baseline allocation of 3% (more details provided below). No other aspects of these allocations, and no other alternatives in the associated Addendum, may be revised by the Management Board.

In June, the Council agreed to revisit it recommendations for the allocation percentages with the intent of maintaining the same final recommendations as the Management Board.

Clarification of the Policy Board Motion

Policy Board Motion to Remand Action to the Management Board*: Move to remand Addendum XXXIII, specifically Section 3.1.1. Baseline Quota Allocations, back to the ASMFC Summer Flounder, Scup, and Black Sea Bass Management Board for corrective action that addresses impacts to New York's baseline in a manner comparable to the consideration given Connecticut for the expansion of black sea bass into Long Island Sound. Corrective action taken by the Summer Flounder, Scup, and Black Sea Bass Board*

should not result in a Connecticut baseline allocation less than 3% or decrease the percentage of quota redistributed according to regional biomass.

In the above motion the Policy Board stated, "…corrective action taken by the Summer Flounder, Scup, and Black Sea Bass Board should not result in a Connecticut baseline allocation less than 3%..." as part of the corrective action. A question was raised if Connecticut's base line could be changed because the motion used "should" vs will not. After review of the minutes, the Policy Board Chair concluded it was the Policy Board's intent to not adjust Connecticut's baseline quota.

Summer Flounder, Scup, and Black Sea Bass Management Board voting procedures with the Mid-Atlantic Fishery Management Council for August 4th meeting.

The Board will be meeting in early August to determine the appropriate increase in New York's baseline quota as a result of the appeal filed by the state. The traditional "joint" voting process presents some challanges under the Commission's appeal process. Linking the Commission's and Council's votes may limit the Board's ability to make the changes required for this appeal.

To address the difficulties resulting from the joint voting process, the below modified voting process will be used for the meeting on August 4th.

*****This voting process will only be used for this unique meeting to address the appeal.*****

- Following the presentation and discussion of the background on Policy Board remand, the Management Board will be given the opportunity to make the first motion. Once a motion is made by the Management Board, the Council will then be given the opportunity to make a like motion.
- The Management Board and Council will jointly discuss the motions. If the Council does not make a like motion, the Management Board's motion will be discussed.
- After the discussion on the motion the Management Board will conduct a roll call vote.
- If the Management Board passes the motion, the Council will then vote (if a like motion was made).
- If the motion fails the Management Board vote, the Board (and Council) will need to make a new motion(s). The Board will have the first opportunity to make the next motion and after discussion on the motion the Board will conduct a roll call vote (this process will repeat until the Management Board passes a motion).
- If the Council passes the motion, then both bodies have approved like motions.
- If the motion fails the Council vote, the Management Board motion is still valid and stands approved.

Tina Berger

From: Tom Lilly <foragematters@aol.com>
Sent: Monday, July 26, 2021 12:13 PM
To: Tina Berger
Subject: [External] Fwd: Discussion . more bay research?
Attachments: 2020-09-05_211412 CBF PRESS RELEASE.pdf; 2020-06-02_144500 amendment 3 comparison.pdf; VA ALLOCATION.pdf; 2020-08-25_220701 WATTS.pdf; MILLER CBL.pdf; 2020-07-08_124852 Beal letter to Ross.pdf; 2020-08-13_084131 CIERI MAIL.pdf

Tina this is my comment on the agenda item at the menhaden board dealing with more research, Could you put this in the supplemental materials for the Commissioners and the menhaden board? The first mail dealt with the other agenda item on possible state reallocation. Thanks Tom Lilly

Subject: Discussion . more bay research?

to Josh Newhart Menhaden TC Chair

I have questions and a comment about agenda item 4 :
" Review data needs for Spacially Explicit Management of Menhaden in Chesapeake Bay"

Does it benefit the ecology of Chesapeake Bay and the people of Maryland and Virginia to start a new research project instead of taking known management action that will substantially increase menhaden forage in Chesapeake Bay as shown on the scan Single Concept ? With all due respect will you and the TC and the Board consider that question?

Bob Beal, ASMFC Director has said with respect to the Chesapeake Bay and menhaden that " in the face of uncertainty affecting resources ....in poor stock condition, in this case predator species including striped bass,the Commission is to take preventative action..." (n.1) More research that will not produce results for many years, if ever. is not preventative action. The Charter requires decisions be made on the best ecologic, social and economic information available.

Under Amendment 3 management decisions are not to focus on narrow and uncertain quantitative factors but are to apply much broader social and economic values to protect the Atlanic ecosystem and the people of Chesapeake Bay. In 2009 the Commission consultant Jacques Maguire told the menhaden delegates that further quantitative research, such as you are considering now, was unnecessary. He said the bay and the interest groups could be protected "more rapidly" using "time and area restrictions as well as zoning of the fishery". (n.2) The Board has in its possession ample data of all the significant declines in Bay species dependen on menhaden (n.3) and the fishermen of the Bay. Just as Dr. Maguire predicted when the delegates did not follow his advice.

Does the TC and the Board agree that right now the only important question for the people of Maryland and the ecology of the Bay is whether there is enough menhaden in Chesapeake bay right now to properly feed our bay fish and wild life... right now not five or ten years from now. You have the opinions from two of menhaden's top fisheries research scientists and top avian biology scientist that there are not enough menhaden in Chesapeake bay right now and this has caused chronic and continuing damage to the bay's most iconic fish and bird species... the striped bass and osprey, Their

conclusions and management advice is supported by data in a recent 2020 CBF press release (scan 1412)

Dr.Bryan Watts is one of the nation's foremost avian biology and raptor researchers. He is a teaching professor at William and Mary College and founder of the Center for Conservation Biology. In just the last six years he has 21 scientific publications in journals and 61 technical reports. He has been involved in mentoring graduate students in field research in bay and national ornithology for many years.

Dr. Watts' comments seem very clear. Ospreys in the main stem of the bay are dying out due to chronic nesting failures due to inadequate menhaden...he says " no other fish species avaliable to consumers provides the energy content of menhaden" He says "fish delivery rates (the feeding of the chicks by the parents...piece by piece) were three times higher in 1975 ..... " hIs conclusions and data are supported by the same CBF press release (scan 0701) Sea birds are reliable indicators of forage depletion.

Dr. Matt Cieri with New Jersey is a long term ASMFC menhaden delegate and TC member who recently led the ASMFC ERP task force on menhaden. At my request Dr. Cieri corrected a quote in Bay Journal and said in the attached mail that both striped bass conservation and "reductions in menhaden fishing" would be needed to rebuild the striped bass stock. (scan 4131)

Dr. Tom Miller is the Director of Chesapeake Biological Lab,Solomons Maryland, the second oldest marine teaching institution in the nation, that is part of the UMCES system.He is a long time menhaden researcher and distinguished faculty member. His bio lists 82 journal publications including menhaden topics, He was asked to comment on the opinions of Dr. Watts and Dr.Cieri he said ; (scan MILLER)

"My take on all of this is that there will likely have to be compromises on all sides to reach a solution that will sustain the ecosystem services provided by menhaden, striped bass and sea birds. Reductions of fisheries,both menhaden and striped bass,will likely improve the level of ecosystem services. A central challenge is how to allocate these cuts among the different sectors equitably"

What these three respected scientists have said very plainly is that the managers of menhaden at the ASMFC should be taking the necessary steps now to reduce menhaden fishing in the bay to help restore striped bass and ospreys the species that represent the rest. They do not say more research is needed, They have a lifetime of research on menhaden and the Atlantic ecology and generations of clinical and field experience to base their conclusions on.

After 2009 the last three states that had not banned factory fishing in their waters (but Virginia) New York, New Jersey and North Carolina did so,,,they followed Dr.Maguire's advice. They all protected their environment and fishermen , however, only the menhaden board can protect Maryland. Only this board can prevent the purse seine fishery in Virginia from catching the menhaden schools just as they are migrating into Maryland. scan Virginia Allocation.

We request you take action that would produce known results in 2022 to benefit the millions of people that enjoy and respect the Bay and tens of thousands of businesses without any loss of jobs or quota for the three owners of the 12 Virginia purse seine boats. scan Amendment 3 Comparisons. (scan 4500)

Thank you and "good fishing" ! Tom Lilly Whitehaven Maryland 443 235 4465

(n.1) Scan Beal ltr to Ross pg 4 par 2.

(n.2) Scan Beal ltr to Ross pg 3 par 1
(n.3) Scan Beal ltr to Ross pg 4 par 1, pg 5 par 2,3,5
pg 6 par 1,

AMENDMENT 3 COMPARISON . We consider the number of people, jobs and businesses that are affected by whether menhaden are allocated to Omega Protein or to "user groups" three and four. These are the people , the jobs and businesses, that benefit by leaving menhaden in the water to feed and grow abundant and healthy fish

OMEGA	MARYLAND	VIRGINIA	BENEFIT RATIOS

(1.) BUSINESSES AFFECTED (2019 data)

One foreign Owned company	645 Charter Businesses 683 finfish watermen	269 Charter Businesses 270 Finfish watermen	1 versus 1,867 businesses

There were 88,009 Virginia charter trips in 2000 , the trips dropped from 65,943 in 2015 to 33,197 in 2019. . there were 412,000 number of anglers in 2009 to 294,000 in 2019.
There were 18,199 Maryland charter trips in 2,000, 16,771 in 2010 and 9,571 in 2019., according to the figures the Number of anglers stayed constant around 112,000.
The number of finfish watermen in Maryland was 1,112 in 2000. In 2010 it was 953 and in 2018 was 783.

CONCLUSION Reducing the allocation to Omega would benefit 1,867 traditional Maryland and Virginia small businesses. If fishing improved by 20% it would allow many of these people to stay in business and increase the chances younger people would continue to work on the water. That alone is a very meaningful goal to achieve. Charter captains could provide more successful fishing for up t0 400,000 to 500,000 customers in just our two states.

(2.) COMMERCIAL CREWS AFFECTED

8 purse seiners with 15 crew, 120 crew	1,328 working boats with 2,656 crewmen	523 working boats with 1,046 crewmen	120 versus 3,702 (crew)

CONCLUSION

Fewer watermen and fewer fish means much less fresh Maryland and Virginia caught Fresh fish for our local markets and restaurants . There is a lot of dollars added as fresh fish moves from the waterman at the dock to the wholesaler to the distributor and then to the retail level of markets and restaurants. The 935 finfish watermen sell to over 90 independent fish wholesalers in the two states . All of this economic activity occurs only when menhaden are left in the water to grow abundant healthy fish for our watermen to catch. None of this happens when the menhaden are taken and exported.

(3.) FISHERMEN AFFECTED

Omega has 120 Fishermen	228,000 anglers includes 30,000 Seniors add at least 30,000 children	428,000 fishermen	120 versus 656,000 fishermen

CONCLUSION Maryland has seen a decline in salt water anglers of over 50,000 and Virginia over 20,000. Many of these people have given up the thing they enjoyed most. The numbers are not there but this means thousands of kids aren't fishing, People in our area are not fishing close to what it was just a few years ago. Based on average spending this is a loss of over 100 Million dollars annually to the two states.

(4.) RETAIL SPENDING BY ANGLERS...SALES TAX COLLECTION ...WAGES.....JOBS

OMEGA	MARYLAND	VIRGINIA	TOTAL/RATIO
$ 6 million spending	$225 million spending	$360 million	$6 million vs $885 million
$ 20 thousand tax	$13.5 million tax	$18 million tax	$.30 vs $21.5 million tax
$ 20 million wages	$108 million wages	$139 million	$20 vs $274 million
300 jobs	1,972 jobs	2,864 jobs	300 vs. 4,836 jobs

CONCLUSION The ASMFC striped bass Amendment 6 section 2.2.5 states the impact of recreational striped bass fishing as $7.7 billion and supporting 104,867 jobs. When menhaden serve their natural purpose of growing more abundant healthy fish their value is spread up and down the Atlantic Coast to the economic benefit of hundreds of thousands of our fellow citizens not just to one foreign fish meal company

(5.) ECONOMIC IMPACT OF RETAIL SPENDING ON FISHING BOATS.....JOBS SUPPORTED.....
TAX REVENUE (NMMA report – Michigan State University)

OMEGA	MARYLAND	VIRGINIA	TOTALS/RATIOS
8 boats	142,952 power boats	264,379 power boats	
	100,000 boats fishing	184,000 boats fishing	8 vs. 284,000 boats
Retail spending...			
$4-6 million	$1.0 billion total , average	$1.2 billion total,average	$ 6 million vs.
	$5,600 @ is $560 million	$5,600 @ is $1.03 billion	$1.59 billio

Businesses directly involved (boat building, motor work, supplies, services and dealers);

Unknown –	50% total Md. Businesses is	50% total Va. Businesses is	
Estimate 30	521	378	30 vs. 899

Existing Jobs for recreational boating vs Omega existing jobs for 8 boats in use same categories

Unknown-			
Estimate 100	6,641	6,628	100 vs 13,239

(reference National Marine Manufacturing Assoc....scans 0196,0197)

(6) INVESTMENT IN FISHING BOATS

OMEGA	MARYLANDERS	VIRGINIANS	TOTALS/RATIOS
8 boats @	60,000 boats @	66,000 boats@	8 vs 126,000 boats

$600,000 is $4.8 million	$20,000@ is $1.2 billion	$20,000 is $1.32 billion	$4.8 million vs. $2.52 billion

COMMENT The Omega boats are owned by one foreign company to our knowledge. The 100,000 plus boats used for fishing by Maryland and Virginia families often are often the favorite way that families spend quality time together enjoying Chesapeake Bay , its rivers and creeks. Collectively these Maryland and Virginia friends and families spend 4,304,000 days saltwater fishing according to the ASA . For the entire Atlantic states this total would be over 99 million days. If fishing on the Chesapeake rebounded even twenty percent from its low rate now we could see a million or more days of enjoyable fishing by families, friends and kids in Maryland and Virginia resulting in hundreds of millions of dollars of economic impact.

MARINAS AFFECTED BY THE QUALITY OF COMMERCIAL AND SPORT FISHING

Omega operates from one Marina.	There are over 500 marinas In Maryland (marinas.com)	There are over 300 marinas in Virginia	1 versus 800

CONCLUSION There is a direct connection between the frequency of use of our marinas, boat ramps and parks both on the bay and ocean. We believe numbers of people fishing and fishboat use has declined by over 50% in a few short years.

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Atlantic States Marine Fisheries Commission

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Patrick C. Keliher (ME), Chair *A.G. "Spud" Woodward (GA), Vice-Chair* *Robert E. Beal, Executive Director*

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

November 15, 2019

The Honorable Wilbur Ross
Secretary of Commerce
United States Department of Commerce
Herbert C. Hoover Building
1401 Constitution Avenue, Northwest
Washington, DC 20230

Dear Mr. Secretary:

This letter is to notify you that the Atlantic States Marine Fisheries Commission (Commission) has determined the Commonwealth of Virginia is out of compliance with the Commission's Interstate Fishery Management Plan (FMP) for Atlantic Menhaden pursuant to the provisions of the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act). The Commission unanimously adopted the following motion on October 31, 2019, based upon the recommendation of its Atlantic Menhaden Management Board (Board) and Interstate Fisheries Management Program Policy Board:

On behalf of the Interstate Fisheries Management Program Policy Board, move that the Atlantic States Marine Fisheries Commission find the Commonwealth of Virginia out of compliance for not fully and effectively implementing and enforcing Section 4.3.7 Chesapeake Bay Reduction Fishery Cap of Amendment 3 to the Interstate Fishery Management Plan for Atlantic Menhaden. The Commonwealth of Virginia must implement an annual total allowable harvest from the Chesapeake Bay by the reduction fishery of no more than 51,000 metric tons. The implementation of this measure is necessary to achieve the goals and objectives of the Fishery Management Plan and maintain the Chesapeake Bay marine environment to assure the availability of the ecosystem's resources on a long-term basis.

By this action, the Commission has found the Commonwealth of Virginia out of compliance with the FMP and has outlined what the Commonwealth must do to come back into compliance.

The Board approved Amendment 3 in November 2017 with the goal of managing the menhaden resource in a way that balances menhaden's important ecological role, primarily as a prey species, with the needs of all user groups. As part of the Amendment, the Board set the Chesapeake Bay (Bay) reduction fishery cap (cap) at 51,000 metric tons (mt). The cap recognized the Bay's importance as nursery ground for many species by limiting future reduction landings in the Bay to levels equivalent to the recent harvesting practices by the reduction fishery[1].

[1] The reduction fishery "reduces" whole fish into fish meal, fish oil and fish soluble

The Commission's noncompliance decision results from two findings: (1) the Commonwealth of Virginia has failed to implement the cap and (2) as of September, the 2019 reduction fishery harvest from the Bay exceeded the cap of 51,000 mt. The exceedance is significant; to date, the cap has been exceeded by approximately 15,000 mt (33 million pounds) or about 30 percent. This overage represents approximately seven percent of the total allowable quota (coastwide quota).

It is important to note the Board has exhibited great forbearance and has taken numerous actions over the past 18 months in an effort to avoid this noncompliance determination, including multiple postponements designed to provide Virginia more time to adopt and enforce the cap. In February 2019, the Board effectively granted Virginia an accommodation on adopting Amendment 3's cap provided harvest did not exceed it. Unfortunately, the cap was, in fact, exceeded by a substantial amount. Based on its responsibilities under the Atlantic Coastal Act, the Board was obligated to respond to Virginia's unwillingness to effectively implement and enforce the Bay cap in 2019 by determining the Commonwealth Virginia out of compliance[2].

While long-term overages of the cap may impact the stock status of menhaden, the noncompliance decision was not made in response to menhaden's current stock status, which is generally accepted as robust. Instead, the decision was made to uphold a mandatory conservation tool of Amendment 3, namely to conserve menhaden within the Bay to serve as forage for the many other key species that depend on it. The cap addresses the potential for localized depletion of this important forage species caused by concentrated reduction fishing in the Bay, and the implications of such depletion for numerous other Commission-managed species that utilize the Bay and rely on menhaden as forage. Some of these species are in poor condition, including the Commission's flagship species, Atlantic striped bass, as well as Atlantic bluefish and weakfish. These species are highly sought after by recreational and commercial fishermen. For example, in 2017, 32% of recreational removals and 69% of commercial removals of striped bass came from the Bay.

The impacts of focusing high levels of removals from the Bay extend beyond ecosystem considerations to the other competing users of the menhaden resource, including economically important commercial and recreational fishing activities which target predators of menhaden. These species have supported valuable commercial and recreational fisheries on the Atlantic coast for centuries. For example, in 2016, Atlantic striped bass commercial and recreational fisheries supported 2,664 and 104,867 jobs, respectively. The economic impact of these fisheries was $103.2 million and $7.7 billion, respectively.[3]

History and Implementation of the Chesapeake Bay Cap

In the years leading up to Amendment 1 to the Atlantic Menhaden FMP (2001), the number of plants and vessels in the reduction fleet declined along the coast, with effort concentrating in Virginia and North Carolina. As a result, total landings along the coast and within the Bay also declined, but the proportion of removals from the Bay increased. The higher proportion of effort in the Bay amidst lower levels of menhaden recruitment to the Bay raised concerns about the possibility of localized depletion, defined as a reduction in menhaden population size/density below the level of abundance that is sufficient to maintain its basic ecological (e.g., forage base, grazer of plankton), economic, and social/cultural functions, as a result of fishing pressure, environmental conditions, and predation pressures that occur on a small spatial or temporal scale.

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[2] All other states and jurisdictions have complied with the FMP.

[3] Southwick Associates. 2019. The Economic Contributions of Recreational and Commercial Striped Bass Fishing. Fernandina Beach, Florida.

In the late 2000s, the NOAA Chesapeake Bay Office coordinated funding for a series of research projects to address whether localized depletion of menhaden was occurring in the Bay. These projects were reviewed by a panel appointed by the Center for Independent Experts. The panel determined the individual research projects were relevant and well-designed. However, the panel noted that without quantitative definition of depletion, it could not be determined whether localized depletion was occurring or how well the ongoing research could address that question.[4] In his 2009 review, Dr. Jean-Jacques Maguire said, "Whether there is enough [menhaden] for the increasing demands of striped bass and other predators, including the commercial and the recreational fisheries, will be a difficult and possibly very expensive question to resolve. Time and area restrictions as well as zoning of the fisheries that are competing for menhaden might provide a more rapid mechanism to mitigate the possible negative consequences of competing fisheries and predators."

Such concerns were at the forefront of the Board's reasoning when it established the first cap in 2005 and remains the primary reason the Board has continued to include the cap as an important component of menhaden management. Specifically, Board members expressed concerns that concentrated, intense commercial fishing of menhaden in specific areas and at certain times could cause detrimental socioeconomic impacts for other user groups (commercial, recreational, ecotourism) who depend upon adequate local availability of menhaden to support business and recreational interests both at sea and on shore.[5] Accordingly, the Board established the cap to address the potential for localized depletion of menhaden and to minimize possible detrimental biological impacts on predators of menhaden and associated socioeconomic impacts on other user groups.

The Commission first implemented a harvest cap on the reduction fishery in the Bay through Addendum II to Amendment 1. The Addendum limited removals of Atlantic menhaden from the Bay for reduction purposes to the average of 2000 to 2004 landings to be implemented in the 2006 fishing year. Before its first year of implementation, the cap was revised through Addendum III to Amendment 1 to be the average landings from 2001 to 2005, or 109,020 mt. The cap was reduced by 20% in 2013 to 87,216 mt with the concurrent implementation of a coastwide quota, which also represented a 20% reduction from recent average landings in response to stock status concerns at the time. Amendment 3 further reduced the cap to 51,000 mt, approximately equal to the five-year average of reduction harvest from the Bay between 2012 and 2016, to complement the Amendment that sought to bolster the conservation of the resource along the coast, including the Bay. From 2013 to 2018, reduction landings had not exceeded 51,000 mt even under the higher historical caps. While the Commission recognized the cap could impose some costs on the reduction fleet, those costs were balanced and minimized because fishermen excluded from the Bay once the cap was reached had the option to fish outside of the Bay. This is not the only Commission managed species for which recent years harvest is used to set a quota when faced with uncertainty. For example, Maine's glass eel quota, implemented in 2015, was set based on the 2014 harvest level.

The Commission's action in setting the cap at 51,000 mt was carefully considered and deliberate. It reflects the reality that even with the stock of Atlantic menhaden not undergoing overfishing on a coastwide basis, localized depletion within the unique Bay ecosystem could have serious adverse effects on key

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[4] Maguire, J.J. 2009. Report on the evaluation of the Chesapeake Bay Fisheries Science Program: Atlantic Menhaden Research Program. Laurel, Maryland.

[5] Atlantic States Marine Fisheries Commission (ASMFC). Proceedings of the Atlantic Menhaden Management Board Meetings. Arlington, VA: February 2005 available at http://www.asmfc.org/uploads/file/52865780Feb05AtlMenhadenBoardProceedings.pdf; August 2005 available at http://www.asmfc.org/uploads/file/52865780Feb05AtlMenhadenBoardProceedings.pdf; December 2012 available at http://www.asmfc.org/uploads/file/atlMenhadenBoardProceedings_Dec2012.pdf

Commission-managed fisheries in poor condition, as well as a variety of other avian and aquatic species. These issues could be exacerbated if localized depletion of menhaden in the Bay was occurring due to increased fishing pressure. Menhaden are important prey for many species, including Atlantic striped bass, bluefish, and weakfish. Striped bass and bluefish stocks have decreased by 36% and 25%, respectively, in the last decade.[6] Concentrated menhaden fishing could decrease menhaden availability, exacerbating issues with these stocks. During the public comment period for Amendment 3, a wide range of stakeholders with knowledge of the Bay environment expressed serious concern about the need to protect menhaden and the Bay. Over 85,000 comments were received in support of setting the cap at 51,000 mt to prevent expansion of the reduction harvest within the Bay.

The decision to establish a cap and to subsequently modify the cap has and continues to be supported by science-based information on the ecological role of Atlantic menhaden, particularly as an important food source for species managed by the Commission. Additionally, it supports sound management practices which favor protective measures in the face of recognized but uncertain threats to the resources. It is reflective of recent fishery performance to prevent an increase amidst scientific uncertainty as to the impact of intensive reduction fishery harvest on the Bay ecosystem while ecological reference points are developed to establish scientifically-sound harvest limits that consider menhaden's important role as forage. Acting with such precaution is an accepted and responsible management practice in resource conservation, referred to as the Precautionary Principle.[7] This principle counsels that, in the face of uncertainty affecting resources that are known to be under poor stock condition, in this case predator species including striped bass, the Commission is to take preventative action before serious harm occurs.

Impacts of the Overage on Atlantic Menhaden and the Ecosystem

Exceeding the Bay cap has implications for the stock assessment and its quota projections. The menhaden stock assessment model uses important assumptions about the size and age classes caught by the fisheries to produce projections, which the Commission uses to set management measures moving forward. The projections used to set the coastwide quota are based on the assumption that future fishery selectivity pattern (i.e., the age classes vulnerable to the fishery) would be the same as the selectivity pattern in the most recent year of the data used in the model, which reflects 2016 harvest in the Bay (less than 51,000 mt). The Bay reduction fishery harvests a higher proportion of age 1 and 2 fish than the ocean fisheries north of the Bay. Therefore, if removals from the Bay increased beyond the 51,000 mt cap, the impact of those removals on the total population would change even if the coastwide quota was not exceeded, because the overall selectivity pattern would be different.[8] Any change to the selectivity pattern will affect the validity of assessment projections, potentially leading to underperformance of the stock and failure to meet prescribed conservation objectives. This undermines the Board's ability to meet the goals and objectives of the FMP. Setting a cap provides stability within the Bay, allowing for greater certainty in stock projections and

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[6] 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. and NEFSC. 2019. Prepublication Copy (9-4-2019): Operational Assessment of the Black Sea Bass, Scup, Bluefish, and Monkfish Stocks, Updated Through 2018

[7] See, e.g., Kriebel, D., J. Tickner, P. Epstein, J. Lemons, R. Levins, E.L. Loechler, M. Quinn, R. Rudel, T. Schettler, and M. Stoto. 2001. The Precautionary Principle in Environmental Science. Environmental Health Perspectives 109(9): 871-876, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240435/; V.R. Restrepo. 1998. Technical Guidance On the Use of Precautionary Approaches to Implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Technical Memorandum NMFS–F/SPO–31, available at https://www.st.nmfs.noaa.gov/Assets/stock/documents/Tech-Guidelines.pdf. NOAA Office of General Counsel, Precautionary Approach (collecting authorities), available at https://www.gc.noaa.gov/gcil_precautionary_approach.html.

[8] Gabriel, W.L., M.P. Sissenwine, and W.J. Overholtz. 1989. Analysis of Spawning Stock Biomass per Recruit: An Example for Georges Bank Haddock. North American Journal of Fisheries Management 9: 383-391.

increased certainty that management actions taken by the Board will meet the goals and objectives of the FMP. This includes maintaining the Atlantic menhaden stock at levels that sustain viable fisheries and support predators which depend on a healthy forage base.

Atlantic menhaden are a critically important – perhaps the most important – forage species for some of the Atlantic coast's most iconic species, including those that support valuable recreational and commercial fisheries. Science-based information reveals critical ecological linkages between menhaden and other species in the Bay, including striped bass, bluefish, and weakfish. The Bay is an important nursery ground for many of these predator species, and several studies confirm menhaden are a significant component of the diet of numerous predator species in the Bay during certain times and in certain areas.[9] This includes both fish and avian predators. Numerous studies have been conducted on the food habits of fish species within the Bay and concluded Atlantic menhaden are a commonly consumed prey item. Some recent studies show menhaden make up 90% of the diet of age-8+ striped bass during the winter and up to 50% of the diet of larger bluefish during the summer in the Bay.[8]

Atlantic menhaden are also consumed by other predators such as piscivorous birds. Mersmann found bald eagles consume fish almost exclusively during the summer, with most of their summer diet being comprised of Atlantic menhaden and gizzard shad.[10] In addition, McLean and Byrd found menhaden made up 75% of the diet of nesting ospreys in the Bay.[11] Many other avian species are thought to rely on menhaden; however, the diets of these non-fish predators within the Bay are not well studied. For example, cormorant and heron abundance within the Bay has increased over time and both species are known, from studies in other regions, to consume tidal freshwater fish like menhaden. However, there are no studies of their diet in the Bay.[12]

Numerous studies document Atlantic menhaden can comprise a significant proportion of many predators' diets for specific seasons, age classes and locations within the Bay, particularly when menhaden are abundant. However, understanding the impact of reduced menhaden abundance on predator population health is much more difficult. Some work has been done to estimate the predatory demand of individual species within the Bay but whether there is sufficient menhaden biomass in the Bay to support this demand cannot be determined from the current coastwide stock assessment.[13] As a first step, the Commission is developing scientifically-sound, peer-reviewed ecological reference points for Atlantic menhaden at the coastwide level, but spatially explicit models will require more work before they are ready for management use. This effort to integrate ecosystem considerations is consistent with the priorities identified in NOAA Fisheries Strategic Plan for 2019-2022.

Lower levels of menhaden recruitment in the Bay have been linked with negative population impacts for

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[9] Southeast Data, Assessment, and Review (SEDAR). 2015. SEDAR 40 - Atlantic menhaden stock assessment report. SEDAR, North Charleston, South Carolina. SEDAR. 2015.

[10] Mersmann, T.J. 1989. Foraging Ecology of Bald Eagles on the Northern Chesapeake Bay with an Examination of Techniques Used in the Study of Bald Eagle Food Habits. Doctoral dissertation. Virginia Polytechnic Institute and State University, Blacksburg, Virginia

[11] McLean, P.K., and M.A. Byrd. 1991. The diet of Chesapeake Bay ospreys and their impact on the local fishery. Journal of Raptor Research 25: 109-112.

[12] Viverette, C.B., G.C. Garman, S.P. McInnch, A.C. Markham, B.D. Watts, and S.A. Macko. 2007. Finfish-Waterbird Trophic Interactions in Tidal Freshwater Tributaries of the Chesapeake Bay. Waterbirds 30: 50-62.

[13] Hartman, K.J., and S.B. Brandt. 1995. Predatory demand and impact of striped bass, bluefish, and weakfish in the Chesapeake Bay: applications of bioenergetics models. Canadian Journal of Fisheries and Aquatic Sciences 52: 1667-1687; Uphoff, J.H. 2003. Predator–prey analysis of striped bass and Atlantic menhaden in upper Chesapeake Bay. Fisheries Management and Ecology 10: 313-322.

some important predator species. Within the Bay, the prevalence of mycobacteriosis in striped bass increased and striped bass condition decreased when menhaden recruitment indices were low[14] (striped bass outside the Bay had lower levels of infection.)[15] Jacobs et al. found the progression and severity of mycobacteriosis in striped bass increased when the fish were not well fed.[16] In addition to striped bass, the weakfish population has continued to decline, even with greatly reduced fishing pressure.[17] As the population declined and natural mortality increased, recruitment indices remained relatively stable for weakfish, suggesting there is a mortality bottleneck around ages 1-2, when weakfish switch over to consuming fish. One hypothesis is that the increase in natural mortality is linked to reduced prey availability, including menhaden.[18] Osprey population growth rates in the Bay were higher during the late 1970s and early 1980s, a period when menhaden recruitment indices in the Bay were high, than they were during the late 1980s and in 2006 when the recruitment indices were low.[19]

While the Commission recognizes these correlations come with caveats, the body of work on this issue indicates a precautionary approach is warranted. The Board appropriately took a precautionary approach in managing the menhaden fishery as the Commission pursues development of ecological reference points to manage menhaden as a forage species. In doing so, the Board not only considered the stock status of menhaden but also the species' pivotal role in the marine environment.[20] In the case of the Bay, the cap was specifically developed to mitigate risk of negative consequences to the unique and sensitive Bay environment in order to assure the availability of menhaden as a critical forage resource on a long-term basis.

Prudent fishery managers often use precautionary techniques such as control rules or risk policies that are not based on direct or explicit quantifications supporting the need for a determinate reduction in fishing effort, but instead indicate a need to mitigate known but as yet unquantifiable risks. The need for such approaches occurs frequently in fisheries management, which often operates in a realm of high uncertainty due to the complexity of marine ecosystems and the difficulty of assembling complete and current data. The approach the Commission has taken for menhaden is not different from protective approaches employed in similar circumstances for other fisheries. For example, in the Atlantic herring fishery, also an important forage fish, the New England Fishery Management Council established a seasonal gear restriction in an area addressing potential impacts of midwater trawling on schools of herring in the Gulf of Maine (GOM). There was a concern the concentrated fishing effort of trawlers could cause localized depletion in the GOM. In the face of scientific uncertainty and in the absence of definitive data, as is the case with menhaden, the Council chose to be precautionary and implement measures intended to address or prevent a resource problem. Given the importance of herring as a forage species and its role in the GOM ecosystem, NOAA Fisheries agreed it was appropriate to enact the measure to maintain the health of the resource in the GOM, the

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[14] Overton, A.S., F.J. Margraf, C.A. Weedon, L.H. Pieper, and E.B. May. 2003. The prevalence of mycobacterial infections in striped bass in Chesapeake Bay. Fisheries Management and Ecology 10: 301 – 308; see also Mersmann (1989).

[15] Matsche, M.A., Overton, A., Jacobs, J., Rhodes, M.R. and Rosemary, K.M., 2010. Low prevalence of splenic mycobacteriosis in migratory striped bass *Morone saxatilis* from North Carolina and Chesapeake Bay, USA. Diseases of aquatic organisms, 90: 181-189.

[16] Jacobs, J.M., C.B. Stine, A.M. Baya, and M.L. Kent. 2009. A review of mycobacteriosis in marine fish. Journal of Fish Diseases 32: 119-130

[17] ASMFC. 2016. Weakfish Benchmark Stock Assessment and Peer Review Report. Arlington, VA

[18] Northeast Fisheries Science Center (NEFSC). 2009. 48th Northeast Regional Stock Assessment Workshop (48th SAW) Assessment Report. US Department of Commerce, NEFSC Reference Document 09-15.

[19] Watts, B.D., and B.J. Paxton. 2007. Ospreys of the Chesapeake Bay: Population Recovery, Ecological Requirements, and Current Threats. Waterbirds 30: 39-49.

[20] ASMFC. 2017. Atlantic Menhaden Management Board Proceedings. Arlington, VA. http://www.asmfc.org/uploads/file/5d2f56c4AtlMenhadenBoardProceedingsNov2017.pdf

resources that depend on herring as prey, and the businesses that are sustained by a healthy GOM ecosystem.[21] Similar to one of the cap's goals to prevent concentrated harvest, the Atlantic Herring FMP establishes area specific quotas to distribute harvest throughout the range of the species.

Under Amendment 3, the Commission committed to managing menhaden in consideration of its role as a forage fish, and in the absence of a quantitatively derived cap in the Bay. Historical fishery performance was used not as an arbitrary measure, but as a precautionary approach to mitigate risk to the Bay's ecosystem and to achieve the management objectives of the plan. Conserving menhaden takes on an even greater role as other important forage species on the Atlantic coast, such as Atlantic herring and Atlantic mackerel, have suffered significant declines.

Notably, the cap allows viable prosecution of the reduction fishery yet limits removals. By using the average annual harvest in setting the cap, the approach mitigated economic harm as it provided the fishery with adequate access to menhaden to maintain current fishing levels while new approaches to managing this pivotal forage species are developed. In addition, the reduction fleet has the opportunity to fish in other areas. The Commonwealth of Virginia is privileged to have over 78.66% of the coastwide quota. This certainly allows the reduction fleet the opportunity to focus its efforts outside the Bay when cap has been reached. Because menhaden are a key forage species for some of the most important recreational and commercial fisheries on the East Coast, an approach that seeks to avoid further harm while transitioning to a more advanced ecosystem-based management regime, is particularly appropriate in this context.

When considering whether a state is in noncompliance with an FMP, the Commission must decide whether the state in question has "not implemented and enforced" the mandatory provisions of the FMP within the prescribed time period, 16 U.S.C. § 5105(a). Before transmitting a noncompliance determination for the Secretary's independent determination under *id.* § 5106, the Commission also considers it appropriate to express its own judgment concerning whether the relevant plan provisions are necessary for conservation of the menhaden fishery. *See* 16 US.C. §5104(a)(2)(A) (requiring that Commission FMPs "promote the conservation of fish stocks throughout their ranges and [be] based on the best scientific information available; 16 U.S.C. §5102(4) (defining "conservation" for purposes of the Atlantic Coastal Act to mean "the restoring, rebuilding, and maintaining of any coastal fishery resource and the marine environment, in order to assure the availability of coastal fishery resources on a long-term basis."). For reasons set forth above, the Commission does, indeed, consider the Bay cap necessary for conservation.

The Commonwealth of Virginia's failure to implement the bay reduction fishery cap will negatively impact the Commission's ability to achieve the goals and objectives of the FMP. Its persistent noncompliance threatens the Commission's ability to maintain the Bay's marine environment to assure adequate availability of menhaden within the ecosystem on a long-term basis. Indeed, failure of any state to fully comply with the mandatory provisions of a Commission interstate FMP has the ability to undermine the cooperative nature of the Commission's entire fisheries management process.

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[21] National Marine Fisheries Service (NMFS). 2007. Fisheries of the Northeastern United States Atlantic Herring Fishery Amendment 1. 72 Federal Registry 11251. https://www.federalregister.gov/documents/2007/03/12/E7-4163/fisheries-of-the-northeastern-united-states-atlantic-herring-fishery-amendment-1

The Atlantic Coastal Act requires all Atlantic coastal states to implement and enforce fishery management plans adopted by the Commission. 16 U.S.C. § 5104(b). If the Commission determines a state is out of compliance with one of its FMPs, the Act requires the Commission to report this determination to you, as the Commission hereby does in this instance. I have also transmitted this letter to the Secretary of the Interior.

Sincerely,

Robert E. Beal

cc: Patrick Keliher, ASMFC Chair
A.G. "Spud" Woodward, ASMFC Vice-Chair
ASMFC Commissioners
Atlantic Menhaden Management Board

From: Cieri, Matthew
Matthew.Cieri@maine.gov
Subject: Re: YOUR REMARK ??
Date: Aug 2, 2020 at 10:17:54 AM
To: Tom Lilly foragematters@aol.com

Hi Tom,

Yes, that is correct. That is what our work showed. At the current striped bass fishing mortality, striped bass won't rebuild no matter how low they set menhaden fishing mortality.

Any meaningful rebuilding of striped bass has include reductions in the striped bass fishing mortality from where it currently is. They can get part of the way there with reductions in menhaden fishing, but it won't be enough to rebuild the stock to target levels without reductions in striped bass fishing mortality.

Matt

From: Tom Lilly <foragematters@aol.com>
Sent: Sunday, August 2, 2020 12:06:20 AM
To: Cieri, Matthew <Matthew.Cieri@maine.gov>
Subject: YOUR REMARK ??

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20 August 2020

The Honorable Ralph Northam
Governor, State of Virginia
PO Box 1475
Richmond, VA 23218

Dear Governor Northam,

The menhaden is a keystone fish within the Chesapeake Bay ecosystem. Many of our most iconic species including the bald eagle, osprey, great blue heron and brown pelican depend on menhaden stocks to sustain their breeding populations within the Bay. Other species such as common loons and northern gannets that stage within the Chesapeake also depend on menhaden to fuel their migrations. Approximately 30% of the North Atlantic gannet population comes into the Bay during the spring to feed on menhaden before flying north to breeding grounds in Newfoundland.

Deep withdraws of menhaden stocks for the reduction fishery is having an impact on consumer species. We have conducted fieldwork with osprey throughout the lower Chesapeake Bay for 50 years and data demonstrate ongoing impacts. Through three generations of graduate students (1975-2006) we have observed shifts in diet and an associated reduction in productivity. Fish delivery rates were more than three times higher in 1975 compared to 2006. Menhaden, once the dominant fish in the diet now represents less than 30%. Shifts in diet away from menhaden have been coincident with a 90% reduction in menhaden stocks (Maryland, DNR haul surveys). No other fish species available to consumers provides the energy content of menhaden. Reductions in menhaden stocks have caused osprey productivity to decline to below DDT-era rates. These rates are insufficient to support the osprey population within the main stem of the Bay.

Menhaden provide critical ecosystem services within the Chesapeake Bay. We request that the needs of the broader ecosystem be considered when setting harvest policy and that menhaden stocks be maintained at levels that support a healthy Chesapeake Bay ecosystem.

Sincerely,

Bryan Watts

Bryan D. Watts, Ph.D.
Mitchell A. Byrd Professor of Conservation Biology
Director, Center for Conservation Biology
College of William and Mary

ATLANTIC MENHADEN

C41 9/05 0350

The Most Important Fish in the Bay

UPDATE: August 5, 2020—the Atlantic States Marine Fisheries Commission has taken the first step to formally consider the importance of menhaden to other predators, including striped bass, bluefish, and weakfish, in its management framework. This is the first time that ASMFC has committed to including Ecological Reference Points, the value of the species to the ecosystem, in its fishery management plans. *(Read CBF's press release)* (http://www.cbf.org/news-media/newsroom/2020/all/asmfc-adopts-groundbreaking-change-to-menhaden-fishery-management.html)

Atlantic menhaden, *Brevoortia tyrannus*, are small, nutrient-packed fish that are central to the Chesapeake Bay's food chain and support one of the largest commercial fisheries on the Atlantic coast. As a result of their environmental and economic importance, management of the menhaden fishery is a political flashpoint across the region.

Why are menhaden (also called bunker or pogy) important in the Chesapeake Bay?

Menhaden have been called the "most important fish in the sea." In the Bay, they create a vital connection between the bottom and top of the food chain. They eat tiny plants and animals, called plankton, by filtering them from the water. In turn, menhaden are a rich food source for many predator fish—including rockfish (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/rockfish/) (striped bass), bluefish, and weakfish—as well as ospreys (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/ospreys/), bald eagles, dolphins, and whales. (See our video, *Why Whales Follow Menhaden into the Bay (http://www.cbf.org/news-media/multimedia/video/why-whales-follow-menhaden-into-the-bay.html).*)

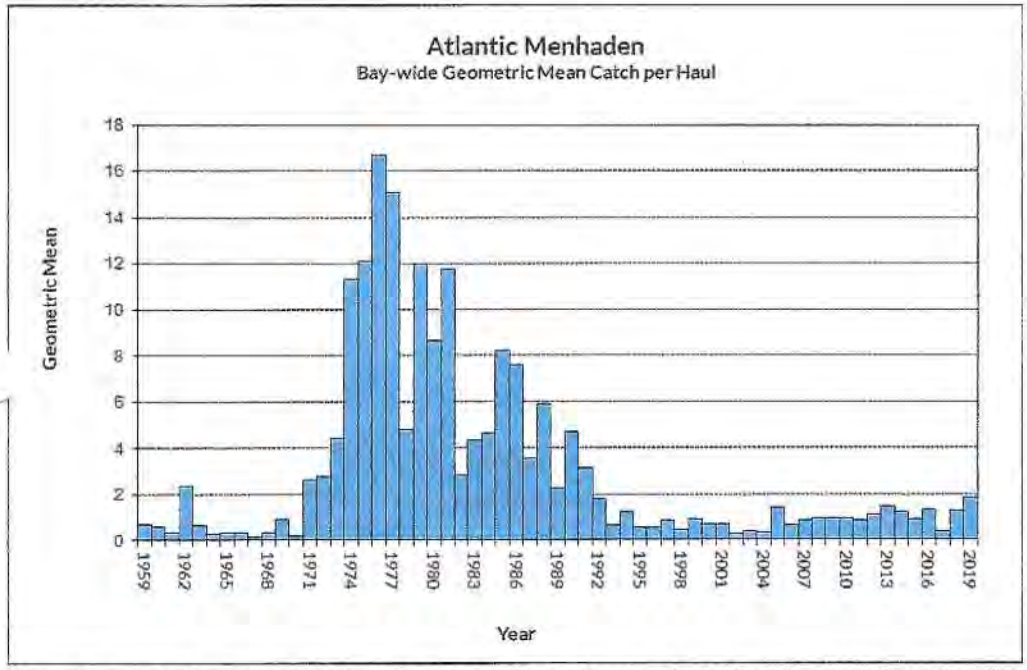
Rockfish, in particular, historically relied on menhaden for a large portion of their diet. Researchers have raised concerns that a lack of menhaden could make rockfish more vulnerable to disease.

Why should I care about menhaden?

If you enjoy feeling the tug of a big rockfish on the end of your line (and savoring the taste of it at dinner) or watching osprey snatch a silvery fish from the water, you have menhaden to thank! These small fish are the unsung heroes of the Chesapeake Bay, providing a rich food source for many of our favorite critters.

What are the threats facing menhaden?

The Bay is one of the most important nurseries for menhaden, helping to sustain the population along the Atlantic coast. Menhaden eggs hatch in the open ocean before drifting on currents into the Bay, where juvenile fish live and grow for their first year of life. But long-running scientific surveys show the number of young menhaden in the Chesapeake Bay dropped dramatically in the early 1990s and remains low.



This graph represents the average number of juvenile menhaden available ("abundance"), which has a direct impact for predators like striped bass and osprey. Unfortunately, the number of young menhaden produced in the Bay each year has been poor for the last 20 years.

DURELL, E.Q., AND WEEDON, C. 2019. STRIPED BASS SEINE SURVEY JUVENILE INDEX WEB PAGE. DNR.MARYLAND.GOV/FISHERIES/PAGES/JUVENILE-INDEX.ASPX. MARYLAND DEPARTMENT OF NATURAL RESOURCES, FISHERIES SERVICE

At the same time, almost three-quarters of all menhaden caught on the East Coast are harvested by the Omega Protein Corporation—a Canadian-owned company that fishes largely in or near the mouth of the Bay. Omega operates the sole remaining menhaden reduction facility on the U.S. East Coast in Reedville, Virginia. The plant reduces (cooks and grinds up) the fish for a variety of uses, such as nutritional supplements, food additives, and feed for livestock and fish farms.

Menhaden by the Numbers

70%

The amount of an adult rockfish's diet historically filled by menhaden.

The amount of an adult rockfish's diet currently filled by menhaden.

of-menhaden-conservation.html)

Northern Green Frog (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/northern-green-frog-at-home-in-the-bog.html)

Ospreys (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/ospreys/)

Pelicans (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/moving-on-up-pelicans-are-at-home-on-the-bay.html)

River Otters (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/aquatic-ambassadors-river-otters-are-poster-pups-for-conservation.html)

Rockfish (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/rockfish/)

Sea Nettles (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/sea-nettles.html)

Smallmouth Bass (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/smallmouth-bass.html)

Sturgeon (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/sturgeon.html)

Terrapins (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/terrapins-swimming-for-shore.html)

Tundra Swans (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/tundra-swans-a-fading-winter-chorus-in-the-chesapeake.html)

Stay up to date about the Bay!

8%	*The rockfish population in the Chesapeake Bay is showing signs of malnourishment and increasing mortality.*
75%	The amount of an osprey nestling's diet filled by menhaden in the 1980s.
28%	The amount of an osprey nestling's diet filled by menhaden today. *Though the number of nests throughout the Bay region has improved, nestling mortality is as high as it was in the DDT era.*
65%	The annual removal of adult menhaden from East Coast waters.
2,500	The number of jobs supported by menhaden-dependent species in Virginia alone.
$236	In millions, the total amount fishing for menhaden-dependent species contributes to Virginia's economy.
8%	The current Atlantic menhaden population compared against historical levels.

Why is there a harvest cap for menhaden in the Bay?

Menhaden migrate along the Atlantic coast from Florida to Maine. An interstate governing body—the Atlantic States Marine Fisheries Commission (ASMFC)—manages the fishery for the 15 states that share the coastline.

Over the past two decades, **fishery managers have raised concerns that the concentration of fishing effort in Bay waters could disrupt the Bay's food chain**, harming populations of rockfish and other predator species. As a precaution, the ASMFC first set a cap for Omega's industrial menhaden harvest in the Bay in 2006. In 2017, the ASMFC voted to update the cap to reflect more recent menhaden harvest levels in the Bay.

In blatant disregard for the fishery management process, Omega knowingly exceeded the cap in 2019 (http://www.cbf.org/news-media/newsroom/2019/virginia/cbf-expresses-deep-concern-with-omega-proteins-announcement-it-will-violate-the-bay-menhaden-cap.html). The violation resulted in a unanimous ASMFC vote (http://www.cbf.org/news-media/newsroom/2019/virginia/fisheries-board-finds-virginia-out-of-compliance-with-menhaden-harvest-cap.html) referring Virginia to the U.S. Department of Commerce for noncompliance with interstate fishery rules. The Secretary of Commerce decided to uphold the ASMFC decision (http://www.cbf.org/news-media/newsroom/2019/virginia/us-commerce-department-takes-action-after-virginia-menhaden-limit-exceeded.html). The new harvest cap approved by the VMRC in April 2020 lowers the amount of menhaden that

SIGN UP (HTTP://WWW.US/STAY-UP-TO-DATE-ABOUT-THE-BAY.HTML)

In the News

08/05/20: ASMFC Adopts Groundbreaking Change to Menhaden Fishery Management (http://www.cbf.org/news-media/newsroom/2020/all/asmfc-adopts-groundbreaking-change-to-menhaden-fishery-management.html)

04/28/20: New Menhaden Limits Approved by VMRC, Preventing Fishery Shutdown (http://www.cbf.org/news-media/newsroom/2020/virginia/r menhaden-limits-approved-by-vmrc-preventing-fishery-shutdown.html)

02/27/20: Menhaden Legislation Approved by Virginia House And Senate (http://www.cbf.org/news-media/newsroom/2020/virginia/n legislation-approved-by-virginia-house-and-senate.html)

01/29/20: Menhaden Legislation Approved by Virginia House and Senate Committees (http://www.cbf.org/news-media/newsroom/2020/virginia/n legislation-approved-by-virginia-house-and-senate-committees.html)

12/19/19: U.S. Commerce Department Takes Action after Virginia Menhaden Limit Exceeded (http://www.cbf.org/news-media/newsroom/2019/virginia/u commerce-department-takes-action-after-virginia-menhaden-limit-exceeded.html)

11/21/19: CBF Statement on Gov. Northam's Call for Action on Menhaden (http://www.cbf.org/news-media/newsroom/2019/virginia/c

can be caught in the Chesapeake Bay to 51,000 metric tons per year. Due to Omega Protein's excess harvest during the 2019 fishing season, this year's level will be further lowered to 36,192 metric tons. The VMRC's action avoids a shutdown of the menhaden ishery due to noncompliance with the ASMFC.

statement-on-gov-northams-call-for-action-on-menhaden.html)

VIEW MORE (HTTPS://WWW MEDIA/NEWSR PRIMARY_ISSUI

How can better management protect menhaden and the Bay?

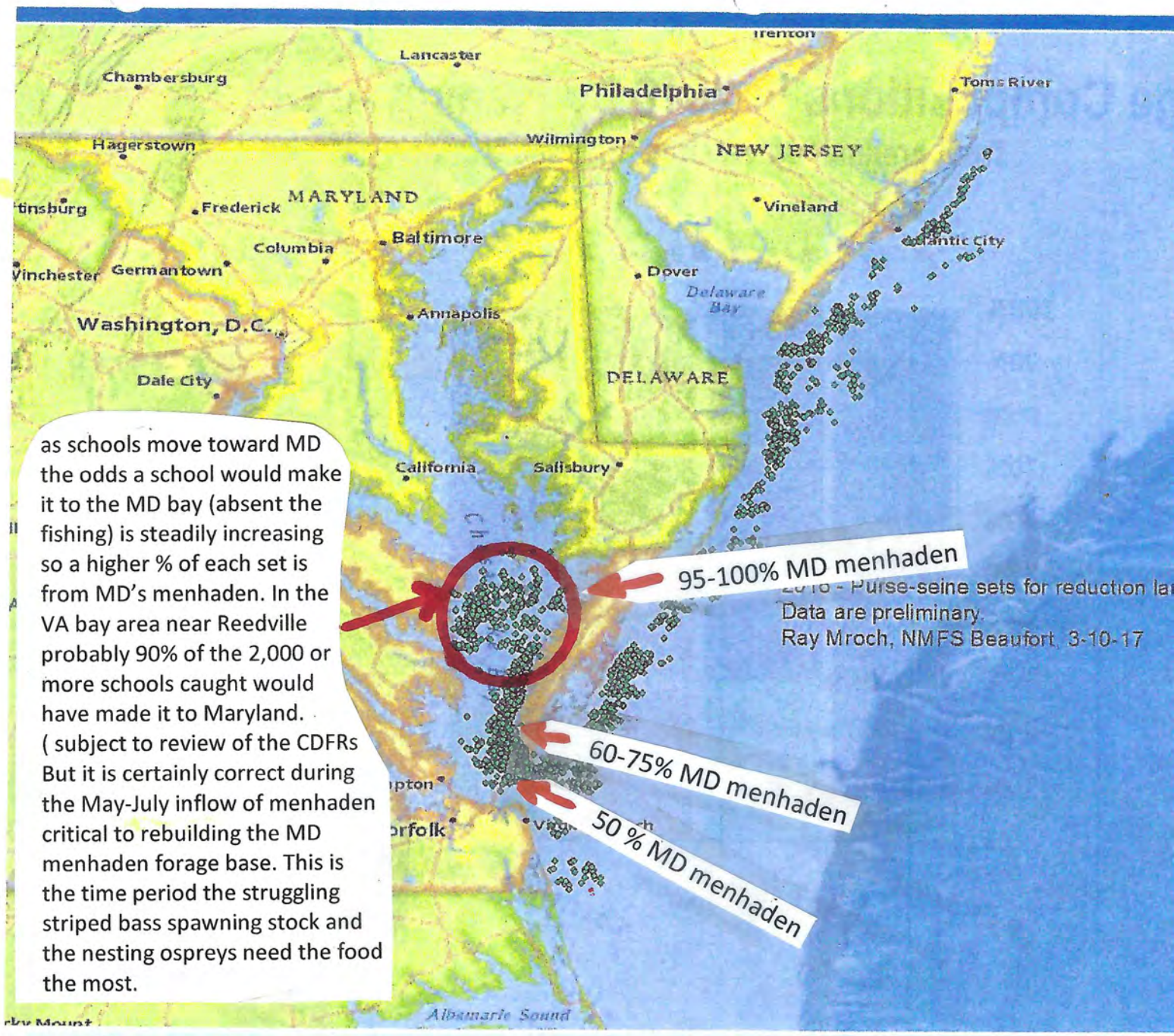
For more than 25 years (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/menhaden/timeline-of-menhaden-conservation.html), CBF has worked with partners toward a healthy menhaden population in the Chesapeake Bay to ensure that this nutrient-packed fish can fulfill its key role in the food chain. In 2012, ASMFC's Benchmark Stock Assessment showed the total menhaden population was at its lowest level on record. Peer-reviewed population estimates showed menhaden have been overfished for 32 of the past 54 years. A strong fisheries management plan was needed to rebuild the population, and once rebuilt, to maintain it. (See *A Timeline of Menhaden Conservation* (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/menhaden/timeline-of-menhaden-conservation.html).)

For decades, management decisions and catch limits relied on "single species" stock assessments, independent of other species. In other words, **they accounted for demand from the fishing industry, but did not account for demand from rockfish, osprey, and other animals that rely on menhaden for food.** This did not necessarily mean there would be sufficient stock to sustain the larger ecosystem needs.

That changed in August 2020, when the ASMFC adopted benchmarks, known as ecological reference points (http://www.cbf.org/blogs/save-the-bay/2017/10/a-historic-opportunity-for-fish-and-fishermen.html), that will allow managers to **account for menhaden's role in the food chain** and set catch limits accordingly. CBF has been a strong proponent of this process and will continue to advocate for an ecosystem-based approach to menhaden management.

SAVE THE BAY

Founded in 1967, the Chesapeake Bay Foundation (CBF) is the largest independent conservation organization dedicated solely to saving the Bay.



NOAA FISHERIES

U.S. Department of Commerce | National Oceanic and Atmospheric Admin

Tina Berger

From: Tom Lilly <foragematters@aol.com>
Sent: Friday, July 23, 2021 1:56 PM
To: Tina Berger; kroots-murdy@asmfc.com
Subject: [External] Material for Menhaden board Summer meeting etc
Attachments: 2020-06-02_144500 amendment 3 comparison.pdf; 2021-01-26_182617 pages 13-29 of site.pdf; VA ALLOCATION.pdf; 2020-07-08_124852 Beal letter to Ross.pdf; CBF Press Release.pdf

Tina will you please include this in the briefing materials for the Commissioners, the menhaden board and the Policy board. ?..I have sent it to the menhaden work group members Thanks Tom Lilly

-----Original Message-----
From: Tom Lilly <foragematters@aol.com>
To: joseph.cimino@dep.nj.gov <joseph.cimino@dep.nj.gov>; megan.ware@maine.gov <megan.ware@maine.gov>; nichola.meserve@state.ma.us <nichola.meserve@state.ma.us>; acolden@cbf.org <acolden@cbf.org>; pat.geer@mrc.virginia.gov <pat.geer@mrc.virginia.gov>; chris.batsavage@ncdenr.gov <chris.batsavage@ncdenr.gov>; robert.lafrance@quinnipiac.edu <robert.lafrance@quinnipiac.edu>; kr00ts-murdy@asmfc.com <kr00ts-murdy@asmfc.com>; rbeal@asmfc.org <rbeal@asmfc.org>; swoodward1957@gmail.com <swoodward1957@gmail.com>; patrick.keliher@maine.gov <patrick.keliher@maine.gov>
Cc: Tom Lilly <foragematters@aol.com>; flypax@md.metrocast.net <flypax@md.metrocast.net>
Sent: Fri, Jul 23, 2021 1:39 pm
Subject: Answer to Joe Cimino ...request for reply

For Joe Cimino and the work group.and the board..First to Joe ...thanks you for being willing to discuss the merits of things...very refreshing.... again thanks...
... This is a reply to Joe's recent comments about Chesapeake bay and the advice given by Dr. Matt Cieri, Dr. Bryan Watts and Dr.Tom Miller

Chesapeake Bay is the largest estuary in the United States with an area of 4,480 square miles,150 rivers,1,684 miles of shoreline. ...24 billion dollars spent on air and water quality..Half ot the bay watershed's 18 million residents try to act in ways that benefit the bay. Regulations affect the use and value of real estate owned by millions of people. 427 wastewater plants are impacted. Rules about nitrogen and phosphoros levels in ag soils , timing of fertilizer application etc. have impacted yields, expenses,land values and the survivability of 87,000 farms.Business in the watershed is subject to bay regulations that impact labor, expenses and a business's value. So,millions of people and 100s of thousands of businesses and farms adjust their daily lives and business practices to save Chesapeake Bay for the common good.The point is. Should the Commission and this menhaden board continue to exempt the three owners of the 12 purse seine boats in Virginia from making changes to benefit the common good as all the other residents,businesses and farms in six states are required to do? Is that where this is going? I think the public deserves an answer to that question, will you please answer that?

According to the Commission Director striped bass sport fishing on the Atlantic coast affects 104,867 jobs and has an impact of $7.7 billion,74 times the value of the

commercial fishery. (scan Ross letter page 2) There are about 10 captains and 100 crew at Omega versus 3,700 crew and about 1,867 captains in finfish and charters.just in Virginia and Maryland.Over 400 thousand recreational fishermen and a potential for a 100 thousand kids fishing if fishing got good again.Scan Amend 3 Comparisons,

Only this group and the board can act to increase the third thing wildlife need...their food supply, no one else can do that . Moving the purse seine fishing into the US Atlantic north of Cape Charles VA, the kind of time and area control recommended by your own consultant 12 years ago (top of page 3 Beal ltr) and exactly what each of your states but Virginia has done would guarantee the bay received an additional 51,000 tons of menhaden forage a year.(scan single concept and VA Allocation.) Does the work group dispute this estimate of forage saved?

You have the advice of three of our top marine and avian scientists that right now bay fish and wildlife are being damaged and need more menhaden. You also have advice from your own Director that where there is uncertainty and the the bay's wildlife is in poor condition you must act under the protective principle. (Beal ltr page 4 par 2) Either way the result seems to be the same...Act to move the fishing into the Atlantic..no loss of jobs or quota. Isn't that an approach tobe considered?

Joe..will you take another look at what the experts had to say.? Matt Cieri corrected a quote in Bay Journal to add his opinion that it will take both conservation and a reduction in menhaden fishing to restore the striped bass. CBF says menhaden diet went from 80% to 8%.

Dr. Bryan Watt's comments seen very clear. Ospreys in the main bay stem are dying out due to inadequate menhaden leading to widespread nesting failures. Are you aware of any equally qualified avian scientist that has read this letter and disagrees with Dr.Watts? Are not his conclusions supported by the CBF press release?

According to one source "Seabirds are the most vunerable (of avian,fish and marine mammals species) See Ecosystem-based Management Objectives North Sea , Collas et al ICES Journal of Marine Science, Vol 71,isssue 1,(2014) page 13/45. We submit the osprey evidence from these two sources shows probable chronic depletion. Do you agree?

Dr, Tom Miller said that Dr. Cieri and Dr. Watts gave good advice. The important question for the work group and the board is whether or not they will act of Dr. Miller's advice. He said:

" ...there will likely have to be compromise on all sides to reach a solution that will sustain the ecosystem services provided by menhaden. Restrictions on fisheries both menhaden and striped bass will likely improve the provision of ecosystem services.A central challenge is how to allocate these cuts among the different fisheries sectors equitably" Does the group and the board agree with the advice Dr. Miller has given them?

There are several different motions you could make to bring this to a head now that 17 years have passed since it was on your radar. One is:

That the Board explore the need for and the possible ecological, social and economic benefits to Chesapeake Bay and the people of Virginia and Maryland of

various management measures such as seasonal,capacity and area controls on the purse seine fishery in Virgina.

A second challenge here is whether the board should start another 5-7 years research on Chesapeake bay when your Charter and Amend. 3 both say action is to be based on the information you have now (n.1).There will never be decisions made for conservation if you keep saying you need more research to make up your mind. Isn't it correct that Dr. Maguire, your own consultant, said you can use "time and area" controls without more quanitative research to do a fair and equitable division of menhaden in Chesapeake Bay? Does this group or the board dispute that moving the factory fishing into the US Atlantic zone north of Cape Charles would likely allow 51,000 tons of menhaden forage to get into Chesapeake bay,forage now being caught... That's the bottom line here...do you agree or disagree?

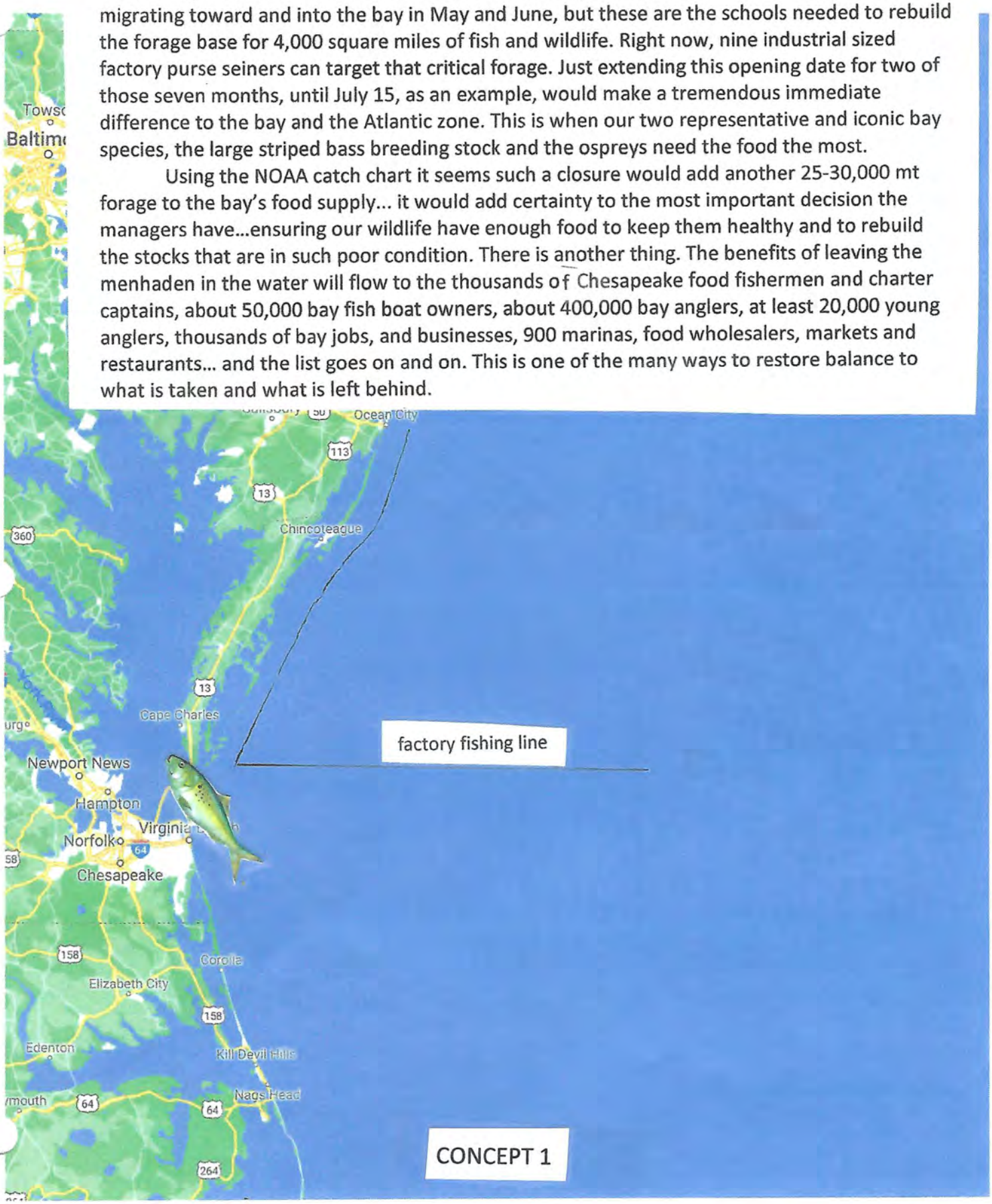
Thank you for your consideration. References on request Tom Lilly 443 235 4465

Charter Section Six (a)(2) " Conservation...and management plans shall be based on the best scientific information available"

CONCEPT...DELAY OPENING THE SEASON FOR A TIME THE MANAGERS FIND APPROPRIATE, THEN ALLOW FACTORY FISHING ONLY IN THE US ATLANTIC ZONE NORTH OF CAPE CHARLES

The factory menhaden season is seven months starting in May. Relatively few schools are migrating toward and into the bay in May and June, but these are the schools needed to rebuild the forage base for 4,000 square miles of fish and wildlife. Right now, nine industrial sized factory purse seiners can target that critical forage. Just extending this opening date for two of those seven months, until July 15, as an example, would make a tremendous immediate difference to the bay and the Atlantic zone. This is when our two representative and iconic bay species, the large striped bass breeding stock and the ospreys need the food the most.

Using the NOAA catch chart it seems such a closure would add another 25-30,000 mt forage to the bay's food supply... it would add certainty to the most important decision the managers have...ensuring our wildlife have enough food to keep them healthy and to rebuild the stocks that are in such poor condition. There is another thing. The benefits of leaving the menhaden in the water will flow to the thousands of Chesapeake food fishermen and charter captains, about 50,000 bay fish boat owners, about 400,000 bay anglers, at least 20,000 young anglers, thousands of bay jobs, and businesses, 900 marinas, food wholesalers, markets and restaurants... and the list goes on and on. This is one of the many ways to restore balance to what is taken and what is left behind.



CONCEPT 1

MOVE FACTORY FISHING TO US ATLANTIC ZONE North of TOWN OF CAPE CHARLES

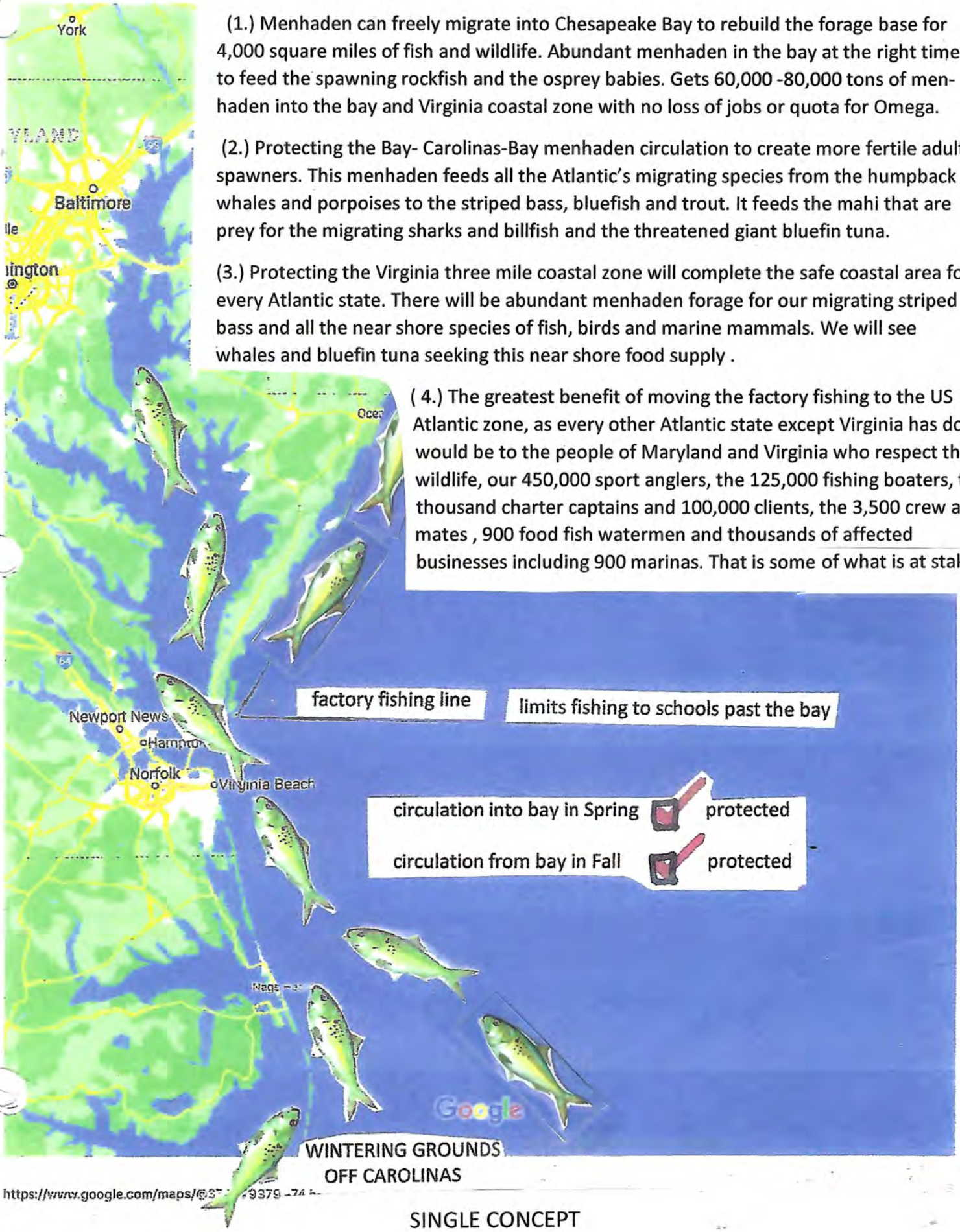
WHAT THIS ACCOMPLISHES:

(1.) Menhaden can freely migrate into Chesapeake Bay to rebuild the forage base for 4,000 square miles of fish and wildlife. Abundant menhaden in the bay at the right time to feed the spawning rockfish and the osprey babies. Gets 60,000 -80,000 tons of menhaden into the bay and Virginia coastal zone with no loss of jobs or quota for Omega.

(2.) Protecting the Bay- Carolinas-Bay menhaden circulation to create more fertile adult spawners. This menhaden feeds all the Atlantic's migrating species from the humpback whales and porpoises to the striped bass, bluefish and trout. It feeds the mahi that are prey for the migrating sharks and billfish and the threatened giant bluefin tuna.

(3.) Protecting the Virginia three mile coastal zone will complete the safe coastal area for every Atlantic state. There will be abundant menhaden forage for our migrating striped bass and all the near shore species of fish, birds and marine mammals. We will see whales and bluefin tuna seeking this near shore food supply .

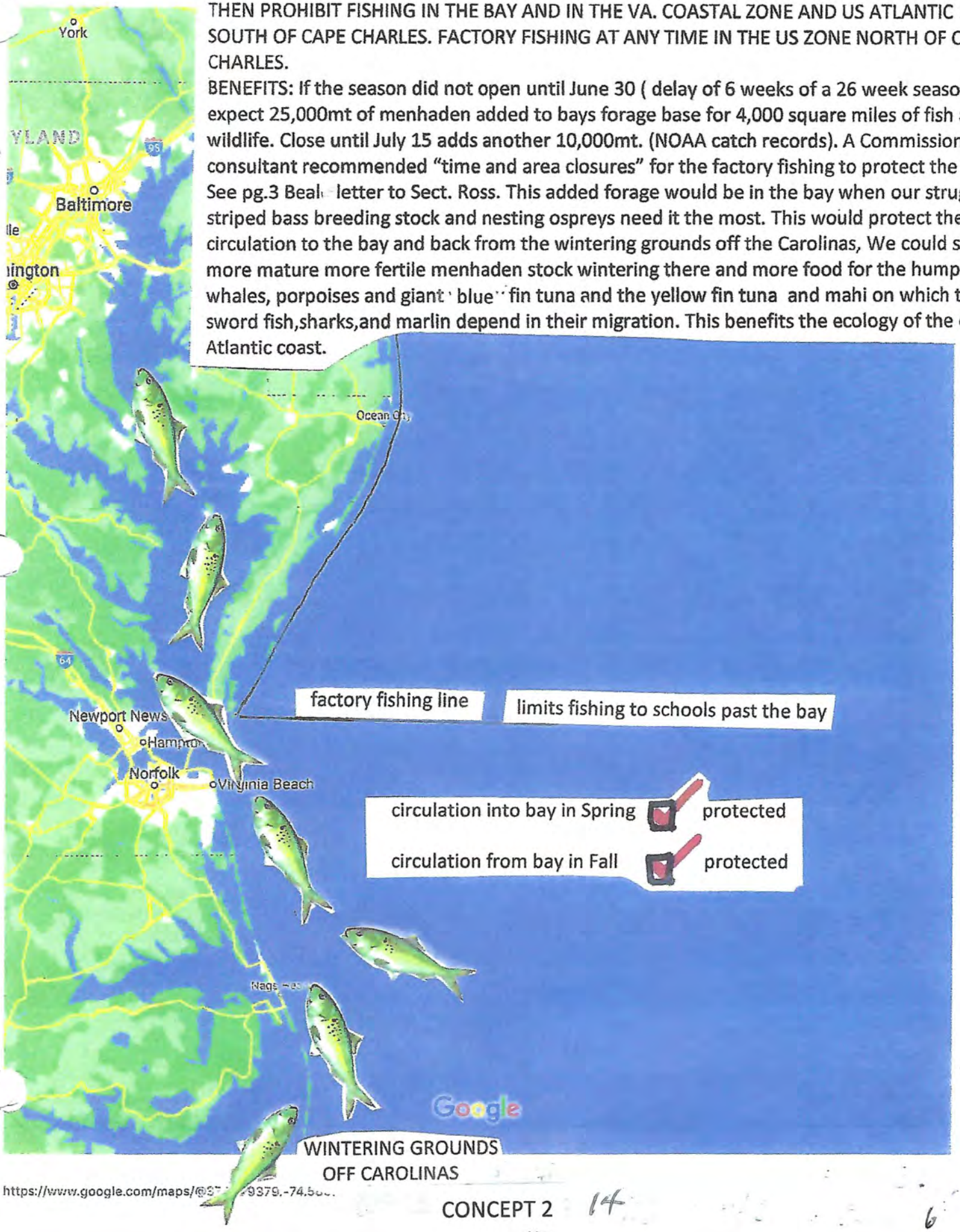
(4.) The greatest benefit of moving the factory fishing to the US Atlantic zone, as every other Atlantic state except Virginia has done, would be to the people of Maryland and Virginia who respect their wildlife, our 450,000 sport anglers, the 125,000 fishing boaters, the thousand charter captains and 100,000 clients, the 3,500 crew and mates , 900 food fish watermen and thousands of affected businesses including 900 marinas. That is some of what is at stake.



SINGLE CONCEPT

CONCEPT 2. (least change) DELAY OPENING FACTORY FISHING IN THE VIRGINIA BAY AND VA ATLANTIC ZONE FOR ENOUGH TIME TO HAVE THE BAY'S MENHADEN FORAGE BASE RECOVER THEN PROHIBIT FISHING IN THE BAY AND IN THE VA. COASTAL ZONE AND US ATLANTIC ZONE SOUTH OF CAPE CHARLES. FACTORY FISHING AT ANY TIME IN THE US ZONE NORTH OF CAPE CHARLES.

BENEFITS: If the season did not open until June 30 (delay of 6 weeks of a 26 week season) expect 25,000mt of menhaden added to bays forage base for 4,000 square miles of fish and wildlife. Close until July 15 adds another 10,000mt. (NOAA catch records). A Commission consultant recommended "time and area closures" for the factory fishing to protect the bay. See pg.3 Beal letter to Sect. Ross. This added forage would be in the bay when our struggling striped bass breeding stock and nesting ospreys need it the most. This would protect the circulation to the bay and back from the wintering grounds off the Carolinas, We could see a more mature more fertile menhaden stock wintering there and more food for the hump-back whales, porpoises and giant blue fin tuna and the yellow fin tuna and mahi on which the sword fish,sharks,and marlin depend in their migration. This benefits the ecology of the entire Atlantic coast.



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Date: Fri. Dec 11, 2020 8:41 am

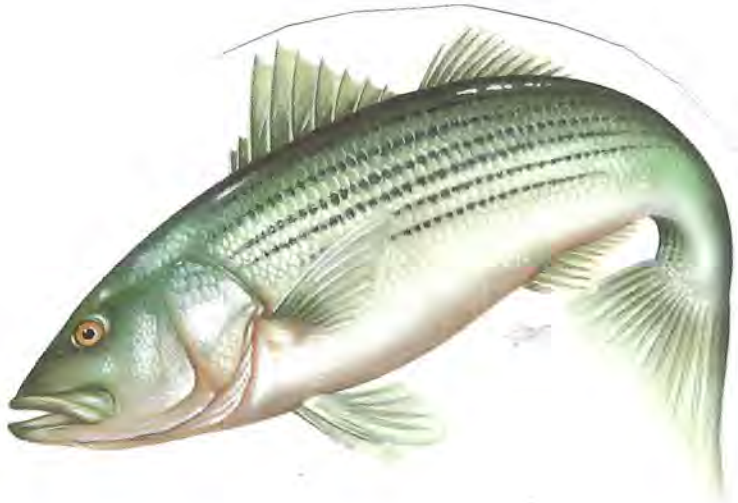
Phil, I would like to add per our conversation last week, that as long as the CBBT is considered the demarcation line for the Chesapeake Bay as set up by ASMFC per the direction of Omega and/or they can fish within the 3 mile EEZ line along the coast then even if the Bay Cap was 0 fish they can still catch a majority of every group of schools migrating into and out of the Bay. They just have to put a little more fuel in their ships.

Moving them out to the EEZ is the only option that will reestablish the menhaden biomass within the Bay. This statement is based on daily observation os Omega's fishing practices of following the schools as they migrate into and out of the Chesapeake Bay by tracking their movements, radio communications discussing the quantity and size of schools as well as class of fish (age groups) that are seen, catch amounts per ships made as reported via radio back to Reedville and learning the migration patterns of the schools after years of watching them follow the groups of schools. While not exact "science " is observed in these daily tracking reports they show the patterns and results of Omega's efforts and are a good representation of what's happening in the local depletion of our state's waters.

If you have followed my post starting this year on https://www.facebook.com/ Chesapeake-Bay-Defenders-1890352121190102 it is apparent that these groups of schools have been dropping off at an alarming rate from the previous 5 years and are in deep decline that is simply not shown or represented in ASMFC's coastal biomass figures. There are 5K people that follow this page and it reaches over 7K people so there are a lot of people that are concerned about these issues as they personally see the results of this depletion out on the water by the lack of menhaden schools seen.

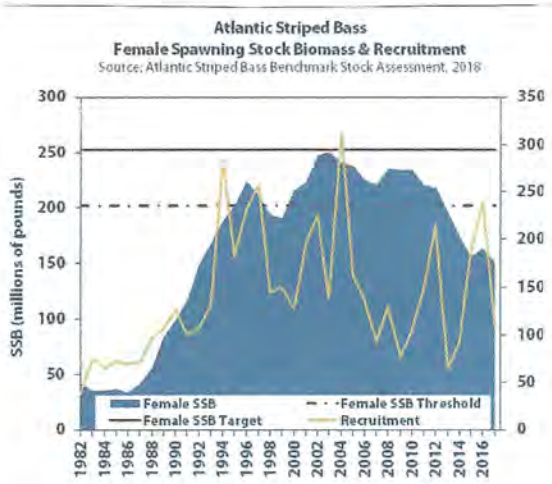
Respectively,

Bill Dunn



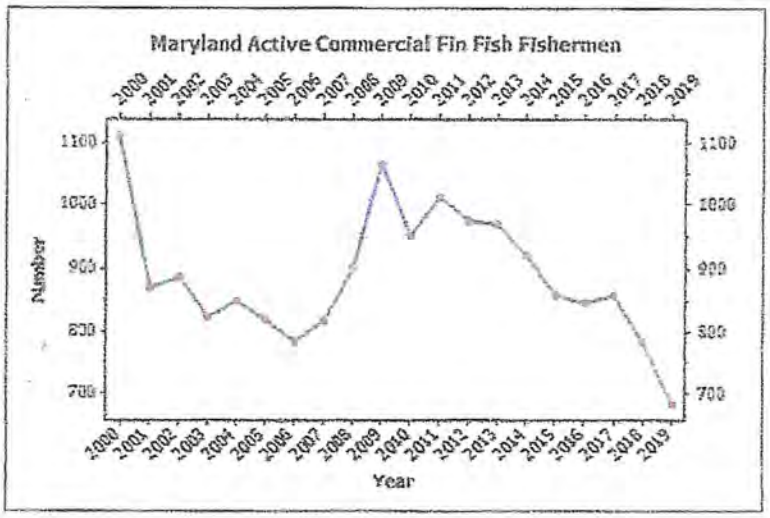
MATERIAL FROM ASMFC ATLANTIC STRIPED BASS MANAGEMENT SECTION

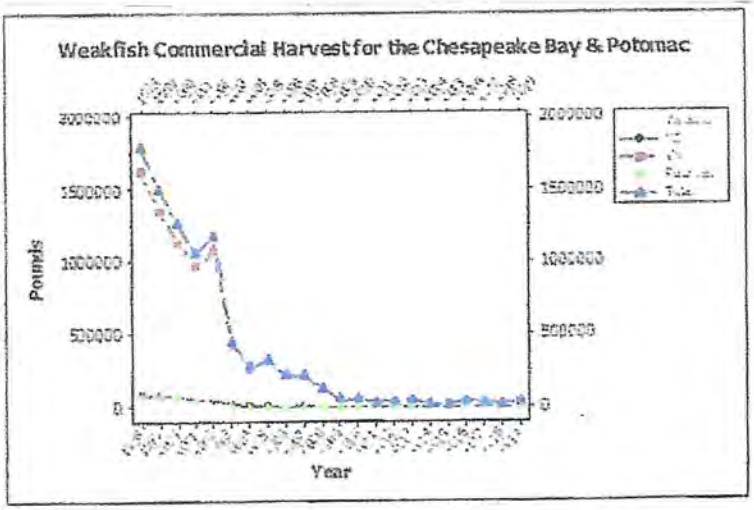
SPAWNING STOCK AND RECRUITMENT STATUS FROM ASMFC STRIPED BASS INTRODUCTION PAGE 2

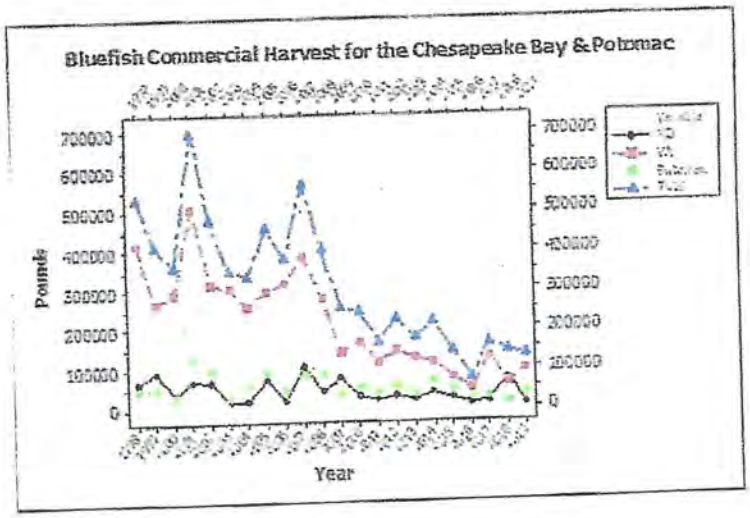


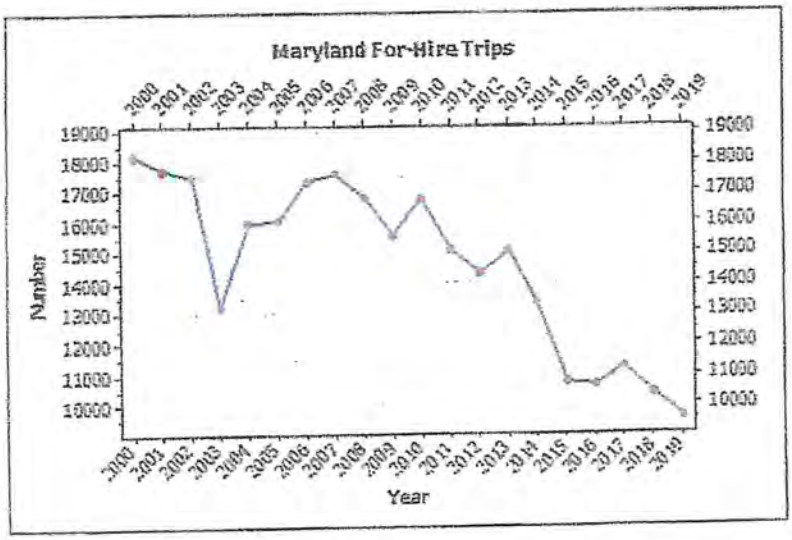
STOCK STATUS FROM SECTION 2.2.1 OF ADENDUM VI TO AMENDMENT 6 STRIPED BASS MANAGEMENT PLAN PAGE 2 (2019) Stock overfished with substantial declines in juveniles

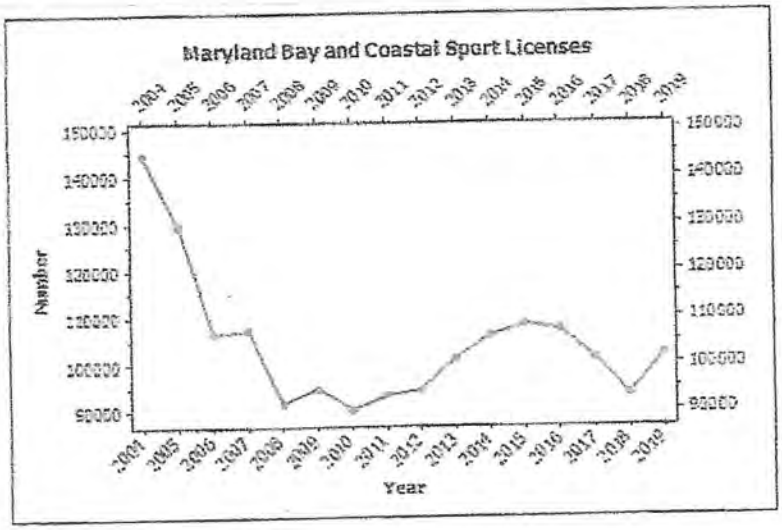
The results of the 2018 benchmark indicate that the Atlantic striped bass stock is overfished and overfishing is occurring. Female SSB in 2017 was estimated at 68,576 metric tons (151 million pounds), which is below the SSB threshold of 91,436 metric tons (202 million pounds) (Figure 1). Female SSB peaked 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.


Maryland Active Commercial Fin Fish Fishermen
Number
Year


Weakfish Commercial Harvest for the Chesapeake Bay & Potomac
Pounds
Year


Bluefish Commercial Harvest for the Chesapeake Bay & Potomac
Pounds
Year


Maryland For-Hire Trips
Number
Year


Maryland Bay and Coastal Sport Licenses
Number
Year

VALUE LOST AND VALUE GAINED WHO IS PAYING THE PRICE HERE?

What is the real cost to Maryland and Virginia when Omega annually takes about 100,000 tons of menhaden forage from the Chesapeake Bay area?

Forage fish stocks all over the world are under unrelenting pressure from multinational fishing conglomerates like Cooke and Omega who can use highly efficient purse seiners to harvest forage fish. This is not a crop they plant, fertilize or cultivate...there is no land rent to pay ..it is just harvested. They get free high protein feed for their growing salmon fish farming operations. There are many other sources of protein for fish farming. This just boils down to what is the cheapest. In Omega's case the cheapest is menhaden forage from the Chesapeake Bay. There is a price to pay, there always is, but the price is being paid by Chesapeake Bay wildlife and the people of Virginia and Maryland.

Using feed conversion ratios of 1.2 pounds feed to one pound gain in salmon fish farming we should be able to get a glimpse of the amount of trout, bluefish, drum and rockfish that 100,000 tons of menhaden forage could be creating in Chesapeake Bay and the Atlantic coast. This is not happening because this huge amount of forage ends up in a purse seine net. If the managers were to change this more of the benefits of abundant and healthier fish and wildlife would be realized by not just one foreign company but by the all the people and businesses described at page 14-15 of this site...Amendment 3 comparisons

REQUIEM FOR TANGIER SOUND
R.I.P. 2008

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

Tangier sound was a very busy place 20 years ago. Lots of fisherman, charter and head boats. It was also a noisy place with hundreds of birds working over schools of "bait"when the fish were feeding. On a typical day during the spring and fall trophy seasons you would see 25 to 30 private boats and a number of charters off the Deal Island bridge. Lots of nice rockfish were being caught. There were also some very good speckled trout to be caught off Crisfield. Dave's tackle shop sold a lot of umbrella rigs. That is all gone now.

I personally date the disappearance of our fish as follows , trout 10 years, flounder 10 years, hardheads eight years, well-nourished young rockfish 2 to 5 years, schools of juvenile menhaden in the fall - steady decline for the last 10 years with practically nothing the last two years.

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

I also spoke to Mary Taylor about Somers Cove Marina in Crisfield. With the decrease in fish over the last ten years their charter boats have gone from ten to three or four. Now, as with Wenona, the captains are older and have other jobs during the week. It's just a weekend charter here and there. There are no head boats anymore. There were four. The last one to leave was the Barbara Ann and the one before that was four or five years ago.

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

We made survey flights over Tangier sound last summer with an experienced menhaden spotter pilot covering Pocomoke sound and the area from Tangier Island Virginia to Hoopers Straights Maryland. We did not see a single school of menhaden in four surveys. When we covered the bay from Cape Charles, Virginia to the Annapolis bridge we saw a strand of menhaden here and there and a few small schools. What we observed was probably one hundredth or less of the menhaden Chesapeake Bay needs to support its fish and wildlife based

on the Rhode Island ecological guidelines.

We have five osprey nests at Whitehaven. Two are in my front yard on the river. I have watched these nests for over 40 years. For the last three or four years or more these birds have struggled to raise even a single chick. Years ago they would find large menhaden almost daily to feed the brood. This year I saw one menhaden caught in the entire season. The nesting eagles have left the area. There was a large blue heron rookery behind the old Whitehaven Hotel but almost all of those birds are gone now. One of the primary foods for the herons is the juvenile menhaden . If the juveniles were there the herons would be as well.

The absence of juvenile menhaden in Chesapeake Bay for over twenty years is an established fact. Since all of our juvenile fish species, the rockfish trout and bluefish etc. are dependent on these juveniles I would expect to hear much more discussion at the commission and Maryland DNR on ways to restore this population. I do not hear this discussed. I do not hear any proposals to solve this problem. If you look at the original menhaden plan you see the menhaden spawn in the ocean in April, May and June. It is right off Cape Charles and the Outer Banks. There is no protection for these spawning schools , no closed season and no sampling of the catch for stage of spawn.

Tangier sound, it's people, fisherman, captains and small businesses are just an unwilling poster child for what is happening all over Chesapeake Bay. We should see this very clearly in the fact there are nearly 100,000 fewer fisherman now than there were eight or ten years ago. Omega corporation is allowed to take a huge volume of menhaden forage out of the Virginia by, shipload by shipload, day by day during the entire time the schools are in the Virginia bay. This amount is allocated without any survey of the number of menhaden left behind for the rock fish and other wildlife to eat.

What does the future hold for the fish and wildlife of Tangier sound and Chesapeake Bay? This is a difficult question to answer. We have a test approaching with the Commission's decision on whether or not to enforce the reduced bay cap. The Charter and Amendment 3, require the Commissioners to look at the menhaden as forage, food for our declining Chesapeake Bay fish stocks and to fairly allocate the fair share of menhaden to the recreational fisherman and the fish and wildlife.

July 2019

GRANDSON ALEX TAKEN ABOUT TEN YEARS AGO. MOST OF THE KIDS AND THEIR PARENTS HAVE LOST INTEREST .....FISHING JUST "ISN'T FUN ANYMORE"

Lets do the math. The bay's 400,000 fishing families aren't fishing much these days..the fishing has gotten worse and worse. Lets get the Chesapeake Bay the food their fish and wildlife need and deserve. Let's add more healthy fish to the equation. These families might get out on the bay a few more times a Summer and maybe have some great adventures. That could be another one million more precious days each year these parents and grandparents would have together enjoying the great sights and sounds Chesapeake bay has to offer. That is what is at stake here.

IF YOU CAN " REMEMBER WHEN" the bay was a noisy vibrant place with plenty of adult and baby bunker or if this material has given you enough information and you want to express your opinions to the Maryland and Virginia ASMFC delegates please do so ASAP urging them to ask the board to consider measures, such as time and area controls over the menhaden harvest in Virginia.You can also speak to this during the public comment time at the ASMFC meeting Feb 2nd.We can send you more information on proposals and social-economic data .... just call or contact us on email

CONTACT INFORMATION

The Maryland ASMFC menhaden delegates are

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Lynn Fegley and Bill Anderson
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Virginia Marine Resources Commission....log on the home site for complete Staff and meeting and names of the VMRC Commissioners. There is a menhaden Advisory group. The eight citizens of Virginia comprising the VMRC have complete control over menhaden in Virginia under Virginia Code 28.2-203 as of April 2020 but they have not acted in any meaningful way to date.

The complete story of menhaden regulation is on the ASMFC site...go to management for all the board minutes, the technical committees . the assessments , press releases. Board members from each state, etc.---its all there

You can contact Menhaden Project at foragematters@aol,com and at flypax@metrocast.net

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MENHADEN PROJECT

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The Most Important Fish in the Bay

UPDATE: August 5, 2020—the Atlantic States Marine Fisheries Commission has taken the first step to formally consider the importance of menhaden to other predators, including striped bass, bluefish, and weakfish, in its management framework. This is the first time that ASMFC has committed to including Ecological Reference Points, the value of the species to the ecosystem, in its fishery management plans. *(Read CBF's press release)* (http://www.cbf.org/news-media/newsroom/2020/all/asmfc-adopts-groundbreaking-change-to-menhaden-fishery-management.html)

Atlantic menhaden, *Brevoortia tyrannus*, are small, nutrient-packed fish that are central to the Chesapeake Bay's food chain and support one of the largest commercial fisheries on the Atlantic coast. As a result of their environmental and economic importance, management of the menhaden fishery is a political flashpoint across the region.

Why are menhaden (also called bunker or pogy) important in the Chesapeake Bay?

Menhaden have been called the "most important fish in the sea." In the Bay, they create a vital connection between the bottom and top of the food chain. They eat tiny plants and animals, called plankton, by filtering them from the water. In turn, menhaden are a rich food source for many predator fish—including rockfish (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/rockfish/) (striped bass), bluefish, and weakfish—as well as ospreys (http://www.cbf.org/about-the-bay/more-than-just-the-bay/chesapeake-wildlife/ospreys/), bald eagles, dolphins, and whales. (See our video, *Why Whales Follow Menhaden into the Bay (http://www.cbf.org/news-media/multimedia/video/why-whales-follow-menhaden-into-the-bay.html).*)

Rockfish, in particular, historically relied on menhaden for a large portion of their diet. Researchers have raised concerns that a lack of menhaden could make rockfish more vulnerable to disease.

Why should I care about menhaden?

82 CBF Pen, Release 07/07

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Business Session

FROM: Dustin Colson Leaning, FMP Coordinator

DATE: July 21, 2021

SUBJECT: Bluefish Allocation and Rebuilding Amendment Summary

In June, the Bluefish Management Board (Board) recommended approval of the Bluefish Allocation and Rebuilding Amendment to the Fishery Management Plan (FMP) by the Commission. Mid-Atlantic Fishery Management Council (Council) approved the same preferred alternatives for the Bluefish Allocation and Rebuilding Amendment for consideration and approval by NOAA Fisheries. The Amendment updates the FMP goals and objectives; initiates a rebuilding plan; establishes new allocations between the commercial and recreational sectors; implements new state-by-state commercial allocations; revises the process for quota transfers between sectors; and revises how the FMP accounts for management uncertainty. If approved by the Commission and NOAA Fisheries, this Amendment would be implemented for management for the 2022 fishing year.

Revised Bluefish FMP Goals and Objectives

Goal 1: Conserve the bluefish resource through stakeholder engagement to maintain sustainable recreational fishing and commercial harvest.

Objective 1.1: Achieve and maintain a sustainable spawning stock biomass and rate of fishing mortality.

Objective 1.2: Promote practices that reduce release mortality within the recreational and commercial fishery.

Objective 1.3: Maintain effective coordination between the National Marine Fisheries Service, Council, and Commission and its member states by promoting compliance and to support the development and implementation of management measures.

Objective 1.4: Promote compliance and effective enforcement of regulations.

Objective 1.5: Promote science, monitoring, and data collection that support and enhance effective ecosystem-based management of the bluefish resource.

Goal 2: Provide fair and equitable access to the fishery across all user groups throughout the management unit.

Objective 2.1: Ensure the implementation of management measures provides fair and equitable access to the resource to all user groups within the management unit.

Objective 2.2: Consider the economic and social needs and priorities of all groups that access the bluefish resource in the development of new management measures.

Objective 2.3: Maintain effective coordination with stakeholder groups to ensure optimization of economic and social benefits.

Rebuild Plan

The Board and Council selected a rebuilding plan which utilizes a constant fishing mortality approach that is projected to rebuild the stock in 7 years. Rebuilding progress will be analyzed through management track stock assessments every two years.

Commercial/Recreational Sector Allocation Changes

The revised sector allocations increase the recreational allocation from 83% to 86% of the acceptable biological catch and decrease the commercial allocation from 17% to 14%. The Board and Council used catch data from 1981-2018 as the basis for sector allocations since those years more accurately capture the cyclical nature of the fishery, while providing each sector with sufficient access to the resource considering historical usage

Commercial State Allocations Changes

The Amendment allocates a baseline quota of 0.1% to each state, and then allocates the rest of the commercial quota based on landings data from 2009 to 2018 (see Table 1 below). Recognizing that several states will be losing quota during a time when the coastwide commercial quota is already at an historic low, the Board and Council decided to phase-in the allocation changes over 7 years in order to reduce short-term economic impacts to the affected commercial fishing industry. The Board and Council also committed to reviewing the approved state allocations within 5 years.

Table 1. Revised state allocation percentages of the bluefish commercial quota based on 2009-2018 landings data with a minimum default allocation of 0.1%. Previous allocations are provided for comparison purposes.

State	Previous Allocations Under Amendment 1	Revised Allocations to be Phased in Over 7 Years
Maine	0.67%	0.11%
New Hampshire	0.41%	0.22%
Massachusetts	6.72%	10.12%
Rhode Island	6.81%	9.61%
Connecticut	1.27%	1.09%
New York	10.39%	19.76%
New Jersey	14.82%	13.85%
Delaware	1.88%	0.49%
Maryland	3.00%	1.92%
Virginia	11.88%	5.87%
North Carolina	32.06%	32.03%
South Carolina	0.04%	0.10%
Georgia	0.01%	0.10%
Florida	10.06%	4.78%

Sector Transfer Changes

The Amendment also updates the sector transfer process to allow for quota transfers in either direction between the commercial and recreational sectors. Previously, quota could only be transferred from the recreational sector to the commercial fishery. The transfers will now be capped at 10% of the acceptable biological catch for a given year.

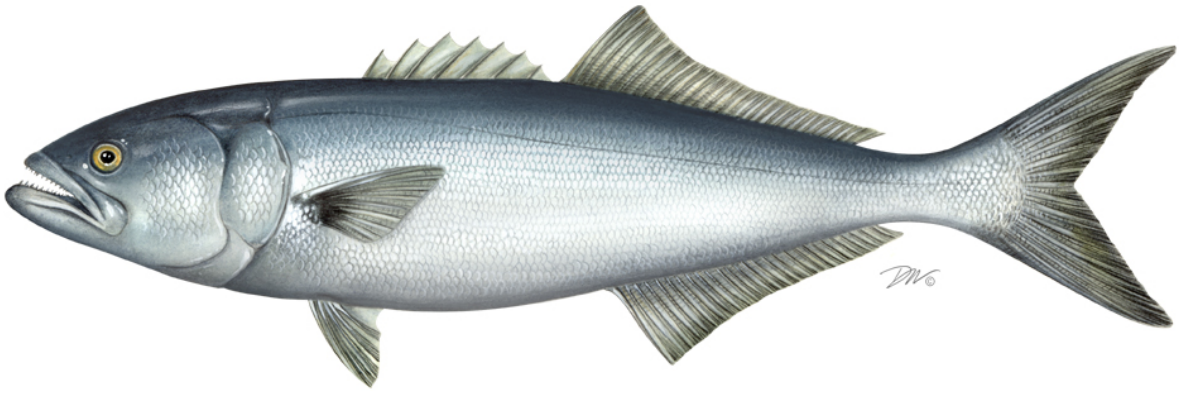
Changes to Management Uncertainty

Finally, the Amendment modified the management uncertainty tool within the FMP to a sector-specific approach. It allows the Board and Council to apply a buffer to either sector, in the form of a quota reduction, to account for management uncertainty during specifications. While this tool has not been used often, the modified approach allows managers to better target areas of uncertainty within one sector without reducing the quota or harvest limit in the other sector.

Atlantic States Marine Fisheries Commission

Draft Amendment to the Interstate Fishery Management Plan for Bluefish for Public Comment

Bluefish Allocation and Rebuilding Amendment



February 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT DOCUMENT FOR PUBLIC COMMENT

Draft Amendment to the Interstate Fishery Management Plan for Bluefish

Prepared by

Atlantic States Marine Fisheries Commission and
Mid-Atlantic Fishery Management Council's Fishery Management Action Team

Fishery Management Action Team Members:
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This is a report of the Atlantic States Marine Fisheries Commission pursuant to U.S. Department of Commerce, National Oceanic and Atmospheric Administration Award No. NA20NMF4740012.

The Atlantic States Marine Fisheries Commission (Commission) and Mid-Atlantic Fishery Management Council (Council) seek your input on the following Draft Amendment to the Bluefish Fishery Management Plan.

You are encouraged to submit comments regarding this document during the public comment period. Comments must be received by **April 23.** Regardless of when they were sent, comments received after that time will not be included in the official record. The Commission and Council will consider public comment on this document before finalizing the amendment.

You may submit public comment by attending a public hearing or mailing, faxing, or emailing written comments to the address below. Comments can also be referred to your state's members on the Bluefish Management Board or Bluefish Advisory Panel; however, unless those comments are also submitted as instructed below they will not be considered as part of the official public comment record.

Written comments may be sent by any of the following methods:

1. **Online** at https://www.mafmc.org/comments/bluefish-allocation-rebuilding-amendment
2. **Email** to the following addresses: mseeley@mafmc.org
3. **Mail or Fax** to:
   Chris Moore, Ph.D, Executive Director
   Mid-Atlantic Fishery Management Council
   North State Street, Suite 201
   Dover, DE 19901
   FAX: 302.674.5399

If your organization is planning to release an action alert in response to this Draft Amendment, or if you have questions, please contact either Dustin Colson Leaning (email: dleaning@asmfc.org; phone: 703.842.0740) or Matt Seeley (email: mseeley@mafmc.org; phone at 302.526.5262)

The timeline for completion of the Bluefish Allocation and Rebuilding Amendment is as follows:

	Dec 2019	Feb–Mar 2020	May 2020	May 2020 – Jan 2021	Feb 2020	March – April 2021	June 2021
Approval of Draft PID by Board and Council	**X**						
Public review and comment on PID		**X**					
Board and Council review of public comment; Board direction on what to include in the Draft Amendment			**X**				
Preparation of Draft Amendment				**X**			
Review and approval of Draft Amendment by Board and Council for public comment					**X**		
Public review and comment on Draft Amendment ***Current Step***						**X**	
Board review of public comment on Draft Amendment							**X**
Review and approval of the final Amendment by the Council, Board, Policy Board, and Commission							**X**

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1.0 INTRODUCTION

Bluefish (*Pomatomus saltatrix*) fisheries are managed under the Bluefish Fishery Management Plan (FMP) that was prepared cooperatively by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (ASMFC or Commission). The Commission, under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, is responsible for managing bluefish in state waters (0-3 miles). The Council develops regulations for federal waters (3-200 nautical miles from shore), with final review and approval conducted by NOAA Fisheries.

1.1 BACKGROUND INFORMATION

The Bluefish FMP, approved by the Commission's Bluefish Management Board (Board) and the Council, was the FMP developed jointly by an interstate commission and regional fishery management council. Bluefish is currently managed under Amendment 1 to the Bluefish FMP, which was approved in October 1998 and implemented in 2000. In December 2017, the Board and Council initiated development of an amendment to revisit commercial and recreational sector allocations as well as other management issues in the Bluefish FMP. An initial round of scoping was conducted in the summer of 2018 to gauge public interest on the development of an amendment. After initial scoping, the 2019 bluefish operational assessment incorporated the recalibrated Marine Recreational Information Program (MRIP) recreational catch estimates. The updated biological reference points indicated that bluefish were overfished. Given the overfished designation, the Board and Council recommended including the rebuilding plan into this ongoing amendment.

The Board and Council approved the Supplemental Scoping and Public Information Document for public comment in December 2019. Eleven scoping hearings were held from Massachusetts through Florida between February and March 2020 to solicit public input. The hearings were attended by approximately 208 people and public comment was provided by 159 individuals and organizations in person at the hearings or in writing.

Based on the summary of public input, comments from the Advisory Panels (APs), and recommendations from the Fishery Management Action Team (FMAT), the Board and Council supported reviewing and potentially revising several management issues including 1) FMP goals and objectives, 2) the allocation of quota between the commercial and recreational sectors, 3) commercial allocations to the states, 4) a rebuilding plan for the overfished stock, 5) allocation transfers between sectors, 6) regional commercial allocations, 7) state-to-state transfers of commercial quota, and 8) separate allocations for the for-hire and private sectors of the recreational fishery.

At the August 2020 joint meeting, the Board and Council determined that revisions to the state-to-state quota transfer process and exploration of separate allocations for the for-hire and private sectors of the recreational fishery should be removed from consideration in this Amendment. ASMFC Administrative Commissioners agreed that communication and cooperation between states could improve upon inefficiencies in the commercial quota transfer

process that have lately proved challenging for some states. The Board and Council also recommended that the recreational reform initiative would be better suited to address the for-hire sector separation issue, especially because this issue was simultaneously under consideration for the Summer Flounder, Scup, and Black Sea Bass FMP as well. At the October 2020 joint meeting, the Board and Council decided to remove consideration of regional commercial allocations when several concerns regarding state autonomy and flexibility were raised.

In October 2020, the Board and Council identified the following priority issues for further development within this action including:

1. FMP Goals and Objectives *Section 2.5*
2. Commercial and Recreational Allocation *Section 4.1*
3. Commercial Allocations to the States *Section 4.2*
4. Rebuilding Plan *Section 4.3*
5. Quota Transfers *Section 4.4*
6. Management Uncertainty *Section 4.5*
7. *De Minimis Section 4.6*

1.1.1 Statement of Problem

1.1.1.1 Bluefish Commercial/Recreational Allocation

In 2000, Amendment 1 established an 83% allocation of total allowable landings (TAL) to the recreational sector and a 17% allocation to the commercial sector based on landings data from 1981-1989. In 2011, the Council's Amendment 3 to the Bluefish FMP changed the plan from a landings-based allocation to a catch-based allocation with the establishment of an annual catch limit (ACL), which replaced the TAL. This was done to increase sector accountability for discards. Since the initial allocation percentages were established, each sector's proportional contribution to total landings has changed. Recent changes in how recreational catch is estimated have resulted in an even larger discrepancy between the current levels of estimated recreational catch and the allocation of catch to the recreational sector.

In July 2018, MRIP released a revised time series of catch and harvest estimates based on adjustments to its angler intercept methodology (used to estimate catch rates) and its effort estimation methodology (namely, a transition from a telephone-based effort survey to a mail-based effort survey). These revisions resulted in much higher recreational catch estimates compared to previous estimates, affecting the entire time series of data going back to 1981. The 2018 MRIP recalibration increased recreational catch estimates from 1985-2017 by an average of 116% (from 29.9 million lb to 64.6 million lb), ranging from +63% in 1986 to +291% in 2017.

The recreational data revisions not only impacted catch accounting, but also significantly affected our understanding of the population level for the bluefish stock. Due to the fixed commercial/recreational allocation percentages defined in the FMP, the allocation percentages currently defined in the FMP do not reflect the current understanding of recent and historic proportions of catch and landings from the two sectors. Modifications to these allocation

percentages can only be done through an amendment because they are defined in the Council and Commission FMPs. This Draft Amendment will consider whether the allocations are still appropriate and meeting the objectives of the FMP.

1.1.1.2 Commercial Allocations to the States

The current commercial state allocations are based on 1981-1989 landings data. The Board and Council received many comments during the amendment scoping process requesting that allocations be reconsidered, while some comments supported status quo. Several states have consistently requested transfers of quota from other states that are not fully utilizing their commercial allocation. This suggests that the current state commercial allocations are not meeting the needs of all states' commercial fisheries. These allocations are being reevaluated and compared to more recent years of data to consider changes to commercial state allocations. Equity, economic efficiency, and social impacts are all being considered through this action.

1.1.1.3 Rebuilding Plan

The 2019 operational assessment for bluefish indicated that the stock is overfished, but overfishing was not occurring in 2018. The incorporation of revised MRIP estimates impacted the estimated stock biomass, the biological reference points, and resulting catch limits. However, the revised MRIP data were one of several factors that influenced the overfished designation and the resulting catch limits. For example, almost all indices of abundance showed a decrease from 2017 to 2018. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that the Council implement a rebuilding plan within two years of the overfished designation. The MSA requires the Council to implement regulations consistent with the plan to rebuild the stock biomass back to the biomass target. The Council and the Board will work jointly to identify a plan to rebuild the stock as fast as possible, while still taking into consideration the socioeconomic impacts of rebuilding on the bluefish fisheries.

1.1.1.4 Quota Transfers

Quota transfers are a frequently utilized management tool that offers the potential for increased fishing opportunities for the commercial or recreational sectors. Amendment 1 established the ability to transfer quota, subject to a 10.5 million lb cap, from the recreational sector to the commercial sector. The decision to transfer quota and the size of the transfer is considered annually through the specifications setting process. During the amendment scoping process, the Board and Council received several comments in support of changing the one-way transfer of quota into a bi-directional option. In effect, this would update the transfer process to allow for transfers of quota from the commercial sector to the recreational sector. The sector transfer cap is also being reevaluated to ensure its applicability to a bi-directional transfer. This updated process would allow for an expedient response to a potential future pressing need for increased recreational fishing opportunities.

1.1.1.5 Management Uncertainty

The Monitoring Committee (MC) annually identifies and reviews the relevant sources of management uncertainty in the commercial and recreational bluefish fisheries. Upon determining sources of uncertainty, the MC can recommend that the Board and Council revise down the annual catch target (ACT) through the specifications process. In effect, this provides a buffer to reduce the probability of overfishing. However, the current FMP does not allow for a targeted application of management uncertainty to one specific sector, and is instead is applied to both the recreational and commercial sectors. Members of the MC, the Board, and the Council have voiced support for updating this process to allow for a more targeted management uncertainty approach.

1.1.1.6 De Minimis

Under the Commission's current FMP, states which land less than 0.1% of the coastwide commercial landings in the year prior are exempt from fishery independent monitoring requirements for the following year. During the amendment scoping process, a comment was received from the Georgia Department of Natural Resources in support of expanding upon the existing *de minimis* provision for bluefish by also exempting a state from recreational measures. Under this proposal, states that contribute minimally to coastwide harvest would not have to deal with the administrative burden of frequently altering recreational measures.

1.1.2 Benefits of Implementation

This Draft Amendment is a thorough reevaluation of multiple aspects of the Bluefish FMP that have not been considered since 2000. The abundance, distribution, and health of the stock have changed in some significant ways since these issues were last addressed. Reevaluation of bluefish management processes helps to ensure fair and equitable access to all fishery participants. In addition, the implementation of a rebuilding plan promotes sustainable use of the bluefish resource moving forward.

1.1.2.1 Ecological Benefits

Bluefish are opportunistic feeders that inhabit a key ecological role in the coastal marine food chain. Bluefish will often feed on schools of forage fish including menhaden, herring, and weakfish, but are also preyed upon by larger predators at all life stages. Commercially and recreationally important species such as striped bass, summer flounder, and tuna as well marine mammals frequently feed upon adult bluefish. Rebuilding the stock back to its target level will help to ensure that bluefish maintain their ecological role.

1.1.2.2 Social and Economic Benefits

Recreational and commercial fisheries for bluefish extend along the entire Atlantic coast. Despite bluefish's historic low price per pound, there are several commercial fishing ports that rely on bluefish landings as an important source of revenue. While bluefish are not often described as a primary target species for the for-hire recreational industry, many for-hire captains from the Mid-Atlantic region will assert that bluefish are an important "fallback" species that will help to save a charter trip when other fish are not biting. Bluefish also provide

cultural value to the many private anglers that target bluefish from the shore and piers along the coast. Addressing the revised MRIP information, recent fishing trends, and the needs of the commercial and recreational fisheries to inform the allocation between the two sectors and the allocations between states may enhance social and economic benefits by increasing economic returns and increasing access to the bluefish resource. This in turn could increase resilience in fishery-dependent communities along the Atlantic coast.

1.2 DESCRIPTION OF THE RESOURCE

Bluefish are a migratory, pelagic species found throughout the world in most temperate coastal regions, except the eastern Pacific. In the western North Atlantic, the population ranges from Nova Scotia to Florida. Bluefish travel in schools of like-sized individuals and undertake seasonal migrations, moving into the Mid-Atlantic Bight (MAB) during the spring, and south or farther offshore during the fall. Within the MAB they occur in large bays and estuaries as well as across the entire continental shelf. Juvenile stages have been recorded in all estuaries within the MAB, but eggs and larvae occur in oceanic waters (Able and Fahay 1998). Bluefish live to age 12 or greater (Salerno et al. 2001), and may reach a length of 3.5 ft, and a weight of 27 lb (Bigelow and Schroeder 2002).

Bluefish eat a wide variety of prey. The species has been described by Bigelow and Schroeder (2002) as “perhaps the most ferocious and bloodthirsty fish in the sea, leaving in its wake a trail of dead and mangled mackerel, menhaden, herring, alewives, and other species on which it preys." Bluefish born in a given year (young of the year) typically fall into two distinct size classes suggesting that there are two spawning events along the east coast. More recent studies suggest that spawning is a single, continuous event, but natural mortality increases during the middle portion of the spawning period resulting in the appearance of a split season. As a result of the bimodal size structure of juveniles, young are referred to as the spring-spawned cohort or summer-spawned cohort. In the MAB, the spring cohort appears to be the primary source of fish that recruit into the adult population.

In August 2019, a bluefish operational assessment, which included revised bluefish MRIP estimates, changed the stock status and biological reference points from the 2015 benchmark stock assessment. The updated biological reference points for bluefish include a fishing mortality threshold of $F_{MSY} = F_{35\%}$ (as the F_{MSY} proxy) = 0.183, and a biomass reference point of $SSB_{MSY} = SSB_{35\%}$ (as the SSB_{MSY} proxy) = 438.10 million lbs (198,717 mt). The minimum stock size threshold (1/2 SSB_{MSY}), is estimated to be 219.05 million lbs (99,359 mt). SSB in 2018 was 200.71 million lbs (91,041 mt) (Figure 1.).

Operational assessment results indicate that the bluefish stock was overfished and overfishing was not occurring in 2018 relative to the biological reference points. Fishing mortality (*F*) on the fully selected age 2 fish was 0.146 in 2018, 80% of the updated *F* threshold reference point (Figure 2.). There is a 90% probability that *F* in 2018 was between 0.119 and 0.205.

The bluefish stock has experienced a decline in SSB over the past decade, coinciding with an increasing trend in F. Recruitment has remained fairly steady, fluctuating just below the time-series mean of 46 million fish. Both commercial and recreational fisheries had poor catch in 2016 (44.91 million lbs or 20,370 mt), and 2018 (24.89 million lbs or 11,288 mt), resulting in the second lowest and lowest catches on record, respectively. As a result of the very low catch in 2018, fishing mortality was estimated below the reference point for the first time in the time-series. These lower catches are possibly a result of availability. Anecdotal evidence suggests larger bluefish stayed offshore and remained inaccessible to most recreational fishery participants during the past two years (NEFSC 2019).

The Board and the Council are in the process of initiating a rebuilding plan that must be submitted by November 2021 (two years after receiving notice from NOAA Fisheries) with the goal of rebuilding the bluefish stock in no more than 10 years. See *Section 4.3* for a more detailed discussion of the rebuilding plan and the proposed alternatives under consideration.

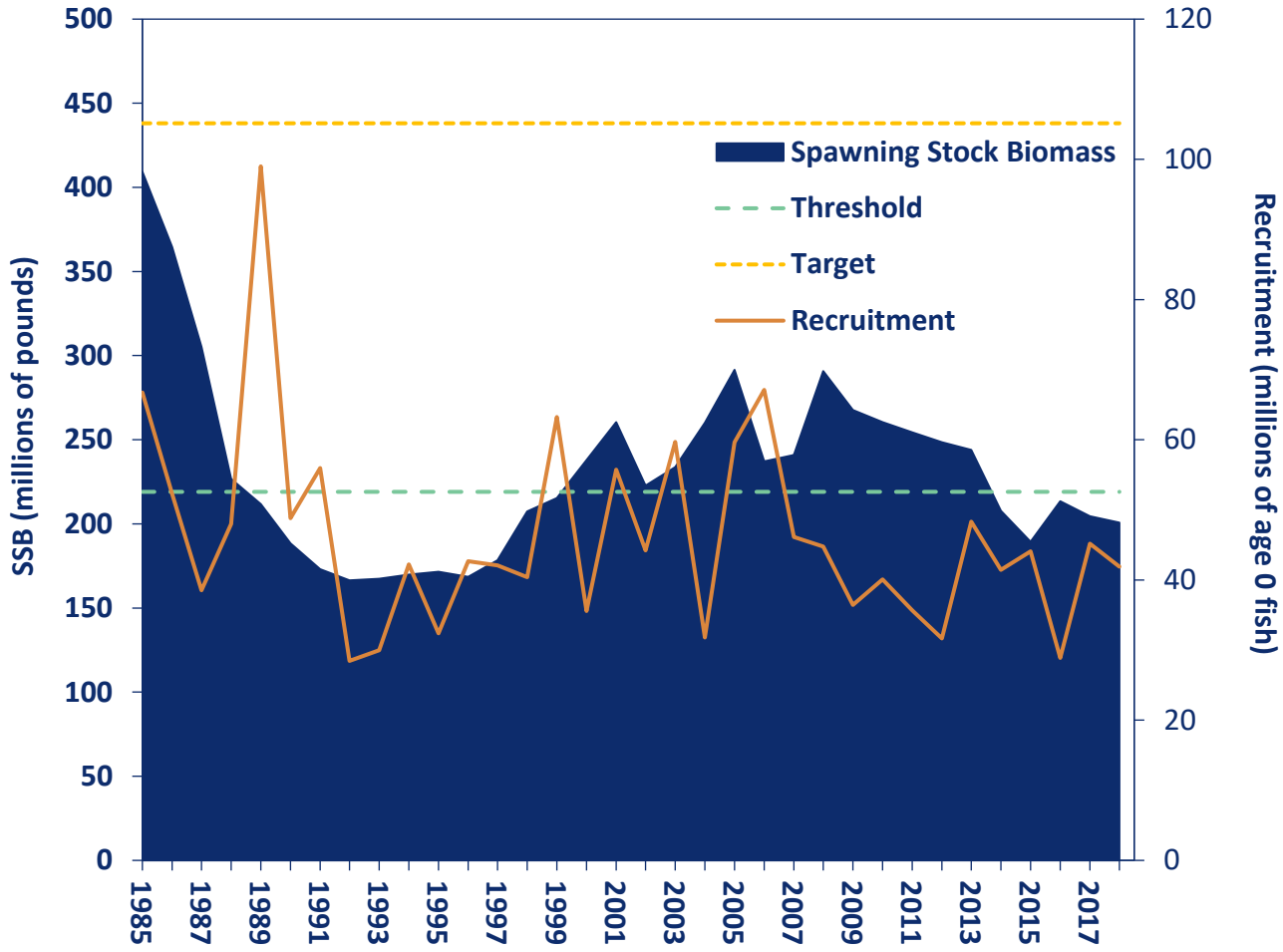


Figure 1. Bluefish spawning stock biomass and recruitment at age 0 by calendar year. The yellow horizontal dashed line is the updated biomass target $SSB_{MSY\ proxy}$ = $SSB_{40\%}$ = 198,717 mt, and the dotted black line is the $SSB_{Threshold}$ = 99,359 mt. Source: 2019 Bluefish Operational Stock Assessment, NEFSC.

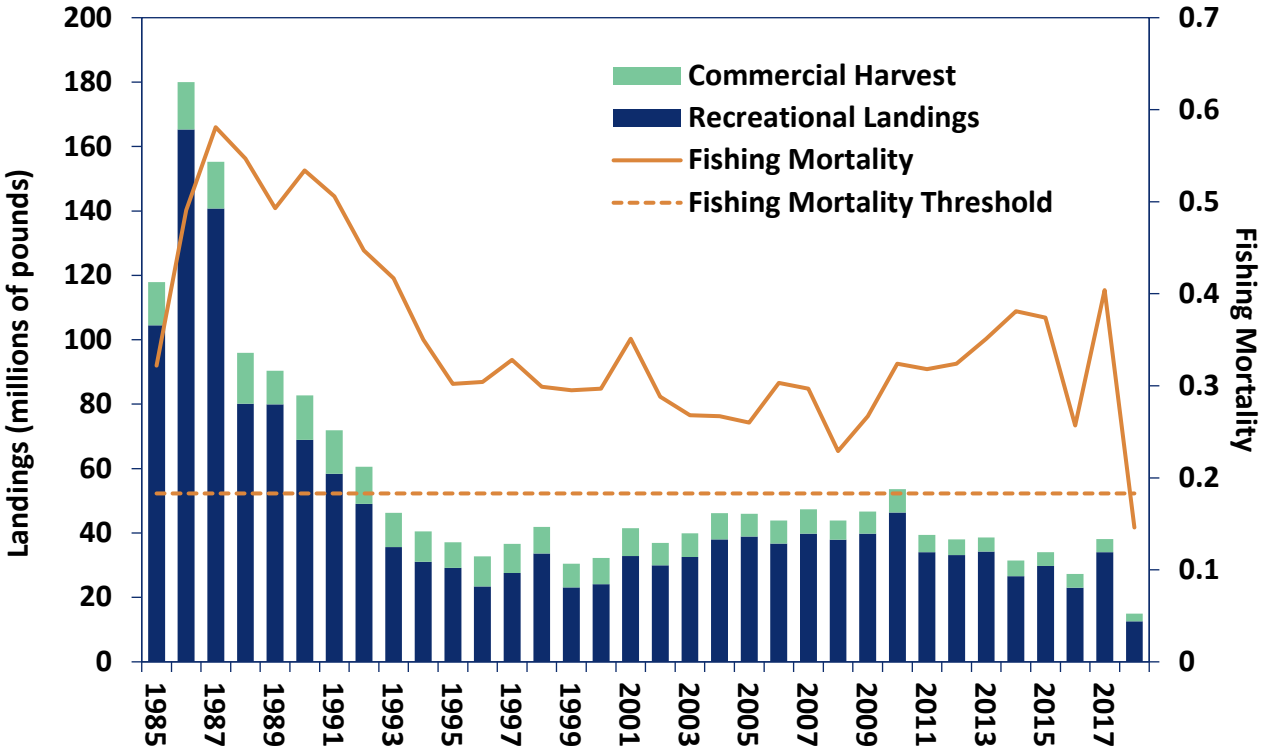


Figure 2. Commercial and recreational landings and fishing mortality for bluefish. The horizontal dashed line is the updated F_{MSY} proxy = $F_{35\%}$ = 0.183. Source: 2019 Bluefish Operational Stock Assessment, NEFSC.

1.3 DESCRIPTION OF THE FISHERIES

Bluefish are targeted by commercial and recreational fishermen[1] throughout Southern New England, the Mid-Atlantic, and the South Atlantic. The commercial and recreational fisheries in each state are driven by the seasonal availability of bluefish. During the summer, concentrations of bluefish are found in waters from Maine to Cape Hatteras, North Carolina. During winter's colder months they tend to be offshore between Cape Hatteras and Florida. Data for commercial landings, recreational landings, and recreational dead discards are available back to 1981. Discards are considered negligible within the commercial fishery, and as such, are assumed to be zero for the purposes of this Amendment. Bluefish are predominately a recreational fishery with recreational landings accounting for 73% of the total catch by weight since 1981, with recreational dead discards accounting for 13%, and commercial landings about 14%. Over the more recent time period of 2015-2019, the comparable percentages are 69% recreational landings, 20% recreational dead discards, and 11% commercial landings (Figure 3).

[1] The term fishermen in this document is used to describe both men and women who fish.

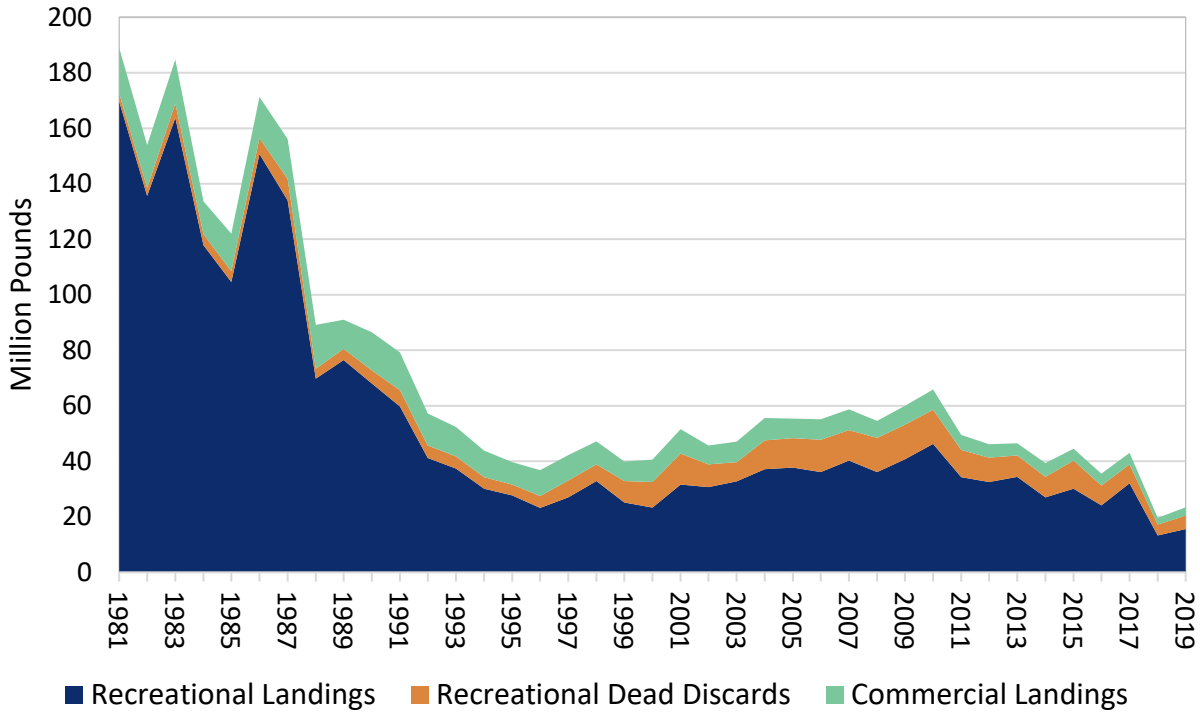


Figure 3. Commercial and recreational bluefish landings and recreational dead discards, 1981-2019. Source: ACCSP Data Warehouse.

Bluefish Commercial Fishery

The commercial quota is divided among the states based on the allocation percentages established in the FMP. States set measures to achieve their state-specific commercial quotas.

Table 1 displays the current commercial state allocations that have been in place since Amendment 1. Modifications to the state allocations are being considered in *Section 4.2*.

Table 1. Bluefish state allocation of annual commercial quota.

State	Percent Allocation
ME	0.67%
NH	0.41%
MA	6.72%
RI	6.81%
CT	1.27%
NY	10.39%
NJ	14.82%
DE	1.88%
MD	3.00%
VA	11.88%
NC	32.06%
SC	0.04%
GA	0.01%
FL	10.06%
Total	100%

In 2019, commercial fishermen landed 2.99 million pounds of bluefish, about 39% of the total commercial quota of 7.71 million pounds. Over the past two decades, total bluefish ex-vessel revenue ranged from a low of $1.9 million in 2000 to a high of $3.5 million in 2015. Total ex-vessel value in 2019 was $2.37 million, resulting in an average price per pound of $0.85. In general, the price of bluefish tends to be lower when landings are higher, and vice versa. This relationship is not linear and many other factors besides landings also influence price. The highest average price per pound over the past two decades was $0.95 in 2018, and the lowest average price per pound was $0.35 in 2004. All revenue and price values were adjusted to 2019 dollars to account for inflation (
Figure 4).

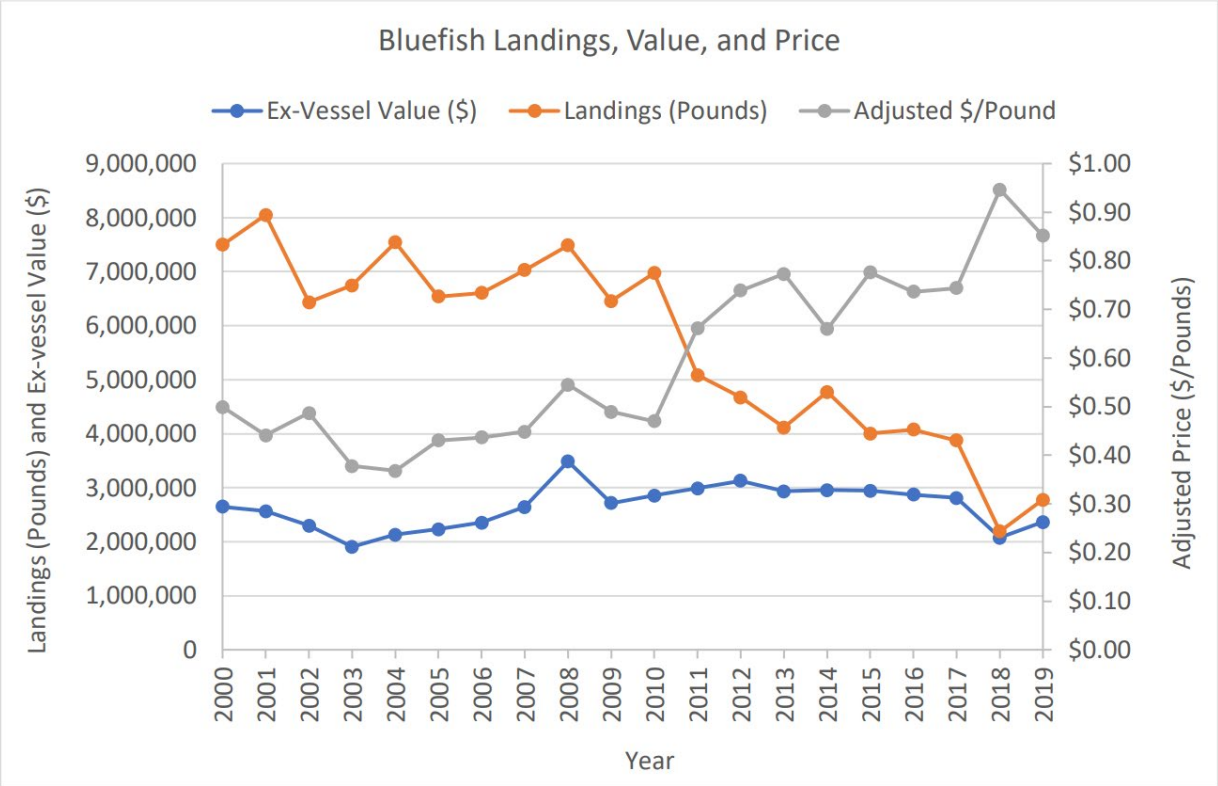


Figure 4. Landings, ex-vessel value, and price for bluefish landed on the Atlantic coast, 2000-2019. Ex-vessel value and price are inflation-adjusted to 2019 dollars using the Gross Domestic Product Price Deflator. Source: Unpublished NOAA Fisheries commercial fish dealer data (i.e., "DERS"), which include both state and federal dealer data).

Table 2 shows commercial landings of bluefish by state in 2015-2019. State landings have decreased in recent years, which is most likely attributable to low availability due to the overfished stock status. North Carolina comprises the majority contribution to the coastwide total landings with New York, Rhode Island, New Jersey, Massachusetts, and Florida comprising the bulk of the remaining landings in that order. Commercial bluefish landings from Maine, New Hampshire, South Carolina, and Georgia are confidential and are not displayed in the table. The landings from these states are also minimal, if they occur at all.

Table 2. State Commercial Bluefish Landings in lbs. (2015-2019). C = confidential data Source: ACCSP Data Warehouse, which includes both state and federal dealer data.

State	2015	2016	2017	2018	2019
Maine	C	C	C	C	C
New Hampshire	C	C	C	C	C
Massachusetts	600,883	499,627	364,862	195,378	184,171
Rhode Island	514,223	463,419	647,257	237,121	415,809
Connecticut	40,305	68,290	42,023	54,239	35,551
New York	954,419	917,279	717,559	538,168	594,842
New Jersey	710,610	669,316	305,552	56,206	203,272
Delaware	72,664	15,667	12,317	6,070	17,166
Maryland	94,376	66,720	39,997	18,985	22,776
Virginia	192,317	199,281	195,349	96,165	124,681
North Carolina	804,094	1,148,643	1,544,037	910,262	1,107,902
South Carolina	C	C	C	C	C
Georgia	C	C	C	C	C
Florida	240,463	240,976	266,728	316,425	284,696
Total	4,225,548	4,289,429	4,135,725	2,429,191	2,866,208

VTR data suggest that NOAA Fisheries statistical areas 611, 539, 613, 626 and 632 were responsible for the largest percentage of commercial bluefish catch in 2019. Statistical area 611, within the Long Island Sound, had the highest number of trips which caught bluefish (Table 3; Figure 5).

Table 3. Statistical areas which accounted for at least 5% of the total commercial bluefish catch (by weight) in 2019, with associated number of trips. Source: Unpublished NOAA Fisheries dealer data (i.e., "AA tables", which include both state and federal dealer data).

Statistical area	% of 2019 commercial bluefish catch	Number of trips
611	18%	1,667
539	18%	1,051
613	14%	727
626	9%	84
632	6%	27

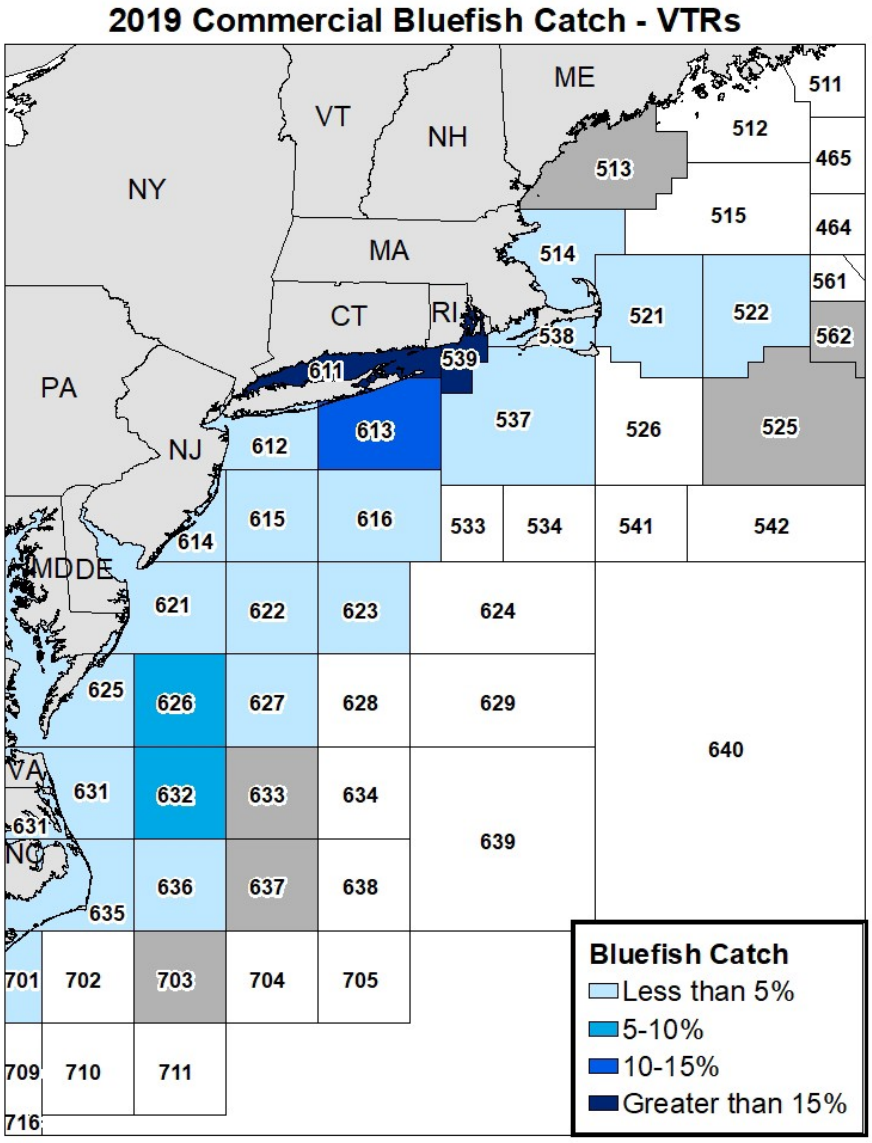


Figure 5. Proportion of bluefish catch by statistical area in 2019 based on federal VTR data. Statistical areas marked "confidential" are associated with fewer than three vessels and/or dealers. Statistical areas with confidential data collectively accounted for less than 1% of commercial catch reported on VTRs in 2019. Source: Unpublished NOAA Fisheries Vessel Trip Report data.

The commercial bluefish fishery in state and federals waters is predominantly a gill net fishery. On average about 59% of the commercial bluefish landings (by weight) reported by state and federal dealers were caught with gill nets over the period 2000 to 2019. Over the same period, trawls accounted for about 10% of landings, hook and line accounted for 6% of landings, pound nets accounted for 6% of landings, seines accounted for 1% of landings, while all other gear types accounted for 2% or less of the commercial bluefish landings. Sixteen percent of landings

reported by dealers during 2000 to 2019 were of an unknown gear type (Figure 6). Many of the commercial fisheries do not fish exclusively for bluefish, but instead target a combination of species including croaker, mullet, Spanish mackerel, spot, striped bass, and weakfish.

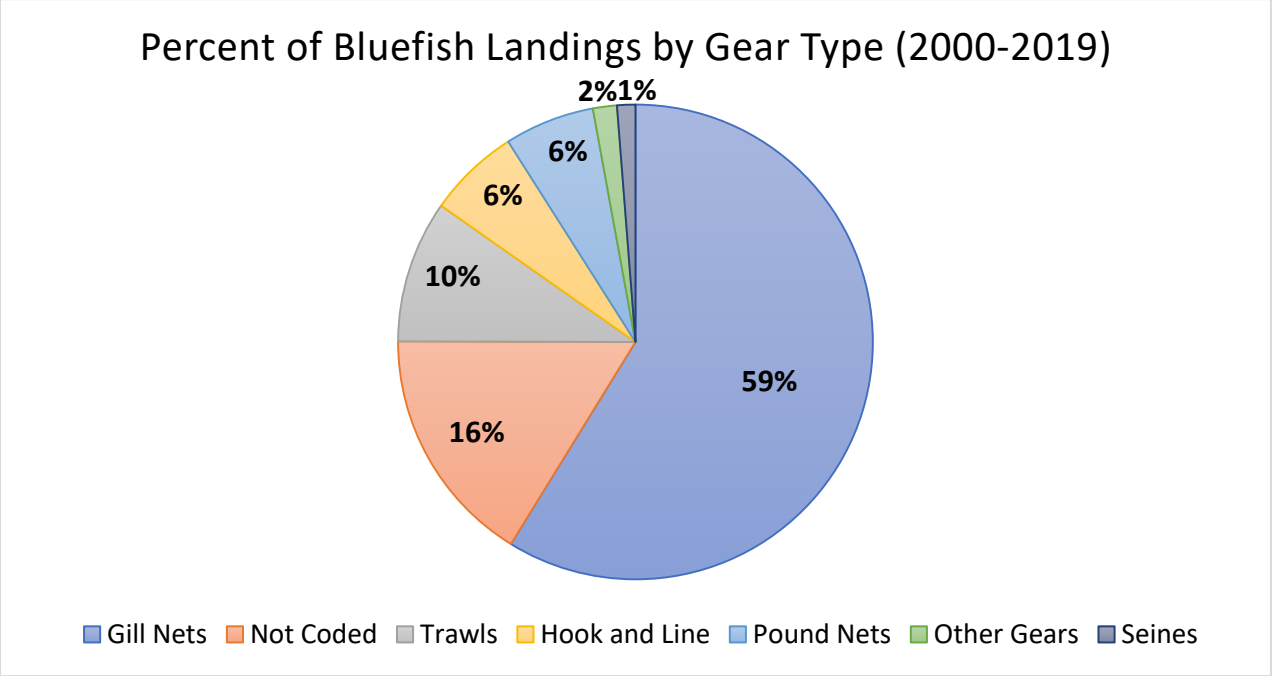


Figure 6. Proportion of bluefish caught by gear type over the period 2000-2019. Source: ACCSP Data Warehouse

At least 100,000 pounds of bluefish were landed by commercial fishermen in 6 ports in Rhode Island, New York and North Carolina in 2019. These ports accounted for approximately 72% of all 2019 commercial bluefish landings. Hatteras, North Carolina was the leading port, both in terms of landings and number of vessels landing bluefish (Table 4).

Table 4. Ports reporting at least 100,000 pounds of commercial bluefish landings in 2019, based on dealer data.

Port	Bluefish landings (lb)	% of total commercial bluefish landings	Number of vessels landing bluefish
Hatteras, NC	393,056	28%	127
Point Judith, RI	283,941	21%	76
Wanchese, NC	273,277	10%	36
Montauk, NY	269,418	7%	52
Hampton Bays, NY	147,959	4%	19
Little Compton, RI	111,107	2%	7

Bluefish Recreational Fishery

NOAA Fisheries has conducted recreational fishing surveys since 1979 to obtain estimates of participation, effort, and catch by recreational anglers in marine waters. Prior to 2004,

recreational data were generated by the Marine Recreational Fishery Statistics Survey (MRFSS). Recreational data for 2004 and later are available from MRIP. Note that MRIP has recently undergone major changes in its collection of effort data[2], as well as changes to its angler intercept methods for private boat and shore anglers.[3] As such, major changes to the time series of recreational catch and landings were released in July 2018. A more detailed description of the revisions to the MRIP sampling methodology may be found in *Section 1.1.1.1*.

The 2018 MRIP recalibration increased recreational catch estimates from 1985-2017 by an average of 116% (from 29.9 million lb to 64.6 million lb), ranging from +63% in 1986 to +291% in 2017 (NEFSC 2019). The revised MRIP data is used in describing the characteristics of the bluefish recreational fishery in the paragraphs below.

Bluefish are a migratory species that school by size. Schools of bluefish can extend over a kilometer, often pursuing schools of baitfish. Bluefish abundance is also tied to season. The majority of recreational bluefish catch occurs in Florida during the winter, followed by North Carolina in the spring, then New York and New Jersey in the summer, and North Carolina again in the fall. However, bluefish can be unpredictable and their north/south and inshore/offshore migration patterns can vary year to year.

From 1981-2019, recreational catch and landings of bluefish on the Atlantic coast peaked in 1981 at 75.76 and 65.35 million bluefish, respectively. Recreational catch was lowest in 1995 with an estimated 25.08 million bluefish were caught, but landings reached a time series low in 2018 when only 10.25 million bluefish were landed. Recreational anglers along the Atlantic coast from Maine through Florida caught an estimated 38.63 million bluefish and landed 12.14 million bluefish (about 15.56 million pounds) in 2019 (

[2] See https://www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements
[3] See https://www.fisheries.noaa.gov/event/access-point-angler-intercept-survey-calibration-workshop

Table 5).

Bluefish are one of the most popular sport fish along the Atlantic coast. While many anglers do catch bluefish for consumption, many others do not due to its strong flavor and its tendency to spoil quickly. The digestive enzymes of bluefish are powerful, and their meat can go bad if not put on ice or cooked soon after capture. Approximately 65% of total recreational catch is comprised of releases in numbers of fish for the period 2010 to 2019. Scientific studies indicate that on average 15% of recreationally released bluefish die, which means that recreational dead discards have accounted for approximately 21% of the total recreational catch in weight over the same period.

Based on MRIP estimates, about 60% of recreational bluefish landings (in numbers of fish) in 2019 were from anglers fishing from shore, approximately 36% were from anglers fishing on private or rental boats, and about 4% were from anglers fishing from party or charter boats (Figure 7).

The majority of recreational bluefish harvest occurs in state waters when the fish migrate inshore. Between 2017 and 2019, about 97% of recreational bluefish landings (in numbers of fish) occurred in state waters and about 3% occurred in federal waters (Figure 8). During the past three years New York (20.2%), New Jersey (14.4%), North Carolina (25.5%), and Florida (16.6%) have comprised the majority (78.7%) of the total coastwide landings in numbers of fish (Table 6).

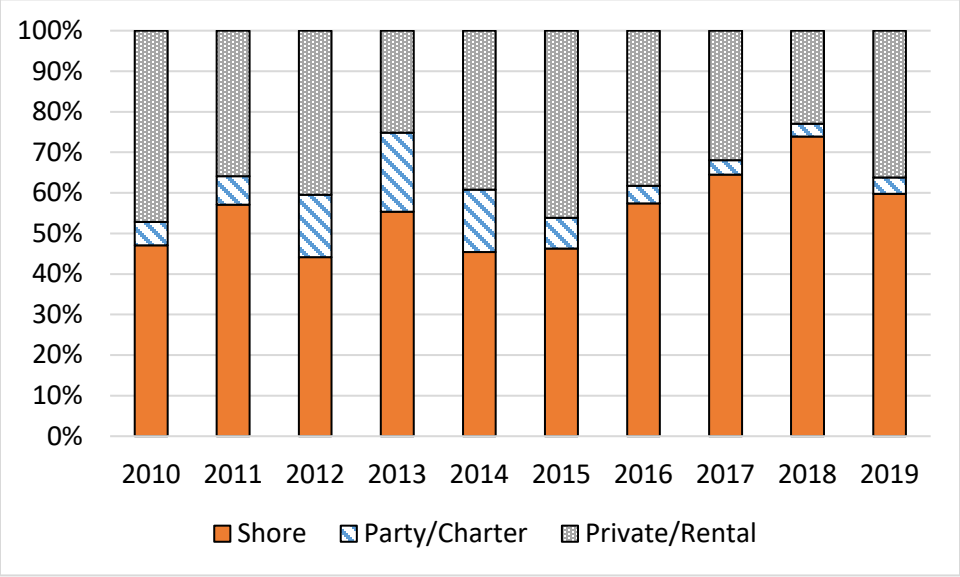


Figure 7. The percent of bluefish harvested by recreational fishing mode in numbers of fish, Maine through Florida, 2010-2019. Source: Personal Communication with the National Marine Fisheries Service, Fisheries Statistics Division, December 31, 2020

Table 5. Recreational bluefish landings, catch, and mean weight of landed fish, Maine through Florida, 1981-2019. Source: MRIP

Year	Catch (number of fish)	Landings (number of fish)	Landings (lbs)	Mean weight of landed fish (lb)
1981	75,758,405	65,354,727	169,626,286	2.60
1982	57,971,455	49,994,993	135,646,634	2.71
1983	65,692,855	53,273,556	163,756,917	3.07
1984	65,363,811	52,644,496	117,871,513	2.24
1985	50,820,919	40,993,554	104,585,434	2.55
1986	58,208,887	47,496,866	150,748,617	3.17
1987	54,036,164	40,310,965	133,966,553	3.32
1988	24,866,437	19,679,223	69,739,293	3.54
1989	53,652,330	38,850,679	76,442,812	1.97
1990	43,895,414	30,936,948	68,090,997	2.20
1991	41,416,279	27,317,927	59,792,834	2.19
1992	29,447,521	20,180,576	41,217,702	2.04
1993	27,427,204	15,369,463	37,415,745	2.43
1994	28,624,143	13,063,625	30,145,683	2.31
1995	25,084,131	11,532,806	27,710,089	2.40
1996	25,864,667	11,126,336	23,207,235	2.09
1997	30,448,294	12,400,977	27,039,376	2.18
1998	28,511,672	13,397,306	32,880,414	2.45
1999	52,596,232	16,878,789	25,106,096	1.49
2000	47,102,862	12,879,478	23,357,123	1.81
2001	60,512,249	18,048,645	31,654,980	1.75
2002	49,810,121	17,607,380	30,654,388	1.74
2003	37,746,239	16,411,936	32,758,672	2.00
2004	49,239,084	18,631,909	37,133,464	1.99
2005	48,482,666	18,341,456	37,742,809	2.06
2006	54,310,045	19,397,265	36,081,959	1.86
2007	56,313,394	19,189,747	40,239,102	2.10
2008	46,044,998	14,845,431	36,166,828	2.44
2009	49,866,591	18,085,387	40,731,434	2.25
2010	62,350,106	21,929,515	46,302,792	2.11
2011	58,290,651	20,814,882	34,218,751	1.64
2012	50,658,371	18,578,840	32,530,916	1.75
2013	53,494,668	19,975,053	34,398,326	1.72
2014	55,093,760	21,510,648	27,044,278	1.26
2015	42,148,960	13,725,107	30,098,650	2.19
2016	42,528,751	14,899,733	24,155,299	1.62
2017	42,163,136	13,845,807	32,071,431	2.32
2018	30,928,701	10,245,712	13,270,863	1.30
2019	38,631,938	12,137,295	15,555,892	1.28

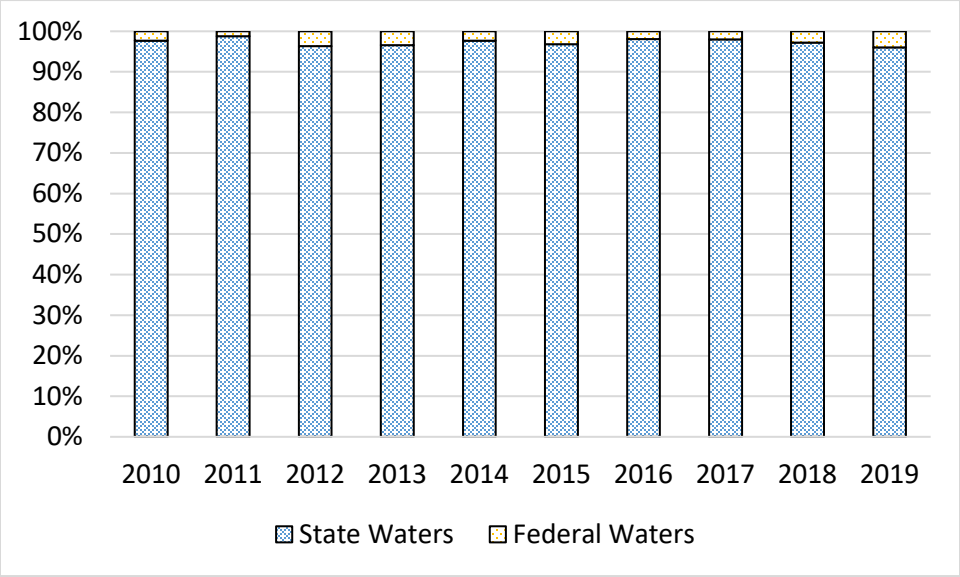


Figure 8. Estimated percentage of bluefish recreational landings (numbers of fish) in state vs. federal waters, Maine through Florida, 2010-2019. Source: Personal Communication with the National Marine Fisheries Service, Fisheries Statistics Division, December 31, 2020

Table 6. State contribution (as a percentage) to total recreational landings of bluefish (in numbers of fish), from Maine through Florida, 2017-2019. Source: Personal Communication with the National Marine Fisheries Service, Fisheries Statistics Division, December 31, 2020

State	2017	2018	2019	Avg 2017-2019
Maine	0.0%	0.0%	0.0%	0.0%
New Hampshire	0.0%	0.0%	0.0%	0.0%
Massachusetts	4.3%	1.8%	2.2%	2.9%
Rhode Island	3.0%	1.2%	3.1%	2.5%
Connecticut	4.2%	3.0%	5.5%	4.3%
New York	22.1%	11.7%	25.0%	20.2%
New Jersey	22.0%	13.9%	6.1%	14.4%
Delaware	1.9%	0.7%	1.2%	1.3%
Maryland	1.3%	2.7%	0.9%	1.6%
Virginia	1.3%	4.3%	6.2%	3.8%
North Carolina	22.9%	32.3%	22.7%	25.5%
South Carolina	5.4%	7.5%	7.2%	6.6%
Georgia	0.1%	0.9%	0.2%	0.3%
Florida	11.5%	20.0%	19.5%	16.6%
Total	100%	100%	100%	100%

1.3.4 Interactions with Other Fisheries

Non-target species are those species caught incidentally while targeting other species, in this case, while targeting bluefish. Some non-target species are occasionally retained, others are commonly discarded. This section describes the non-target species commonly caught in the commercial and recreational bluefish fisheries and summarizes their management status and stock status.

Identification of Major Non-Target Species

It can be difficult to develop accurate quantitative estimates of catch of non-target species. The intended target species for any given tow or set is not always obvious. Fishermen may intend to target one or multiple species and the intended target species may change mid-trip. Given the mixed species nature of the bluefish fishery, incidental catch of non-target species does occur. Table 7 reports the commercial non-target species catch as a percentage of total catch on bluefish observed or captain reported hauls on a trip in 2019 using the observer database. All species reported represent 4% or greater of the observed or reported catch on a trip where bluefish was either the primary or secondary target species. Smooth and spiny dogfish, scup, striped bass, Atlantic bonito and black sea bass were the most commonly caught non-target species on commercial bluefish trips. Table 8 presents the most recent stock information for these species (SEDAR, 2015; NEFSCa, 2018; NEFSC, 2019; NEFSCb, 2018).

Table 7: Percent of commercial non-target species caught on an observed or captain reported haul where bluefish was either the primary or secondary target species in 2019.

Species	% of total catch on bluefish observed or reported trips, 2019
Smooth Dogfish	39.1%
Spiny Dogfish	11.8%
Scup	11.0%
Striped Bass	8.8%
Atlantic Bonito	4.3%
Black Sea Bass	4.0%
Other	20.9%

Table 8: Most recent stock status information for commercial non-target species identified in this action for the bluefish fishery.

	Stock Biomass Status	Fishing Mortality Rate Status
Smooth Dogfish	Not overfished	Overfishing not occurring
Spiny Dogfish	Not overfished	Overfishing not occurring
Scup	Not overfished	Overfishing not occurring
Striped Bass	Overfished; SSB_{2017} estimated at 68,476 mt compared to the $SSB_{Threshold}$ of 91,436 mt	Overfishing occurring; F_{2017} estimated at 0.307 compared to the $F_{Threshold}$ of 0.240
Atlantic Bonito	Unknown	Unknown
Black Sea Bass	Not overfished	Overfishing not occurring

Of all non-target species caught on hauls where bluefish was either the primary or secondary target species on a trip, striped bass is the only species with a concerning stock status and fishing mortality rate (overfished and overfishing occurring). Bluefish and striped bass utilize similar habitat and co-exist in waters throughout their life histories. However, striped bass are caught on only a limited number of bluefish trips, and by comparison to other species, these interactions remain low. Typically, bluefish are a fallback species for fishermen that are not catching their primary target and are often bycatch in other fisheries. Overall, the impact of the bluefish commercial fishery on the non-target species is low, but commercial bluefish fishing effort should continue to be monitored in relation to striped bass. In contrast, the overfished stock status of striped bass and bluefish may result in less directed trips for these two species due to fishermen preferring to target other more abundant demersal species.

A "species guild" approach was used to examine non-target species interactions in the recreational fishery for bluefish. This analysis identified species that were caught together on 5% or more of recreational trips in 2018. The Atlantic coast was split into two regions (Maine to Virginia and North Carolina to Florida) to more effectively classify species based on region. In the north, black sea bass and scup were highly correlated with bluefish in the recreational fishery. In the south, Spanish mackerel and spotted seatrout were highly correlated with bluefish. Other frequently caught non-target species included striped bass, paralichthys flounders, pinfish, and lizard fish (J. Brust, personal communication December 2019).

The status of recreational non-target species relevant to this action are summarized in Table 9. Scup and black sea bass are jointly managed by the MAFMC and the ASMFC. The 2019 operational stock assessments indicate the stocks are not overfished and overfishing was not occurring (NEFSC, 2019). Spanish mackerel is jointly managed by the South Atlantic Fishery Management Council and the Commission. The most recent stock assessment for Spanish mackerel at the 2012 Southeast Data, Assessment and Review indicated the stock is not overfished and overfishing is not occurring (SEDAR, 2012). Spotted sea trout have not been assessed coastwide, therefore their overfished and overfishing status is unknown.

Table 9. Most recent stock status information for non-target species in the recreational bluefish fishery.

Species	Biomass Status	Fishing Mortality Rate Status
Summer Flounder	Not overfished	Overfishing not occurring
Scup	Not overfished	Overfishing not occurring
Black Sea Bass	Not overfished	Overfishing not occurring
Spanish Mackerel	Not overfished	Overfishing not occurring
Spotted Sea Trout	Unknown (not assessed)	Unknown (not assessed)

1.4 HABITAT CONSIDERATIONS

This section of the Draft Amendment currently only contains a description of the physical habitat that bluefish inhabit. Prior to final action, this section will comprise sections that cover: 1) the environmental requirements of bluefish, 2) the anthropogenic impacts on bluefish and

their habitat, and 3) a description of programs to protect, restore, and preserve bluefish. These sections will be drafted in coordination with the Council's Environmental Assessment process.

1.4.1 Description of Physical Habitat

Bluefish are a migratory pelagic species found in most temperate and tropical marine waters throughout the world. Along the U.S. Atlantic coast, bluefish are commonly found in estuarine and continental shelf waters from the Gulf of Maine to the Dry Tortugas in Florida. Bluefish are a schooling species that migrate in response to seasonal changes, moving north and inshore during spring and south and offshore in the late autumn. The Atlantic bluefish fishery exploits what is considered to be a single stock of fish.

Information about the physical environment of the Gulf of Maine, Mid-Atlantic, and South Atlantic regions were adapted from Amendment 3 to the Interstate Fishery Management Plan for Atlantic Menhaden (2017), available here: http://www.asmfc.org/uploads/file//5a4c02e1AtlanticMenhadenAmendment3_Nov2017.pdf

1.4.1.1 Gulf of Maine

The Gulf of Maine is a semi-enclosed sea of 36,300 mi2 (90,700 km2) bordered on the northeast, north and west by the coasts of Nova Scotia, New Brunswick, and the New England states. To the south and east, the Gulf is open to the North Atlantic Ocean; however, Georges Bank forms a partial southern boundary below about 165 ft (50 m). The interior of the Gulf of Maine is characterized by five major deep basins (>600 ft, 200 m) which are separated by irregular topography that includes shallow ridges, banks, and ledges. Basins make up about 30% of the floor area (Thompson, 2010). Retreating glaciers (18,000–14,000 years ago) left behind a variety of patchily distributed sediment types including silt, sand, clay, gravel, and boulders (NMFS, 2015). Major tributary rivers are the St. John in New Brunswick; St. Croix, Penobscot, Kennebec, Androscoggin, and Saco in Maine; and Merrimack in Massachusetts.

The predominantly rocky coast of Maine is characterized by steep terrain and bathymetry, with numerous islands, embayments, pocket beaches, and relatively small estuaries. Tidal marshes and mud flats occur along the margins of these estuaries. Farther south, the coastline is more uniform with few sizable bays, inlets, or islands, but with many small coves. Extensive tidal marshes, mud flats, and sandy beaches along this portion of the coast are gently sloped. Marshes exist along the open coast and within the coves and estuaries.

The surface circulation of the Gulf of Maine is generally counterclockwise, with an offshore flow at Cape Cod which joins the secondary, clockwise gyre on the northern edge of Georges Bank. The Northeast and Great South Channels, which bookend Georges Bank, serve as the primary inflow and outflow channels of marine waters, respectively. Some of the water entering the Northeast Channel flows into the Bay of Fundy; another portion turns west to feed the Maine Coastal Current, initiating the counterclockwise direction of flow. The counterclockwise gyre is more pronounced in the spring when river runoff adds to the southwesterly flowing coastal 16 current. Surface currents reach velocities of 1.5 knots (80 cm/sec) in eastern Maine but

gradually diminish to 0.2 knots (10-20 cm/sec) in Massachusetts Bay where tidal amplitude is about 10 ft (3 m) (Thompson, 2010).

There is great seasonal variation in sea surface temperature in the Gulf, ranging from 4°C in March throughout the Gulf to 18°C in the western Gulf and 14°C in the eastern Gulf in August. The Gulf of Maine sea surface temperature has been warming steadily over the last 35 years. In the most recent decade, the warming trend (0.23 °C /year) was faster than 99 percent of the global ocean (Pershing et al., 2015). The warming is related to a northward shift in the Gulf Stream and to changes in the Atlantic Multidecadal Oscillation and Pacific Decadal Oscillation (Pershing et al., 2015). The salinity of the surface layer also varies seasonally, with minimum values in the west occurring during summer, from the accumulated spring river runoff, and during winter in the east under the influence of runoff from the St. Lawrence River (from the previous spring). With the seasonal temperature and salinity changes, the density stratification in the upper water column also exhibits a seasonal cycle. From well mixed, vertically uniform conditions in winter, stratification develops through the spring and reaches a maximum in the summer. Stratification is more pronounced in the southwestern portion of the Gulf where tidal mixing is diminished.

1.4.1.2 Mid-Atlantic Region

The coastal zone of the Mid-Atlantic states varies from a glaciated coastline in southern New England, to the flat and swampy coastal plain of North Carolina. Along the coastal plain, the beaches of the barrier islands are wide, gently sloped, and sandy, with gradually deepening offshore waters. The area is characterized by a series of sounds, broad estuaries, large river basins (e.g., Connecticut, Hudson, Delaware, and Susquehanna), and barrier islands. Conspicuous estuarine features are Narragansett Bay (Rhode Island), Long Island Sound and Hudson River (New York), Delaware Bay (New Jersey and Delaware), Chesapeake Bay (Maryland and Virginia), and the nearly continuous band of estuaries behind barrier islands along southern Long Island, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The complex estuary of Currituck, Albemarle, and Pamlico Sounds behind the Outer Banks of North Carolina (covering an area of 2,500 square miles) is an important feature of the region. Coastal marshes border those estuaries along much of the glaciated coast from Cape Cod to Long Island Sound. Nearly continuous marshes occur along the shores of the estuaries behind the barrier islands.

At Cape Hatteras, the Continental Shelf extends seaward approximately 20 mi (33 km), and gradually widens northward to about 68 mi (113 km) off New Jersey and Rhode Island where it is intersected by numerous underwater canyons. Surface circulation north of Cape Hatteras is generally southwesterly during all seasons, although this may be interrupted by coastal in drafting and some reversal of flow at the northern and southern extremities of the area. Speeds of drift north of Cape Hatteras are on the order of six miles (9.7 km) per day. There may be a shoreward component to this drift during the warmer half of the year and an offshore component during the colder half. The western edge of the Gulf Stream meanders off Cape Hatteras, sometimes coming within 12 mi (20 km) of the shore; however, it becomes less 17 discrete and veers to the northeast above Cape Cod. Surface currents as high as 4 knots (200 cm/sec) have been measured in the Gulf Stream off Cape Hatteras.

Hydrographic conditions in the Mid-Atlantic region vary seasonally due to river runoff and changing water temperatures. The water column becomes increasingly stratified in the summer and homogeneous in the winter due to fall-winter cooling of surface waters. In the winter, the mean range of sea surface temperatures is 0-7°C off Cape Cod and 1-14°C off Cape Charles (at the southern end of the Delmarva Peninsula). In the summer, the mean range is 15-21°C off Cape Cod and 20-27°C off Cape Charles. The tidal range averages slightly over 3 ft (1 m) on Cape Cod, decreasing to the west. Within Long Island Sound and along the south shore of Long Island, tide ranges gradually increase, reaching 6 ft (2 m) at the head of the Sound and in the New York Bight. South of the Bight, tide ranges decrease gradually to slightly over 3 ft (1 m) at Cape Hatteras. Prevailing southwest winds during the summer along the Outer Banks often lead to nearshore upwelling of colder bottom water from offshore, so that surface water temperatures can vary widely during that period (15-27°C over a period of a few days).

The waters of the coastal Mid-Atlantic region have a complex and seasonally dependent circulation pattern. Seasonally varying winds and irregularities in the coastline result in the formation of a complex system of local eddies and gyres. Surface currents tend to be strongest in late spring, due to river runoff, and during periods of highest winds in the winter. In late summer, when winds are light and estuarine discharge is minimal, currents tend to be sluggish, and the water column is generally stratified.

1.4.1.3 South Atlantic Region

The south Atlantic coastal zone extends in a large oceanic bight from Cape Hatteras south to Biscayne Bay and the Florida Keys. North of Florida, the south Atlantic coastal zone is bordered by a coastal plain that stretches inland for a hundred miles and a broad continental shelf that reaches into the ocean for nearly an equal distance. This broad shelf tapers down to a very narrow and precipitous shelf off the southeastern coast of Florida. The irregular coastline of North Carolina, South Carolina, Georgia, and eastern Florida is generally endowed with extensive bays and estuarine waters, bordered by nutrient-rich marshlands. Barrier beaches and dunes protect much of the shoreline. Along much of the southern coast from central South Carolina to northern Florida, estuarine salt-marsh is prominent. Most of the east coast of Florida varies little in general form. Sand beaches with dunes are sporadically interrupted by mangrove swamps and low banks of earth and rock.

The movements of oceanic waters along the South Atlantic coast have not been well defined. The surface currents, countercurrents, and eddies are all affected by environmental factors, particularly winds. The Gulf Stream flows along the coast at 6-7 miles per hour (10-11 km/hr). It is nearest to the coast off southern Florida and gradually moves away from the coast as it flows northward. Inshore of the Gulf Stream, there is a current that flows southward for most of the year in regions north of Cape Canaveral.

Sea surface temperatures during the winter increase southward from Cape Hatteras to Fort Lauderdale, Florida, with mean minimums ranging from 2-20oC and maximums ranging from 17-26°C. In the summer, the increases are more gradual, ranging north to south from minimums of 21-27°C to maximums of 28-30°C. Mean sea-surface salinity is generally in the

range of 34 to 36 ppt year round. Mean tidal range is just over 3 ft (1 m) at Cape Hatteras and increases gradually to about 6-7 ft (2 m) along the Georgia coast. Tides decrease south of Cape Canaveral to 3 ft (1 m) at Fort Lauderdale.

1.4.2 Anthropogenic Impacts on Bluefish and Their Habitat

A baseline fishing effects analysis is provided in the Mid-Atlantic Council's specification of management measures for the 2004 fishing year (MAFMC 2003). This analysis considered 1995-2001 as the baseline time period. Baseline conditions (i.e., the distribution and intensity of bottom otter trawling in the commercial bluefish fishery) have not changed significantly since 2001. The 2004 evaluation of the habitat impacts of bottom otter trawls, gillnets, and handlines used in the commercial bluefish fishery indicated that the baseline impact of the fishery was minimal and temporary in nature. Additionally, only these gear types which contact the bottom impact physical habitat. Consequently, adverse effects of the bluefish fishery on EFH did not need to be minimized. Since commercial landings of bluefish have remained stable since 2001, the adverse impacts of the bluefish fishery have continued to be minimal during the time period 2001-2018. The FMP limits recreational specifications for bluefish to possession limits and recreational harvest limits. The principal gears used in the recreational fishery for bluefish are rod and reel and handline. The potential adverse impacts of these gears on EFH for this federally managed species in the region is minimal (Stevenson et al. 2004).

Only those gear types which contact the bottom impact physical habitat. The actions proposed in this document are relevant to both the commercial and recreational bluefish fisheries. The recreational fishery is almost exclusively a hook and line fishery. Recreational hook and line gears generally have minimal impacts on physical habitat and EFH in this region (Stevenson et al. 2004). Weighted hook and line gear can contact the bottom, but the magnitude and footprint of any impacts resulting from this contact is likely minimal. Thus, the recreational fisheries are expected to have very minor or no impacts on habitat.

The limited commercial fishery for bluefish is primarily prosecuted with gill net gear (Figure 6) and has limited contact with the bottom. Thus, the magnitude and footprint of any impacts resulting from this contact is likely minimal.

Stevenson et al. (2004) compiled a detailed summary of several studies on the impacts of a variety of gear types on marine habitats. Conclusions relevant for this action are briefly summarized below with a focus on bottom trawl gear since this is the gear type used in commercial harvest that causes the greatest impact, when it occurs.

Otter trawl doors can create furrows in sand, mud, and gravel/rocky substrates. Studies have found furrow depths that range from 2 to 10 cm. Bottom trawl gear can also re-suspend and disperse surface sediments and can smooth topographic features. It can also result in reduced abundance, and in some cases reduced diversity, of benthic species such as nematodes, polychaetes, and bivalves. It can also have short-term positive ecological impacts such as increased food value and increased chlorophyll production in surface sediments. The duration

of these impacts varies by sediment type, depth, and frequency of the impact (e.g., a single trawl tow vs. repeated tows). Some studies documented effects that lasted only a few months. Other studies found effects that lasted up to 18 months. Impacts tend to have shorter durations in dynamic environments with less structured bottom composition compared to less dynamic environments with structured bottom. Shallower water, stronger bottom currents, more wave action, finer-grained sediments, and higher frequencies of natural disturbance are characteristics that make environments more dynamic (Stevenson et al. 2004).

1.4.3 Description of Programs to Protect, Restore, & Preserve Bluefish

The Mid-Atlantic Council developed some fishery management actions with the sole intent of protecting marine habitats. For example, in Amendment 9 to the Mackerel, Squid, and Butterfish FMP, the Council determined that bottom trawls used in Atlantic mackerel, longfin and Illex squid, and butterfish fisheries have the potential to adversely affect EFH for some federally-managed fisheries (MAFMC 2008). As a result of Amendment 9, closures to squid trawling were developed for portions of Lydonia and Oceanographer Canyons. Subsequent closures were implemented in these and Veatch and Norfolk Canyons to protect tilefish EFH by prohibiting all bottom trawling activity. In addition, Amendment 16 to the Mackerel, Squid, and Butterfish FMP prohibits the use of all bottom-tending gear in fifteen discrete zones and one broad zone where deep sea corals are known or highly likely to occur (81 Federal Register 90246, December 14, 2016). In addition, section 4.3 details the rebuilding plan alternatives which aim to restore bluefish back to its biomass target.

1.5 IMPACTS TO THE FISHERY MANAGEMENT PROGRAM

The following sections provide a brief summary of biological, economic and social impacts that may result from the changes to the Bluefish FMP considered through this Amendment. Impacts to the fisheries are alternative specific, and a more detailed discussion of alternatives and their impacts can be found in *Section 4*.

1.5.1 Biological Impacts

Changes to the recreational/commercial sector allocations and the commercial state allocations affect the size of each sector's and state's landings limits. Depending on the scale of the change, a decrease in the commercial quota or additional restrictions on the recreational fishery could lead to increased regulatory discards of these species compared to recent levels. However, accountability measures are still in place and designed to prevent harvest and dead discards from exceeding the overfishing threshold. None of the alternatives are expected to change patterns in landings, discards, or fishing effort in such a way that they negatively impact stock status for any of the three species.

The 2019 operational stock assessment indicated that the bluefish stock was overfished. This triggered the requirement under the MSA to submit a rebuilding plan within two years of the overfished designation. The rebuilding plan alternatives under consideration in this Amendment are all projected to rebuild the stock within 7 years or less. The shorter duration rebuilding plans require greater restrictions on fishing mortality to achieve a rebuilt stock

within the timeline. The biological implications of a faster rebuilding plan include the restoration of a robust stock and the reduction of time that bluefish remain in a vulnerable overfished state. That being said, the MSA requires that an overfished stock be rebuilt in as short of a period as possible, and the duration be no longer than 10 years. Regardless of which rebuilding plan is selected, the Council, in coordination with the Bluefish Board, is required to rebuild the stock back to the target biomass level.

1.5.2 Economic Impacts

Section 1.1.1 introduced the many management changes under consideration in this Amendment, all of which have direct or indirect impacts on stakeholder access to the bluefish resource. Access to the resource is managed differently for commercial versus recreational stakeholders, but bluefish fishery management is centered on the landing limits or quotas that each sector is allocated. Changes to a sector's allocation can significantly impact the economic activity associated with access to the bluefish resource.

For the recreational fishery, changes in the Recreational Harvest Limit (RHL) may lead to a liberalization or restriction of recreational measures, which can impact angler access to the bluefish resource. Increased access could take the form of more fish to take home (under higher possession limits or lower minimum fish sizes), while decreased access could mean the ability to retain fewer fish and reduced opportunities to target bluefish (under a shorter open season). This can affect angler satisfaction, revenues for for-hire businesses (e.g., by impacting demand for party and charter trips), and revenues for support businesses such as bait and tackle shops.

For the commercial fishery, changes to the overall commercial sector allocation as well as the commercial allocations to the states are being considered. Depending upon the alternatives adopted through this Amendment, commercial industry members may experience a change in revenue due to corresponding changes to quotas and potential landings of bluefish. Due to the complex interplay between all the management approaches under consideration, it is challenging to determine what the net effect of this Amendment will be on the economic welfare of individual commercial fishermen. However, analyses and descriptions of economic impacts associated with specific alternatives are discussed in more detail in *Section 4*.

1.5.3 Social Impacts

MSA National Standard 8 (NS8) requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen would be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in forecasting social change relative to management alternatives, since communities or other societal groups are constantly evolving in response to

external factors (e.g., market conditions, technology, alternate uses of waterfront, tourism). Certainly, fishery regulations influence the direction and magnitude of social change, but attribution is difficult with the tools and data available.

While the focus here is on the social impacts of the alternatives, external factors may also influence change, both positive and negative, in the affected communities. External factors may lead to unanticipated consequences of a regulation, due to cumulative impacts. These factors contribute to a community's ability to adapt to new regulations. When examining potential social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); bluefish dealers and processors; final users of bluefish; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short-term negative impact on some communities, these should be weighed against potential long-term benefits to all communities which can be derived from a sustainable bluefish fishery.

Social Impact Factors

The social impact factors outlined below can be used to describe the Atlantic bluefish fishery, its sociocultural and community context, and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. Qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts.

The social impact factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities, as well as effects on the community's social structure, politics, etc.
4. The *Non-Economic Social Aspects* of the fishery; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007).

Community Fishing Engagement and Social Vulnerability Indicators

In addition to traditional economic indicators such as landings and revenue, fishing communities can also be understood in terms of overall engagement in the commercial and recreational fishery and other social and economic community conditions. NOAA Fisheries social scientists produce indicators of commercial and recreational fishing engagement, reliance, and other community characteristics for virtually all fishing communities throughout the United States, referred to as the Social Indicators of Fishing Community Vulnerability and Resilience (Colburn and Jepson 2012). The Social Indicators are composite indices of factors that comprise community-level latent constructs, such as commercial fishing engagement or social vulnerability. The strength of these indicators is that they provide greater depth and contextualization to our understanding of fishing communities than the more commonly utilized landings and revenue statistics. The Social Indicators provide a more comprehensive view of fishing communities by including social and economic conditions that can influence the viability of commercial and recreational fishing activities, such as gentrification pressure, poverty, and housing characteristics, among other factors.

2009-2018 Recreational Engagement and Reliance

The Recreational Engagement Indicator is a numerical index that reflects the level of a community's engagement in recreational fisheries relative to other communities in the Northeast and Mid-Atlantic. This index was generated using a principal components factor analysis (PCFA) of variables related to recreational fishing activity from the NOAA Fisheries MRIP datasets. PCFA is a common statistical technique used to identify factors that are related, yet linearly independent, and likely represent a latent or unobservable concept when considered together, such as factors that contribute to the level of a community's social vulnerability or engagement in commercial fishing. The variables that were identified to best reflect community engagement in recreational fisheries included; 1) the total number of shore trips per community for each year; 2) the total number of charter trips per community for each year; and 3) the total number of private recreational trips per community for each year. The Recreational Reliance Indicator is calculated by dividing these three variables by the total community population obtained from the U.S. Census Bureau's American Community Survey (ACS). It should be noted that a high engagement score does not necessarily mean that a community or its fishery participants are solely dependent upon recreational fishing activities. There may be other fishing or economic activities that may sustain the livelihoods of individuals or entities within these communities that have relied on recreational fishing historically.

Figure 9 displays the factor scores for the Recreational Engagement Indicator for the fifteen communities that have the highest average recreational engagement between 2009 and 2018. The index factor scores are commonly categorized from low to high based on the number of standard deviations from the mean, which is set at zero. Categories rank from 0.00 or below as "low", 0.00 – 0.49 as "medium," and 0.50 – 0.99 as "medium-high," and 1 standard deviation or above as "high." All of the ports displayed in Figure 10 have "high" recreational engagement. However, there has also been substantial year-to-year variability in recreational engagement for many of these ports. For example, communities in Florida with high average engagement have seen large increases in engagement in recent years relative to the earlier part of the time series, whereas communities in New York and New Jersey have experienced wide fluctuations over time in their extent of recreational fishing engagement.

Figure 11 shows the factor scores for the Recreational Reliance Indicator for the fifteen communities that have the highest average recreational reliance between 2009 and 2018. A comparison of Figure 9 and Figure 11 reveals that some highly engaged communities may not be as highly reliant on recreational fisheries due to the size of those communities and the accompanying opportunities for other social and economic activities. Among the five most highly reliant communities on recreational fisheries over the period of 2009 to 2018 were Barnegat Light, NJ, Topsail Beach, NC, Orient, NY, Hatteras (and all other communities throughout the Outer Banks), NC, and Montauk, NY. In recent years, Nags Head, NC, and Melbourne Beach, FL, have increased considerably in their reliance on recreational fisheries.

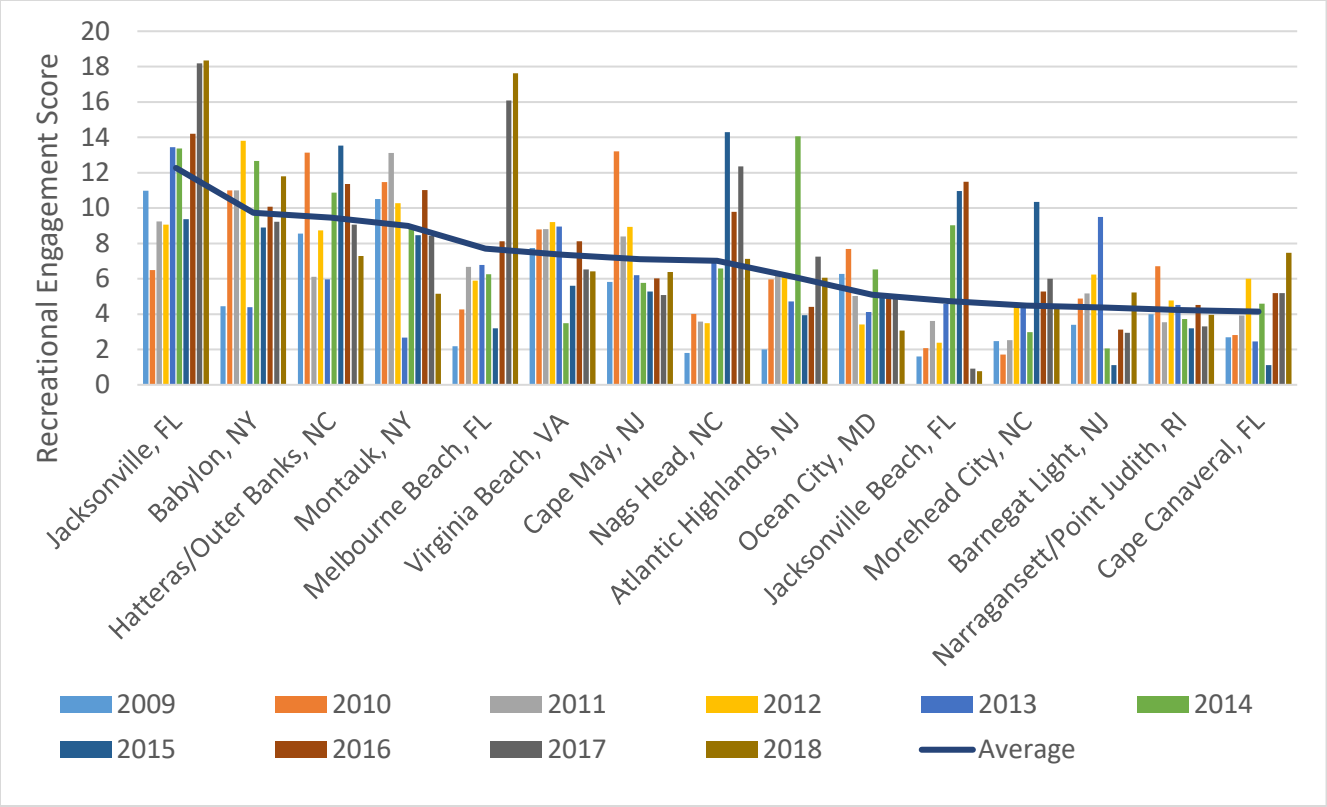


Figure 9: Recreational Fishing Engagement Scores by Community: Top Fifteen Communities in Average Engagement from 2009-2018.

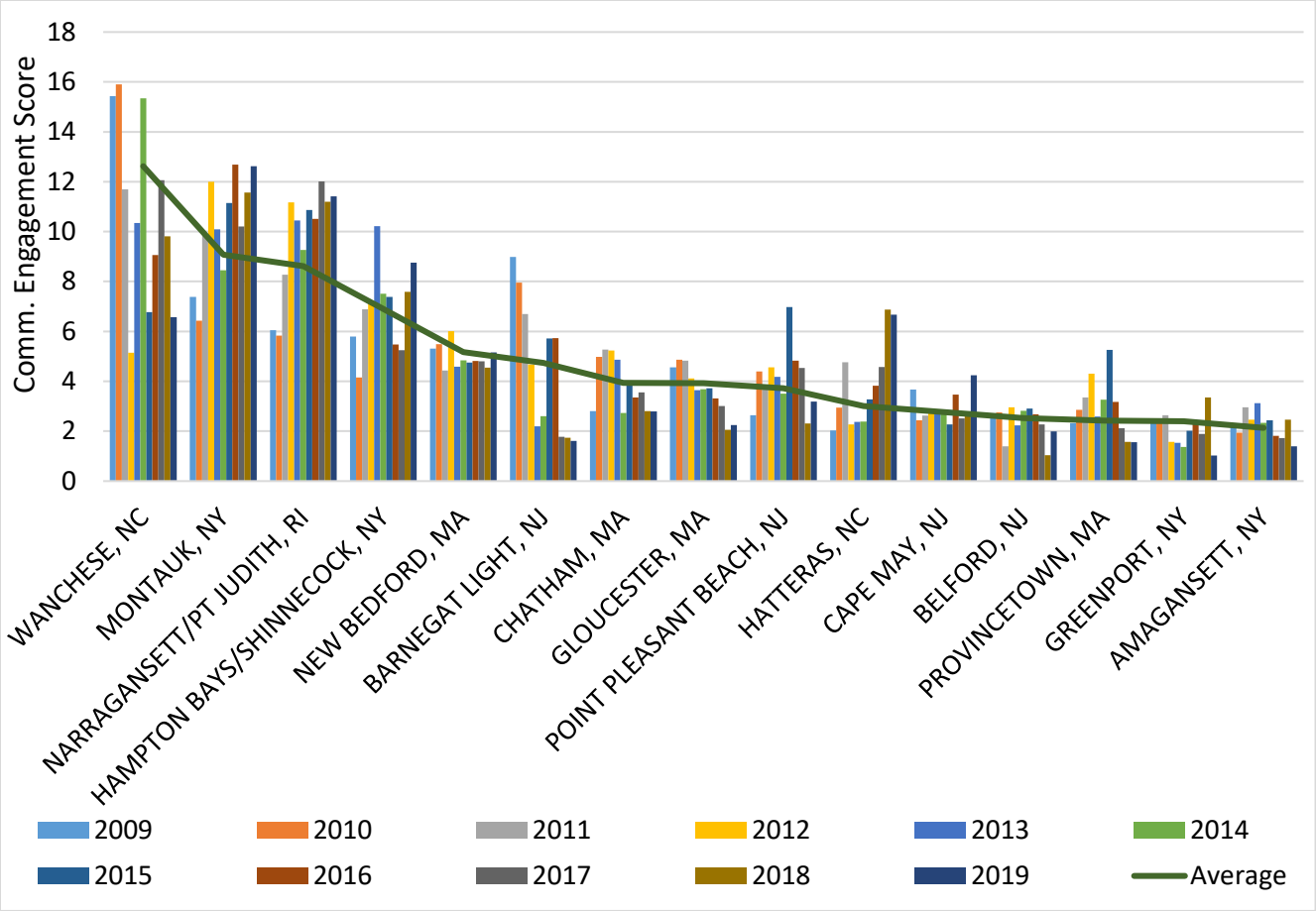


Figure 10: Commercial Bluefish Engagement Scores by Community: Top Fifteen Communities in Average Engagement from 2009-2019.

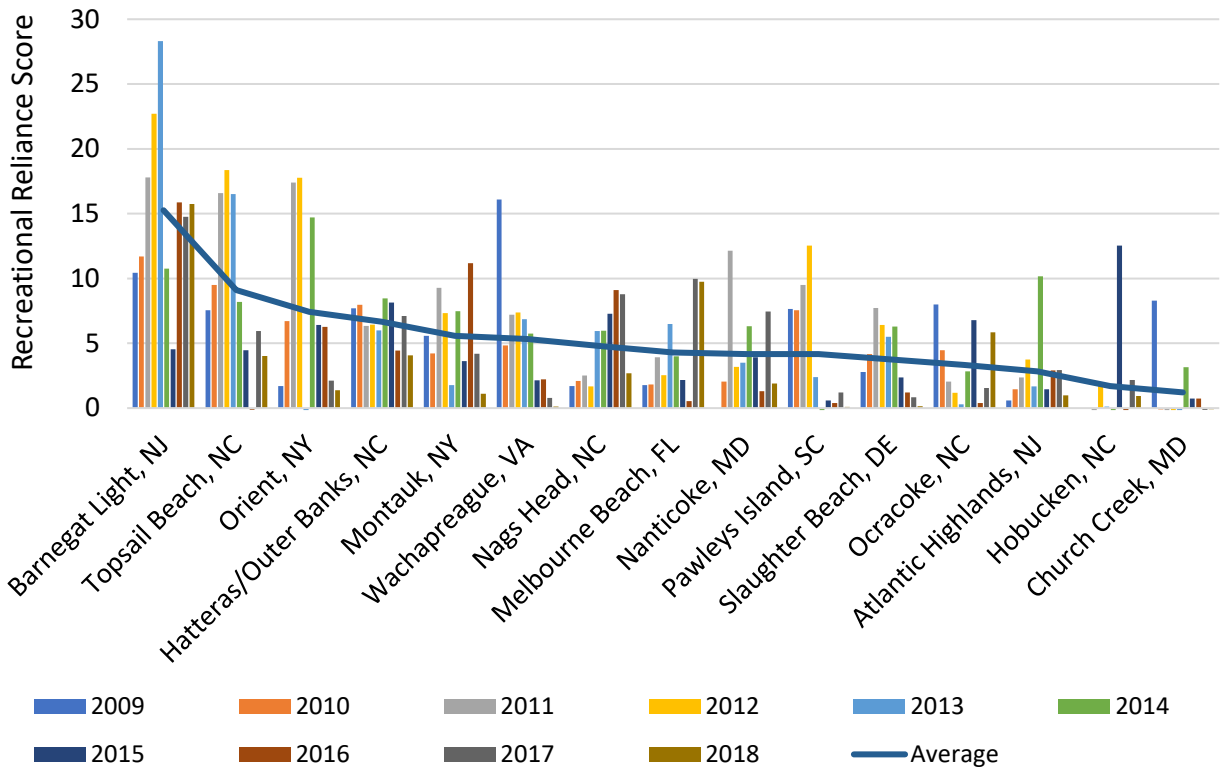


Figure 11: Recreational Fishing Reliance Scores by Community: Top Fifteen Communities in Average Reliance from 2009-2018.

Community Social Vulnerability Indicators

The Community Social Vulnerability Indicators (CSVI) include indices of labor force structure, housing characteristics, poverty, population composition, and personal disruption. The labor force structure index measures the makeup of the labor force and is reversed scored so that a higher factor score represents fewer employment opportunities and greater labor force vulnerability. The housing characteristics index measures vulnerability related to infrastructure and home and rental values. It is also reversed score so that a higher score represents more vulnerable housing infrastructure. The poverty index captures multiple different factors that contribute to an overall level of poverty in a given area. A higher poverty index score would indicate a greater level of vulnerability due to a higher proportion of residents receiving public assistance and below federal poverty limits. The population composition index measures the presence of vulnerable populations (i.e., children, racial/ethnic minorities, and/or single-parent, female-headed households) and a higher score would indicate that a community's population is composed of more vulnerable individuals. Finally, the personal disruption index considers variables that affect individual-level vulnerability primarily and include factors such as low individual-level educational attainment or unemployment. Higher scores of personal disruption likely indicate greater levels of individual vulnerability within a community, which can in turn impact the overall level of community social vulnerability.

Gentrification Pressure Indicators include housing disruption, urban sprawl, and retiree migration. The Housing Disruption Index combines factors that correspond to unstable or shifting housing markets in which home values and rental prices may cause residents to become displaced. The Urban Sprawl Index indicates the extent of population increase due to migration from urban centers to suburban and rural areas, which often results in cost of living increases and gentrification in the destination communities. The Retiree Migration Index characterizes communities by the concentration of retirees or individuals above retirement age whose presence often raises the home values and rental rates, as well as increase the need for health care and other services. These components of gentrification pressure influence the degree to which the current residents, communities, and local economies can remain in place, generally, and the extent to which those in the fishing industry in these communities are able to withstand or overcome changes to fisheries conditions and management, specifically. As places go through the process of gentrification, housing becomes less available and/or unaffordable for the existing population and the historically significant local fishing businesses and industries that had once thrived become displaced or replaced by new and emerging industries, such as tourism, finance, real estate, and service.

Data used to develop these indices come from multiple secondary data sources, but primarily the U.S. Census ACS at the place level (Census Designated Place and Minor Civil Division). More information about the data sources, methods, and other background details can be found online at https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/.

Table 10 displays the CSVI categorical scores for all of the highly engaged and/or reliant communities on recreational fishing activities.

Table **11** displays CSVI categorical scores for all highly engaged communities in commercial bluefish fishery activities.

Socioeconomic Survey of Hired Captains and Crew in New England and Mid-Atlantic Commercial Fisheries (Crew Survey)

The Socioeconomic Survey of Hired Captains and Crew in New England and Mid-Atlantic Commercial Fisheries (hereafter referred to as the Crew Survey) is an ongoing effort conducted by the Social Sciences Branch of the National Oceanic and Atmospheric Administration Fisheries Northeast Fisheries Science Center intended to gather general information about the characteristics and experiences of commercial fishing crew members (including hired captains) because little is known about this critical segment of the commercial fishing industry. Information collected by the survey include demographic information, wage calculations systems, well-being, fishing practices, job satisfaction, job opportunities, and attitudes towards fisheries management, among other subjects. There have been two waves of Crew Survey data collection thus far – Wave 1 in 2012-13 and Wave 2 in 2018-19.

Table 10: 2018 Community Social Vulnerability Indicator Categorical Scores for Recreational Fishing Communities.

Community	Poverty	Labor Force	Housing Characteristics	Population Composition	Personal Disruption	Housing Disruption	Retiree Migration	Urban Sprawl
Slaughter Beach, DE	Low	High	Low	Low	Low	High	High	Low
Cape Canaveral, FL	Low	Med-High	Med-High	Low	Low	Med-High	Med-High	Low
Jacksonville, FL	Medium	Low	Medium	Medium	Medium	Low	Low	Low
Jacksonville Beach, FL	Low	Low	Low	Low	Low	High	Low	Low
Melbourne Beach, FL	Low	Medium	Low	Low	Low	Medium	Med-High	Low
Church Creek, MD	Low	Low	Medium	Low	Medium	Medium	Low	Low
Nanticoke, MD	Low	Med-High	Low	Low	Low	Low	High	Low
Ocean City, MD	Low	Medium	Med-High	Low	Low	Med-High	Med-High	Low
Hatteras/Outer Banks, NC	Med-High	Low	Medium	Low	Med-High	Med-High	Medium	Low
Hobucken, NC	High	Low	Low	Low	Medium	Low	Med-High	Low
Morehead City, NC	Medium	Medium	Med-High	Low	Medium	Medium	Medium	Low
Nags Head, NC	Low	Low	Low	Low	Low	High	Low	Low
Ocracoke, NC	Med-High	Med-High	Low	Medium	High	Low	Med-High	Low
Topsail Beach, NC	Medium	Med-High	Low	Low	Low	Low	Med-High	Low
Atlantic Highlands, NJ	Low	Low	Low	Low	Low	Medium	Low	Medium
Barnegat Light, NJ	Low	High	Low	Low	Low	High	High	Med-High
Cape May, NJ	Low	Med-High	Low	Low	Low	High	High	Medium
Babylon, NY	Low	Low	Low	Low	Low	Med-High	Low	High
Montauk, NY	Low	Medium	Low	Low	Low	High	Med-High	Med-High
Orient, NY	Low	High	Low	Low	Low	High	High	Med-High
Narragansett/Point Judith, RI	Low	Medium	Low	Low	Low	Med-High	Medium	Low
Pawleys Island, SC	Low	High	Low	Low	Low	Medium	High	Low
Virginia Beach, VA	Low	Low	Low	Medium	Low	Medium	Low	Low
Wachapreague, VA	Low	Med-High	Medium	Low	Low	Low	Med-High	Low

Table 11: 2018 Community Social Vulnerability Indicator Categorical Scores for Commercial Bluefish Fishing Communities.

Community	Poverty	Labor Force	Housing Characteristics	Population Composition	Personal Disruption	Housing Disruption	Retiree Migration	Urban Sprawl
Chatham, MA	Low	High	Low	Low	Low	High	High	Medium
Gloucester, MA	Low	Low	Low	Low	Low	Medium	Low	Medium
New Bedford, MA	High	Low	Medium	Med-High	Med-High	Medium	Low	Med-High
Provincetown, MA	Low	Medium	Low	Low	Low	High	Med-High	Med-High
Hatteras, NC	Low	High	Low	Low	Low	Low	High	Low
Wanchese, NC	Low	Low	Med-High	Medium	Low	Medium	Low	Low
Barnegat Light, NJ	Low	High	Low	Low	Low	High	High	Med-High
Belford, NJ	Low	Low	Low	Low	Low	High	Low	Medium
Cape May, NJ	Low	Med-High	Low	Low	Low	High	High	Medium
Point Pleasant Beach, NJ	Low	Medium	Low	Low	Low	High	Medium	Med-High
Amagansett, NY	Low	Med-High	Low	Low	Low	High	Med-High	High
Greenport, NY	Low	Medium	Low	Medium	Medium	High	Medium	Med-High
Hampton Bays/Shinnecock, NY	Low	Low	Low	Medium	Low	High	Medium	Med-High
Montauk, NY	Low	Medium	Low	Low	Low	High	Med-High	Med-High
Narragansett/Pt Judith, RI	Low	Medium	Low	Low	Low	Med-High	Medium	Low

2.0 GOALS AND OBJECTIVES

2.1 HISTORY OF MANAGEMENT

The original MAFMC-ASMFC FMP (1989) established a 10 fish bag limit for the recreational sector, a 20% allocation of total allowable catch to the commercial sector, state by state commercial quotas, permit requirements, a plan to begin annually reviewing the performance of management measures, and the ability to adjust gear regulations. Since then, six amendments have been developed and approved. Amendment 1 was implemented jointly by the Commission and the Council, the remaining amendments were implemented by the Council.

Amendment 1 (2000) brought the FMP into compliance with new and revised National Standards and other required provisions of the Sustainable Fisheries Act, implemented a rebuilding plan, and required that a commercial quota and recreational harvest limit be based on projected stock size estimates as derived from the latest stock assessment information.

Amendment 2 (2007) implemented a standardized bycatch reporting methodology

Amendment 3 (2011) established Annual Catch Limits (ACLs) and Accountability Measures (AMs)

Addendum I: Biological Monitoring Program (2012) Addendum I established a coastwide monitoring program for bluefish to improve the quantity and quality of age data used in bluefish stock assessments.

Amendment 4 (2013) modified the AMs for the Council's recreational fisheries.

Amendment 5 (2015) implemented a new standardized bycatch reporting methodology to address a legal challenge.

Amendment 6 (2017) implemented management measures to prevent the development of new, and the expansion of existing, commercial fisheries on certain forage species in the Mid-Atlantic.

Board revises Addendum I (2021) sampling program to include Florida among states required to collect bluefish age data for use in stock assessments.

2.2 JOINT MANAGEMENT

The Council and Commission work cooperatively to develop fishery regulations for bluefish off the east coast of the United States. The Council and Commission work in conjunction with NOAA Fisheries, which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the EEZ).

The Commission has primary authority for development of FMPs for state waters under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) of 1993. Recognizing the interjurisdictional nature of fishery resources and the necessity of the states and federal government coordination on regulations, under this act, all Atlantic coast states that are included in a Commission FMP must implement required conservation provisions of the plan or the Secretary of Commerce may impose a moratorium for fishing in the noncompliant state's waters.

The Council, under the MSA, has primary authority for developing federal FMPs for Council managed species. The Commission and the Council meet jointly at least twice a year to approve management measures for the fishery for the upcoming year or years. State fishery departments implement FMP measures under the ACFCMA, while NOAA Fisheries issues rules for the approved FMPs prepared by the Councils.

State regulations apply to vessels fishing in state waters; however, vessels with federal permits must abide by the federal regulations regardless of where they are fishing. If state and federal measures differ, the vessel must abide by whichever measure is more restrictive. Approved regulations are enforced through cooperative actions of the U.S. Coast Guard, NOAA Fisheries Law Enforcement, and state authorities.

The Secretary of Commerce has the ultimate responsibility for federal measures. The Council's proposed FMPs and amendments are submitted to the Secretary of Commerce for approval, which in most cases is delegated to NOAA Fisheries. NOAA Fisheries typically prepares specifications and implementing federal regulations for the fisheries based on the recommendations of the Council and Commission, if such recommendations are deemed to be consistent with the MSA and other applicable law. NOAA Fisheries publishes proposed rules in the *Federal Register* for public comment. As mentioned above, the Secretary of Commerce also has ultimate responsibility for determining whether individual state measures are consistent with the Commission's FMP. If the Commission finds a state out of compliance and is unable to rectify this issue, the Commission may notify the Secretary. Within 30 days of receiving the Commission's notice, the Secretary must decide whether the state is out of compliance, and if so, whether the noncompliance compromises the conservation of the resource. If it does, the Secretary can impose a moratorium on all fishing (commercial and recreational) for the species in question, until the Commission and the Secretary determine that the noncompliance has ceased.

2.3 MANAGEMENT UNIT

Bluefish fisheries are managed cooperatively by the Commission in state waters (0-3 miles), and by the Council and NOAA Fisheries in federal waters (3-200 miles). The management unit for bluefish in US waters is the western North Atlantic Ocean from Florida northward to the US-Canadian border.

2.4 PURPOSE AND NEED FOR ACTION

The purpose of this amendment is to consider modifications to the FMP goals and objectives, current allocations between the commercial and recreational sectors, current commercial allocations to the states, initiate a rebuilding plan, revise the quota transfer processes, revise how the FMP accounts for management uncertainty, and revise *de minimis* provisions in the Commission's FMP.

The current sector-based and commercial state-to-state allocations were set in 2000 using data from 1981-1989 and have not been revised since that time. Recreational catch and harvest data are provided by the Marine Recreational Information Program (MRIP). In July 2018, MRIP released revisions to their time series of catch and harvest estimates based on adjustments for a revised angler intercept methodology (used to estimate catch rates) and a new effort estimation methodology (namely, a transition from a telephone-based effort survey to a mail-based effort survey). These revisions resulted in much higher recreational catch estimates compared to previous estimates, affecting the entire time series of data going back to 1981.

These data revisions have management implications due to the fixed commercial/recreational allocation percentages defined in the FMP. These allocation percentages do not reflect the current understanding of the recent and historic proportions of catch and landings from the two sectors. Since these allocation percentages are defined in the Council and Commission FMPs, they cannot be modified without an FMP amendment. This amendment will consider whether the allocations are still appropriate and meeting the objectives of the FMP. In reviewing/adjusting the allocations, the need for transfers may be reduced, however, improvements to the transfer processes will also be reviewed.

Bluefish was deemed overfished with overfishing not occurring as a result of the 2019 Operational Assessment. Therefore, the Council is mandated to initiate a rebuilding plan within two years of notice by the Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator. Under a rebuilding plan, the stock will be considered rebuilt once spawning stock biomass reaches the target biomass (spawning stock biomass maximum sustainable yield proxy) of 198,717 mt. The MSA requires the overfished stock to be rebuilt within ten years once the regional office notifies the Council of the overfished state. Under the current amendment timeline, the rebuilding plan would be implemented at the beginning of 2022.

Several other issues identified during scoping for this action were considered by the Council and Board for inclusion in this amendment but have since been removed. Some of those issues will be taken up through other initiatives or actions. More information on removed issues is available in past meeting documents and meeting summaries for this amendment, available at: https://www.mafmc.org/actions/bluefish-allocation-amendment.

2.5 GOALS AND OBJECTIVES

The Board and Council are considering revisions to the existing FMP goals and objectives for bluefish through this amendment. The no action/status quo option keeps the existing FMP goals and objectives that were developed in 1991. The proposed FMP goals and objectives include revisions based on input provided by the public, bluefish advisory panel members, and Board and Council members.

While these revisions are not included as an explicit alternative within this amendment, the proposed revisions are not final until approved by the Council and Board. The Council and Board are seeking feedback from the public on the proposed revisions during the public hearing process.

2.5.1 Current Fishery Management Plan Goals and Objectives

Goal: Conserve the bluefish resource along the Atlantic coast.

Objective 1: Increase understanding of the stock and of the fishery.

Objective 2: Provide the highest availability of bluefish to U.S. fishermen while maintaining, within limits, traditional uses of bluefish.

Objective 3: Provide for cooperation among the coastal states, the various regional marine fishery management councils, and federal agencies involved along the coast to enhance the management of bluefish throughout its range.
Objective 4: Prevent recruitment overfishing.
Objective 5: Reduce the waste in both the commercial and recreational fisheries.

2.5.2 Proposed Fishery Management Plan Goals and Objectives

Goal 1: Conserve the bluefish resource through stakeholder engagement to maintain sustainable recreational fishing and commercial harvest.

Objective 1.1: Achieve and maintain a sustainable spawning stock biomass and rate of fishing mortality.
Objective 1.2: Promote practices that reduce discard mortality within the recreational and commercial fishery.
Objective 1.3: Maintain effective coordination between the National Marine Fisheries Service, Council, and Commission and its member states by promoting compliance and to support the development and implementation of management measures.
Objective 1.4: Promote compliance and effective enforcement of regulations.
Objective 1.5: Promote science, monitoring, and data collection that support and enhance effective ecosystem-based management of the bluefish resource.

Goal 2: Provide fair and equitable access to the fishery across all user groups throughout the management unit.

Objective 2.1: Ensure the implementation of management measures provides fair and equitable access to the resource across to all groups along the coast.
Objective 2.2: Consider the economic and social needs and priorities of all groups that access the bluefish resource in the development of new management measures.
Objective 2.3: Maintain effective coordination with stakeholder groups to ensure optimization of economic and social benefits.

3.0 MONITORING PROGRAM SPECIFICATION

In order to achieve the goals and objectives of this Amendment, the collection and maintenance of quality data is necessary. All state fishery management agencies were encouraged to pursue full implementation of the standards of the Atlantic Coastal Cooperative Statistics Program (ACCSP).

3.1 COMMERCIAL CATCH AND LANDINGS PROGRAM

The reporting requirements for the bluefish commercial fishery are specified by two general permit types: 1) state issued commercial permits and 2) federal commercial permits. State commercial permits are issued to individuals, with qualification and reporting requirements varying by state. Weekly landings information including species landed by gear and state are submitted by the Atlantic coastal states through the Standard Atlantic Fisheries Information System (SAFIS). Landings information assembled in the SAFIS database include both state and

federal landings data. ACCSP's standard for commercial catch and effort statistics requires mandatory, trip-level reporting of all commercial harvested marine species, with fishermen and/or dealers required to report standardized data elements for each trip by the 10th of each month. For federal permit holders, commercial landings information is collected from VTRs monthly and are submitted 15 days after the end of the reporting month. Discards are estimated from the NEFSC observer program, and, if needed, from the VTR data. The NEFSC weigh out program provides commercial age and length information.

3.2 RECREATIONAL FISHERY CATCH REPORTING PROCESS

MRIP provides estimated bluefish catch from 1981-2019. Recreational catch was previously collected through the MRFSS, which was a recreational data collection program used from 1981-2003. The MRFSS program was replaced by MRIP in 2004 and was designed to provide more accurate and timely reporting as well as greater spatial coverage. The MRFSS and MRIP programs were simultaneously conducted in 2004-2006 and this information was used to calibrate past MRFSS recreational harvest estimates against MRIP recreational harvest estimates.

In 2018, MRIP implemented the Fishing Effort Survey (FES) which used an improved methodology to address several concerns with the prior Coastal Household Telephone Survey. These concerns included under-coverage of the angling public, declining number of households with landline telephones, reduced response rates, and memory recall issues. Past estimates have been recalibrated to the FES. This calibration resulted in a much higher recreational catch estimates compared to previous estimates.

Recreational bluefish catch were downloaded from http://www.st.NOAA Fisheries.noaa.gov/st1/recreational/queries/index.html using the query option.

An online description of MRIP survey methods can be found here: http://www.st.NOAA Fisheries.noaa.gov/recreational-Fisheries/index#meth

3.3 SOCIAL AND ECONOMIC COLLECTION PROGRAMS

Data on a number of variables relevant to social and economic dimensions of bluefish fisheries are collected through existing ACCSP data collection programs and MRIP; however, no explicit mandates to collect socioeconomic data for this species currently exist. In addition to landed quantities, commercial harvesters and dealers may report ex-vessel prices or value, fishing and landing locations, landing disposition, and a variety of measures capturing fishing effort. MRIP regularly collects information on recreational fishing effort and landings, and occasionally gathers socioeconomic data on angler motivations and expenditures.

3.4 BIOLOGICAL DATA COLLECTION PROGRAMS

3.4.1 Fishery-Dependent Data Collection

Addendum I to Amendment 1 implemented a biological monitoring program to enhance age and length data used in bluefish stock assessments. Under Addendum I, states that account for

more than 4% of total coastwide removals (sum of recreational and commercial landings and dead discards) for the 2010-2019 period are required to collect a minimum of 100 bluefish ages with a target of collecting 50 from January through June and 50 from July through December. Those states are Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, North Carolina, and Florida. Age samples are primarily collected from fishery-dependent sources (e.g., party/charter boats, fishing tournaments and volunteer anglers), although samples collected from fishery-independent sources are sometimes utilized as needed to fulfill this requirement.

3.4.2 Observer Program

As a condition of state and/or federal permitting, many vessels are required to carry at-sea observers when requested. A minimum set of standard data elements are to be collected through the ACCSP at-sea observer program (refer to the ACCSP Program Design document for details). Specific fisheries priorities will be determined by the Discard/Release Prioritization Committee of ACCSP.

3.4.3 Fishery-Independent Data Collection

Many states, Northeast Fisheries Science Center (NEFSC) National Marine Fisheries Service (NMFS), the Northeast Area Monitoring and Assessment Program (NEAMAP), and the Southeast Area Monitoring and Assessment Program (SEAMAP) conduct fishery-independent surveys. New Hampshire, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and South Carolina (SEAMAP) provide indices of juvenile bluefish abundance for stock assessment, and Connecticut, New Jersey, Virginia (NEAMAP), and North Carolina provide indices of adult abundance. Although not included in the 2019 operational assessment, Massachusetts, Delaware, Georgia and Florida also maintain indices of abundance from surveys that encounter bluefish. In addition, Rhode Island, Connecticut, and New Jersey collect release length data from voluntary angler surveys that help to characterize the length frequency distribution of recreationally released fish.

4.0 MANAGEMENT PROGRAM

Several aspects of the Bluefish FMP are subject to Board and Council review in the amendment. Six issues are specified below to allow for public comment and Board and Council decisions on these issues.

4.1 COMMERCIAL AND RECREATIONAL ALLOCATION ALTERNATIVES AND IMPACTS

Section 4.1.1 describes the alternatives for commercial and recreational allocations for bluefish, and *Section 4.1.2* describes the expected impacts. The range of allocation alternatives includes options that would maintain the current allocations, as well as options to revise allocations based on updated data using modified base years. *Section 4.1.3* describes options to phase in any allocation changes over multiple years, and the expected impacts of these phase-in provisions are discussed in *Section 4.1.4.*

Under the current FMP for bluefish, the Acceptable Biological Catch (ABC) equals the fishery level ACL, which is then divided into a commercial and recreational Annual Catch Target (ACT) based on the allocation percentages defined in the FMP. Sector-specific expected discards are subtracted from the sector-specific ACTs to derive a commercial quota and a RHL.

Commercial discards are considered negligible within the bluefish fishery (NEFSC 2015). Recreational discards are estimates based on the MRIP B2s (released alive). Managers assume a 15% mortality rate on the released alive fish (NEFSC 2015). The number of fish are converted to weight by multiplying by the average weight of landed fish coastwide in a given year. This approach assumes that the weight of released fish is equal to the weight of landed fish.

Aside from the status quo option (alternative 2a-1), the following approaches revise the allocation percentages based on modified base years or different data sets.

4.1.1 Commercial/Recreational Allocation Alternatives

Table 12 lists the alternatives under consideration for the commercial and recreational bluefish allocation percentages based on both catch and landings data. The current allocations for bluefish are based on commercial and recreational landings data from 1981-1989 that have not been updated with a renewed understanding of historic fishery performance. The current allocations for bluefish are represented by the no action/status quo alternative (alternative 2a-1, highlighted in green in Table 12).

Table 12: Bluefish commercial/recreational allocation alternatives. The current allocations are highlighted in green.

Allocation Percentages	
Alternative	**Basis**
2a-1: 83% recreational, **17%** commercial	No action/status quo (1981-1989 landings data)
2a-2: 89% recreational, **11%** commercial	Multiple approaches: 2014-2018 and 2009-2018 catch data
2a-3: 87% recreational, **13%** commercial	1999-2018 catch data
2a-4: 86% recreational, **14%** commercial	Multiple approaches: 1981-2018 catch data; 2014-2018 and 2009-2018 landings data
2a-5: 84% recreational, **16%** commercial	Multiple approaches: 1981-2018 and 1999-2018 landings data

4.1.2 Impacts of Commercial/Recreational Allocation Alternatives

Alternatives 2a-2 through 2a-5 result in lower commercial allocations and higher recreational allocations compared to the no action/status quo alternative (2a-1).

Table **13** compares the commercial and recreational allocation alternatives by displaying the percent change in allocation share from the status quo alternative. The relative percent change to each sector's allocation differs notably. Since the commercial sector's share of the fishery-

level ACL is much smaller by comparison to the recreational sector's share, any changes to the allocation percentages have a larger impact on the commercial sector relative to the impact on the recreational sector.

Table 13: Percent change (in green and red) of commercial and recreational allocations for each alternative relative to status quo. The grey boxes refer to the status quo alternative.

Alternative	2a-1	2a-2	2a-3	2a-4	2a-5
Proposed Recreational Allocation	83%	89%	87%	86%	84%
% Change from Status Quo	0%	+7%	+5%	+4%	+1%
Proposed Commercial Allocation	17%	11%	13%	14%	16%
% Change from Status Quo	0%	-35%	-24%	-18%	-6%

An increase in the recreational allocation would result in increased RHLs compared to the current allocations. RHLs are tied to recreational measures such as possession limits, fish size restrictions, and open/closed seasons. These measures are adjusted as needed to allow the RHL to be achieved, but not exceeded. Depending on the magnitude of the increase, an increased recreational allocation may not allow for liberalized recreational management measures compared to recent years in all cases. In some cases, recreational restrictions may still be needed if the allocation increase is not enough to account for recent increases in the MRIP harvest estimates.

Liberalizing or restricting recreational measures can impact angler access to bluefish. Increased access could take the form of more fish to take home (under higher possession limits and/or lower minimum fish sizes) and more opportunities to target the species (under longer open seasons), while decreased access could mean the ability to retain fewer fish and reduced opportunities to target the species. This can affect angler satisfaction, revenues for for-hire businesses (e.g., by impacting demand for for-hire trips), and revenues for support businesses such as bait and tackle shops.

With respect to the commercial sector, alternatives other than status quo will result in lower quotas relative to status quo with impacts described below.

Social Impacts

Alternative 2a-1 is anticipated to have positive social impacts for commercial stakeholders in general due in part to the support for the status quo from written and oral comments received during the amendment scoping process. The plurality of comments (41%) supported the status quo on Issue 2: Commercial/Recreational Allocation (MAFMC et al 2020). Moreover, the majority of commercial crew surveyed in both the 2012 and 2018 Crew Surveys reported that the rules and regulations change so quickly that it can be hard to keep up. While these results are not necessarily representative of bluefish commercial crew in general, they do align with

the overall sentiment supporting the status quo among those who provided comment during the scoping process.

Alternative 2a-2 would increase the recreational fishery allocation by 6 percentage points and reduce the commercial allocation by the same amount using 2014-2018 and 2009-2018 catch data. Results from the Commercial Crew Survey indicate that the majority of crew and hired captains believe the rules and regulations in their respective commercial fisheries are too restrictive. An increase in allocation to the recreational sector could allow for a liberalization of measures, potentially providing positive social impacts. Further reducing the commercial allocation could lead to negative impacts with respect to commercial fishers' attitudes towards management, as well as detrimental impacts on the ability of some fishers to continue to participate in the fishery. According to the Social Performance Indicators[4], the five most highly engaged communities in the commercial bluefish fishery from 2009 to 2019 are: 1) Wanchese, NC; 2) Montauk, NY; 3) Narragansett/Point Judith, RI; 4) Hampton Bays/Shinnecock, NY; and 5) New Bedford, MA (Figure 10). For commercial bluefish stakeholders located in these ports, the reduction in allocation to the commercial fishery may have the most substantial negative social impacts.

Relative to the status quo alternative, alternative 2a-2 would have positive impacts for recreational user groups, and in particular for those groups in communities that are highly engaged in and reliant upon recreational fisheries. The top fifteen communities in recreational fishing engagement and reliance are displayed in Figure 9 and Figure 11. Please note that the recreational fishing engagement and reliance scores are not bluefish specific, the metrics were based off of fishing engagement and reliance for all recreational species. For a more thorough introduction of community fishing engagement and social vulnerability indicators please reference Appendix A.

These communities are likely to benefit from Alternative 2a-2, but some may see greater positive social impacts based on relative social vulnerabilities and reliance on the recreational industry. Communities in NC in particularly, such as Topsail Beach, Hatteras, and throughout the Outer Banks, have high reliance on recreational fisheries while at the same time moderate to high poverty, labor force vulnerability, and housing vulnerability. Increasing recreational allocations for bluefish could improve economic opportunities and result in positive social outcomes for these communities in particular.

Alternative 2a-3 proposes to set the recreational allocation at 87% and adjust the commercial allocation down to 13%, based on the 1999 to 2018 catch data. Under alternative 2a-4, the recreational allocation would be set to 86% and the commercial allocation would be 14%, based on multiple approaches including 1981-2018 catch data, 2014-2018 landings data, and 2009-2018 landings data. The commercial and recreational impacts described for alternative 2a-2 likely apply to a lesser degree to alternatives 2a-3 and 2a-4 considering that the shifts in

[4] https://apps-nefsc.fisheries.noaa.gov/socialsci/pm/index.php.

allocation from the commercial to the recreational sector are smaller than what is proposed in alternative 2a-2.

Under alternative 2a-5, the recreational allocation would increase slightly from the status quo to 84% and the commercial allocation would correspondingly decrease slightly to 16%. These allocation determinations would be based on multiple approaches using the 1981-2018 and 1999-2018 landings data. Alternative 2a-5 is expected to have neutral to low positive social impacts on the recreational bluefish fishery relative to the status quo, whereas 2a-5 would likely produce neutral to low negative impacts on the commercial fishery as compared to the status quo. While the allocations would change, the increases and decreases for each user group are comparatively minimal to alternatives 2a-2, 2a-3, or 2a-4.

At the community level, impacts may be greatest for communities with or near recreational fishing sites, communities where for-hire businesses are based, and communities with tourism that is impacted by recreational fishing.

Economic Impacts

Aside from the no action/status quo alternatives, all alternatives result in a reduced allocation to the commercial sector, which is expected to decrease commercial quotas compared to the current allocations. The commercial sector could experience a loss in revenue due to corresponding decreased quotas and a reduction in potential landings of bluefish. However, with the exception of 2020, the commercial sector has not fully utilized its post transfer quota in over a decade, so a decrease in allocation may not necessarily lead to a decrease in commercial landings or revenues in the long term. The economic analysis discussed below looks at historical landings to inform the potential future economic impacts of a reduction in the commercial allocation.

The economic impacts stemming from alterations in the commercial pre-transfer bluefish allocations were assessed using historical realized and predicted bluefish landings for the commercial sector. The time series used spans from 1999-2019[5] where realized landings are compared to pre-transfer landings across the various proposed sub-alternatives, allocating 17% (i.e., the status quo), 11%, 13%, 14%, or 16% of the ACL to the commercial sector (sub-components 2a-1 to 2a-5, respectively) (Figure 12). A key assumption of this analysis is that all the allocated quota is landed. When comparing the pre-transfer allocated quota to the total realized landings, there are 14 of 95 cases where the pre-transfer quotas exceed the realized landings quantities. Each allocation sub-alternative (2a-1 to 2a-5) contains at least one year in which the pre-transfer commercial allocation exceeds the realized annual commercial landings, suggesting that in these years, the pre-transfer allocation would not have been a limiting factor in landing bluefish. Ultimately, losses in landings resulting from smaller pre-transfer quota allocations relative to realized landings becomes relevant if transfers from the recreational sector to the commercial sector are discontinued.

[5] Regulations and catch limits for this fishery are not clearly defined until Amendment 1 (approved in 1999). The year of 2019 was the last full year of data on record when this economic assessment was drafted.

Post transfer, projected quotas exceed the realized commercial landings for all alternatives each year except in for 2a-2 and 2a-3 in 2001, 2015 (2a-2 only) and 2016. However, if MRIP recalibration was factored into these years when transfers occurred, the commercial sector may not have actually received any transfers (or the transfers may have been much smaller). Ultimately, if sector transfers are to continue and are not substantially lower than previous years, changes in landings stemming from the pre-sector transfer quota allocations are expected to be minimal.

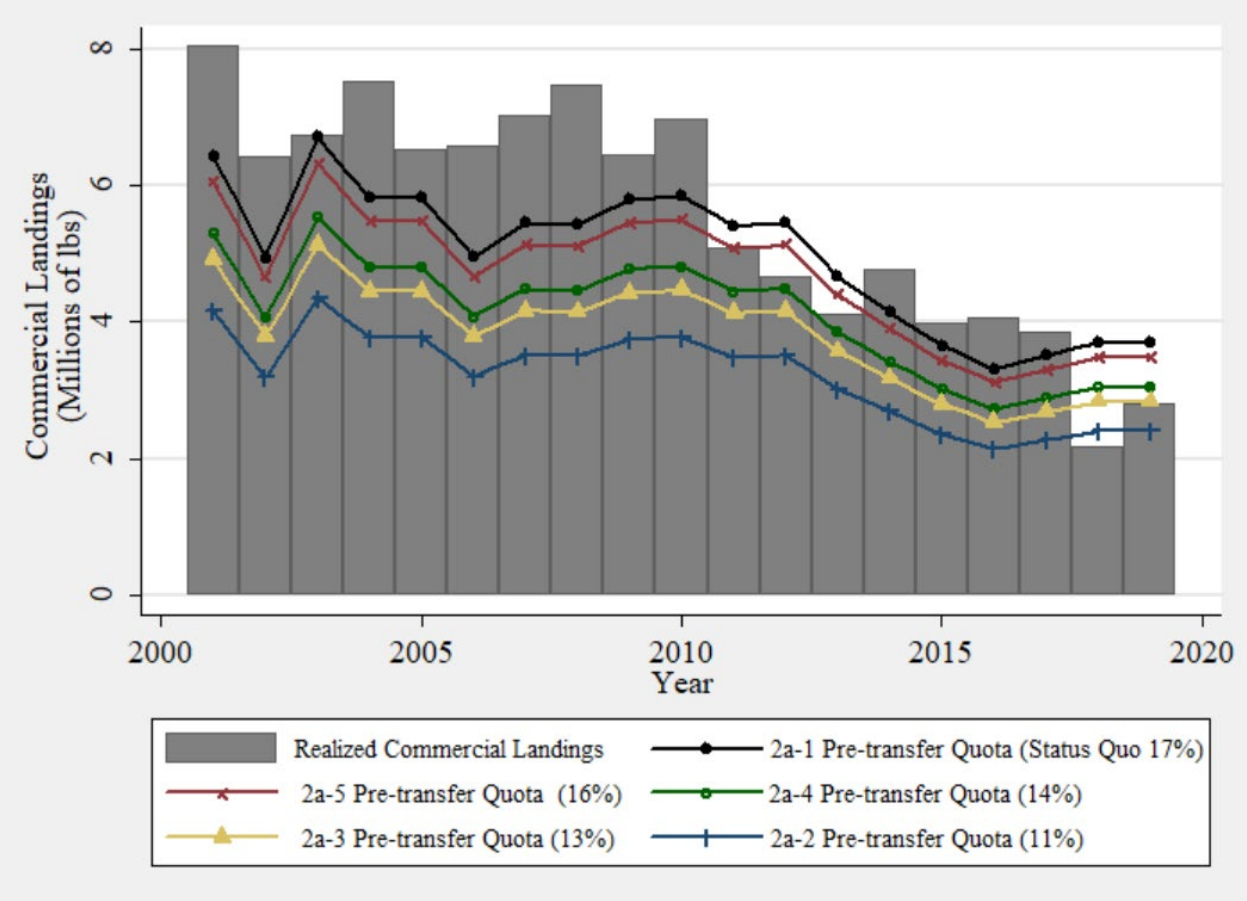


Figure 12: Realized commercial bluefish landings and proposed pre-transfer commercial landings (Millions of lbs.) by sub-allocation alternative and year (2001-2019).

For this analysis, commercial revenues are estimated for allocations under the status quo of pre-transfer quota (i.e.,17% of the ACL) and are compared to revenues estimated under the four additional proposed allocation sub-alternatives (2a-2 – 2a-5, 11%,13%,14%, and 16% of the ACL) to provide insight into how allocation changes could impact revenue. Revenues are estimated using the allocated pre-transfer quota percentage and all quota is assumed to be landed. The price model described in Appendix B is used to generate average annual ex-vessel bluefish prices at the various landings levels. The pre-transfer landings are multiplied by the predicted price and presented in 2020 constant dollars as the estimated revenue. Average differences in revenues between the status quo (17% of the ACL) and the additional proposed

allocation percentages are presented in Table 14. Over 1999-2019, annual revenues decrease by an average of $200K (6%), $590K (18%), $790K (29%) and $1.19M (35%) under the 16%, 14%, 13% and 11% commercial allocations relative to the 17% allocation, respectively. Average differences in annual revenues decrease in magnitude when averaged over the last 10 years and further decrease when compared to the 5-year average annual revenue differences driven by relatively lower historical ABC's from 2010-2019. This analysis is informative in the potential average reduction in revenue that may be experienced under each allocation alternative. However, it is important to remember that this analysis assumes that the entire commercial quota be landed, which may not always be the case, especially when considering that commercial quotas will increase substantially as the stock rebuilds back to the biomass target.

Table 14: Average differences in estimated commercial bluefish revenues by pre-transfer alternative relative to the pre-transfer quota status quo (2a-1 vs. 2a-2-5).

Time Series	Average Differences in Estimated Revenues (Millions of 2020 Constant Dollars)			
	11% Commercial Quota (2a-2) vs 17% Status Quo (2a-1)	**13% Commercial Quota (2a-3) vs 17% Status Quo (2a-1)**	**14% Commercial Quota (2a-4) vs 17% Status Quo (2a-1)**	**16% Commercial Quota (2a-5) vs 17% Status Quo (2a-1)**
Averaged over Entire Time Series (1999-2019) *Standard Deviation*	-$1.19M *0.14*	-$0.79M *0.09*	-$0.59M *0.07*	-$0.20M *0.02*
Averaged over Past 10 Years (2010-2019) *Standard Deviation*	-$1.09M *0.12*	-$0.72M *0.08*	-$0.54M *0.06*	-$0.18M *0.02*
Averaged over Past 5 Years (2015-2019) *Standard Deviation*	-$0.98M *0.03*	-$0.65M *0.02*	-$0.49M *0.01*	-$0.16M *0.00*
Average Percent Decrease Relative to Annual Status Quo Revenues (1999-2019)	35%	24%	18%	6%

Note: This calculation does not consider transfers from the recreational sector and is based solely on the full utilization of the pre-transfer quota.

Impacts from a reduction in commercial quota will not be uniform across all states and commercial industry participants. Commercial fishermen from states that fully utilize quota are more likely to experience losses in revenue, restrictive trip limits, and seasonal closures to account for the reduced commercial quota. States that have historically underutilized their quota may still be impacted in the medium- to long-term; reduced access to quota may inhibit the ability for market expansion in the future. These states could also be impacted in the near-term depending on the magnitude of allocation reduction. If the commercial allocation is

reduced substantially, quotas in some states may drop below what is currently being utilized. Again, the impacts across states are also dependent upon the state commercial allocation alternative selected in *Section 4.2.*

Ultimately, alternatives 2a-2 through 2a-5 may limit the potential for market expansion and future increases in landings and ex-vessel revenue compared to the status quo alternative (2a-1).

Currently, accountability measures (AM)[6] are implemented when the fishery-level ACL is exceeded, and a transfer was deemed not the cause of the overage. When there has been a sector transfer to the commercial fishery that is larger than the overage, there will be no transfer allowed in the following fishing year unless the transfer amount is smaller than the overage. However, given the bluefish stock is currently overfished, a combination of management measures and a pound for pound payback may be implemented.

Under *Section 4.5*, management uncertainty is discussed. If alternative 6b is selected, which creates sector-specific ACLs, AMs will be modified to ensure overages by one sector do not affect the other sector, unless a transfer has occurred and was the cause of an overage.

It is difficult to identify and quantify the economic impacts stemming from increases in recreational bluefish quota. Without a demand model, it is impossible to estimate the changes in angler effort and expenditures resulting from quota increases. Qualitatively, increases in recreational bluefish quota is expected to have neutral or slightly positive economic impacts which may result from increases in recreational sector quota. Increases in bag limits might increase angler satisfaction as well as recreational for-hire and independent angler trips which would result in increased expenditures and effort. However, the economic impacts resulting from increases in recreational quota could be neutral given the high catch and release nature of the sector—where the same number of trips may occur despite the changes in quota.

Biological Impacts

As described above, all but the no action/status quo alternatives would reduce the commercial allocations, which would in turn result in lower commercial quotas than the no action/status quo alternatives.

Depending on the scale of the change, a decrease in the commercial quota or additional restrictions on the recreational fishery could lead to altered fishing behavior and increased regulatory discards compared to recent levels. Actual changes will depend on many factors such as weather, availability of other target species, and market demand. Discards are also influenced by availability of bluefish, both overall abundance and by size class. For example, a new large year class can lead to high availability of fish smaller than some states' minimum size for a few years, which can lead to increased regulatory discards. Lower availability of legal-sized

[6] Current accountability measures for bluefish can be found in Amendment 4: Bluefish Accountability Measures.

fish can lead to decreased discards. For these reasons, it is challenging to predict future discards based on changes in allocations.

In all cases, total dead catch will continue to be constrained by the overall ABC, which is set based on the best scientific information available and is intended to prevent overfishing. In this way, none of the alternatives are expected to change patterns in landings, discards, or fishing effort in such a way that they negatively impact stock status.

In 2019, the operational stock assessment indicated that the bluefish stock was at 46% of the biomass target level. The stock will begin a rebuilding program in 2022 with the goal of reaching the biomass target within ten years or less.

4.1.3 Allocation Change Phase-in Alternatives

The alternatives listed in Table 15 consider if any changes to the allocation percentages considered through alternative sets 2a should occur in a single year (alternative 2b-1, no phase-in) or if the change should be spread out over 4, 5, or 7 years (alternatives 2b-2). The Council and Board agreed that if alternative 2b-2 is selected, the duration over which new allocations will be phased in will match the duration of the selected rebuilding plan (alternatives 4a-4d). The choice of whether to use a phase-in approach, and the phase-in approach duration, may depend on the magnitude of allocation change proposed. *A phase-in period may not be desired if the overall allocation change is relatively small.* However, larger allocation changes may be less disruptive to fishing communities if they are phased in over several years (Table 16).

Table 15: Bluefish commercial/recreational allocation change phase-in alternatives.

Phase-in Alternatives
2b-1: No phase-in
2b-2: Allocation change spread evenly over the same duration as the selected rebuilding plan

Table 16: Percent shift in bluefish commercial/recreational allocation per year for 4, 5, and 7-year phase-in options for all allocation change alternatives.

Bluefish Allocation Change Phase-In			
Current allocation (2a-1): 83% recreational, 17% commercial			
Allocation Alternatives	**4-year phase-in**	**5-year phase-in**	**7-year phase-in**
2a-2: 89% Rec., **11%** Comm.	**1.5%** change per year	**1.2%** change per year	**0.86%** change per year
2a-3: 87% Rec., **13%** Comm.	**1%** change per year	**0.8%** change per year	**0.57%** change per year
2a-4: 86% Rec., **14%** Comm.	**0.75%** change per year	**0.6%** change per year	**0.43%** change per year
2a-5: 84% Rec., **16%** Comm.	**0.25%** change per year	**0.2%** change per year	**0.14%** change per year

4.1.4 Impacts of Allocation Change Phase-in Alternatives

The biological, social, and economic impacts of the phase-in alternatives under consideration in this amendment are dependent on two main factors: 1) the difference between the status quo allocation percentage and the allocation percentage selected, and 2) the duration of the phase-

in period, which will be the same duration as the preferred rebuilding plan. Based on the range of allocation percentages for bluefish (*Section 4.1.1*), the commercial and recreational sector allocations could shift by as much as 1.5% per year, or as little as 0.2% per year under the above phase-in timeframes of 4-7 years. Ideally, minimal transfers will occur while phasing-in allocations considering reallocation will reflect more up-to-date landings history.

Considering the small range that the phased-in allocations would change over 4-7 years, minimal impacts are expected for the recreational fishery, which already holds the larger share of the ACL. However, a 1.5% shift in allocation away from the commercial sector is a much larger annual impact to the commercial sector relative to its smaller initial allocation. As such, a phase-in approach may slightly reduce the economic burden on commercial stakeholders. A phase-in would most likely have short-term economic benefits in the form of increased landings and revenues over the non-phase in alternative if all else was held constant.

Under Alternative 2b-1, the preferred allocation selected from the 2a set of alternatives will occur in a single year upon implementation. This will likely have a range of social impacts depending upon the alternative selected from the 2a allocation set. Alternative 2b-1 will likely have neutral to low negative impacts on the commercial fishery if alternatives 2a-4 or 2a-5 are selected, but the negative impacts increase substantially if alternatives 2a-2 or 2a-3 are selected due to the abrupt and sizeable change in allocations to the commercial fishery. However, this remains contingent on the continuation of sector transfers and if the transfers decrease in relation to historical transfers given the MRIP update.

By contrast, an abrupt shift from alternative 2b-1 in concert with 2a-2 or 2a-3 could have substantial short-term positive social impacts on the recreational fishery user group. A single year increase of 4-6% in the recreational allocation could provide additional employment and income opportunities, especially in communities most highly engaged in and/or reliant upon recreational fisheries in general (Figure 9 and Figure 11).

Under alternative 2b-2, the new allocation selected from the 2a set of alternatives will be phased in over the period of time that matches the selected rebuilding plan. The phase-in approach of alternative 2b-2 will likely have the most substantial social impacts if alternative 2a-2 is selected, with diminishing impacts across the other alternatives with smaller percent changes in allocations. The 7-year phase-in approach may reduce the negative impacts to the commercial industry the most, with less than a one percent reduction in the commercial allocation per year. For communities that are the most highly engaged in commercial bluefish (Figure 10) a prolonged phase-in approach may buffer against negative social impacts that accompany abrupt employment and income losses that result from the allocation reductions associated with alternatives 2a-2 through 2a-5.

4.2 COMMERCIAL ALLOCATIONS TO THE STATES ALTERNATIVES AND IMPACTS

This section describes alternatives for commercial allocations of bluefish to the states, along with their expected impacts. The range of allocation alternatives includes options that would

maintain the current allocations as well as options to revise them based on updated data using modified base years. Only landings data were used to develop allocation alternatives since commercial discards are considered negligible. *Section 4.2.3* describes options to phase in any allocation changes over multiple years, and the expected impacts of these phase-in provisions. *Section 4.2.5* describes options to implement quota-based triggers that would reallocate any commercial quota that exceeds a specified threshold, and the expected impacts of those trigger provisions. *Section 4.2.7* describes options to implement minimum default allocations, and the expected impacts of these provisions.

The alternatives in *Section 4.2.1* are mutually exclusive, meaning the Council and Board can only choose one of the alternatives from set 3a, 3b, 3c, and 3d. Considering *Section 4.2* contains multiple moving parts, the Fishery Management Action Team (FMAT) recommends that the Council and Board select either a trigger approach or minimum default allocation, but not both. Using too many management tools at once can overcomplicate the process and reduce the benefits associated with just using one approach.

4.2.1 Commercial Allocations to the States Alternatives

Table 17 lists the alternatives under consideration for the bluefish commercial allocations to the states using only landings data since commercial discards are considered negligible. The percent allocations represent the share of coastwide quota that is annually allocated to each state. The current allocations are represented by the no action/status quo alternative (alternative 3a-1, highlighted in green in Table 17), which was set through Amendment 1 using General Canvass Data.

Table 17: State-by-state commercial bluefish allocations along the U.S. Atlantic coast using different proposed time series. Percentages sum to > 100% due to rounding; actual allocations will not exceed 100% of quota.

Landings-Based Allocation Alternatives				
State	3a-1	3a-2	3a-3	3a-4
	No action/ Status quo (1981-1989)	5 year (2014-2018)	10 year (2009-2018)	1/2 '81-'89 1/2 '09-'18
ME	0.67%	0.00%	0.01%	0.49%
NH	0.41%	0.03%	0.12%	0.33%
MA	6.72%	10.64%	10.16%	7.66%
RI	6.81%	11.81%	9.64%	7.59%
CT	1.27%	1.18%	1.00%	1.19%
NY	10.39%	20.31%	19.94%	13.01%
NJ	14.82%	11.23%	13.94%	14.57%
DE	1.88%	0.58%	0.40%	1.47%
MD	3.00%	1.50%	1.84%	2.68%
VA	11.88%	4.62%	5.85%	10.26%
NC	32.06%	32.06%	32.38%	32.13%

SC	0.04%	0.00%	0.00%	0.03%
GA	0.01%	0.00%	0.00%	0.01%
FL	10.06%	6.07%	4.75%	8.59%
Total	**100.02%**	**100.01%**	**100.03%**	**100.00%**

4.2.2 Impacts of Commercial Allocations to the States Alternatives

Under alternative 3a-1, no changes to the commercial allocations would be made, meaning this alternative would result in impacts to the bluefish stock, non-target species, habitat, protected resources, and human communities that are generally similar to conditions in recent years. Bluefish landings and effort would continue to be constrained by the annual quotas and associated management measures. States would continue to be constrained to their existing state allocation, and the distribution of landings by state would remain similar to the generally stable levels observed since allocations were implemented in 2000 (Figure 13). Typically, landings by state as a percentage of coastwide landings do not fluctuate much from year to year since allocations are constant and most states land or come close to landing their quota. Exceptions do occur, as bluefish often display an idiosyncratic nature in movements into deeper waters offshore and up the coast, and states often receive transfers of quota from other states. Commercial landings from ME, NH, SC, and GA are minimal if they occur at all, since directed fisheries for bluefish do not exist in these states. The majority of landings in these states are incidental.

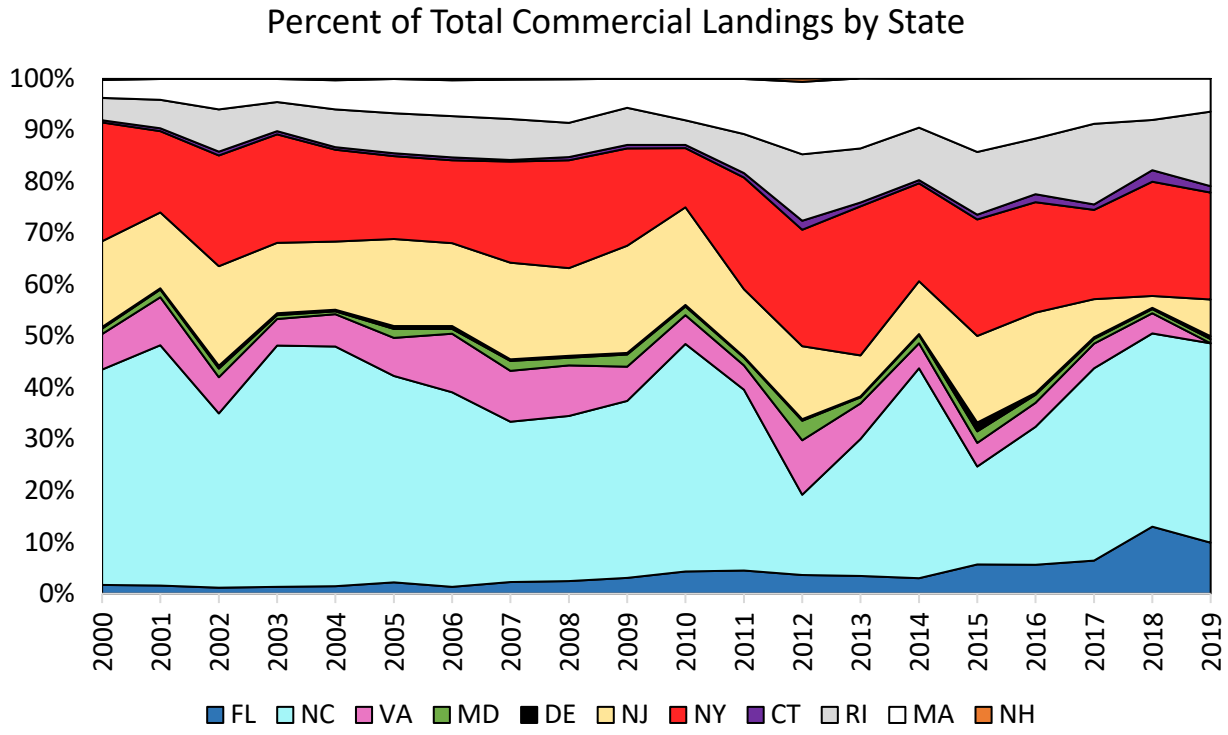


Figure 13: Percentage of coastwide landings by state from 2000-2019 (Atlantic coast excluding ME, SC and GA). ME, SC, and GA each account for less than 0.1% of landings each year.

Alternatives 3a-2 and 3a-3 are both based on recent time series (most recent 5 and 10-year time series, respectively) Therefore, the allocations are relatively similar given both time series reflect more recent landings. In contrast, alternative 3a-4 is based on the average of one recent time series (2009-2018) and one historic time series (1981-1989) to encompass the recent state of the commercial fishery as well as historical fishery performance. In capturing recent and historical fishery performance, the allocations associated with alternative 3a-4 equally weigh both time series resulting in allocations that are closer to the status quo (3a-1) alternative than alternatives 3a-2 and 3a-3. Table 18 displays the four alternatives and the resulting percentage increase (blue) or decrease (red) relative to the current allocations (3a-1) for each state.

Table 18: State-by-state commercial bluefish allocations along the U.S. Atlantic coast including the percent change (negative in red; positive in blue) from status quo for each alternative.

Allocation Alternatives Based on Landings Data							
	3a-1	3a-2		3a-3		3a-4	
State	Status quo (1981-1989)	5 year (2014-2018)		10 year (2009-2018)		1/2 '81-'89 1/2 '09-'18	
ME	0.67%	0.00%	-100%	0.01%	-99%	0.49%	-27%
NH	0.41%	0.03%	-93%	0.12%	-71%	0.33%	-20%
MA	6.72%	10.64%	58%	10.16%	51%	7.66%	14%
RI	6.81%	11.81%	73%	9.64%	42%	7.59%	11%
CT	1.27%	1.18%	-7%	1.00%	-21%	1.19%	-6%
NY	10.39%	20.31%	95%	19.94%	92%	13.01%	25%
NJ	14.82%	11.23%	-24%	13.94%	-6%	14.57%	-2%
DE	1.88%	0.58%	-69%	0.40%	-79%	1.47%	-22%
MD	3.00%	1.50%	-50%	1.84%	-39%	2.68%	-11%
VA	11.88%	4.62%	-61%	5.85%	-51%	10.26%	-14%
NC	32.06%	32.06%	0%	32.38%	1%	32.13%	0%
SC	0.04%	0.00%	-100%	0.00%	-100%	0.03%	-25%
GA	0.01%	0.00%	-100%	0.00%	-100%	0.01%	-0%
FL	10.06%	6.07%	-40%	4.75%	-53%	8.59%	-15%
Total	100.02%	100.01%[7]		100.03%		100.00%	

Social Impacts

The socioeconomic impacts of the existing allocations vary from state to state. Some states report negative economic impacts associated with current allocations due to a mismatch between their current allocation and their fishery capacity and/or bluefish availability in their waters. Commercial fishermen that land bluefish within a state that consistently harvests less than its quota have the benefit of operating within an unconstrained fishery. Future fluctuations in stock size are less likely to restrict fishing effort and mitigate revenue losses

[7] Some percentages exceed 100% due to rounding but will be adjusted by the regional office upon implementation.

within that state. Each state manages their fishery differently in terms of total number of participants, trip limits, seasons, and other measures. A restriction in one or more of these measures is the driver of the social and economic impacts to industry participants. For example, a restriction in the daily trip limit will likely have an outsized impact on larger vessels compared to smaller vessels which may already harvest bluefish under the newly imposed daily trip limit.

The proposed allocation alternatives incorporate more recent data that are reflective of current state-specific performance and have the potential to increase economic efficiency. Nonetheless, any reduction in allocation may limit a state's potential for market expansion and future increases in landings and ex-vessel revenue compared to the no action alternative. Revenue is also variable in nature and is influenced by fluctuations in costs and prices.

Under alternative 3a-1, impacts are likely negative for commercial fishery stakeholders located in states with smaller proportions of allocations relative to what commercial stakeholders believe should be their states' allocations. The submitted scoping comments were divided roughly in half, with 52% of commenters supporting status quo and 48% in favor of altering the commercial allocations to the states. Among the commercial stakeholders who submitted comments opposed to altering the state allocations were those from NJ (and other states where reductions would take place) who were opposed to reductions in the NJ allocation. Others supported the status quo so long as flexibility remained to transfer quotas between states when necessary. On the other hand, roughly half of the submitted comments were in favor of revisiting state commercial allocations.

Alternative 3a-2 would set allocations using a five-year time series of landings data (2014-2018). MA, RI, and NY would see the most substantial increases in allocations using this approach, whereas NJ, VA, and FL would see the largest reductions in commercial allocations under this approach. NY has two of the top five (Montauk and Hampton Bays/Shinnecock) and four of the fifteen most highly engaged communities in the commercial bluefish fishery (Figure 11). Relative to status quo, alternative 3a-2 would likely result in positive social impacts for these NY communities given the substantial increase in allocations to the state. While FL and VA do not have any communities among the top fifteen in commercial bluefish engagement, four of the fifteen highest in engagement are located in NJ. Therefore, while FL and VA may not experience substantial negative impacts from the reductions in commercial allocations, NJ communities and user groups will likely experience negative social impacts from alternative 3a-2.

Under alternative 3a-3, a 10-year time series of landings data would inform the distribution of state allocations of commercial bluefish. This scenario would increase the allocations for RI (~3%), MA (~3%), and NY (~9%) considerably, but reduce allocations for VA and FL by a similarly substantial amount (~6%). Unlike alternative 3a-2, however, this alternative would only reduce the NJ allocation by less than one percent. Relative to the status quo, alternative 3a-3 would likely result in positive social impacts for commercial stakeholders in MA, RI, and NY, while at the same time limiting the negative impacts of reducing the allocation to NJ. As discussed under alternative 3a-2, communities in FL and VA do not feature among the most highly engaged in

commercial bluefish activity (Figure 11), whereas MA, RI, NY, and NJ all have several communities with relatively high engagement in commercial bluefish fishery activities. Alternative 3a-3 provides relative benefits to most of the north Mid-Atlantic and New England user groups without affecting stakeholders in NJ as dramatically as alternative 3a-2. Under alternative 3a-4, state allocations would be redistributed based partially on landings data from the 1981-1989 time series and partially on the 2009-2018 time series. This approach provides the most limited change in state allocations among other alternatives to the status quo. Northern states such as MA, RI, and NY would see modest increases in allocations (under 3%), while southern states such as NJ, VA, and FL would only see minor decreases in allocations (~2% or less). Alternative 3a-4 would likely result in neutral to low positive social impacts for the northern states and neutral to low negative impacts for the southern states relative to the status quo alternative. Among all state allocation alternatives, alternative 3a-4 would likely produce the least impactful changes to the social factors among commercial bluefish fishery stakeholders and communities.

Economic Impacts

The current state-level commercial allocations consider landings data from 1981-1989. Through transfers, states which predict to land bluefish quantities above their allocated quota can request additional quota from states which are not expected to land their allocation. This transfer increases the requesting state's landings and revenues, overall. In addition, no incentives are given to the state transferring out quota. In theory, this transaction could be classified as a Pareto improvement, where the transfer of quota does not negatively impact either participating party. Given that these state-to-state transfer channels exist, the economic impacts of the proposed reallocations at the state-level are expected to be marginal during years of higher bluefish population levels given that 1) allocations are based on realized landings/catch data and 2) states can transfer quota depending on their predicted performance in any given year. However, in years when the coastwide commercial quota is low resulting from an overfished stock, there may not be a sufficient number of states with additional quota available to cover other states' needs. During these years, states with a small allocation relative to their share of recent coastwide landings are likely to be negatively impacted the most. In addition, there is opportunity cost in the form of time and effort associated with transfers. There is a decrease in economic efficiency linked with the processing and approving of transfer requests. If transfers continue, the maximum economic benefits are associated with the reallocation plan which accurately captures each states' quota needs and minimizes the need for quota transfers.

To highlight how each allocation alternative relates to decreases in state quota transfers, both realized landings and average reallocation quantities by sub-alternative are depicted in Figure 14. Here, the distribution of each state's annual bluefish landings are summarized by box and whisker plots. The interquartile range of state-level bluefish landings are portrayed by the gray boxes and the whiskers, which indicate the maximum and minimum annual bluefish landing

quantity for each state from 1999-2019.[8] Average annual allocations are calculated using the percentages presented in 3a-1 to 3a-4 which include the status quo of allocations determined using the 1981-1989 time series of landings data, allocations based on the previous five years of state landings, allocations based on landings from the previous 10 years, and allocations based on landings from 1981-89 and 2009-18. State allocations by sub-alternative are calculated using the historical commercial sector quota and each allocation plan's corresponding quota percentage from 1999-2019. The average allocations by state and plan are plotted against realized bluefish landings for comparison.

There is no consistent trend in impacts stemming from each reallocation sub-alternative when compared across states. For example, under status-quo, quota allocations for FL would be much greater than the state's median landings value (above the state's maximum annual landings value); however, for NY, quota allocated under the status quo alternative would be much less than the state's median realized landings. When comparing which sub-alternative is closest in value to the median realized landings of each state, plan 3a-3 (ten-year) performs the best, with landings predictions closest to 38% of state median landings values and furthest from only 8% of state median landings.[9] The 3a-2 plan (five-year) is second in performance based on this metric, which is closest to the median landings for 31% of states but furthest from the median value for 25% of states. The status quo (3a-1) plan had average allocations most similar to the median landings values for 23% of states but is furthest from the median landings value for 67% of states. Lastly, 3a-4 (1989-91 & 2009-18 based allocations) is nearest to 8% of state median landings values but furthest from the median value of 0% of the states. It should be reiterated that landings and revenues may not be impacted by the state-level reallocations if transfer requests continue to be issued and approved. However, by determining the plan which best predicts state landings, the need for transfers will decrease—increasing efficiency within the commercial sector. A slight economic advantage is expected for states which are allocated quota above their historic median landings value, as these states will have the ability to land above their expected median landings without requesting additional quota from another state, while states which are allocated a quota slightly below their annual median may need to request quota on an annual basis.

[8] The 1999-2019 time series is used to show how the proposed allocations align with realized landings over the past two decades.

[9] This analysis excludes Georgia and South Carolina because each plan had an equal average allocation estimate.

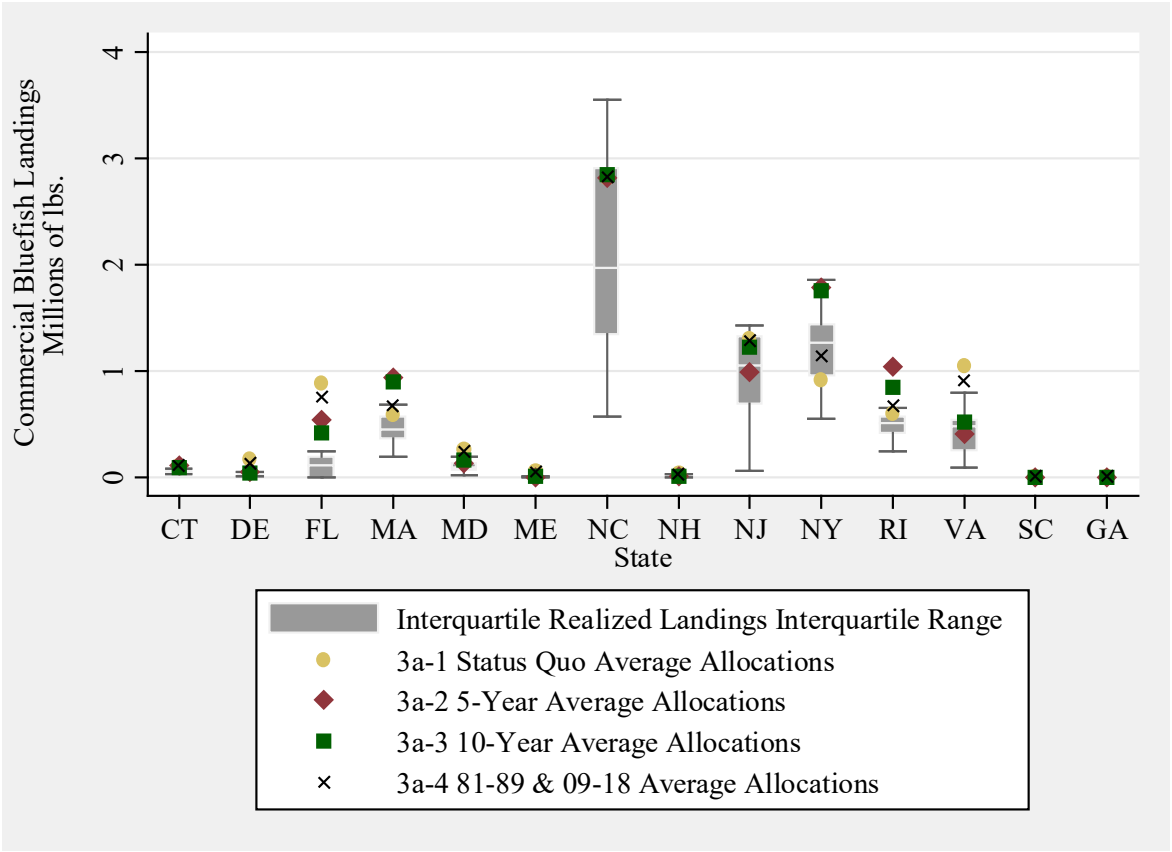


Figure 14: Realized annual commercial bluefish landings box and whisker plots (1999-2019) and average annual allocations (1999-2019) by proposed state-level allocation sub-alternative by state. Median landings represented by white horizontal line within box and whisker.

Biological Impacts

Currently, bluefish discards in the commercial fishery are considered negligible. Depending on the scale of the allocation change, a decrease in the commercial quota or additional restrictions on the commercial fishery could lead to increased regulatory discards compared to recent levels. Actual changes in discards will depend on many factors such as fishing behavior, weather, availability of other target species, and market demand. Discards are also influenced by availability of bluefish, both overall abundance and by size class. Therefore, it is challenging to predict future discards based on changes in allocations.

4.2.3 Commercial Allocation Change Phase-In Alternatives

The alternatives listed in

Table **19** consider if any changes to the allocation percentages considered through alternative set 3a should occur in a single year (alternative 3b-1, no phase-in) or if the change should be spread out over 4, 5, or 7 years (alternative 3b-2). The Council and Board agreed that if alternative 3b-2 is selected, the duration over which new allocations will be phased in will match the duration of the selected rebuilding plan (*Section 4.3*). The choice of whether to use a

phase-in approach may depend on the magnitude of allocation change proposed. Larger allocation changes may be less disruptive to fishing communities if they are phased in over several years as identified by the percent point change (Table 20).

Table 19: Bluefish state commercial allocation change phase-in alternatives

Phase-in Alternatives
3b-1: No phase-in
3b-2: Allocation change spread evenly over the same duration as the selected rebuilding plan

Table 20: Percentage point shifts in bluefish state commercial allocation per year for 4, 5, and 7-year phase-in options for all allocation change alternatives

		5 year (2014-2018) See 3a-2			**10 year (2009-2018)** See 3a-3			**1/2 '81-'89 1/2 '09-'18** See 3a-4		
State	**Current Allocations**	**4-year**	**5-year**	**7-year**	**4-year**	**5-year**	**7-year**	**4-year**	**5-year**	**7-year**
ME	0.67%	-0.17%	-0.13%	-0.10%	-0.17%	-0.13%	-0.09%	-0.05%	-0.04%	-0.03%
NH	0.41%	-0.10%	-0.08%	-0.05%	-0.07%	-0.06%	-0.04%	-0.02%	-0.02%	-0.01%
MA	6.72%	0.98%	0.78%	0.56%	0.86%	0.69%	0.49%	0.23%	0.19%	0.13%
RI	6.81%	1.25%	1.00%	0.71%	0.71%	0.57%	0.40%	0.19%	0.16%	0.11%
CT	1.27%	-0.02%	-0.02%	-0.01%	-0.07%	-0.05%	-0.04%	-0.02%	-0.02%	-0.01%
NY	10.39%	2.48%	1.98%	1.42%	2.39%	1.91%	1.36%	0.65%	0.52%	0.37%
NJ	14.82%	-0.90%	-0.72%	-0.51%	-0.22%	-0.18%	-0.13%	-0.06%	-0.05%	-0.04%
DE	1.88%	-0.33%	-0.26%	-0.19%	-0.37%	-0.30%	-0.21%	-0.10%	-0.08%	-0.06%
MD	3.00%	-0.38%	-0.30%	-0.21%	-0.29%	-0.23%	-0.17%	-0.08%	-0.06%	-0.05%
VA	11.88%	-1.82%	-1.45%	-1.04%	-1.51%	-1.21%	-0.86%	-0.41%	-0.32%	-0.23%
NC	32.06%	0.00%	0.00%	0.00%	0.08%	0.06%	0.05%	0.02%	0.01%	0.01%
SC	0.04%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	<0.01%	<0.01%	<0.01%
GA	0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	0.00%	0.00%	0.00%
FL	10.06%	-1.00%	-0.80%	-0.57%	-1.33%	-1.06%	-0.76%	-0.37%	-0.29%	-0.21%

Section 4.2.5 discusses alternatives related to the trigger approach. The trigger approach requires baseline quotas to determine the allocation of the quota greater than the trigger threshold. By design, the phase-in approach alters each state's baseline quota on a yearly basis, which greatly complicates the calculation of each state's additional quota. The various combinations of phase-in and trigger alternatives would require numerous tables to display each state's allocation for each year during the phase-in period. *As such, examples are not included in this document and the combination of these approaches is not recommended. Section 4.2.7* discusses alternatives related to minimum default allocations. If the Council and Board decide to select both phase-in and a minimum default allocation, the percentage point shifts in Table 20 will be slightly smaller (see Appendix C).

4.2.4 Impacts of Commercial Allocation Change Phase-In Alternatives

The impacts described in *Section 4.1.4* largely apply here to the commercial allocations to the states. The biological, social, and economic impacts of the phase-in alternatives for the commercial allocations to the states under consideration in this amendment are dependent on three main factors: 1) the difference between the status quo allocation percentage and the allocation percentage selected, 2) the duration of the phase-in period, which will be the same duration as the preferred rebuilding plan (*Section 4.3*), and 3) the continuation of state-to-state transfers (*Section 4.4*). Based on the range of allocation percentages in *Section 4.2.1*, the commercial allocations to the states could shift by as much as 2.48 percentage points per year (NY), or as little as 0.01 percentage points (NH, SC, GA) per year under the above phase-in timeframes of 4-7 years. Table 18 (red/blue showing change in *Section 4.2.2*) presents the percent change that would be associated with each alternative.

In summary, under alternative 3b-1, the state allocations selected from among the 3a set of alternatives would occur in a single year upon implementation. The social impacts of alternative 3b-1 will align with whichever 3a alternative is selected for determining the future of state allocations of commercial bluefish.

Under alternative 3b-2, both the positive and negative social impacts discussed in *Section 4.2.2* would still apply, but they would be phased in over time. This could mitigate to an extent the negative social impacts by providing a buffer through smaller percentage changes over time, but also slow the realization of some states' increases in quota and their associated positive social impacts.

4.2.5 Commercial Quota Trigger Alternatives

This alternative set would create state allocations that vary with overall stock abundance and resulting coastwide commercial quotas (

Table **21**). The selection of alternative 3c-1 would implement no trigger, which is consistent with the current FMP. Alternative 3c-2 would implement a trigger level equal to the average of the initial commercial quota for each time series associated with alternative set 3a that do not include transfers from the recreational to commercial fishery. Alternative 3c-3 would implement a trigger level equal to the average of the final commercial quota that includes transfers from the recreational to the commercial fishery. Ultimately, the commercial quota time series selected will correspond with the time series associated with the alternative selected in *Section 4.2.1*.

Please note, no trigger threshold was developed under the status quo state commercial allocations because no formal commercial quotas existed prior to the implementation of Amendment 1 in 2000. As such, the trigger approach is not able to be implemented under status quo commercial allocations to the states (alternative 3a-1).

Table 21: Trigger threshold levels for additional quota allocations.

Commercial Quota Time Series	**No Trigger** Alternative: **3c-1**	**Pre-Transfer** Alternative: **3c-2**	**Post Transfer** Alternative: **3c-3**
No Action/Status quo [3a-1]	No trigger approach implemented	N/A	N/A
5-year (2014-2018) [3a-2]		3.67 M lbs	6.67 M lbs
10-year (2009-2018) [3a-3]		4.31 M lbs	8.21 M lbs
½ 1981-1989 and ½ 2009-2018 [3a-4]		4.31 M lbs*	8.21 M lbs*

*No formal commercial quota existed before the implementation of Amendment 1 in 2000; the average represents the quota for available years only.

For all years when the annual commercial quota is at or below a specified annual commercial quota trigger level, the state allocations would be specified by the selected option from alternative set 3a. In years when the annual coastwide quota exceeds the specified trigger level, quota up to the trigger amount would be distributed according to the chosen allocation alternative from alternative set 3a, and the distribution of quota over the trigger would be set according to the allocations listed in Table 22.

Table 22: Bluefish commercial state allocations applying a trigger threshold for all commercial allocation time series.

Allocation of additional quota greater than the trigger threshold.				
State	**Status quo (1981-1989)**	**5 year (2014-2018)**	**10 year (2009-2018)**	**1/2 '81-'89 1/2 '09-'18**
ME	0.10%	0.10%	0.10%	0.10%
NH	0.10%	0.10%	0.10%	0.10%
MA	7.50%	16.60%	19.60%	7.50%
RI	7.50%	16.60%	7.50%	7.50%
CT	3.00%	3.00%	0.10%	3.00%
NY	15.12%	16.60%	19.60%	17.03%
NJ	15.12%	16.60%	19.60%	17.03%
DE	3.00%	0.10%	0.10%	3.00%
MD	3.00%	3.00%	3.00%	3.00%
VA	15.12%	3.00%	7.50%	17.03%
NC	15.12%	16.60%	19.60%	17.03%
SC	0.10%	0.10%	0.10%	0.10%
GA	0.10%	0.10%	0.10%	0.10%
FL	15.12%	7.50%	3.00%	7.50%
Total	100%	100%	100%	100%

The allocations in Table 22 were developed by using the tiered approach displayed in Table 23 where the baseline quota allocations selected from alternative set 3a determine how the quota greater than the trigger will be allocated to each state. In summary, the trigger threshold level and the associated additional quota allocation are all informed by the time series selected in alternative set 3a.

Table 23: Range of baseline quotas and the associated additional quota allocation once a trigger threshold is surpassed.

Range of Baseline Quota Tiers	Associated Additional Quota Allocations
<=1%	0.10%
>1-5%	3.00%
>5-10%	7.50%
>10%	Remainder

Section 4.2.7 discusses alternatives related to minimum default allocations. If the Council and Board decide to select both a trigger approach and minimum default allocations, the percentages in Table 22 will shift slightly. On occasion, specific state allocations in the proposed time series will cross a threshold into a different percentage of associated additional quota (see Appendix C).

4.2.6 Impacts of Commercial Quota Trigger Alternatives

Between alternatives 3c-2 and 3c-3, the trigger thresholds associated with 3c-2 are more likely to be exceeded given the thresholds are much lower. These thresholds are approximately half those associated with alternative 3c-3 because they account for the commercial quotas prior to incorporating historical transfers from the recreational to commercial fishery. Figure 15 displays the four potential trigger thresholds and the post-transfer commercial quotas as well as total coastwide commercial landings for the years 2000-2018. Both of the potential pre-transfer trigger thresholds associated with alternative 3c-2 would have been exceeded by the commercial quota every year going back to 2000. By comparison, both of the potential post-transfer trigger thresholds associated with alternative 3c-3 would have been exceeded by the commercial quota for every year except 2015 and 2016 when the commercial quota was much lower. The trigger approach only impacts states directly in years when the trigger threshold level is exceeded. Following this logic, the impacts discussed in the economic impacts section are experienced to a greater degree under the lower pre-transfer trigger (3c-2) compared to the higher post-transfer trigger (3c-3).

The trigger approach could also provide additional beneficial social impacts or buffers against negative impacts, for states that are either receiving increased allocations or having allocations reduced. Therefore, alternatives 3c-2 and 3c-3 are likely to have a range of social impacts from neutral to low positive varying state-to-state, depending upon the alternative selected from the 3a set. Ultimately, the impacts are difficult to ascertain because of the number of combinations that can arise under the trigger option. Some states will experience neutral to positive impacts,

others neutral to negative, and those impacts might change when quotas are below the trigger vs above the trigger. In summary, it is difficult to know what the impacts are, and the impacts will depend on other decisions made in this document.

Considering the bluefish FMP will be going through rebuilding starting at the end of this year, the FMAT concluded that it is unlikely the initial ABCs will be large enough to exceed the trigger threshold.

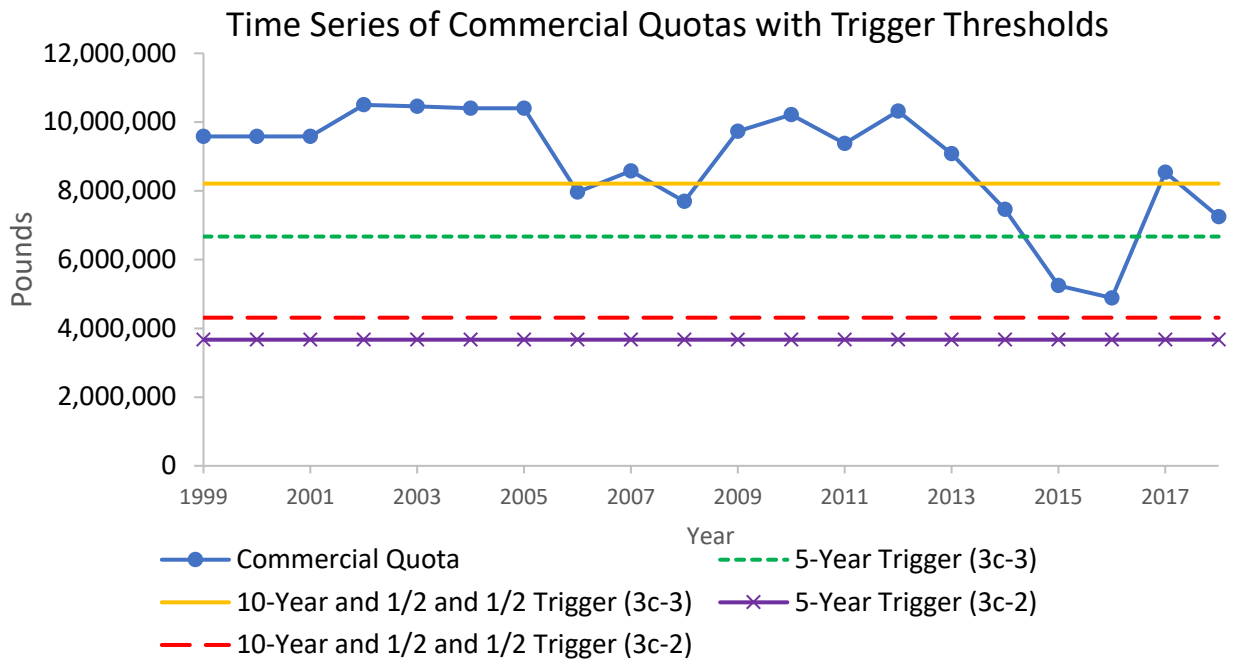


Figure 15: Trigger thresholds for additional quota compared to commercial quotas.

Economic Impacts

Section 4.2.5 would allocate quota differently above a specified pre- or post-transfer threshold (i.e., the trigger) than the allocation method described in *Section 4.2.1* To analyze the economic impacts of this difference in allocation, a commercial quota 100,000 lbs. above both the pre- and post-transfer threshold levels is used.[10] Revenues are calculated at the state-level using allocations under the trigger scheme. The revenues generated from the trigger-allocated quota are compared to revenues generated under a no-trigger allocation scenario across the various commercial sector allocations proposed in *Section 4.2.5* (i.e., 3a-1 through 3a-4). Since ex-vessel bluefish prices are needed at the state-level and a state-level price model has yet to be developed, annual state ex-vessel bluefish prices, averaged over 1996-2019, are used for the calculation of revenues and reported in 2020 constant dollars. One limitation of this analysis is that average state prices omit the inverse relationship between ex-vessel prices and estimated

[10] Average total realized bluefish landings from 1999-2019 equal 5.68 M lbs. which also informs the average price data used calculate revenues. Given that the post-transfer trigger quantities exceed the average realized landings, a minimum overage quantity of 100,000 lbs. was chosen to highlight the possible economic impacts of the trigger-induced allocation process of additional quota.

landing quantities. Average state prices reflect landing quantities closer to that of the pre-transfer trigger threshold amounts, as bluefish landings have never reached the proposed post-transfer trigger threshold levels.

Conceptually, when the trigger is activated, states will receive greater quantities of quota if they are grouped into an allocation category which results in higher allocations than the non-trigger alternative allocation method. The opposite is true for a state that is allocated a higher percentage of quota under the non-trigger allocation but is grouped in an allocation bracket lower than its original allocation. For example, ME is allocated 0.67% under the status quo (i.e., 17% of the ABC for commercial sector pre-transfer allocations) with no trigger. With a trigger, the allocation of additional quota to ME would be set at 0.1% given that it falls in the ≤1% allocation range, resulting in less allocated quota than would be received under the state's baseline allocation percentage. The state of MA, on the other hand, would be allocated 6.72% of the additional quota under the status quo with no trigger, but quota allocation after the trigger threshold would increase to 7.50% under the trigger sub-alternative.

When an additional 100,000 lbs. is allocated under the trigger vs. the non-trigger status quo, average revenues decrease for NC, ME and NH, when averaged across all state allocation alternatives (Figure 16). On average, NC revenues would decrease by $7,912, ME by $167, and NH by $101. It should be noted, however, that whether a state earns increases or decreases in revenues varies across the allocation alternatives. For example, RI would earn a revenue increase of $2,854 under 3a-2 (i.e., the five-year allocation) but a decrease in revenues (-$1,275) under 3a-3 (i.e., the ten-year allocation). The highest increases in revenues when averaged across the alternatives are earned by MA, NJ and VA with increases of $3,430, $2,508, and $1,378, respectively.

This analysis highlights the variation in economic outcomes and their dependence on the allocation sub-alternatives proposed in *Section 4.2.5*. Though triggers would impact the initial allocation of the quota, this analysis assumes that each state will fully utilize their allocated quota with no state-to-state transfers. If additional allocations resulting from the trigger method are not utilized and transfers are to continue, there may be little change in landings/revenues and the burden of transfers will be the main economic consequence of this sub-alternative.

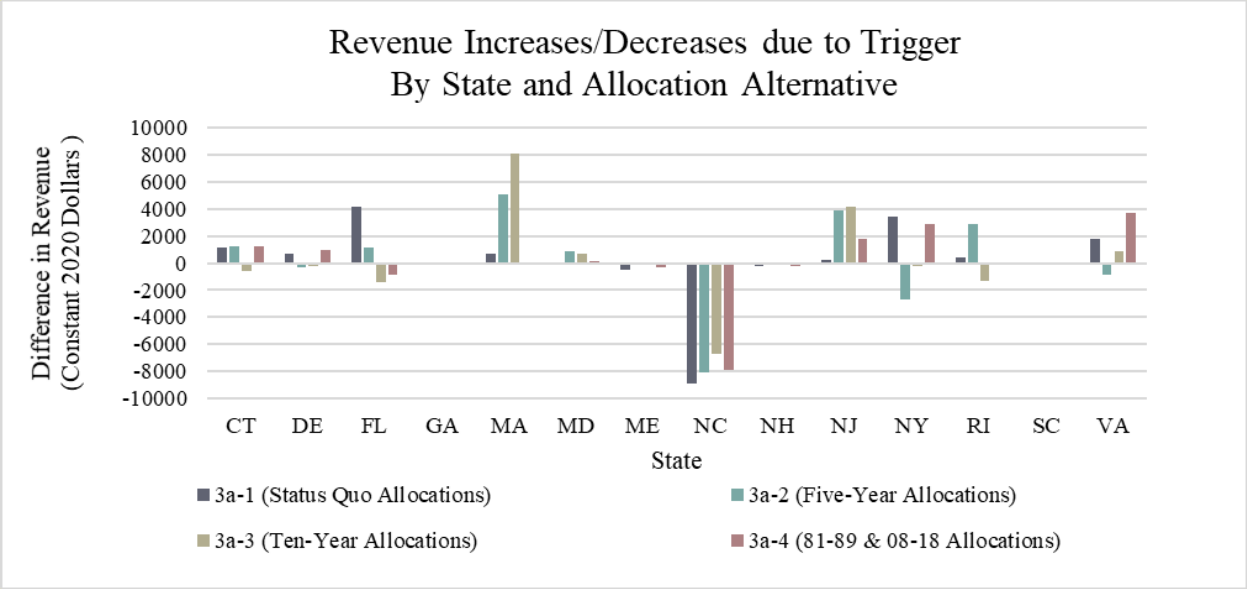


Figure 16: Differences in commercial bluefish revenues (2020 constant dollars) resulting from trigger-induced allocations by state and state-level allocation sub-alternative.

4.2.7 Minimum Default Allocation Alternatives

This alternative set would establish minimum default commercial quota allocations for each state within the bluefish management unit. A minimum default allocation provides each state with a fixed minimum percentage allocation of the coastwide commercial quota, and the remainder would be allocated based on the commercial allocation alternative selected from *Section 4.2.1*. The minimum default allocation alternatives are presented in Table 24. If 0.1% (3d-2) is selected, 1.4% of the allocation would be evenly distributed amongst the 14 states within the bluefish management unit. Then, the remaining 98.6% of the commercial quota would be distributed in accordance with the preferred alternative in *Section 4.2.1*. If 0.25% (3d-3) is selected, 3.5% of the allocation would be evenly distributed to the 14 states. Then, the remaining 96.5% of the commercial quota would be distributed following the preferred alternative in *Section 4.2.1*.

Table 24: Minimum default allocation alternatives.

Minimum Default Allocation Alternatives	
3d-1	No Action/Status quo: No Minimum Default Allocation
3d-2	0.10% Minimum Default Allocation
3d-3	0.25% Minimum Default Allocation

Table **25** and
Table **26** present the final state allocations with the incorporated minimum default allocations of 0.10% and 0.25%, respectively.

Table 25: State-by-state commercial bluefish allocations along the U.S. Atlantic coast using different proposed time series and a minimum default allocation of 0.10%.

3d-2		0.10% Minimum Default Allocation			
State	No Action 1981-1989	Status quo 1981-1989	5-year 2014-2018	10-year 2009-2018	1/2 '81-'89 1/2 '09-'18
ME	0.67%	0.76%	0.10%	0.11%	0.58%
NH	0.41%	0.50%	0.13%	0.22%	0.42%
MA	6.72%	6.73%	10.59%	10.12%	7.65%
RI	6.81%	6.81%	11.74%	9.61%	7.58%
CT	1.27%	1.35%	1.26%	1.09%	1.28%
NY	10.39%	10.34%	20.12%	19.76%	12.93%
NJ	14.82%	14.71%	11.17%	13.85%	14.46%
DE	1.88%	1.95%	0.67%	0.49%	1.55%
MD	3.00%	3.06%	1.57%	1.92%	2.75%
VA	11.88%	11.81%	4.65%	5.87%	10.22%
NC	32.06%	31.71%	31.71%	32.03%	31.78%
SC	0.04%	0.14%	0.10%	0.10%	0.13%
GA	0.01%	0.11%	0.10%	0.10%	0.11%
FL	10.06%	10.02%	6.08%	4.78%	8.57%

Table 26: State-by-state commercial bluefish allocations along the U.S. Atlantic coast using different proposed time series and a minimum default allocation of 0.25%.

3d-3		0.25% Minimum Default Allocation			
State	No Action 1981-1989	Status quo 1981-1989	5-year 2014-2018	10-year 2009-2018	1/2 '81-'89 1/2 '09-'18
ME	0.67%	0.90%	0.25%	0.26%	0.72%
NH	0.41%	0.65%	0.28%	0.36%	0.56%
MA	6.72%	6.73%	10.52%	10.05%	7.64%
RI	6.81%	6.82%	11.65%	9.56%	7.57%
CT	1.27%	1.48%	1.39%	1.22%	1.40%
NY	10.39%	10.28%	19.85%	19.49%	12.80%
NJ	14.82%	14.55%	11.09%	13.70%	14.31%
DE	1.88%	2.06%	0.81%	0.64%	1.67%
MD	3.00%	3.15%	1.69%	2.03%	2.84%
VA	11.88%	11.71%	4.71%	5.89%	10.16%
NC	32.06%	31.19%	31.19%	31.50%	31.25%
SC	0.04%	0.29%	0.25%	0.25%	0.28%
GA	0.01%	0.26%	0.25%	0.25%	0.26%
FL	10.06%	9.96%	6.10%	4.83%	8.54%

4.2.8 Impacts of Minimum Default Allocation Alternatives

Minimum default allocations were proposed to ensure states currently allocated a small share of the coastwide commercial quota do not lose their entire allocation through the re-allocation process. ME, NH, SC, and GA stand to benefit most from the implementation of a minimum default commercial allocation. All four of these states are currently allocated less than 1% of the coastwide quota. Furthermore, the allocation alternatives under consideration in *Section 4.2.1* would provide these states with allocations close to 0%. The commercial fisheries in these states are quite small, but bluefish are still occasionally landed. Without a sufficient share of the commercial quota, fishermen operating within ME, NH, SC, and GA waters may be forced to discard incidental bluefish catch or travel further to offload landings in another state. The adoption of a minimum default allocation may reduce these negative biological and economic impacts. In addition, bluefish are historically a cyclical species and highly migratory. States like Maine and New Hampshire may encounter bluefish more in the future due to distribution shifts in the bluefish population. If this occurs, these two northern states would be afforded a small allocation that would allow some harvest of bluefish.

Alternatives 3d-2 and 3d-3 provide for minimum default allocations to states of 0.10% and 0.25%, respectively. Relative to the status quo/no action alternative, 3d-1, these minimum default allocations may result in neutral to low positive social impacts on state commercial bluefish stakeholders, depending upon the alternative selected from the 3a set. The difference between 3d-2 and 3d-3, however, is relatively small in terms of default percentages and thus the difference in social impacts between these two alternatives is anticipated to be neutral or negligible.

Economic Impacts

Differences in state bluefish revenues resulting from allocations with minimum defaults vs. allocations without the minimum defaults are calculated across the various state-allocation alternatives proposed (3a-1 through 4). Revenues are estimated and compared across both of the proposed minimum defaults (0.10% and 0.25%). Landings for each allocation series (3a-1 to 3a-4) are simulated using historic pre-sector transfer quota quantities given that pre-sector transfer allocations are closer to realized landings relative to post-transfer quantities (1999-2019) and the assumption that all allocated quota is landed is necessary for the analysis. The simulated allocated quota, and therefore estimated landings, for each series is multiplied by the average state ex-vessel bluefish price. Average annual state bluefish prices ($/lb) are used rather than an econometric model as a peer-reviewed state-level annual price model has yet to be developed. The use of average state bluefish prices omits the inverse relationship between price and quantity of bluefish landed, which is a limitation of this specific analysis. The average difference in revenues under minimum default allocations and their non-minimum default counterparts are presented in Figure 17.

In terms of revenue gains or losses, NC's revenues decrease the most under the minimum default allocation, with average losses of $55K and $137K for the 0.10% and 0.25% minimum defaults, respectively (Figure 17). This is followed by NY and NJ where revenues decrease on average by $29K and $19K under the 0.10% minimum default and $66K and $49K under the

0.25% minimum default for NY and NJ, respectively. The states with the highest increases in revenues are NH, ME, GA and SC. This is not surprising given that these states have the lowest allocations across all of the state-level reallocation plans, all of which are allocated under 1% of the commercial quota on when averaged across the non-minimum default allocations. SC, GA, ME and NH earn average annual revenue increases of $21K, $21K, $25K and $25K under the 0.10% minimum default and $52K, $52K $62K and $62K under the 0.25% minimum default, respectively. Revenues for the states not mentioned previously range from an average decrease of $8K to average increase of $17K for the 0.10% minimum default and an average decrease of $15K to average gain of $41K under the 0.25% minimum default when summarized across all proposed state-level allocation alternatives. Lastly, if transfers are to occur and if the states receiving minimum allocations are not projected to land their quota, it is possible for quota transfers to counteract the decreases in revenue stemming from minimum default allocations.

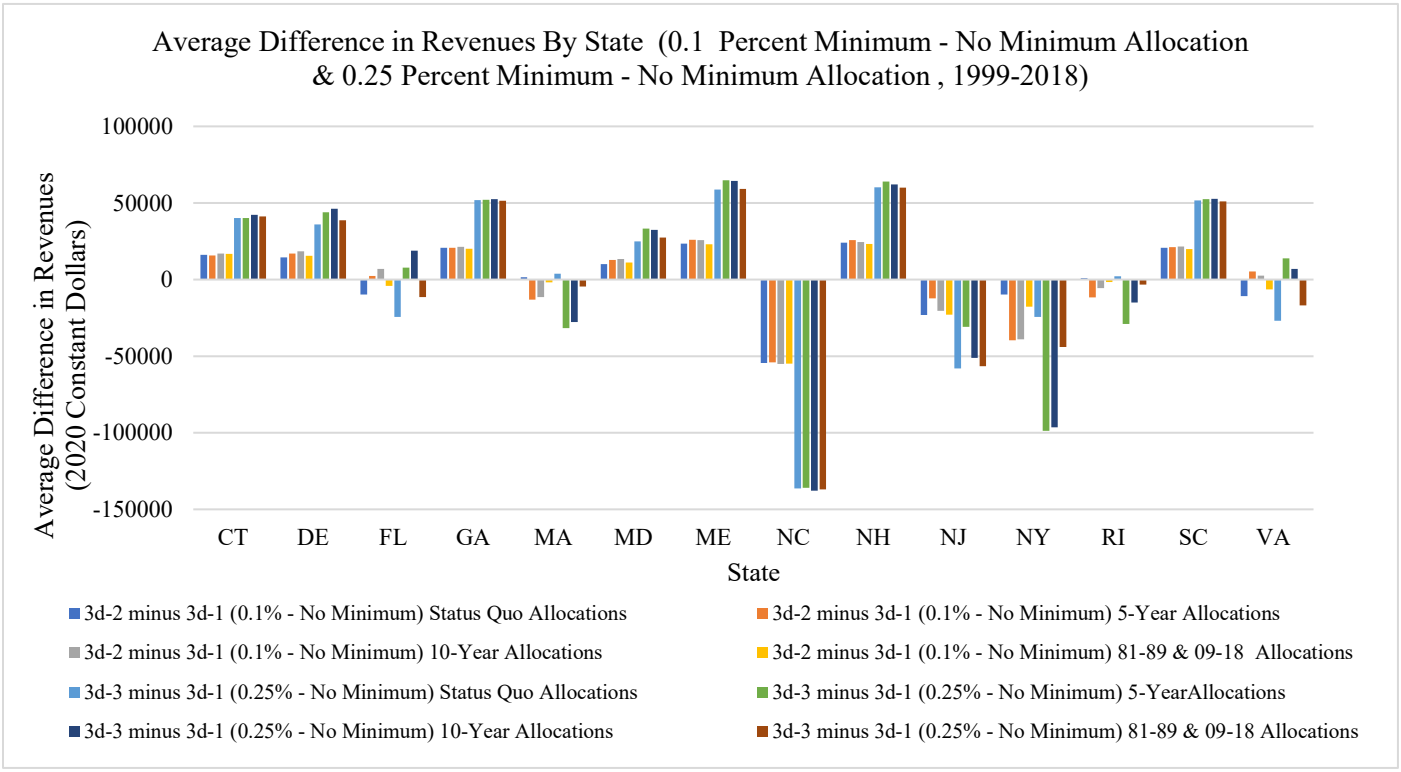


Figure 17: Average difference in commercial bluefish revenues under minimum default allocations and no minimum default allocations (1999-2019) by commercial allocation alternative and state.

4.3 REBUILDING PLAN ALTERNATIVES AND IMPACTS

The 2019 operational stock assessment indicates that the bluefish stock is overfished, but overfishing was not occurring in 2019[11]. Section 304(e)(3) of the MSA states: "Within 2 years after…notification…the appropriate Council…shall prepare and implement a fishery

[11] 2019 Bluefish Operational Stock Assessment Report

management plan, plan amendment, or proposed regulations…to end overfishing immediately in the fishery and to rebuild affected stocks of fish…" Furthermore, the MSA states that FMPs shall "contain the conservation and management measures… necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery." If adequate progress is not made through the rebuilding plan, the regional office will immediately make revisions necessary to achieve adequate progress. NOAA Fisheries technical guidance on MSA National Standard 1 recommends that in these situations the rebuilding fishing mortality proxy (F) be set at 75% of the target F. This means that if the selected rebuilding plan is demonstrating difficulty in achieving the target on time, F may be further decreased to achieve a rebuilt stock.

Spawning stock biomass (SSB) was estimated to be 91,041 metric tons in 2018, or 46% of the SSB target. The biomass target is the SSB associated with the fishing mortality proxy (F) that achieves maximum sustainable yield (MSY) or SSB_{MSY} proxy. Under a rebuilding plan, the stock will be considered rebuilt once SSB reaches the SSB_{MSY} proxy equal to 198,717 mt (Figure 18). Once rebuilt, the MSYproxy is estimated to be 26,677 mt. Total fishing mortality is also available for reference (
Figure **19**). Again, MSA requires the overfished stock to be rebuilt within 10 years once the regional office notifies the Council of the overfished state. Under the current amendment timeline, the rebuilding plan would be implemented at the beginning of 2022.

In mid-2021, a management track assessment will be conducted to re-assess the bluefish stock. As a result of this assessment, the biological reference points may shift. Moreover, rebuilding projections will be rerun to reflect the updated status of the stock. Then, Council and Commission staff will work with the NOAA Fisheries regional office and the Scientific and Statistical Committee (SSC) to identify how these new projections will be translated into future specifications.

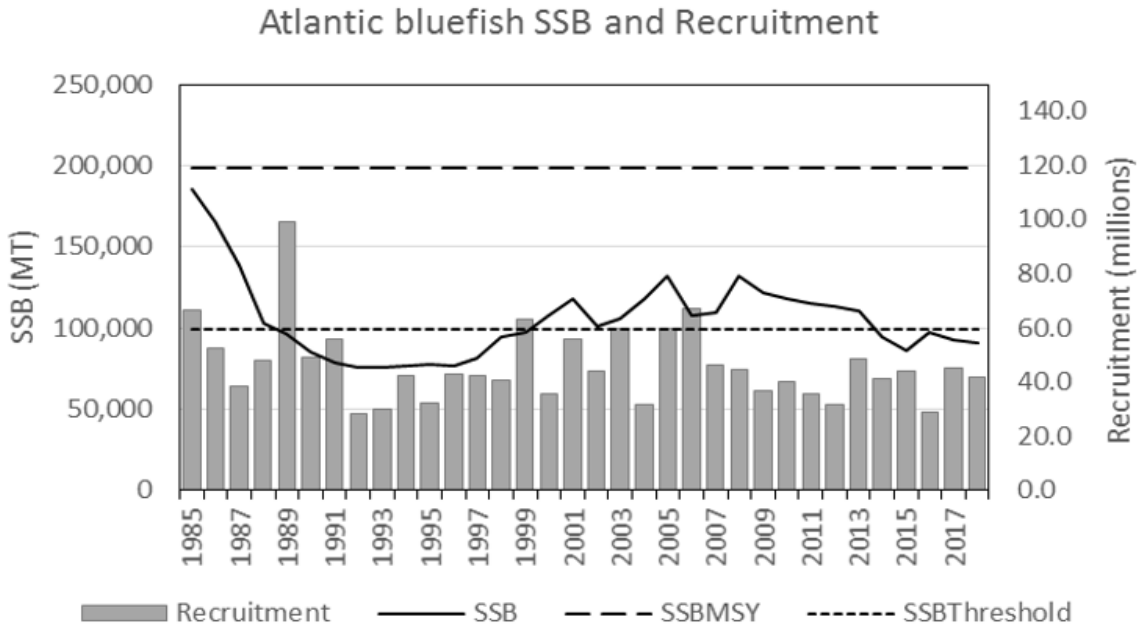


Figure 18: Atlantic bluefish SSB and recruitment at age 0 (R; gray vertical bars) by calendar year. The horizontal dashed line is the updated SSBMSY proxy = SSB40% = 198,717 mt.

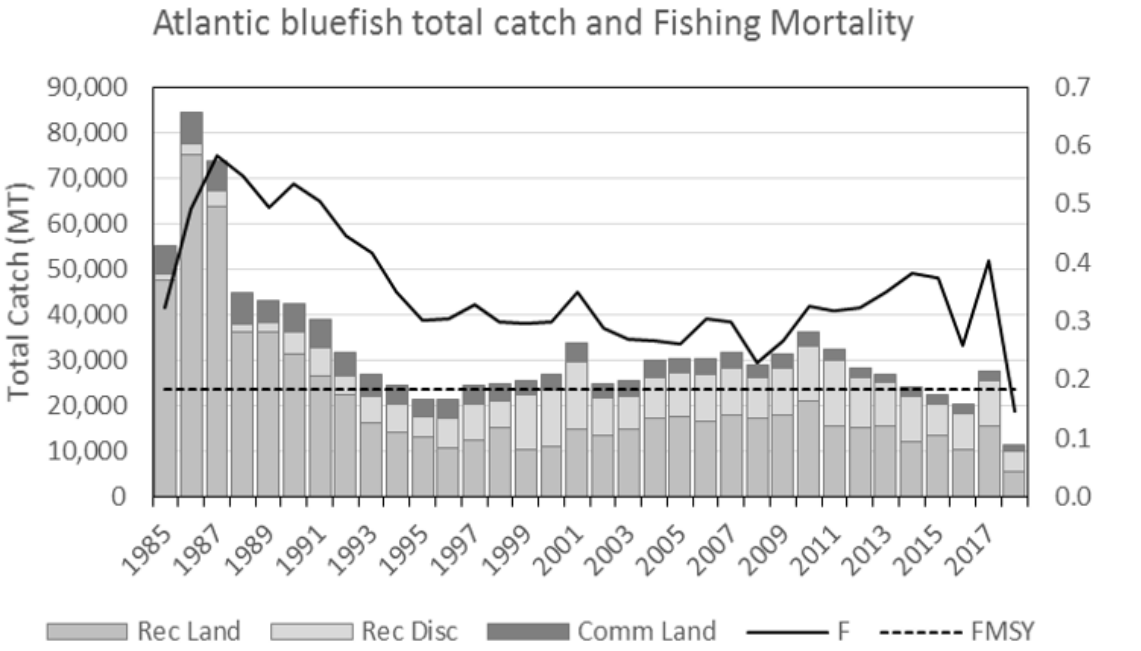


Figure 19: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 3; squares) for Atlantic bluefish. The horizontal dashed line is the updated FMSY proxy = F35% = 0.183.

4.3.1 Rebuilding Plan Alternatives

This section introduces the four rebuilding plan alternatives under consideration, including status quo (Table 27). SSB values and catch projections are provided for reference for each of the three rebuilding plans. The proposed rebuilding plans assume all the projected catch will be caught. Regardless of which alternative is selected, the stock assessment scientist will perform assessment updates and rerun projections every two years. Each projection is based on current stock status information, meaning the catch values are subject to change depending upon the latest assessment. The SSC will then use the projections to develop recommendations for the specification packages that remain in line with the goals of the rebuilding plan.

Table 27: Rebuilding projection alternatives and the duration until rebuilt.

Alternative	Rebuilding Plan	Duration	Adjustment to Council Risk Policy
4a	No Action/ Status Quo	N/A	N/A
4b	Constant Harvest	4 years	No
4c	P* (Council Risk Policy)	5 years	N/A
4d	Constant Fishing Mortality	7 years	Yes

All rebuilding alternative sections contain tables detailing the biomass levels, fishing mortality, catch, SSB_{MSY} proxy, and $SSB_{Threshold.}$ The P* approach includes all the same metrics, but in terms of the projected ABCs.

Table **28**, Table 29, and
Table **30** all begin in 2019 despite the rebuilding plans beginning in 2022. These data are presented for reference to display the assumed catch values when the projection was run in 2020.

4.3.1.1 No Action/Status quo (Alternative 4a)

The no action/status quo alternative would not initiate a rebuilding plan, no changes to the current risk policy would occur, and the current specifications would remain in place, as described in the proposed rule for the 2021 specifications package[12].The Council is legally bound to develop a rebuilding pan and this alternative is included as a formality.

4.3.1.2 Constant Harvest – 4-year Rebuilding Plan (Alternative 4b)

The 4-year constant harvest rebuilding alternative specifies that the stock be rebuilt by the end of 2025. The rebuilding plan projection presented in

[12] https://www.federalregister.gov/documents/2020/11/05/2020-24364/fisheries-of-the-northeastern-united-states-atlantic-bluefish-fishery-2021-bluefish-specifications.

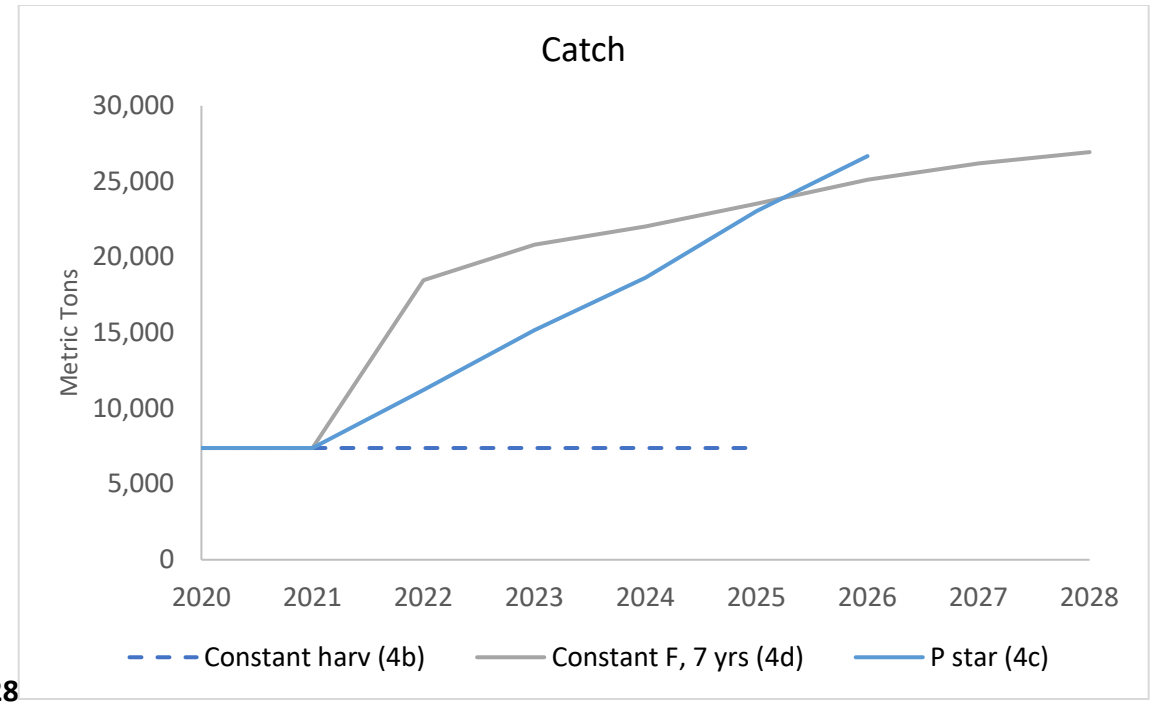


Table **28**

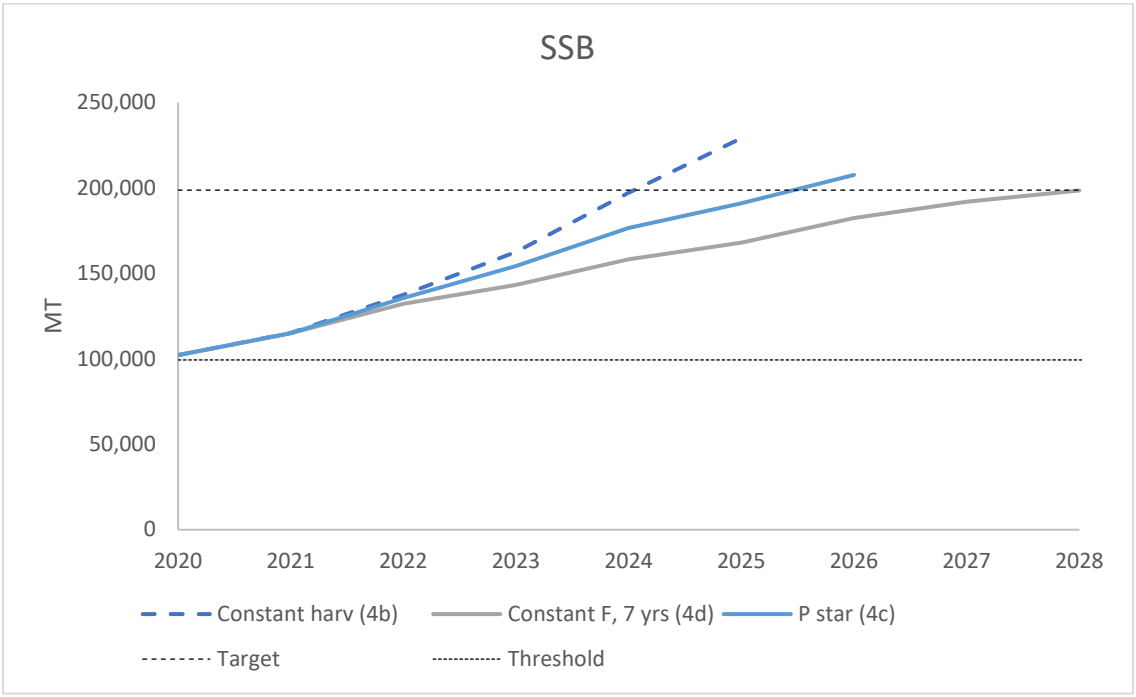
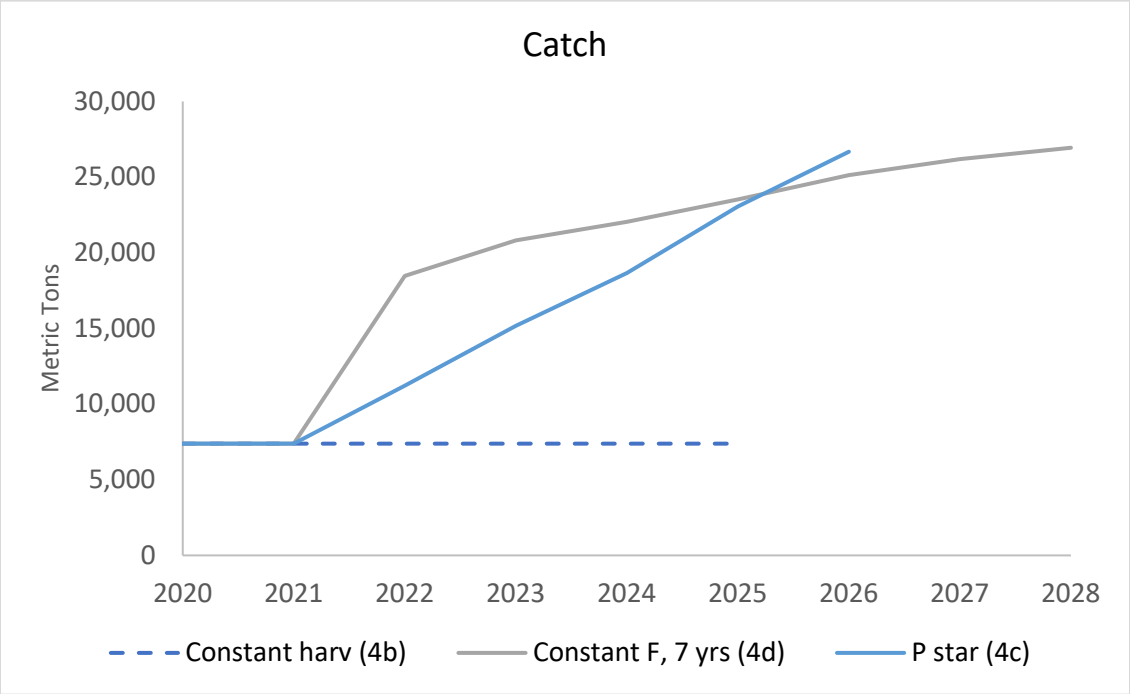


Figure 20: Rebuilding plan projections including catch (top) and SSB (bottom) for alternatives 4b, 4c, and 4c.

Table 28 and Figure 20 demonstrates that the projected catch and SSB values remains constant across the four years. However, as previously mentioned, the stock assessment scientist will conduct assessment updates and rerun projections every 2 years, which means the catch values may be adjusted up or down depending upon the assessment results. This alternative does not require an adjustment to the Council's risk policy because the catches are less than those described under the P* approach. In 2022, fishing mortality rates peak at F=0.064, but still remains below the overfishing threshold (MSY Proxy above 0.183). Rebuilding projections indicate that this alternative would be expected to rebuild bluefish to slightly above the SSB_{MSY} proxy as defined in the recent bluefish operational assessment (198,717 mt) by 2025.



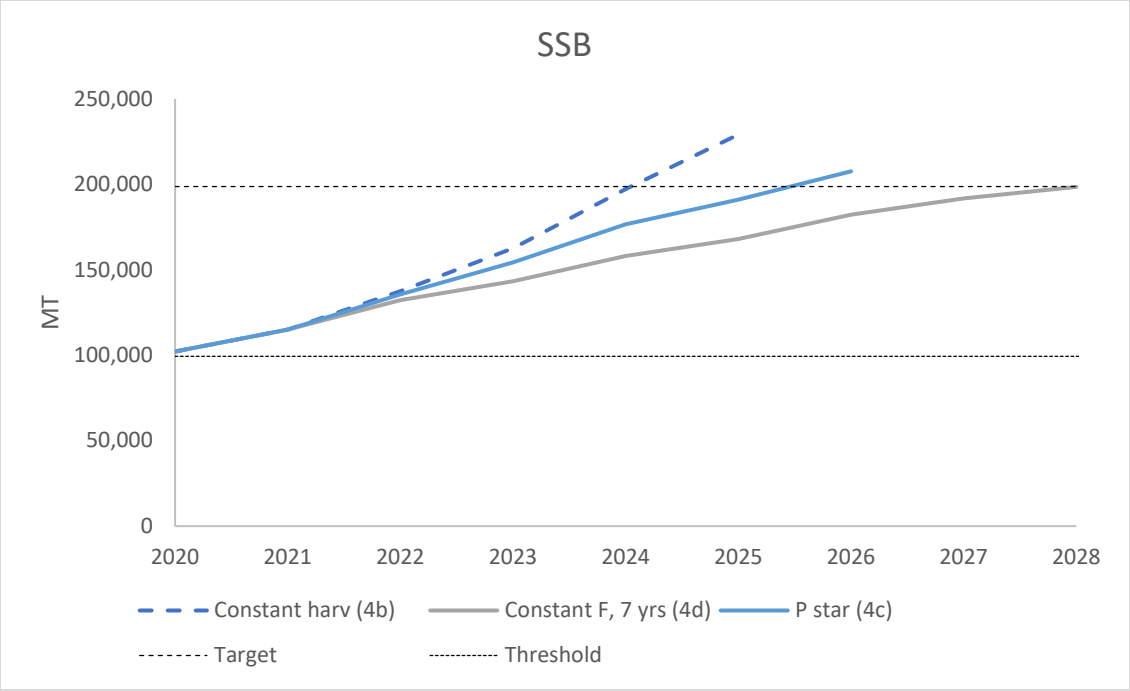


Figure 20: Rebuilding plan projections including catch (top) and SSB (bottom) for alternatives 4b, 4c, and 4c.

Table 28: Constant harvest projection to rebuild over 4 years.

Year	SSB (MT)	Recruits (000s)	*F*	Catch (MT)	SSB_{MSY} (MT)	$SSB_{threshold}$ (MT)
2019	92,779	43,282	0.279	22,614	198,717	99,359
2020	102,165	43,455	0.087	7,385	198,717	99,359
2021	115,085	43,428	0.075	7,385	198,717	99,359
2022	137,450	43,460	0.064	7,385	198,717	99,359
2023	162,495	43,353	0.052	7,385	198,717	99,359
2024	197,141	43,239	0.045	7,385	198,717	99,359
2025	229,121	43,379	0.039	7,385	198,717	99,359

4.3.1.3 P Council Risk Policy – 5-year Rebuilding Plan (Alternative 4c)*

The 5-year P* Council risk policy rebuilding alternative specifies that the stock be rebuilt by the end of 2026. The catch values shown in Table 29 are in accordance with the ABC control, which is guided by the Council's risk policy. Figure 20 provides a visual of catch and SSB rebuilding over the 5-year period. In 2022, the probability of overfishing is 29%. This coincides with a projected fishing mortality rate of F=0.098, which remains below the overfishing threshold (FMSY proxy = F35% = 0.183). Rebuilding projections indicate that this alternative would be expected to rebuild bluefish to slightly above the SSB_{MSY} proxy as defined in the recent bluefish operational assessment (198,717 mt) by 2026. As previously stated, the ABC values presented in Table 29 are based on the 2019 operational assessment and are subject to revision following each stock assessment update.

Table 29: Rebuilding projection based on P* using the Council's risk policy to rebuild over 5-years.

Year	OFL Total Catch (MT)	ABC Total Catch (MT)	ABC *F*	ABC P_{star}	ABC SSB (MT)	SSB_{MSY} (MT)	$SSB_{threshold}$ (MT)
2019	15,368	22,614	0.280	0.183	92,732	198,717	99,359
2020	16,212	7,385	0.087	0.207	102,174	198,717	99,359
2021	17,205	7,385	0.075	0.239	115,012	198,717	99,359
2022	20,237	11,222	0.098	0.291	135,586	198,717	99,359
2023	23,998	15,181	0.113	0.338	154,257	198,717	99,359
2024	26,408	18,653	0.127	0.394	176,619	198,717	99,359
2025	28,807	23,048	0.144	0.431	191,063	198,717	99,359
2026	30,848	26,677	0.157	0.450	207,619	198,717	99,359

4.3.1.4 Constant Fishing Mortality – 7-year Rebuilding Plan (Alternative 4d)

The 7-year constant fishing mortality rebuilding plan alternative specifies that the fishing mortality rate be set constant across the duration of the rebuilding period with a rebuilt date set for 2028.

Table **30** presents the project catch and SSB values associated with the rebuilding plan and Figure 20 presents catch and SSB over time. Starting in 2022 and for the duration of the rebuilding plan, the fishing mortality rate is projected to be at F=0.166, which remains below the overfishing threshold. However, because these catches are higher than the P* catches described in 4c, the Council would also adjust its risk policy for this rebuilding plan. The Council's current risk policy states that the SSC should provide ABCs that are the lesser of rebuilding ABCs or standard risk policy (P*) ABCs (4c follows the current P* approach). The P* catches in 4c are lower than 4d. In absence of a risk policy adjustment, ABCs prescribed under alternative 4c would override those in 4d. The adjustment to the Council risk policy would be limited to only bluefish for this specific rebuilding alternative. Approval of this adjustment to the risk policy is necessary for the implementation of any rebuilding plan exceeding five years with the associated higher catches. Rebuilding projections indicate that this alternative would be expected to rebuild bluefish to slightly above the SSB_{MSY} proxy as defined in the recent bluefish operational assessment (198,717 mt) by 2028. As previously discussed, the catch values produced by the projection are subject to change following new stock assessment information.

Table 30: Constant 7-year F rebuilding projection.

Year	SSB (MT)	Recruits (000s)	*F*	Catch (MT)	SSB*MSY* (MT)	$SSB_{threshold}$ (MT)
2019	92,755	43,320	0.279	22,614	198,717	99,359
2020	102,186	43,531	0.087	7,385	198,717	99,359
2021	115,073	43,310	0.075	7,385	198,717	99,359
2022	132,150	43,390	0.166	18,477	198,717	99,359
2023	143,271	43,292	0.166	20,813	198,717	99,359
2024	158,152	43,272	0.166	22,033	198,717	99,359
2025	168,006	43,395	0.166	23,532	198,717	99,359
2026	182,311	43,336	0.166	25,121	198,717	99,359
2027	191,855	43,578	0.166	26,191	198,717	99,359
2028	198,520	43,411	0.166	26,939	198,717	99,359

4.3.2 Impacts of Rebuilding Plan Alternatives

All proposed alternatives, with the exception of no action, are projected to rebuild the stock to the SSB_{MSY} proxy biomass target of 198,717 by 2028 or earlier. The catch values associated with each rebuilding plan scale up with the duration of the rebuilding period. The recreational and commercial sectors are likely to experience significantly different impacts from each rebuilding plan considering the varied duration and projected catch values.

When comparing impacts of the three rebuilding plans, individuals need to consider how a longer rebuilding timeline will affect ABCs, fishing mortality rates, and the resulting ACL, which may be constrained with various management measures, if necessary.

Social Impacts

Alternative 4a is the status quo alternative under which no action would be taken to initiate a rebuilding plan and therefore the bluefish stock would remain in an overfished state. It is likely that there would be negative social impacts from the no action alternative due to the negligence of the MAFMC to comply with its legal obligation to develop a rebuilding plan when a stock is overfished. This would likely lead to an erosion of trust and confidence among stakeholders across user groups in the ability of the MAFMC to handle its responsibilities to ensure the equitable sustainability of the bluefish resource. According to the written and oral comments provided during the scoping process, about 40% of commenters supported some type of rebuilding plan. By contrast, about 21% doubted the overfished status of the stock or viewed the stock status as "cyclical," and 17% reported that they believed the stock to be affected by environmental factors and more research is needed on those issues. These stakeholder perspectives indicate that a plurality of resource users would prefer the MAFMC take action on rebuilding the stock, but the approach in doing so would need to be carefully considered in terms of its impacts and equitability for stakeholders across user groups.

Under alternative 4b, a constant harvest approach would be utilized until the stock is rebuilt. The projected date for the stock to be rebuilt under this scenario is the end of 2025 (4 years). This approach applies perhaps the most constraining rebuilding plan given that catch would be set at a constant level of 7,385 mt over the four-year period. Relative to the no action alternative, alternative 4b would have positive social impacts due to the MAFMC implementing a rebuilding plan as it is legally required to do, but this approach may have neutral to negative social impacts relative to the other rebuilding plan alternatives under consideration. Most commercial crew and hired captains reported through Crew Survey results that they believed the rules and regulations in their primary fisheries have been too restrictive. If the projection holds and the stock is rebuilt in four years, however, the potential negative impacts may be offset by an improved stock status and likely increases in catch thereafter, subject to constraining fishing mortality below the threshold.

Alternative 4c would utilize the MAFMC risk policy (P*) to rebuild the stock. This approach is projected to rebuild the stock by the end of 2026 (i.e., a 5-year rebuilding plan). Under this alternative, there would likely be positive social impacts relative to the no action alternative and positive impacts relative to alternative 4b, the four-year rebuilding plan. Alternative 4c provides for more catch over the course of the rebuilding plan, thus allowing more flexibility for stakeholders across user groups to continue to access the resource and potentially preserve employment and income opportunities in the short term as the stock is being rebuilt.

Under alternative 4d, the rebuilding plan would follow a constant fishing mortality approach through which the stock is projected to be rebuilt by the end of the year in 2028 (i.e., a 7-year rebuilding plan). This alternative would likely produce positive social impacts relative to the no action alternative and alternative 4b but might result in only neutral to low positive impacts relative to alternative 4c. While the amount of allowable catch is higher in the short term than under alternative 4c, the additional time to rebuild the stock might reduce the opportunities for employment and income from the bluefish resource over the longer-term relative to a shorter rebuilding plan target. However, if alternative 4d provides the greatest probability of rebuilding

the stock then the potential negative impacts relative to alternative 4c might be negated by the benefits of a rebuilt stock for stakeholders to utilize across the spectrum of resource user groups. Additionally, most crew and hired captains interviewed through the Crew Surveys reported that the rules and regulations change so quickly that it can be hard to keep up. A longer rebuilding period with more gradual changes to allowable catch might reduce the amount of uncertainty in fishing business decisions and thus mitigate potential negative social impacts of a rebuilding plan.

Economic Impacts

Forecasted bluefish commercial landings and revenues are compared across the 4-year (alternative 4b), 5-year (alternative 4c), and 7-year (alternative 4d) rebuilding schedules. Landings and revenues are estimated from 2019 to 2028 for each rebuilding plan with the expectation that each plan will be implemented in 2022. Landings and revenues for 2019 and 2020 in this analysis were based off of the values used in the projections and likely differ from 2019 and 2020 realized values because the projections were conducted before final data for these years were made available Moreover, rebuilding projections will continue to be revised every two years as the assessment is updated. For plans which indicate the stock will be rebuilt in less than 7 years, the ABC upon rebuilding the stock is assumed to equal 26,677 mt (58.8M lb)[13] for the remaining years in the time series, allowing for meaningful comparison between rebuilding schedules. For each plan, a minimum and maximum commercial allocation percentage was used to simulate allocations (11% and 17%, respectively, as proposed by alternatives 2a-1 and 2a-2). This analysis assumes that all allocated commercial quota is landed in each forecasted year. Revenue streams are estimated using the predicted landings and ex-vessel bluefish prices are predicted using the modeling methods and parameters specified in Appendix B. Once estimated, future revenues streams are discounted to obtain present values for each rebuilding plan. Discounting revenue streams accounts for the time value of money when assessing future benefits. We present three different discount rates (0%, 3% and 7%) which are applied to the forecasted revenue streams.[14] The 0% discount rate serves as a baseline, while the 3% and 7% discount rates are suggested by NOAA's Social Rate of Time Preference (NOAA 1999) and the Executive Branch's Office of Management and Budget Circular No. A-94 discounting recommendations, respectively.

Trends in landings by rebuilding plan are shown in Figure 21 while average landings are summarized in
Figure **22**, where A and B represents the 11% and 17% commercial allocations for each figure, respectively. Alternative 4b (i.e., the 4-year plan) had the lowest overall landings in terms of average landings (3.6 M lb and 5.5 M lb under the 11% and 17% commercial allocations, respectively). Alternative 4d had the highest average annual landings with averages of 4.9 M lb and 7.5 M lb under the 11% and 17% commercial allocations, respectively.

[13] The 26,677 MT quantity is the terminus year of the 5-year rebuilding projection based on P* using the Mid-Atlantic Fishery Management Council's rebuilding risk policy.

[14] The discount rate is a highly disputed topic in the field of economics. The discount rates presented are used to ensure that a low and high discount rate is accounted for when presenting results.

Discounted revenue streams across the various rebuilding timelines are shown in Figure 23, where the three discount rates (0%, 3% and 7%) are applied to the 11% commercial quota allocations for panels A-C and to the 17% commercial allocations in panels D-F. Additionally, average revenues by plan are presented in

Figure **24** where panels A and B refer to the 11% and 17% commercial quota allocations, respectively. The highest average annual revenues by rebuilding plan follow trends similar to those of the landings results. Average annual revenues for alternative 4b range from $1.8M-$2.7M and $2.8M-$4.2M across the discounted revenue streams under the 11% and 17% commercial allocations, respectively. The highest average annual revenues range from $2.2M-$3.3M and $3.5M-$5.1M across the three discount rates under the 11% and 17% commercial allocations, respectively. Overall, alternative 4d (i.e., 7-year schedule) has the highest economic benefits and alternative 4b (i.e., 4-year schedule) the lowest, in terms of average annual bluefish landings and revenues.

Without a demand model, it is unclear how the proposed rebuilding plans will impact recreational bluefish fishing effort. However, given the high catch and release nature of the fishery, there is likely to be little shift in the demand for recreational fishing given the changes in proposed ABCs by the rebuilding plans. Any increases in recreational TAL may have a slight positive economic impact in possibly more for-hire trips which may have higher value on catching and retaining fish. It is overall unclear to what degree recreational effort and angler expenditures will be impacted by the proposed rebuilding plans.

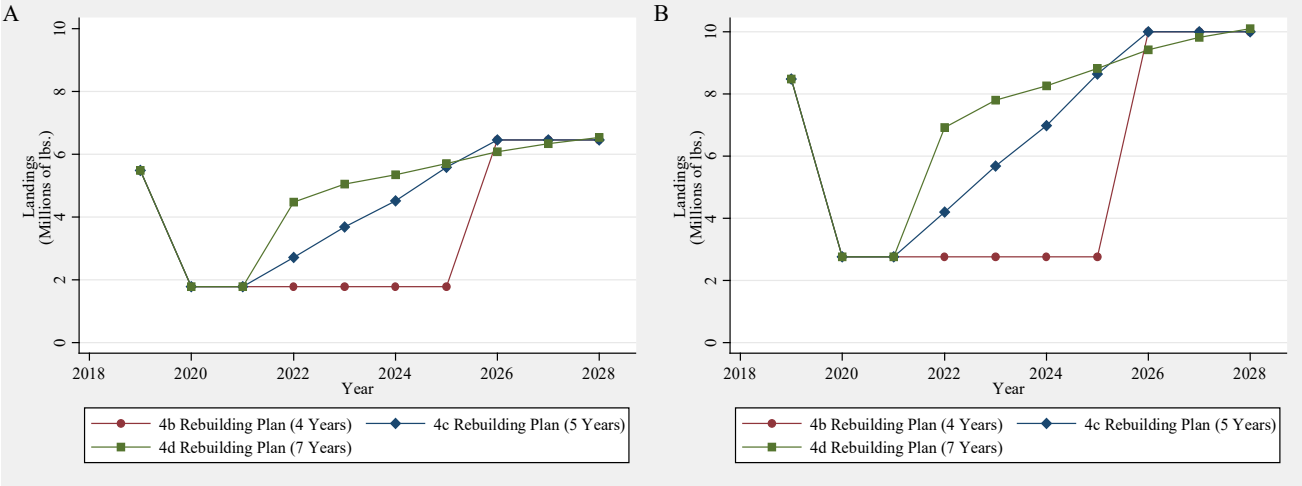


Figure 21: Projected commercial bluefish landings under an 11% and 17% commercial sector allocation (A and B, respectively) by rebuilding plan for years 2019-2028.

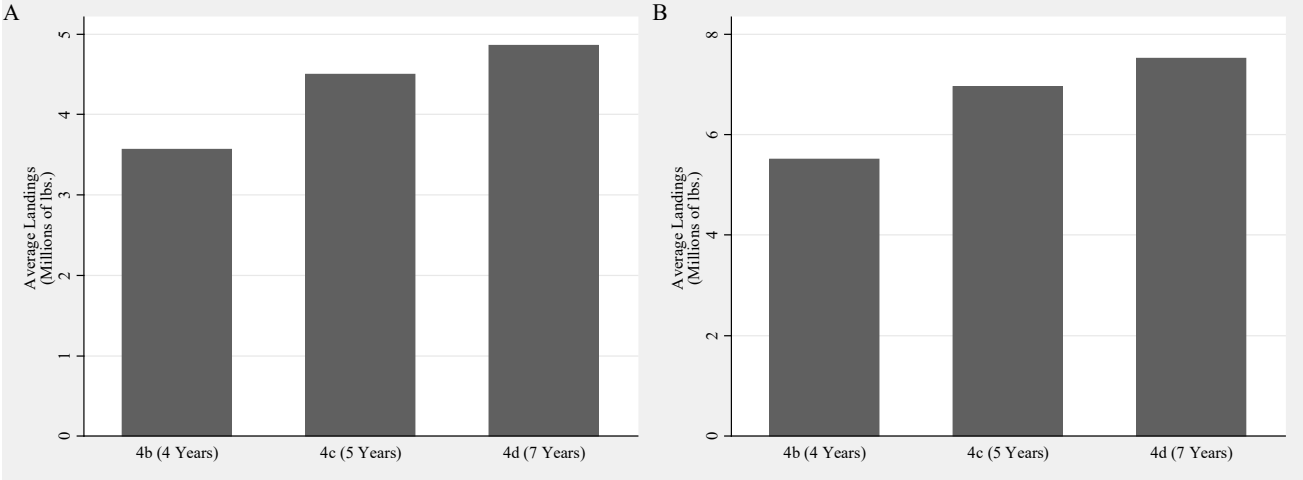


Figure 22: Average projected commercial bluefish landings (2019-2028) under an 11% and 17% commercial sector allocation (A and B, respectively) by rebuilding plan.

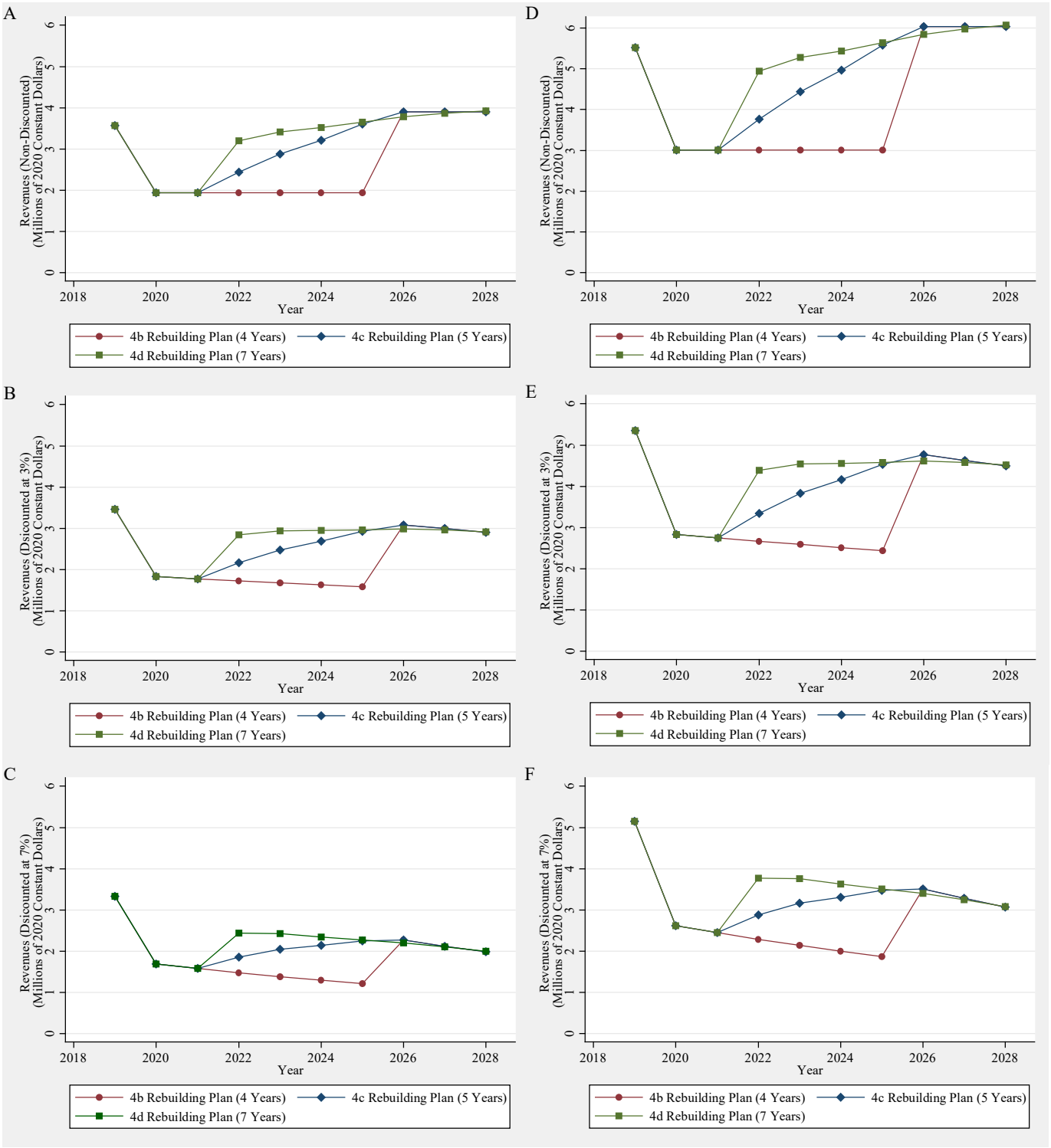


Figure 23: Estimated commercial bluefish revenues under 11% (A-C) and 17%(D-F) commercial allocations and discounted at 0%, 3%, and 7% by rebuilding plan and year (2019-2028).

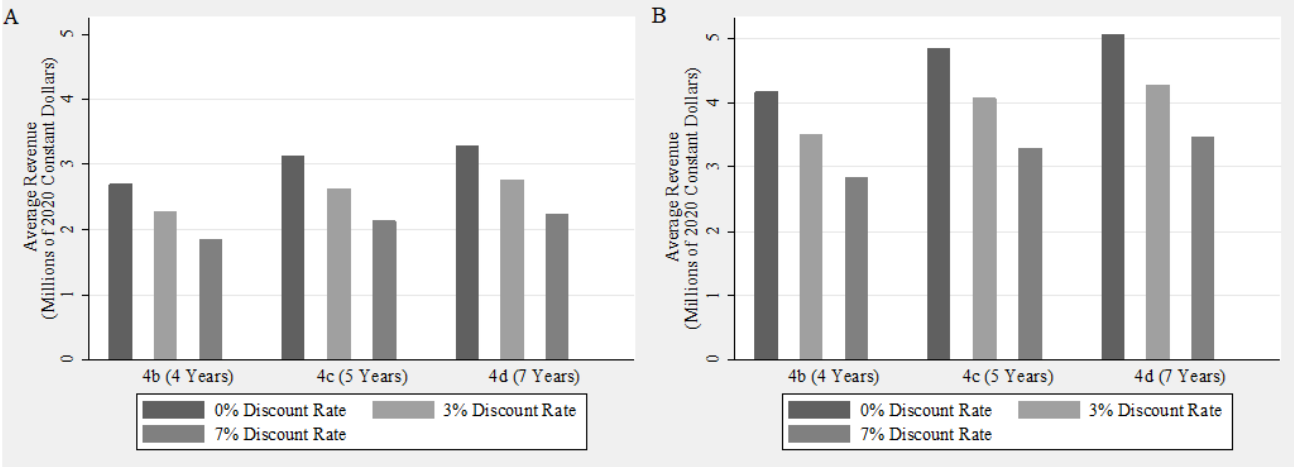


Figure 24: Average annual commercial bluefish revenues (2019-2028) discounted at 0%, 3% and 7% by rebuilding alternative and under 11% (A) and 17% (B) commercial quota allocations.

4.4 QUOTA TRANSFER ALTERNATIVES AND IMPACTS

The following alternatives describe options for allowing annual transfer of quota between the commercial and recreational sectors as part of the specifications setting process (i.e., the annual process of setting or reviewing catch and landings limits for the upcoming fishing year). *Section 4.4.1* discusses quota transfer process alternatives while *Section 4.4.3* addresses options for a cap on the total amount of a transfer.

4.4.1 Sector Transfer Provision Alternatives

Alternatives under consideration for quota transfer provisions are presented in Table 31.

Table 31: Alternatives for annual transfer of quota between the commercial and recreational sectors.

Alternatives	Annual Quota Transfer Alternatives
5a-1	No Action/Status Quo
5a-2	Allow for optional bi-directional transfers through the annual specifications process with pre-defined guidelines and process. The transfer would consist of a portion of the total ABC in the form of a landings limit (i.e., commercial quota and RHL) transfer. Transfers would not occur if the stock is overfished or overfishing is occurring.

Under alternative 5a-1, transfers from the recreational to the commercial sector could continue but transfers from the commercial to the recreational sector would not be included as an option in the FMP.

Under alternative 5a-2, each year during the setting or review of annual catch limits, the Council and Board would have the ability to recommend a transfer of quota between the recreational and commercial sectors, affecting the final commercial quota and RHL. The Council and Board could recommend a transfer from the commercial fishery to the recreational fishery or from the recreational fishery to the commercial fishery. The transfer amount would not exceed the cap adopted via one of the sub-alternatives under alternative set 5b. Table 32 describes how the process of transfers works within the Council and Board's current specifications process under alternative 5a-1 and would work under alternative 5a-2.

Table 32: Quota transfer process during a typical specifications cycle under alternative 5a-1. The quota transfer process would differ slightly under alternative 5a-2 as described in the green shaded rows.

July: **Assess the need for a transfer**	Staff and the Monitoring Committee (MC) assesses the potential need for a transfer and develop recommendations to the Council and Board as part of the specifications setting or review process. The MC considers the expected commercial quota and RHL (pending Council and Board review/approval) in the coming year, and each sector's performance relative to landings limits in recent years. The MC has very limited data for the current year and is not able to develop precise current year projections of landings for each sector. The MC also considers factors including but not limited to: • Projected changes in stock size, availability, or year class strength; • Recent or expected changes in management measures; • Recent or expected changes in fishing effort; The MC considers how these factors might have different impacts on the commercial and recreational sectors. The effects of these considerations are largely difficult to quantify and there is currently no methodology that allows the MC to quantitatively determine the need for a transfer with a high degree of precision. The MC uses their best judgement to recommend whether a transfer furthers the Council and Board's policy objectives, using mostly recent trends by sector.
August: **Council and Board consider whether to recommend a transfer**	The Council and Board considers MC recommendations on transfers while setting or reviewing annual catch and landings limits. Similar to the process for jointly setting catch limits, the Council and Board need to jointly agree on the transfer amount.
August: **Alternative 5a-2**	In addition to the steps described in the row above, the Council and Board would also need to jointly consider the direction of transfer if alternative 5b-2 were to be adopted.

Table 33 (continued): Quota transfer process during a typical specifications cycle under alternative 5a-1. The quota transfer process would differ slightly under alternative 5a-2 as described in the green shaded rows.

October: **Council staff submits specifications package to NMFS**	Council staff prepares and submits supporting documents if needed to modify catch limits or implement transfers.
Mid-December: **Recreational measures adopted***	The Council and Board would adopt federal waters recreational measures and a general strategy for coastwide recreational management including any reductions or liberalizations needed in state waters. These recommendations are based on the expected post-transfer RHL which are not always implemented via final rule but have usually been recommended by the Council and Board and proposed to the public.
Late December: **Final specifications published**	NMFS approves and publishes the final rule for the following year's catch and landings limits (if new or modified limits are needed), including any transfers.
January 1: **Fishing year specifications effective, including any transfers**	Fishing year specifications including any transfers would be effective January 1.
February: **NOAA Fisheries post-implementation review and adjustment**	NOAA Fisheries compares the estimate of recreational landings for the previous year to the RHL to make any necessary adjustments before finalizing the amount of quota transferred. The adjustment notice with final specifications is usually published in March/April.
February: **Alternative 5a-2**	No post-implementation reviews and adjustments to the transfer amount would occur given the final rule would recently have published, and recreational measures would have already been considered based on expected post-transfer RHLs.

*While this step is not directly part of the quota transfer process, the timing of the recreational measures setting process influences the necessary timeline of transfer-related decisions.

If transfer provisions under alternative 5a-2 are adopted, some changes to the AMs may need to be considered. The AMs indicate that if the MC determines that a transfer from the recreational to commercial sector caused the fishery-level ACL to be exceeded, the transfer amount could be deducted from the receiving fishery in a subsequent year. The Council and Board could consider whether to include these changes in this amendment or develop a follow-up action.

4.4.2 Impacts of Sector Transfer Alternatives

The impacts of transfers depend on the frequency of transfer, the amount transferred in each year, the direction of transfer between sectors, and to what extent each sector has been or is expected to achieve their limits. The impacts of a transfer are also dependent on the marginal economic value of additional allowable landings for each sector (in terms of commercial and for-hire revenues and revenues for associated commercial and recreational businesses), as well as the positive or negative impacts on angler satisfaction that may arise from modifying or maintaining recreational measures. As described below, many additional factors can influence how the commercial and recreational fisheries may be impacted by a transfer, including market conditions, overall availability of the species, availability of substitute species, and trends in effort driven by external factors.

Commercial to Recreational Transfers

If the recreational fishery receives a transfer, they will experience positive socioeconomic impacts due to outcomes such as the potential for liberalized measures, the ability to maintain measures when a reduction may otherwise be needed, and a reduced risk of an RHL or ACL overage that may impose negative consequences in a future year. These outcomes are likely to result in maintained or increased revenues for recreational businesses as well as improved or maintained levels of angler satisfaction, compared to if no commercial to recreational transfer occurred.

In this scenario, the commercial sector would give up quota that is not expected to be fully utilized. In theory, if the decision to transfer is based on a pattern of underutilization in the commercial sector, the economic impacts to the commercial sector from such a transfer would be neutral. However, the commercial sector could experience a loss in revenue if the potential for underutilization is incorrectly evaluated. This could be due to a disconnect in the data used to evaluate the transfer and conditions in the relevant fishing year, possibly driven by changes in market conditions or fishery participation and effort.

Impacts to the commercial fisheries are not likely to be felt equally across states given different commercial quota management systems and differing quota utilizations by state. While coastwide commercial landings can frequently fall short of the total commercial quota, individual states vary considerably in utilizing or underutilizing their individual quotas. A coastwide projected underutilization could occur even if one or more states would be expected to fully utilize their quota in the upcoming year. This could have negative economic impacts to the commercial industries in states that regularly achieve their quotas.

Recreational to Commercial Transfers

If the commercial fishery receives a transfer, they will experience positive social and economic impacts in the year of the transfer due to increased revenue earning potential associated with higher potential landings. In general, quota increases tend to result in higher revenues, although some of these benefits may be partially offset by decreases in price per pound that can be associated with higher quotas. All else held constant, transfers from the recreational to commercial sector would lead to positive impacts for the commercial sector.

In theory, if the decision to transfer is based on a pattern of underutilization by the recreational sector, negative socioeconomic impacts to the recreational sector from such a transfer may not be realized. However, this would limit the potential for liberalizing recreational management measures. Since recreational harvest is more difficult to predict and control than commercial harvest, recreational management measures are frequently adjusted in order to strike an appropriate balance between conservation and angler satisfaction.

Impacts of Transfers in Either Direction

The impacts of transfers should be considered in combination with the short-term and long-term impacts associated with commercial/recreational allocation modifications under alternative set 2. However, it is difficult to do so quantitatively given the uncertainties about allocation changes as well as the uncertainties in the frequency, amount, and direction of potential transfers. In general, any annual transfers away from a sector can compound the negative impacts experienced due to a reduction in that sector's total allocation, or in the short term could partially offset the positive impacts of an increase in allocation. Annual transfers to a sector can simultaneously create additional positive impacts on top of the positive impacts of reallocation from the perspective of the receiving sector, and also exacerbate negative impacts of a loss in allocation for the donating sector.

The impacts of transfers would also be influenced by annual reductions or increases in the overall ABC based on changes in projected stock biomass and the application of the Council's risk policy. The recipient of a transfer could have some negative socioeconomic impacts from ABC reductions mitigated by receiving a transfer, while the transferring sector may experience exacerbated negative economic impacts from ABC reductions. Conversely, if the ABC were increasing, this could offset negative impacts to the transferring sector and provide additional benefits to the sector receiving the transfer.

The impacts of transfers can also be impacted by the availability and management of substitute species for a particular sector. High availability and access to recreational or commercial substitute species would help mitigate negative impacts of a transfer away from a given sector, while lower availability and access would compound these negative effects.

Social Impacts

Under alternative 5a-1, the status quo would remain, and no action would be taken to allow for bi-directional sector quota transfers. This might result in neutral to low-negative social impacts. Some stakeholders may desire and could benefit from the flexibility to transfer unused quota across sectors in both directions whenever the need or oversupply might arise.

Under alternative 5a-2, bi-directional transfers of quota across sectors would be permissible. This alternative is anticipated to have low positive social impacts relative to the no action alternative. Allowing for bi-directional transfers across sectors might improve flexibility for stakeholders throughout the fluid and changing quota needs of various stakeholders across user groups, sectors, and state lines. This may be especially helpful for some stakeholders in light of new rebuilding plans and allocation changes, which might have disparate impacts on

stakeholders depending upon their initial positions and access to the resource prior to the change in allocations and implementation of a rebuilding plan.

Economic Impacts

The economic impacts of 5a-1 (status quo, recreational to commercial sector transfers, only) are expected to continue to be more or less neutral for the recreational sector and positive for the commercial sector. The commercial sector has historically utilized a portion of the additional transferred quota by increasing landings above the initial pre-transfer commercial allocation. The additional quota transferred from the recreational sector to the commercial sector may also contribute to increases in job opportunities and/or higher paying trips for crew members along with increases in revenues. A bi-directional transfer, suggested by alternative 5a-2, would only provide positive economic impacts to the recreational sector if a future quota transfer were large enough to allow for a liberalization of recreational measures. In the absence of an increase in the bag limit resulting from a higher post-transfer RHL, the recreational sector is likely to experience negligible economic impacts. Within the commercial sector, there is a slight negative economic impact associated with a bi-directional transfer which could result from miscalculations in projected commercial landings which could limit the quantity landed by the commercial sector.

4.4.3 Transfer Cap Alternatives

The no action/status quo transfer cap alternative 5b-1 keeps the existing commercial sector transfer cap in place. If the pre-transfer commercial share of the ACL is less than 10.5 million and the Council and Board determines the need for a transfer from the recreational sector to the commercial sector, the commercial quota may be allocated up to 10.5 million lb as its quota. If the Council and Board selects alternative 5b-1 along with alternative 5a-2, which allows for bi-directional transfers, no transfer cap would be implemented for the recreational sector. Specifically, if the Council and Board determines the need for a transfer from the commercial sector to the recreational sector, the transfer amount and the RHL would not be subject to any cap.

Under alternative 5b-2, any transfer from one sector to the other would be capped at 10% of the ABC (Table 34). This approach allows quota transfers to scale with biomass. The size of the transfer cap will increase and decrease with changes in the acceptable biological catch that are associated with changes in the stock size. Unlike 5b-1, transfers could still occur even when the commercial quota is above 10.5 million pounds.

Table 34: Proposed transfer caps for sector-based transfers.

Alternatives	Transfer Cap
5b-1	No Action/Status Quo
5b-2	Up to 10% of the ABC

4.4.4 Impacts of Transfer Cap Alternatives

Alternative 5b-1 10.5 million lb cap was set through Amendment 1 and was based on the average commercial landings for the period 1990-1997. The existing transfer cap was

specifically designed for one-way transfers, and as such, selecting bi-directional transfers with no action on the transfer cap does not cap transfers from the commercial sector to the recreational sector. However, due to the smaller commercial allocation it is highly unlikely that the commercial sector would ever transfer more than 10.5 million lb to the recreational sector, meaning a 10.5 million lb cap on commercial to recreational transfers would not be restrictive anyway.

Alternative 5b-2 would implement a maximum transfer cap of up to 10% of the ABC. Considering a recent time series of ABCs (
Table **35**), 10% of the average of ABCs from 2000-2019 would result in a sector transfer of 2.97 M lbs. This estimate is smaller than the average transfer over the same time period (4.30 M lb). However, since alternative 5b-2 is a percentage of the total ABC, future transfer amounts would scale with biomass as bluefish continues through the rebuilding plan. By comparison, the status quo alternative will result in no transfers if the commercial quota exceeds 10.5 M lb.

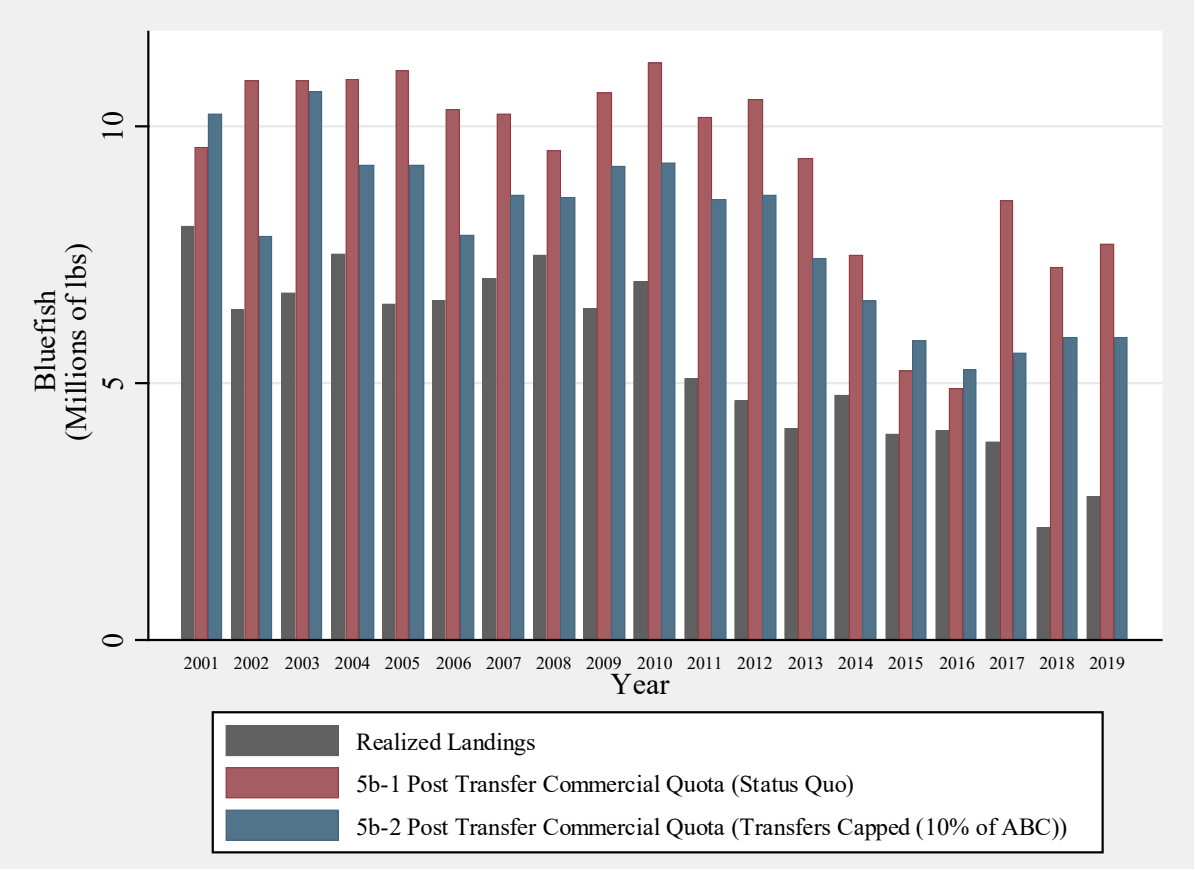
Table 35: Recreational to commercial sector transfer amounts, ABCs in million lb, and estimates of retroactive 10% transfer caps from 2000-2019.

Year	Sector Transfer Amount	ABC	10% Transfer Cap
2000	0	36.840	3.684
2001	3.150	37.840	3.784
2002	5.933	29.100	2.910
2003	4.161	39.500	3.950
2004	5.085	34.215	3.422
2005	5.254	34.215	3.422
2006	5.367	29.150	2.915
2007	4.780	32.033	3.203
2008	4.088	31.887	3.189
2009	4.838	34.081	3.408
2010	5.387	34.376	3.438
2011	4.772	31.744	3.174
2012	5.052	32.044	3.204
2013	4.686	27.472	2.747
2014	3.340	24.432	2.443
2015	1.579	21.544	2.154
2016	1.577	19.456	1.946
2017	5.033	20.642	2.064
2018	3.535	21.815	2.182
2019	4.000	21.82 0	2.182

Economic Impacts

The economic impact of sector transfer caps on the commercial bluefish sector are investigated by comparing realized landings data to predicted landings under a 10% ABC cap transfer

scenario over 2001-2019.[15] Revenues are also estimated under these two scenarios. Ex-vessel bluefish prices are estimated using the price model and methods described in Appendix B. Revenues are estimated as opposed to incorporating realized revenues in order to establish an equal comparison between the status quo transfer cap alternative (5b-1) and the 10% ABC transfer cap alternative (5b-2) and their economic implications. Quotas under alternative 5b-2 are estimated using the historic ABC's for each year and for each of the sector allocation sub-alternatives presented in *Section 4.1.1* (i.e., 2a-1 to 2a-5). Then 10% of the ABC is added to the pre-transfer quantities to produce the post-transfer values. Similar to previous economic analyses, it is assumed that all allocated quota is landed when comparing the projected commercial quotas under alternative 5b-2 to the realized landings. It should be noted that in every year in the time series, realized landings have been less than the full allocation generated under the 5b-2 scenario (Figure 25). If the proposed transfer cap had been implemented over the time series, and all else was held constant, landings would not have been restricted by the transfer cap. Further, in some years (2001, 2015, and 2016) the realized post-transfer quantities are less than the 5b-2 scenario[16] such that a transfer cap equal to 10% of the ABC would not have impacted landings in these years even if the full historic post transfer landings had been fully utilized.



[15] Sector transfers occurred on an annual basis from 2001-2019.
[16] The realized sector transfer was less than 10% of the ABC.

Figure 25: Realized bluefish landings, historical post-transfer commercial bluefish quotas under the status quo alternative 5b-1, and post-transfer commercial bluefish quota with a transfer cap of 10% of the ABC (5b-2) applied over 2001 to 2019.

There are only a handful of years where predicted landings under the 5b-2 transfer scenario are less than realized landings when investigated across the proposed commercial allocations described in *Section 4.1.1* (Figure 26). Specifically, there are only six years where predicted landings are less than realized landings, all occurring under the 2a-2 (11% commercial allocation) alternative.

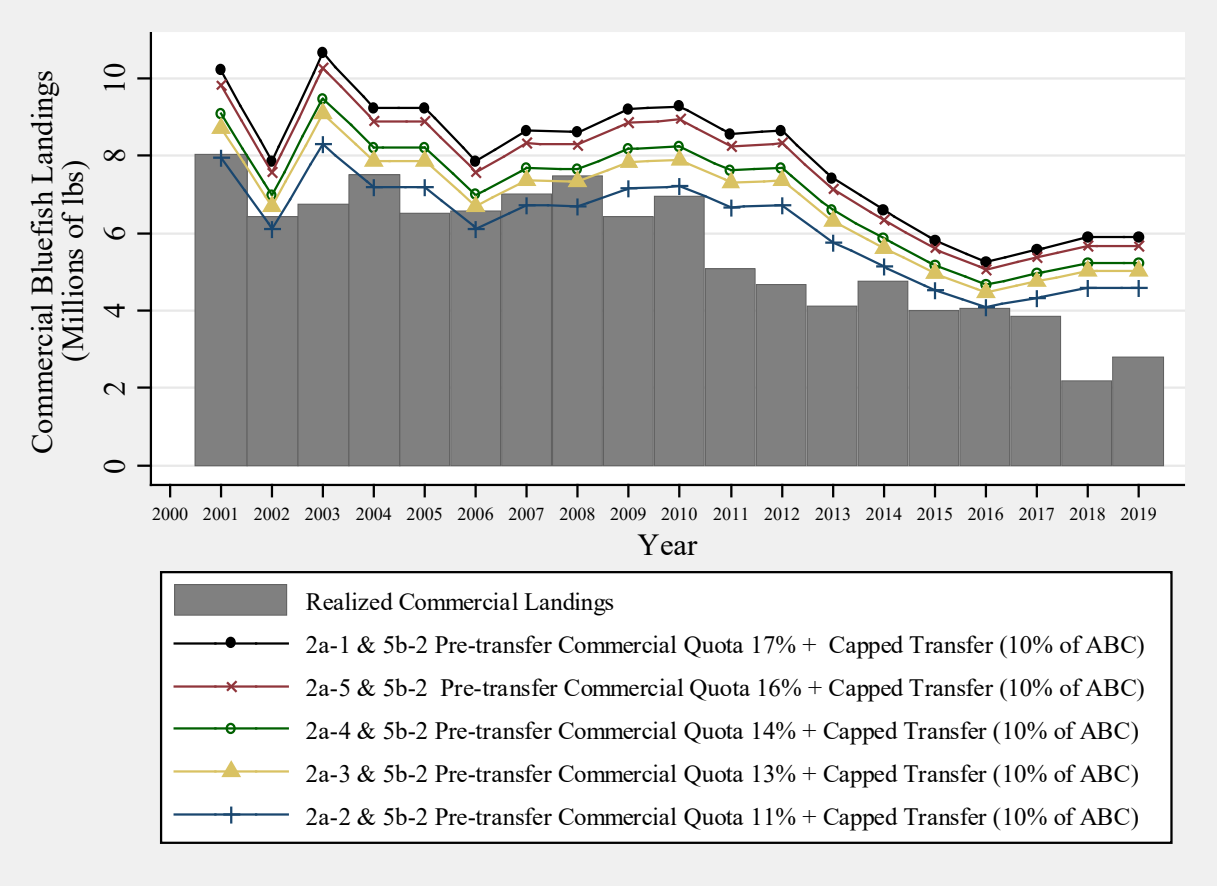


Figure 26: Realized commercial bluefish landings and predicted commercial landings under the 10% ABC cap transfer scenario across proposed commercial allocation alternatives from 2001-2019.

Despite the few instances where realized landings are less than landings predicted under the 5b-2 scenario, estimated revenues are higher under all 5b-2 landings scenarios relative to revenues estimated under the realized landings scenario (Figure 27). This result is driven by the inverse relationship between ex-vessel price and landings (described further in Appendix B). However, higher revenues under the 5b-2 transfer scenario are heavily reliant on the price

model which only describes about 68% of the variability in annual prices and is informed by a limited sample size.

In summary, realized commercial bluefish landings are almost always less than the possible landings under the 5b-2 transfer scenario. In the six cases where realized landings *do* exceed landings from the capped transfer scenarios, the differences in revenue are marginal. Overall, there are few cases where bluefish landings/revenues are expected to be impacted by the implementation of a sector transfer cap of 10% of the ABC.

The economic impacts of implementing a 10% cap on sector transfers on the recreational sector of the bluefish fishery are expected to be negligible. Although, these caps would limit the transfer quantities from the commercial sector to the recreational sector, recreational harvest, effort, and expenditures are not expected to be impacted by this sub-alternative unless a sector transfer resulted in the need to adjust recreational measures. In reverse, transfers from the recreational to the commercial sector only occur when the recreational sector is predicted to harvest quantities below the recreational RHL, such that the existence of a transfer cap should not impact recreational harvest, effort, or expenditures.

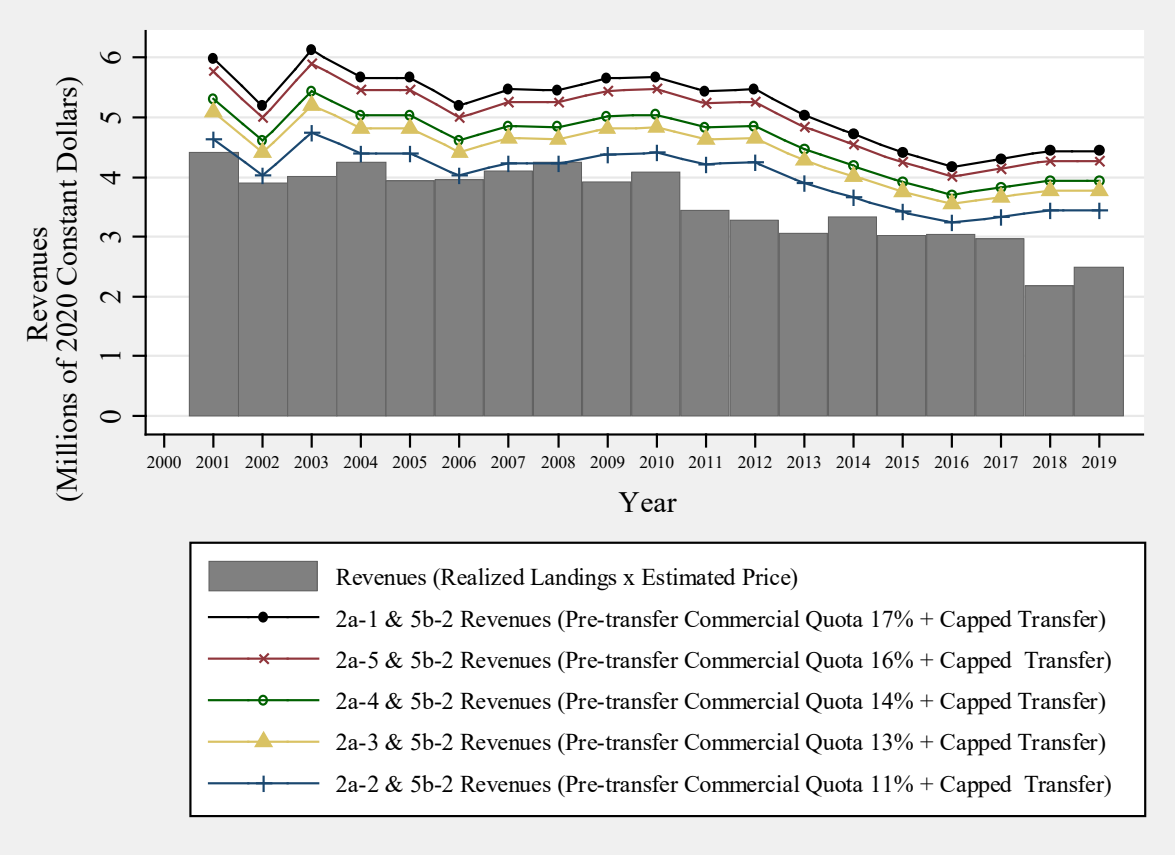


Figure 27: Estimated commercial bluefish revenues (realized landings multiplied by estimated ex-vessel bluefish price) and estimated commercial revenues under the 10% ABC cap sector transfer scenarios across proposed sector allocation alternatives from 2001-2019.

4.5 MANAGEMENT UNCERTAINTY ALTERNATIVES AND IMPACTS

4.5.1 Management Uncertainty Alternatives

This alternative set is included to modify how the Monitoring Committee accounts for management uncertainty (
Table **36**). In the current FMP, the fishery-level ACL may be reduced by a buffer to account for sources of management uncertainty. The ACL minus the management uncertainty buffer equals the ACT as displayed in the bluefish flowchart (Figure 28). The Monitoring Committee annually identifies and reviews the relevant sources of management uncertainty to recommend ACTs for the commercial and recreational fishing sectors as part of the bluefish specification process. The status quo option (alternative 6a) would maintain the bluefish flowchart as displayed in Figure 28, which demonstrates that any uncertainty buffer applied to the fishery-level ACL applies to both sector specific ACTs equally. Alternative 6b would provide greater flexibility by establishing ACLs and ACTs for each sector as displayed in the bluefish flow chart in Figure 29. Specifically, the proposed flowchart allows for management uncertainty to be accounted for within each sector. This targeted approach would allow for the identification of sources of management uncertainty that are specific to one sector and are not present in the other.

Table 36: Proposed management uncertainty alternatives.

Alternatives	Management Uncertainty Alternatives
6a	No Action/Status Quo
6b	Post-Sector Split

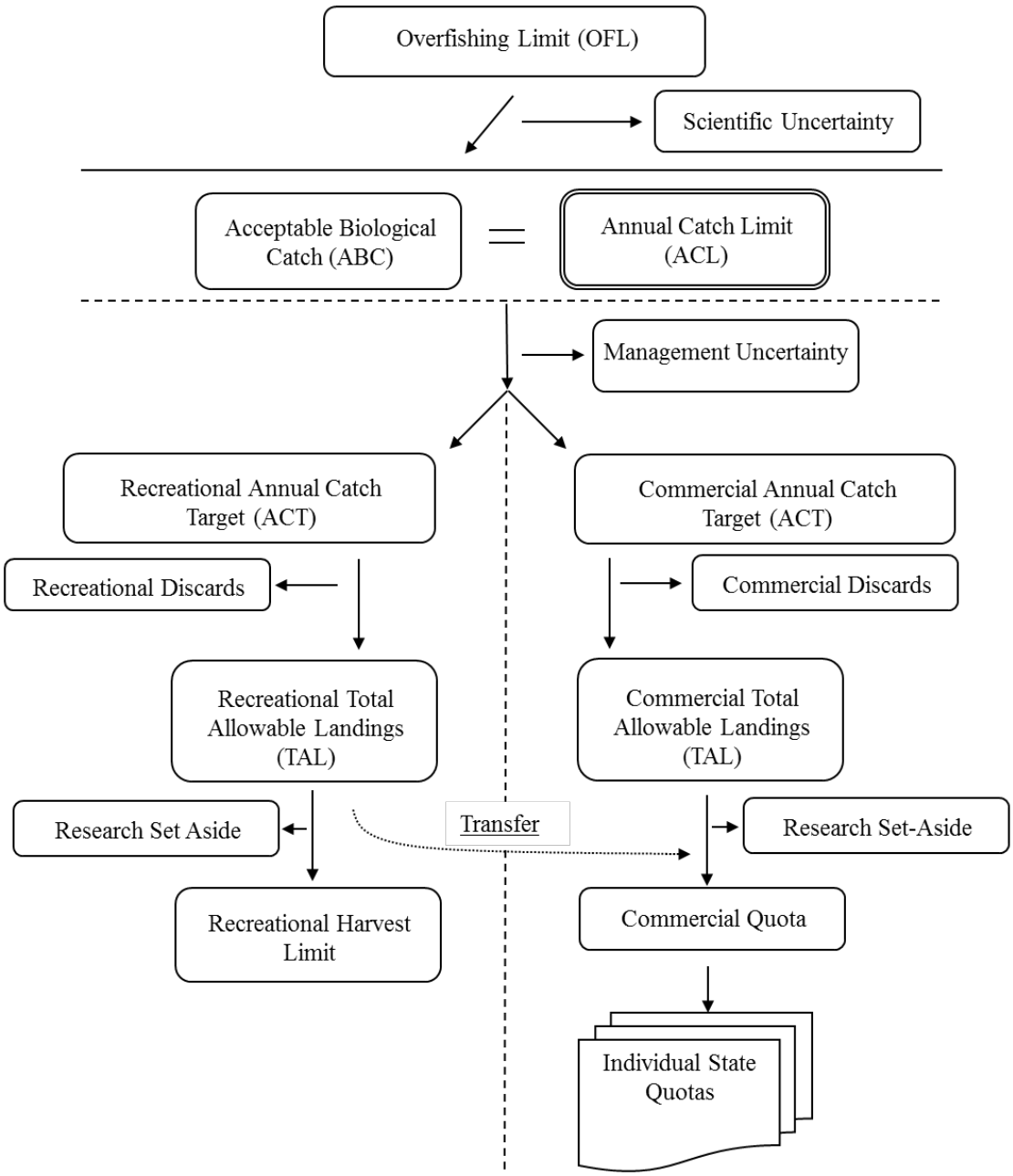


Figure 28: Current bluefish flow chart representing a reduction for management uncertainty prior to the sector split.

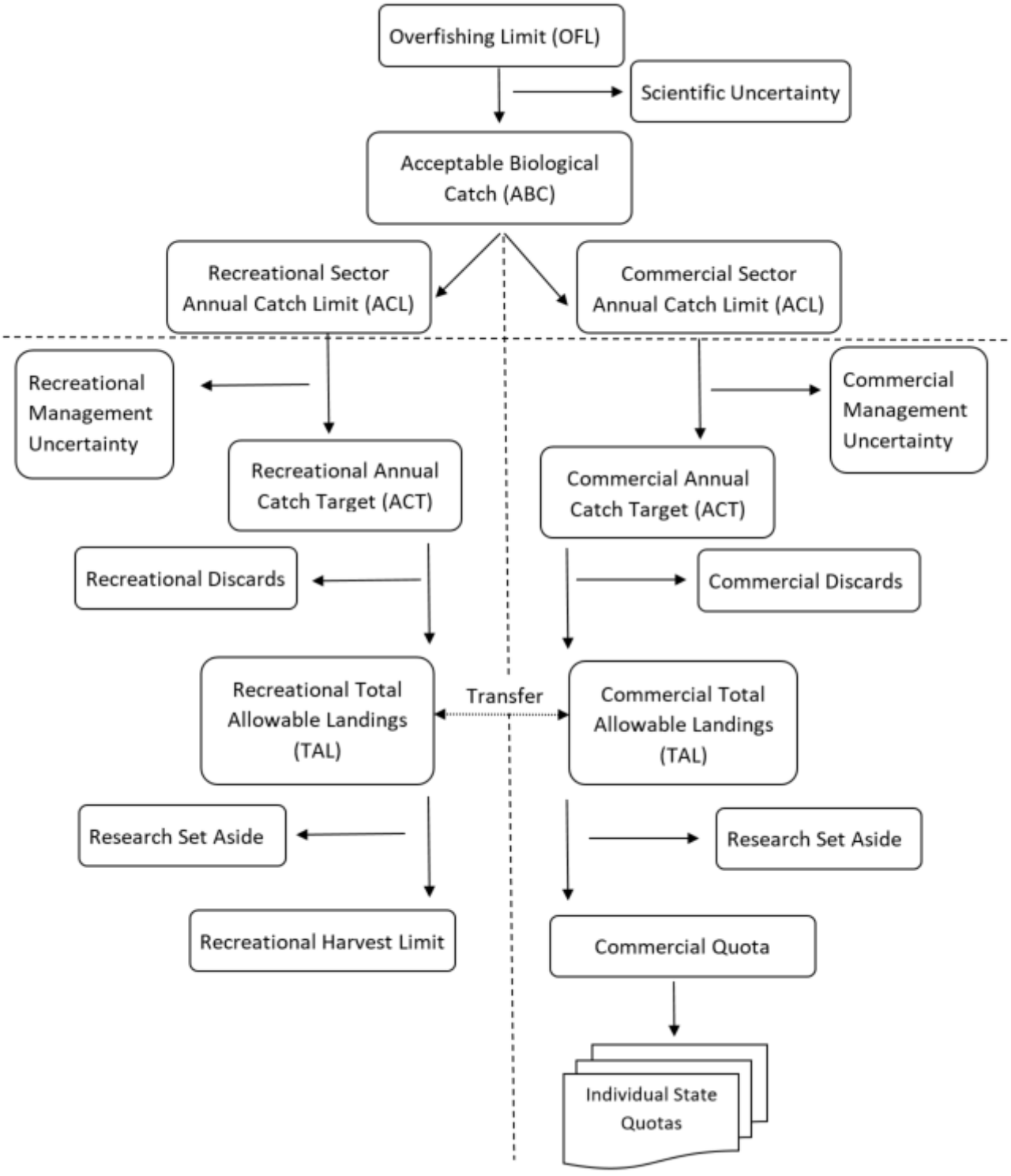


Figure 29: Proposed bluefish flow chart including sector specific management uncertainty.

4.5.2 Impacts of Management Uncertainty Alternatives

Identifying sources of management uncertainty and applying a buffer to reduce the probability of exceeding an ACL is a helpful tool in the management toolkit. However, the status quo

alternative (6a) is lacking in its inability to specifically target sources of uncertainty that are present in one sector and not the other. In the current FMP, the management uncertainty buffer is applied to the fishery-level ACL prior to the sector split and as such has the unintended consequence of reducing both sector's ACLs regardless of the source of management uncertainty. Alternative 6b allows for a more targeted approach, where management uncertainty can be addressed by reducing one sector's ACL to the ACT while leaving the other sector unaffected.

The following example is used for demonstrative purposes only. Under alternative 6a, if the Council and Board are concerned about the lack of data on commercial discards and believe this to be a source of management uncertainty, the fishery-level ACL may be reduced by an agreed upon buffer. According to the flowchart in Figure 28, this reduction trickles down to both the commercial and recreational sectors' ACTs. This negatively impacts the recreational sector's catch and landings limits despite the fact that the source of the management uncertainty was the commercial sector. To avoid these cascading effects, the Council and Board could decide to not implement management uncertainty despite the associated greater potential risk of exceeding the ABC. Using this same example under alternative 6b, the Council and Board has the ability to reduce the commercial sector's ACT through the application of a management uncertainty buffer to the commercial sector ACL. This would leave the recreational sector's ACL unaffected and would not negatively impact the recreational sector's catch or landings limits.

Without the ability to apply sector specific management uncertainty buffers, Council and Board members are faced with the difficult decision of applying management uncertainty to both sectors indiscriminately, or not applying management uncertainty at all and risking potential overages in the fishery-level ACL or ABC.

Ultimately, alternative 6b might have neutral to low positive impacts for resource user groups. If management uncertainty disproportionately affects one sector over another, keeping the process in its current order could continue to frustrate and constrain some stakeholders who might otherwise benefit from determining uncertainties after dividing out sector catch targets. Furthermore, alternative 6b is expected to have minimal to no economic impacts on the commercial and recreational bluefish sectors.

The adoption of alternative 6b would require adjustments to the AMs as currently written. The evaluation of catch overages would transition from the fishery-level ACL to sector specific ACLs. The adoption of sector specific ACLs also has implications for the transfer process. For the purpose of maintaining accurate accounting and accountability of the ACL, both sector's ACLs would be adjusted to reflect the transfer at the landings limit level. If alternative 6b is selected by the Council and Board, the AM regulations would be updated through the federal rule making process for this amendment.

4.6 *DE MINIMIS* PROVISION ALTERNATIVES AND IMPACTS

Under the Commission's current FMP, states which land less than 0.1% of the coastwide commercial landings in the year prior are exempt from fishery independent monitoring requirements for the following year. However, the federal plan does not require states to submit fishery independent monitoring reports, and as such has no *de minimis* provision.

4.6.1 *De Minimis* Provision Alternatives

The *de minimis* alternative set is presented in Table 37. Under the no action/status quo alternative 7a, *de minimis* status would remain excluded from the Federal Bluefish Amendment and maintain the status quo *de minimis* provision in the Commission Amendment.

Alternatives 7b, 7c, 7d, and 7e all expand upon the Commission's current *de minimis* provision, and the existing exemption of the requirement to conduct fishery independent monitoring remains. A state's three-year average of combined recreational and commercial landings compared against coastwide landings for the same period with a 1% threshold would be used to determine status for alternatives 7b, 7c, 7d, and 7e. The key distinction between the four alternatives is the different recreational management measures that *de minimis* states may adopt. Under all alternatives a *de minimis* state has the option to implement the coastwide measures if the state is only requesting *de minimis* status for the purposes of the fishery independent monitoring exemption.

Under alternative 7b, a *de minimis* determination would exempt the state from recreational measures. Since *de minimis* states would be exempt from coastwide recreational measures in state waters, there is potential for recreational effort to shift to *de minimis* states and for landings to become substantial before adequate action can be taken. To mitigate this, *de minimis* states are encouraged to implement recreational bag limits which would deter shifts in effort to their state.

Under alternative 7c, a *de minimis* determination would exempt the state from the coastwide measures. However, a *de minimis* state would still be required to implement recreational management measures of its choosing, which would deter shifts in effort from other states. *De minimis* states would be required to design measures that maintain harvest at levels below the 1% coastwide harvest threshold.

Under alternative 7d, a *de minimis* determination would allow a state to maintain the measures that were in place when the state first requested and qualified for *de minimis* status. The intent of this alternative would be to maintain low levels of harvest with consistent regulations. Please note that the base year of reference would be measures implemented in 2019, which was prior to the most recent change in coastwide measures. For example, Georgia has requested and qualified for *de minimis* status for the years 2019-2021. Upon implementation of this Amendment in 2022, Georgia would be allowed to adopt recreational measures consistent with those in place during the 2019 fishing year, assuming Georgia maintains its *de minimis* status for the 2022 fishing year. North Carolina on the other hand, has not qualified for *de minimis*

status for any of the years 2019-2021. If North Carolina requested and qualified for *de minimis* status in 2022, North Carolina would be able to implement recreational measures consistent with what were in place for 2021.

Under alternative 7e, a *de minimis* determination would allow a state to maintain a set of minimum default recreational measures. At the October 2020 meeting, the Board and Council agreed that the fixed set of minimum default measures would consist of a bag limit of 3 fish for anglers fishing from shore or private vessels and 5 fish for anglers fishing on a for-hire trip, no minimum size, and an open season all year. These measures are consistent with the coastwide measures that were implemented in 2020.

Table 37: Proposed *de minimis* provision alternatives.

Alternatives	*De Minimis* Alternatives
7a	No Action/Status Quo
7b	Recreational *De Minimis* – no management measures
7c	Recreational *De Minimis* – state-selected management measures
7d	Recreational *De Minimis* – rollover management measures
7e	Recreational *De Minimis* – 2020 management measures

4.6.2 Impacts of *De Minimis* Provision Alternatives

Alternative 7a is anticipated to have neutral social impacts to the majority of stakeholders to the bluefish resource across user groups and sectors. Taking no action on the *de minimis* provision is expected to have low negative social impacts to recreational anglers that fish within state waters of *de minimis* states. These anglers would be subject to the coastwide recreational measures, which as of winter 2021 consist of a 3-fish bag limit for private anglers and a 5-fish bag limit for for-hire party and charter vessels. During the scoping process, the Georgia Department of Natural Resources provided a written request to alter the *de minimis* provision to allow for an exemption of restrictive recreational measures. GA, along with SC and ME have historically qualified for *de minimis* status. In the short term, alternatives 7b, 7c, and 7d would likely provide more liberalized recreational measures for anglers operating within these states' waters as well as any states that meet the requirements of *de minimis* status in the future.

Alternatives 7b, 7c, 7d and 7e complicate coastwide management of bluefish from an enforcement perspective. Anglers will need to be cognizant of the differing regulations between state and federal waters, as well as differing regulations when crossing state lines from a non *de minimis* state to a *de minimis* state. However, these concerns are already at play when states implement recreational measures within state lines under the Commission's conservation equivalency policy that differ from the coastwide measures. Alternatives 7b, 7c, and 7d would allow for a greater variety of state measures compared to alternative 7e, which would maintain just one default set of *de minimis* measures.

From a catch accounting perspective, the proposed *de minimis* provision in alternatives 7b, 7c, and 7d would reduce a state's accountability for its recreational harvest in the short term.

Currently, the plan ensures that all states are held accountable by annually evaluating the need to adjust recreational measures to insure coastwide recreational catch does not exceed the RHL. A state that meets the *de minimis* criteria would not be held accountable in the same way, which raises questions about fairness and equity across state user groups. However, if a *de minimis* states' recreational landings increase significantly due to an unforeseen increase in angler effort, the state may exceed the 1% coastwide landings threshold and no longer be afforded *de minimis* status in the coming year. As such, that state will be held accountable and be required to implement recreational measures through the standard specifications process. Thus, *de minimis* states are incentivized under each of the proposed alternatives to implement measures that would prevent large increases in recreational landings. By comparison to incentivizing restrictive measures, alternative 7e requires more restrictive measures, which has a greater likelihood of constraining *de minimis* states to low levels of catch, but restricts flexibility.

Ultimately, the *de minimis* alternatives 7b, 7c, and 7d would result in minor economic benefits for states that meet the *de minimis* criteria. Currently, there is an opportunity cost associated with abiding to the coastwide bluefish recreational regulations, such that relieving a state from adhering to these regulations would give a slight economic advantage to these low-landing states. Alternatives 7b, 7c, and 7d also have the potential to relieve *de minimis* states of the administrative burden of implementing new and changing recreational measures.

4.7 ALTERNATIVE STATE MANAGEMENT REGIMES

4.7.1 General Procedures

A state may submit a proposal for a change to its regulatory program or any mandatory compliance measure under this Amendment to the Commission. Such changes shall be submitted to the Chair of the Plan Review Team (PRT), who shall distribute the proposal to appropriate groups, including the Board, the PRT, the TC, and the AP.

The PRT is responsible for gathering the comments of the TC and the AP. The PRT is also responsible for presenting these comments to the Board for decision.

The Board will decide whether to approve the state proposal for an alternative management program if it determines that it is consistent with the target fishing mortality rate applicable as well as the goals and objectives of this Amendment.

In order to maintain consistency within a fishing season, new rules should be implemented prior to the start of the fishing season. Given the time needed for the TC, AP, and Board to review the proposed regulations, as well as the time required by an individual state to promulgate new regulations, it may not be possible to implement new regulations for the on-going fishing season. In this case, new regulations should be effective at the start of the following season after a determination to do so has been made.

4.7.2 Management Program Equivalency

The Technical Committee, under the direction of the PRT, will review any alternative state proposals under this section and provide its evaluation of the adequacy of such proposals to the Board via the PRT. The PRT can also ask for reviews by the Law Enforcement Committee (LEC) or the AP.

4.7.3 De minimis Fishery Guidelines

The Commission's Interstate Fisheries Management Program Charter defines *de minimis* as a situation in which, under existing conditions of the stock and scope of the fishery, conservation and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coastwide conservation program required by an FMP or amendment. Commission FMPs commonly include *de minimis* provisions to relieve regulatory and monitoring burdens for states that meet predetermined conditions and follow a defined request process. Revisions to the bluefish FMP's de minimis provision are under consideration in *Section 4.6.*

4.8 ADAPTIVE MANAGEMENT

The Board may vary the requirements specified in this Amendment as a part of adaptive management in order to conserve the bluefish resource. The elements that can be modified by adaptive management are listed in *Section 4.8.2*. The process under which adaptive management can occur is provided below.

4.8.1 General Procedures

The PRT will monitor the status of the fishery and the resource and report on that status to the Board annually or when directed to do so by the Board. The PRT will consult with TC, the SASC, and the AP in making such review and report, if necessary.

The Board will review the report of the PRT, and may consult further with the TC, or AP. The Board may, based on the PRT report or on its own discretion, direct the plan development team (PDT) to prepare an addendum to make any changes it deems necessary. The addendum shall contain a schedule for the states to implement the new provisions.

The PDT will prepare a draft addendum as directed by the Board, and shall distribute it to all states for review and comment. A public hearing will be held in any state that requests one. The PDT will also request comment from federal agencies and the public at large. After at least a 30-day review period, staff, in consultation with the PDT, will summarize the comments received and prepare a final version of the addendum for the Board.

The Board shall review the final version of the addendum prepared by the PDT, and shall also consider the public comments received and the recommendations of the TC, LEC, and AP. The Board shall then decide whether to adopt, or revise and then adopt, the addendum.

Upon adoption of an addendum by the Board, states shall prepare plans to carry out the addendum, and submit them to the Board for approval according to the schedule contained in the addendum.

4.8.2 Measures Subject to Change

The following measures are subject to change under adaptive management upon approval by the Board:

1. Minimum fish size
2. Maximum fish size
3. Gear restrictions
4. Gear requirements or prohibitions
5. Permitting restrictions
6. Recreational possession limit
7. Recreational seasons
8. Closed areas
9. Commercial seasons
10. Commercial trip limits
11. Commercial quota system including commercial quota allocation procedure and possible quota set asides to mitigate bycatch
12. Recreational harvest limit
13. Annual specification quota setting process
14. FMP Technical Monitoring Committee composition and process
15. Description and identification of essential fish habitat (EFH) and fishing gear management measures that impact EFH
16. Description and identification of habitat areas of particular concern
17. Overfishing definition and related thresholds and targets
18. Regional gear restrictions
19. Regional season restrictions (including option to split seasons)
20. Restrictions on vessel size (LOA and GRT) or shaft horsepower
21. Operator permits
22. Any other commercial or recreational management measure
23. Any other management measures currently included in the FMP
24. Set aside quotas for scientific research

4.9 EMERGENCY PROCEDURES

Emergency procedures may be used by the Board to require any emergency action that is not covered by, is an exception to, or a change to any provision in this Amendment. Procedures for implementation are addressed in the ASMFC Interstate Fisheries Management Program Charter, Section Six (c)(10) (ASMFC 2019).

4.10 MANAGEMENT INSTITUTIONS

4.10.1 Atlantic States Marine Fisheries Commission and ISFMP Policy Board

The Commission and the ISFMP Policy Board are generally responsible for the oversight and management of the Commission's Fisheries management activities. The Commission must

approve all fishery management plans and amendments, including this Amendment. The ISFMP Policy Board reviews any non-compliance recommendations of the various Boards and, if it concurs, forwards them to the Commission for action.

4.10.2 Bluefish Management Board

The Board was established under the provisions of the Commission's ISFMP Charter (Section Four; ASMFC 2019) and is generally responsible for carrying out all activities under this Amendment.

The Board establishes and oversees the activities of the Plan Development Team, Plan Review Team, Technical Committee, and the Advisory Panel. In addition, the Board makes changes to the management program under adaptive management, reviews state programs implementing the amendment, and approves alternative state programs through conservation equivalency. The Board reviews the status of state compliance with the management program annually, and if it determines that a state is out of compliance, reports that determination to the ISFMP Policy Board under the terms of the ISFMP Charter.

4.10.3. Bluefish Allocation and Rebuilding Amendment Fishery Management Action Team and Plan Development Team

The Fishery Management Action Team (FMAT) and the Plan Development Team (PDT) is composed of personnel from state and federal agencies who have scientific knowledge of bluefish and management abilities. The FMAT/PDT is responsible for preparing and developing management documents, including amendments, using the best scientific information available and the most current stock assessment information. FMAT and PDT membership and purpose are identical, the key distinction is the FMAT is convened in accordance with MAFMC guidelines and the PDT is convened in accordance with the Interstate Fisheries Management Program Charter. For ease of reading, the PDT/FMAT is simply referred to as FMAT throughout this Amendment. The ASMFC FMP Coordinators are members of the FMAT/PDT. The FMAT/PDT will either disband or assume inactive status upon completion of this Amendment.

4.10.4 Bluefish Commercial/Recreational Allocation Amendment Plan Review Team

The Plan Review Team (PRT) is composed of personnel from state and federal agencies who have scientific and management ability and knowledge of bluefish. The PRT is responsible for providing annual advice concerning the implementation, review, monitoring, and enforcement of this Amendment once it has been adopted by the Commission. After final action on the amendment, the Board may elect to retain members of the PDT as members of the PRT, or appoint new members.

4.10.5 Bluefish Technical Committee

The Bluefish Technical Committee consists of representatives from state or federal agencies, Regional Fishery Management Councils, the Commission, a university, or other specialized personnel with scientific and technical expertise, and knowledge of the bluefish fisheries. The Board appoints the members of the TC and may authorize additional seats as it sees fit. The role of the TC is to assess the species' population, provide scientific advice concerning the

implications of proposed or potential management alternatives, and respond to other scientific questions from the Board, PDT, or PRT.

4.10.6 Bluefish Advisory Panel

The Bluefish Advisory Panel (AP) is established according to the Commission's Advisory Committee Charter. Members of the AP are citizens who represent a cross-section of commercial and recreational fishing interests and others who are concerned about bluefish conservation and management. The AP provides the Board with advice directly concerning the Commission's bluefish management program.

4.10.7 Federal Agencies

4.10.7.1 Management in the Exclusive Economic Zone

Management of bluefish in the EEZ is within the jurisdiction of one Regional Fishery Management Council (the Mid-Atlantic Fishery Management Council) under the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.). The Council annually makes recommendations on catch and landings limits as well as gear modifications to the NOAA Fisheries through the specification process.

4.10.7.2 Federal Agency Participation in the Management Process

The Commission has accorded USFWS and NOAA Fisheries voting status on the ISFMP Policy Board and the Bluefish Management Board in accordance with the Commission's ISFMP Charter. NOAA Fisheries can also participate on the Bluefish FMAT, PRT, and TC.

4.10.7.3 Consultation with Fishery Management Councils

At the time of adoption of this Amendment, the Mid-Atlantic Fishery Management Council is the only Regional Fishery Management Council to have implemented a management plan for bluefish; no other Councils have indicated an intent to develop a plan.

4.11 RECOMMENDATIONS TO THE SECRETARY OF COMMERCE FOR COMPLEMENTARY ACTIONS IN FEDERAL JURISDICTIONS

The Bluefish FMP is jointly managed between the Commission, Council, and NOAA Fisheries. The proposed alternatives in this Amendment will affect both state and federal permit holders operating in the commercial and recreational bluefish fisheries in both state and federal waters. The Atlantic states (through the Commission), the Council, and NOAA Fisheries through joint management coordinate to ensure consistency in management between state and federal waters. Therefore, a specific recommendation to the Secretary of Commerce for complementary action in federal jurisdictions is unnecessary at this time. The Board may consider further recommendations to the Secretary if changes to this Amendment occur through the adaptive management process (*Section 4.8*).

4.12 COOPERATION WITH OTHER MANAGEMENT INSTITUTIONS

The Board will cooperate, when necessary, with other management institutions during the implementation of this Amendment, including NOAA Fisheries and the New England, Mid-Atlantic, and South Atlantic Fishery Management Council.

5.0 COMPLIANCE

The full implementation of the provisions included in this Amendment is necessary for the management program to be equitable, efficient, and effective. States are expected to implement these measures faithfully under state laws. The Commission will continually monitor the effectiveness of state implementation and determine whether states are in compliance with the provisions of this fishery management plan.

The Board sets forth specific elements that the Commission will consider in determining state compliance with this fishery management plan, and the procedures that will govern the evaluation of compliance. Additional details of the procedures are found in the ASMFC Interstate Fishery Management Program Charter (ASMFC 2019).

5.1 MANDATORY COMPLIANCE ELEMENTS FOR STATES

A state will be determined to be out of compliance with the provision of this fishery management plan according to the terms of Section Seven of the ISFMP Charter if:

- Its regulatory and management programs to implement this Amendment have not been approved by the Board; or

- It fails to meet any schedule required by *Section 5.2*, or any addendum prepared under adaptive management (*Section 4.6*); or

- It has failed to implement a change to its program when determined necessary by the Board; or

- It makes a change to its regulations required under *Section 4* or any addendum prepared under adaptive management (*Section 4.6*), without prior approval of the Board.

5.1.1 Regulatory Requirements

To be considered in compliance with this fishery management plan, all state programs must include a regime of restrictions on bluefish fisheries consistent with the requirements of *Section 3.1: Commercial Catch and Landings Programs; Section 3.4: Biological Data Collection Programs;* and *Section 4.0: Management Program*. A state may propose an alternative management program under *Section 4.5: Alternative State Management Regimes*, which, if approved by the Board, may be implemented as an alternative regulatory requirement for compliance. Bluefish key compliance items requested through the annual compliance review are listed below in *Section 5.3*.

5.2 COMPLIANCE SCHEDULE

States must implement this Amendment according to the following schedule:

Month Day, 202X:	Submission of state plans to implement the amendment for approval by the Board, if it is necessary to change state law or regulation.
Month Day, 202X:	Implementation date of the Amendment. This date may change based on the timing of Final Approval of the Council FMP by the Secretary of Commerce.

5.3 COMPLIANCE REPORT CONTENT

Each state must submit to the Commission an annual report concerning its bluefish fisheries and management program for the previous year, no later than May 1st. A standard compliance report format has been prepared and adopted by the ISFMP Policy Board. States should follow this format in completing the annual compliance report.

The report shall cover:

Request for *de minimis*, where applicable.
Any state that has commercial landings of less than 0.1% of the total coastwide commercial landings in the last preceding year for which data are available is eligible for *de minimis* status.

Previous calendar year's fishery

a. As required by the Biological Monitoring Program implemented through Addendum I, please answer the following?
    i. Was the state able to collect the specified 100 samples? Specify number of samples collected from January – June and from July – December.
    ii. What is the source of the otolith, length, and age data?
b. Activities of fishery independent monitoring (provide a brief review of results and tables).
c. Copy of regulations that were in effect for the prior year. Has the state implemented the required measures as mandated in the FMP, listed below? Please answer with either 'yes' or 'no'.

Has the state implemented the required measure?	yes	no
Bluefish commercial vessel permit requirements		
Party/charter permit requirements		
Dealer permit requirements		
Recreational possession limit 15 or lower?		

*Compliance reports should include an overview of permitting requirements for commercial and party/charter vessels and commercial dealers.

d. Harvest broken down by commercial (by gear type where applicable) and recreational, and non-harvest losses (when available).

Planned management programs for the current calendar year
Summarize any changes from previous years

5.4 PROCEDURES FOR DETERMINING COMPLIANCE

Detailed procedures regarding compliance determinations are contained in the ISFMP Charter, Section Seven (ASMFC 2019). In brief, all states are responsible for the full and effective implementation and enforcement of fishery management plans in areas subject to their jurisdiction. Written compliance reports as specified in the amendment must be submitted annually by each state with a declared interest. Compliance with this Amendment will be reviewed at least annually; however, the Board, ISFMP Policy Board, or the Commission may request the PRT to conduct a review of state's implementation and compliance with the amendment at any time.

The Board will review the written findings of the PRT within 60 days of receipt of a State's compliance report. Should the Board recommend to the Policy Board that a state be determined out of compliance, a rationale for the recommended noncompliance finding will be addressed in a report. The report will include the required measures of the FMP that the state has not implemented or enforced, a statement of how failure to implement or enforce required measures jeopardizes the species in question's conservation, and the actions a state must take in order to comply with requirements of the FMP.

The ISFMP Policy Board will review any recommendation of noncompliance from the Board within 30 days. If it concurs with the recommendation, it shall recommend to the Commission that a state be found out of compliance.

The Commission shall consider any noncompliance recommendation from the ISFMP Policy Board within 30 days. Any state that is the subject of a recommendation for a noncompliance finding is given an opportunity to present written and/or oral testimony concerning whether it should be found out of compliance. If the Commission agrees with the recommendation of the ISFMP Policy Board, it may determine that a state is not in compliance with the FMP, and specify the actions the state must take to come into compliance.

Any state that has been determined to be out of compliance may request that the Commission rescind its noncompliance findings, provided the state has revised its conservation measures.

5.5 ANALYSIS OF ENFORCEABILITY OF PROPOSED MEASURES

All state programs must include law enforcement capabilities adequate for successfully implementing that state's bluefish regulations. The LEC will monitor the adequacy of a state's enforcement activity.

6.0 MANAGEMENT AND RESEARCH NEEDS

The following lists of research needs have been identified to enhance knowledge of the bluefish resources. These research needs are drawn from the 2015 benchmark stock assessment; the MAFMC's Five Year Research Plan (2020-2024); and the Commission's Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. The list of research recommendations are classified into 1) stock assessment and population dynamics; 2) research and data needs.

6.1 STOCK ASSESSMENT AND POPULATION DYNAMICS

1. Explore a tag based assessment and associated costs compared to age based assessments to determine if it could supplement or replace other assessment techniques.
2. Characterize dynamics of older fish that are not well sampled by fishery independent trawl surveys by developing additional adult bluefish indices of abundance (e.g., broad spatial scale longline survey or gillnet survey).
3. Expand age structure of the SEAMAP index.
4. Investigate species associations with recreational angler trips targeting bluefish (on a regional and seasonal basis) to potentially modify the MRIP index used in the assessment model
5. Evaluate methods for integrating disparate indices produced at multiple spatial and temporal scales into a stock-wide assessment model.
6. Evaluate changes in selectivity of age-0 bluefish in fishery independent surveys due to shifting environmental conditions. Investigate trends in recruitment.

6.2 RESEARCH AND DATA NEEDS

1. Continue research on species interactions and predator-prey relationships.
2. Investigate the feasibility of alternative survey methods that target bluefish across all aged classes to create a more representative fishery-independent index of abundance.
3. Initiate sampling of offshore populations in winter months.
4. Initiate coastal surf zone seine study to provide more complete indices of juvenile abundance.
5. Conduct a post-release mortality study to determine if the recreational discard mortality rate has changed over time.
6. Investigate the assumption of zero discards in the commercial fishery.

7.0 PROTECTED SPECIES

7.1 ESA-LISTED SPECIES AND MMPA PROTECTED SPECIES

Numerous protected species inhabit the affected environment of the bluefish FMP (Table 38) and have the potential to be impacted by the proposed action (*i.e.*, there have been observed/documented interactions in the fishery or with gear type(s) similar to those used in the fishery (hook and line, bottom trawl or gillnet gear)). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Table 38. Species Protected Under the ESA and/or MMPA that May Occur in the Affected Environment of the Bluefish Fishery. Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks.[1]

Species	Status[2]	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***Yes***
Humpback whale, West Indies DPS (Megaptera novaeangliae)[3]	Protected (MMPA)	Yes
Fin whale (Balaenoptera physalus)	***Endangered***	***Yes***
Sei whale (Balaenoptera borealis)	***Endangered***	***Yes***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter microcephalus	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (Globicephala spp.)3	Protected (MMPA)	Yes

Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	Yes
Short Beaked Common dolphin (*Delphinus delphis*)	Protected (MMPA)	Yes
Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[4]	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Giant manta ray (*Brosme brosme*)	Threatened	Yes
Smalltooth sawfish (U.S. DPS) (*Pristis pectinata*)	Endangered	No
Oceanic Whitetip shark (*Carcharhinus longimanus*)	Threatened	No
Nassau grouper (*Epinephelus striatus*)	Threatened	No
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected (MMPA)	Yes
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	Yes
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	Yes
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	Yes
Corals		
Elkhorn Coral (Acropora palmata)	Threatened	No
Staghorn Coral (Acropora cervicornis)	Threatened	No

Pillar Coral (Dendrogyra cylindrus)	Threatened	No
Rough cactus coral (Mycetophyllia ferox)	Threatened	No
Lobed star coral (Orbicella annularis)	Threatened	No
Mountainous star coral (*Orbicella faveolata)*	Threatened	No
Boulder star coral (*Orbicella franksi)*	Threatened	No
Seagrass		
Johnson's Sea Grass (*Halophila johnsonii)*	Threatened	No
Critical Habitat		
North Atlantic Right Whale	ESA (Protected)	No
Northwest Atlantic Ocean DPS of Loggerhead Sea Turtle	ESA (Protected)	No
Johnson's Sea Grass	ESA (Protected)	No
Elkhorn and staghorn corals	ESA (Protected)	No
Smalltooth sawfish (U.S. DPS)	ESA (Protected)	No

Notes:
[1] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3, 1972).
[2] The status of the species is defined by whether the species is listed under the ESA as endangered (species are at risk of extinction) or threatened (species at risk of endangerment), or protected under the MMPA. Note, marine mammals listed under the ESA are also protected under the MMPA. Candidate species are those species in which ESA listing may be warranted.
[3] There are two species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.

[4] This includes all stocks of bottlenose dolphins except for the Florida Bay stock (see marine mammal stock assessment reports: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region).

Cusk (Table 38), a NMFS "species of concern," as well as a "candidate species" under the ESA, occurs in the affected environment of the bluefish fishery. Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the FR. Once a species is proposed for listing, the conference provisions of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, this species will not be discussed further in this section. However, for additional information on cusk and proactive conservation efforts being initiated for the species, visit: http://www.greateratlantic.fisheries.noaa.gov/protected/pcp/soc/cusk.html.

7.1.1 Species and Critical Habitat Not Likely to be Impacted by the Proposed Action

Based on available information, it has been determined that this action is not likely to impact multiple ESA listed and/or marine mammal protected species or any designated critical habitat (Table 38). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports, there have been no observed or documented interactions between the species and the primary gear type (i.e., hook and line, gillnet, and bottom trawl) used to prosecute the bluefish fishery (Greater Atlantic Region Marine Animal Incident Database, unpublished data ; Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html; MMPA List of Fisheries (LOF): https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries)[17]. In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 38 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2014a; NMFS 2015a,b).

7.1.2 Species Potentially Impacted by the Proposed Action

Table 38 has a list of protected species of sea turtle, marine mammal, and fish species present in the affected environment of the bluefish fishery, and that may also be impacted by the operation of this fishery; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fishery. To aid in the identification of MMPA protected species potentially impacted by the action, the MMPA LOF, and marine mammal SARS and serious injury and mortality reports were referenced (see Marine Mammal SARS for the Atlantic Region: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; MMPA LOF: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries; NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html).

To help identify ESA listed species potentially affected by the action, the most recent 10 years of marine animal incidence (e.g., entanglement) and NEFSC observer data (i.e., 2010-2019; NEFSC observer/sea sampling database, unpublished data, Greater Atlantic Region Marine Animal Incident Database, unpublished data), as well as the 2013 Biological Opinion issued by

[17] For marine mammals protected under the MMPA the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2007-2016; however, entanglement data is available through 2019. For ESA listed species, information on observer or documented interactions with fishing gear is from 2010-2019.

NMFS on the operation of seven commercial fisheries, including the bluefish FMP, was referenced (NMFS 2013). The 2013 Opinion, which considered the best available information on ESA listed species and observed or documented ESA listed species interactions with gear types used to prosecute the 7 FMPs (e.g., gillnet, bottom trawl), concluded that the seven fisheries may adversely affect, but was not likely to jeopardize the continued existence of any ESA listed species. The Opinion included an incidental take statement (ITS) authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon. Reasonable and prudent measures and terms and conditions were also issued with the ITS to minimize impacts of any incidental take.

New information indicates that North Atlantic right whale abundance has been in decline since 2010 (Pace et al. 2017). This new information is different from that considered and analyzed in the 2013 Opinion and therefore, reveals effects from this fishery that were not previously considered. As a result, per an October 17, 2017, ESA 7(a)(2)/7(d) memo issued by NMFS, the 2013 Opinion, as well as several other fishery Opinions, has been reinitiated. However, the October 17, 2017, ESA 7(a)(2)/7(d) memorandum issued by NMFS, determined ".....For the consultations being reinitiated..... Allowing these fisheries to continue during the reinitiation period will not increase the likelihood of interactions with these species above the amount that would otherwise occur if consultation had not been reinitiated, because allowing these fisheries to continue does not entail making any changes to any fishery during the reinitiation period that would cause an increase in interactions with whales, sea turtles, sturgeon, or Atlantic salmon. Because of this, the continuation of these fisheries during the reinitiation period would not be likely to jeopardize the continued existence of any whale, sea turtle, Atlantic salmon, or sturgeon species." Until replaced, the bluefish FMP is currently covered by the October 17, 2017, memorandum.

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the bluefish fishery is below, while information on protected species interactions with specific fishery gear is in Section 6.3.3.

7.1.2.1 Sea Turtles

Below is a brief summary of the occurrence and distribution of sea turtles in the affected environment of the bluefish fishery. Additional background information on the range-wide status of affected sea turtles species, as well as a description and life history of each of these species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant et al. 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS;

NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS et al. 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

Hard-shelled sea turtles **-** In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill et al. 2008; Braun & Epperly 1996; Epperly et al. 1995a,b; Mitchell et al. 2003; Shoop & Kenney 1992; TEWG 2009; Blumenthal et al. 2006; Braun-McNeill & Epperly 2004; Griffin et al. 2013; Hawkes et al. 2006; Hawkes et al. 2011; Mansfield et al. 2009; McClellan & Read 2007; Mitchell et al. 2003; Morreale & Standora 2005). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly et al. 1995a,b,c; Griffin et al. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; Shoop & Kenney 1992).

Leatherback sea turtles **-** Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (James *et al.* 2005; Eckert *et al.* 2006; Murphy *et al.* 2006; NMFS and USFWS 2013b; Dodge *et al.* 2014). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (NMFS and USFWS 1992; James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014). They are found in more northern waters (i.e., Gulf of Maine) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014).

7.1.2.2 Large Whales

Humpback, North Atlantic right, fin, sei, and minke whales occur in the Northwest Atlantic. Generally speaking, large whales follow an annual pattern of migration between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer/fall foraging grounds (primarily north of 41°N; see marine mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). This is a simplification of whale movements, particularly as it relates to winter movements. It is unknown if all individuals of a population migrate to low latitudes in the winter, although increasing evidence suggests that for some species, some portion of the population remains in higher latitudes throughout the winter (Clapham et al. 1993; Davis et at. 2017; Davis et al. 2020; Hayes et al. 2020; Swingle et al. 1993; Vu et al. 2012). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the occurrence of large whales in low latitude foraging grounds in the spring/summer/fall is well understood. Large whales consistently return

to these foraging areas each year, therefore these areas can be considered important areas for whales (Davis et al. 2017; Davis et al. 2020; Hayes et al. 2020; Payne et al. 1986; Payne et al. 1990; Schilling et al. 1992). For additional information on the biology, status, and range wide distribution of humpback, North Atlantic right, fin, sei, and minke whales, refer to the marine mammal SARs provided at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

7.1.2.3 Small Cetaceans and Pinnipeds

Table 38 lists the small cetaceans and pinnipeds that may occur in the affected environment of the bluefish fishery. Small cetaceans can be found throughout the year in the Northwest Atlantic Ocean (Maine to Florida); however, within this range, there are seasonal shifts in species distribution and abundance. Pinnipeds are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N) . For additional information on the biology and range wide distribution of each species of small cetacean and pinniped, refer to the marine mammal SARs provided at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region

7.1.2.4 Atlantic sturgeon

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (ASSRT 2007; Dovel and Berggren 1983; Dadswell et al. 1984; Kynard et al. 2000; Stein et al. 2004a; Dadswell 2006; Laney et al. 2007; Dunton et al. 2010, 2015; Erickson et al. 2011; Wirgin et al. 2012; Waldman et al. 2013; O'Leary et al. 2014; Wirgin et al. 2015a,b; ASMFC 2017b).

Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein et al. 2004 a,b; Erickson et al. 2011; Dunton et al. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein et al. 2004a,b; Dunton et al. 2010; Erickson et al. 2011). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon may undertake seasonal movements along the coast (Dunton et al. 2010; Erickson et al. 2011; Wipplehauser 2012); however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year.

For additional information on the biology, status, and range wide distribution of each distinct population segment (DPS) of Atlantic sturgeon please refer to 77 FR 5880 and 77 FR 5914, as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic

sturgeon (ASSRT 2007) and the Atlantic States Marine Fisheries Commission 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017).

7.1.2.5 Atlantic salmon

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily northern portion of the GOM), to the coast of Greenland (NMFS and USFWS 2005, 2016; Fay et al. 2006). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay et al. 2006; USASAC 2013; Hyvarinen et al. 2006; Lacroix and McCurdy 1996; Lacroix et al. 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993; Sheehan et al. 2012; NMFS and USFWS 2005, 2016; Fay et al. 2006). For additional information on the on the biology, status, and range wide distribution of the GOM DPS of Atlantic salmon, refer to NMFS and USFWS (2005, 2016); Fay et al. (2006).

7.1.2.6 Giant Manta Ray

Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast (Miller and Klimovich 2017). Along the U.S. East Coast, giant manta rays are usually found in water temperatures between 19 and 22 degrees Celsius (Miller and Klimovich 2017) and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller and Klimovich 2017).

7.1.3 Interactions Between Gear and Protected Species

Protected species are at risk of interacting with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For marine mammals protected under the MMPA, this primarily covers the period from 2008-2017[18]; however, the Greater Atlantic Region (GAR) Marine Animal Incident Database (unpublished data) contains large whale entanglement reports through 2019. For ESA listed

[18] Waring et al. 2015a; Waring et al. 2016; Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; MMPA List of Fisheries (LOF): https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://nefsc.noaa.gov/publications/crd/.

species, the most recent 10 years of data on observed or documented interactions is available from 2010-2019[19] (data. Available information on gear interactions with a given species (or species group) is provided in the sections below. The sections to follow are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on the primary gear types used to prosecute the multispecies bluefish fishery (i.e., recreational: hook and line; commercial: sink gillnet and bottom trawl gear).

7.1.3.1 Recreational Fisheries Interactions

The recreational bluefish fishery is primarily prosecuted with rod and reel and handline (i.e., hook and line gear). In the absence of an observer program for recreational fisheries, records of recreational hook and line interactions with protected resources are limited. However, as a dedicated observer program exists for all commercial fisheries, there is a wealth of information on observed protected species interactions with all fishing gear types and years of data assessing resultant population level effects of these interactions. Other sources of information, such as state fishing records, stranding databases, and marine mammal SARs, provide additional information that can assist in better understanding hook and line interaction risks to protected species.

Large whales

Large whales have been documented entangled with hook and line gear or monofilament line (GAR Marine Animal Incident Database, unpublished data;Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region;). In the most recent (2008-2017) mortality and serious injury determinations for baleen whales, the majority of cases identified with confirmed hook and line or monofilament entanglement did not result in the serious injury or mortality to the whale (84.8 % observed/reported whales had a serious injury value of 0; 15.2 % had a serious injury value of 0.75; none of the cases resulted in mortality; Cole and Henry 2013; Henry et al. 2017; Henry et al. 2020). In fact, 75.8 % of the whales observed or reported with a hook/line or monofilament entanglement were resighted gear free and healthy; confirmation of the health of the other remaining whales remain unknown as no resightings had been made over the timeframe of the assessment (Cole and Henry 2013; Henry et al. 2017; Henry et al. 2020). Based on this information, while large whale interactions with hook and line gear are possible, there is a low probability that an interaction will result in serious injury or mortality to any large whale species. Therefore, relative to other gear types, such as fixed gear, hook and line gear represents a low source serious injury or mortality to any large whale (Henry et al. 2020).

Small cetaceans and pinnipeds

Table 38 provides a list of small cetaceans and pinnipeds that will occur in the affected environment of the bluefish fishery. Reviewing the most recent 10 years of data provided in the

[19] ASMFC 2017; GAR Marine Animal Incident Database, unpublished data; Kocik et al. 2014; Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; Miller and Shepard 2011; Murray 2015; Murray 2018; Murray 2020; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://nefsc.noaa.gov/publications/crd/; NEFSC observer/sea sampling database, unpublished data.

marine mammal SARs (i.e., 2008-2017), of these species, only bottlenose dolphin stocks have been identified (primarily through stranding records/data) as entangled in hook and line gear (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). In some cases, these entanglements have resulted in the serious injury or mortality to the animal. Specifically, reviewing stranding data provided in marine mammal SARs from 2008-2017, estimated mean annual mortality for each bottlenose stock due to interactions with hook and line gear was approximately one animal (Palmer 2017; https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). Based on this, although interactions with hook and line gear are possible, relative to other gear types, such as trawl gear, hook and line gear represents a low source serious injury or mortality to any bottlenose dolphin stock. For other species of small cetaceans or pinnipeds, hook and line gear is not expected to be a source of serious injury or mortality.

Sea turtles

Interactions between ESA listed species of sea turtles and hook and line gear have been documented, particularly in nearshore waters of the Mid-Atlantic (e.g., GAR Sea Turtle and Disentanglement Network, unpublished data; NMFS Sea Turtle Stranding and Salvage Network, unpublished data; Palmer 2017;). Interactions with hook and line gear have resulted in sea turtle injury and mortality and therefore, poses an interaction risk to these species. However, the extent to which these interactions are impacting sea turtle populations is still under investigation, and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of sea turtle populations.

Atlantic Sturgeon

Interactions between ESA-listed species of Atlantic sturgeon and hook and line gear have been documented, particularly in nearshore waters (ASMFC 2017). Interactions with hook and line gear have resulted in Atlantic sturgeon injury and mortality and therefore, poses an interaction risk to these species. However, the extent to which these interactions are impacting Atlantic sturgeon DPSs is still under investigation and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of Atlantic sturgeon DPSs (NMFS 2011b; ASMFC 2017).

Atlantic salmon

Review of the most recent 10 years of data on observed or documented interactions between Atlantic salmon and fishing gear, there have been no observed/documented interactions between Atlantic salmon and hook and line gear (NEFSC observer/sea sampling database, unpublished data). Based on this information, hook and line gear is not expected to pose an interaction risk to any Atlantic salmon and therefore, is not expected to be source of injury or mortality to this species.

Giant Manta Ray

Review of the most recent 10 years of data on observed or documented interactions between giant manta rays and fishing gear, there have been no observed/documented interactions

between giant manta rays and hook and line gear (NEFSC observer/sea sampling database, unpublished data). Based on this information, hook and line gear is not expected to pose an interaction risk to giant manta rays and therefore, is not expected to be source of injury or mortality to this species

7.1.3.2 Commercial Fisheries Interactions

The bluefish commercial fishery uses gillnets, bottom otter trawls, and hook and line gear. Except for what has been provided in section 6.3.3.1, no additional information is available on commercial hook and line interactions with protected species. Gillnet and/or bottom otter trawls are known to interact with ESA-listed and MMPA species of marine mammals, fish, and sea turtles.

Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or sink gillnet gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2021 LOF (86 FR 3028 (January 14, 2021)) categorizes commercial gillnet fisheries (Northeast or Mid-Atlantic) as Category I fisheries and commercial bottom trawl fisheries (Northeast or Mid-Atlantic) as Category II fisheries.

Large Whales

Bottom Trawl Gear

With the exception of minke whales, there have been no observed interactions with large whales and bottom trawl gear[20]. In 2008, several minke whales were observed dead in bottom trawl gear attributed to the northeast bottom trawl fishery; estimated annual mortality attributed to this fishery in 2008 was 7.8 minke whales (Waring et al. 2015). Since 2008, serious injury and mortality records for minke whales in U.S. waters have shown zero interactions with bottom trawl (northeast or Mid-Atlantic) gear[21]. Based on this information, large whale interactions with bottom trawl gear are expected to be rare to nonexistent.

[20] Refer to Greater Atlantic Region Marine Animal Incident Database (unpublished data); Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; NEFSC observer/sea sampling database, unpublished data ; MMPA LOF: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html

[21] Refer to: Greater Atlantic Region Marine Animal Incident Database (unpublished data); Waring et al. 2016; Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Cole and Henry 2013; and, Henry et al. 2014, 2015, 2016, 2017, 2019, 2020; MMPA LOF: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries.

Fixed Fishing Gear (e.g., Sink Gillnet Gear)

Large whale interactions (entanglements) with fishing gear have been documented in the waters of the Northwest Atlantic.[22] Information available on interactions with large whales comes from reports documented in the Greater Atlantic Region (GAR) Marine Animal Incident Database (unpublished data). For instance, review of the databases' most recent ten years (i.e., 2010-2019) of validated data indicates that there have been a total of 112 North Atlantic right whale entanglements; these entanglements include those confirmed to country and unknown country of origin (Table 39).[23] The best available data also shows that fin, minke, humpback, and to a lesser extent, sei and sperm whales, have also been observed and documented entangled in fishing gear (see footnote 7).

Table 39 Observed entanglements of North Atlantic right whales from 2010 through 2019 by country of origin. Entanglements resulting in SI/M are presented in the parentheses.

	Number of Entanglements	Confirmed Canada	Confirmed U.S.	Unknown Country of Origin
2010	6 (4)	0	1	5 (4)
2011	14 (5.5)	0	2	12 (5.5)
2012	12 (4)	0	1 (1)	11 (3)
2013	5 (0.75)	0	0	5 (0.75)
2014	17 (8)	1	1 (1)	15 (7)
2015	9 (3.5)	1	0	8 (3.5)
2016	15 (9.5)	3 (3)	1	11 (6.5)
2017	15 (6)	8 (3)	1	6 (3)
2018	12 (5.75)	3 (1)	1	8 (4.75)
2019	7(2)	2(2)	0	5(0)
Total	**112 (49)**	**18 (9)**	**8 (2)**	**86 (38)**

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Angliss and Demaster 1998; Cassoff et al. 2011; Kenney and Hartley 2001; Knowlton and Kraus 2001; Hartley *et al*. 2003; Johnson *et al*. 2005;Whittingham *et al*. 2005a,b; Knowlton et al. 2012; NMFS 2014; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Sharp et al. 2019; see Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-

[22] **NMFS Atlantic Large Whale Entanglement Reports**: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan (for years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; GAR Marine Animal Incident Database (unpublished data); **NMFS Marine Mammal** SARs **for the Atlantic Region** :https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; **NMFS NEFSC Marine Mammal Serious Injury and Morality Reference Documents**: https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html; **MMPA List of Fisheries**: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries

[23] The data included in Table 53, includes entanglement events categorized as serious injury, mortality, or a non-serious injury. These observed events are considered a minimum estimate and the actual entanglement rate is likely higher.

assessment-reports-region). Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Hamilton and Kraus 2019; Hartley *et al*. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Johnson *et al*. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001;Knowlton et al. 2012; NMFS 2014; Whittingham *et al*. 2005a,b; see NMFS Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region).[24] Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear often result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; Pettis et al. 2019; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton *et al.* 2012; Pace et al. 2017; Robbins 2009).

Due to the incidences of interactions with vertical lines associated with gillnet and trap/pot gear, in addition to the endangered status of the species being affected most by these gear types (i.e., North Atlantic right and fin whales), pursuant to the MMPA, these large whale species were designated as strategic stocks. Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. As a result, to address and mitigate the risk of large whale entanglement in fixed fishing gear comprised of vertical lines, including gillnet gear, the Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan) was implemented. The ALWTRP identifies gear modification requirements and restrictions for Category I and II gillnet fisheries in the Northeast, Mid-Atlantic, and Southeast regions of the U.S. (designated management areas); these fisheries must comply with all regulations of the Plan. For further details on the ALWTRP, specifically gear modification requirements, restrictions, and management areas under the ALWTRP, see: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan.

Small Cetaceans

Sink Gillnet and Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with bottom trawl gear.[25]

[24] Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear. For ALWTRP regulations currently implemented: see https://www.fisheries.noaa.gov/action/atlantic-large-whale-take-reduction-plan-regulations-1997-2015.

[25] For additional information on small cetacean and pinniped interactions, see: Chavez-Rosales et al. 2017; Hatch and Orphanides 2014, 2015, 2016, 2019; Josephson et al. 2017; Josephson et al. 2019; Lyssikatos 2015; Lyssikatos

Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years data (i.e., 2008-2017), as well as the MMPA LOF's covering this time frame (i.e., issued between 2016 and 2021), Table 40 provides a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category I (frequent interactions) gillnet and/or Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the bluefish fishery. Of the species provided in Table 40, gray seals, followed by harbor seals, harbor porpoises, short beaked common dolphins, and harps seals are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the Greater Atlantic Region (GAR; Hatch and Orphanides 2014, 2015, 2016, 2019; Orphanides 2020). In terms of bottom trawl gear, short-beaked common dolphins, Risso's dolphins, and Atlantic white-sided dolphins are the most frequently observed bycaught marine mammal species in the GAR, followed by gray seals, long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Lyssikatos 2015; Chavez-Rosales et al. 2017, Lyssikatos et al. 2020).

Table 40: Small cetacean and pinniped species observed seriously injured and/or killed by Category I and II sink gillnet or bottom trawl fisheries in the affected environment of the bluefish fishery.

Fishery	Category	Species Observed or reported Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Pilot whales
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet	I	Bottlenose dolphin (Northern Migratory coastal)
		Bottlenose dolphin (Southern Migratory coastal)
		Bottlenose dolphin (offshore)
		Harbor porpoise
		Short-beaked common dolphin
		Harbor seal

et al. 2020; Orphanides 2020; Read *et al*. 2006; Waring et al. 2015b; Marine Mammal SARS: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; MMPA LOF at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries.

		Harp seal
		Pilot whales
		Atlantic white sided dolphin
		Risso's dolphin
		Gray seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Pilot whales
		Short-beaked common dolphin
		Atlantic white-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	Atlantic white-sided dolphin
		Short-beaked common dolphin
		Pilot whales
		Risso's dolphin
		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal
Source: MMPA 2012-2021 LOFs at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries		

MMPA Section 118(f)(1) requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II fisheries. Thus, the Harbor Porpoise TRP (HPTRP) and the Bottlenose Dolphin TRP (BDTRP) were developed and implemented for these species.[26] Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid-Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS) was implemented. Additional information on each TRP or Strategy is at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-take-reduction-plans-and-teams.

Sea Turtles

Bottom Trawl Gear

[26] Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal SARs (Hayes et al. 2020) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso and Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the Gulf of Maine, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the Gulf of Maine (Murray 2008; Murray 2015b; Murray 2020; NMFS Observer Program, unpublished data; Warden 2011 a, b). As few sea turtle interactions have been observed in the Gulf of Maine, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate (0.43 turtles/day fished) was in waters south of 37º N during November to June in waters greater than 50 meters deep. The greatest number of estimated interactions occurred in the Mid-Atlantic region north of 39º N, during July to October in waters less than 50 meters deep. Within each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)[27], from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI = 0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

Sink Gillnet Gear

Interactions between sink gillnet gear and green, Kemp's ridley, loggerhead, and leatherback sea turtles have been observed in the Greater Atlantic region since 1989 (NEFSC observer/sea sampling database, unpublished data). Specifically, sea turtle interactions with gillnet gear have been observed in the Gulf of Maine, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the Gulf of Maine (Murray 2009a,b; Murray 2013; Murray 2018; NEFSC observer/sea sampling database, unpublished data). As few sea turtle interactions have been observed in the Gulf of Maine, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle

[27] Murray (2020) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2008; Murray 2015b; Warden 2011a,b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be similar to those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007, Murray and Orphanides 2013, Orphanides 2010).

interactions with sink gillnet gear in this region. As a result, the bycatch estimates and discussion below are for sink gillnet gear in the Mid-Atlantic and Georges Bank.

From 2012-2016 (the most recent five-year period that has been statistically analyzed for gillnets), Murray (2018) estimated that sink gillnet fisheries in the Mid-Atlantic and Georges Bank bycaught 705 loggerheads (CV=0.29, 95% CI over all years: 335-1116), 145 Kemp's ridleys (CV =0.43, 95% CI over all years: 44-292), 27 leatherbacks (CV =0.71, 95% CI over all years 0-68), and 112 unidentified hard-shelled turtles (CV=0.37, 95% CI over all years (64-321).[28] Of these, mortalities were estimated at 557 loggerheads, 115 Kemp's ridley, 21 leatherbacks, and 88 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 19 adults. The highest bycatch rate of loggerheads occurred in the southern Mid-Atlantic stratum in large mesh gear during November to June. Though only one sea turtle was observed in this stratum, observed effort was low, leading to a high bycatch rate. Bycatch rates of all other species were lower relative to loggerheads. Highest estimated loggerhead bycatch occurred in the northern mid-Atlantic from July to October in large mesh gears due to the higher levels of commercial effort in the stratum. Mean loggerhead bycatch rates were ten times those of Kemp's ridley bycatch rates in large mesh gear in the northern Mid-Atlantic from July to October (Murray 2018). Although interactions between sink gillnet gear and green sea turtles have been observed (NEFSC observer/sea sampling database, unpublished data); green sea turtles were excluded from the bycatch rate calculations in Murray (2018) because the observed interaction occurred in waters of North Carolina, and therefore, outside the study region.

Atlantic Sturgeon

Sink Gillnet and Bottom Trawl Gear

Since 1989, Atlantic sturgeon interactions (i.e., bycatch) with sink gillnet and bottom trawl gear have frequently been observed in the Greater Atlantic Region, with most sturgeon observed captured falling within the 100 to 200cm total length range; however, both larger and small individuals have been observed (ASMFC 2007; ASMFC 2017; Miller and Shepard 2011; NEFSC observer/sea sampling database, unpublished data; Stein et al. 2004). For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths of less than 40 meters, mesh sizes of greater than 10 inches, and the months of April and May (ASMFC 2007). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch have been associated with depths less than 30 meters (ASMFC 2007). More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic surgeon, with Atlantic sturgeon encountered primarily at depths less than 20 meters (ASMFC 2017).

[28] Murray (2018) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2009, 2013), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be similar to those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007, Murray and Orphanides 2013, Orphanides 2010).

The ASMFC (2017) Atlantic sturgeon benchmark stock assessment represents the most accurate predictor of annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The stock assessment analyzes fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2015, the timeframe which included the most recent, complete data at the time of the report. The total bycatch of Atlantic sturgeon from bottom otter trawls ranged between 624-1,518 fish over the 2000-2015 time series, while the total bycatch of Atlantic sturgeon from gillnets ranged from 253-2,715 fish. Focusing on the most recent five-year period of data provided in the stock assessment report[29], the estimated average annual bycatch during 2011-2015 of Atlantic sturgeon in bottom otter trawl gear is 777.4 individuals and in gillnet gear is 627.6 individuals.

Atlantic salmon

Sink Gillnet and Bottom Trawl Gear

Atlantic salmon are at risk of interacting with bottom trawl or gillnet gear (NEFSC observer/sea sampling database, unpublished data; Kocik *et al*. 2014). NEFOP data from 1989-2019 show records of incidental bycatch of Atlantic salmon in seven of the 31 years, with a total of 15 individuals caught, nearly half of which (seven) occurred in 1992 (NEFSC observer/sea sampling database, unpublished data).[30] Of the observed incidentally caught Atlantic salmon, ten were listed as "discarded," which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Five of the 15 were documented as lethal interactions. The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Observed captures occurred in March (2), April (2), May (1), June (3), August (1), and November (6). Given the very low number of observed Atlantic salmon interactions in gillnet and bottom trawl gear, interactions with these gear types are believed to be rare in the Greater Atlantic Region.

Giant Manta Ray

Giant manta rays are potentially susceptible to capture by bottom trawl and gillnet gear based on records of their capture in fisheries using these gear types (NEFSC observer/sea sampling database, unpublished data). Review of the most recent 10 years of NEFOP data showed that between 2010-2019, two (unidentified) Giant Manta Rays were observed in bottom trawl gear and two were observed in gillnet gear (NEFSC observer/sea sampling database, unpublished data). Additionally, all of the giant manta ray interactions in gillnet or trawl gear recorded in the NEFOP database (13 between 2001 and 2019) indicate the animals were encountered alive and released alive. However, details about specific conditions such as injuries, damage, time out of water, how the animal was moved or released, or behavior on release is not always recorded. While there is currently no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0 to 16 giant manta rays captured per year between

[29] The period of 2011-2015 was chosen as it is the period within the stock assessment that most accurately resembles the current trawl fisheries in the region.

[30] There is no information available on the genetics of these bycaught Atlantic salmon, so it is not know how many of them were part of the GOM DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the GOM DPS.

1998 and 2015 and estimated that approximately 89% survived the interaction and release (see NMFS reports available at: http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm).

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APPENDIX I PRICE MODEL

To assess the economic impacts of the various rebuilding alternatives as well as estimation of revenues under various landing scenarios, ex-vessel bluefish prices require estimation. In lieu of well-developed market supply and demand models, an inverse-demand based price model is used to estimate ex-vessel bluefish prices. Though price and quantity demanded are jointly determined such that Gauss Markov assumptions of exogeneity are violated, here, we assume harvest is weakly exogenous to ex-vessel price given the quota allocations and seasonal constraints which cause fishermen to maximize catch in order to maximize profits (Gordon 2020). This specification implies that the decision to fish is independent of ex-vessel prices. This assumption, as well as ex-vessel price models, are not uncommon in fishery economics literature.[31]

The Generalized Least Squares bluefish price model is given as:

$$(\log)\text{Ex-vessel Price}_t = \alpha + \beta_1 (\log)\text{Landings}_t + AR_t \qquad \text{(Equation A)}$$

where the dependent variable is the natural logarithm of average annual ex-vessel bluefish price[32] ($/lb.) and the dependent variable is the natural log of total annual bluefish landings, t is time (i.e., years) and AR is an autoregressive error term. The dependent and independent variables are logged because the relationship between ex-vessel prices and landings is not expected to be strictly linear such that the slope of the regression is not assumed to be constant. The logged GLS model was implemented in place of a logged OLS model as the error term is suggested to be serially correlated over time with a Durbin-Watson d statistic of 0.72. After the implementation of the Prais–Winsten GLS estimator, the Durbin-Watson statistic was transformed to 1.67. It should be noted that additional models were taken into consideration after autocorrelation was detected, including a Cochrane-Orcutt AR(1) regression, linear autoregressive integrated moving-average (ARIMA) specified models with AR(2-5), an OLS regression with the inclusion of a lagged ex-vessel price, and a separate OLS regression with a lagged landings variable. Given the dependence of the lagged OLS regression on the previous year's price, the lack of significance on the AR(n) coefficients when the lag is greater than one[33], along with the consideration of RMSE's, the Prais-Winsten GLS with an AR(1) error term was chosen. The Prais-Winsten was selected over the Cochrane-Orcutt given a lower RMSE and a Durbin-Watson statistic closer to 2. The Prais-Winsten GLS model parameters and results are shown in Table 41.

Table 41: Prais-Winsten Generalized Least Squares (GLS) logged ex-vessel bluefish price model results.

[31] Gordon (2020), Bloznelis (2018) and Tai (2017) offer thorough reviews of various price models and their respective methods.

[32] Prices were adjusted to 2020 constant dollars using the Annual, Seasonally Adjusted, Gross Domestic Implicit Price Deflator (2012=100) https://fred.stlouisfed.org/series/GDPDEF.

[33] $\alpha = 0.01$

Variable	Coefficient	Standard Error	t	P>t	95% Confidence Interval	
Ln Landings	-0.543	0.0951	-5.71	0	-0.74	-0.35
Constant	7.753	1.435	5.40	0	4.78	10.73
ρ	0.688		**Durbin-Watson Statistic (original)**			0.72
R-squared	0.68		**Durbin-Watson Statistic (transformed)**			1.67
Number of Obs.	24		**Root Mean Square Error**			0.08

Both price and landings data were retrieved from the Commercial Fisheries Database (CFDERS) from 1996 to 2019. About 68% of the variability in logged average ex-vessel bluefish prices are explained by logged total annual landings. Modeling the inverse relationship between prices and landings aids in more precisely estimating revenues given various expected landing quantities. The logged price variables are retransformed using Duan's smearing method to avoid inciting heteroskedastic errors. Average realized ex-vessel prices and estimated prices by year are shown in Figure 30. Average annual predicted ex-vessel prices range from $0.55 to $0.98 per lb with an average price of $0.66/lb. Average realized prices range from $0.46 to $1.03/lb and average $0.66/lb across the time series.

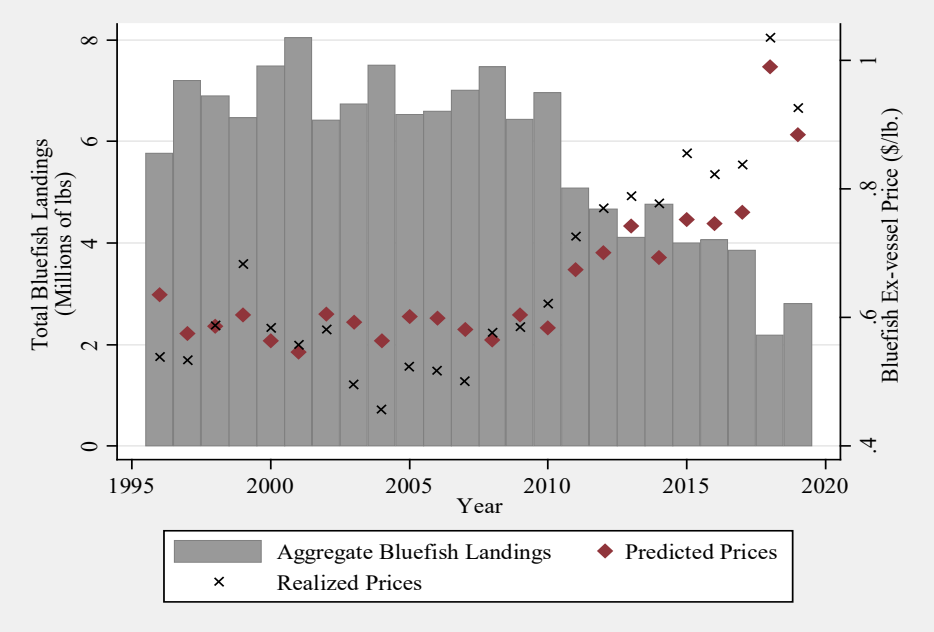

Figure 30: Realized and predicted ex-vessel bluefish prices and realized commercial bluefish landings by year (1996-2019).

APPENDIX II: SUPPLEMENTAL MINIMUM DEFAULT TABLES

Table 42: Bluefish state-by-state allocation percentage point shift along the U.S. Atlantic coast using different proposed time series and a minimum default allocation of 0.10% while incorporating a phase-in approach.

0.1% Minimum Default Allocation		Min. Def. Status quo			5 year (2014-2018) - 3a-2			10 year (2009-2018) - 3a-3			1/2 '81-'89 1/2 '09-'18 - 3a-4		
State	Current Allocations	4-year	5-year	7-year	4-year	5-year	7-year	4-year	5-year	7-year	4-year	5-year	7-year
ME	0.67%	0.02%	0.02%	0.01%	-0.14%	-0.11%	-0.08%	-0.14%	-0.11%	-0.08%	-0.02%	-0.02%	-0.01%
NH	0.41%	0.02%	0.02%	0.01%	-0.07%	-0.06%	-0.04%	-0.05%	-0.04%	-0.03%	0.00%	0.00%	0.00%
MA	6.72%	0.00%	0.00%	0.00%	0.97%	0.77%	0.55%	0.85%	0.68%	0.49%	0.23%	0.19%	0.13%
RI	6.81%	0.00%	0.00%	0.00%	1.23%	0.99%	0.70%	0.70%	0.56%	0.40%	0.19%	0.15%	0.11%
CT	1.27%	0.02%	0.02%	0.01%	0.00%	0.00%	0.00%	-0.05%	-0.04%	-0.03%	0.00%	0.00%	0.00%
NY	10.39%	-0.01%	-0.01%	-0.01%	2.43%	1.95%	1.39%	2.34%	1.87%	1.34%	0.63%	0.51%	0.36%
NJ	14.82%	-0.03%	-0.02%	-0.02%	-0.91%	-0.73%	-0.52%	-0.24%	-0.19%	-0.14%	-0.09%	-0.07%	-0.05%
DE	1.88%	0.02%	0.01%	0.01%	-0.30%	-0.24%	-0.17%	-0.35%	-0.28%	-0.20%	-0.08%	-0.07%	-0.05%
MD	3.00%	0.01%	0.01%	0.01%	-0.36%	-0.29%	-0.20%	-0.27%	-0.22%	-0.15%	-0.06%	-0.05%	-0.04%
VA	11.88%	-0.02%	-0.01%	-0.01%	-1.81%	-1.45%	-1.03%	-1.50%	-1.20%	-0.86%	-0.41%	-0.33%	-0.24%
NC	32.06%	-0.09%	-0.07%	-0.05%	-0.09%	-0.07%	-0.05%	-0.01%	-0.01%	0.00%	-0.07%	-0.06%	-0.04%
SC	0.04%	0.02%	0.02%	0.01%	0.02%	0.01%	0.01%	0.02%	0.01%	0.01%	0.02%	0.02%	0.01%
GA	0.01%	0.02%	0.02%	0.01%	0.02%	0.02%	0.01%	0.02%	0.02%	0.01%	0.02%	0.02%	0.01%
FL	10.06%	-0.01%	-0.01%	-0.01%	-0.99%	-0.80%	-0.57%	-1.32%	-1.06%	-0.75%	-0.37%	-0.30%	-0.21%

Table 43: Bluefish state-by-state allocation percentage point shift along the U.S. Atlantic coast using different proposed time series and a minimum default allocation of 0.25% while incorporating a phase-in approach.

0.25% Minimum Default Allocation		Min. Def. Status quo			5 year (2014-2018) - 3a-2			10 year (2009-2018) - 3a-3			1/2 '81-'89 1/2 '09-'18 - 3a-4		
State	Current Allocations	4-year	5-year	7-year	4-year	5-year	7-year	4-year	5-year	7-year	4-year	5-year	7-year
ME	0.67%	0.06%	0.05%	0.03%	-0.10%	-0.08%	-0.06%	-0.10%	-0.08%	-0.06%	0.01%	0.01%	0.01%
NH	0.41%	0.06%	0.05%	0.03%	-0.03%	-0.03%	-0.02%	-0.01%	-0.01%	-0.01%	0.04%	0.03%	0.02%
MA	6.72%	0.00%	0.00%	0.00%	0.95%	0.76%	0.54%	0.83%	0.67%	0.48%	0.23%	0.18%	0.13%
RI	6.81%	0.00%	0.00%	0.00%	1.21%	0.97%	0.69%	0.69%	0.55%	0.39%	0.19%	0.15%	0.11%
CT	1.27%	0.05%	0.04%	0.03%	0.03%	0.02%	0.02%	-0.01%	-0.01%	-0.01%	0.03%	0.03%	0.02%
NY	10.39%	-0.03%	-0.02%	-0.02%	2.36%	1.89%	1.35%	2.27%	1.82%	1.30%	0.60%	0.48%	0.34%
NJ	14.82%	-0.07%	-0.05%	-0.04%	-0.93%	-0.75%	-0.53%	-0.28%	-0.22%	-0.16%	-0.13%	-0.10%	-0.07%
DE	1.88%	0.05%	0.04%	0.03%	-0.27%	-0.21%	-0.15%	-0.31%	-0.25%	-0.18%	-0.05%	-0.04%	-0.03%
MD	3.00%	0.04%	0.03%	0.02%	-0.33%	-0.26%	-0.19%	-0.24%	-0.19%	-0.14%	-0.04%	-0.03%	-0.02%
VA	11.88%	-0.04%	-0.03%	-0.02%	-1.79%	-1.43%	-1.02%	-1.50%	-1.20%	-0.86%	-0.43%	-0.34%	-0.25%
NC	32.06%	-0.22%	-0.17%	-0.12%	-0.22%	-0.17%	-0.12%	-0.14%	-0.11%	-0.08%	-0.20%	-0.16%	-0.12%
SC	0.04%	0.06%	0.05%	0.04%	0.05%	0.04%	0.03%	0.05%	0.04%	0.03%	0.06%	0.05%	0.03%
GA	0.01%	0.06%	0.05%	0.04%	0.06%	0.05%	0.03%	0.06%	0.05%	0.03%	0.06%	0.05%	0.04%
FL	10.06%	-0.03%	-0.02%	-0.01%	-0.99%	-0.79%	-0.57%	-1.31%	-1.05%	-0.75%	-0.38%	-0.30%	-0.22%

Table 44: Bluefish state allocations above a trigger threshold for all commercial allocation time series and a minimum default allocation of 0.10%.

Allocation of additional quota beyond the trigger threshold with a Minimum Default Allocation of 0.10%.				
State	**Status quo (1981-1989)**	**5 year (2014-2018)**	**10 year (2009-2018)**	**1/2 '81-'89 1/2 '09-'18**
ME	0.10%	0.10%	0.10%	0.10%
NH	0.10%	0.10%	0.10%	0.10%
MA	7.50%	16.60%	18.88%	7.50%
RI	7.50%	16.60%	7.50%	7.50%
CT	3.00%	3.00%	3.00%	3.00%
NY	15.12%	16.60%	18.88%	17.03%
NJ	15.12%	16.60%	18.88%	17.03%
DE	3.00%	0.10%	0.10%	3.00%
MD	3.00%	3.00%	3.00%	3.00%
VA	15.12%	3.00%	7.50%	17.03%
NC	15.12%	16.60%	18.88%	17.03%
SC	0.10%	0.10%	0.10%	0.10%
GA	0.10%	0.10%	0.10%	0.10%
FL	15.12%	7.50%	3.00%	7.50%
Total	100%	100%	100%	100%

Table 45: Bluefish state allocations above a trigger threshold for all commercial allocation time series and a minimum default allocation of 0.25%.

Allocation of additional quota beyond the trigger threshold with a Minimum Default Allocation of 0.25%.				
State	**Status quo (1981-1989)**	**5 year (2014-2018)**	**10 year (2009-2018)**	**1/2 '81-'89 1/2 '09-'18**
ME	0.10%	0.10%	0.10%	0.10%
NH	0.10%	0.10%	0.10%	0.10%
MA	7.50%	16.60%	18.88%	7.50%
RI	7.50%	16.60%	7.50%	7.50%
CT	3.00%	3.00%	3.00%	3.00%
NY	17.03%	16.60%	18.88%	17.03%
NJ	17.03%	16.60%	18.88%	17.03%
DE	3.00%	0.10%	0.10%	3.00%
MD	3.00%	3.00%	3.00%	3.00%
VA	17.03%	3.00%	7.50%	17.03%
NC	17.03%	16.60%	18.88%	17.03%
SC	0.10%	0.10%	0.10%	0.10%
GA	0.10%	0.10%	0.10%	0.10%
FL	7.50%	7.50%	3.00%	7.50%

Total	100%	100%	100%	100%

APPENDIX III: ACRONYMS AND ABBREVIATIONS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
ACCSP	Atlantic Coastal Cooperative Statistics Program
ACFCMA	Atlantic Coastal Fisheries Cooperative Management Act
ACS	American Community Survey
AM	Accountability Measure
AP	Advisory Panel
ASMFC	Atlantic States Marine Fisheries Commission
Board	The Commission's Bluefish Management Board
Commission	Atlantic States Marine Fisheries Commission
Council	Mid-Atlantic Fishery Management Council
CSVI	Community Social Vulnerability Index
EEZ	Economic Exclusive Zone
EFH	Essential Fish Habitat
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
MC	Monitoring Committee
MAB	Mid-Atlantic Bight
MRFSS	Marine Recreational Fishery Statistics Survey
MRIP	Marine Recreational Information Program
MSA	Magnuson-Stevenson Act
NEFSC	Northeast Fisheries Science Center
PCFA	Principle Components Factor Analysis
PDT	Plan Development Team
PRT	Plan Review Team
RHL	Recreational Harvest Limit
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
SFA	Sustainable Fisheries Act
TAL	Total Allowable Landings
VTR	Vessel Trip Report