Atlantic States Marine Fisheries Commission

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Spud Woodward (GA), Chair *Joe Cimino (NJ), Vice-Chair* *Robert E. Beal, Executive Director*

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEMORANDUM

April 19, 2023

TO: Commissioners; Proxies; American Lobster Management Board; Atlantic Menhaden Management Board; Atlantic Coastal Cooperative Statistics Program Coordinating Council; Atlantic Striped Bass Management Board; Coastal Sharks Management Board; Executive Committee; Horseshoe Crab Management Board; ISFMP Policy Board; Law Enforcement Committee; Sciaenids Management Board

FROM: Robert E. Beal REB
Executive Director

RE: ASMFC Spring Meeting: May 1-3, 2023 (TA 23-036)

The Atlantic States Marine Fisheries Commission's Spring Meeting will be May 1-3, 2023 at **The Westin Crystal City**, located at 1800 Richmond Highway, Arlington, VA. The room block is now closed; if you need assistance reserving a room, please contact Cindy Robertson at crobertson@asmfc.org. This will be a hybrid meeting to allow for remote participation by Commissioners and interested stakeholders in all meetings.

The final agenda and meeting materials for the Spring Meeting are now available at http://www.asmfc.org/home/2023-spring-meeting; click on the relevant Board/Committee name to access the documents for that Board/Committee.

Webinar Information

Board meeting proceedings will be broadcast daily via webinar beginning Monday, May 1 at 12:45 p.m. and continuing daily until the conclusion of the meeting (expected to be 3:00 p.m.) on Wednesday, May 3. To register for the webinar, please go to: https://attendee.gotowebinar.com/register/8336694404906038107 (Webinar ID: 780-037-899).

If you are joining the webinar but will not be using voice over Internet protocol (VoIP), you can may also call in at 914.614.3221, access code 140-893-572. A PIN will be provided to you after joining the webinar; see webinar instructions for details on how to receive the PIN

Meeting Process

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

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

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

Enclosed: Final Agenda, Hotel Directions, TA 23-036, Travel Reimbursement Guidelines, and Webinar Instructions

Atlantic States Marine Fisheries Commission

Spring Meeting

May 1-3, 2023

The Westin Crystal City

Arlington, Virginia

Public Comment Guidelines

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

For issues that are not on the agenda, management boards will continue to provide 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 three weeks prior to the start of a meeting week (April 10th) have been included in the briefing materials.
2. Comments received by 5:00 PM on Tuesday, April 25th will be included in supplemental materials.
3. Comments received by 10:00 AM on Friday, April 28th will be distributed electronically to Commissioners/Board members prior to the meeting.

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

Final Agenda

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

Monday May 1

12:45 – 2:30 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: McNamee
Other Participants: Perry, Reardon, Beal, Moore
Staff: Starks

1. Welcome/Call to Order *(J. McNamee)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from January 2023
3. Public Comment
4. Consider Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock for Final Approval *(C. Starks)* **Final Action**
   - Review Options and Public Comment Summary *(C. Starks)*
   - Advisory Panel Report *(G. Moore)*
   - Consider Approval of Addendum XXVII
5. Update from Work Group on Implementation of Addendum XXIX: Tracker Devices in the Federal Lobster and Jonah Crab Fishery *(T. Kerns)*
6. Progress Update on 2023 Jonah Crab Benchmark Stock Assessment *(J. Kipp)*
7. Review Lobster Conservation Management Team Roles and Process *(C. Starks)*
8. Other Business/Adjourn

2:45 – 3:15 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: Bell
Other Participants: Craig, Corbin
Staff: Boyle

1. Welcome/Call to Order *(M. Bell)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from February 2023
3. Public Comment
4. Review Report on the Atlantic Menhaden Fishery in Virginia *(P. Geer)*

5. Progress Update on Menhaden Single-species and Ecological Reference Point (ERP) Stock Assessments **Action**
   - Review and Consider Approval of ERP Terms of Reference *(K. Drew)*
6. Other Business/Adjourn

3:30 – 5:00 p.m. **Sciaenids Management Board**
Member States: New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: NMFS, PRFC
Chair: Batsavage
Other Participants: Simpson, Smott, Rickabaugh, Rogers, McDonough, Reichert
Staff: Bauer

1. Welcome/Call to Order *(C. Batsavage)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from August 2022
3. Public Comment
4. Consider 2023 Black Drum Benchmark Stock Assessment and Peer Review Report **Final Action**
   - Presentation of Stock Assessment *(C. McDonough)*
   - Presentation of Peer Review Panel Report *(M. Reichert)*
   - Consider Acceptance of Benchmark Stock Assessment and Peer Review Report for Management Use
   - Consider Adopting Annual Indicators
5. Consider Not Conducting 2023 Atlantic Croaker and Spot Traffic Light Analyses *(T. Bauer)*
6. Other Business/Adjourn

Tuesday, May 2

8:30 a.m. – Noon **Atlantic Striped Bass Management Board**
Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina
Other Members: DC, NMFS, PRFC, USFWS
Chair: Gary
Other Participants: Lengyel Costa, Mercer, Celestino, Newhard
Staff: Franke

1. Welcome/Call to Order *(M. Gary)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from January 2023
3. Public Comment
4. Update on Atlantic Striped Bass Cooperative Tagging Program *(J. Newhard)*
5. Technical Committee Report *(M. Celestino)* **Possible Action**
   - Projections Using 2022 Preliminary Data and Quota Utilization Scenarios
   - Consider Management Response to the Technical Committee Projections
6. Consider Approval of Addendum I on Ocean Commercial Quota Transfers **Final Action**
   - Review Options and Public Comment Summary *(E. Franke)*
   - Review Advisory Panel Report *(E. Franke)*
   - Consider Final Approval of Addendum I

7. Other Business/Adjourn

10:00 a.m. – 5:00 p.m. **Law Enforcement Committee**

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

Members: Baker, Beal, Blanchard, Brown, Cloyd, Corbin, Couch, Day, Gadomski, Henry, Hettenbach, Hodge, Hogan, Mercer, Moore, Noel, Pearce, Rogers, Sabo, Snellbaker, Thomas, Walker, Williams

Chair: *Snellbaker*

Staff: Blanchard

1. Welcome/Call to Order *(J. Snellbaker)*
2. Committee Consent
   - Approval of Agenda
3. Public Comment
4. Introductions
5. Review and Discuss Vessel Tracker Agency Interface *(J. Simpson)*
6. Discuss and Consider Changes to Enforceability Guidelines *(J. Snellbaker)*
7. Review and Discuss Commission Species (as needed)
   - Atlantic Striped Bass Plan Review Team Compliance Question
8. Review and Discuss Ongoing Enforcement Activities (**Closed Session**)
9. State Agency Reports
10. Other Business/Adjourn

Noon – 1:30 p.m. **Lunch Break** (provided)

Noon – 1:30 p.m. **Legislative and Governors Appointee Commissioners Luncheon**

1:45 – 3:45 p.m. **Atlantic Coastal Cooperative Statistics Program (ACCSP) Coordinating Council**

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

Chair: McNamee

Staff: White

1. Welcome/Call to Order *(J. McNamee)*
2. Council Consent
   - Approval of Agenda
   - Approval of Proceedings from November 2022
3. Public Comment
4. Consider Funding Decision Document and FY2024 Requests for Proposals *(J. Simpson)* **Action**
5. Update on Program and Committee Activities *(G. White, J. Simpson)*
6. Other Business/Adjourn

4:00 – 5:15 p.m. **Coastal Sharks Management Board**

Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: NMFS
Chair: Bell
Other Participants: Willey, Thomas, Brewster-Geisz
Staff: Starks

1. Welcome/Call to Order *(M. Bell)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from November 2022
3. Public Comment
4. Review NOAA Fisheries' Final Actions and Consider Comment on Proposed Actions for Coastal Sharks *(K. Brewster-Geisz)*
   - Proposed Rule to Prohibit the Harvest of Oceanic Whitetip Sharks
   - Final Amendment 14 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP)
   - Final Atlantic Shark Fishery Review (SHARE)
   - Scoping for Amendment 16 to the 2006 Consolidated Atlantic HMS FMP
   - Scoping for Electronic Reporting
   - Proposed Rule for Amendment 15 to the 2006 Consolidated Atlantic HMS FMP
5. Consider Fishery Management Plan Review and State Compliance for 2021 Fishing Year *(C. Starks)* **Action**
6. Other Business/Adjourn

5:45 – 7: 15 p.m. **Annual Awards of Excellence Reception**

<u>Wednesday, May 3</u>

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

Breakfast will be served at 7:45 a.m.

(A portion of this meeting will be closed for Committee members and Commissioners only)
Members: Abbott, Bell, Burgess, Cimino, Clark, Davis, Fegley, Geer, Gilmore, Keliher, Kuhn, McKiernan, McNamee, Miller, Patterson, Rawls, Woodward
Chair: Woodward
Staff: Leach

1. Welcome/Call to Order *(S. Woodward)*
2. Committee Consent
   - Approval of Agenda
   - Approval of Meeting Summary from February 2023
3. Public Comment
4. Report of the Administrative Oversight Committee *(J. Cimino)* **Action**
   - Presentation of the Fiscal Year 2024 Budget
5. Discuss Potential for Legislator and Governors Appointee Commissioner Stipends *(R. Beal)*

6. Future Annual Meetings Update *(L. Leach)*
    - October 15-19, 2023 – Beaufort, North Carolina
    - 2024 – Maryland
    - 2025 – Delaware
    - 2026 – Rhode Island
    - 2027 – South Carolina
7. Executive Director Performance Review (**Closed Session**)
8. Other Business/Adjourn

10:15 a.m. – 12:15 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
Chair: Woodward
Staff: Kerns

1. Welcome/Call to Order *(S. Woodward)*
2. Board Consent
    - Approval of Agenda
    - Approval of Proceedings from February 2023
3. Public Comment
4. Executive Committee Report *(S. Woodward)*
5. Discuss Possible Responses to Issues Identified in the Commissioner Survey *(T. Kerns)*
6. Consider Options Paper for Atlantic Bonito and False Albacore Management *(T. Kerns)* **Possible Action**
7. Update on Follow-up Addendum for the Harvest Control Rule **Action**
    - Overview of Timeline
    - Consider Approval of Plan Development Team Membership
8. Discuss Future of Mid-Atlantic Fishery Management Council's Research Set-aside Program *(R. Beal)* **Possible Action**
9. Assessment Science Committee Report *(K. Drew)* **Action**
10. Law Enforcement Committee Report *(K. Blanchard)*
11. Update on East Coast Climate Change Scenario Planning Initiative *(T. Kerns)*
12. Review Noncompliance Findings (if necessary) **Action**
13. Other Business/Adjourn

12:15 – 12:30 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: Woodward
Staff: Beal

1. Welcome/Call to Order *(S. Woodward)*
2. Board Consent
    - Approval of Agenda
    - Approval of Proceedings from November 2022

3. Public Comment
4. Consider Noncompliance Findings (if necessary) **Final Action**
5. Other Business/Adjourn

12:30 – 1:00 p.m. **Lunch Break** (provided)

1:00 – 3:00 p.m. **Horseshoe Crab Management Board**
Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
Other Members: NMFS, PRFC, USFWS
Chair: Clark
Other Participants: Ameral, Couch, Hoffmeister
Staff: Starks

1. Welcome/Call to Order *(J. Clark)*
2. Board Consent
   - Approval of Agenda
   - Approval of Proceedings from November 2022
3. Public Comment
4. Consider Work Group Report on Biomedical Best Management Practices *(C. Starks)* **Action**
5. Review Potential Processes and Resources Required for Evaluating Management Objectives for the Delaware Bay Bait Fishery *(C. Starks)* **Possible Action**
6. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

American Lobster Management Board

May 1, 2023
12:45 – 2:30 p.m.
Hybrid Meeting

Draft Agenda

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

1.	Welcome/Call to Order *(J. McNamee)*	12:45 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from January 2023	12:45 p.m.
3.	Public Comment	12:50 p.m.
4.	Consider Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock for Final Approval **Final Action** • Review Options and Public Comment Summary *(C. Starks)* • Advisory Panel Report *(G. Moore)* • Consider Final Approval of Addendum XXVII	1:00 p.m.
5.	Update from Work Group on Implementation of Addendum XXIX: Tracker Devices in the Federal Lobster and Jonah Crab Fishery *(T. Kerns)*	2:00 p.m.
6.	Progress Update on 2023 Jonah Crab Benchmark Stock Assessment *(J. Kipp)*	2:10 p.m.
7.	Review Lobster Conservation Management Team Roles and Process *(C. Starks)*	2:20 p.m.
8.	Other Business/ Adjourn	2:30 p.m.

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

MEETING OVERVIEW

American Lobster Management Board
May 1, 2023
12:45 – 2:30 p.m.
Hybrid Meeting

Chair: Dr. Jason McNamee (RI) Assumed Chairmanship: 02/22	Technical Committee Chair: Kathleen Reardon (ME)	Law Enforcement Committee Representative: Rob Beal (ME)
Vice Chair: Pat Keliher (ME)	Advisory Panel Chair: Grant Moore (MA)	Previous Board Meeting: January 31, 2023
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 January 31, 2023

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

4. Consider Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock for Final Approval (1:00-2:00 p.m.) Final Action

Background

- Draft Addendum XXVII considers modifications to the management program with the goal of increasing protection of the GOM/GBK spawning stock. Two issues are included in the addendum. Issue 1 addresses the standardization of a subset of management measures within LCMAs and across the GOM/GBK stock. Issue 2 considers applying either a trigger mechanism or a predetermined schedule for implementing biological management measures that are expected to provide increased protection to the spawning stock biomass and increase the resiliency of the stock. The Board approved Draft Addendum XXVII for public comment in January 2023 (**Briefing Materials**).
- Public comment was gathered in March and April, 2023 (**Briefing Materials**).
- The Advisory Panel (AP) met on April 10, 2023 to review the Addendum options and public comments (**Briefing Materials**).

Presentations

- Draft Addendum XXVII Options and Public Comment Summary by C. Starks

- Advisory Panel Report by G. Moore

Board Actions for Consideration at the Meeting

- Select management options and implementation dates
- Approve final Addendum XXVII

5. Update from Work Group on Implementation of Addendum XXIX: Tracker Devices in the Federal Lobster and Jonah Crab Fishery (2:00 – 2:10 p.m.)

Background

- In March 2022, the Board approved Addendum XXIX to Amendment 3 to the Interstate Fishery Management Plan (FMP) for American Lobster and Addendum IV to the Jonah Crab FMP. The Addenda establish electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries with commercial trap gear area permits for Lobster Conservation Management Areas (LCMAs) 1, 2, 3, 4, 5, and Outer Cape Cod to collect location data via an approved electronic tracking device.
- Commission staff formed a Work Group comprised of state and federal partners to develop a request for quotes from vessel tracking device manufacturers. The request for quotes was released in the fall of 2020. The Work Group reviewed five proposals, and has approved a list of tracking devices for use in the fishery.
- Commission and ACCSP staff are working with state and federal partners to develop regulations, data platforms, and administrative processes for the tracking program.

Presentations

- Update on Implementation of Addendum XXIX by T. Kerns

6. Progress Update on 2023 Jonah Crab Benchmark Stock Assessment (2:10-2:20 p.m.)

Background

- The first benchmark stock assessment for Jonah crab is ongoing and scheduled for completion in 2023.
- The assessment workshop is scheduled for April 18-20, 2023.
- A peer review workshop will be scheduled for the summer of 2023.

Presentations

- Progress Update on 2023 Jonah Crab Benchmark Stock Assessment by J. Kipp

7. Review Lobster Conservation Management Team Roles and Process (2:10-2:20 p.m.)

Background

- Amendment 3 established the seven lobster conservation management areas (LCMAs): Inshore and offshore GOM (Area 1), Inshore SNE (Area 2), Offshore Waters (Area 3), Inshore and offshore Northern Mid-Atlantic (Area 4), Inshore and offshore Southern Mid-Atlantic (Area 5), Long Island Sound (Area 6) and Outer Cape Cod). Lobster Conservation Management Teams (LCMTs), composed of industry representatives, were formed for each management area.

• It has been a number of years since the LCMTs were convened to provide management advice, warranting a review of the LCMT operating procedures **(Briefing Materials).**
Presentations • Overview of Lobster Conservation Management Team Roles and Process by C. Starks

8. Other Business/ Adjourn

American Lobster and Jonah Crab TC Task List

Activity level: Medium

Committee Overlap Score: Medium

Committee Task List
Lobster TC • August 1, 2023: Annual Compliance Reports Due • Fall 2023: Annual data update of lobster abundance indices *Jonah Crab TC* • Spring-Summer 2023: Development of Jonah crab stock assessment • August 1, 2023: Annual Compliance Reports Due

TC Members
American Lobster: Kathleen Reardon (ME, TC Chair), Joshua Carloni (NH), Jeff Kipp (ASMFC), Catherine Fede (NY), Conor McManus (RI), Chad Power (NJ), Tracy Pugh (MA), Burton Shank (NOAA), Craig Weedon (MD), Somers Smott (VA), Renee St. Amand (CT)
Jonah Crab: Derek Perry (MA, TC Chair), Joshua Carloni (NH), Chad Power (NJ), Jeff Kipp (ASMFC), Conor McManus (RI), Allison Murphy (NOAA), Kathleen Reardon (ME), Chris Scott (NY), Burton Shank (NOAA), Somers Smott (VA), Corinne Truesdale (RI), Craig Weedon (MD)

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

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

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

AMERICAN LOBSTER MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

January 31, 2023

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

TABLE OF CONTENTS

INDEX OF MOTIONS

1. **Approval of agenda** by consent (Page 1).

2. **Approval of Proceedings of November 7, 2022** by consent (Page 1).

3. **Move to modify Option E by including a 1/4" maximum gauge reduction in LCMA 3 with each annual adjustment, and set a maximum gauge size in the OCC management area of 6 ½" and include a 1/4" maximum gauge reduction in OCC with each annual adjustment. In the final year of adjustments, the maximum gauge size in LCMA 3 and OCC would be 6" at a minimum. The vent size in LCMA 1, LCMA 3 and OCC would be adjusted once, at the same time the final gauge size is implemented. The Board, during final action will specify the years of the schedule, with the first step occurring no later than 2026, and the second step occurring 2 years later** (Page 18).
   Motion by Pat Keliher; second by Emerson Hasbrouck. Motion approved by consensus (Page 21).

4. **Move to approve Addendum XXVII for public comment, as amended today** (Page 21). Motion by Doug Grout; second by Steve Train. Motion carried (Page 22).

5. **Move to adjourn** by consent (Page 26).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Stephen Train, ME (GA)
Rep. Allison Hepler, ME (LA)
Renee Zobel, NH, proxy for C. Patterson (AA)
Doug Grout, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Dan McKiernan, MA (AA)
Raymond Kane, MA (GA)
Rep. Sarah Peake, MA (LA)
Jason McNamee, RI (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Colleen Bouffard, CT, proxy for J. Davis (AA)
Bill Hyatt, CT (GA)
John Maniscalco, NY, proxy for B. Seggos (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Peter Clarke, NJ, proxy for T. Fote (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Dave Sikorski, MD, proxy for Del. Stein (LA)
Mike Luisi, MD, proxy for L. Fegley (AA, Acting)
Shanna Madsen, VA, proxy for J. Green (AA)
Jay Hermsen, NOAA proxy for A. Murphy
Janet Coit, NOAA
Sam Rauch, NOAA

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

Ex-Officio Members

Kathleen Reardon, Technical Committee Chair
Rob Beal, Law Enforcement Committee Rep.

Staff

Bob Beal
Toni Kerns
Madeline Musante
Tina Berger
Kristen Anstead
Lindsey Aubart
Pat Campfield
Julie DeFilippi Simpson
Chris Jacobs
Mike Rinaldi
Geoff White

Guests

Max Appelman, NMFS
Pat Augustine, Coram, NY
Richard Balouskus, RI DEM
Alan Bianchi, NC DENR
Delayne Brown, NH F&G
Michael Brown, ME DMR
Jeff Brust, NJ DEP
Josh Carloni, NH F&G
Beth Casoni, MLA
Nicole Caudell, MD DNR
Matt Cieri, ME DMR
Barry Clifford, NOAA
Heather Corbett, NJ DEP
Jamie Cournane, NEFMC
Jessica Daher, NJ DEP
Justin Davis, CT (AA)
Sam Duggan, NOAA
Glen Fernandes
Joe Fessenden
Jared Flowers, GA DNR
Lauren Gaches, NOAA
Emily Gilbert, NOAA
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Jennifer Goebel, NOAA
Jon Hare, NOAA
Amalia Harrington, Univ ME
Olin Hartkopf, Ofc. Sen. King
Marin Hawk, MSC
Heidi Henninger, AOLA
Kiana Kekoa, Ofc. Sen. Reed
Ashley Law, Ofc. Sen. Blumenthal
Ed Liccione
Eric Lorentzen
Chip Lynch, NOAA
Jerry Mannen, NC (GA)
Genine McClair, MD DNR
Kim McKown
Conor McManus, RI DMF
Sean McNally, NOAA
Meredith Mendelson, ME DMR
Steve Meyers
Jeffrey Nichols, ME DMR
Scott Olszewski, RI DEM
Gerry O'Neill, Cape Seafoods

Guests (continued)

Jeffrey Pierce, Dresden, ME
Michael Pierdinock
Nicole Pitts, NOAA
Tracy Pugh, MA DMF
Rebecca Quinones, MA DMF
Elizabeth Rasheed, SELCNC
Gray Redding, NFWF
Story Reed, MA DMF
Sen. Cameron Reny, ME
Mike Ruccio, NOAA
Erin Schnettler, NOAA
Chris Scott, NYS DEC
Phillip Sheffield
Ethan Simpson, VMRC
Molly Smith
Somers Smott, VMRC
Ariana Spawn, Ofc. Sen. Booker
Renee St. Amand, CT DEEP
David Stormer, DE DFW
ElizaBeth Streifeneder, NYS DEC
Kevin Sullivan, NH F&G
Jason Surma, Woods Hole Group
Pam Thames, NOAA
Marisa Trego, NOAA
Maureen Trinka, NOAA
Mike Waine, ASA
Jesica Waller, ME DMR
Megan Ware, ME DMR
Craig Weedon, MD DNR
Ben Whalley
Ritchie White, CCA NH
Holly White, NC DENR
Wes Wolfe
Chris Wright, NOAA
Angela Young, ME Elvers
Darrel Young, ME Elvers
Erik Zlokovitz, MD DNR

The American Lobster Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, January 31, 2023, and was called to order at 10:00 a.m. by Chair Jason McNamee.

CALL TO ORDER

CHAIR JASON McNAMEE: Good morning, everybody; I'm calling to order the American Lobster Management Board. I hope everybody is doing well. The first thing we're going to start with is the agenda.

APPROVAL OF AGENDA

CHAIR McNAMEE: We have an Agenda that has been published for the meeting.

I have one modification that I will add, and that is to give a couple of minutes to the Assistant Administrator from NOAA Fisheries to give a few comments. We'll take that up right after we dispense with the proceedings from our November meeting. Are there any other modifications to the agenda? Okay, Pat, go ahead.

MR. PATRICK C. KELIHER: Just under Other Business, I've got a quick update on 100 percent harvest reporting for the state of Maine.

CHAIR McNAMEE: What was the topic again, Pat? I'm sorry, I didn't hear it. Very good, thank you. Okay, any other changes? Seeing none; I'll ask the question. Is the agenda approved as modified? Any objections to approving the agenda as modified? Seeing no objections, we'll consider that approved.

APPROVAL OF PROCEEDINGS

CHAIR McNAMEE: Next, we'll move on to the proceedings from our November meeting. Are there any changes, edits, deletions, any other sort of thing to those proceedings? All right, seeing no hands, we will consider the proceedings approved as submitted.

PUBLIC COMMENT

CHAIR McNAMEE: Moving on, let's take a moment here to see if there is any public comment that anyone wants to make.

This would be public comment on things that are not already on the agenda. Looking around the room first, not seeing any hands. Any hands on the webinar? Okay, so there are no public comments, and why don't we then dig into our meeting.

COMMENTS FROM ASSISTANT ADMINISTRATOR FROM NOAA

As we modified the agenda, it is my honor and pleasure to introduce Janet Coit; Comments from Assistant Administrator from NOAA the Assistant Administrator from NOAA Fisheries, who would like to address the Board. Janet, whenever you're ready, please take it away.

MS. JANET COIT: Good morning, everyone. It's great to see all of you. Some of you I've gotten to know in person, and others I know your names very well, and I look forward to meeting you. I'm Janet Coit; as Jason said, and Jay and I work very closely together, so I have the utmost respect for him, and it's nice to be here with him as the Chair of the Lobster Board. I'm also here with another person I have utmost respect for, who is Sam Rauch, who is the Deputy Assistant Administrator of NOAA Fisheries. I know ASMFC very well, 35, 40 years ago when I worked for Senator John Chafee and we were working on striped bass conservation, we worked very closely with ASMFC, so I guess that dates me a bit.

I also was officially part of this Commission, when I was the head of the Rhode Island DEM. I just think it's a constructive, important venue, the way it brings state legislators and the representative state leaders together with NOAA and scientists and stakeholders. You're really a terrific entity, and we

have a lot of tough issues, and I'm really glad you're taking them on.

I wanted to talk to, and among those issues, of course, are climate change, and how our ecosystems are changing, which are affecting lobster and plankton, and the things for which plankton are prey. That brings me to talking about lobster and right whales. That's what I wanted to talk to you today.

The lobster sector is incredibly important to our nation. It's the economy of Maine and other states, and I know we're all here wanting to see it be sustainable, and continue to be an important industry going forward. We also, I think are all committed in wanting to conserve and restore threatened and endangered species.

The endangered North Atlantic Right Whale is really on the brink. Preventing its decline and conserving North Atlantic Right Whales, that's a tall task. We're legally required to do that under the Endangered Species Act, legally required to achieve Marine Mammal Protection Act Standards, and that is going to require us working together, and collaborating.

I wanted to give you, really an update and just a few thoughts, and urge that we collaborate and be as strategic and as thoughtful and as forceful as we can right now. A couple actions that you're probably aware of. NMFS has a Proposed Rule out on vessel speed. The second most lethal problem for right whales is vessel strikes, and we have a Proposed Rule out.

I believe the comment period closes shortly, and we'll be taking a look at thousands of comments, and looking at the best way to approach reducing vessel strikes. We also, Dan, are publishing the Ledge Rule today, which is something that is an emergency rule, and I think you are all aware we did it last year, and it's important to remove gear that is either being used or staged in that ledge area in Cape Cod this time of year, when whales are congregating.

Really appreciate the leadership of the state of Massachusetts. We're continuing to consider how offshore wind affects right whales and other mammals and species. That is a tremendous task for NOAA Fisheries, and something we're putting a lot of resources in. You may have seen the guidance that we developed together with BOEM and also, we had right whale communication.

That is something we're trying to finalize, but we didn't want the identified research needs and gaps, things like understanding better the oceanographic impacts of these large wind farms, and how they affect productivity and placement, and how that might affect species like right whales. There is a lot that needs to be studied further. Then here is the work that we're doing together on developing ropeless gear. That is what I primarily wanted to talk about today. I know that for any of these issues, understanding the stakeholders and the sociology, for lack of a better word, you know what motivates people, what their concerns are, is part of being successful well beyond the technology.

I wanted to review quickly. If you don't already know about the provision in the FY23 Omnibus Budget Bill or Appropriations Bill, you will now. But I imagine everyone in the room does. We have a new legislation that was enacted in December that declared that our 2021 Final Rules of the Take Reduction Team worked on that NOAA promulgated in the Fall of 2021.

That law says that rule is sufficient to ensure that the federal and state American lobster and Jonah crab fisheries are in full compliance with the Marine Mammal Protection Act and the Endangered Species Act. That term of this provision gave us until December of 2028 to implement additional whale protections. Essentially, the rule we were working on with the TRT, and under the District Court remedy is now put off for another six years.

Between now and then we need to work really hard together on additional options to protect right whales. Fortunately, that Omnibus Bill also

included significant resources, including a large uptick to the ASMFC to work on developing ropeless gear, to work on developing better approaches to monitoring right whales, to consider what might be the foundations for a different approach, a dynamic approach to management.

I wanted to come here both because I wanted to address this group, which I haven't had a chance since I started in June, 2021, to address. But also, just to emphasize how important it is that we collaborate and are strategic about how we work with that pot of money, which is a total 26 million dollars to ASMFC for, not just ropeless gear, for a number of other monitoring and cost recovery.

But, I think primarily, that what I am anticipating is that we're working on all of the antecedent steps to having ropeless gear available, so that it can be used in closed areas close to vertical lines when you get to the 2028 Rule. We also have a new 20-million-dollar pot of money in that Omnibus Bill that we can work with the National Fish and Wildlife Foundation, an entity that is a partner to NOAA, and that can attract and leverage other funding, or we can do our own grant program.

But whatever we do, Congress has let us know they also would like to see that funding go primarily for on-demand for ropeless gear. The grantees for that 20 million dollar pot of money are much broader, it's not going to the states or through the states. But we are right now considering, how do we couple that with the money that ASMFC has to have the biggest bang for the buck.

There is also additional funds in that Bill that come to NOAA Fisheries, for additional work in the Gulf of Maine. There are some requirements for that bill. There is a lot of attention, while Congress can get a longer lead time for the next set of regulations. They also gave us tens of millions of additional funding, and we're looking at whether or how we might supplement that with our Inflation Reduction Act Funding. We're still a few steps to go in that, so we can't announce anything. But essentially, it's just we have a moment, we have a historic moment in time where we can further right whale conservation, where we can potentially stop the decline and develop technologies and test pilot them, and work with people who are on the water, who are the best experts.

Working with the states, working with the state of Maine, working with a Sea Grant, which also got funding. Working with our industry, and we need to really put our shoulders to the wheel. Now Jason likes to quote the Jedi Master, Yoda. He probably has an appropriate quote for this. I like to quote country song writers.

One of the absolute bests is Willie Nelson, who turns 90 in April, and I just keep thinking of his song, Pick Up the Tempo. Pick up the tempo just a little, and bring it on home. We have got to accelerate this work. NOAA has been working with industry partners, NOAA has been working with some of the environmental stakeholders who are helping test different technology, encourage folks to try it out.

But, we have got to accelerate this work if we're going to have the necessary protections for right whales ready in time for that 2028 Rulemaking. If 2028 doesn't seem around the corner, but when you think of all the work that we need to do, and how far we need to go, and all the stakeholders and the TRT process. We would need to get going right away.

Among our challenges that I wanted to leave you with in regard, well how do we do things differently than we have in the past? You know what is the array of new technologies that we can develop and test pilot? How do we improve our monitoring, our modeling? How do we better understand what is happening with changing ecosystems to inform our decision making?

How do we think about managing in a changing environment? How do we think about managing in a more dynamic way? Those are some of the issues

I hope the Lobster Board and the Commission will consider, and continue to work with us, at GARFO, at the Northeast Science Center with Kim Damon-Randall in our Office of Protected Resources, with Sam.

We have a new right whale initiative across NOAA Fisheries, because we're committed to thinking both broadly and being innovative, but also looking at how all these component parts connect. It's truly, well Commissioners, with that 26 million dollars we have to think about how you are using it, versus how we are using it, and how these things connect.

To be successful we need to work together. I have the utmost confidence in Jason as your Chair, and the members of this Board. When I think about the spawning biomass resilient measures that you're about to discuss, they take a long time, like too long. I think that fisheries, I often feel impatient with fisheries regulation, and with changing ecosystems.

You know we have to move more quickly. I'm just urging everyone, we need to be thoughtful, we need to look before we leap. But we need to move in coordination, and we need to move quickly, if we're going to both conserve right whales and be ready in time for new rule making, and have more options on the table that allow our American lobster industry to continue as a new generation, and to conserve the magnificent right whale. That is what I wanted to say. I think of you as partners and collaborators in all of this, and either Sam or I are happy to entertain comments or questions.

CHAIR McNAMEE: Awesome, thank you so much, Janet. I thought you were going to bust out a Yoda quote. Obi-Wan Kenobi also would have been okay, but Willie Nelson is pretty good. The Assistant Administrator has offered to take a few questions, so open it up to the Board for any questions you might have for Janet. Dan McKiernan, go ahead.

MR. DANIEL McKIERNAN: Thank you, and welcome, Janet. We got a six-year reprieve, and I totally agree with your perspective that we really need to get working on getting to a place where we have enough information and refinement, so that in 2028 we can have a different management scheme. But I just want NMFS to also understand that we've done something in the last couple of years that is new and novel, that is weak rope and marked rope.

I know there are three new entanglements that have come up since the infamous Omnibus. But I hope that we can really work, or that your staff will really work with us as states, because you've basically asked each of our states to be responsible for entanglements, be responsible for the marked gear.

We're ready to look at that gear, because if it is our state's gear, it is going to go a long way to convincing those that are involved in the fishery that we need to make those changes. We're really anxious to see the gear, particularly that new whale that came entangled and has been disentangled off North Carolina.

We're really anxious to see that, and we hope that the NOAA folks will work with us, and that we can mine into the new information, so that when we get to 2028, we can be more surgical, because even the ropeless road map states clearly that ropeless probably isn't needed everywhere. That's like the biggest challenge that we have on the waterfront is, you know a guy with a small open boat is looking at this saying, is this the end of my participation in the fishery?

It's like, well, not really, look at the ropeless road map. Anyway, so I hope that NOAA will try to use this interim period to gather the vetting information that we've been lacking. I know in the past it's well, 70, or 80 or 90 percent of the entanglements, you don't know where they came from. Well now we should, because of those two features. I hope that we'll work together to gather better evidence.

MS. COIT: Thanks, Dan, excellent points. We've all seen in several entanglements, as you've said, and

we were able to collect the gear from that last one. Determining whose gear, it is, where the gear is from is important. I won't restate your other points; I think they were all very good.

I think you all know, Colleen is going to speak next, I believe, that we're doing the Peer Review shortly of the Decision Support Tool. Actually, it might be underway. But I think one of the things that this, to quote you, "reprieve" that's your word, allows us to do is gather more information and then you input that information into that tool, among others. Thank you.

CHAIR McNAMEE: Discussion, go ahead, Pat.

MR. KELIHER: Thank you, Mr. Chairman, thank you, Janet, for those remarks. I agree there is a lot of work to do. We have heard people in Maine, industry members, talk about this as a six-year pause or reprieve, we don't have to do anything. That is certainly not the intent of the state of Maine.

We have four years to collect data, and so I want to make sure, you know just our focus is going to be on issues around gear. We know ropeless, but to Dan's point. You know ropeless shouldn't be needed everywhere, but we do need a ropeless system that works. That dynamic type of approach is also going to be important that you spoke of.

One hundred percent harvest reporting, trackers, there is a lot of data that we're going to have now that we did not have in the past, which I think is going to be instrumental on maybe seeing that we're in a different place, hopefully in four years when this rulemaking starts. But we're also not blind to the fact that big changes are coming.

We all recognize that, and so we do want to work together. The one thing I do want to bring up that I didn't hear you mention directly is, kind of tracking and the acoustical work that needs to be done. The state of Maine, and I think others, are looking at the ways that we can expand our footprint within the Gulf of Maine or within the range of right whales.

Using passive acoustics, we think it's going to be a critical tool to understand where they are, how they're behaving in those particular areas. But the Coast Guard and BOEM got a lot of money for passive acoustics too, so I would just urge the Agency to bring your parties together on passive acoustics, to make sure that we're not duplicating efforts in areas. I think that is going to be really important. There is a lot of money there, and I think if we use it wisely it will give us a lot of information to benefit right whales. Thank you very much.

MS. COIT: Thank you, Pat. We are meeting with the other agencies, and agree that's another set of coordination that needs to happen, so we can cover more ground. Improving monitoring is key to both your and Dan's comments, and we're committed to that. As you well know, Senator King is encouraging us to work more on satellite monitoring, and that is something that has promise, though perhaps not in the near term.

CHAIR McNAMEE: Representative Peake.

REPRESENTATIVE SARAH PEAKE: Thank you very much, Madam Administrator, nice to see you and nice to meet you here today, appreciate that and your comments. I would just like to offer a comment relative to climate change and the effects that that is having with ocean acidification as it may affect food sources for various species, and of course the warming of our waters.

I feel like having served on, as the Legislative Commissioner, I think since 2009 on this Board, I've had a front row seat to witness climate change. When I go out and meet with constituents I say, you know we never really used to care about black sea bass, now we have a fishery in Massachusetts. The gentlemen all sitting across the table from us, are seeing a fishery of black sea bass also. But getting back to the North Atlantic right whale. I think that climate change must be given equal weight or more

to what our management plan might be, whether it's ropeless fishing. I think the gear marking that Dan talked about is important.

But we have North Atlantic right whales right now in Cape Cod Bay that are visible from Herring Cove Beach in my district. There is a concern with that, because their food source is not webbed in Cape Cod Bay, but those right whales are in Cape Cod Bay, and obviously that affects their very viability, their strength, their ability to feed, and to nurse whatever calves that may be with them.

Although it may not be universally popular around this table, I believe that the efforts of Massachusetts, specifically, moving boldly forward with deep water offshore wind, to remove the carbonization out of the energy grid, in effect, is a critical and important thing for us to look at and continue to support.

As we're balancing potential effects of offshore wind projects, let's keep in mind that, I think you talked about moving quickly, that that is the swiftest way that we are going to meet our carbon reduction goals that we need to, in order to slow the warming of this planet that we live on, and this giant ecosystem that includes human beings and the North Atlantic right whale. Thank you.

MS. COIT: Thank you very much for those comments. Sam has corrected me that the comment period is closed for the Vessel Speed Rule, so I just wanted to correct the record on that. Jason, we closed October 31st.

CHAIR McNAMEE: All right, good discussion. Thanks for that update. Any remaining questions, comments for Janet? Anyone online raising their hand? Okay, I think that will do it then. Janet, I know you can't stick with us, but thank you so much. Really appreciate you taking the time to address the Board. Great to see you.

MS. COIT: Thank you, and if you ever want to talk about black sea bass, Representative, talk to Jason.

REVIEW REPORT FROM THE ATLANTIC LARGE WHALE TAKE REDUCTION TEAM AND PROGRESS ON ATLANTIC LARGE WHALE TAKE REDUCTION PLAN

CHAIR McNAMEE: All right, on to our next agenda item. We are going to get a Review Report from the Atlantic Large Whale Take Reduction Team and Progress on Atlantic Large Whale Take Reduction Plan from Colleen Coogan and Marissa Trego. I'm sorry if I mispronounced that.

MS. MARISSA TREGO: That was correct. This is Marissa Trego; I'm going to be giving the presentation for the most part, but Colleen is also on, and will be available for questions as well. I am going to give you guys a summary of the results of our meeting, meetings that we held in November and December of last year.

I'll just note that this is a draft meeting summary, since they key outcomes isn't final yet, and we haven't found team feedback just yet. I'll be talking a little bit about that as well as our next steps. Just a short overview of what I'll be talking about. First, I'll talk about what the charges to the Atlantic Large Whale Take Reduction Team, what the Risk Reduction measures were that we discussed at our meeting, the overview of that package that the team pulled together and voted on at the end.

I'll give you a little preliminary interpretation of the Consolidated Appropriations Act, though Janet already went into that in a little more detail. Then finally, I think we do have some information on large whale strandings that I'll kick off to Colleen, if that is of interest. The Atlantic Large Whale Take Reduction Plan was created at the end of the nineties.

NMFS is mandated by law to create a Tier T when incidental mortality and serious injury in U.S. Commercial fisheries exceeds PBR. This Atlantic Large Whale Take Reduction Plan was implemented primarily to look at mortality of right, humpback

and fin whales, and make sure to get those mortality levels below that potential biological removal level.

It's largely focused on right whales, since the population is very small, and the mortality is much higher than PBR. The goal of the team is to develop recommended measures to reduce that mortality and serious injuries. It's a consensus-based process, and the team is comprised of 60 members, which includes 23 fishermen, as well as stakeholders from states, fishery management organizations, NGOs and academics.

Ultimately, while we get recommendations from the Team, NMFS is responsible for taking action in the end. There are several fisheries that are covered under the Atlantic Large Whale Take Reduction Plan. I won't go over all this in detail, but the PBS will be available if you want to look at all the details.

In general, it's mostly trap pot fisheries along the east coast, as well as several gillnet fisheries, including sink gillnet, drift gillnet and sharks, for example. In 2022 the charge to the Take Reduction Team was to create recommendations to us, to reduce mortality and serious injuries of right whales in U.S. commercial fisheries to a level below that population's potential biological removal level, which for this population is really low at 0.7 whales per year.

We estimated that this would require about an 88 to 93 percent total risk reduction, which is at 41 to 46 percent additional risk reduction on top of the September 2021 Final Rule that modified the Northeast lobster and Jonah crab fisheries. There are several recommended measures that were brought to a vote, and these were among three different categories.

Largely, closure to buoy lines, so either moving or removing lines in a particular area seasonally. Line reductions including things like trap caps, line caps, trawl ups, and using only one buoy line for a trawl, and weak rope, which is using a 1700-pound maximum breaking strength, for example.

Then there are a lot of implementation challenges that were discussed throughout the meeting, including things like economic concerns, the affordability and readiness of on-demand gear, things like gear conflict and enforcement, some equity concerns for things like trap caps, as well as safety. There are a lot of things that we discussed in relation to these that kind of determine where these types of measures might be most useful and least concerning, in terms of their implementation. I'm just going to go through a list of the different areas and trap pots and gillnet Package Elements, so you can know what was put for a vote at the end of our TRT meeting. First, I'm going to focus on the trap pot elements that were discussed by the team.

In LMA 1, different trap pot closures were suggested that got at really key areas of overlap between the lines and whales. Those included closure in Maine Zone A from June and July, and expansion of the LMA 1 restricted area slightly, and then additional closures around Jeffrey's Ledge, and as well as other areas close to the Massachusetts Restricted Area that would expand into high cooccurrence habitats in that region.

In terms of line reduction, there were several options that people discussed, including things like a 400-trap limit in certain Maine areas and Jeffrey's Ledge, where there is a lot of concern for reducing the amount of gear in that area, without using closures. There is also a line cap that was discussed that was seasonal that would occur in Jeffrey's Ledge and then some other trawl length-base scenarios in Massachusetts.

In terms of weak rope, that was something that was widely discussed throughout the region. That would vary by distance from shore. Taking into account some of those implementation concerns I touched on earlier, where in deeper water there is more of a concern for using weak rope, and so there is a lighter use of weak rope in offshore

versus onshore, where weak rope in this package was a little more heavy.

In Outer Cape Cod this was a pretty low risk area already, given the closure of the Massachusetts Restricted Area. But there was a suggestion to expand that closure in Outer Cape Cod a little bit in space and time, so all federal waters and going into January, as well as to May 15. There was also a trawl length suggestion to reduce line reduction in December, which is a higher critical month without closing that area, and using 100 percent weak rope.

In Southern New England, which we know is a critical area as well, and has been more frequented by right whales recently. There were a lot of suggestions to have large seasonal closures to buoy lines in this area, including the entire LMA 2, as well as a 2/3 overlap between January 15 through April 30.

This was really the most effective way to remove lines from the water, rather than moving it into new areas that would create other areas of risk. In this area in particular, moving gear just created more risk. Some way to remove that risk was the most affective. Other line reduction options looked at trawl length, based on latitude, and 100 percent weak rope again to have lower chances of creating serious entanglement, should one occur.

In Lobster Management Area 3, we had some proposals. This group in particular did not necessarily propose all of these items. We took a few elements from this group, but largely the package that we pulled together didn't quite get to the risk reductions. We were asked to show an example of what did get to the risk reduction that might be needed. Several of these were proposed by NMFS as well, to kind of make up for that gap. These blue line closures look fairly large, and that's because it's really hard to remove line from the water in this area in particular. That would include some really large closures in the purple area during the summer months, and in Southern New England during the spring months that line up with the Southern New England closures I just mentioned, as well as an extension of the LMA 1 restricted area that I noted on a few slides earlier.

For line reduction, some of the ideas that were put forth were line caps. The example in the package that was voted on included a 45-line cap for lobster, and also removed one end line in areas north of the Canyon year-round, and seasonally south of the 100-fathom line in the Mid-Atlantic.

There was also a weak rope suggestion just in the top 33 percent, given those concerns we have about implementation of weak rope in deeper water. For Lobster Management Areas 4 and 5 in the Mid-Atlantic there was a suggestion to have a minimum trawling for lobster and black sea bass of 20 traps per trawl in certain areas.

Then one end line as well in some of those fisheries in Delaware, Maryland and Virginia, and in this area another thing that was of interest is 100 percent weak rope to reduce the lethality of those lines. I'll just move on to the gillnet package elements, there is just a few of them. I'm just going to go over these combined.

Gillnet is also one of the fisheries that was lower in terms of risk reduction, but we were able to get really decent risk reduction from some of these closures, in areas where most important, which was in Gulf of Maine and Southern New England. There was a closure proposed west of 70 degrees and north of 42.5 degrees in orange, during springtime.

This was pretty effective at reducing risk of the gillnet fishery in this region. That was the area of most risk where gillnet fishing was occurring. Then the Southern New England there is a suggestion to apply that South Islands Restricted Area that is already implemented for trap pot to gillnet in this critical area.

A few other options for gillnet was brought to line reduction through use of an end line cap in the Gulf of Maine and Southern New England, and the use of

one buoy line in the Mid-Atlantic in certain fisheries from New York to Virginia. In terms of weak rope, this looked a little bit different by region.

In the Gulf of Maine there was a suggestion to use weak rope based on depth, to account for different gear weights. In other areas they chose to go with more of a hundred percent weak rope that kind of was a mix of full manufactured weak rope and weak at the bottom. At the end of these meetings, on December 2, the Team was able to vote on this final package, and we had a mix of responses.

Seventy percent supported the package, 45 percent supported it with reservation, 32 percent could not support it and opposed it, and we had 16 percent abstain. You can see on the right this is the representatives, the caucuses that were represented in those votes. We had fishery managers throughout each of those votes. We had some support from industry and some opposition from industry, and the NGOs did not support or abstain, largely, and we had a few academics on either side as well. Some of the areas of general support that we did hear was that there wasn't a lot of strong opposition to a lot of the gillnet measures that were discussed, nor was there as much opposition to measures in the Mid-Atlantic and Southeast for both gear types. We had some mixed support for some of the package measures.

NGOs and academics largely didn't support the use of weak rope as much as was relied upon in those packages. Then they also had an interest in really supporting measures, but showed progress toward ropeless, and there was a statement of support for some deadlines using these that didn't quite achieve consensus.

There are a few other things that were discussed that didn't go in the ultimate package but did get some mixed support from the team as well, which is including the increased value of the Massachusetts restricted area in the total risk reduction package, and a dynamic closure proposal for Maine's Zone A, which also didn't end up in the final package.

One of the main concerns we heard from people about the rope was that LMA 3 requested to accept the package proposal that went to vote as interim, until AOLA submitted their own proposal of equal value in January. But as Janet mentioned, the Consolidated Appropriations Act was passed in December, which changed a little bit of the next steps that we have.

Our previous charge was, according to the court mandated deadlines, and for now I kind of want to go over what that, given all of the information we got from the TRT meeting, what that means in terms of next steps for TRT plans. We still got a lot of really helpful information from those meetings that we will use to inform all of the rules that we work on moving forward. It will just be at kind of a different pace.

As she mentioned, there is a lot of research that will be invested in, especially efforts to advance ropeless gear and other technological solutions, especially given some of those closure areas that you saw. They are really large areas, and things like ropeless can circumvent that and really be a solution that allows people to keep fishing during those closures.

That sort of development is also really essential to some of those other ideas, including fishing with one buoy line. Certain areas like gillnet and other trap pots, we discussed the idea of using ropeless on one end. That is something that we would really need to develop if we were to implement that for other fisheries like gillnet and other trap pot.

There is additional money that will likely go into things like prioritizing surveys and other data collection that will really inform all of the models for our decision making. That will hopefully be a really important tool as we move forward, developing our world of the future. In terms of rulemaking, we will be closing that wedge area that

is circumscribed by the Massachusetts restricted area.

That will be effective as of February 1st, and run through April 30th, in line with the Massachusetts restricted area in federal waters. We'll also be moving forward with reducing risk in Atlantic gillnet and mixed species trap pot fisheries, similar to what we used to haul our Phase 2 efforts. We'll use all of that information we got from the TRT to inform that rule moving forward on those other fisheries. We'll obviously be working really closely with the Councils and Commission to explore those options to use things other than buoys as gear marking schemes, which is really important for advancing that ropeless technology. The goal will be to have a rule effective by 12/31/28 that reduces risk within the lobster and Jonah crab fisheries in line with that Consolidated Appropriations Act deadline.

We would propose regulations earlier than that, and aim to have something effective by the end of 2028. Though this isn't necessarily TRT related, it's associated, and we just wanted to give a short update on some of the entanglement incidents we've had this month, since there have been quite a few.

One of these in red you will see is a resighted entanglement. This is an entanglement that we were aware about that was first sighted in Canadian waters. These other ones are new entanglements. The one on January 8th,to the 20th, and the 27th, are new entanglements. The first up there is a 4-year-old female, had previously been seen with no gear in May, 2022.

It is a serious injury and has not been resighted. The last two, we were able to get some gear from these. Both were, so I guess the January 20th Nimbus was sighted without entanglement as of August, 2022, in the Gulf of St. Lawrence, and Argos was last seen without an entanglement in May 2022 in the Great South Channel.

Both of these last two we were able to get some gear. Some gear analysis is underway. There is a transboundary gear analysis process that will last at least 45 days before we can release anything about that information. But once that analysis is complete, we'll notify the TRT and let them know what the results of that are.

It's really helpful when we are able to get that gear in here. That is about it, and I'll open it to questions, unless there is anything else Colleen wants to add. Oh, she did note that it's up to 45 days, so we won't necessarily take 45 days for the transboundary gear analysis. It may be sooner.

CHAIR McNAMEE: Okay, thank you very much, Marissa. Are there questions for Marissa or Colleen from the Board? We have one online, David Borden, go ahead. We can't hear you, David, if you're talking. Sorry, David, we're not hearing you. It looks like you're unmuted, so hopefully we can come back to David once we get that squared away. But I saw another hand, so I'll go to you, Dan. Go ahead.

MR. McKIERNAN: Could I just get clarification on the transboundary gear analysis. Is that a new agreement with U.S. and Canada to share the gear information? It's new to me.

MS. COLLEEN COOGAN: I'll jump in here, Marissa. Hey, Dan, this is Colleen. We have been working with them really over the last few years. We don't have a strict agreement with them. The 45 days is our typical gear investigation time period. We try and get a report out, at least a preliminary report within 45 days. We are in the case of these last two events, working as well with Canada, because so much of the gear retrieved over the last five or six years has been Canadian. We have told them that we'll be releasing results within 45 days. It's not so much that it's a 45-day process with them, we do look at the gear. We do look at it with them, and we ask them to do the same when there is an entanglement in Canadian waters. It's an informal agreement not a formalized one.

CHAIR McNAMEE: Thanks for that, it looks like Dan is satisfied with that. Let's try David again. Go ahead, David, if you're able to, or if we're able to hear you. Go ahead, Toni.

MS. TONI KERNS: Jason, David has texted me his question. Colleen, he's wondering, or Marissa, I'm not sure who it's to. But the last entanglement where you actually retrieved the gear, where was it from?

MS. COOGAN: We have not finished the gear investigations on the last two entanglements that we retrieved gear from this month.

CHAIR McNAMEE: Okay, Toni can keep her eye on her text if Dave has a follow up there. Nothing so far.

MS. COOGAN: Just to clarify a little bit, we actually don't even have that gear in our gear warehouse yet. While we've done some remote review, and the folks that did retrieve it have looked at it. Again, we haven't done our formal gear analysis yet.

CHAIR McNAMEE: Thank you for that. We have Beth Casoni on line, go ahead, Beth.

MS. BETH CASONI: Beth Casoni, Executive Director, Massachusetts Lobsterman's Association. I would like to put this on the record that we feel that the emergency action taken to close the wedge outside of the month of April, is in violation of the language in the Omnibus Spending Bill. You know I'm getting e-mails from our members, and they are not seeing any whales up there now, and they have 500, 600 traps up there. I am aghast.

You know Massachusetts is lightyears ahead for right whale conservation, and to take this two months away from the industry, when the language was clear, it was for existing emergency action. The month of April was last year, and now our industry is facing February, March, April. We just want it on the record that we think it's a violation and we don't support this. Thank you.

CHAIR McNAMEE: Thanks, Beth, Colleen or Marissa, any response?

MS. TREGO: There wasn't a question in that. I will say that the most recent aerial survey conducted by the Center for Coastal Studies did identify 16 right whales. I think it was done yesterday in the Cape Cod Bay area. Also, we understand there may still be gear there, and as always, our enforcement will be working closely with the Mass Environmental Police to support compliance while gear is removed from the area.

CHAIR McNAMEE: Thank you for that. Any remaining questions from the Board? Ray, go ahead, Ray.

MR. RAYMOND W. KANE: Question. I heard this conversation that they had retrieved gear, a rope type. But it's not in the warehouse, so who maintains custody of the gear and the rope type if it's not at the warehouse? Who has got it right now? Where is it?

MS. COOGAN: That gear, I think one of those was disentangled off of Georgia, the other off of North Carolina. I believe that the Georgia DNR folks that we work closely with, and that were involved in both of those disentanglements, are working with enforcement to maintain a chain of custody and transfer the gear to the warehouse.

CHAIR McNAMEE: Okay, got a thumbs up from Ray. Any final questions from the Board before we move on to our next agenda item? I don't see anyone online. No one around the table, so Colleen and Marissa, thank you both very much, appreciate the information and your response to those questions. Thank you very much.

MS. TREGO: Thank you for the time.

CHAIR McNAMEE: You're more than welcome.

CONSIDER DRAFT ADDENDUM XXVII ON INCREASING PROTECTION OF SPAWNING STOCK BIOMASS OF THE GULF OF MAINE/GEORGES BANK STOCK.

CHAIR McNAMEE Moving on to our next item, this is our action item for the day, so we are going to now Consider Draft Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock. The goal here is to decide if we want to send this document out for public comment.

We've been working on this for a while. You know I think we can make some small adjustments today without delaying further. If the adjustments are more significant, we'll have to think that through a little bit. With that, I am going to turn it over to Caitlin to give us a quick blast through the Addendum, and we'll meet back on the other side.

MS. CAITLIN STARKS: I'm going to go over Draft Addendum XXVII. This is again on increasing protection of the spawning stock in the Gulf of Maine and Georges Bank stock, and the PDT has revised this document since the last meeting per the Board's request. I'll go over those changes.

I'm going to start off with some very brief background on the Addendum Action Timeline, then I'll review the proposed management options in the document, and provide a quick update on the discussion related to the Magnuson-Stevens Act implications for changing the minimum gear size. Then I'll wrap up with next steps and a tentative timeline for the Board. We've covered the full history of this action over the last few meetings.

But I just want to remind the Board of the more recent changes to the Addendum. The objective that is here on the slide is ultimately what the Board provided for the focus of the document, after receiving the results of the 2020 stock assessment, and acknowledging the continued low indices in the settlement surveys, and declines in recruit abundance in the ventless trap survey and trawl surveys for the Gulf of Maine and Georges Bank stock.

The objective is to increase the overall protection of spawning stock biomass of the Gulf of Maine/Georges Bank stock by establishing a trigger mechanism, whereupon reaching the trigger management measures would be automatically implemented. That is our focus, and then for the timeline, this is what we had done so far, and where we're going. We started off with the re-initiation of work on this Addendum XXVII in February, 2021, and then in January 2022, the Board approved the Draft Addendum for public comment. However, at that same meeting the Policy Board chose to delay the release of the document for public comment, to allow some time for upcoming actions and information to potentially better inform the public comment on this Addendum.

Then at the last meeting of the Board in November, 2022, it reevaluated the Addendum and decided to rescind the documents approval for public comment, in order to make some changes to the proposed management options. Today the Board will be considering the modified draft addendum document for public comment.

These are the motions that were passed at the November meeting, just as a reminder, which directed the PDT to make some changes to the Draft Addendum XXVII document. First the Board asked to simplify Section 3.2 by creating a single trigger level, rather than multiple triggers that would act as a backstop to protect the stock from further declines.

Specifically, the Board asked for the trigger to fall between the range of 30 to 45 percent decline in the index from the reference period. Then additionally, the Board asked to change Option E to shift those years in which the scheduled changes to gauge and vent sizes would occur to 2025 and 2027, rather than 2023 and 2025.

I'll go over the proposed management options in the document that have been modified. First, the

proposed options in the Addendum are still separated into two issues, with Issue 1 addressing the standardization of a subset of management measures within LCMAs and across the Gulf of Maine and Georges Bank stock.

Then Issue 2 considers either a trigger mechanism or a predetermined schedule to implement the biological management measures that would be expected to provide increased protection to the spawning stock biomass. Since the last meeting the options under Issue 1 have not changed. But just for a quick recap of these.

The two main options are A, status quo, or B implementing some standardized measures upon approval of this Addendum. Under the Option B, there are 4 sub-options that define what those standardized measures would include. B1 is standardizing measures only within LCMAs where there are current discrepancies.

B2 is standardizing the v-notch requirement across the LCMAs. B3 is to standardize the v-notch possession definition across the LCMAs, and B4 is to standardize the regulations for issuing additional trap tags for trap losses. I guess I didn't move forward on that last one, but just as a quick note from this list of sub-options. The Board, as an option, could select as many of those sub-options as desired.

All right, so that Issue 2 focuses on implementing the management measures to increase protection of the spawning stock biomass, specifically using changes to the minimum and maximum gauge sizes, along with corresponding vent sizes for the LCMAs within a stock that are expected to increase the spawning stock biomass, and also increase the minimum gauge size, to meet or exceed the size at 50 percent maturity for each LCMA. Each option the vent sizes would change according to the final minimum gauge size that is implemented in a specific area. Then for the way that these options are set up, there are two approaches.

The first is using this trigger mechanism, and that would result in a predetermined set of management measures being triggered upon reaching a defined trigger level, based on changes in recruit abundance indices. The second approach is using a predetermined schedule for future changes to the management measures. These are the five options that are under Issue 2, and these are modified based on the Board motions in November.

A, status quo, no additional changes to the management measures. B is that the gauge size changes would be triggered by a 32 percent decline in the trigger index. C is that gauge size changes would be triggered by 45 percent decline in the trigger index, and then D is a 32 percent decline in the index, triggering a series of gradual changes in gauge sizes over several year.

Option E is the scheduled changes to minimum gauge sizes, and as a note, Option E only has changes to the minimum gauge size in LCMA 1, happening on a predetermined schedule. These are the proposed measures for Option B that would be implemented when the trigger level is reached. Again, this is a trigger at a 32 percent decline in the index.

First, I want to make a note about why the PDT chose to use this 32 percent as the low end of the trigger range, although the November Board motion said a range of 30 to 45 percent. The reason is that when the TC was originally proposing a range of possible trigger levels to the PDT to include in the Addendum, 32 percent was one of the proposed trigger levels, because it's approximating a decline in reference abundance, so the level where the stock abundance regime from the stock assessment shifted from moderate to high abundance.

The PDT thought this was a more justified option than the 30 percent, because the 30 percent number was an arbitrary number that was thrown out as an additional trigger level by the Board after

the 32 percent had already been proposed. Under this option, when the trigger index shows a 32 percent decline from the reference period, then the minimum gauge size for LCMA 1 would increase to 3 and 3/8 of an inch for the following fishing year.

In addition, the maximum gauge sizes in LCMAs 3 and Outer Cape Cod would decrease to 6 inches. The vent size in LCMA 1 would be adjusted once as well, to 2 x 5-3/4 of an inch rectangular, and 2 and 5/8 of an inch circular. These final vent sizes were chosen to maintain similar retention rates of the legal-size lobsters, and protection of sublegal sizes.

They are also consistent with the current vent size that is used in Southern New England for the same minimum gauge size of 3 and 3/8 of an inch. For Option C, the management measures are identical to what is in Option B. The only difference is the trigger level. This trigger level is a 45 percent decline in the index.

That would trigger the same exact management measures that I just described for Option B. The 45 percent trigger level is approximating a decline in stock abundance to the 75th percentile of lobster abundance during a moderate abundance regime from the stock assessment. Since the document includes these two alternative trigger level options with 32 and 45 percent, that means the Board would establish a single trigger at final action, and that could fall anywhere within that range.

For Option D, this is the one that considers implementing a series of gradual changes in gauge sizes that would be triggered by a 32 percent decline in the trigger index. Only at that fifth level the 32 percent, that could also be changed at final action to fall within the range of 32 percent to 45 percent as provided in Options B and C.

With this option, when the trigger level is reached, the minimum gauge size would increase in increments of 1/16 of an inch, and the maximum gauge size would decrease in increments of 1/4 inch, with changes occurring every other year. If the trigger level is reached in Year 0, then the first gauge change would occur for Year 1, and that's what is shown in the first row of changes.

Then the second change would occur in Year 3, and the final change in Year 5, and that's shown in the last row. Similar to the other options, the vent size in LCMA 1 would be adjusted once to correspond with the final minimum gauge size change in Year 5. Then the last option is E, and instead of using the trigger mechanism, this option would establish a schedule for changing the minimum gauge size and vent sizes in LCMA 1.

That choice was put in by the PDT To provide an option that only focused on LCMA 1, because proportionately the amount of impact that changing the minimum gauge size in LCMA 1 has is larger than in LCMAs 3 and Outer Cape Cod, in terms of positive impact on the spawning stock biomass.

As a reminder, this first step would increase the minimum gauge size in LCMA 1 to 3 and 5/16 of an inch for the 2025 fishing year, and then two years later for the 2027 fishing year, the final adjustment would be an increase in the minimum gauge size in LMA 1 to 3 and 3/8 of an inch. At that time the vent size in LMA 1 would also change corresponding to that final gauge size.

Again, all of the other measures for LMA 3 and Outer Cape Cod would stay status quo as written. This is where we are with the trigger index. This is calculated through 2021 with the available data. The top left panel shows the combined index, which is what would be used to determine when the trigger level is reached. Then each of the other surveys, their indices that go into this combined index are shown individually in the other panel.

Then the two horizontal lines in each box represent the proposed trigger levels of a 32 percent decline and a 45 percent decline. At the last meeting, just want to give a quick update on the MSA issue that we discussed. The Board discussed this concern

that the minimum size being proposed for LMA 1 in the Addendum.

There are some implications that it could have for commerce, given the language in the Magnuson-Stevens Act. But since the last meeting, staff has spoken with NOAA Counsel, and determined that this Addendum will not have an effect on the legal minimum size in effect or enforced. While the Addendum proposes a gauge size change for Area 1 that is larger than 3 and a quarter inch, the Commission's FMP still maintains a 3 and 1/4 inch coastwide minimum size. That would act as a baseline that no LMA can go below, and because that is still in the FMP with the lobster that would be imported from Canada at 3 and 1/4 inch would still be allowed, if this Addendum is adopted. That is the guidance that we've received and that has been modified in the document as well.

With that the next steps for the Board for today are to consider approving Draft Addendum XXVII for public comment. If desired, of course, the Board could make any simple changes to the document before releasing it. Significant changes would potentially delay our timeline. If the Board approves the Addendum for public comment today, we would be able to work on publishing it and getting the hearing schedules over the next few weeks

Those hearing would probably be able to occur in late February or early March. Then we could hold an Advisory Panel meeting to review public input on the document in March or April, and then the Board could consider final action on this Addendum in May. I'm happy to take any questions on that.

CHAIR McNAMEE: Awesome, thank you, Caitlin, great job getting through all that. Let's start with any clarifying questions folks might have for Caitlin. Looking to the Board, folks around the table first. I see Dan, go ahead.

MR. McKIERNAN: I guess this would be a Rob O'Reilly style question. I'm concerned, not in the content of the Addendum, but sort of the logical order. I'm wondering if we could endeavor to actually reorder some of these things in a more logical way. What I'm getting at is, I think there ought to be a feature of this Addendum where it says, choose a trigger.

Then when you choose the trigger, then it's like, okay under this trigger you either do it right away, or you do it in a three-year period. Then like those kinds of sub-options. I just find that the way it's written now, it's with a 32 and a 45 is really difficult to follow, because we're going to choose one trigger. I'm just wondering, and I would be happy to dedicate my time to working with Caitlin to maybe reorder this. Is this ringing true with anybody else, in terms of how it is structured?

CHAIR McNAMEE: Go ahead, Caitlin.

MS. STARKS: I am sure we can make that change. I don't think it would be too complicated to rewrite it so that there is one issue that specifically addresses the trigger level, and then a sub-issue that addresses the management options, and how they change when that trigger is hit.

MR. McKIERNAN: Right, sub-options, in other words. You would choose one of the two, for example in that case. Yes, I'm not taking issue with any of the content. I just would wonder if it would be easier for the public to digest it in that fashion.

CHAIR McNAMEE: Thanks, Dan, good suggestion. It's just sort of working what is already there, so not a significant change necessarily. I will work around the table really quick, to see if other folks think that is a kind of logical way to sort of do this. It sounds intuitive to me, but wondering if anyone else feels differently. Adam.

MR. ADAM NOWALSKI: I'll just ask if we're going to start by choosing a management trigger, how would that impact Option D here, because Option D is written, I believe it's just for one of those two triggers, not both. I can understand how choosing

on or the other would flow with B and C, but then how would that impact D, if you wound up choosing the 45 percent trigger, which the Option D is silent on?

MS. STARKS: I would just have to restructure the whole document so that there is a trigger level option that is either 32 or 45 percent, and then besides that there are two options, really for the management measures. Either it's one and done, it all changes at once, or if it's like Option D, where there is a series of gradual changes that occur when that trigger is hit. Then Option E would remain as a separate option.

CHAIR McNAMEE: Go ahead, Adam.

MR. NOWALSKI: Just for clarity, we would include gradual changes for the 45 percent trigger, which this document doesn't currently contemplate, or are we saying only the 32 percent trigger is going to have the gradual changes?

MS. STARKS: I think that is a decision of the Board today. If the intent is to allow for the potential to have a 45 percent decline trigger level, that then triggers gradual changes in measures, then I can make that happen. But if the Board does not want that to happen, does not want to allow that to be an option, then I can structure it that way.

CHAIR McNAMEE: I'll ask a question in follow up, and that is if we, so all of those things exist, right in the document now, it kind of changes one of the elements. Would we consider that significant, or is that something that we can do and still get this document out?

MS. STARKS: I believe that there is clear agreement from the Board today, then I can make those changes before really seeing the document without needing to come back to the Board.

CHAIR McNAMEE: Excellent. Thank you very much. Steve.

MR. STEPHEN TRAIN: Coming off of Adam's thing, how are we going to do this in stages if we hit 45 percent, and we're talking about how we may have to do something else? If we're at 45 percent and then we start talking about slowing what we're doing down, we're not doing this industry any favors. I would hate to see that happen. I can't speak for the whole Board. You said if it's a decision of the Board we can put it in steps, but if we get that far and then we delay what we're doing and do it in stages, we might as well not be here.

CHAIR McNAMEE: Thanks, Steve, appreciate that. Other questions, and I think we can then switch to actual deliberations. Pat, go ahead.

MR. KELIHER: I think this is in keeping with the question that Dan asked, or the type of question that Dan asked, because it's about the makeup of the document itself. I've had a chance to talk to staff about this. I think the rationale within the introduction is really good, but I think there could be some strengthening of that rationale.

Maybe with the use of some of the tables within the document, especially showing the trends of both young of the year and trawl survey data, where we're seeing that trend now, since we're past the assessment data. I think that would be beneficial for the document. I think also, adding where we are with the current reductions within a statement within the introduction, so people understand we're already in that decline, and it's already equal to around 23 percent.

CHAIR McNAMEE: The suggestion here is to just bolster, not change anything, but just bolster the kind of informational lead-in to the Addendum. Caitlin, comments on that?

MS. STARKS: Yes, I think that is something I can easily do. There is already information to what Pat Keliher was asking for in the document, but it's in the appendix that includes the data update from this past year, so I can pull information directly from

that into the introduction, just to show the most recent trends.

CHAIR McNAMEE: Good, follow up, Pat.

MR. KELIHER: Yes, just a couple more points. Throughout the document we used the term fishing year, but I think we need to define fishing year. That could either be done by receiving comments through the public process, and then defining what the fishing year is at final action or defining it now. I don't' know about the rest of the Board, but the idea of doing these changes on June 1st, versus January 1st, I think January 1st is probably a more logical time. I would be happy to define it now or happy to do it at a later date.

Just while I have the floor, the Magnuson issues that were raised, I think I get it. I think it's clear. But the Magnuson piece is footnoted on Page 8, and I'm wondering if there should be a little bit more clarity around that. Because this is where a lot of consternation is coming from dealers. I wonder if we could just add some clarity, by bringing that out of the footnote and putting it into the main part of the document.

CHAIR McNAMEE: Thanks, Pat, I think the fishing year comment, just being more explicit on, I get confused all the time as to what we're talking about, so I think that's a great idea. It doesn't substantively change the document. The second thing, I'm kind of looking either at Caitlin or Toni.

MS. KERNS: I think we can take the language from the footnote and just put it into the paragraph, if that works for you, Pat. Okay.

MR. KELIHER: I think that works fine.

CHAIR McNAMEE: Dan, go ahead.

MR. McKIERNAN: A question on fishing year. I believe National Marine Fishery Service defines the lobster fishing year as May 1st. Can we get clarification on that?

CHAIR McNAMEE: Clarifying fishing year, we like that idea, and this is exactly why. Jimmy, are you able to respond to that? You're far away.

MR. JAMES BOYLE: Yes, the fishing year for lobster is May 1st through April 30.

MR. McKIERNAN: As a follow up, May 1st works for us, because our state waters fishery, you know most of it's closed until May 1st, May 15th, depending on whale departure. Anyway, I think most of the gauge increases historically have, at least like the Area 2 gauges and stuff and Area 3. I think they have been effective in the spring. I think it's something we should establish in this document.

CHAIR McNAMEE: Back to the concept of the fishing year. I'll take from your comments, Dan, that you would suggest that be defined to start on May 1st, is that what you are driving at there?

MR. McKIERNAN: Yes, but I'm comfortable if I'm outvoted. I just want to introduce that as, A, there is precedent in the federal system, and B, it kind of feels like that's where we've been doing it in the past in other LMAs.

CHAIR McNAMEE: Yes, got it. Pat, a response?

MR. KELIHER: Yes. I appreciate that, Dan, earlier is better. But I'm still not sure I'm 100 percent comfortable with May 1, if we're talking about some of these changes. Maybe the best thing to do is define it at final action.

CHAIR McNAMEE: I'm seeing nodding, but just to make sure it's on the record.

MS. STARKS: Yes, I think when you take final action on this document, under the compliance section we can be very specific about the dates by which things are required to be implemented.

CHAIR McNAMEE: In the short term then, we won't be changing the way it's defined in the document. Is that the idea, we'll wait for final action, or are we going to put something in there?

MS. STARKS: I'm happy to add a sentence that says fishing year will be defined at final action, if that would help.

CHAIR McNAMEE: Okay, seeing nodding around the table, so that sounds good. Any remaining questions before we get down to business here? Pat.

MR. KELIHER: My last one is a bit more substantial, but not so much that I think it would take any additional time here today to resolve. Throughout our options we deal with the maximum gauge in Area 3, in establishing a gauge for outer Cape Cod. I think for the document to be consistent we should add those to Option E. I have a motion prepared, but I'm also happy to just deal with it by consensus, whatever the Chair would like.

CHAIR McNAMEE: Yes, I think giving a motion and then sort of working from that, I think is the way to go there, Pat. Before we go there, I just want one more pass through on questions, and it's pretty long, so it gives people time to take a look. Doug, go ahead.

MR. DOUGLAS E. GROUT: All I want to do is clarify one of the points that was made concerning the fact that we don't have a phase-in. Option D looks at things where it only applies to a 32 percent increase. I think I agree with Steve's comment that we should have that option where there is a phased-in only for a 32 percent, as opposed to adding something for a 45. I don't know how the rest of the Board is, but I just want to add my two cents on that.

CHAIR McNAMEE: Okay, thanks, Doug, yes. We sort of brought that up, but that is the first direct comment to it other than Steve's initial comment, so I appreciate that. I do see there is a hand online, Eric, we see you. I will provide some time for the public to offer comments, but I want to get a motion on the Board here before we do that. It doesn't look like there are any more hands at the table, so why don't we get down to it, and Pat you have offered a motion, it is up on the board. Would you like to read through that to get it into the record?

MR. KELIHER: I apologize, because this is a David Pierce type motion, now that I see it actually in big print on the screen. I was trying to make it a little shorter here. **I would move to modify Option E by including a 1/4" maximum gauge reduction in LCMA 3 within each annual adjustment, and set a maximum gauge size in the Outer Cape Cod management area of 6-1/2" and include a 1/4" maximum gauge reduction in OCC with each annual adjustment.**

In the final year of adjustments, the maximum gauge size in LCMA 3 and Outer Cape Cod would be 6". The vent size in LCMA 1, LCMA 3 and Outer Cape Cod would be adjusted once, at the same time the final gauge size is implemented. The Board during final action will specify the years of the schedule, with the first step occurring no later than 2026, and the second step occurring 2 years later.

CHAIR McNAMEE: Okay, we have the motion on the table from Pat. Is there a second to the motion? It looks like folks are still discussing a little bit. I'm looking for a second. Emerson seconds the motion, thank you, Emerson. Pat, as the maker of the motion, I'll come back to you for first comments.

MR. KELIHER: As I said, I think it's important that we be consistent within each option, and this option was missing those maximum gauge components. I also think there is some benefit to the stock. It was noted within the TC documents. These larger animals are carrying more eggs, they are potentially more robust eggs, and it does provide forever protections for these oversized lobsters that do have a valuable contribution to the resource.

CHAIR McNAMEE: Emerson, anything as the seconder of the motion?

MR. EMERSON C. HASBROUCK: No, I don't support nor do I oppose this motion. I seconded it so that we could debate and discuss it. Thank you.

CHAIR McNAMEE: Thank you, Emerson. We have a motion that is a modification to Option E, and I see a hand up from Dan McKiernan. Go ahead, Dan.

MR. McKIERNAN: I have a question. In the spirit of the operating procedures that have been brought forth by John Clark in previous iterations on other addendums for other species. Would it be acceptable as a final action if we were to adopt that option, but not include Pat Keliher's modification? Are we going to be able to go forward with an Option E as a potential final action, and not include that in that? I just want to know if we have that chance to kind of deviate from the option as written.

CHAIR McNAMEE: Got it, Dan, thank you.

MS. STARKS: I think we just got this at the last meeting. I think there was the intention to be able to combine different aspects of these options. But I think it might be clearer to the public if the option were included. I do think without including this option you could do it. If that were the case, we could just add some language to the document to specifically clarify that the management measures from each option could be mixed and matched.

CHAIR McNAMEE: Just to make sure I understand. The response back is, what is being proposed here by this motion could be adopted. The motion potentially could not pass now, but it could still be adopted at final action. Is that what we just said, Dan? Okay, got it. Adam.

MR. NOWALSKY: Is the desire by the maker of this motion to as this says, modify Option E, so modifying Option E would allow basically for just one Option E to read as it's up here on the board right now, or is the intent here to create this as a second sub-option under E for us to choose from Option E as it exists, or from this version?

CHAIR McNAMEE: Go ahead, Pat.

MR. KELIHER: Well, at the time that I drafted this we weren't talking about having sub-options as we described these changes earlier in the meeting. I'm happy for it to be a sub-option. Really, the only thing I'm looking for is consistency within the document so it's clearer for the public on what they are voting.

At the end of the day, it doesn't mean the Board supports or rejects, it's just putting this out for the public and having clarity, so when they are commenting they know that every option or sub-option would include these potential maximum gauge changes in those management areas.

CHAIR McNAMEE: Follow up, Adam? Okay. Doug.

MR. GROUT: The first question I have for the maker of the motion is, you know we had in Option E specific years that the measures would be in. The first one would be 2025, the second would be in 2027. But clearly, you're proposing to have something different in the document. What is the rationale? Why wouldn't we put before the public a specific first year of it and a specific follow up year?

CHAIR McNAMEE: Pat, response.

MR. KELIHER: Thank you for that question, Doug, and I should have been explicit in my justification. I think what I was looking here for is a little bit more flexibility with the Board, knowing that if we make a determination to use this particular option, we have some challenges when it comes to gauges and gauge manufacturing, and it could take some period of time. I didn't want to lock ourselves into a certain year, trying to give us a little bit of flexibility, but saying occurring no later than. I hope that adds some clarity.

CHAIR McNAMEE: Eric Reid.

MR. ERIC REID: I totally understand the intent of this motion, but the sentence that reads in the final years of adjustments the minimum gauge size would be 6 inches, and I don't think that's what you really mean. I would suggest a change that says in the final year of the adjustment the maximum gauge size would be a minimum of 6 inches.

CHAIR McNAMEE: A suggested modification, I believe. I haven't done this one yet. It looks like Pat is in agreement, so officially do we make this a friendly amendment to the original language? I'm like eavesdropping over there, because I knew there would be a good discussion on the parliamentary procedure. It sounds like perhaps the way we should go about this is to actually make it an official amendment. Now what I'm not sure about is, do we need to vote on this first, or can the amendment kind of come in here directly? Okay.

EXECUTIVE DIRECTOR ROBERT E. BEAL: We'll learn about this tomorrow. If this is fixing an error in the motion, which I think it is. I think if everyone around the table is comfortable with that change, then I think it's okay. I was eavesdropping as well on Dennis saying, it's not really Pat's and Emerson's motion at this point.

The Board owns it, and changes should be agreed to by the Board. But I think since this is fixing an error, if everyone around the table is comfortable with it, then I think it's fair to move forward. But you should just ask if there are any concerns about the change.

CHAIR McNAMEE: Okay. I did see nodding as Bob was talking there, but just to be clear. Eric Reid's suggestion is correcting a potential error in your motion, Pat. Do you agree with that?

MR. KELIHER: I completely agree with Mr. Reid's fixing of the error in my motion.

CHAIR McNAMEE: Just to round it out, Emerson, are you okay with that as well?

MR. HASBROUCK: Yes, I'm good with that.

CHAIR McNAMEE: Okay, so it sounds like we can make that modification. I didn't see if the text changed up there. Has it been corrected? Thank you. Great. Further discussion on the motion. Okay, actually I do have virtual hands up. They have since gone down, but I'll check just in case. David Borden, do you have a comment on the motion?

MR. DAVID V. BORDEN: No, I'll pass.

CHAIR McNAMEE: Colleen, did you have a comment on the motion? We're not hearing you, Colleen, if you're speaking. But you did put your hand down.

MS. COLLEEN BOUFFARD: Can you hear me now?

CHAIR McNAMEE: We've got you.

MS. BOUFFARD: Sorry, I couldn't unmute. Eric made my point, thank you.

CHAIR McNAMEE: Excellent, thank you, Colleen. Maybe before we vote, we did have one hand up from the public, so why don't we go to that now, so Eric, I can't quite see the last name there. Eric Lorentzen, go ahead, Eric. You can unmute and make your comment.

MR. ERIC LORENTZEN: I'm a lobsterman from Area 1, Massachusetts in Federal Area 1. I guess my comment looking at this conservation measure. If this or something like this were to go into effect, I would have to change all the vents in my traps, which some traps have three vents, some traps have five vents.

I would alone need 2,400 to 4,000 escape vents to change. Thinking of the manufacturer of these vents. Would they be able to produce enough vents for the entire industry to change them all out? Not to mention the manufacturer. One of my other thoughts was, with all the whale regulations coming down, they also act as though a conservation equivalent for the lobsters, with all the traps being out of the water and things like that.

I just see these changes, because of the stock assessment and things like that, having a huge impact on the industry. It's not something that's going to be easily done, in my eyes as a fisherman. If we're all competing to get new vents for our traps, and we have all these whale rules telling us to get out of the water, which also helps the lobsters, because there is less pressure being put on them and things like that. I just think some of that needs to be taken into account when looking at this adjustment to the industry.

CHAIR McNAMEE: Thank you, Eric. I appreciate the comment, and the manufacturing piece, we talked a little bit out that with gauges. But I think there is time to kind of investigate that question as well before we take final action. I appreciate you kind of putting that on the record so we can check on that before we make the final action on this. Steve, go ahead.

MR. TRAIN: I just want to address part of that. You are only required to change one vent to be legal.

CHAIR McNAMEE: Thank you for that, Steve. Looking around the table I'm not seeing any additional hands. Don't see any additional virtual hands, so I think we are ready to call the question here. I think I can do it this way. I'm not sure how this is going to go, but are there any objections to the motion that is before us? If so, please raise your hand, either virtual or real.

Not seeing any hands around the table and not seeing any hands online, so we will consider this motion approved by consensus. That made a small adjustment to one of the options. Any additional adjustments that anyone wants to make to the document before we approve it for public comment? Yes, go ahead, Caitlin, if you have a clarifying question.

MS. STARKS: I just want to make sure that the Board is all in agreement on the issue of reordering the management option, such that we would have one set of options that specifically chooses the trigger level, and then a second set of options that specifies what the management measure would be and when they're implemented, and then a third option for Option E, which is a scheduled change to management measures.

CHAIR McNAMEE: Okay, there is a nodding around the table, I saw a couple thumbs up. I think we're good. Thanks for that clarification, Caitlin. Okay, one last pass through to see if there are any other modifications requested on the document. Not seeing any, so the final step then is looking for someone to make a motion to approve the document as amended today. I see a hand up from Doug Grout. Go ahead, Doug.

MR. GROUT: I make that motion to approve this document as amended today for public comment.

CHAIR McNAMEE: Okay, we'll take a minute to get that up on the board. The motion up on the board specifies Addendum XXVII. Is that okay, Doug? Great, is there a second to that motion? Seconded by Steve Train. Thank you, Steve. Any discussion on the motion? Doug, I'll give you a first crack at it if you want. Okay, Steve.

MR. TRAIN: Just one thing. We've been working on this a while. We've already had to adjust the date to a fixed date thing because it's taken so long to get out. We actually have a lull in our whale regulations, where this won't be a double impact if it goes through. If this resource is in decline, or continues to go into decline, this is our chance to get something done.

CHAIR McNAMEE: Thanks for that comment, Steve. Any other comments on the motion before we take a vote? Not seeing any hands at the table, not seeing any little green virtual hands either. I'm going to check one thing, hang on one second. I think we can go ahead and call the question at this point.

Are there any objections to the motion that is up on the board before us? Please, raise your hand, whether at the table or online if you object. Not

seeing any hands anywhere, so we will consider this motion approved, which approves the Addendum as modified, which will go out for public comment. Caitlin, any kind of parting thoughts on this before we move on to the next agenda item?

MS. STARKS: I think I have a clarity from the Board to move forward with the changes, without needing to bring it back to the Board. It's not my intention to resend the document out to the Board before publishing it for public comment. I will be reaching out to all the states to schedule public hearings, so please, try to respond as soon as you can to that with your available dates for those hearings.

CHAIR McNAMEE: I'll just emphasizes that point. You know we want to keep this moving so that we can take action in a reasonable amount of time, to Steve Train's comments before. Great, all right, so with that nice job everyone. We got the document out the door. Well done!

UPDATE FROM THE WORKING GROUP ON IMPLEMENTATION OF ADDENDUM XXIX ON ELECTRIC VESSEL TRACKING FOR FEDERAL PERMIT HOLDERS

CHAIR McNAMEE: Let's move on now to our next agenda item, which is an Update from the Working Group on Implementation of Addendum XXIX on Electric Vessel Tracking for Federal Permit Holders, and this won't be Caitlin it will be Toni, so Toni, whenever you're ready.

MS. KERNS: Caitlin and I have been sharing some duties on this, and I've been doing a little bit more right now, so we switched up on you. Sorry about that. In terms of moving forward on implementing the Addendum, we are now in the process of getting out to fishermen which devices that we have type approved.

We are moving towards our deadline of December 15th for all federal lobster and Jonah crab vessels to have tracking devices on them at that time. We approved four tracking devices out of the five that applied. You will see them all listed on the board here. They vary from, 3 of these devices are 100 percent cellular, and 1 of the devices does have both satellite and cellular capabilities.

The next steps in moving forward on working on the tracking devices is to get the information out there for fishermen to purchase these devices. We're just working with the companies to get all the appropriate information on the Commission's web page, and I think other states will also have it available on their web pages as well.

Then we'll work also with the states to make sure that the harvesters get them installed, installed and approved by the states, prior to their first trips. Then if there are any measures that the states need to put in place, they are working towards getting those done for these federally permitted vessels. ACCSP is on track and moving forward with the interface for tracking the data.

We have tested all of the vendor's data submission, and these four companies have passed that test. NOAA Fisheries is working on complementary rulemaking to the Commission's requirements. I do not know where they are, in terms of meeting that December 15th deadline, and I can let Jay speak to that when we're done here. If there are any questions, I am happy to entertain them.

CHAIR McNAMEE: Jay, any comment to the timeline portion that Toni just asked?

MR. JAY HERMSEN: I think that's something that we could have published for December 15th, but we would have to ask leadership about an implementation timeline for that.

CHAIR McNAMEE: Thank you for that, Jay. Questions from the Board. I see Dan's hand.

MR. McKIERNAN: When we approved this last spring, we said it was to be implemented no later than, I think the end of the year, December something. But there are a whole lot of reasons we

need this data sooner than later. My Agency has moved forward with rulemaking, and we're requiring it on May 1.

We were under the impression that NOAA Fisheries would be on or about the same timeframe with their EVTR, because the EVTR and the tracker data have to be integrated. I would beg NMFS to fast track this thing, because on May 1, the Massachusetts fleet, we're going to have these installed.

CHAIR McNAMEE: Comment for Dan, Jay? I don't think there is an obligation or any response to what Dan just offered.

MR. HERMSEN: Not at this time, Mr. Chair, thank you.

CHAIR McNAMEE: John Clark.

MR. JOHN CLARK: I was just curious about the four approved devices. Is the idea to kind of winnow it down to eventually a single device, or are all these compatible? Is all the data that comes in compatible between systems?

MS. KERNS: All these devices are compatible; fishermen can choose from the different devices on their own. I don't have all the costs of the devices for all of them, so I can't tell you the total range. But it will be up to the fishermen to decide which device works best for their vessel, and they can use any one.

CHAIR McNAMEE: Okay, thanks. Eric Reid.

MR. REID: That is an interesting point about who gets to choose. You've only got one company that has satellite tracking, is that right? I agree that the data needs to be produced as soon as possible. I agree with that 100 percent for a lot of reasons, and I've been on that bandwagon for a long time.

But starting with Madam Coit this morning, we were talking about ropeless fishing, which is not going to happen tomorrow. But it is a solution that people are very interested in making solve a problem. My question is, is there any discussion about which device can be integrated into ropeless fishing in the future?

You've got to know where you are, and of course real time for positioning of where the gear is, is going to be critical, because that way the lobsterman don't lose it, and the trawlermen don't find it, and so that other lobstermen can find it as well. That's just a question. If you don't have an answer today that's fine. But I'm interested to know what the answer is, and people might want to consider what device they pick that they're going to get paid for to install that is adaptable in the future, because the cellular ones are probably not going to be able to do it.

CHAIR McNAMEE: The question I think is, have we thought ahead a little bit to integrating with all of the other sort of things going on in the lobster world. Looking over at Toni for this one.

MS. KERNS: Thank you, Mr. Reid. As you are aware, we started up this project, I don't know, it might have been three or four years ago when we first started piloting them. The on-demand gear wasn't really being developed at that time. When we started this project, it wasn't something that we were thinking about. You know in the last 6 to 8 months it is something that we have thought about. At this time, it was not incorporated into the RFA, so none of the devices that we have right now can do that.

It is something the tracker group is thinking about and trying to think about how the technology can evolve, and work with the companies that are out there, or other companies that did not choose to participate in the RFA at this time. It is something that we are hoping to be able to do if on-demand gear becomes something that the entire industry is using, of even a small portion of the industry, if that is something that is going to be helpful. We will continue to keep it in mind.

CHAIR McNAMEE: I'll offer a comment as well, just from a couple of the, I don't know what you would

call them, meetings that I've been to on this. They may not be integrated yet. It certainly could be integrated in the future. But they don't necessarily need to be either. I think some of the technology with on-demand gear would exist as like an APP on your phone, that kind of thing. They can both exist without like a large burden to the fishermen. But in any case, it sounds like we're working on it. Pat.

MR. KELIHER: Yes, I think the key here is the sub-sea gear technology that is being worked on, so mobile gear fleet can see this, so law enforcement can see this gear. I'm not sure if this technology is right, but this technology, certainly we're looking at it from the harvester reporting side.

Having the harvester reporting APPs and these types of devices be linked. That's one thing that is being looked at to simplify those particular processes. I think in the long run as this technology improves, hopefully it's all going to come together. I agree with you, Eric, that we can't lose sight of those things.

CHAIR McNAMEE: David Borden, go ahead, David.

MR. BORDEN: On the federal rulemaking, I would just like to make the suggestion that this is really a critical part of this whole exercise. I think we should get a formal report at the next meeting by the NOAA Representative.

CHAIR McNAMEE: We made that request; I see Jay nodding his head. He heard that request. Thanks for that. Okay, anything further on this agenda topic? Not seeing any hands around the table. I see a hand online, Mike Luisi. Go ahead, Mike.

MR. MICHAEL LUISI: I'm sorry for not being there today. I just had a quick question for the Commission. There was a conversation in the past, and I'm sorry if I might have missed this during the presentation. The Commission had talked about trying to get funding to pay for the initial tracker system. Is that still in the plans, or is it going to be up to the states or the individual fishermen, at this point? Does anyone have any feedback on that?

CHAIR McNAMEE: It looks like Toni does. Go ahead, Toni.

MS. KERNS: Yes, Mike, this is the 14 million dollars that was allocated to the Commission, and included in that is to pay for trackers and the subscription fees for X amount of time, hopefully up to three years. The discussion at lunch we'll be talking about how the states are putting together spend plans for that money.

MR. LUISI: Excellent, okay, thank you so much.

CHAIR McNAMEE: Looking around the table, I'm not seeing any other hands. No hands online.

OTHER BUSINESS
UPDATE ON 100 PERCENT HARVEST REPORTING FOR THE STATE OF MAINE

CHAIR McNAMEE: We had one additional item that was added to the agenda, and that is on 100 percent Harvester Reporting. Pat Keliher, I'll look to you to take that one away.

MR. KELIHER: I'll just be brief. I just wanted the Board to know that the state of Maine has implemented 100 percent harvest reporting one year ahead of schedule. Certainly, this pertains to the, excuse me, my apologies, Mr. Chairman. The state has implemented it. In order to implement it with the amount of harvesters we have, we have added 10 new staff members.

We had to set up a call center. This came at some really serious expenses to the state. We did have a lot of early infusion of cash from the ACCSP program as well, with some additional investments with general fund as well. It is a learning process, what we're doing right now. This is a big lift.

I can't remember what the total amount of data is, but I think it's more data than is collected in almost

combined between all the rest of the fisheries between Maine and Virginia. It's a big amount of data that ACCSP will be handling, and we are hopefully, we're doing it in stages, dealing with the active harvesters now, and then we'll be fully integrated.

We do have quite a few people who are not going to be able to do this electronically, so that has been a challenge, and we're trying to work through that as well. I just wanted to make the Board aware that we are plowing some new ground here as we move forward, so thank you.

CHAIR McNAMEE: Awesome, thank you, Pat. Any comments or anything for Pat on that? Renee, go ahead.

MS RENEE ZOBEL: Pat, just a process question for you. You said that they had a hunch that they probably wouldn't be able to go all electronic, despite that being the intention. What is the process in your state for the paper reporting, and how does that integrate? Just a curiosity question.

MR. KELIHER: To date we've only, I think approved, maybe a couple dozen individuals to supply us with paper, and then what we do is have staff enter that information electronically, with the idea that those individuals will continue to work with those individuals to get them up to speed to try to make sure that they can do that electronically in the future. It's not in any way, shape or form us saying, you know you don't have to do this forever. It's a one-year process. There will be individuals though, that will not be able to do it, and so we're taking those types of things into consideration.

CHAIR McNAMEE: Thanks for that. I see a hand online, Mike Luisi, comment.

MR. LUISI: Yes, I just had a question for Pat. We've been talking about this a lot down here in our state in Maryland. Let me just ask you, Pat. Do you have regulations that mandate the electronic reporting, and then you make exemption for folks who just can't physically do it? How does that work? I'm just thinking about how we're going to, because we're talking about the same kind of thing down here as well.

MR. KELIHER: Certainly, all of this is in statute, it's required. But I have broad authority to be able to waive, in some instances, those type of requirements. We do so not liberally, very targeted, we're very targeted in those type of approaches. It was all considered in the development of the reporting though.

MR. LUISI: Okay, thank you very much.

CHAIR McNAMEE: Good discussion, thanks for that. Any other hands, questions, comments on this topic? Not seeing any around the table, I'm not seeing online. Before we wrap up, I'm going to give one last call out for any additional Other Business to come before the Board. I'll look for a hand.

I'm looking mostly online. Not seeing a hand, so I'm assuming we're okay. Waiting one last second. I'll make the pause really uncomfortably long. I've got 45 minutes in the bank here. Just a very explicit, David, do you have anything you want to bring before the Board?

MR. BORDEN: If you would like, Mr. Chairman.

CHAIR McNAMEE: Not trying to coerce you, just making sure.

MR. BORDEN: I can give you a one-minute comment, and the comment is that the Lobster Board moving ahead and looking ahead, is going to have to deal with a really diversified list of issues. I think that the solution to some of the problems we're going to deal with, we're going to have to consider other mechanisms.

At some point I think we need a broader discussion of how we're going to get at some of these problems. The whale issues aren't going to go away, wind issues aren't going to go away. We have too much effort in certain areas. I think we

need that type of broader discussion at some point at a subsequent meeting. Thank you.

CHAIR McNAMEE: Great, thank you, David, appreciate that. Good comments. Any reaction to that around the table? Not seeing any, all right so that takes us to the end of the agenda.

ADJOURNMENT

CHAIR McNAMEE: I think we can go ahead and adjourn, if anybody wants to make that motion. Motion made by Dennis, seconded by Steve Train. Any objections to that motion? Not seeing any around the table, so that is a wrap. Thanks everybody.

(Whereupon the meeting adjourned at 12:00 p.m. on Tuesday, January 31, 2023)

Draft Document for Public Comment

Atlantic States Marine Fisheries Commission

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

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

February 2023
Revised March 9, 2023

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Draft Document for Public Comment

Public Comment Process and Proposed Timeline

In August 2017, the American Lobster Management Board (Board) initiated Draft Addendum XXVII to increase the resiliency of the Gulf of Maine/Georges Bank (GOM/GBK) stock. Work on this addendum was paused due to the prioritization of work on take reduction efforts for North Atlantic right whales and the 2020 stock assessment. The Board reinitiated work on Draft Addendum XXVII in February 2021, and has since revised the goal of the addendum to consider a trigger mechanism such that, upon reaching the trigger, measures would be automatically implemented to increase the overall protection of spawning stock biomass of the GOM/GBK stock. The management action was initiated in response to signs of reduced juvenile settlement and the combining of the GOM and GBK stocks following the 2015 Stock Assessment. This document presents background on the Atlantic States Marine Fisheries Commission's management of lobster, the addendum process and timeline, a statement of the problem, and management measures for public consideration and comment. Additionally, three appendices are included, which provide information on (A) the current condition of the stock, (B) potential impacts of proposed management measures, and (C) the development of the proposed trigger index.

This document was revised on March 9. Changes were made to section 3.2 (Issue 2, Option C) for Lobster Conservation Management Area 3 and Outer Cape Cod, and the public comment deadline has been extended.

The public is encouraged to submit comments regarding the proposed management options in this document at any time during the addendum process. The final date comments will be accepted is **April 8, 2023 at 11:59 p.m**. **EST.** Comments may be submitted by mail or email. If you have any questions or would like to submit comments, please use the contact information below.

Mail: Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject line: Lobster
Draft Addendum XXVII)

May – Dec 2022	Draft Addendum for Public Comment Developed
January 2023	Board Approved Draft Addendum for Public Comment
February - April 2023	Public Comment Period Including Public Hearings
May 2023	Board Reviews Public Comment, Selects Management Measures, Final Approval of Addendum XXVII
TBD	Implementation of Addendum XXVII Provisions

Table of Contents

1.0 Introduction

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

The American Lobster Management Board (Board) initiated Draft Addendum XXVII as a proactive measure to improve the resiliency of the GOM/GBK stock. Since the early 2000s, landings in the GOM/GBK stock have exponentially increased. In Maine alone, landings have increased three-fold from 57 million pounds in 2000 to a record high of 132.6 million pounds in 2016. Maine landings have declined slightly but were still near time-series highs at 97.9 million and 108.9 million in 2020 and 2021, respectively. However, since 2012, lobster juvenile settlement surveys throughout the GOM have generally been below the time series averages in all areas. These surveys, which measure trends in the abundance of newly-settled lobster, can be used to track populations and potentially forecast future landings. Consequently, persistent lower densities of settlement could foreshadow decline in recruitment and landings. In the most recent years of the time series, declines in other recruit indices have already been observed.

Given the American lobster fishery is one of the largest and most valuable fisheries along the Atlantic coast, potential decreases in abundance and landings could result in vast economic and social consequences. With peak values in 2016 and 2021, the at-the-dock value of the American lobster fishery has averaged $660 million dollars from 2016-2021, representing the highest ex-vessel value of any species landed along the Atlantic coast during peak years. Ex-vessel value declined slightly from 2017 to 2020, but not proportionally to declines in landings. The vast majority of the overall landings value (>90%) comes from the GOM/GBK stock, and more specifically from the states of Maine through Rhode Island. As a result, the lobster fishery is an important source of jobs (catch, dock side commerce, tourism, etc.) and income for many New England coastal communities. The lack of other economic opportunities, both in terms of species to fish and employment outside the fishing industry, compounds the economic reliance of some coastal communities on GOM/GBK lobster – particularly in Maine.

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

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

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

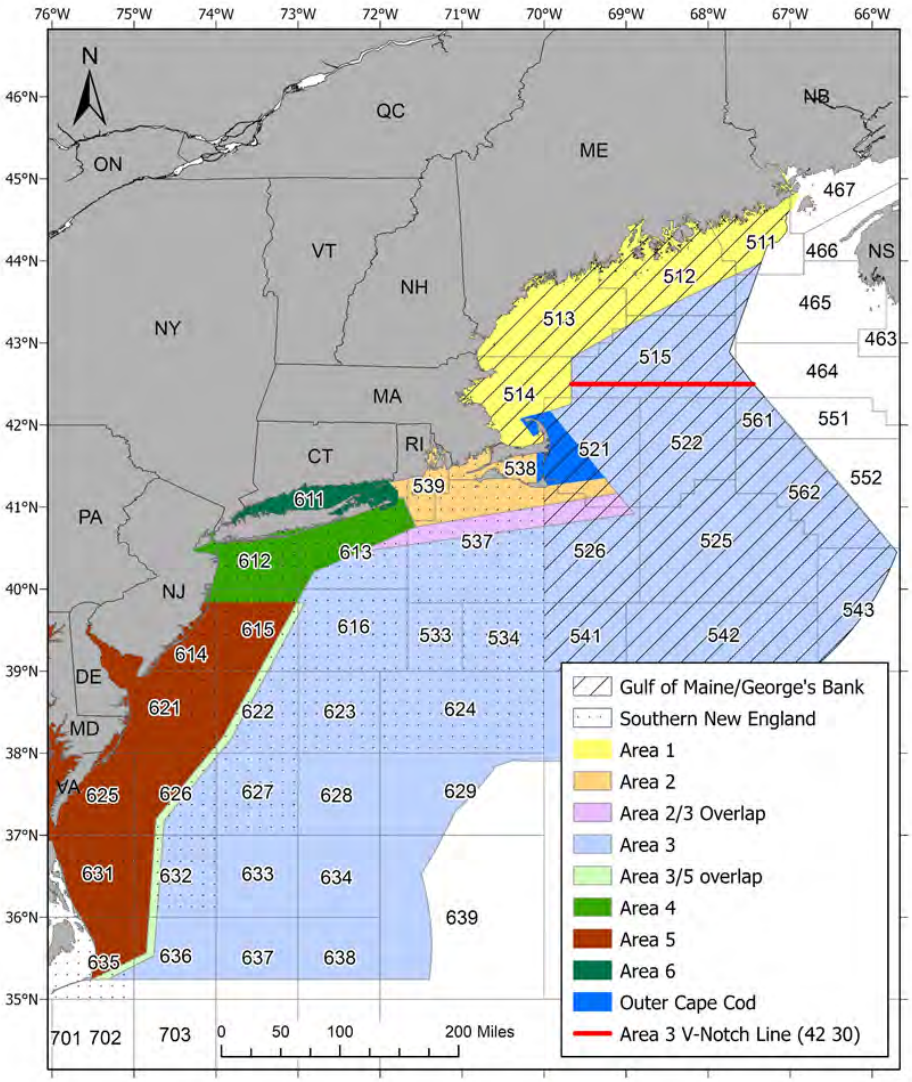

Figure 1. Lobster conservation management areas (LCMAs) in the American lobster fishery. LCMAs 1, 3, and Outer Cape Cod make up the majority of the GOM/GBK stock. The Area 3 v-notch line is shown in red where v-notching is required north of the 42°30' line.

2.0 Overview

2.1 Statement of Problem

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

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

2.2 Status of the GOM/GBK Fishery

The GOM/GBK fishery has experienced incredible growth over the past two decades. Throughout the 1980s, GOM/GBK landings averaged 35 million pounds, with 91% of landings coming from the GOM portion of the stock. In the 1990s, landings slightly increased to an average of 53 million pounds; however, landings started to rapidly increase in the mid-2000s. Over a one-year span (2003-2004), landings increased by roughly 18 million pounds to 86 million pounds. This growth continued through the 2000s with 97 million pounds landed in 2009 and 113 million pounds landed in 2010. Landings continued to increase and peaked at 156 million pounds in 2016 (Figure 2).

In the peak year of 2016, Maine alone landed 132.7 million pounds, representing an ex-vessel value of over $541 million. The states of Maine through Rhode Island (the four states that account for the vast majority of harvest from the GOM/GBK stock), landed 158 million pounds in 2016, representing 99% of landings coastwide. Total ex-vessel value of the American lobster fishery in 2016 was $670.4 million, the highest valued fishery along the Atlantic coast in 2016. While landings have declined slightly from peak levels in 2016, they remain near all-time highs. Coastwide landings and ex-vessel value for 2017-2021 averaged 133.4 million pounds and $658.4 million, respectively. However, ex-vessel value in 2021 increased and was estimated at over $924 million, the highest value in the time series.

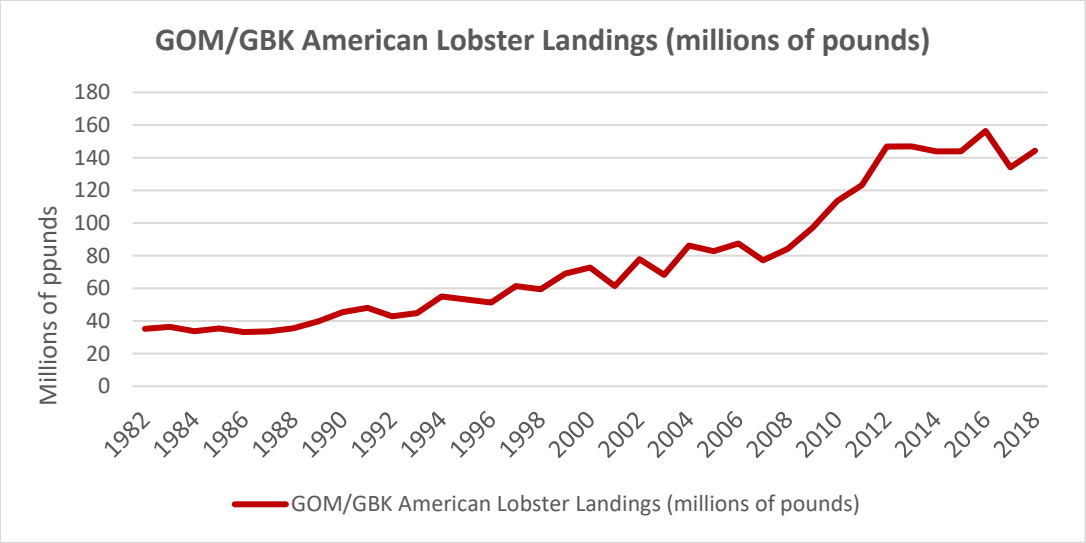

Figure 2. Landings in the GOM/GBK stock (1982-2018). Stock-specific landings are updated during each benchmark stock assessment.

2.3 Status of the GOM/GBK Stock

2.3.1 *2020 Stock Assessment*

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

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

However, stock indicators based on observed data were also used as an independent, model-free assessment of the lobster stocks, and some of these have shown concerning trends. These indicators included exploitation rates as indicators of mortality; young-of-the-year (YOY), fishery recruitment, and spawning stock biomass (SSB) as indicators of abundance; encounter rates as indicators of distribution; and total landings, effort, catch per unit effort, and monetary

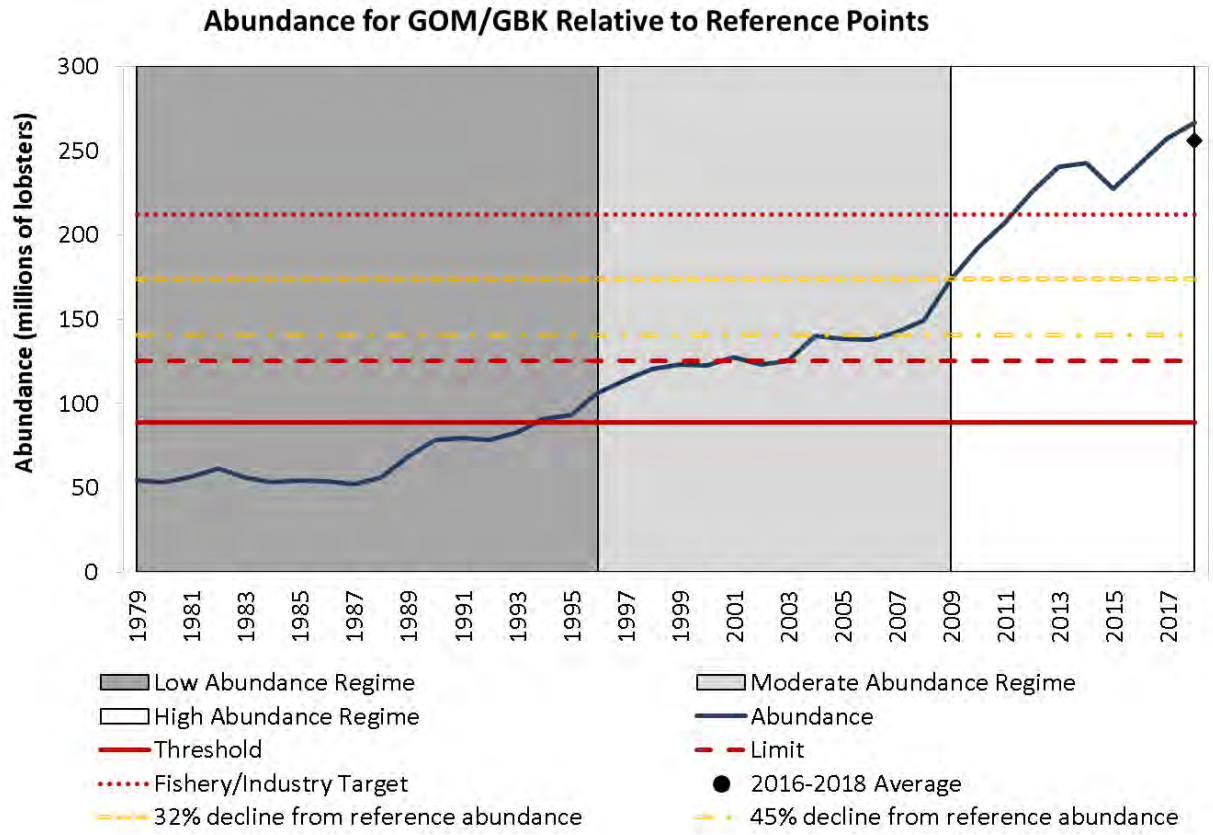

Figure 3. GOM/GBK stock abundance from the 2020 Stock Assessment.

measures as fishery performance indicators. Additionally, annual days with average water temperatures >20°C at several temperature monitoring stations and the prevalence of epizootic shell disease in the population were added as indicators of environmental stress. The 20°C threshold is a well-documented threshold for physiological stress in lobsters. Epizootic shell disease is considered a physical manifestation of stress that can lead to mortality and sub-lethal health effects.

While the stock assessment model and model-free indicators supported a favorable picture of exploitable stock health during the recent 2020 Stock Assessment, the assessment conversely noted YOY indices did not reflect favorable conditions in recent years and indicate potential for decline in recruitment to the exploitable stock in future years (Table 2). Specifically, YOY indices in two of five regions were below the 25th percentile of the time series (indicating negative conditions) in the terminal year of the assessment (2018) and when averaged over the last five years (2014-2018); the remaining three regions were below the 75th percentile (indicating neutral conditions).

Mortality indicators generally declined through time to their lowest levels in recent years. Fishery performance indicators were generally positive in recent years with several shifting into positive conditions around 2010. Stress indicators show relatively low stress, but indicate some

increasingly stressful environmental conditions through time, particularly in the southwest portion of the stock.

As recommended in the 2020 stock assessment, a data update process will occur annually to update American lobster stock indicators, including YOY settlement indicators, trawl survey indicators, and ventless trap survey indices. The second annual data update was completed in 2022 with data through 2021, and the results are provided in Appendix A.

2.3.2 *YOY Surveys*

Since 2018, YOY indices have continued to show unfavorable conditions in the GOM/GBK stock. There have been sustained low levels of settlement observed from 2012 to 2021 (Figure 4). In Maine, 2019, 2020, and 2021 YOY indices were below the 75th percentile of their time series throughout most statistical areas sampled, (all except Statistical Area 512 in 2019). In 2021, YOY values fell below the 25th percentile in all three Northeast areas. In New Hampshire, YOY values have shown a lot of interannual variation over the past three years (2019-2021) with values above the 50th percentile in 2019, then below the 25th in 2020, followed by an increase in 2021 above the 75th percentile of the time series. In Massachusetts, the 2019 index was below the 25th percentile of its time series; it rebounded slightly in 2020 and 2021, but remained below the 75th percentile.

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

There are several hypotheses as to why the YOY indices have been low and what this could mean for the future of the GOM/GBK stock. One hypothesis is that declines in the YOY indices are reflecting a true decline in the newly-settled portion of the stock, and are related to declining food resources (specifically zooplankton). Carloni et al. (2018) examined trends in lobster larvae to explore linkages between SSB and YOY abundance. The study found a significant increasing trend in stage I larval abundance consistent with the increases in SSB in the GOM. Planktonic postlarvae, on the other hand, had a declining trend in abundance similar to trends for YOY settlement throughout western GOM. The study also found significant correlations between lobster postlarvae and the copepod *C. finmarchicus*, but there were no relationships with other zooplankton. This suggests recruitment processes in the GOM could be linked to larval food supply.

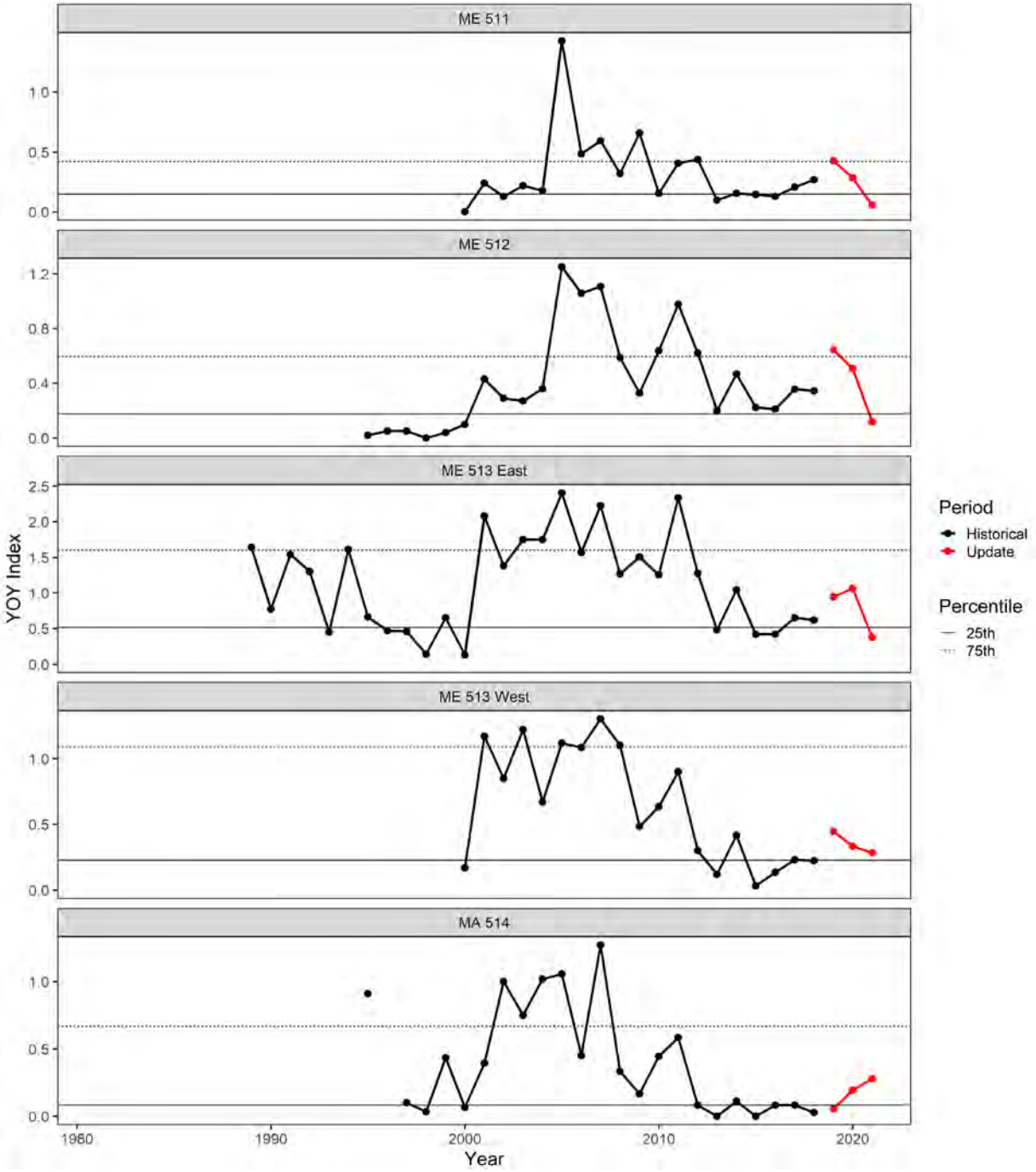

Figure 4. GOM abundance indicators: YOY indices.

Declines in the YOY indices could also be an artifact of the lobster population moving further offshore. Recent work suggests warming in the GOM on the scale of decades has expanded thermally suitable habitat areas and played a significant role in the increase of observed settlement into deeper areas, particularly in the Eastern Gulf of Maine (Goode et al. 2019), so lobster settlement may be diluted across a greater area. Given the YOY surveys typically occur inshore, the surveys may be unable to account for increased abundance of YOY lobsters farther offshore. In an effort to test this theory, the Technical Committee (TC) looked at potential

increases in the habitat available for recruitment in the GOM/GBK stock due to warming waters. Specifically, the TC calculated the quantity of habitat by depth in the GOM. Results showed that incremental increases in depth result in incremental increases in habitat suitable for recruitment and small observed decreases in recruit densities in shallow waters. Therefore, there is no evidence that incremental increases in depth result in exponential increases in available habitat. In order for the diffusion of YOY lobsters over a larger area to completely explain the observed decreases in the YOY indices, the habitat available to recruitment would have to more than double. This suggests dilution effects from increased habitat availability alone are not sufficient to explain decreases in the YOY indices, and there are likely other changes occurring in the system.

2.3.3 *Ventless Trap Surveys and Trawl Surveys*

While YOY surveys have detected declines in the number of newly settled lobsters for about a decade, results of the ventless trap survey (VTS) and trawl surveys, which encounter larger sized lobsters just before they recruit to the fishery, have only exhibited evidence of decline in the most recent years. The interpretation of these trends is complicated by sampling restrictions and limited surveys in 2020 resulting from the COVID-19 pandemic. VTS indices show declines since peaking in 2016, especially in the eastern regions (Figure 5). The Maine/New Hampshire and the Massachusetts Fall Trawl Surveys have both showed declines in recruit lobster abundance since 2018. For the spring trawl surveys, recruit abundance indices increased from 2018 to 2019, but decreased again in 2021. Only the Maine/New Hampshire Fall Trawl Survey ran in 2020 due to the COVID-19 pandemic.

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

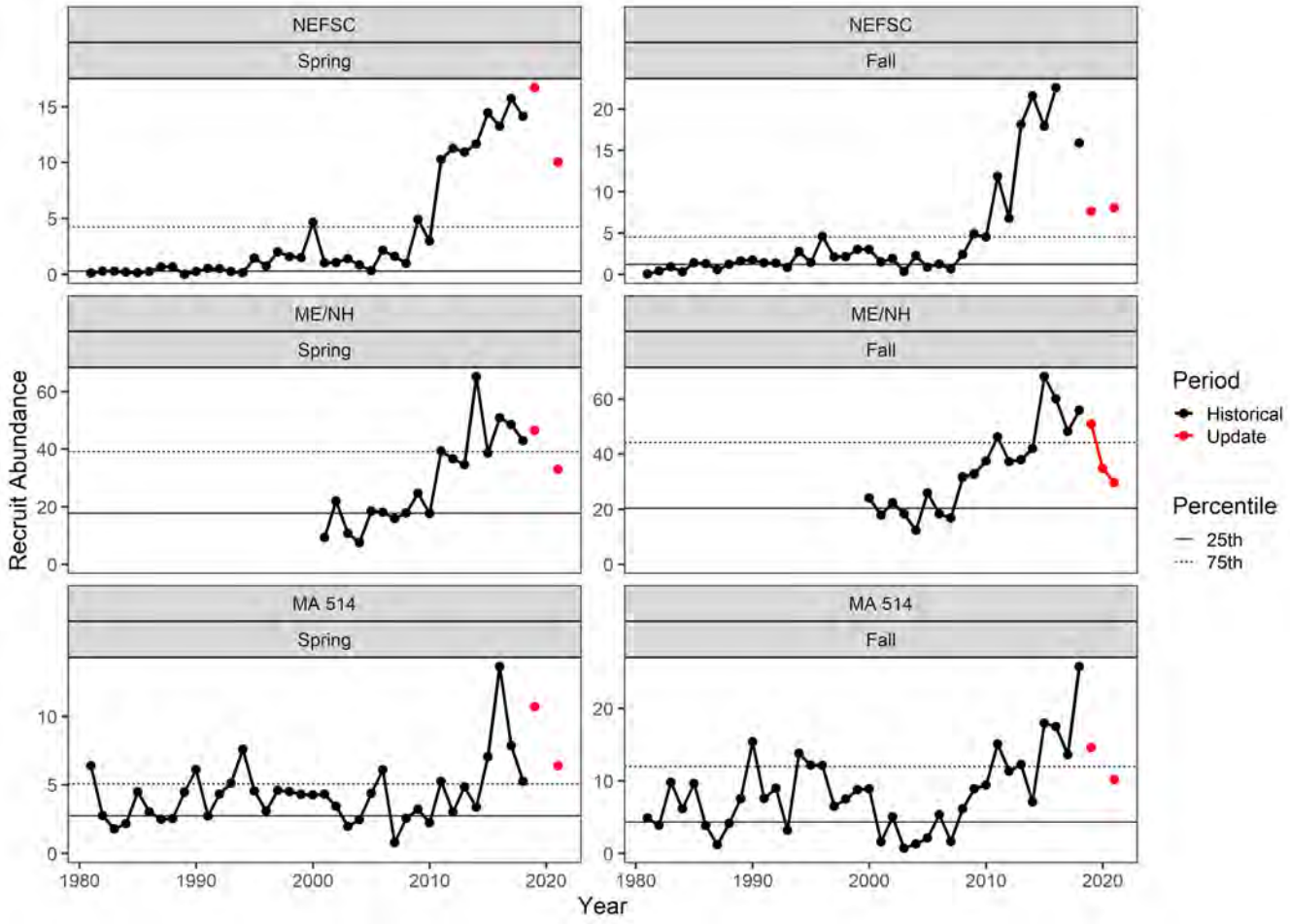

Figure 5. GOM abundance indicators: trawl survey recruit abundance

2.4 Economic Importance of the American Lobster Fishery

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

For Maine, American lobster is an essential economic driver for the coastal economy. Lobster annually represents more than 75% of Maine's marine resource landings by ex-vessel value (82% in 2021). The landings peaked in 2016 with more than 132 million pounds harvested, while in 2021, the ex-vessel value was estimated as more than $730 million dollars[1]. The lobster harvester sector includes more than 5,770 license holders, 4,200 of which are active license holders who complete more than 250,000 trips a year selling to 240 active lobster dealers (Maine DMR, unpublished data). The lobster distribution supply chain was estimated in 2018 to contribute an additional economic impact of $1 billion annually ("Lobster to Dollars," 2018).

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

Not included in these numbers are the vessel crew members and other associated businesses (bait vessels and dealers, boat builders, trap builders, and marine supply stores) that are essential in delivering lobsters to consumers worldwide, supporting the industry, and driving Maine's coastal communities.

The American lobster fishery is the most valuable commercial fishery in New Hampshire with an ex-vessel value of over $44 million in 2021. The value of lobster landed accounted for over 90% of the value of all commercial species landed in New Hampshire. The lobster fishery in New Hampshire includes over 300 licensed commercial harvesters, over 200 of which are active, who sold to more than 30 licensed wholesale lobster dealers (Renee Zobel, personal communication). The importance of the economic impact of the lobster fishery to New Hampshire is also seen in the over 350 businesses licensed to sell lobster to consumers at the retail level.

For Massachusetts, American lobster is the second most valuable fishery in terms of overall landings value, and the most valuable of all fisheries conducted within Massachusetts state waters. The total estimated value for annual lobster landings in Massachusetts has been over $93 million per year on average for 2017-2021. On average, landings from the GOM/GBK stock make up 96% of the total lobster landings for Massachusetts; roughly 72% of this comes from LCMA 1, 22% from LCMA 3, and 7% from LCMA OCC (Massachusetts DMF, unpublished data).

Though the state is not directly situated on the GOM, a significant contingent of the Rhode Island commercial lobster fleet harvests lobsters in GOM/GBK. In 2020 and 2021, approximately 30% and 19% of Rhode Island's commercial landings, respectively, came from statistical areas in GOM/GBK (2020: 497,705 pounds, 2021: 257,225 pounds). The estimated ex-vessel value for lobsters from this stock was approximately $2.9 million in 2020.

2.5 Current Management Measures in the GOM/GBK Stock

Lobster is currently managed under Amendment 3, and its 27 addenda. One of the hallmarks of Amendment 3 was the creation of seven LCMAs along the coast. The GOM/GBK stock is primarily comprised of LCMAs 1 and OCC as well as the northern half of LCMA 3. Each management area has a unique set of management measures. Table 1 shows the current measures for each area. Because the GOM/GBK stock is now assessed as a single area, the result is a diverse suite of regulations for each LCMA within a single stock unit, creating challenges for assessing the impacts of management measures within the stock. Specifically, the minimum gauge size (the smallest size lobster that can be legally harvested) in LCMA 1 is 3 ¼", while it is $3^{3}/_{8}$" in LCMA OCC and $3^{17}/_{32}$" in LCMA 3. It should be noted that the coastwide minimum size remains at 3 ¼", which is the minimum size any LCMA may implement. Each LCMA has its own minimum size that may be larger than the coastwide minimum size.

Likewise, the maximum gauge size (the largest size lobster that can be legally harvested) differs among the three areas, with a 5" maximum gauge size in LCMA 1, a 6 ¾" maximum gauge size in LCMA 3 and for federal permit holders in LCMA OCC, and no maximum gauge size for state-only OCC permit holders. V-notch definitions are also inconsistent. LCMA 1 has a no tolerance

for possession of any size v-notch or mutation. LCMA 3 defines a v-notch as greater than $^1/_8$" with or without setal hairs while OCC has different definitions for federal permits (similar to LCMA 3) and state only permits (> ¼" without setal hairs). There are also inconsistent v-notch requirements across LCMAs, with LCMA 1 requiring all egg-bearing lobsters to be v-notched, LCMA 3 only requiring v-notching above 42°30' line, and no requirement in OCC (Figure 1).

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

2.6 Biological Benefits of Modifying Gauge Sizes

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

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

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

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

2.7 Potential Implications of Increasing Consistency of Measures

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

2.7.1 Stock Boundaries

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

To date, there have been no permit requirements to delineate within which stock a harvester in LCMA 3 is eligible to fish. In addition, management actions responding to the decline in the SNE stock have been applied throughout LCMA 3. Given the Board initiated this addendum with the goal of increasing resiliency in the GOM/GBK stock, new management measures must either apply to all LCMA 3 fishermen regardless of location and stock fished (with implications on the SNE fishery) or be stock specific.

2.7.2 Interstate Shipment of Lobsters

Increasing consistency in regulations may address concerns regarding the sale and shipment of lobsters across state lines. With decreased landings in SNE and expanding markets for the GOM/GBK stock, there has been increased demand for the shipment of lobsters across state lines. This movement of lobster can be complicated by the fact that the gauge sizes differ across LCMAs, and many states implement the minimum and maximum gauge sizes as possession limits rather than landing limits per state regulation or law. This means the gauge sizes apply to

anyone in the lobster supply chain, not just harvesters. While these strict regulations improve the enforcement of gauge sizes, it can complicate interstate shipment of lobsters, particularly given the minimum size in LCMA 1 is smaller than the other management areas. As a result, some dealers must sort lobster by size in order to ship product across state lines.

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

2.7.3 Improve Enforcement

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

3.0 Proposed Management Options

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

- Issue 1 considers the standardization of a subset of management measures within LCMAs and across the GOM/GBK stock (Section 3.1).
- Issue 2 considers applying either a trigger mechanism or a predetermined schedule for implementing biological management measures that are expected to provide increased protection to SSB and increase the resiliency of the stock (Section 3.2).

When the Board takes final action on the addendum, there is the opportunity to select any measure within the range of options that went out for public comment, including combining options across issues.

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

This issue considers options to modify some management measures immediately upon final approval of the Addendum to achieve more consistency in measures within and across LCMAs. One option proposes to modify some of the OCC measures to address differing regulations for state and federal permit holders. Specifically, for state-permitted harvesters in state waters there is no maximum gauge size and the v-notch definition is $^{1}/_{4}$" without setal hairs. For

federal permit holders, the maximum gauge size is 6 3/4" and the v-notch definition is 1/8" with or without setal hairs. The disparity between regulations for different harvesters within the same area creates challenges for enforcement, and potentially weakens the conservation benefit of the stricter definition.

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

Option A: Status Quo
This option would maintain the current management measures for each LCMA at final approval of the addendum.

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

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

3.2 Issue 2: Implementing management measures to increase protection of SSB
The primary objective of this proposed action is to increase the protection of SSB in the GOM/GBK stock. The proposed options consider changes to the minimum and maximum gauge sizes along with corresponding vent sizes for the LCMAs within the stock. The proposed measures are expected to 1) increase SSB, and 2) result in the minimum gauge size increasing

to meet or exceed the size at 50% maturity (L50) for each LCMA (LCMA 1: eastern GOM L50 = 88 mm, western GOM L50 = 83 mm, LCMA 3: Georges Bank L50 = 91 mm). Appendix B includes a full technical report of analysis performed to project the impacts of various gauge size combinations on total weight of lobsters landed, number of lobsters landed, SSB and exploitation.

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

The management trigger is defined by a certain level of decline in the indices from an established reference period. The reference value for each index is calculated as the average of the index values from 2016-2018. This reference period reflects the condition of the stock when the 2020 stock assessment was completed, and includes the same years used to determine the stock status and reference points. The percent declines in the indices are expected to approximate comparable declines in overall abundance of the stock, and relate to the abundance reference points established by the Board. The analyses conducted to develop the trigger mechanism and evaluate its performance in appropriately triggering management are described in detail in Appendix C. Figure 6 (top left panel) shows the calculated trigger index compared to the two proposed trigger levels in this document.

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

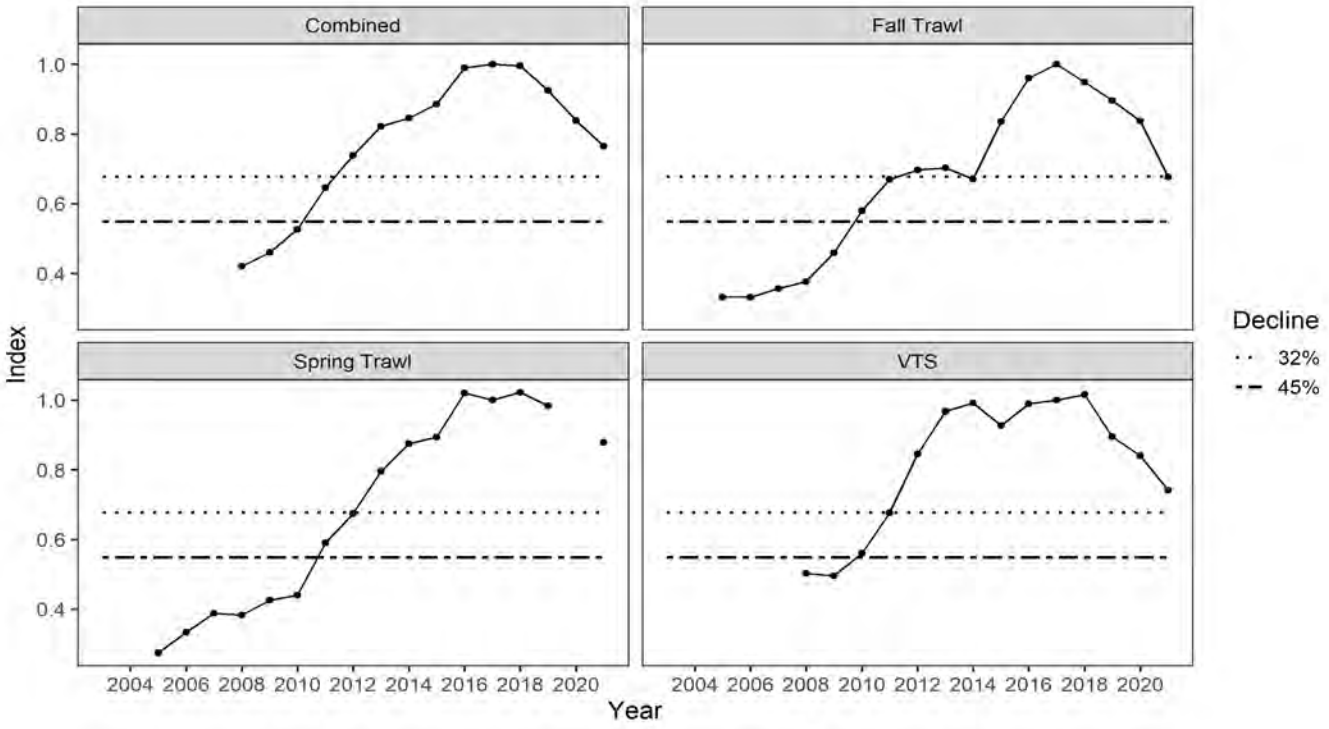

Figure 6. Scaled survey-specific indices and combined trigger index compared to proposed trigger levels. Top-left: combined trigger index that would be used to trigger changes in management measures. Top-right: moving three-year average of fall trawl survey indices. Bottom-left: moving three-year average of spring trawl survey indices. Bottom-right: moving three-year average of VTS indices.

Option A: Status Quo
Under this option there would be no additional changes to the management measures for the LCMAs within the GOM/GBK stock beyond the option(s) selected under Issue 1.

Option B: Gauge and vent size changes triggered by a defined change in trigger index
Under this option, the Board would establish a trigger mechanism whereby pre-determined management changes would be implemented upon reaching a defined trigger level based on observed changes in recruit abundance indices compared to the reference level of the trigger index. Upon the defined trigger level being reached, a predetermined set of management measures selected by the Board (see *Management Measures,* below) would be implemented for the following fishing year. Including the 2021 survey data as the terminal year, the most recent trigger index value was 0.765, which equates to a 23% decline from the reference period (Figure 6).

Trigger Level
If Option B is selected, the Board must establish a trigger level that, when reached, would result in the implementation of biological management measures to increase the protection of SSB in the GOM/GBK stock. The Board may select one of the following options as the trigger level, or any number within the range of the proposed options.

- **Trigger Option 1**: Management measures for the following fishing year would be implemented when a 32% decline in the trigger index is observed relative to the reference abundance level (equal to the average of the index values from 2016-2018). This trigger level approximates a decline in reference abundance to the level where the stock abundance regime shifted from moderate to high abundance (Figure 3).
- **Trigger Option 2**: Management measures for the following fishing year would be implemented when a 45% decline in the trigger index is observed relative to the reference abundance level (equal to the average of the index values from 2016-2018). This trigger level approximates a decline in stock abundance to the 75th percentile of lobster abundance during the moderate abundance regime from the stock assessment (Figure 3).

Management Measures

If Option B is selected, the Board must also select the biological management measures that would be automatically implemented to increase the protection of SSB in the GOM/GBK stock when the defined trigger level is reached. The following options include specific gauge and escape vent sizes for each LCMA in the GOM/GBK stock, and possible timelines for implementing changes to the gauge and vent sizes. In the first option, a single change in gauge and vent sizes would occur, whereas the second option would allow for management measures to be implemented via a series of gradual changes in gauge sizes, with the first change triggered by a change in the abundance indices, as defined by the Board.

- **Measures Option 1:** Upon the established trigger level being reached, the minimum gauge size for LCMA 1 would increase from the current size (3 ¼") to 3 $^{3}/_{8}$" for the following fishing year. The escape vent size in LCMA 1 would be adjusted corresponding with the minimum gauge size change. Additionally, the maximum gauge size in LCMA 3 and OCC would decrease to 6" for the following fishing year. The table below lists the management measures that would be automatically implemented when the trigger point is reached, with changes from the current measures in bold.

  The proposed increase to the minimum gauge size in LCMA 1 is expected to increase the proportion of the population protected from being harvested by the fishery before being able to reproduce. The proposed decreases to the maximum gauge sizes in LCMA 3 and OCC are expected to enhance resiliency by placing forever protections on a small proportion of the population, including larger lobsters of both sexes. The proposed gauge and vent size changes are expected to maintain similar retention rates of legal lobsters and protection of sub-legal sizes as the current gauge and vent sizes. The vent size is consistent with the current vent size used in SNE for the same minimum gauge size of 3 $^{3}/_{8}$".

Issue 2, Option B: Management Measures Option 1			
Area	**LCMA 1**	**LCMA 3**	**OCC**
Measures to Implement in Following Fishing Year	**Minimum gauge: 3 3/8" (86 mm)** Maximum gauge: status quo **Vent size: 2 x 5 3/4" rectangular; 2 5/8" circular**	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo

- **Measures Option 2:** Under this option, when the established trigger level is reached a series of gradual changes in gauge sizes for the LCMAs in the GOM/GBK stock would be initiated. The minimum gauge size would change in increments of 1/16", and the maximum gauge size would change in increments of ¼". The first change in measures would be triggered by a change in the recruit abundance indices greater than or equal to the trigger level established by the Board. Following this initial change, incremental changes to the gauge sizes would occur every other year. The gauge size changes that would be implemented at each step and the final gauge sizes that would be reached for each area are shown in the table below. The escape vent size in LCMA 1 would be adjusted once, when the final gauge size is implemented, to maintain protection of sub-legal sizes. The final vent size is also consistent with the current vent size used in SNE for the same minimum gauge size of 3 3/8".

Issue 2, Option B: Management Measures Option 2			
Area	**LCMA 1**	**LCMA 3**	**OCC**
Current Measures	Minimum gauge: 3 ¼" Maximum gauge: 5" Vent size: status quo	Minimum gauge: 3 17/32" Maximum gauge: 6 ¾" Vent size: status quo	Minimum gauge: 3 3/8" Maximum gauge: 6 ¾" Vent size: status quo
Initial gauge size changes	**Minimum gauge: 3 5/16" (84 mm)** Maximum gauge: status quo Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6 ½"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6 ½"** Vent size: status quo
Intermediate gauge sizes	**Minimum gauge: 3 3/8" (86 mm)** Maximum gauge: status quo **Vent size: 2 x 5 3/4" rectangular; 2 5/8" circular**	Minimum gauge: status quo **Maximum gauge: 6 ¼"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6 ¼"** Vent size: status quo
Final gauge and vent sizes	Minimum gauge: 3 3/8" Maximum gauge: status quo Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo

Option C: Scheduled changes to gauge and escape vent sizes
This option considers establishing a predetermined schedule for implementing gradual changes to the minimum gauge and vent size in to increase the SSB (see table below for the proposed changes). The first step increases the minimum gauge size in LCMA 1 by $^{1}/_{16}$" to $3^{5}/_{16}$" and decreases the maximum gauge size in LCMA 3 and OCC to 6 ½". The second step only decreases the maximum gauge size in LCMA 3 and OCC to 6 ¼". The third and final step increases the minimum gauge size in LCMA 1 to 3 $^{3}/_{8}$", and decreases the maximum gauge size in LCMA 3 and OCC to 6". The vent size in LCMA 1 would also be adjusted once, at the same time the final minimum gauge size is implemented. The final gauge and vent size changes are expected to maintain similar retention rates of legal lobsters and protection of sub-legal sizes as the current gauge and vent sizes.

The implementation deadline for the measures included in the first step would be no later than the 2026 fishing year. The implementation deadline for the measures included in the second step would be one year after the first step. The implementation deadline for the measures in the third step would be two years after the first step.

Issue 2, Option C			
Option C	**LCMA 1**	**LCMA 3**	**OCC**
Current Measures	Minimum gauge: 3 ¼" Maximum gauge: 5" Vent size: status quo	Minimum gauge: $3^{17}/_{32}$" Maximum gauge: 6 ¾" Vent size: status quo	Minimum gauge: 3 $^{3}/_{8}$" Maximum gauge: 6 ¾" Vent size: status quo
Step 1: Implementation no later than 2026 fishing year	**Minimum gauge: 3 $^{5}/_{16}$" (84 mm)** Maximum gauge: status quo Vent size: status quo	Minimum gauge: status quo **Max gauge: 6 ½"** Vent size: status quo	Minimum gauge: status quo **Max gauge: 6 ½"** Vent size: status quo
Step 2: Implementation one year after initial measures		Minimum gauge: status quo **Maximum gauge: 6 ¼"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6 ¼"** Vent size: status quo
Step 3: Implementation two years after initial measures	**Minimum gauge: 3 $^{3}/_{8}$ (86 mm)** Maximum gauge: status quo **Vent size: 2 x 5 $^{3}/_{4}$" rectangular; 2 $^{5}/_{8}$" circular**	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo	Minimum gauge: status quo **Maximum gauge: 6"** Vent size: status quo

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

Applying the selected measures to only the GOM/GBK portion of LCMA 3 would create a significant administrative burden, as well as additional potential for confusion and noncompliance among LCMA 3 permit holders. To date, there have been no permit requirements that delineate in which stock area an LCMA 3 harvester is eligible to fish. Given the objective of this addendum is specific to protecting the GOM/GBK spawning stock, new management measures must either apply to all LCMA 3 harvesters regardless of location and stock fished (and therefore also impact the SNE fishery) or new measures would have to be stock (and geographic area) specific in order to only affect the GOM/GBK fishery. For example, an LCMA 3 harvester seeking to continue fishing in GOM/GBK would either have to declare and be permitted to fish within the GOM/GBK stock area to be held accountable, or opt to not participate in the GOM/GBK fishery to avoid the more restrictive measures.

Applying the measures across the entire management area is consistent with previous changes to the management measures in LCMA 3. When several addenda implemented reductions in fishing capacity and the Area 3 conservation tax (Addendum XIX) to address the declining condition of the SNE stock, the measures were also applied to the GOM/GBK portion of LCMA 3, which was not overfished nor experiencing overfishing. Though the impacts of the proposed measures on the SNE stock and fishery have not been analyzed, it is likely that they would have only minor negative impacts to catch and positive impacts to SSB considering the current depleted status of the stock.

4.0 Compliance

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

5.0 Recommendations for Actions in Federal Waters

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

6.0 References

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7.0 Tables

Table 1. Existing LCMA specific management measures.

Mgmt. Measure	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	OCC
Min Gauge Size	3 1/4"	3 3/8"	3 17/32"	3 3/8"	3 3/8"	3 3/8"	3 3/8"
Vent Rect.	1 15/16 x 5 3/4"	2 x 5 3/4"	2 1/16 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"
Vent Cir.	2 7/16"	2 5/8"	2 11/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"
V-notch requirement	Mandatory for all eggers	Mandatory for all legal size eggers	Mandatory for all eggers above 42°30'	Mandatory for all eggers in federal waters. No V-notching in state waters.	Mandatory for all eggers	None	None
V-notch Definition[1] (possession)	Zero Tolerance	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	State Permitted fisherman in state waters 1/4" without setal hairs Federal Permit holders 1/8" with or w/out setal hairs[1]
Max. Gauge (male & female)	5"	5 ¼"	6 3/4"	5 ¼"	5 ¼"	5 ¼"	State Waters none Federal Waters 6 3/4"
Season Closure				April 30-May 31[2]	February 1-March 31[3]	Sept 8-Nov 28	February 1-April 30

Table 2. GOM/GBK model-free indicators for the 2020 Stock Assessment. The left table shows the GOM spawning stock abundance, the right table shows GBK spawning stock abundance.

SPAWNING STOCK ABUNDANCE Mean weight (g) per tow of mature females						
Survey	*NESFC*		*ME/NH*		*MA 514*	
	fall	*spring*	*fall*	*spring*	*fall*	*spring*
1981	175.32	400.28			502.65	430.53
1982	39.45	113.58			626.48	151.21
1983	206.03	234.21			844.76	67.08
1984	234.64	443.81			593.77	126.47
1985	499.62	2771.23			919.56	93.81
1986	267.97	502.99			231.88	112.97
1987	85.35	497.40			194.34	148.62
1988	186.56	244.92			200.58	88.14
1989	325.69	247.15			293.61	230.26
1990	216.65	516.20			1048.72	241.94
1991	247.11	430.56			335.80	165.54
1992	193.95	453.31			512.83	212.89
1993	284.34	484.30			120.59	229.72
1994	430.32	720.67			783.17	285.01
1995	464.96	390.15			520.26	171.71
1996	734.25	872.53			569.39	156.53
1997	568.34	1083.76			235.18	114.78
1998	381.81	1182.44			282.79	170.21
1999	1444.07	807.41			365.53	282.12
2000	585.66	1281.05	4430.55		533.40	236.55
2001	511.25	1498.42	2446.85	690.89	165.74	235.85
2002	1789.42	2022.04	4638.64	1436.34	324.34	175.73
2003	985.93	2343.63	3949.63	1226.05	129.67	72.99
2004	685.89	2773.35	3610.67	907.07	120.27	259.35
2005	465.35	1670.29	4805.25	1990.08	248.23	489.12
2006	681.87	1810.96	3698.94	1327.93	240.27	410.97
2007	445.78	1536.47	3163.24	1437.85	176.95	139.94
2008	805.10	1894.91	4080.36	1107.00	559.70	300.35
2009	1787.92	1864.92	6906.45	1747.30	630.52	219.83
2010	2850.60	2476.79	5793.51	1886.61	1424.75	211.52
2011	2317.94	2089.39	6169.40	2013.80	1268.44	267.51
2012	3215.29	3516.38	4174.85	2287.55	889.87	124.81
2013	3299.56	2499.71	5363.14	2007.92	1135.54	300.86
2014	4979.28	3083.09	5891.58	3010.73	768.88	382.81
2015	3553.44	3665.39	8488.62	2233.05	1947.04	418.46
2016	3692.26	5142.42	7691.01	2613.49	3712.66	1119.26
2017	3274.69	6566.80	4629.68	2530.74	2309.44	564.30
2018	2093.20	3555.09	5242.34	2005.07	2782.55	550.68
2014-2018 mean	3518.57	4402.56	6388.65	2478.62	2304.11	607.10
25th	272.06	487.57	4015.00	1355.03	242.26	149.27
median	539.79	1389.74	4638.64	1938.34	526.83	224.78
75th	1789.05	2443.50	5842.54	2178.24	878.60	296.52

SPAWNING STOCK ABUNDANCE Mean weight (g) per tow of mature females		
Survey	*NESFC*	
	fall	*spring*
1981	707.14	69.71
1982	670.07	123.96
1983	643.84	152.05
1984	397.33	45.17
1985	504.87	39.00
1986	491.96	307.05
1987	537.31	113.27
1988	695.27	307.49
1989	933.18	161.43
1990	761.64	103.62
1991	848.03	164.32
1992	817.25	213.11
1993	626.81	126.03
1994	774.61	41.77
1995	939.85	71.74
1996	1051.09	482.61
1997	754.00	62.46
1998	993.56	64.67
1999	1363.68	395.66
2000	945.69	132.57
2001	1756.38	313.41
2002	2183.80	341.90
2003	1030.19	842.92
2004	1557.16	298.95
2005	1404.20	491.00
2006	2123.43	465.72
2007	1859.53	728.26
2008	3074.33	1827.61
2009	3703.99	1336.34
2010	2120.51	1126.52
2011	4681.76	1113.11
2012	2696.38	1510.08
2013	2530.26	1369.39
2014	3012.69	1833.98
2015	3743.71	1509.13
2016	3020.98	2138.96
2017	6627.18	3749.60
2018	9630.86	725.09
2014-2018 mean	5207.09	1991.35
25th	755.91	124.47
median	1040.64	310.45
75th	2443.64	1045.56

Appendix A. 2022 Annual Data Update of American Lobster GOM/GBK Stock Indicators

Background

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

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

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

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

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

Results

Gulf of Maine (GOM)

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

- YOY conditions showed improvements since the stock assessment, but were still not positive (Table 1 and Figure 1).
    - Updated five-year means were all neutral, indicating improvement since the stock assessment when two of the five-year means were negative (both southwest areas).

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

Georges Bank (GBK)

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

- Trawl survey recruit abundance indicators showed conditions similar to during the stock assessment (Table 5 and Figure 5).
  - Updated means for both indicators were neutral. This is unchanged from the stock assessment.
  - 2021 values were both positive and relatively high compared to other recent years.
  - No indicators were available for 2020 due to covid-19 sampling restrictions.
  - These indicators tend to be noisier than some of the other abundance indicators, with high interannual variability and lack of discernible trends.
- Trawl survey encounter rates showed declines in the fall since the stock assessment (Table 6 and Figure 6).
  - The updated mean for the fall indicator changed from positive to neutral, while the updated mean for the spring indicator remained positive.
  - No indicators were available for 2020 due to covid-19 sampling restrictions.

Southern New England (SNE)

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

- YOY conditions were negative across the stock with some decline since the stock assessment (Table 7 and Figure 7).

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

Tables and Figures

Table 1. GOM abundance indicators: YOY indices.

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

25th	0.15	0.18	0.51	0.23	0.08
median	0.22	0.34	1.26	0.63	0.33
75th	0.42	0.60	1.60	1.09	0.67

Figure 1. GOM abundance indicators: YOY indices.

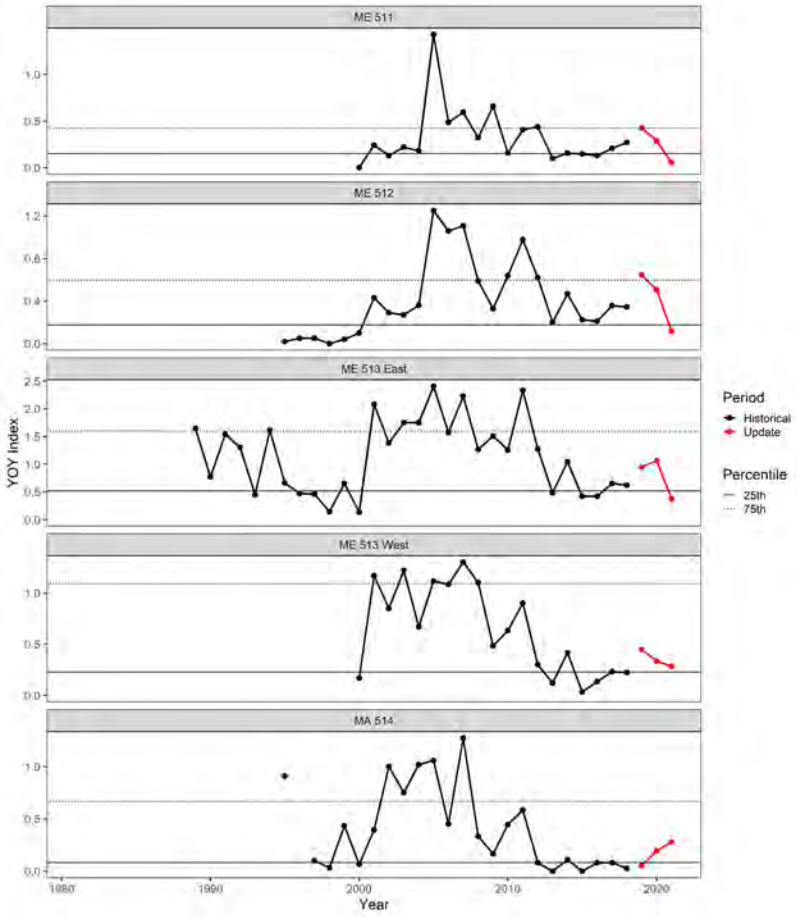


Table 2. GOM abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)						
Abundance of lobsters 71 - 80 mm CL (sexes combined)						
Survey	*NEFSC*		*ME/NH*		*MA 514*	
	Spring	*Fall*	*Spring*	*Fall*	*Spring*	*Fall*
1981	0.13	0.06			6.38	4.84
1982	0.29	0.42			2.74	3.85
1983	0.28	0.90			1.76	9.76
1984	0.20	0.31			2.15	6.13
1985	0.14	1.41			4.48	9.60
1986	0.27	1.29			3.01	3.80
1987	0.67	0.57			2.47	1.16
1988	0.67	1.21			2.52	4.12
1989	0.00	1.61			4.48	7.51
1990	0.27	1.76			6.11	15.36
1991	0.55	1.41			2.73	7.55
1992	0.50	1.37			4.31	8.95
1993	0.25	0.86			5.12	3.19
1994	0.15	2.75			7.59	13.77
1995	1.45	1.44			4.54	12.12
1996	0.76	4.59			3.09	12.10
1997	2.02	2.12			4.59	6.46
1998	1.59	2.16			4.50	7.47
1999	1.51	3.01			4.29	8.73
2000	4.64	3.01		24.09	4.24	8.87
2001	1.05	1.51	9.28	17.81	4.32	1.58
2002	1.08	1.91	22.00	22.41	3.43	5.00
2003	1.41	0.36	10.65	18.32	1.96	0.66
2004	0.84	2.26	7.55	12.29	2.46	1.30
2005	0.34	0.87	18.51	25.90	4.35	2.11
2006	2.17	1.27	18.07	18.30	6.09	5.30
2007	1.62	0.64	15.91	16.82	0.77	1.61
2008	0.99	2.41	17.88	31.61	2.54	6.12
2009	4.88	4.90	24.72	32.67	3.19	8.88
2010	2.98	4.53	17.66	37.35	2.22	9.39
2011	10.27	11.83	39.25	46.09	5.24	15.04
2012	11.25	6.74	36.55	37.12	3.03	11.30
2013	10.93	18.12	34.50	37.86	4.83	12.20
2014	11.66	21.54	65.07	41.95	3.35	7.06
2015	14.44	17.89	38.51	67.99	7.05	17.91
2016	13.25	22.54	50.83	60.07	13.61	17.44
2017	15.74		48.42	48.13	7.85	13.58
2018	14.15	15.87	42.77	55.84	5.25	25.69
2014-2018 mean	13.84	19.46	49.12	54.80	7.42	16.34
2019	16.69	7.62	46.37	50.85	10.69	14.59
2020				34.65		
2021	10.04	8.04	32.86	29.64	6.39	10.16
2017-2021 mean	14.15	10.51	42.61	43.82	7.55	16.01
25th	0.30	1.21	17.72	20.37	2.73	4.30
median	1.07	1.76	23.36	32.67	4.30	7.53
75th	4.23	4.53	39.07	44.02	5.05	11.90

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

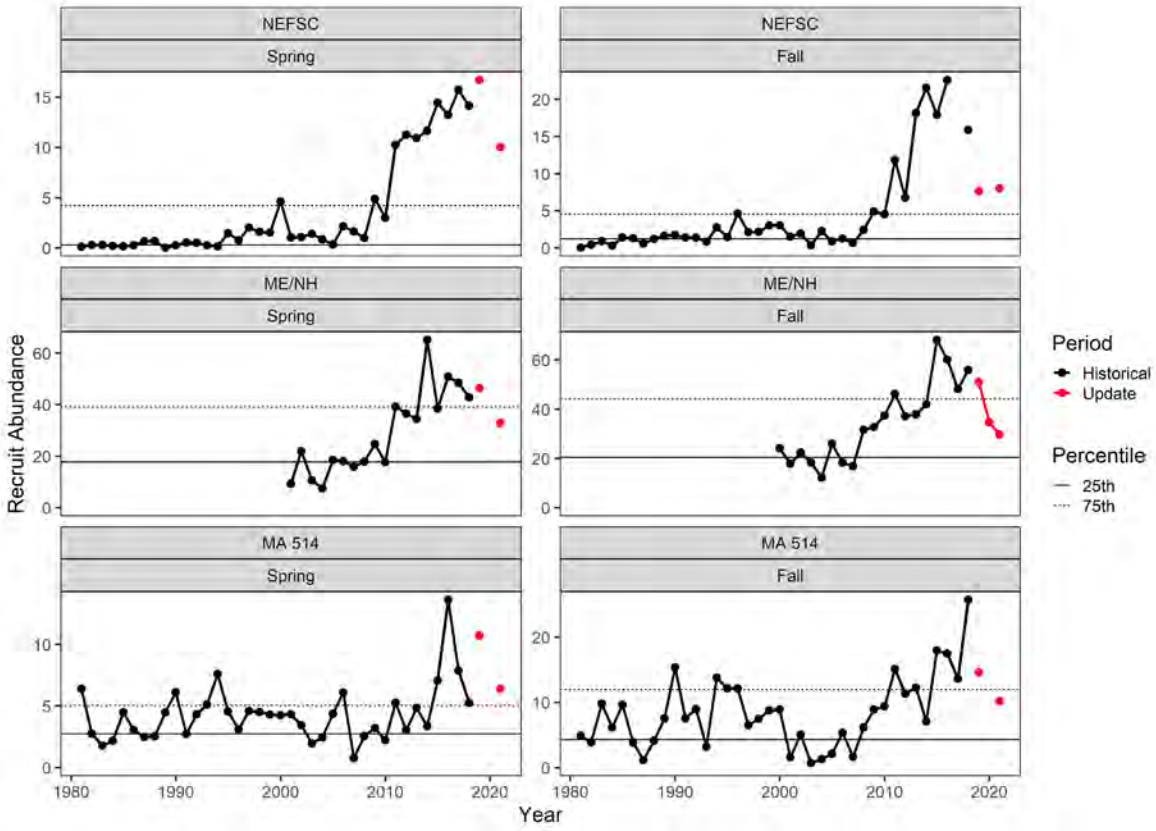


Table 3. GOM abundance indicators: trawl survey encounter rate.

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

25th	0.41	0.35	0.93	0.89	0.78	0.72
median	0.60	0.42	0.98	0.94	0.87	0.86
75th	0.84	0.60	0.99	0.96	0.93	0.95

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

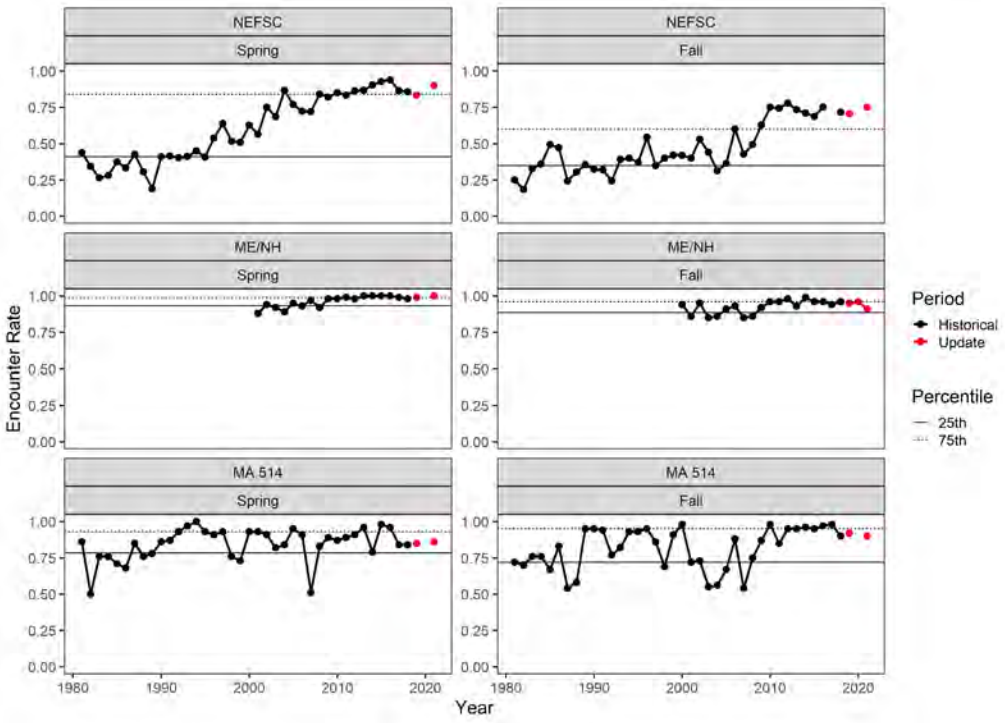


Table 4. GOM abundance indicators: ventless trap survey abundance.

VENTLESS TRAP ABUNDANCE								
Abundance of lobsters ≥ 53 mm CL								
Survey	511		512		513		514	
	Female	Male	Female	Male	Female	Male	Female	Male
1981								
1982								
1983								
1984								
1985								
1986								
1987								
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995								
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								
2004								
2005								
2006	7.65	5.34	6.87	5.38	5.73	4.37	3.10	3.40
2007	5.06	3.91	3.95	3.83	5.82	4.35	1.85	1.84
2008	4.94	3.87	5.78	4.95	5.78	4.97	2.77	2.51
2009	3.60	2.65	6.31	5.35	6.89	5.53	2.72	2.66
2010	5.66	3.90	6.95	5.69	6.61	5.27	2.49	2.22
2011	8.70	6.52	11.10	8.48	7.32	5.60	3.47	2.60
2012	10.95	7.64	12.06	9.47	11.40	7.72	5.21	4.52
2013	11.14	7.95	11.87	8.64	9.36	6.49		
2014	10.38	6.63	11.92	8.04	7.74	4.96	3.15	2.35
2015	8.47	4.63	10.39	7.70	8.54	5.48	4.01	3.16
2016	14.59	9.15	14.34	10.75	10.78	7.56	4.79	3.56
2017	11.69	7.07	11.61	8.52	8.46	5.56	3.38	2.45
2018	15.10	9.43	11.26	8.23	9.57	6.37	3.47	2.43
2014-2018 mean	12.05	7.38	11.90	8.65	9.02	5.99	3.76	2.79
2019	12.93	8.27	8.22	5.94	8.68	5.25	2.85	1.93
2020	7.66	5.47	7.91	5.96	9.29	6.61	2.50	1.69
2021	7.34	5.44	5.94	5.23	8.24	5.93	1.77	1.37
2017-2021 mean	10.94	7.14	8.99	6.78	8.85	5.94	2.80	1.97
25th	5.66	3.91	6.87	5.38	6.61	4.97	2.76	2.41
median	8.70	6.52	11.10	8.04	7.74	5.53	3.27	2.56
75th	11.14	7.64	11.87	8.52	9.36	6.37	3.61	3.22

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

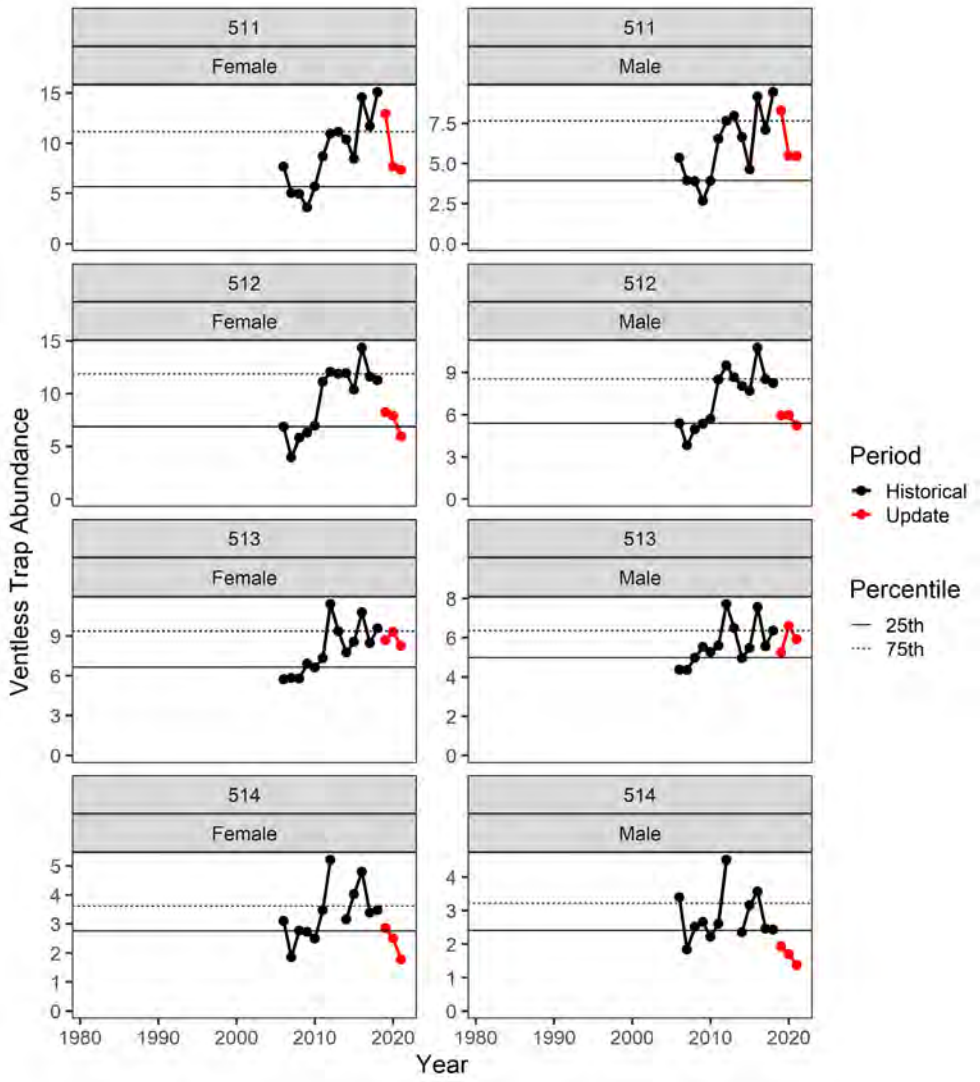


Table 5. GBK abundance indicators: trawl survey recruit abundance.

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

25th	0.06	0.18
median	0.11	0.29
75th	0.25	0.40

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

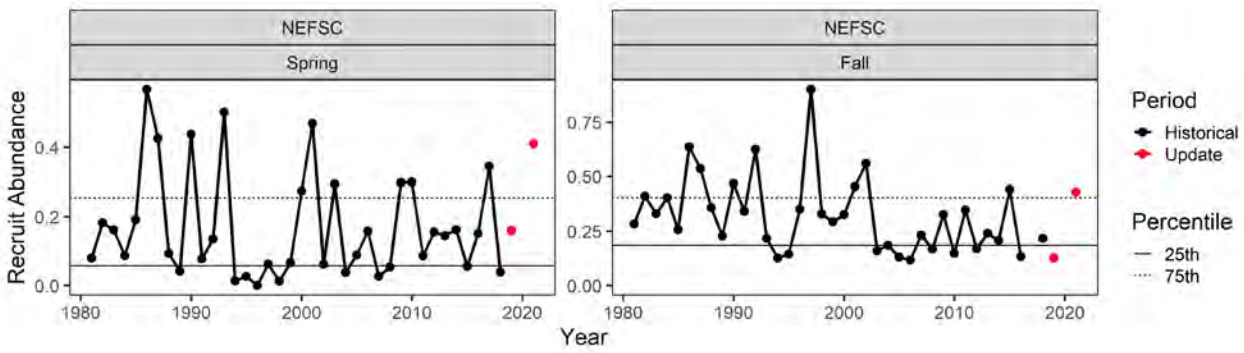


Table 6. GBK abundance indicators: trawl survey encounter rate.

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

25th	0.18	0.40
median	0.23	0.48
75th	0.29	0.55

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

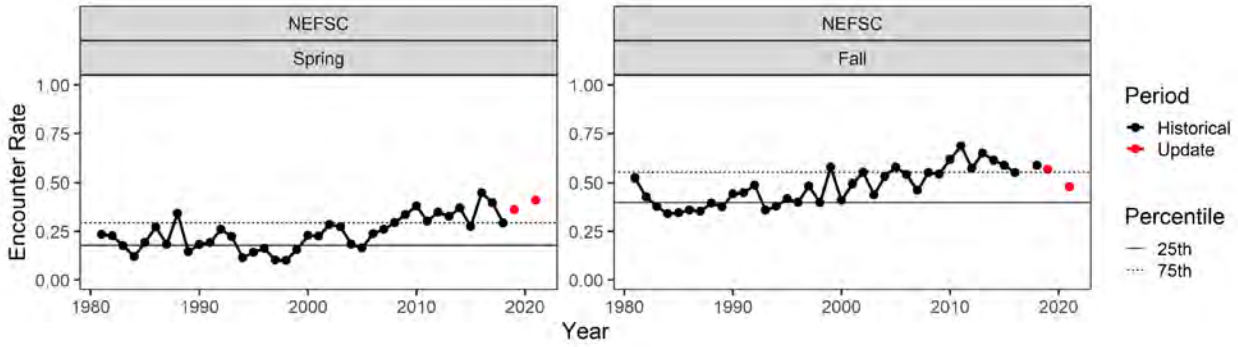


Table 7. SNE abundance indicators: YOY indices.

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

25th	0.00	0.14	0.26
median	0.06	0.34	0.45
75th	0.17	0.63	0.76

Figure 7. SNE abundance indicators: YOY indices.

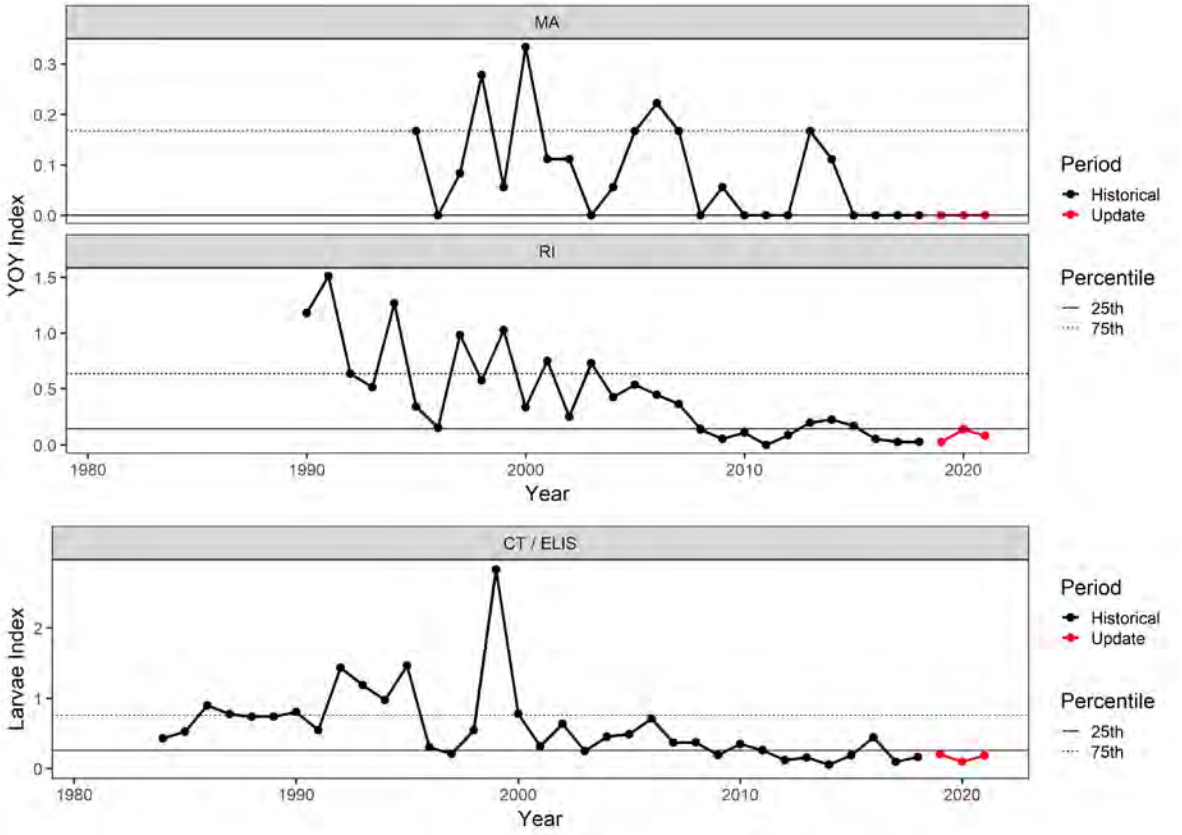


Table 8. SNE abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)								
Abundance of lobsters 71 - 80 mm CL (sexes combined)								
Survey	*NEFSC*		*MA*		*RI*		*CT*	
	Spring	*Fall*	*Spring*	*Fall*	*Spring*	*Fall*	*Spring*	*Fall*
1981	0.10	0.89	0.65	0.07	0.89	1.31		
1982	0.74	0.74	0.10	0.04	0.26	0.64		
1983	0.45	0.62	0.09	0.04	0.94	0.43		
1984	0.10	0.81	0.42	0.01	1.03	1.35	10.09	6.80
1985	1.99	1.01	0.34	0.09	0.28	0.97	3.08	3.93
1986	0.18	0.59	0.17	0.20	0.91	1.28	2.77	5.76
1987	1.04	0.45	0.26	0.17	0.79	3.14	2.93	6.86
1988	0.55	0.60	0.24	0.16	0.47	4.05	1.85	4.88
1989	0.09	1.65	0.14	0.43	0.90	3.26	4.86	5.28
1990	0.71	0.83	2.29	0.31	2.17	2.69	6.89	7.74
1991	0.31	0.51	1.18	0.87	4.77	3.10	10.83	10.32
1992	0.19	0.94	0.10	0.57	0.62	1.97	10.31	10.65
1993	0.59	0.42	0.25	0.52	7.81	8.29	7.78	15.18
1994	0.15	0.38	0.95	0.42	1.00	3.88	5.07	11.51
1995	0.01	0.61	1.14	0.03	1.33	4.50	12.13	11.20
1996	0.40	2.39	0.40	0.32	1.60	6.55	11.37	11.08
1997	1.64	1.60	1.45	0.12	2.58	6.10	15.42	24.99
1998	0.78	1.06	1.09	0.11	1.63	3.24	24.06	12.72
1999	2.43	0.66	0.75	0.19	1.71	2.07	24.57	12.96
2000	0.67	1.27	0.56	0.13	1.54	1.83	13.37	8.27
2001	0.39	0.45	0.18	0.03	2.97	2.17	10.77	7.41
2002	1.63	0.39	0.34	0.00	2.68	0.73	8.07	2.75
2003	0.34	0.33	0.07	0.00	0.29	0.93	3.52	4.08
2004	0.27	0.28	0.05	0.00	1.86	1.48	2.38	3.37
2005	0.11	0.24	0.08	0.00	1.07	2.53	2.26	1.54
2006	0.19	0.32	0.08	0.03	3.63	2.24	2.02	1.38
2007	0.19	0.35	0.08	0.00	0.68	2.68	2.65	1.12
2008	0.21	0.29	0.16	0.01	0.64	2.95	2.20	1.27
2009	0.15	0.35	0.16	0.05	1.14	1.36	1.20	1.33
2010	0.21	0.73	0.06	0.18	0.44	1.21	1.26	
2011	0.10	0.64	0.18	0.00	0.42	1.02	0.43	0.18
2012	0.11	0.99	0.07	0.21	0.30	0.18	0.44	0.08
2013	0.23	0.44	0.11	0.04	0.16	0.02	0.23	0.06
2014		0.67	0.04	0.00	0.02	0.14	0.15	0.05
2015	0.03	0.28	0.07	0.30	0.05	0.37	0.15	0.06
2016	0.83	0.69	0.05	0.14	0.57	0.25	0.16	0.00
2017	0.10		0.13	0.16	0.14	0.41	0.03	0.00
2018	0.08	0.38	0.02	0.01	0.18	0.68	0.00	0.01
2014-2018 mean	0.26	0.51	0.06	0.12	0.19	0.37	0.10	0.03
2019	0.06	0.32	0.01	0.02	0.52	0.50	0.03	0.00
2020					0.23	0.32		
2021	0.01	0.59	0.01	0.00	0.27	0.07	0.03	0.00
2017-2021 mean	0.06	0.43	0.04	0.05	0.27	0.40	0.02	0.00

25th	0.11	0.38	0.08	0.02	0.42	0.78	1.23	1.16
median	0.23	0.61	0.17	0.10	0.91	1.65	2.93	4.48
75th	0.67	0.83	0.42	0.20	1.62	3.07	10.20	9.81

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

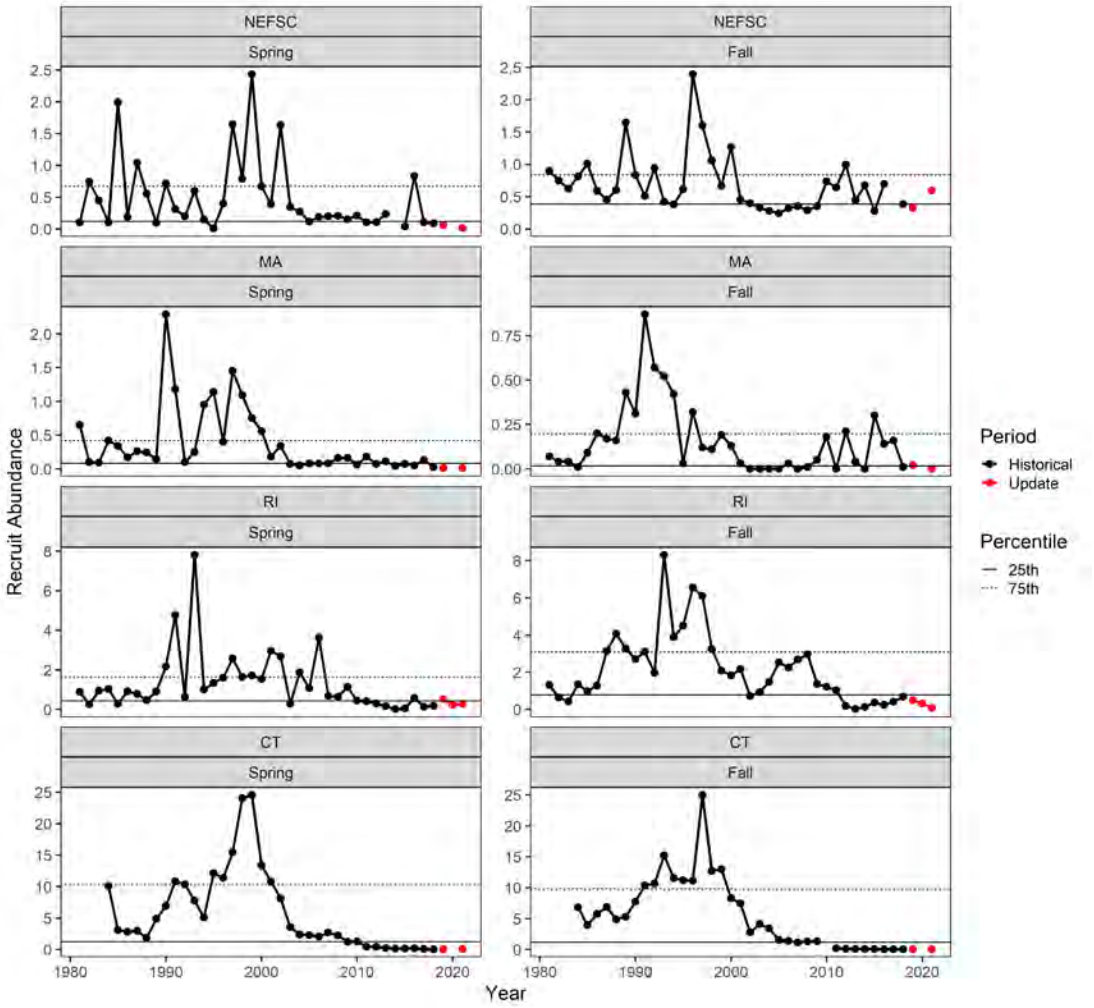


Table 9. SNE abundance indicators: trawl survey encounter rate.

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

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

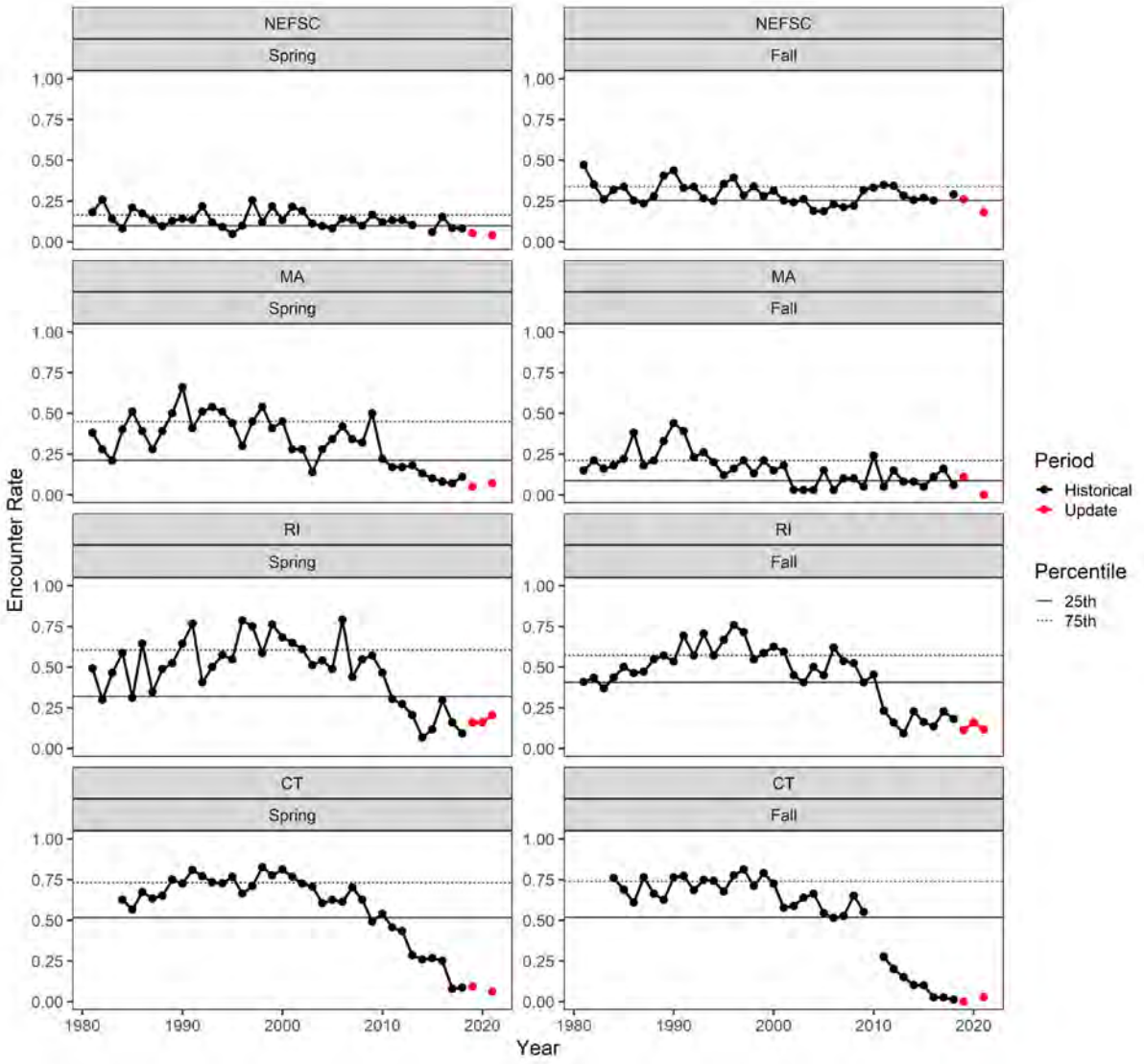
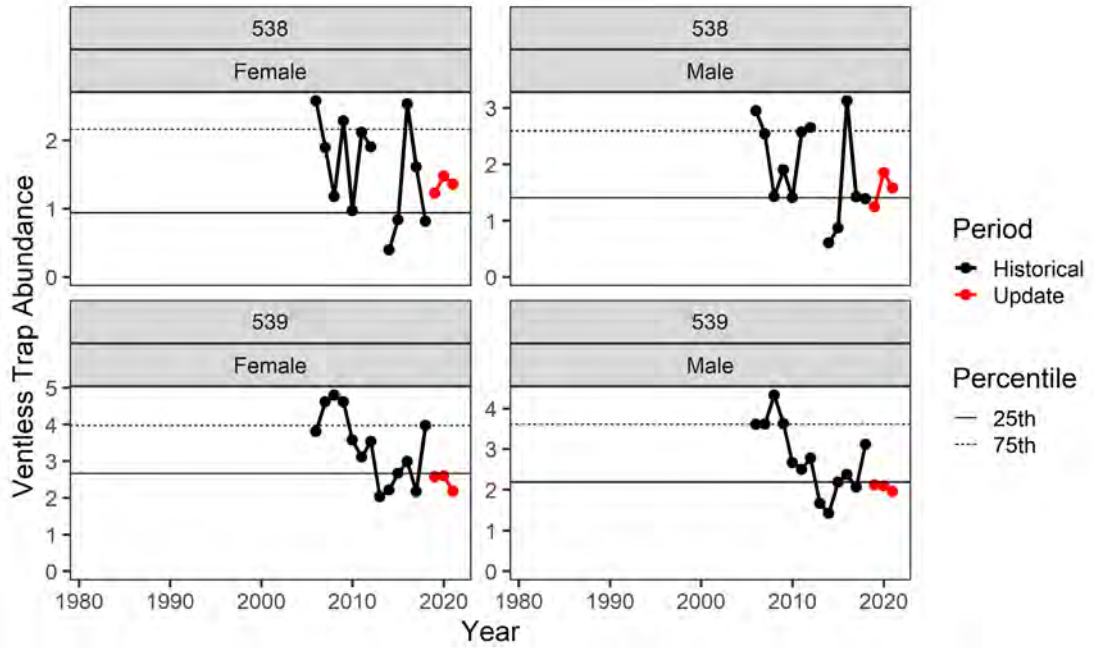


Table 10. SNE abundance indicators: ventless trap survey abundance.

VENTLESS TRAP ABUNDANCE				
Abundance of lobsters ≥ 53 mm CL				
Survey	*538*		*539*	
	Female	*Male*	*Female*	*Male*
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006	2.58	2.95	3.81	3.60
2007	1.89	2.54	4.61	3.61
2008	1.18	1.43	4.80	4.32
2009	2.29	1.90	4.61	3.62
2010	0.97	1.41	3.57	2.67
2011	2.12	2.58	3.11	2.50
2012	1.90	2.65	3.53	2.77
2013			2.03	1.67
2014	0.40	0.61	2.22	1.42
2015	0.84	0.87	2.66	2.18
2016	2.53	3.13	2.99	2.38
2017	1.61	1.43	2.17	2.06
2018	0.82	1.39	3.97	3.12
2014-2018 mean	1.24	1.48	2.80	2.23
2019	1.23	1.25	2.57	2.12
2020	1.47	1.85	2.60	2.10
2021	1.36	1.58	2.19	1.95
2017-2021 mean	1.30	1.50	2.70	2.27
25th	0.94	1.40	2.66	2.18
median	1.75	1.67	3.53	2.67
75th	2.16	2.60	3.97	3.60

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


538
Female
538
Male
539
Female
539
Male
Ventless Trap Abundance
Year
1980
1990
2000
2010
2020
Period
Historical
Update
Percentile
25th
75th

Appendix B. Analysis of alternate minimum and maximum sizes as management options for Lobster Management Areas in the Gulf of Maine. Report to the ASFMC Lobster TC and PDT.

Burton Shank and Jeff Kipp

Sept. 9, 2021

The Lobster TC provided analysis to the ASFMC Lobster Board ahead of the Spring 2021 meeting with estimated outcomes to the Gulf of Maine / Georges Bank lobster fishery given the implementation of alternative management measures (min and max gauge size), including changes to total weight of lobsters landed, number of lobsters landed, Spawning Stock Biomass (SSB) and Exploitation. The analysis included an attempt to examine how fisheries in different LCMAs would be affected though the population simulation model was not re-parameterized for each LCMA. In discussions, we concluded that the simulations for LCMA1 were probably reasonably accurate because:

1. Many of the inputs for the simulations are taken from the 2020 stock assessment. Because the vast majority of the landings come from LCMA1, the stock assessment parameters are essentially already tuned to the parameters of the LCMA1 fishery.
2. LCMA1 is primarily a recruitment-based fishery in inshore or nearshore habitats and, therefore, likely to be representative of the full stock model.

However, there was concern that the offshore fishery in Lobster Management Area 3 was considerably different from the full stock model and, thus, may have inaccurate outcomes due to a mis-parameterized simulation model. The parameters for the Outer Cape Cod fishery are probably somewhere between LCMA1 and LCMA3 as it consists of both a resident lobster population and a seasonally-migrating population, moving between inshore and offshore habitats.

To address these differences between the LCMAs in population simulations, we performed the following:

1. For the LCMA1 simulations, we used the stock assessment parameters as the inputs.
2. For LCMA3 simulations, we attempted to manually tune the population simulation model to match the catch characteristics of the LCMA3 fishery, under the assumption that a simulation model that could reproduce the catch characteristics of the fishery may more accurately project changes in the fishery given changing management measures.
3. For the OCC simulations, we ran two sets of simulations, using the input parameters for both LCMA1 and LCMA3 under the assumption that this bounds the dynamics we might see in OCC.

For all simulations, populations were initiated with zero abundance and run for 50 years with constant recruitment to allow population abundances and length comps to reach equilibrium.

The equilibrium populations were then compared across the various legal selectivity scenarios to determine the effect of these different management alternatives.

For a simple, model-free analysis of the fishery catch composition for LCMA1 and LCMA3, we calculated the cumulative proportion of catch by weight at length by converting catch-at-size to weight-at-size and weighting for unequal sex ratios and seasonality of landings.

LCMA1 Simulations

The input parameters for the LCMA1 simulations were primarily drawn from the 2020 stock assessment. This includes the recruitment seasonality, length composition and sex ratio, growth model, gear, legal and conservation selectivities and mean estimated fishing mortality from the terminal years.

LCMA1 Results

The cumulative catch weight-by-length curve indicates that the mean size of lobsters landed in the LCMA1 fishery is within the smallest legal size bin (83-91mm, Figure 1). Nearly 90% of the catch are below 100mm CL and only about 2% of the catch are over 120mm CL. This supports the perspective that LCMA1 landings involve a narrow range of small lobster sizes and is primarily a recruitment-dependent fishery.

Increasing the minimum legal size is projected to decrease the total number of lobsters landed but result in a net increase in yield-per-recruit (YPR) and total weight of catch (Table 1 and 2). However, the magnitude of these changes are small enough that they may not be detectable in the actual fishery given inter-annual variations in recruitment and catch. Changing the maximum legal size is projected to have very little effect on either catch number or weight.

Note that these are purely yield-per-recruit simulations so recruitment subsidies from increased SSB are not assumed in the calculations of catch weight or number so, thus, probably represent a conservative, lower bound. A less conservative upper bound would be the product of change in YPR and the change in SSB.

Increasing the minimum legal size is projected to result in large increases in SSB (Table 3). Minimum legal sizes that approach or exceed the size of maturity produce increasing returns on SSB as this allows a much larger portion of the population to reproduce at least once. Thus, increasing minimum legal size to 88mm is projected to result in a near doubling in SSB. Increasing maximum size can result in a large decrease SSB, particularly as the minimum legal size increases and more of the population survives to reach the current maximum legal size.

Increasing legal size would result in moderate to large decreases in exploitation as more of the stock becomes protected (Table 4) with exploitation decreasing by nearly 30% at a minimum legal size of 88mm. As with catch weight and number, changing maximum legal size has little effect on exploitation rates as these sizes represent a very small portion of the LCMA1 population.

LCMA3 Simulations

We first analyzed the port and sea sampling data provided for the 2020 benchmark assessment but constrained to LCMA3 to estimate fishery characteristics, including catch size composition, catch sex ratio, and conservation selectivity (discarding due to egg-bearing or V-notch status).

We then specified the conservation selectivity from the biosamples and current legal selectivity appropriate for LCMA3 in the population simulation model and iteratively tuned the following parameters:

1. Fully-selected fishing mortality, assumed constant across seasons
2. Recruitment sex ratio
3. Recruitment size composition for each sex.

For a given tuning run, the population simulation model was provided an updated set of input parameters and projected forward 25 year to reach equilibrium. The resulting catch composition from the model run was then compared to the average catch composition from the last five years of the biosamples to determine accuracy of the simulation models. Comparisons were conducted both visually for obvious lack-of-fit and by correlating the simulated and observed catch compositions. Correlations were performed on both the catch proportions and logit-transformed catch proportions, the latter to place more emphasis on length compositions that occur in smaller proportions.

Once the model was tuned to perform as well as might be expected, given minor, seasonal lack-of-fit that could not be easily resolved, the simulation model was then run with the tuned parameters for all combinations of proposed minimum and maximum size limits. We then summarized the outputs from the different simulations as values relative to the current minimum and maximum size regulations in place for LCMA3.

Results

The cumulative catch weight-by-length curve indicates that 110 mm carapace length is the approximate mean size of lobsters landed in the LCMA3 fishery (Figure 1). However, the cumulative curve is nearly linear from 90mm through 130mm, indicating lobsters across this size range are about equally important to the landings of this fishery. Lobsters less than about 92mm constitute the lower 10% quantile of landings while lobsters greater than 136mm constitute the upper 10% quantile with lower and upper quartiles around 98mm and 123mm respectively. This suggests that LCMA3 landings include a broad range of lobster sizes, unlike typical inshore lobster fisheries that are primarily recruitment-driven.

The final tuned parameters included a quarterly fishing mortality of 0.1 (0.4 total annual mortality) and a 70:30 female to male recruitment sex ratio. The tuned recruit length compositions are bi-modal for both sexes, indicating recruitment to the fishery comes both from growth of smaller individual within the LCMA and immigration from outside the LCMA (Figure 2). With these compositions, about 80% of male recruitment and 30% of female

recruitment is attributed to growth with the remainder of new individuals coming from immigration from outside the LCMA.

Fitting the simulation length comps by manually tuning these parameters resulted in reasonably good fits to the observed length compositions (Figures 3, 4, and 5). Some lack-of-fit is still evident within seasons but this lack-of-fit is generally contrary to the lack-of-fit observed in other seasons, making it difficult to further improve the fit with just the parameters of interest. Correlations between observed and predicted compositions were 0.981 for simple proportions and 0.97 for logit-transformed proportions, suggesting both high and low proportion values for observed length comps are well matched by the simulation and we deemed this adequate to a basis to examine alternative management options.

Decreasing either the minimum or maximum legal size is projected to decrease total weight of catch (Table 5). However, contrary to the previous analysis for the full stock or inshore LCMA's, changes to the maximum size have much larger impacts on landings than changes to the minimum size, particularly once the maximum size drops to between 140 and 150mm. Decreasing the maximum size from 171mm to 127mm is projected to decreases landings by about 30% while decreasing the minimum size from 90mm to 83mm is only projected to decrease landings by a couple of percent.

Decreasing the minimum legal size is projected to marginally increase the number of lobsters being landed but decreasing the maximum size marginally to moderately decreases the number of lobsters landed, producing neutral effects for many of the management options explored here (Table 6).

Decreasing maximum legal size from current regulations is projected to increase SSB, possibly significantly, but decreasing minimum sizes would decrease SSB (Table 7). The greatest observed increase would be from holding the minimum size at current values but maximally decreasing maximum sizes, essentially narrowing the length range where lobsters are legal, which is estimated to result in a 64% increase in spawning stock. As above, changes to maximum size have bigger effects on SSB than changes to minimum sizes.

Decreasing maximum sizes would result in a decrease in exploitation but decreasing minimum sizes would increase exploitation (Table 8), countering each other and paralleling patterns observed for SSB. Because the calculation of exploitation is based on numbers of individuals rather than mass, decreasing minimum sizes have larger effects on exploitation than observed above for landings or SSB. Again, changes in exploitation increase rapidly with decreasing maximum sizes once the alternate maximum gauge size reaches a size that includes a significant portion of the catch for the LCMA.

OCC Simulations

Due to time and data constraints, we did not attempt to tune a simulation model for OCC. Rather, we assume that population dynamics and fishing mortality rates in OCC are bounded by

the conditions observed in the LCMA1 and LCMA3 fisheries. Thus, we ran simulations for OCC using the OCC legal size range with both the LCMA1 and LCMA3 parameterizations and present both sets of results with the understanding that results for OCC should fall between these extremes.

In general, outputs (catch weight, number, SSB and exploitation) show different responses for the LCMA1 than the LCMA3 parameterizations. LCMA1 parameterizations tend to produce simulations that are very sensitive to changes in minimum legal size but not maximum legal size, while simulations with LCMA3 parameterization only slightly sensitive to changes in minimum legal size but moderately to highly sensitive to changes in maximum legal size.

Total weight of landings is projected to be sensitive to changing minimum legal size with the LCMA1 parameterization but be insensitive with the LCMA3 parameterization (Table 9 A & B). With the LCMA1 parameterization, decreasing minimum size is projected to decrease landings by ~5% while increasing legal size to 88mm would increase landings by 8%. Conversely, landings weight is insensitive to changes in maximum legal size for the LCMA1 parameterization but sensitive to changes for the LCMA3 parameterization.

Total catch number simulations shows trend similar to catch weight with the LCMA1 parameterization being sensitive to changes in minimum size and the LCMA3 parameterization sensitive to changes in maximum size (Figure 10 A & B). The pattern otherwise holds that larger minimum legal sizes result in lower catch numbers.

For SSB, the LCMA1 parameterization is responsive to both changes in minimum and maximum legal size while the LCMA3 parameterization is more sensitive to changes in maximum size (Figure 11 A & B). For example, decreasing minimum legal size to 127mm would increase SSB by between 24% and 65% for the LCMA1 and LCMA3 parameterizations, respectively. The ranges of minimum size tested in simulations produce changes in SSB in the rage of -26% to +76% for the LCMA1 parameterization and -1% to +6.8% for the LCMA3 parameterization.

Decreasing minimum legal size produce increases moderate to small increases in exploitation (16% to 4% for LCMA1 and LCMA3 parameterizations, respectively, Figure 12 A & B). Either increasing minimum legal size or decreasing maximum legal size decrease serve to decrease exploitation with a maximum decrease of ~39% observed at the largest minimum and smallest maximum size and the LCMA3 parameterization.

Discussion

There is a stark difference in cumulative landings by size between LCMA1 and LCMA3. LCMA1 is clearly a recruitment-based fishery that would be highly sensitive to variations in recruitment. The LCMA3 fishery, in contrast, is fishing a broad range of lobster sizes, and therefore ages, and is thus somewhat buffered from interannual variation in recruitment dynamics.

The LCMA1 fishery is highly sensitive to changes in minimum legal size because of high exploitation rates on newly-recruited lobsters. The range of minimum sizes tested in

simulations encompasses size range that represents the majority of landings for the inshore / nearshore fishery. Thus, changes to minimum size would dramatically change the length composition of the catch. Increases in the minimum size will have temporarily but significantly depress landing in the years immediately after are implemented but the benefits to SSB would be similarly immediate. Increasing the minimum legal size can add to the resilience of the fishery by marginally increasing the spread of effort across multiple year classes and significantly increasing SSB and egg production which may buffer the effects in any future change in productivity.

Generally, decreasing maximum gauge sizes have larger effects for LCMA3 both relative to decreasing minimum sizes in LCMA3 or for changing maximum sizes for the other LCMAs. This matches the conclusions based on the cumulative catch curve (Figure 1) that showed that the LCMA3 fishery lands a much broader size range of individuals than the inshore LCMAs, with the upper portion of length compositions overlapping proposed alternative maximum sizes.

This analysis for LCMA3 matches previous analysis conducted for inshore LCMAs, finding that larger minimum legal sizes had positive effects across population parameters including higher catch weights, increased SSB and decreased exploitation. However, decreasing maximum legal sizes has mixed effects, decreasing immediate landings but increasing SSB, potentially by a larger margin. Because recruitment subsidies from increasing SSB are not included in this simulation, the net effect of these two opposing changes are uncertain. While decreasing maximum legal sizes would decrease immediate landings and make a larger portion of the population inaccessible to the fishery permanently (i.e. excluded lobsters won't grow into a legal size in the future), this increase in SSB may eventually produce a recruitment subsidy that could offset this loss of catch. The net effect would depend on multiple factors including the connectivity of the added SSB to larval settlement habitat and the migration patterns of these large females into adjacent habitats including inshore Gulf of Maine and international waters.

Finally, it is important to note the importance of large female lobsters that dominate the landings for much of LCMA3. This both highlights the partial dependence of this fishery on immigration from adjacent habitats and adds uncertainty to this analysis. The growth and molt cycling of such large females is poorly understood and are not particularly well informed in the current growth model. Thus, the tuned parameters may be biased by mis-specification of the growth model and results in this analysis may be sensitive to the growth model used in some cases. Interpretation of tuned parameters and confidence in the precise results of this analysis should be taken with some caution. However, the general patterns of changing catch, SSB and exploitation with changes in minimum and maximum legal sizes is consistent across this and previous analyses so may be treated with higher confidence.

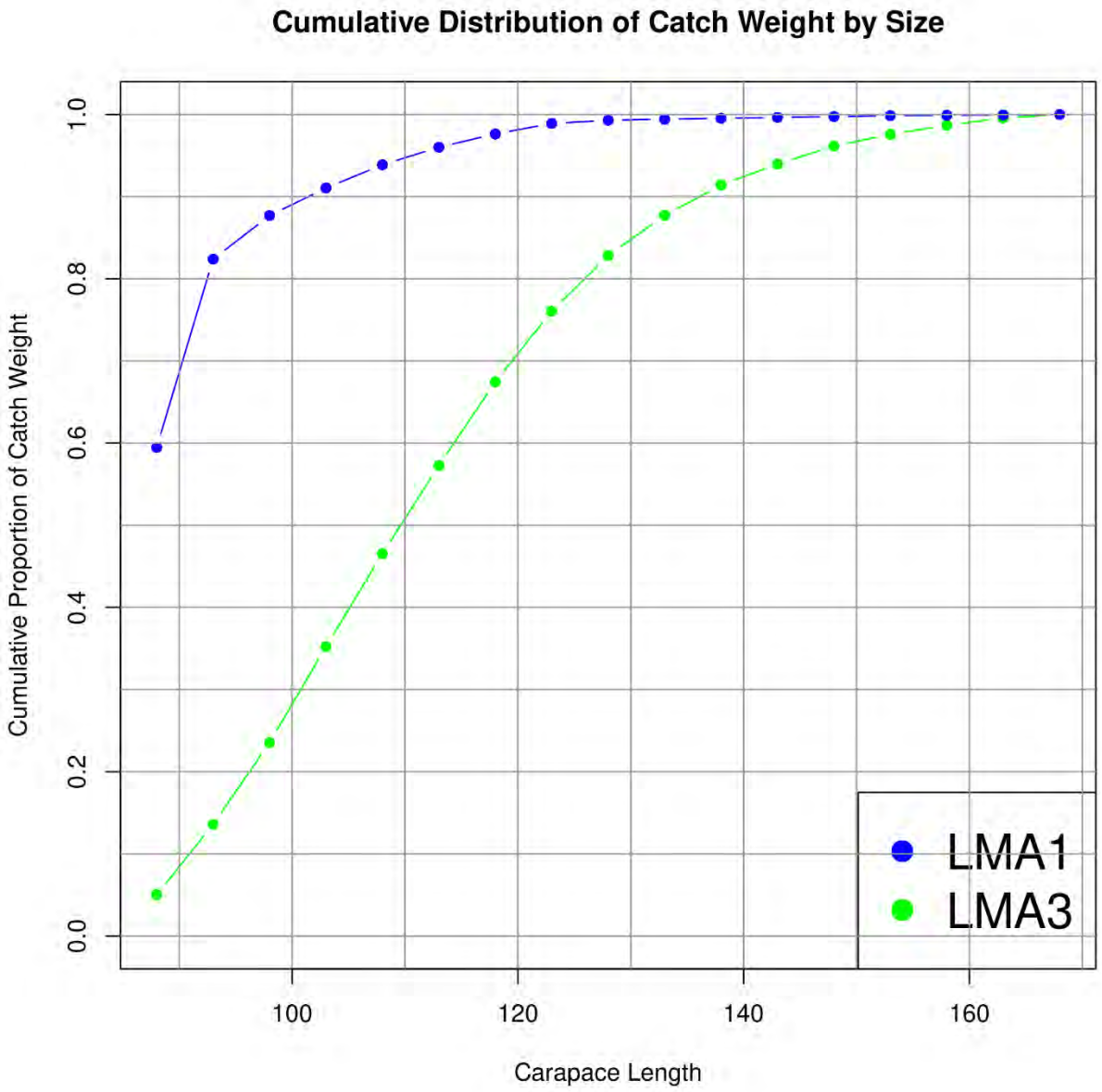


Figure 1. Cumulative proportion of catch weight by carapace length. To interpret, lobsters less than 90mm constitute approximately 8% of landings, while lobsters less than 130mm constitute approximately 85% of landings.

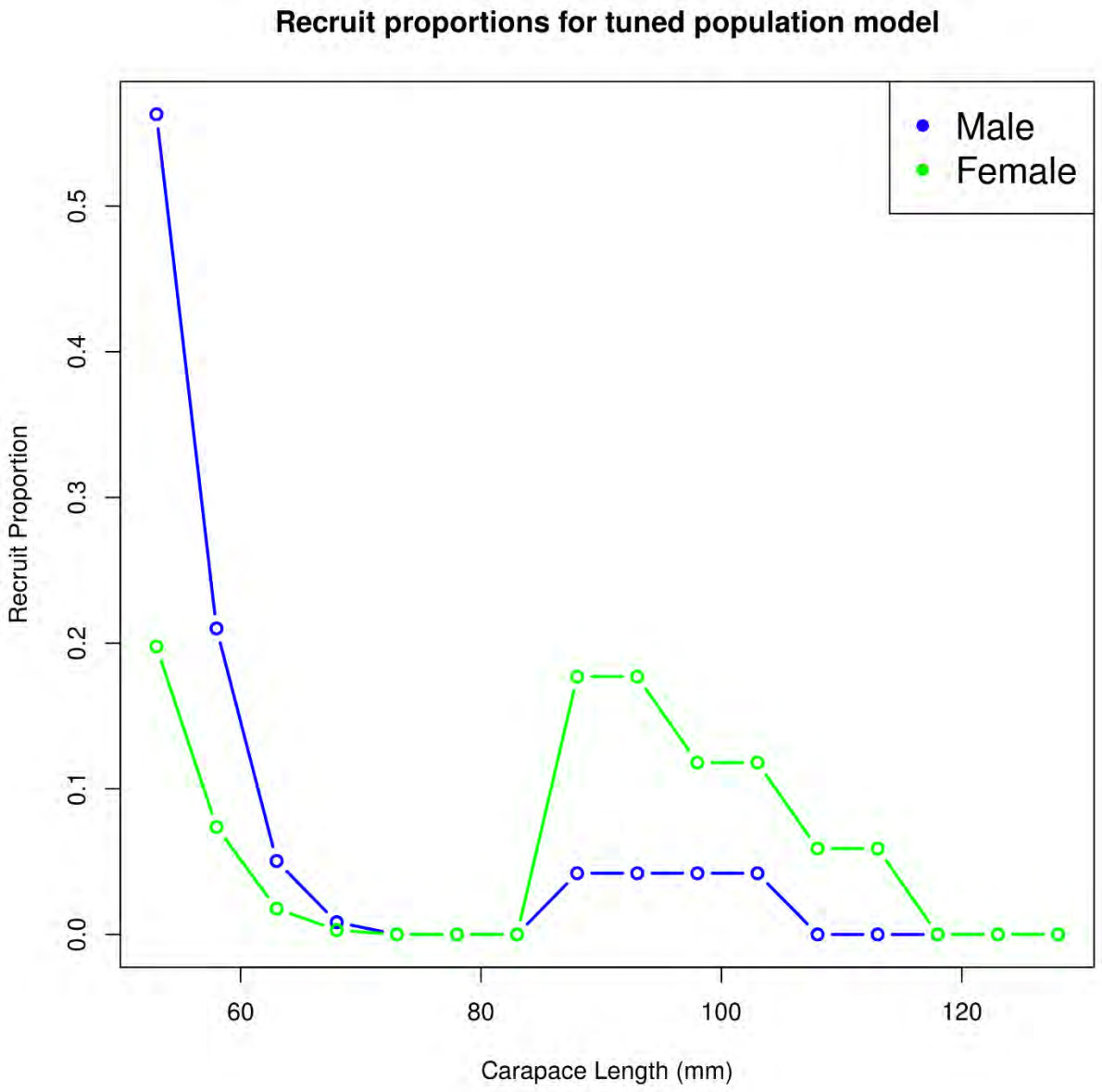


Figure 2. Tuned recruitment length compositions for the fitted model. The bi-modal length distribution suggests a combination of recruitment by growth (individuals <70mm) and migration (individuals >85 mm) with males primarily recruiting by growth and females primarily recruiting by migration as mature adults.

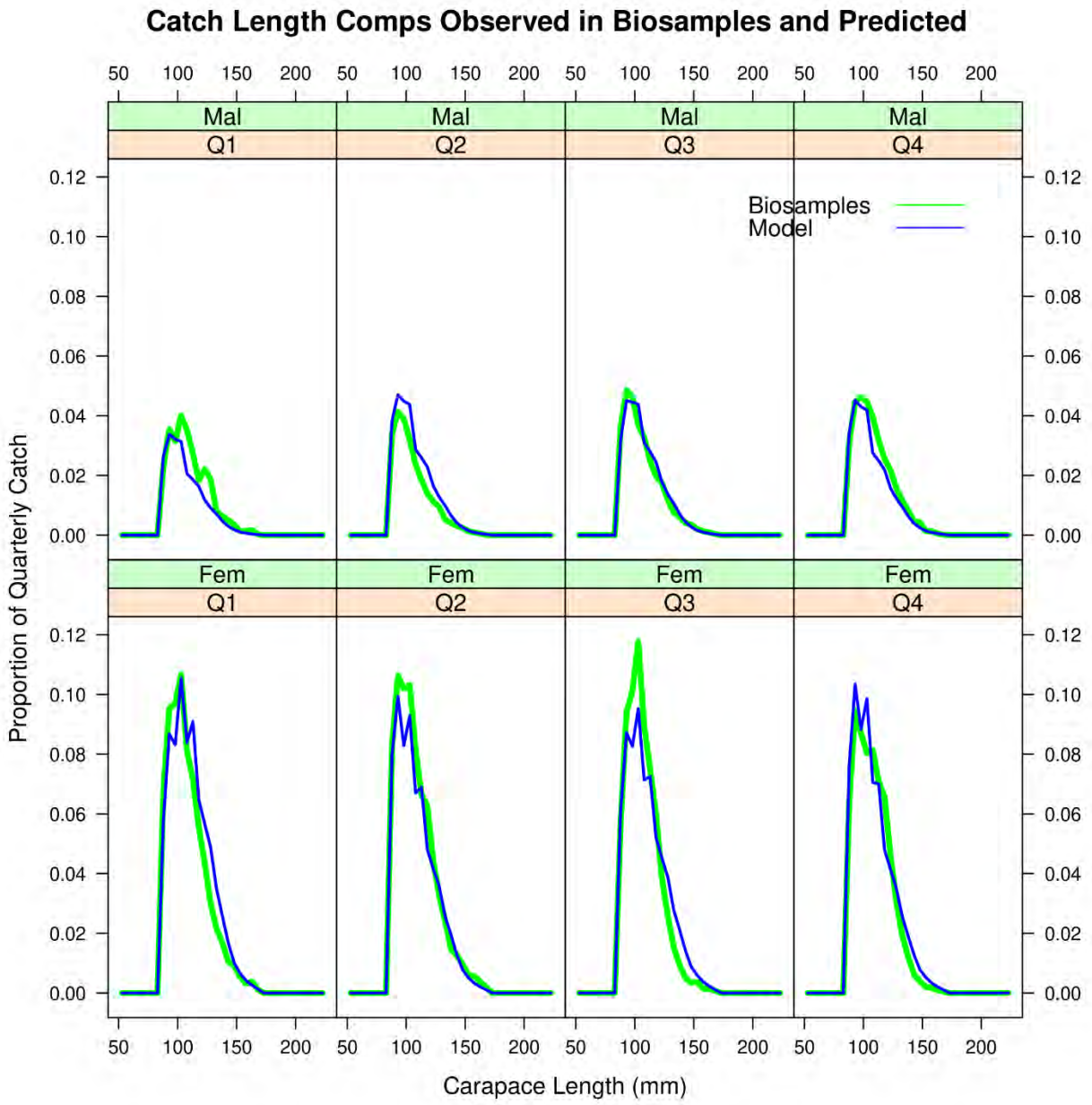


Figure 3. LCMA 3 catch length compositions by sex and quarter based on biosampling and from the tuned population model.

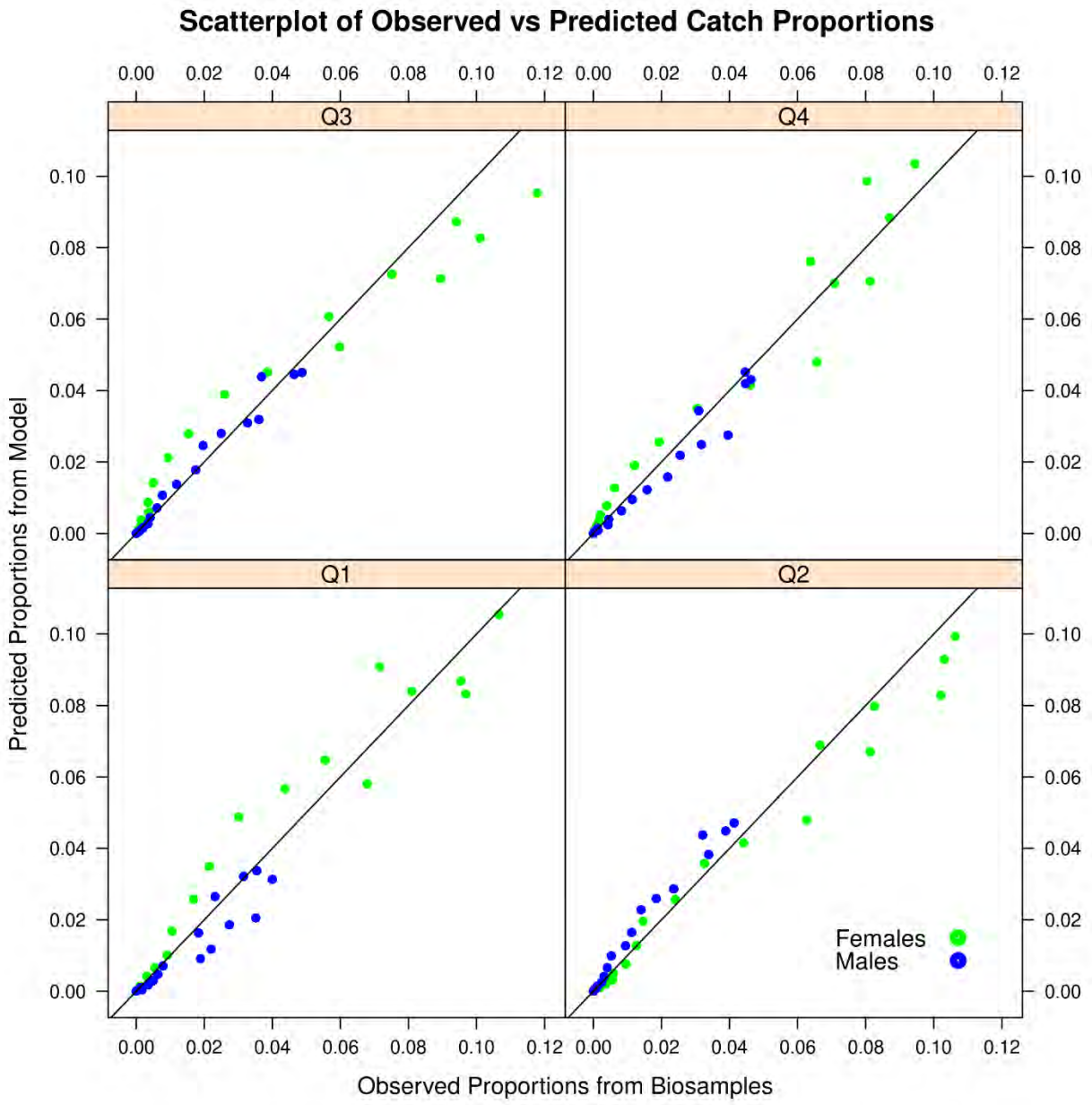


Figure 4. Relationship between length composition proportions observed in biosamples and predicted in the tuned population model by quarter and sex. The diagonal 1:1 line shows an ideal fit between the data sets.

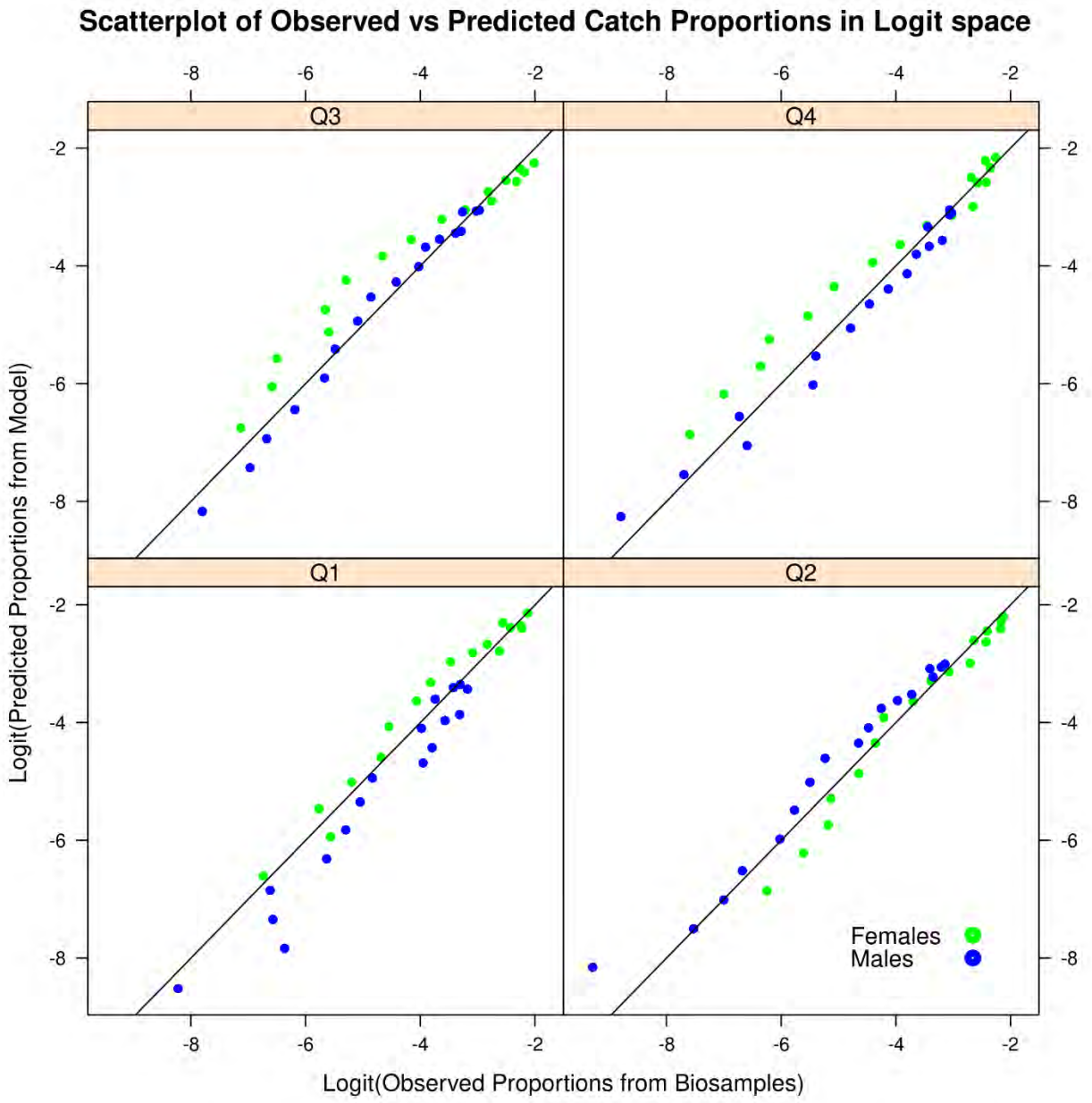


Figure 5. Relationship between length composition proportions observed in biosamples and predicted in the tuned population model by quarter and sex. Data points are logit-transformed to emphasize fit to lengths that occur in low proportions. The diagonal 1:1 line shows an ideal fit between the data sets.

Table 1. LCMA1 projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
3.31in / 84mm	3.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
3.38in / 86mm	5.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
3.47in / 88mm	13.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
3.53in / 90mm	14.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
3.594in / 91mm	16.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%

Table 2. LCMA1 projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	0.00%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%
3.31in / 84mm	-2.00%	-1.80%	-1.80%	-1.80%	-1.80%	-1.80%	-1.80%
3.38in / 86mm	-3.60%	-3.30%	-3.30%	-3.30%	-3.30%	-3.30%	-3.30%
3.47in / 88mm	-8.50%	-8.10%	-8.00%	-8.00%	-8.00%	-8.00%	-8.00%
3.53in / 90mm	-9.50%	-9.00%	-9.00%	-9.00%	-9.00%	-9.00%	-9.00%
3.594in / 91mm	-11.30%	-10.80%	-10.70%	-10.70%	-10.70%	-10.70%	-10.70%

Table 3. LCMA1 projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	0.00%	-16.50%	-18.30%	-18.50%	-18.50%	-18.60%	-18.60%
3.31in / 84mm	19.00%	-1.40%	-3.60%	-3.80%	-3.90%	-3.90%	-3.90%
3.38in / 86mm	38.00%	13.90%	11.30%	11.00%	10.90%	10.90%	10.90%
3.47in / 88mm	98.00%	61.00%	56.90%	56.60%	56.50%	56.40%	56.40%
3.53in / 90mm	117.00%	75.80%	71.30%	70.90%	70.70%	70.70%	70.70%
3.594in / 91mm	151.00%	101.70%	96.40%	95.90%	95.70%	95.70%	95.60%

Table 4. LCMA1 projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	0.00%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
3.31in / 84mm	-8.50%	-7.70%	-7.60%	-7.60%	-7.60%	-7.60%	-7.60%
3.38in / 86mm	-14.40%	-13.60%	-13.50%	-13.50%	-13.50%	-13.50%	-13.50%
3.47in / 88mm	-29.40%	-28.40%	-28.30%	-28.30%	-28.30%	-28.30%	-28.30%
3.53in / 90mm	-32.10%	-31.00%	-30.90%	-30.90%	-30.90%	-30.90%	-30.90%
3.594in / 91mm	-36.50%	-35.40%	-35.30%	-35.20%	-35.20%	-35.20%	-35.20%

Table 5. LCMA3 projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-31.30%	-14.60%	-6.30%	-4.20%	-2.80%	-2.10%	-0.80%
3.31in / 84mm	-31.20%	-14.30%	-6.00%	-3.80%	-2.40%	-1.60%	-0.40%
3.38in / 86mm	-31.20%	-14.00%	-5.60%	-3.40%	-2.00%	-1.20%	0.00%
3.47in / 88mm	-31.10%	-13.60%	-5.00%	-2.70%	-1.30%	-0.50%	0.80%
3.53in / 90mm	-31.40%	-13.40%	-4.60%	-2.30%	-0.90%	0.00%	1.30%
3.594in / 91mm	-31.70%	-13.20%	-4.10%	-1.70%	-0.30%	0.60%	1.90%

Table 6. LCMA3 projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-11.10%	-0.80%	3.20%	4.00%	4.50%	4.70%	5.00%
3.31in / 84mm	-12.20%	-1.70%	2.30%	3.20%	3.70%	3.90%	4.20%
3.38in / 86mm	-13.20%	-2.60%	1.50%	2.30%	2.80%	3.10%	3.40%
3.47in / 88mm	-15.20%	-4.20%	-0.10%	0.80%	1.30%	1.50%	1.80%
3.53in / 90mm	-17.10%	-5.90%	-1.70%	-0.80%	-0.30%	0.00%	0.30%
3.594in / 91mm	-19.50%	-7.90%	-3.60%	-2.60%	-2.10%	-1.90%	-1.50%

Table 7. LCMA3 projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	56.00%	19.00%	3.00%	-1.50%	-3.80%	-5.20%	-6.90%
3.31in / 84mm	57.00%	20.00%	3.00%	-0.80%	-3.10%	-4.50%	-6.20%
3.38in / 86mm	59.00%	21.00%	4.00%	0.00%	-2.40%	-3.70%	-5.50%
3.47in / 88mm	61.00%	23.00%	6.00%	1.50%	-0.90%	-2.30%	-4.10%
3.53in / 90mm	64.00%	25.00%	8.00%	3.80%	1.40%	0.00%	-1.80%
3.594in / 91mm	69.00%	29.00%	11.00%	6.70%	4.20%	2.80%	1.00%

Table 8. LCMA3 projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-20.40%	-0.30%	8.40%	10.30%	11.40%	11.90%	12.50%
3.31in / 84mm	-22.30%	-2.40%	6.30%	8.10%	9.20%	9.70%	10.30%
3.38in / 86mm	-24.10%	-4.40%	4.10%	6.00%	7.00%	7.50%	8.10%
3.47in / 88mm	-27.40%	-8.10%	0.30%	2.20%	3.10%	3.70%	4.30%
3.53in / 90mm	-30.60%	-11.60%	-3.30%	-1.50%	-0.50%	0.00%	0.60%
3.594in / 91mm	-34.20%	-15.60%	-7.50%	-5.70%	-4.80%	-4.20%	-3.70%

Table 9. OCC projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 paramerizations.

A.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-5.60%	-5.00%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%
3.31in / 84mm	-2.70%	-2.00%	-1.90%	-1.90%	-1.90%	-1.90%	-1.90%
3.38in / 86mm	-0.90%	-0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
3.47in / 88mm	6.60%	7.80%	8.00%	8.00%	8.00%	8.00%	8.00%
3.53in / 90mm	7.40%	8.80%	8.90%	8.90%	8.90%	8.90%	8.90%
3.594in / 91mm	9.30%	11.00%	11.20%	11.20%	11.20%	11.20%	11.20%

B.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-30.40%	-13.50%	-5.20%	-3.00%	-1.60%	-0.80%	0.00%
3.31in / 84mm	-30.30%	-13.20%	-4.80%	-2.60%	-1.20%	-0.40%	1.00%
3.38in / 86mm	-30.30%	-13.00%	-4.40%	-2.20%	-0.80%	0.00%	1.00%
3.47in / 88mm	-30.30%	-12.50%	-3.80%	-1.50%	-0.10%	0.70%	2.00%
3.53in / 90mm	-30.60%	-12.40%	-3.40%	-1.10%	0.40%	1.20%	3.00%
3.594in / 91mm	-30.90%	-12.10%	-2.90%	-0.50%	1.00%	1.90%	3.00%

Table 10. OCC projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 paramerizations.

A.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	3.40%	3.60%	3.60%	3.60%	3.60%	3.60%	3.60%
3.31in / 84mm	1.30%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%
3.38in / 86mm	-0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3.47in / 88mm	-5.40%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%
3.53in / 90mm	-6.40%	-5.90%	-5.90%	-5.90%	-5.90%	-5.90%	-5.90%
3.594in / 91mm	-8.30%	-7.70%	-7.70%	-7.70%	-7.70%	-7.70%	-7.70%

B.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-13.80%	-3.70%	0.10%	0.90%	1.40%	1.60%	1.90%
3.31in / 84mm	-14.80%	-4.60%	-0.70%	0.10%	0.60%	0.80%	1.10%
3.38in / 86mm	-15.80%	-5.50%	-1.50%	-0.70%	-0.20%	0.00%	0.30%
3.47in / 88mm	-17.70%	-7.10%	-3.10%	-2.20%	-1.70%	-1.50%	-1.20%
3.53in / 90mm	-19.60%	-8.70%	-4.60%	-3.70%	-3.20%	-3.00%	-2.70%
3.594in / 91mm	-21.90%	-10.70%	-6.40%	-5.50%	-5.00%	-4.80%	-4.50%

Table 11. OCC projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 parameterizations.

A.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-9.80%	-24.70%	-26.40%	-26.50%	-26.60%	-26.60%	-26.60%
3.31in / 84mm	7.00%	-11.10%	-13.10%	-13.30%	-13.30%	-13.30%	-13.30%
3.38in / 86mm	24.30%	2.70%	0.30%	0.10%	0.00%	0.00%	0.00%
3.47in / 88mm	78.20%	45.10%	41.50%	41.20%	41.10%	41.00%	41.00%
3.53in / 90mm	95.50%	58.50%	54.40%	54.00%	53.90%	53.90%	53.90%
3.594in / 91mm	126.20%	81.80%	77.00%	76.60%	76.50%	76.40%	76.40%

B.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	63.00%	24.00%	7.00%	2.00%	-0.10%	-1.50%	-3.30%
3.31in / 84mm	64.00%	25.00%	7.00%	3.00%	0.60%	-0.70%	-2.60%
3.38in / 86mm	65.00%	26.00%	8.00%	4.00%	1.40%	0.00%	-1.80%
3.47in / 88mm	67.00%	27.00%	10.00%	5.00%	2.90%	1.50%	-0.30%
3.53in / 90mm	71.00%	30.00%	12.00%	8.00%	5.30%	3.90%	2.00%
3.594in / 91mm	75.00%	34.00%	15.00%	11.00%	8.30%	6.80%	4.90%

Table 12. OCC projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 paramerizations.

A.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	15.60%	16.50%	16.50%	16.50%	16.50%	16.50%	16.50%
3.31in / 84mm	5.80%	6.70%	6.80%	6.80%	6.80%	6.80%	6.80%
3.38in / 86mm	-1.10%	-0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
3.47in / 88mm	-18.40%	-17.30%	-17.10%	-17.10%	-17.10%	-17.10%	-17.10%
3.53in / 90mm	-21.50%	-20.20%	-20.10%	-20.10%	-20.10%	-20.10%	-20.10%
3.594in / 91mm	-26.70%	-25.30%	-25.20%	-25.20%	-25.20%	-25.20%	-25.20%

B.

Minimum Gauge Size \ Maximum Gauge Size	5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
3.25in / 83mm	-26.00%	-7.30%	0.80%	2.60%	3.60%	4.10%	4.60%
3.31in / 84mm	-27.70%	-9.20%	-1.20%	0.60%	1.50%	2.00%	2.60%
3.38in / 86mm	-29.40%	-11.10%	-3.20%	-1.40%	-0.50%	0.00%	0.60%
3.47in / 88mm	-32.50%	-14.50%	-6.70%	-5.00%	-4.10%	-3.60%	-3.00%
3.53in / 90mm	-35.40%	-17.70%	-10.00%	-8.40%	-7.50%	-7.00%	-6.50%
3.594in / 91mm	-38.80%	-21.50%	-13.90%	-12.30%	-11.40%	-10.90%	-10.40%

Appendix C. Trigger Mechanism Analysis and Recommendation

Recruit (71-80 mm carapace length) indices are used as model-free indicators of recruitment to the lobster fishery in the following year. During the 2020 stock assessment, recruit indicators were found to be correlated with the stock assessment model estimates of reference abundance (78+ mm carapace length), providing a reliable means to track abundance changes and potential need for management response more frequently than through intermittent stock assessments. There are eight GOM/GBK stock recruit indicators updated for each assessment: spring and fall indices for each of the ME/NH, MA DMF, NEFSC GOM, and NEFSC GBK bottom trawl surveys. The NEFSC indicators in the GOM and GBK regions are considered to be indicators of offshore recruitment which differs from the GOM/GBK stock-wide recruitment dynamics. Therefore, the American Lobster Technical Committee (TC) recommended using only the inshore surveys (ME/NH and MA DMF) where the bulk of the population and fishery occur, which are assumed to be more representative of stock-wide recruitment. These trawl surveys employ similar methodologies and, along with selectivity and swept area calibration factors, can be combined into two indices, a spring index and a fall index. Additionally, the TC recommends using the standardized index from the Ventless Trap Survey as an indicator of recruitment during the summer.

To calculate a trigger index, each of the three individual indices were scaled to their 2017 reference levels so they are on the same scale. The one year lag expected between recruit indices and reference abundance due to growth results in 2017 recruit indices mapping to the terminal year reference abundance used in the 2020 stock assessment status determination (2018). The TC recommended linking the trigger index to the reference abundance in this way so the trigger index is an indication of proportional changes to the reference abundance since the 2020 stock assessment. Proportional changes in the trigger index are compared directly to proportional changes between the terminal year reference abundance and abundance reference points established in the assessment to provide an early indication of reference abundance falling below the reference points. Scaled indices were then averaged across surveys to generate a single trigger index. The final trigger index value represents proportional change from 2017 recruitment (and, therefore, expected proportional change from the reference abundance one year later in 2018 - the terminal year of the stock assessment). A value of one indicates no change, a value greater than one indicates an increase (e.g., 1.2 indicates a 20% increase), and a value less than one indicates a decrease (e.g., 0.8 indicates a 20% decrease).

During the 2020 stock assessment, the peer review panel supported using a smoothing algorithm, such as the running average used in past assessments, to determine stock status, but also recommended exploring alternatives (e.g., running median) to evaluate the robustness of status determinations. To evaluate performance of different methods for a trigger mechanism, akin to evaluating stock status in a stock assessment, a simulation analysis was conducted using the trigger index annual point value, three-year running average, and three-year running median to identify need for management action. For each method, all three individual indices were scaled to a 2017 reference level calculated with the same method used to calculate the

index. That is, the 2017 reference level was the 2017 point value for the annual index trigger method, the 2015-2017 average for the three-year running average trigger method, and the 2015-2017 running median for the three-year running median trigger method. The scaled individual and combined indices are compared to various trigger points related to assessment abundance reference points in Figure 1.

The TC treated 0.68 (i.e., a 32% decline) as the trigger for action in the simulation analysis. This decline represents the proportional change between the terminal year stock assessment reference abundance level and the boundary between the high and moderate abundance regimes. Each individual index was projected from 2018 to 2025 following a steady decline that reflected a 32% decline from the observed 2017 index value in 2021. This projected trend is hypothetical to evaluate the performance of the three calculation methods being considered and does not necessarily reflect the true status or projection of the population. It was unclear what impacts the method used to calculate the starting point of the projected trend would have on performance of each trigger mechanism, so declines projected from the (1) 2017 point value, (2) 2015-2017 running average, and (3) 2015-2017 running median were evaluated in three separate scenarios. Indices were then sampled from these simulated trends with CVs equal to the average CV over the respective index's time series, assuming a lognormal error structure. These simulations only consider observation error and do not account for process error. Indices were scaled to their reference level as described above, averaged across surveys, and the combined trigger index was evaluated for whether or not it would trigger action ($\leq$0.68) in each year of the projection period. This was repeated 1,000 times for each scenario and action determinations were tallied by year for each of the methods.

Results show similar patterns between the scenarios using a simulated decline from the 2017 point value and from the 2015-2017 average (Table 1; Figures 2-3). The 2015-2017 running median was equal to the 2017 point value for all indices, so the results with a simulated decline from this value were identical to the 2017 point value scenario (Table 2; Figure 4). Incorrect action is triggered very infrequently (< 3% of the time) by the annual and running median methods in the first two years of the projection period and never by the running average method. On average, the annual and running median methods incorrectly triggered action about 9% of the time and about 15 times more frequently than the running average method the year before the decline reached the threshold (2020), but also correctly triggered action ≈38% of the time and roughly twice as frequently as the running average method in the year when the threshold was met (2021). The running average method then tended to perform as well as or better than the other methods from 2022-2025, albeit generally at smaller margins of difference, as all methods tended to perform relatively well in these later years when the decline is exacerbated. The delayed response of the running average method can be seen in Figures 5-7, where the median trigger index value across simulations tends to be slightly higher than the annual and running median methods. The variance in index values, however, is lower for the running average method resulting in more consistency across simulations in terms of guidance for management action, whereas the other methods result in mixed guidance for some of the more extreme simulations in more years than the running average method.

Based on these results, the trigger mechanisms using the annual point value and the running median may be considered precautionary methods that perform better for an immediate trigger, on average, but with more variable guidance than the running average method. The running average method may provide a less responsive trigger mechanism that is less likely to incorrectly trigger premature action, and performs well and more consistently after the initial risk of not triggering action when first needed.

The TC recommended the running average method for calculating the trigger index. The individual surveys display interannual variation that might be related to environmental impacts on catchability (for example), an issue that was identified in the stock assessment and is expected to continue to impact these indices index data sets into the future. This simulation analysis suggests the running average method is more robust to interannual variation than the other methods and therefore can be interpreted with higher confidence.

Table 1. Percentage of 1,000 simulated indices that triggered action for three simulated decline starting point scenarios, and the averages of these scenarios. The simulated stock was projected to decline 32% in 2021.

Simulated Decline Starting Point	Index Calculation Method	2018	2019	2020	2021	2022	2023	2024	2025
2017 Point Value	Annual	0%	2%	12%	50%	85%	97%	100%	100%
	Three-Year Running Average	0%	0%	1%	27%	86%	100%	100%	100%
	Three-Year Running Median	0%	2%	12%	44%	84%	98%	100%	100%
2015-2017 Average	Annual	0%	0%	3%	21%	59%	89%	99%	100%
	Three-Year Running Average	0%	0%	0%	3%	46%	95%	100%	100%
	Three-Year Running Median	0%	0%	3%	19%	60%	90%	99%	100%
2015-2017 Running Median	Annual	0%	2%	12%	50%	85%	97%	100%	100%
	Three-Year Running Average	0%	0%	1%	27%	86%	100%	100%	100%
	Three-Year Running Median	0%	2%	12%	44%	84%	98%	100%	100%
Average	**Annual**	**0%**	**2%**	**9%**	**40%**	**76%**	**94%**	**100%**	**100%**
	Three-Year Running Average	**0%**	**0%**	**1%**	**19%**	**73%**	**98%**	**100%**	**100%**
	Three-Year Running Median	**0%**	**1%**	**9%**	**36%**	**76%**	**95%**	**100%**	**100%**

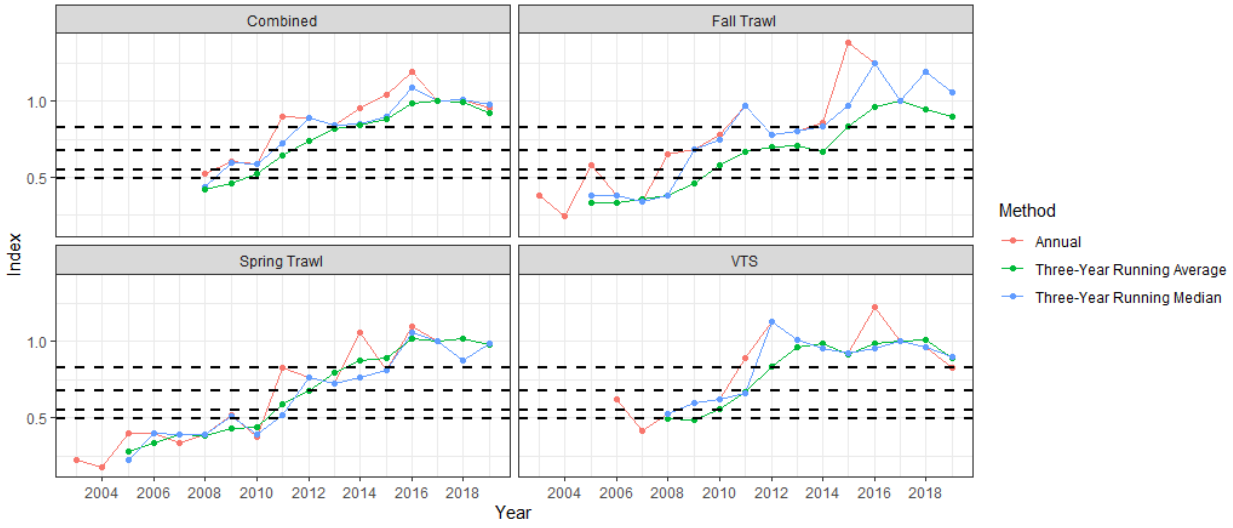


Figure 1. Scaled individual and combined indices using three calculation methods compared to four trigger levels (0.83 – Fishery/Industry Target, 0.68 – Moderate/High Abundance Regime Shift Level, 0.55 – Abundance Limit, 0.49 – Abundance Threshold) identified from potential reference abundance declines (dashed lines).

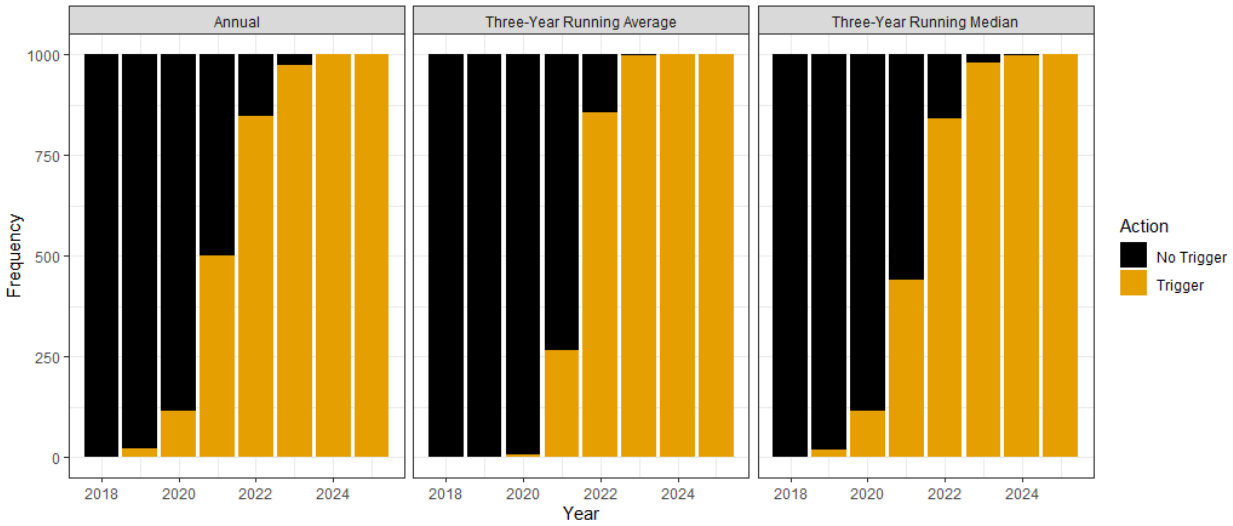


Figure 2. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2017 point value. The simulated stock was projected to decline 32% in 2021.

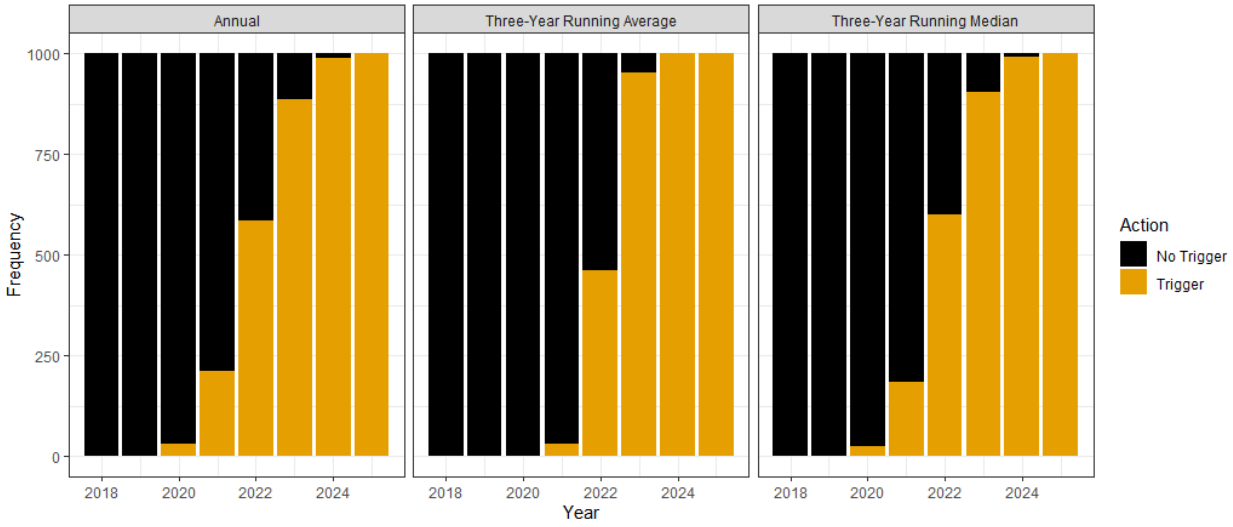


Figure 3. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2015-2017 average. The simulated stock was projected to decline 32% in 2021.

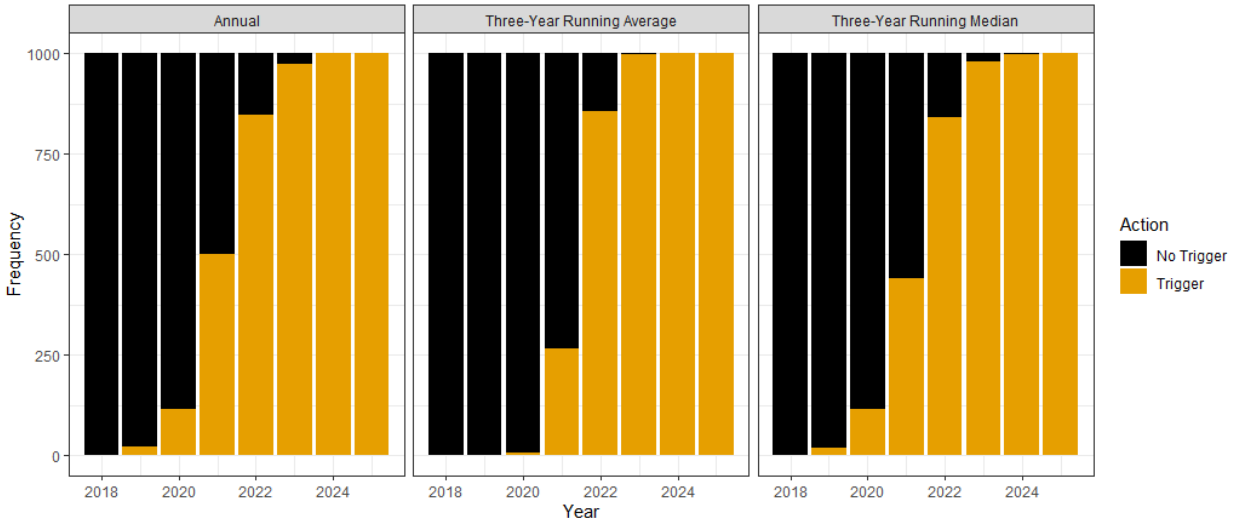


Figure 4. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2015-2017 median. The simulated stock was projected to decline 32% in 2021.

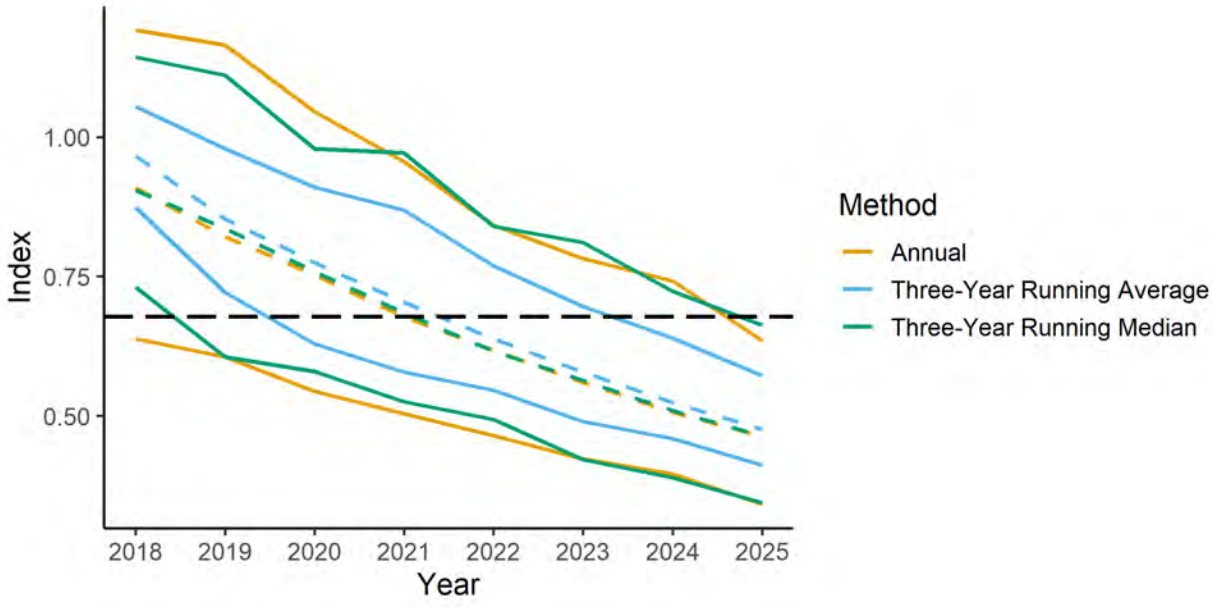


Figure 5. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2017 point value. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

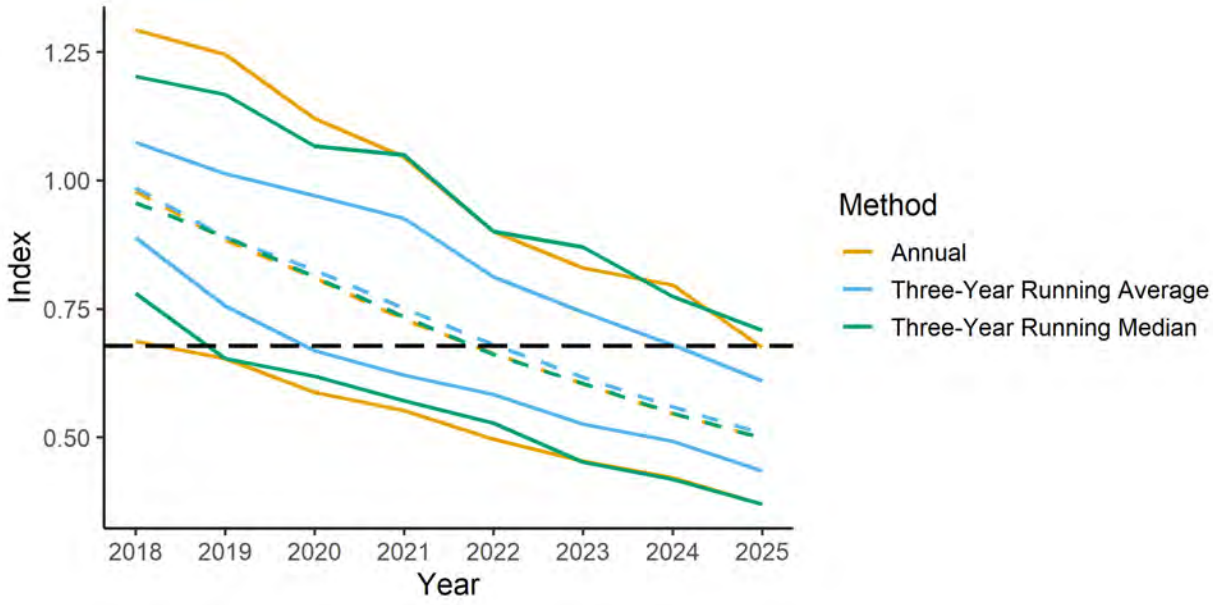


Figure 6. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2015-2017 running average. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

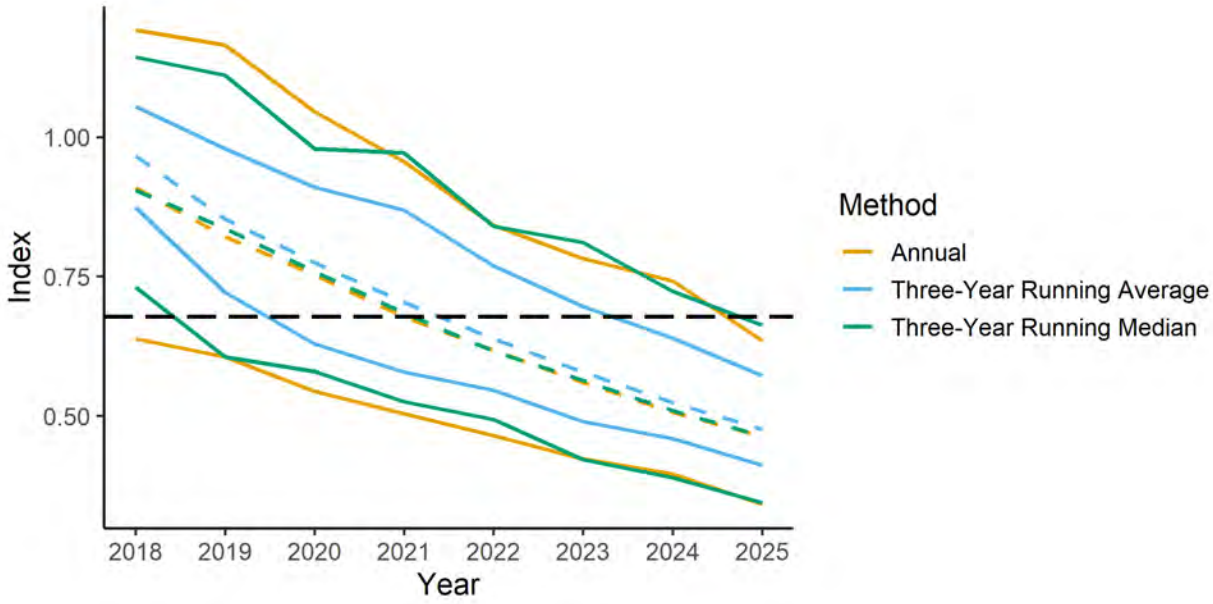


Figure 7. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2015-2017 running median. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **American Lobster Management Board**

FROM: **Caitlin Starks, Senior FMP Coordinator**

DATE: **April 14, 2023**

SUBJECT: **Public Comment on Draft Addendum XXVII to Amendment 3 to the American Lobster Fishery Management Plan**

The following pages represent a draft summary of all public comments received by ASMFC on American Lobster Draft Addendum XXVII as of 11:59 PM (EST) on April 8, 2023 (closing deadline).

Comment totals for the Draft Addenda are provided in the table below, followed by summaries of the state public hearings, and written comments sent by organizations and individuals. A total of 68 written comments were received. These included 6 letters from organizations, and the remainder from individual industry stakeholders and concerned citizens. Eight public hearings were held; four were virtual and four were in-person. The total public attendance across the eight hearings was 214, though some individuals attended multiple public hearings. A total of 159 public comments were provided during the public hearings.

The following tables are provided to give the Board an overview of the support for each of the management options contained in Draft Addendum XXVII. Comment totals for comments provided during public hearings are organized by the hearing at which they were provided; some individuals attended hearings outside their home state. It should also be noted that some individuals provided comments at a public hearing and also submitted written comments, and these are counted separately in the tables below. Additional comments that did not indicate support for a particular option are included in the public hearing summaries and written comments. Prevailing themes from the comments are highlighted below, including general considerations and rationales for support or opposition.

Table 1. Total Written Comments Submitted to ASMFC

Total Comments Received	
Total Form Letters	0
Organization Letters	6
Individual Comments	62
Total Written Comments	**68**

Table 2. Public Hearing Attendance and Comments

Public Hearings	# Attendees	# Comments
ME 1	13	2
ME 2	41	11
ME 3	29	19
NH	16	9
MA 1	70	25
MA 2	35	26
RI	6	0
NY	4	0
Total	**214**	**159**

Table 3. Total Comments in Support of Each Option

Management Options	Written Comments	Public Hearings					
		ME	NH	MA	RI	NY	Total
Issue 1, Option A (Status quo)	35	3	0	35	0	0	**73**
Issue 1, Option B	13	0	1	2	0	0	**16**
Sub-option B1	3	0	0	0	0	0	**3**
Sub-option B2	9	0	0	0	0	0	**9**
Sub-option B3	10	0	0	2	0	0	**12**
Sub-option B4	5	0	1	0	0	0	**6**
Issue 2, Option A (Status quo)	40	20	8	38	0	0	**106**
Issue 2, Option B	5	1	0	0	0	0	**6**
Trigger Option 1	2	0	0	0	0	0	**2**
Trigger Option	0	1	0	0	0	0	**1**
Measures Option 1	0	0	0	0	0	0	**0**
Measures Option 2	2	0	0	0	0	0	**2**
Issue 2, Option C	4	3	0	0	0	0	**7**

Prevailing themes from the public comments on Addendum XXVII are summarized below.

General Considerations

- Regardless of support or opposition, a significant number of individuals expressed concerns about market impacts that would result from the proposed increase to the minimum gauge size in the US, while Canada is allowed to continue importing smaller lobster. The concern is that the US would lose the market share for chick lobsters to Canada, creating an unfair disadvantage to the US fishery. Many comments stated opposition to allowing imports of undersized lobster from Canada if the minimum gauge increase goes into effect in the US.
    - Concern that the addendum does not contain any analysis of the market impacts of a gauge increase, particularly the disparity that will be created between the minimum size in Canada versus the minimum gauge in LCMA 1.

- Across the hearings and comments, many expressed support for standardization of the v-notch definition and requirement, which have proven effective to protect breeding females. However, a significant number of comments expressed that a zero-tolerance definition is preferred to the proposed definition.
    - Many comments also thought v-notching should occur in all the LCMAs
    - A few comments noted that they could support the proposed increase to the LCMA minimum gauge size if a zero-tolerance definition were required for all areas
- Some comments did not identify a preferred option or preferred status quo for Issue 2 because they could have supported some of the proposed changes, but not all of them. For example, some supported increasing the minimum gauge size in LCMA 1 but not decreasing the maximum gauge size in LCMA 3 and OCC. The rationale for this was generally related to the greater projected stock benefit from the LCMA 1 minimum size. Comments that supported the maximum size decrease, but not the minimum size increase, generally favored the protection of larger breeding lobster because they have more eggs that are of better quality.
- There are concerns that the proposed changes are ill-timed and will hinder the lobster industry's ability to remain successful and economically viable due to compounded challenges to the fishery
    - The industry is facing extreme regulatory uncertainty due to future changes in regulations related to whale conservation efforts
    - Lobster prices, bait shortages, and fuel costs are affecting the fishery and should be accounted for
        - Mackerel regulations hinder ability to bait traps effectively
        - Fuel prices have risen
    - Concern that the proposed changes could result in a permanent loss of yield to the fishery
- Many individuals spoke to the fact that the OCC is a unique management area that needs more specific management and data
    - The proposed changes would not have a significant impact on the stock due to the relatively small contribution to overall effort and catch, but they would significantly harm the OCC industry
    - Because the OCC fishery has developed a niche market and relies on large hard-shelled lobster, the proposed maximum size decrease would cause a significant and direct financial loss to fishermen in the OCC
    - The current OCC management plan is tailored to meet economic needs and conservation interests
    - Changes would have a disproportionately negative impact on fishermen in the OCC because the cost of living in the area is so high compared to other areas
    - Many requested that more data be gathered from the OCC area before changes are made
- If gauge changes occur, some would prefer gradual changes but others would prefer a single change to the measures. Ample notice is needed (12 months) for manufacturers to supply new gauges.
- The trigger should be based on a longer moving average than three years, and/or should incorporate landings data
- Many expressed concerns that the indices used in the Addendum are not accurately representing the stock and the fishery due to sampling locations
    - Lack of targeted juvenile sampling in the Outer Cape area

    - Climate affecting the movement of lobster to deeper water and habitat availability within the range
- Concern over increased juvenile lobster consumption by increased groundfish and black sea bass populations
- Measures should apply to all LCMA 3 permit holders, regardless of stock fished or home port state
- More time should be allowed to further observe stock trends before any measures are implemented
- A few comments mentioned that offshore wind development will further hinder lobster industry through additional future regulatory changes
- A number of comments proposed other types measures to improve protection of the stock
    - A tiered licensing system with more traps for people who have been fishing longer, equal trap limits by zone, and permit buybacks
    - A 7" trap entrance ring size requirements as opposed to maximum gauge size changes in the offshore fishery
    - Consider restricting harvest of lobster from 5 to 5 ½" inches to allow more lobsters to reach larger sizes in Area 3 and OCC
    - The Commission could consider an increase in the vent size, rather than a gauge increase, to minimize potential market impacts and equity issues
- If gauge changes are implemented, there should be a sunset clause, or the ability to revert to previous measures if the trigger index increases

Rationales for Issue 1 Option A. Status Quo

- Concerns that changing measures will hurt the lobster industry and lobster population
    - For example, increased restrictions on commercial harvest
    - Financial strain caused by requiring new gear
- Belief that the current measures are working and do not need to be changed
- More research is needed to justify this proposed change
- Belief that standardization is not needed because it will not benefit the stock, only law enforcement

Rationales for Option B. Standardized measures to be implemented upon final approval of addendum

- Standardizing and increasing the strictness of v-notch requirements across all LCMAs will help the stock across the entire GOM
    - Support for mandatory v-notching and a zero-tolerance v-notching definition across all management areas
    - Belief that mandatory v-notching with a zero-tolerance definition has contributed significantly to the increase in abundance of the lobster stock
    - V-notching female lobsters and protecting oversize lobsters are core conservation values for lobstermen in LCMA 1
- Support for sub-option B3 (standard v-notch definition):
    - It is a problem that lobsters that have to be thrown back in one area can just be harvested in another
- Support for sub-option B4 (limiting issuance of trap tags to equal allocation):
    - States should not issue surplus trap tags unless trap loss is documented. This is very important to reducing lost and derelict gear, which is causing environmental problems.

If harvesters have to report lost traps to get a new tag, it is more likely that gear can be removed.
    - A small initial replacement allowance, that is less than the current 10%, would likely be easier to administer for states that do not already hold back replacement tags.
    - If approved, this measure would need to be enacted for all of LCMA3, which would require revision to NH, MA, RI, and NMFS's trap tag distribution procedures.
- There is some concern that v-notching is an unenforceable mandate, based on level of at sea participation

Rationales for Issue 2 Option A. Status Quo

- Market concerns regarding the proposed increase to the minimum gauge size, which would give the market share of smaller lobsters to Canada.
    - Concern that the addendum does not contain any analysis of the market impacts of a gauge increase, particularly the disparity that will be created between the minimum size in Canada versus the minimum gauge in LMA 1.
    - Unfair disadvantage to American harvesters and advantage for Canadian product
    - Opposition to allowing undersized lobster imported from Canada if minimum gauge change goes into effect in US
    - Opposition to any change to the LCMA 1 minimum gauge until a market study has been conducted to better understand the trade dynamics between the U.S. and Canada, impacts on demand, market segments, and boat price given that comparable gauge measures will not be adopted in Canada
- Massachusetts' commercial lobster fishery effort continues to decline through the loss of permits and the trap transfer tax, so pressure on the fishery is already being reduced
- The Outer Cape Lobstermen's Association supports status quo because the proposed changes would disproportionately harm the OCC fishermen due to the area's unique catch demographics, niche market, and high costs of living.
- Belief that the current measures are working and do not need to be changed
- Changing the measures will have a short-term negative impact on catch numbers but a long-term positive impact on catch weight
- A number of people believe current downward trends in juvenile indices are part of the lobster populations natural cycle, and are not grounds for changing the regulations already in place
- A number of comments stated that the lobster stock is in good condition and action is not yet needed or premature.
    - Some recognized that increasing the LCMA 1 minimum gauge size could help to expand overall lobster abundance, but it is not worth an overall change to the current fishery
- The reference timeframe for the trigger mechanism is too narrow

Rationales for Issue 2 Option B. Gauge and vent size changes triggered by a defined change in trigger index

- If the trigger mechanism is used, there was support for a change to minimum gauge size but would prefer a single change rather than multiple changes
- Support for implementing the minimum gauge size by 1/16" per year
- Support for measure increase in LCMA 1 and the decrease in LCMA 3
    - The proposed changes will increase the overall health of the stock

    - Proposed changes will increase overall poundage by increasing the average weight per lobster harvested
    - Proposed changes will bring a higher quality product to market, fetch a higher price, and provide more value to the marketplace
- The Atlantic Offshore Lobstermen's Association would support measures appropriate to the magnitude of documented recruitment declines, but opposes the proposed LCMA3 maximum gauge change because the conditions of the offshore stock and fishery do not warrant a permanent loss of landings

Rationales for Issue 2 Option C. Scheduled changes to gauge and escape vent sizes

- Increasing the measure as soon as possible will be better for the stock
- A gauge increase is essential for the fishery to remain viable in the years ahead
- The last gauge increase benefitted the stock, and we should act now while there is still time to reverse the trend

Lobster Addendum XXVII Public Hearing Summary

Freeport, Maine
March 7, 2023
13 Public Participants

Staff and Commissioners in Attendance: Caitlin Starks (ASMFC), Megan Ware (ME DMR), Kathleen Reardon (ME DMR), Blaise Jenner (ME DMR), Stephen Train (ME)

Public: Daniel Sawyer, Justin Papkee, Matt Gilley, Ray Waite, Allison Hepler, Nicole Ogrysko, Marianne LaCroix, Kara Morrison, Jeremy Willey, Donald Ulrickson, Hugh Bowen, Lewis Cameron, John Hathaway

HEARING OVERVIEW

- It was suggested that there should be studies on the economic impacts of the proposed changes.
- Several attendees agreed that there should be discussions with Canada to better align the minimum sizes for both countries, because if we increase the minimum gauge size Canada will still be able to harvest smaller lobsters.
- Attendees commented that they are seeing mature lobsters seems at smaller sizes now than they did in the past.
- One person asked if the effects of dumping excess bait from traps into the water in previous years has been considered. This practice has changed in recent years due to decreased bait availability and increased prices, so there is much less bait being added to the habitat as an additional food source.
- Several attendees suggested that the landings time series should be incorporated into the trigger mechanism, along with the survey time series.
- One attendee commented on a proposed management plan for lowering risks to right whales which would lower trap limits and create an adjustable trap limit depending on the annual pounds harvested per trap.

PUBLIC COMMENT SUMMARY

Lewis Cameron

- Supports status quo measures for Maine. Other states should decrease their maximum gauge size to the size in LCMA 1.
- Sees this action as Maine once again footing the bill for the lobster stock. Canada is capitalizing on our proactive management measures.
- Believes the data is flawed and does not include how cod are affecting the recruitment of lobster, and how throwing bait overboard affects lobster.

Jeremy Willey

- Does not prefer to change the measures, but of the two approaches he supports the trigger mechanism approach over scheduled changes to measures.
- Should be additional data sets considered as part of this action, including climate data, data on the bait amount and type thrown overboard, and landings incorporated.

American Lobster Addendum XXVII Public Hearings - Sign in Sheet

Atlantic States Marine Fisheries Commission

Freeport, Maine
March 7, 2023

-- PLEASE PRINT --

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Draft Addendum XXVII Public Hearing Summary

March 8, 2023
Maine (via webinar)
41 Public Attendees

Staff and Commissioners in Attendance: Megan Ware (ME DMR), Lorraine Morris (ME DMR), Kathleen Reardon (ME DMR), Pat Keliher (ME DMR), Tracy Bauer (ASMFC)

HEARING OVERVIEW

- There were several suggestions given by multiple stakeholders regarding the management options in Draft Addendum XXVII:
    - Would prefer to see a maximum gauge size decrease in LMA1 as opposed to a minimum gauge size increase.
    - The trigger index should be based on a longer average than the three highest years in the surveys (suggested using 10-year average)
- Several stakeholders opposed a gauge size change. Reasons provided included: not seeing a decrease in eggers or juvenile lobsters, not enough data collected from offshore waters, the timing is bad given the other pressures on the industry (whales, offshore wind).
- Commenters expressed strong concerns about continuing to allow 3 ¼" lobsters caught in Canada to be shipped and transported into Maine. They commented that Canada will be catching the lobsters Maine is throwing back and then selling them in Maine, negatively impacting local markets.
- Many commenters pointed to the impact of predation (cod, striped bass, black sea bass) as a reason why the young-of-year surveys have declined and wanted greater research on the impact of predation before action is taken.
- Several comments expressed concern about offshore wind and the negative impact that this will have on the lobster resource and Gulf of Maine habitat.

PUBLIC COMMENT SUMMARY

Jesse Roche - A sternman in Boothbay but grew up in Long Island Sound. Black sea bass (BSB) has been steadily moving north and we're seeing all sorts of baby lobsters getting eaten by BSB. This predation decimated Long Island Sound. ASMFC should be looking at the stomach contents a little closer to inform their decision in Gulf of Maine. Maine is starting to see BSB in traps.

Jason Joyce – I would like to see the trigger mechanism, if implemented, to be the highest option (45%) and would recommend that the trigger index be modified so that it is based on a 10-year average and that would slide along instead of being based off of the 3 highest years in the survey (2016-2018). I do support the decrease in the max gauge size in LMA3 and I would rather see a decrease in the max gauge size in LMA1 as an option instead of an increase in the minimum gauge size. This should provide benefit since large lobsters are bigger reproducers. I would also like to see ASMFC come out as opposed to offshore wind since it will destroy habitat, negatively impact larval lobsters and plankton, and create a web of cables which are electrified and will radiate heat into the Gulf of Maine. This will all negatively impact the lobster resource. Finally, I am completely opposed to allowing Canadian lobsters at 3 ¼" to continue to come into the states (by maintaining the 3 ¼" min gauge size in the federal plan). A gauge size change will cause our landings to come down and if the price doesn't reflect our sacrifice then that's not good. I'm opposed to allowing Canadian lobsters to fill the gap.

Chris Clark – I also support using a 10-year average for the trigger index instead of the 3-year average. I also think the federal trawl surveys should be included in the trigger index in addition to the state surveys. The amount of lobsters caught in federal waters has gone up so data from that area should be included. ASMFC should definitely address offshore wind and oppose it because it will damage the habitat. I would rather see a decrease in the maximum gauge size in LMA1 because it will have less impact on fishermen. I don't think there is a problem with the stock because I've seen a lot of juvenile lobsters. Regarding Canada, I don't think it is ok if they can import 3 ¼" lobsters; that will impact our bottom line if that were to happen. I'm also hearing friends see BSB in their traps and am concerned that the predatory fish aren't being looked at. We've been seeing more cod too. I also think the ventless trap survey should go deeper than 30 fathom.

Michael Dawson – I fish out of New Harbor. I am totally opposed to this change. We have seen lobsters move offshore. There is not enough science in deep waters to make this decision. What we see as fishermen should show ASMFC that there are plenty of lobsters offshore since we are fishing there year-round. This action is unnecessary, especially with all of the other issues going on such as whales, offshore wind, high costs of everything, low prices of lobsters. If we allow Canadian lobsters to keep coming in at 3 ¼" there will be no financial benefit to Maine fishermen and it will be a double whammy. We would take a big hit if Canadians can still import the smaller size.

Kate – I've heard that there is a seven-year slump in the industry and that seems to follow the data shown. The climate is always changing and this follows the seven-year slump. We also need to look at the migratory pattern of lobsters and the predators - there are so many cod and BSB now which need to be taken into consideration. In regards to MA and NH, all the states need to get on the same page for measures. We also need a baseline for a trigger index that is more than the three years of 2016-2018.

Sam Joy – I think we should lower the max gauge size instead of increasing the minimum gauge size. I think this addendum is potentially helpful but it is another stress on the industry right now given whales and wind. It is poor timing to do this. The data isn't all there to support this and we should focus on better funding for the ventless trap surveys to do more surveys offshore.

Jack Merrill – The fishing industry has been focusing on a lot of other topics recently and this has been in the background. I'm not necessarily opposed but there are a lot of questions that need to be answered first. There needs to be an extensive marketing study on the importance of chick lobsters to the market. For example, will a larger lobster drive down the price per pound? Are customers willing to accept a higher price for a lobster roll or a lobster on a plate since it will be bigger? Regarding lobsters coming across the border, we would want to guarantee that we wouldn't allow smaller lobsters to come across the border to take up that marketplace. Another question is a gauge size increase is expected to raise the weight landed but what percentage of lobsters will egg out in a smaller gauge size window? Will this result in no increase in the weight landed? We do not see any lack of v-notch lobsters on the bottom and I'm seeing a year class of lobsters that is 5-6 years away from the fishery which is big. And we have already seen an increase in smaller lobsters carrying eggs due to climate change. A gauge increase is not going to address global warming. Last summer we heard complaints from dealers that they couldn't handle the volume of lobsters. If this action is going to increase the volume of lobsters that might not be a positive for the fishermen. We had prices that were really scary last year. Finally regarding predation, changing the legal size could increase egg production but it doesn't guarantee the smaller lobsters will make it to legal size given higher predation.

Virginia Olsen – I don't agree with a change in our gauge until we investigate predation more. And I don't agree with allowing Canadians to bring the smaller catch into the US.

Tad Miller – I'm not necessarily against the gauge increase. But I agree with the comment about more data and the Canadians lobsters is an area of concern. Opening the door for Canada would affect our local markets. The biggest thing that concerns me is that there is parity between the LMAs. Maine is being asked to make a big sacrifice but other LMAs are going to see the benefit, especially LMA3. The sacrifice of each LMA needs to be more equitable. I think LMA3 needs to come down further on the maximum gauge size. They are a smaller part of the fishery but I feel like we are seeding their bottom for them. Regarding predation, that might be a reason to do the gauge size change.

Mike Walsh – I'm from Cape Cod Bay. We need to be equal across LMAs. The increases and decreases between the LMAs need to be proportional.

Timothy Holmes – The two biggest problems I have are for the baseline years in the trigger index you are taking outliers in the top three years. Those outliers should be thrown out of the average. And the index should be based on a longer average. And then a 32% decline from that type of trigger index is more reasonable. I'm not opposed to more conservation measures but why measure a decline from the top three years? I agree that these lobsters move all around and Canada is going to catch our lobster and then come to sell them in Maine. Nothing should be done unless Canada does the same. With all the whale regulations, there has been a lot of talk of future trap reductions. That is a conservation effort that should be taken into account.

March 8, 2023 - Maine Webinar Hearing Attendees		
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Draft Addendum XXVII Public Hearing Summary

March 9, 2023

Ellsworth, Maine

Staff: Megan Ware (ME DMR), Kathleen Reardon (ME DMR), Lorraine Morris (ME DMR)

Attendees: Robert Burke, Patrick Faulkingham, Jerome Briggs, Sherman Hutchins, John Renwick, John Temple, Virginia Olsen, Rand Beattie, Samantha Beattie, Bryan Bridges, John Williams, Judy Williams, William Anderson, Billy Bob Faulkingham, Tom Duym, Richard Smith, Jeff Libby Jr., Dean Beal, Roy Fagonde, Jim Hanscom, Jim Dow, Matt Knowlton, Kate O'Neal, Herman Faulkingham, Brian Jason Gordius, R. Todd Goodell, Colin Piper, Eric Beal, Joshua Beal

Overview:

- 16 commenters supported status quo on the LMA1 gauge size. Reasons given included: seeing different trends than what the surveys show, the lobster industry is facing too much adversity particularly from whale rules, and opposition to seeing gauge size changes as the only management tool.
- 3 commenters supported Option C on the gauge size, which includes breaking up the gauge size change into two steps and implementing the vent size increase at the end. There were suggestions that implementing a gauge size change in June would minimize impacts on fishermen.
- Several fishermen (both for and against) expressed concerns about market impacts of a gauge size change, particularly in regard to Canadian lobsters.

Public Comments:

Richard Smith (Beals, ME) – I support status quo. Is there a reason that the vent size needs to go bigger? I don't think the vent increase is necessary. There is enough discrepancy between our vent size now and our current minimum gauge size. We are regularly trapping lobsters over 3 3/8" as is.

John Williams (Stonington, ME) – I'm thankful that the ASMFC is managing lobsters and not NMFS. I like Option 3 (Option C) and if you do it in two steps and do the gauge increase late in the season such as June, we will never know. And I support not doing the vent increase until the end. We don't want to handle lobsters if we don't have to. Predation is another reason to do this. We lived through the last gauge size increase, and we will live through this one.

Jonathan Renwick (Birch Harbor, ME) – I support status quo. There are several issues here, including predation. I am really worried about the wind mills in the future and that will affect where everyone will fish. And there will be an impact on the lobsters from the sonic boom. Lobsters are very reactive to waves and noise in the water and if we blind the antennas, what will happen? When we had the earthquake, the lobsters disappeared for a bit. It is going to be the same with the windmills.

Bill Anderson (Trescott, ME) – I'm speaking in favor of Option 3 (Option C) which would increase the gauge in two steps with a vent increase at the end. I'm speaking in favor but I hate the thought of increasing gauges and wish there were other options. I'm concerned about what this will do to the markets. What about shipping lobsters overseas? I generally speak in favor because of the changing

conditions we have. We had basically no winter in Maine this year. Our water temperature only made it to 40°F and it used to go into the 30's. I'm hearing that the Labrador current is dying out and that is increasing out water temperature. We have to be ready for everything that is changing.

Bob Burke (Sedgwick, ME) – I support status quo. I'm concerned because in a meeting a few weeks ago we were talking about a 6-year extension but also the need to get things done now. It sounds like they have made up their minds. There is no fairness here. There are only three things that cannot be hidden – the sun, the moon, and the truth. My criteria are to look for the truth. I have read a lot of the species assessment reports. Averaging is a statistical golden rule, and you don't grab three great years and say we need to cut down from there. That means you never want to have a great year. Every fisherman, every family member, every buyer depends on this fishery being successful. And there has been 15 years of beating the hell out of the lobster fishery. It's because they are disproportionately successful. You should ask the fishermen for the data. The knowledge is out here in the audience and not on the screen. Ignorance is defined as the lack of knowledge. All you need is the willingness to learn, and someone will teach you. We also need some money in the budget for more sea sampling so we can have more daily and honest data.

Kate O'Neal (Deer Isle, ME) – I support status quo. I don't feel like you have a constant and a variable here. Every time we make a law change, that is a new variable. For example v-notching could have caused a change. Is that a variable? Have you used the migration paths of lobsters? Are those variables taken into account? There are more variables here and its not clear what is your constant.

Jim Dow (Bass Harbor, ME) – I support the third choice (Option C) and I agree with John Williams. We should make the change in June, and we wouldn't see harm. I am very concerned about the market and Canada filling in the market, but the bigger concern is for folks who fish in the grey zone. The Canadian fishermen there are going to take those lobsters that we throw over.

Jeff Libby (Beals, ME) – Status quo. We've been here for 10 years. I wish our comments really mattered. You're going to do whatever you want. I've written down the data every day in books. I don't understand your logic. I might be young, but I've been doing this and I want me kids to do this and its going downhill. No one cares. I wish people would listen.

Virginia Olsen (Stonington, ME) – I support status quo and my reason is that we have a very short time to come into compliance with the NOAA right whale regulations. If we have 5 years left and we know from the TRT it is looking like we are going to end up with 400 traps in 2028 and additional closures. How does that impact settlement? How will the existing LMA1 offshore closure or future closures impact this? If we haven't evaluated what our future fishery will look like 5 years out, I don't think we should move forward with a gauge size change now. This is an ASMFC Addendum change, but the original motion came from Pat.

Jim Hanscom (Bar Harbor, ME) – I support status quo and I agree with what Virginia Olsen said. We are facing so much adversity and a lot of unknowns with the whale rules. I think we can leave this alone. I still will insist that before Maine changes our regulations, everyone else should come to our standards. I think that should be the priority.

Herman Faulkingham (Winter Harbor, ME) – I support status quo. A multistate board of unelected bureaucrats should not be regulating fisheries on a state level. If you are going to regulate us, then you need a better plan. We need hatcheries. We are facing adversity from other regulations like a decrease

in traps. Status quo on the gauge will work. There is no need for a gauge change or vent change. It is not the right time. This is being decided by people who don't have the expertise.

Patrick Faulkingham (Winter Harbor, ME) – I agree with everything Herman Faulkingham just said and status quo. A gauge size increase is the only option?! We need other options and we need hatcheries. We had hatcheries producing thousands of baby lobsters. I don't agree with any of this.

Billy Bob Faulkingham (Winter Harbor, ME) – I am with the Maine Lobster Union and am a State Representative. I am in favor of status quo. If they start looking at a plan, then we should push this off for three years before implementation. We should be looking at historical averages instead of starting the graph off at the three record years. In the 1990's, 70 million pounds was the record catch. So we should be looking at 70-80 million pounds for the trigger level. My other concern is equity with Canada and the other states. The v-notch should be across the board and set up in a compact with Canada and the other states. And if we are going to change the gauge sizes, we should be talking about a compact with Canada on the size of lobsters. We are really good at screwing over US lobstermen for the Canadians. This makes just a much sense as the whale regulations. This is another example of us getting regulated out of business and Canada is going to benefit. This has happened with shrimp and halibut. Why continue to not let us fish? Any plan needs equity with Canada. And I urge status quo for the next three years.

Wayne? (Beals, ME) – I support status quo. I've been in the lobster business 60 years. I've been involved with shrimp, scallops, lobsters, quahogs. Years ago, I talked to someone walking along the Maine highway running for senate about a research paper on offshore factory boats. They were harvesting everything in the ocean and none of the remnants were being sent back into the oceans. When we gillnet, we catch fish but we leave some behind. My comment to the guy was we have a problem because there are no remnants of living organisms going back to the ocean. That was how we got MSA. Since then shrimping has disappeared. But we just can't panic. If we do, we might do one thing right but four things wrong. Look at the quahog business; that was the biggest industry to hit Downeast Maine. How many people are dragging quahogs now? I don't want the lobster fishery to go like the quahog fishery. Scares me when you do the landings stuff. They say statistics don't lie but liars use statistics. When this addendum gets into politics we are going to get buried. And what are we going to do Downeast? We have to do something because we cannot survive the way things are going. It's going to be Canadian lobsters that we are competing with. If you mess with markets, Canada will control the markets. And we can't compete with Canada on minimum wage. We saw a pay increase immediately with Trump and we aren't getting that help anymore. The idea of basing things on statistics scares me. We had two sheddings last year in our lobster pound. Climate change is the answer to everything now. I hope people listen to the fishermen. We can't panic.

Richard Goodell (Bar Harbor, ME) – I support status quo.

John Temple (Gouldsboro, Maine) – I support status quo.

Jason Gordius (Bass Harbor, ME) – I support status quo. I disagree with the trawl survey and your information. Things change and we are better at adapting to this change. If it doesn't work out, we move. You guys go by a set point each year. Things change and you need to change too. You'll never see what we see. All fall we throw back short lobsters. I'm see more oversized lobsters. More people are fishing offshore because the bays didn't produce this year. The landings aren't going to be right. You

don’t see what we see. It’s not what is on the graph. I disagree that ASMFC controls Maine lobster. 15 states shouldn’t control Maine.

Sherman Hutchins (Deer Isle, ME) – I support status quo. For the ventless trap survey, anyone who signs up is trapped to a certain box/area to set the gear. They are told where they can put the traps. If you went out to 42 fathoms (instead of 30 fathoms) you would have very different data. People who sign up for the ventless trap survey should be allowed to adapt because everything moves.

Jerome Briggs (Sullivan, ME) – I support status quo.

American Lobster Addendum XXVII Public Hearings - Sign in Sheet

Atlantic States Marine Fisheries Commission

Ellsworth, Maine
March 9, 2023

-- PLEASE PRINT --

Name	Organization	City, State	Email
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Roy Fayonbe	Fisherman	Jonesport, ME	
Jim Hanscom	Fishermen	Bar Harbor	CAPTCOLIE@MYFAIRPOINT.NET
Jim Dow	Fishermen	Bass Harbor	
Matt Knowlton	Fisherman	Deer Isle	Knowlton.Matt3@Gmail
Kate O'Neal	fisherman	Deer Isle	mytoday4210.@yahoo.com
Herman Farl Kingsbury	Fisherman	winter Harbor, ME	
Brian Jason Gordius	Fisherman	Bass Harbor	
R. Todd Goodell	fishermen	Bar Harbor	
Colin Piper	Fisherman	Hancock	Colinpiper04@gmail.com
Eric Beal	Fisherman	Milbridge	
Joshua Beal	Fishermen	Milbridge	

American Lobster Addendum XXVII Public Hearings - Sign in Sheet

Atlantic States Marine Fisheries Commission

Ellsworth, Maine
March 9, 2023

-- PLEASE PRINT --

Name	Organization	City, State	Email
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Jerome Briggs	Fisherman	Sullivan	
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JOHN WILLIAMS	MLA FISHERMAN	STONINGTON, ME	KITTISTYMICHELLE@YAHOO.COM
JUDY WILLIAMS		"	
W. Wallace Snider	Fisherman	Trescott ME	NA
Billy Bob Faulkingham	Fisherman/legislator	winter Harbor	billybob518709@msn.com
Tom Duggan	Maine Center for Coastal Fish	Lamoine	tduggan@coastalfisheries.org
Richard Smith	Fisherman	Pals, ME	fvboatbehavior1962@yahoo.com
Jeff Libby, Jr.	Fisherman	Pals, ME	

Lobster Addendum XXVII Public Hearing Summary

Portsmouth, New Hampshire
March 8, 2023
16 Public Participants

Staff and Commissioners in Attendance: Caitlin Starks (ASMFC), Cheri Patterson (NH), Dennis Abbott (NH), Doug Grout (NH), Renee Zobel (NHFG), Lt Delayne Brown (NHFG)

Public: Bobby Nudd, Pete Flanigan, Mike Flanigan, Jeff Riccio, Lou Nardello, Ward Byrne, Erik Anderson, Joshua Ford, Vincent Prien, Jim Titone. Pete Flanigan, Andrew Koncheck, Lucas Raymond, Ritchie White, Heidi Henninger

HEARING OVERVIEW

- Some attendees mentioned seeing many egg-bearing lobster under the minimum size, when they did not see those in the past.
- Three attendees commented that the v-notch definition should be standardized to zero tolerance, rather than 1/8" with or without setal hairs under Issue 1, Option B.
- Several attendees agreed that the increase in the vent size proposed would be much more detrimental to the industry than the proposed minimum gauge size increase.
- One attendee asked for a poll of the attendees to determine support for status quo versus changing the management measures. By show of hands, eight attendees supported status quo, and one attendee supported some changes.
- One attendee raised concern about water quality.

PUBLIC COMMENT SUMMARY

Bobby Nudd

- Regarding Issue 1, Option B, Sub-option B3, he would prefer to see the v-notch definition standardized to zero tolerance than 1/8" with or without setal hairs.
- In favor of Issue 1, Option B, Sub-option B4 for because it will eliminate abuse and help enforcement.
- Concerned that increasing the minimum size could decrease the marketability of lobster because some people will not be able to afford the larger lobsters.

Ward Burn

- The change in the escape vent size in LCMA 1 to 2" will be detrimental to the industry and will result in a dramatic drop in landings.
- Right now the lobster industry is under the gun from wind development, and whale risk reduction efforts, so this will hurt the industry.

Pete Flanigan

- Supports a standard v-notch possession definition of zero tolerance across the LCMAs in the stock.
- Supports Issue 2, Option A status quo for gauge and vent size. The 2" vent would be devastating to the industry.

Michael Flanigan

- Supports Issue 2, Option A status quo for gauge and vent size.
- Agrees that the standard v-notch possession definition should be zero tolerance

Vincent Prien

- The proposed vent increases will be the most disastrous part of this. It will have the most impact on catch. The industry might be able to survive the other measures but not the vent increase.

Josh Ford

- Supports status quo
- Concerned about the economic impact of increasing the minimum gauge size. People will not buy the larger lobsters. He thinks it will also drive down the permit value. More economics need to be considered.

American Lobster Addendum XXVII Public Hearings - Sign in Sheet

Atlantic States Marine Fisheries Commission

Portsmouth, New Hampshire
March 8, 2023

– PLEASE PRINT –

Name	Organization	City, State	Email
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Jeff Riccio	NEYFC	Seabrook, NH	jeff.riccio@yahoo.com
[illegible]		Seabrook NH	
Ward Byrne	Lobster	Portsmouth	[illegible]
Bobby Nudd		Hampton NH	
Erik Anderson	NHCFA	Ports NH	ANDY 42152@aol.com
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Joshua Ford		Ports, NH	f.v.gib@hotmail.com
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Heidi Henninger	AOLA	Dover NH	heidi@offshorelobster.org

Draft Addendum XXVII Public Hearing Summary

New York Webinar Hearing
March 14, 2023
4 Public Attendees

Staff and Commissioners in Attendance: Caitlin Starks (ASMFC), Madeline Musante (ASMFC), John Maniscalco (NY DEC), Christopher Scott (NY DEC), Jim Gilmore (NY DEC), Maureen Davidson (NY DEC), Jesse Hornstein (NY DEC),

HEARING OVERVIEW

No comments were provided.

March 14, 2023 - New York Webinar Hearing Attendees		
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John	Whittaker	whittboat@comcast.net

Draft Addendum XXVII Public Hearing Summary

Massachusetts Webinar Hearing
March 15, 2023
70 Public Attendees

Staff and Commissioners in Attendance: Caitlin Starks (ASMFC), Madeline Musante (ASMFC), Emilie Franke (ASMFC), Daniel McKiernan (MADMF), Tracy Pugh (MADMF), Matt Bass (MADMF), George Davis (MADMF), Robert Glenn (MADMF), Derek Perry (MADMF), Story Reed (MADMF), Anna Webb (MADMF), Sarah Ferrara (MA), Sarah Peake (MA), David Borden (RI)

HEARING OVERVIEW

- The majority of comments were in favor of the status quo option under both Issue 1 and Issue 2
- Two were in favor of Issue 1, Option B, with sub-option B3
- Many of those who commented had concerns that the sampling used for the proposed trigger index were not representative of the Outer Cape Cod area. In particular they noted that there is no suction sampling for lobster settlement in the Outer Cape area. Staff responded that habitat in that area is not very suitable for settlement.
- Several comments expressed concern about standardizing the v-notch definition to 1/8" and would prefer it be standardized to "no tolerance" because Area 1's v-notching requirement and zero-tolerance definition is a beneficial conservation measure
- Two people commented that they would support a minimum size increase in LCMA 1, but no change to the maximum gauge size in OCC and LCMA 3

PUBLIC COMMENT SUMMARY

Grant Moore, LCMA 3

- The percentage of large lobsters caught in SNE was minimal compared to lobsters caught in eastern part in Area 3
- Instead of maximum gauge size decrease, suggested a maximum ring size for parlor rings. Taking the maximum gauge size down to 6" would take away a 4-month fishery in the winter time.
- No comment on sub-option B1, and neutral on sub-option B2
- Supports sub-option B3 for standardizing the v-notch definition
- Does not oppose sub-option B4
- Does not support a maximum gauge decrease for LCMA 3 and OCC. It will be detrimental to all fishing in the eastern part of Area 3, and the economic impact has not been sufficiently studied.

Brendan Adams, President of Outer Cape Lobster Association

- The only reasonable option is Option A for both issues
- The standardization options seem to be only for law enforcement's benefit
- Data in this addendum is derived from Area 1 and 3 and is not accurate for OCC
- Large lobsters are estimated to be 25% of the OCC current landings and income. If the maximum gauge size is decreased, landings and income will go down by at least 25%. This loss is critical for our area because the cost of living here is much more expensive than other areas like coastal Maine.
- OCC lands less than 7% of all MA lobster, and OCC has nowhere near the impact of other areas
- Ventless trap surveys should occur in the Outer Cape, and we need to have hard data for OCC before making decisions for our area

John Todd

- Issue 1: would like to see v-notch definition standardized to the 1/8" definition because it will be easier for fishermen and enforcement. Zero tolerance is hard to deal with because it is a bit of a gray area.
- Issue 2: Supports Option A, status quo. The way things are is fine. Done a good job as an industry.
- Concerned that the economic conditions are currently difficult, and things will just keep getting more expensive. Fishermen did not make a lot of money last year. Additionally, dealing with whale rules, COVID, and international market impacts, there is a lot of strain on this industry.
- The proposed minimum gauge increase would result in a lot fewer lobsters being caught because much of what is caught just makes the current gauge.
- There are a lot of factors behind the decline, like pressure on the species by codfish, and lobster moving due to water temperatures.
- For OCC the max gauge is important and everyone will be affected by the financial impact.
- It should be considered that the number of active license holders every year has declined, meaning less gear in the water, and there is already less pressure on the resource.

Sam Pickard, Vice President of the Outer Cape Lobster Association

- Supports Option A, status quo for both issues.
- OCC has a relatively small number of harvesters; only 63 harvesters in OCC vs over 1,000 in all of MA. The number of tags per permit is also below what the state permit allows.
- Costs to fishermen for other issues (whales) are already very high, and if this addendum goes through it will severely damage the industry.
- Need for more independent data sources, and data specifically for the OCC area.
- ASMFC and states should have in person hearings in the future because there are too many technical issues with the webinar hearings.

Jeff Souza, OCC

- Supports Option A for both issues
- The current OCC management plan is working, with a higher minimum gauge than other areas and a trap tax.
- Would have supported Option E before it was changed to Option C (i.e., scheduled changes for LMA 1, but no changes to LMA 3 and OCC).
- Thinks we should make the change that would have the most impact first (i.e., raising the LCMA 1 minimum gauge size) and see what happens.

Steve Budrow, LCMA 1

- Not opposed to a minimum gauge increase
- Does not understand standardizing the v-notch definition to 1/8" for all areas. V-notching is Area 1's biggest conservation effort. Area 1 is v-notching lobsters, and the other areas are keeping them. All LCMAs should be zero tolerance.

Stephen Pickard, OCC

- The management plan for OCC should stay status quo

Olivia Stewart, OCC

- Supports status quo for all issues
- Concerns about the lack of data for OCC

William Bartlett, LCMA 1

- Supports status quo for LCMA 1
- There is too much uncertainty in the market.
- Does not want to give up the market for the smaller lobsters to Canada

Brandon Patterson, OCC

- Supports status quo only for all issues
- Taking away larger lobsters for OCC will devalue the permit in a drastic way

Ben Pickard, OCC

- Agrees with others in OCC that status quo is only reasonable option.
- Canadians can still keep lobsters above our below our legal sizes, so the gauge size changes will not help law enforcement

Chris Pickard, OCC

- Supports status quo only

Eric Lorentzen

- This action should be tabled until after the whale rules are finalized, because the whale rules will have conservation value for the lobster stock
- Increasing the minimum and decreasing the maximum gauge size will put American in a narrow box. Canada will be able to out-compete us in the market.

Faye Anderson and Brock Bobasank, OCC

- Support Option A, status quo and agree with others from OCC

Jeremy Loparto, OCC

- Supports status quo on both issues and agrees with other comments from OCC area
- The current OCC management plan is working, and we need studies to prove that

Jim Bartlett, LCMA 1

- Supports status quo for LCMA 1
- Thinks the v-notch possession definition should be zero tolerance. Does not want to see us go backward on this conservation measures.

Mike Goodwin, LCMA 1

- Agrees that the v-notch definition should be zero tolerance. LCMA 1 has done a lot of work with v-notching and does not want to see it change.
- Suggested that a hole punch could be used for more enforceability if that is the issue.

Ryan Brown

- Agrees that the v-notch definition should be zero tolerance, 1/8" is too big.
- Prefers status quo under issue 2, because a minimum gauge increase will cause a lost market to Canada

Mike Bartlett, LCMA 1

- Supports status quo
- We should not increase the v-notch or the minimum gauge size. Losing the competitive advantage to Canada will hurt Area 1 as a whole and Massachusetts.

Garrent Loparto, OCC

- Supports status quo

- Families in this area are built around the current management plan.
- If the state needs help getting information for OCC, they should ask the lobster fleet for help.

Damian Parkington, LCMA 1

- Supports status quo for both issues
- A standard v-notch definition of 1/8" will undermine benefits from a gauge increase

Sean Leach, OCC

- Supports status quo for all OCC measures.
- There is a high cost of entry for this fishery, and short window.

Ryan Drohan, LCMA 1

- Agrees with Jim Bartlett, that we should not go backwards on the v-notch. After we switched to zero tolerance in LMA 1 the catch numbers have been great and it worked.
- Could survive a gauge increase if we have to, but prefer status quo.
- Want to see more at-sea sampling from DMF, and ventless trap surveys, to align with what we're seeing day to day on the water in different areas at different times of the year

Glen Fernandes, OCC

- For Issue 1, supports status quo because the proposed actions under Issue 1 will not really help the stock.
- For Issue 2, table action on this issue until there are options that would improve SSB but also preserve the OCC fishery. None of the options currently would maintain the maximum size for OCC and LMA 3. Would have supported option E before it was changed.
- Wants to ensure a sustainable fishery, but the best way to do that is to increase the minimum gauge size in LCMA 1.
- Concerned about Canada still being able to supply 3 ¼" lobsters to the US

Michael O'Brien, OCC

- Supports status quo for both issues

Raymond Joseph, OCC

- Supports status quo for both issues and agrees with other comments on the OCC issues

March 15, 2023 - Massachusetts Webinar Hearing Attendees		
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Draft Addendum XXVII Public Hearing Summary

Massachusetts In-Person Hearing
March 29, 2023
35 Public Attendees

Staff and Commissioners in Attendance: Daniel McKiernan (MADMF), Tracy Pugh (MADMF), Matt Bass (MAMEP), Robert Glenn (MADMF), Story Reed (MADMF), Julia Kaplan (MADMF), Kerry Allard (MADMF), Raymond Kane (Chairman of DMF's MFAC), Chris Markey (MA), Sarah Peake (MA), Sarah Ferrara (MA)

HEARING OVERVIEW

- The majority of comments were in favor of the status quo option under both Issue 1 and Issue 2
- Many of those who commented had concerns that the sampling used for the proposed trigger index were not representative of the Outer Cape Cod area. In particular they noted that there is no suction sampling for lobster settlement as well as ventless trap surveys in the Outer Cape area.
- Several comments expressed concern about standardizing the v-notch definition to 1/8"
- There were a couple of comments of concern about not the non-reversible nature of the trigger index (no option to go back to regulations the way they were if conditions improved).

PUBLIC COMMENT SUMMARY

Brendan Adams, OCC – speaking on behalf of the Outer Cape Cod Lobster Association

- Support for status quo on both issues
- Against standardization of lobster regulations
- Would like to see more data collected in regard to YOY lobsters, including ventless trap surveys on the Outer Cape.
- Expressed concern over loss of income due to new regulations especially with an increased cost of living.
- Expressed concern over loss of permit value due to decreased landings that will occur if status quo is not chosen
- Expressed concern over the decline of lobster permits issued for OCC

Dana Pazolt

- Wanted no lobsters landed in MA during the closed season

Chris Markey, state rep and Atty. for Outer Cape Cod Lobster Association

- Putting regulations in place will reduce catch for local lobstermen and ultimately effect local businesses including local banks that have invested in the lobstermen's permits and boats
- Advocated for status quo measures

Garrett Lopardo, OCC

- Expressed concern over loss of trap tags related to the 'transfer tax' where 10% are removed with tags transferred to the new owner. He stated if measures were implemented then the trap tags lost due to partial transfers should be given back.
- Wanted DMF to consider predation as a reason for the reduction in YOYs

Sam Pickard, OCC fishermen and speaking on behalf of OCC Lobstermen's association

- Expressed frustration over time-period closures and the loss of revenue attributed to the closures
- Questioned the validity of the data used for the stock assessment and asked for better data from Outer Cape
- Expressed frustration over a portion of permit funds being allocated to ventless trap surveys when the outer cape is not included in the ventless survey.
- Expressed support for status quo

Edward Wiessmeyer, LMA1

- Wants DMF to consider re-open lobster hatchery

Mike O'Brien, OCC

- In support of status quo

Tyler, marine biology graduate from Outer Cape

- Would like to see error bars on the graphs
- Expressed concern over uncertainty in data

John, OCC

- Advocated for ventless surveys on the Outer Cape and expressed concern over the validity of the data
- Supported status quo measures only

Brendan Patterson, OCC

- Is in support of status quo and doesn't want anything changed without more data

Sean Leach, OCC

- 2-4% loss in landings would be drastic in regard to income
- Expressed concern over feasibility of running a business with regulation changes
- In support of status quo

Jeff Souza, OCC

- Status quo for issue 1
- Wants an actual definition for v-notch
- Status quo for issue 2
- Advocated for one change and then see what happens to know what is working what isn't

Steve Pickard, OCC

- Wants ventless trap survey used in outer cape, gaps in data
- Supports status quo due to lack of data from outer cape

Chet Piccard, OCC

- Believes his landings will drastically decrease if regulations were to be implemented
- Hard shell lobster is primarily caught on OCC and more capable of being shipped
- Advocated for status quo

Chris Pickard, OCC

- Advocated for status quo

Arthur Pickard, OCC

- Advocated for data on the outer cape

Ben Pickard, OCC

- Advocated for status quo
- If any measures were taken, one aspect should be taken at a time considering livelihoods are at stake

Steve Smith, OCC

- Proposed getting rid of v-notch rule completely
- Status quo for OCC
- Change in options to eliminate v-notching, increase minimum size and get rid of maximum size

Fred Penney, Boston Harbor

- One size doesn't fit all and measures implemented should reflect that. Measures that would work for OCC won't work for LMA1
- Increase in gauge size would be detrimental to Boston lobstermen
- Did not see the point in an increased vent size with increased gauge size

Eric Meschino, LMA1

- Not for status quo
- Reduce gauge size and get rid of oversize all together

Eric Lorentzen, LMA1

- Support for status quo

Jim Bartlett, LMA1

- Status quo

Mike Malewicki, Beverly

- Status quo

Dave Casoni, LMA1

- Status quo

Peter Kandrick, Sandwich, MA

- Agrees with Eric Meschino, if climate is changing and the fishery won't be viable then the lobstermen should be able to fish as is

Mike Polisson, LMA1

- Wants status quo
- Does not think data goes back far enough and is concerned about the economic impacts

March 29, 2023 - Massachusetts In-Person Hearing Attendees			
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Mike	Malewicki	Beverly, MA	
Peter	Kendrick	Sandwich, MA	
James	Kendrick	Sandwich, MA	

Draft Addendum XXVII Public Hearing Summary

Rhode Island Webinar Hearing
March 16, 2023
6 Public Attendees

Staff and Commissioners in Attendance: Caitlin Starks (ASMFC), Madeline Musante (ASMFC), Corinne Truesdale (RIDEM), Scott Olszewski (RIDEM)

HEARING OVERVIEW

- One attendee asked a question about impacts on recreational lobster fishing related to right whale regulations.

PUBLIC COMMENT SUMMARY

No comments were provided.

March 16, 2023 - Rhode Island Webinar Hearing Attendees		
First Name	**Last Name**	**Email Address**
Thomas	Achterberg	tra44@cox.net
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April 5, 2023

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Dear Caitlin,

I'm writing as a representative of the Atlantic Offshore Lobstermen's Association to provide comments toward Lobster Draft Addendum XXVII. Generally, the Association supports actions that will increase the resiliency of the Gulf of Maine/Georges Bank (GOM/GBK) lobster stock and encourages the Lobster Board to move expeditiously to approve options that appropriately address the worrying trends in recruitment indices. Draft Addendum 27 is six years in the making and includes options that, if selected, would not be fully implemented for another five years. While the Board needs no reminder of the consequences of insufficient and delayed action in Southern New England (SNE), to put a fine point on it in SNE young-of-the-year (YOY) indices began to decline five years before the precipitous landings decline. In the GOM, YOY indices have shown unfavorable conditions for the last nine years and landings have been declining for six years.

Below I provide comments specific to the options proposed for LCMA3. If measures are implemented in the area, the Association supports the Draft Addendum's position that measures would apply to all LCMA3 permit holders, regardless of stock fished or home port state.

Related to Issue 1, measures to be standardized upon final approval of the Addendum, the Association encourages the Board to select the action option, Option B. Specifically:

Sub-option B1: No comment, given that this sub-option would not impact LCMA3.

Sub-option B2: The Association takes a neutral position on this sub-option. However, it should be noted that a portion of LCMA2 falls within the GOM/GBK stock and current LCMA2 regulations are inconsistent with the proposal for this sub-option. Therefore, as written, sub-option B2 would not standardize a v-notch requirement across the stock area. It is also important to note that v-notching is an unenforceable mandate, so the conservation value of this proposed measure would be dependent on the level of at sea participation.

Sub-option B3: The Association supports standardizing the v-notch definition. If approved, this would create a standard definition across all seven LCMAs in both state and federal waters.

Sub-option B4: The Association does not oppose this sub-option, however a small initial replacement allowance, that is less than the current 10%, would likely be easier to administer for States that do not already hold back replacement tags. If approved, this measure would need to be enacted for all of LCMA3, which would require revision to NH, MA, RI, and NMFS's trap tag distribution procedures.

Related to Issue 2, measures to increase protection of spawning stock biomass (SSB), the Association encourages the Board to select an action option that is appropriate to the magnitude of documented recruitment declines and is implemented without undue delay. That said, the Association opposes the proposed LCMA3 maximum gauge change, reflected in various forms in the Issue 2 sub-options, because we don't feel the conditions of the offshore stock and fishery warrant a permanent loss of landings.

Currently, LCMA 3 landings include a broad range of lobster sizes, unlike the inshore and nearshore lobster fishery which is recruitment-driven (Draft Addendum XXVII, Appendix B). The LCMA3 fishery exhibits the characteristics of a resilient stock with no growth overfishing, a fishing mortality rate eight times lower, and landings 30 times smaller than in LCMA1[1]. The proactive measures taken LCMA3-wide in response to the SNE collapse established the existing maximum gauge in 2008 (Addendum XXI) and increased the minimum gauge in 2012 to 3 17/32", which is above L50 (Addendum XXVII). Conversely, the LCMA1 minimum gauge last changed in 1989, an action that predates the ASMFC's interstate fishery management plan. LCMA3 has also reduced effort, as measured by allocated traps, by ~50% since 2002, when historic participation was enacted in the limited access fishery.

As noted by Bob Glenn, Deputy Director MADMF, in a 2021 letter to the Addendum's Plan Development Team, the analysis in Draft Addendum XXVII Appendix B is based on the relative size of landings in each fishery and indicates:

> *"…that a maximum size of 6" in LMA3 would result in an 8% increase in SSB per recruit, and a minimum size of 3 3/8" in LMA1 would result in a 38% increase in SSB per recruit. What this means in rough absolute terms (using 2018 landings) is 8% of roughly a 4,400,000 lb. exploitable biomass in LMA3, versus 38% of roughly a 130,000,000 lb. exploitable biomass in LMA1... In absolute terms the options in the addendum for LMA3 and LMAOCC will only have a fractional, if not immeasurable, impact on increasing stock wide SSB."* Mr. Glenn further notes that decreasing the maximum gauge in LCMA3 would provide only *"…extremely modest gains in spawning stock biomass at the expense of permanent loss in yield to the fishery".*[1]

The Association firmly opposes decreasing the maximum gauge in LCMA3 as part of this Addendum. However, if future indices warrant additional action, we encourage the ASMFC to evaluate, as a follow-on Addendum, either a ¼" decrease of the LCMA3 gauge or a 7" trap entrance ring requirement. Entrance rings select which sized lobsters can access the trap, so it is a valid approach to protect large individuals and reduce trap cannibalism and discard mortality.

Thank you for the opportunity to comment.

Heidi Henninger
Deputy Director

[1]9/17/21, Bob Glenn, MADMF as representative of the PDT "Draft Addendum XXVII on Gulf of Maine/Georges Bank Resiliency" memo to Caitlin Starks

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Also Admitted in Maine

April 8, 2023
Via Email: comments@asmfc.org

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Re: Lobster Draft Addendum XXVII

Dear Ms. Starks:

Please accept these comments on behalf of Little Bay Lobster ("LBL") of Newington, NH and its affiliated companies. [1] For the following reasons, LBL contends that the proposed measures are unnecessary at this time, scientifically unsupported, premature in light of the upcoming population assessment and ill-timed given other pressures the American Lobster Fishery is facing.

The Proposed Measures Are Ill-Timed Given Other Issues Facing The American Lobster Fishery

The American Lobster fishery is facing an existential threat, and anything that reduces fishing earnings now is ill-timed in light of the existential threat facing the lobster fishery in light of recent developments involving north Atlantic right whales.. In litigation in Washington, Judge Boasberg has declared the current Biological Opinion under which the fishery was operating was not legally sufficient,. If vacated, the American Lobster fishery would then be in violation of the ESA and MMPA and could possibly be shut down. Judge Boasberg initially suggested that he might order NOAA to update the BiOp and bring the fishery into compliance by December of 2024. NOAA has asserted that the only method by which it can currently achieve the required Negligible Impact Determination to bring the fishery into compliance is through implementation of ropeless gear, which the Agency states cannot be implemented prior to 2030. In effect this would lead to a presumptive closure of the lobster fishery in 2024, a sundown provision, unless the Court amended its decision prior to December 2024.

[1] Little Bay Lobster and its affiliates constitute the largest single harvesting group in LCMA 3, comprised of 14 harvesting vessels, and is one of the largest lobster dealers in the Northeast.

The provisions of the Omnibus Budget Act of 2022 have given some relief from the Boasberg Decision, by deeming the fishery in compliance through 2028, which will require NOAA to implement new rules prior to then, still short of when NOAA predicts it can implement its preferred method of ropeless gear. At present, the only other option is widespread closures. Either of these options will severely limit fishing effort and reduce profitability at a time of substantial uncertainty as to the future of the fishery and should not be implemented at this time.[2]

In the face of these obvious harsh future impacts on the fishery, the measures proposed in Addendum XXVII are ill-timed and unnecessary.

Measures Proposed Altering Lobster Size Limits For LMA 3 Are Not Scientifically Substantiated And Should Not Be Adopted Or Should At Least Be Deferred Until After The 2025 Population Assessment

The Addendum document repeatedly notes that neither the GB or GOM lobster stocks are overfished and overfishing is not occurring. Instead, the measures are based on the assertion that certain factors "… could indicate future declines in recruitment and landings…" Page 3, but there is actually no such quantification for LCMA 3. In reality, the measures appear more to meet the objective of standardizing management measures across the LCMAs. While perhaps easier to enforce, it fails to take into account variations and contingencies in the fishery-largely reflected in the different makeup of populations of lobsters in various areas, and the needs of fishermen in different areas. LBL believes this is especially true in the measures proposed for LCMA 3 and suggests that these measures not be adopted.

With regard to LCMA 3, the Addendum notes that the population assessments are being assessed using only the inshore surveys, as this is where the majority of fishing activity occurs. This hardly recommends these assessments as indicative of the conditions in the deeper offshore waters of LCMA 3. As the stock has apparently moved further north and east in the face of warming water and other environmental conditions, the stock in LCMA 3 has remained stable or increased with steady catch per unit of effort. There is no scientific justification for further increasing minimum sizes or reducing maximum sizes it this area. The Addendum document notes that the catch in LCMA 3 is spread across the current slot range, and not recruitment driven, meaning that most of the catch is in the middle of the slot size. Changes in the minimum and maximum size will not increase recruitment of or give significant numbers of smaller lobster

[2] The proposed Addendum makes note of a substantial increase in the value of ex-vessel landings in 2021. This was due largely to an unusually strong demand for lobster during the pandemic. Prices have returned to close to pre-pandemic levels and are not expected to surge again anytime soon.

additional time to spawn, nor will it result in more lobsters sizing out of the fishery. The sole impact of the proposed size changes will be to reduce the landings for LCMA 3 fisheries, with no positive impact on conservation. As noted by Bob Glenn, Deputy Director of MADMF, in a 2012 letter to the Addendum's Plan Development Team, the analysis in Draft Addendum XXVII Appendix B is based on the relative size of landings in each fishery (LCMA) and indicates:

> "… In absolute terms the options in the addendum for LMA3 and LMAOCC will only have a fractional, if not immeasurable, impact on increasing stock wide SSB." Mr. Glenn further notes that decreasing the maximum gauge in LMA3 would provide only " … extremely modest gains in spawning stock biomass att he expense of permanent loss of yield in the fishery".[3][4]

As the The LCMA 3 fishery is dramatically different than the other areas, with less concentration of fishing effort based on early implementation of trap limits factoring in historical use and earlier implementation of limited access. It has developed around a range of lobster sizes and nothing justifies alteration of the nature of this fishery by changing minimum or maximum sizes, absent a strong scientific basis, which is not present in the proposed Addendum. Similarly, there is no reason to modify vent sizes.

Perhaps the new population assessment in 2025 will shed more light on the need for or advisability of these proposed measure, although we suggest the situation is stable, nothing is broken and there is nothing to fix, and there are still unresolved issues, such as reductions in LMA3 trap limits, prospective regulations to protect right whales, etc…

LBL supports Standardization for V-Notch Regulations.

LBL is supportive of standardizing V-Notch rules. These have proven effective at protecting breeding females and in turn have a measurable impact on SSB. Present rules do create confusion based on different rules in the various areas LMAs.

Conclusion

For the reasons, and those set forth above, Little Bay Lobster suggests that the measures proposed in Addendum XXVII to Amendment 3 to alter minimum or maximum lobster sizes are

[3] 9/17/21, Bob Glenn, MADMF as representative of the PDT "Draft Addendum XXVII on Gulf of Maine/Georges Bank Resiliency" memo to Caitlin Stark.
[4] LBL also notes that the ASMFC has proposed reductions in Area 3 trap limits, opposed and potentially to be challenged by LBL if implemented, which would further result in permanent loss of yield in the fishery.

not supported by the science and that the impact to fisheries in terms of permanent loss of yield to the fishery is not justified by the science even if it marginally aids enforcement through uniformity of measures. These differential sizes are between LMAs are justified by the different nature of the stocks between areas and the different manner in which the fisheries in the LMAs have been managed over time.

Thank you for the opportunity to comment on these proposed changes to regulations and your attention in this regard.

Very truly yours,

/s/Stephen M. Ouellette
Stephen M. Ouellette, Esq.

cc.

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Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

April 8, 2023

Dear Ms. Starks:

The Maine Lobstermen's Association (MLA) provides these written comments in response to ASMFC's Draft Addendum 27 to Amendment 3 to the American Lobster Fishery Management Plan for Public Comment. The MLA was founded in 1954 and is the oldest and largest fishing industry association on the east coast. The MLA advocates for a sustainable lobster resource and the fishermen and communities that depend on it.

The MLA appreciates ASMFC's commitment to work with the lobster industry to maintain a resilient lobster stock and fishery. The MLA supports the Commission's original goal to standardize measures across Lobster Management Areas (LMAs) as the most important first step in maintaining a resilient lobster fishery as outlined in Issue 1. While the MLA recognizes that there has been a downturn in several stock indices which must be closely monitored, the association does not believe trends warrant management action at this time as outlined in Issue 2. The MLA is very concerned that the addendum does not include any analysis of the impacts of gauge changes on the lobster market, yet its purpose is to keep the lobster industry economically viable.

<u>Issue 1: Standardizing measures across LMAs</u>

The MLA supports Option B to standardize measures to be implemented upon final approval of the addendum. Each of the sub options outlined in the document are preferable to the status quo. V-notching female lobsters and protecting oversize lobsters are core conservation values for every Maine lobsterman. MLA believes any person permitted to harvest lobster should be required to adopt these protections. The MLA recommends that ASMFC consider the following measures for adoption by all lobstermen in all management areas:

- Mandatory v-notching.
- Zero tolerance v-notch definition. Maine has a long track record demonstrating that this standard is enforceable. Maine lobstermen believe that mandatory v-notching with a zero tolerance definition have contributed significantly to increase in abundance of the lobster stock.

- Maximum gauge required. In addition to 6 ¾" standardized maximum gauge for all areas (or more restrictive), the MLA recommends that ASMFC also restrict the landing of lobsters from 5" to 5 ½" carapace length across all areas. Allowing more lobsters to reach 5 ½" carapace length will enhance the impact of the Area 1 maximum gauge by allowing more lobsters to reach larger sizes if they migrate to the Area 3 or OCC fishery.
- Do not issue surplus trap tags unless trap loss is documented.

Issue 2: Implementing management measures to increase protection of SSB

The MLA supports Option A, Status Quo, that there will be no changes to the current fishery. The MLA does not dispute that increasing the LMA 1 gauge could help to expand overall lobster abundance. However, the MLA has several concerns with the proposed changes and believes that this action is premature.

Market concerns

A primary objective of this addendum is to keep the lobster industry economically viable, yet the document does not contain any analysis of the market impacts of a gauge increase, particularly the disparity that will be created between the minimum size in Canada versus the minimum gauge in LMA 1. The Canadian lobster fishery comprises a significant component of the American Lobster supply chain. Canadian lobster supply impacts the overall lobster market including prices paid to U.S. lobstermen. Changing the minimum gauge size in LMA 1 will impact lobster supply and potentially create an advantage for Canadian product.

The 2021 and 2022 lobster seasons have demonstrated that market conditions manifested through boat price for lobster can impact the economic stability of the lobster industry as much, if not more than volume of lobster landings. The MLA agrees with the Commission that "given the economic importance of the lobster fishery to many coastal communities in New England, especially in Maine, potential reductions in landings could have vast socioeconomic impacts," but we must also be vigilant to not undermine the U.S. position in the lobster market.

Potential trade issues arising from the Magnuson Act prohibition on the import and sale of lobsters smaller than the U.S. minimum were raised when the previous draft of Addendum 27 was released, yet this issue is not addressed in the updated addendum. MLA understands anecdotally that ASMFC has determined the proposed increases to the LMA 1 minimum gauge will not impede lobster imports from Canada, however, this information is not (but should be) included in the addendum.

Resolving the import issue does not address how changing the minimum size for LMA 1, which accounts for the vast majority of U.S. landed lobster, will affect U.S. markets if Canada's minimum gauge remains unchanged. The largest concern raised by MLA members was that changes to the LMA 1 minimum gauge could negatively impact the boat price for U.S. caught lobster. The MLA strongly opposes any change to the LMA 1 minimum gauge until a market study has been conducted to address impacts on demand, market segments, and boat price given that comparable gauge measures will not be adopted in Canada.

The Commission must also recognize that downeast Maine lobstermen fish side by side with Canadian lobstermen who harvest lobster under a different management program. Under the

Addendum 27 proposals, Maine lobstermen will be throwing back short lobsters that will be quickly caught and landed by their Canadian counterparts who fish in LFA 38B. These smaller lobsters may then be sold to U.S. dealers and may drive down boat price.

Action is not needed at this time

The MLA does not dispute the Commission's findings that "settlement surveys for more than five years have consistently been below the 75th percentile of their time series" and "there is evidence of declines in recruit abundance in ventless trap survey and trawl surveys for the GOM/GBK stock since the most recent stock assessment."

However, the MLA is concerned that the reference period used to measure a stock decline includes only 3 years, particularly when one of the years is an all time high. The MLA recommends using a longer time series that includes a broader representation of lobster abundance as a reference period. For example, 2003 to 2018 would reflect a high moderate to high abundance time frame and is more realistic than basing the reference period on a narrow time frame skewed by a historic high.

MLA members also have questions regarding what the survey results actually mean for the future of the fishery. MLA members question whether declines in inshore settlement accurately reflect overall stock settlement given record abundance of older, larger lobsters and expansion of the fishery into deeper offshore waters. While there has been some effort to sample deeper water habitats not currently sampled, significantly more research is required to determine the contribution of unsampled habitats to the overall stock productivity. The MLA is also concerned that the most recent ventless trap and trawl surveys were hindered by covid restrictions. Additional data is needed for all of these surveys before any management action is undertaken.

Addendum 27 was not initiated in response to a stock decline but rather is a proactive measure to avoid economic harm by avoiding a stock decline. It The October 2020 stock assessment states that "Gulf of Maine-Georges Bank (GOMGBK) stock was not depleted, as the three-year average abundance from 2016-2018 was greater than the abundance target. The stock was at record high abundance levels. Stock projections conducted as part of the assessment suggested a low probability of abundance declining below the abundance target over the next 10 years."

Lobstermen continually report that are seeing strong year classes on the bottom, along with huge numbers of eggers and v-notch lobsters. Lobstermen are also facing extreme regulatory uncertainty due to future whale rules. They do not believe that it is necessary to increase the gauge at this time.

Equity issues

The LMA 1 fishery is by far the largest sector of the U.S. lobster fishery. The stock has remained healthy despite high exploitation rates due to the strength of the conservation measures and excellent compliance by the industry. Maine lobstermen strongly believe that the lobster stock could not have achieved record abundance if not for the conservation measures they have implemented over many decades including minimum and maximum size, v-notching with a zero tolerance definition, and only allowing lobster landings from trap/pot gear.

Indeed, the 2020 stock assessment report notes that large female lobsters migrate between the Gulf of Maine and Georges Bank. This finding was the basis of combining the GOM and GBK stocks into a single stock unit. The assessment suggested that small, immature females were recruiting to the GOM and then migrating back and forth between the GOM and GBK after growing to larger sizes.

It is the conservation measures adopted by LMA 1 lobstermen that are largely responsible for stabilizing and expanding the lobster stock in both the GOM and GB stock areas. Yet LMA 1 lobstermen would be most impacted by the measures proposed in Addendum 27. If action is taken, the MLA recommends that the Commission require mandatory v-notching with a zero-tolerance definition for all LMA 3 and OCC lobstermen so that LMA 1 lobstermen are not protecting these lobsters only to have them caught and landed by their colleagues. The MLA also recommends that the Commission consider disallowing Area 3 and OCC to land lobsters with a carapace length of 5 to 5 ½" inches. Protecting lobsters to grow through this ½" window just above the Area 1 maximum gauge would provide a lot more protection than having only a maximum gauge of 6" or 6 ¾".

Other considerations

Any gauge increase for LMA 1 must be implemented gradually and not exceed increments of 1/16" annually. If a gauge increase is moves forward, the implementation schedule must allow the industry adequate time to prepare for the changes.

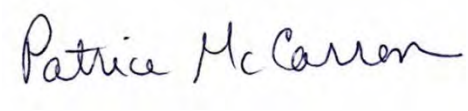
The Commission should consider an increase in the vent size, rather than a gauge increase, to minimize potential market impacts and equity issues of Maine lobstermen throwing back lobsters that can be immediately caught and sold by Canadian lobstermen.

In closing

ASMFC should move forward with standardizing measures across the LMA's as proposed in Issue 1. The MLA supports the Commission's overarching goal with regard to Issue 2 but does not believe this is the right time to take this action. Given that the lobster stock remains in a favorable abundance regime, ASMFC must first conduct a study of the market impacts of changing the LMA 1 gauge, particularly to understand trade dynamics between the U.S. and Canada. This would allow time to consider expanding the reference period and collect more survey data to survey deeper waters and fill in for the poor covid years. It will also allow the lobster industry to prepare for the extreme regulatory uncertainty it faces due to future whale rules.

Thank you for your consideration.

Best regards,



Policy Director

Massachusetts Lobstermen's Association

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781.545.6984

April 3, 2023

Caitlin Starks
Atlantic States Marine Fisheries Commission
050 N. Highland St. Suite 200A-N
Lobster Arlington, VA 22201

Via Email: comments@asmfc.org

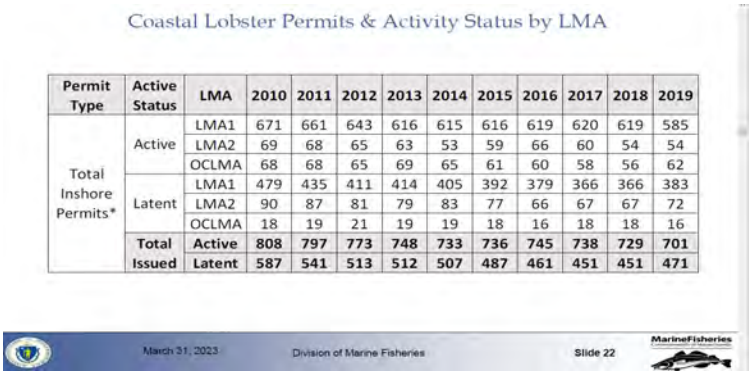
RE: Draft Addendum XXVII

Dear Ms. Starks,

The Massachusetts Lobstermen's Association (MLA) submits this letter of comment and great concern on behalf of its' 1800 members on the: Atlantic States Marine Fisheries Commission (ASMFC) Draft Addendum XXVII (Add. XXVII) to Amendment 3 to the American Lobster Fishery Management Plan for Increasing Protection of the Gulf of Maine/Georges Bank Spawning Stock (GOM/GBNK SS).

Established in 1963, the MLA is a member-driven organization that accepts and supports the interdependence of species conservation and the members' collective economic interests. The membership is comprised of fishermen from Maryland to Canada and encompasses a wide variety of gear types from fixed gear and mobile gear alike. The MLA continues to work conscientiously through the management process with the Massachusetts Division of Marine Fisheries (MADMF), Atlantic States Marine Fisheries, Atlantic Large Whale Take Reduction Team, and the New England Fisheries Management Council to ensure the continued sustainability and profitability of the resources in which our commercial fishermen are engaged in.

The commercial lobster fishery, active effort, in Massachusetts continues to decline and each year is losing an estimated 8 to 10 permits a year with NO NEW PERMITS being issued. Massachusetts has a limited entry fishery that is continually reducing effort on the resource. To further help conservation on the resource there are two Lobster Management Areas (LMA) in Massachusetts that have even more conservation measures in place to further protect the resource through a 10% Trap Tax on trap tag transfers. This measure alone has reduced the effort by tens of thousands of traps from being fished.



Coastal Lobster Permits & Activity Status by LMA

Permit Type	Active Status	LMA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Inshore Permits*	Active	LMA1	671	661	643	616	615	616	619	620	619	585
		LMA2	69	68	65	63	53	59	66	60	54	54
		OCLMA	68	68	65	69	65	61	60	58	56	62
	Latent	LMA1	479	435	411	414	405	392	379	366	366	383
		LMA2	90	87	81	79	83	77	66	67	67	72
		OCLMA	18	19	21	19	19	18	16	18	18	16
	Total Issued	**Active**	**808**	**797**	**773**	**748**	**733**	**736**	**745**	**738**	**729**	**701**
		Latent	**587**	**541**	**513**	**512**	**507**	**487**	**461**	**451**	**451**	**471**

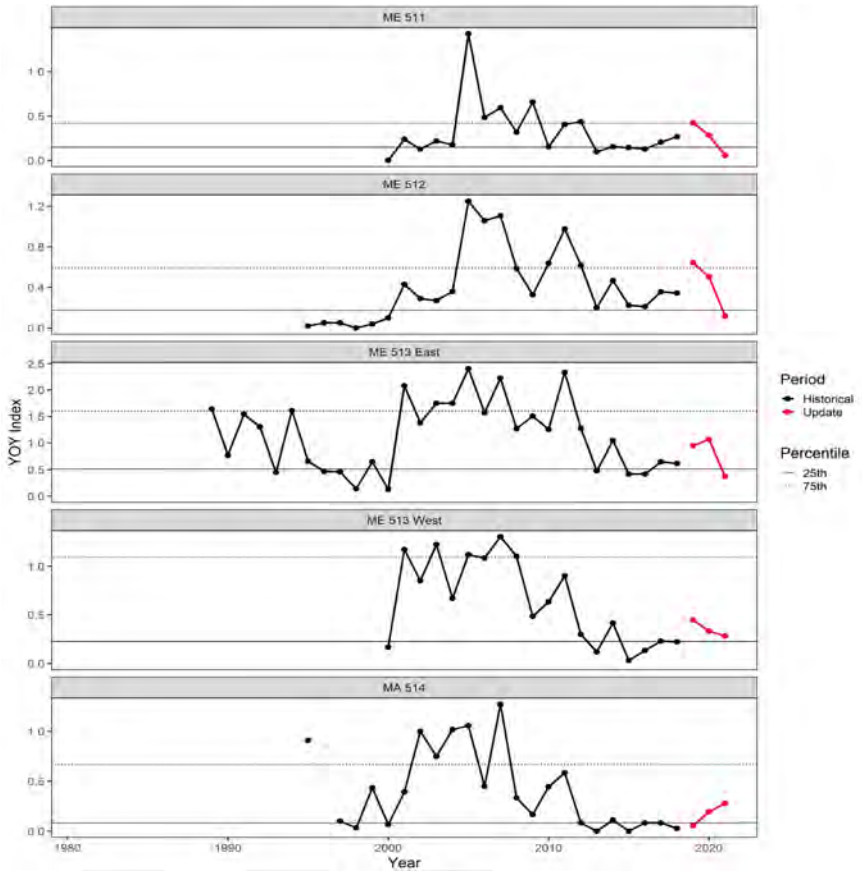
March 31, 2023 Division of Marine Fisheries Slide 22 MarineFisheries

Recently, during the MLAs Annual Weekend & Industry Trade Show, the MADMF gave a presentation on the entire lobster industry here in the Commonwealth and as the data is presented in Slide 22, Coastal Lobster Permits & Activity Status by LMA depicts the effort is clearly trending downward to a mere 647 active permits that are fishing on the GOM/GBNK SS stock.

As the overall effort continues to decline in Massachusetts, as indicated by the MADMF Lobster Tables data on the lobster effort from 2004 and 2021 for LMA 1 and Outer Cape Cod (OCC). The Massachusetts commercial lobster effort has significantly reduced its effort from an estimated high of 1328 total permits in 2004 to total 755 in 2021. That is nearly a 43% reduction in active effort with NO NEW EFFORT being fished on the GOM/GBNK SS.

The impact of the Massachusetts commercial lobster industry is marginal on the resource and the effort continues to decline. There are NO Options in Add. XXVII that the MLA can support. Addendum XXVII is not a one size fits management plan as it is presented. More data is needed to truly understand where the negative impacts are on the resource.

Furthermore, after reviewing Add. XXVII, the many Public Hearings and the scores of comments that were provided all pointed out a critically important gap in data for areas in the OCC and Eastern Cape Cod Bay. These data gaps need to be filled before Add. XXVII is moved forward to ensure ALL the data is included before a permanent management measure is implemented. These areas that historically have not been surveyed are highly productive and landings from these areas remain relatively consistent. The MLA strongly recommends putting Add. XXVII on hold until these data gaps are filled to give a much clearer picture of what is truly happening to the settlement here in the Commonwealth.



During the recent Public Hearing on April 29th, the main question asked was on Figure 4 that depicts the trends in the Young of the Year (YOY) settlement and, why is Massachusetts being asked to do anything when MA Stat Area 514 it clearly showing the settlement trend in the Commonwealth is going up even with missing data as noted above.

The MLA encourages that these data gaps be filled and once they are filled from these highly productive and critical areas, the consensus from the industry is that the YOY settlement index will go up even more.

The MLA is extremely concerned that the approximate 670 active LMA1 & OCC commercial lobstermen are going to be negatively and irreparably harmed should Add. XXVII be passed.

(ASMFC Figure 4. GOM abundance indicators: YOY indices.)

The Massachusetts Lobstermen's Association proudly supports the letters of comment submitted to the Atlantic States Marine Fisheries Commission on Addendum XXVII from the Atlantic Offshore Lobstermen's Association and the Outer Cape Lobstermen's Association.

For the reasons noted above, the Massachusetts Lobstermen's Association can only **SUPPORT STATUS QUO ON ALL OF THE OPTIONS.**

Thank you for your thoughtful deliberation and consideration on our comments.

Sincerely,

Beth Casoni

MLA, Executive Director

Law Office of Christopher Markey

555 Pleasant Street, Suite 5A
New Bedford, MA 02740

Christopher M. Markey, Esq.
cmarkeylaw@gmail.com

April 8, 2023

Caitlin Starks
Atlantic States Marine Fisheries Commissions
1050 N. Highland St. Suite 200A-N
Arlington, Virginia 22201

Email: comments@asmfc.org

Re: Addendum XXVII to Amendment 3 American Lobster Fishery Management Plan

Dear Ms. Starks:

As you may know my office represents the Outer Cape Cod Lobstermen, and I write to implore the Atlantic States Marine Fisheries Commission ("ASMFC") to keep the status quo as it related to Addendum XXVII. The Outer Cape Cod Lobstermen is a group of approximately sixty members. Some members retain only state permits while others have both federal and state permits. The lobstermen harvest in the Outer Cape Cod LCMA ("OCC"). The OCC is a unique fishing parcel. It is made up of the tip of Cape Cod around Provincetown and sits between outer Cape Cod and George's Bank Fishing Area. Most of the lobstermen in the OCC utilize the single-line single-pot harvesting system.

The status quo will continue to protect the growing lobster stock in the OCC and will allow the lobstermen of the OCC to maintain the successful niche market of large, hard-shelled lobsters word wide. In addition, the status quo is not a burden to law enforcement officials. Any change in the regulations will be arbitrary and capricious because they are not based on science. The only study relied upon supports the status quo.

While we all appreciated the opportunity to speak at a public comment meeting on March 28, 2023, in Quincy, Massachusetts, we feel it imperative to have a written record of our concerns of Addendum XXVII. During that hearing, Massachusetts Department of Marine Fisheries ("DMF") biologist, Robert Glenn, described the LCMA OCC as a "dynamic" environment which makes breeding of the lobsters very unlikely. Rather, the lobsters harvested in the OCC are transient lobsters, passing from LCMA Area 1 to GOM/GBK stock. Mr. Glenn further described the transient lobsters passing through the OCC, as being more mature, larger, molted, and hard shelled, unlike the typically smaller lobsters discovered in LCMA Area 1 and Area 2.

Since the OCC acts as a conduit for mature lobsters to pass from the warm waters of the Cape Cod Bay into the open ocean, the current regulations reflect a balance between the economic interests of the lobster fisheries and the conservation of the lobsters. Over twenty years ago the ASMFC and the OCC lobstermen realized this uniqueness and created regulations to meet the needs of economic and conservation interests. The results of the agreement resulted in (1) OCC lobstermen ten percent (10%) tax on all license transfers; (2) increase in the minimum size of the lobsters to 3 3/8th. Further, the right whale population has

delayed the start of the season from March 15 to May 15. As a result, (a) the transfer tax has limited the number of pots in the ocean; (b) the shorter season has limited the number of days for harvesting; and (c) and the increase in minimum size imposed has grown the lobster population in the OCC. The greatest example of the success of this Young of the Year ("YOY") in Massachusetts. The was an increase between 2017-2020 consistent with later 1990's.[1]

The increase in the YOY stock in Massachusetts over the past several years is yet another reason why the status quo is the appropriate action of the ASMFC. The study relied upon by the ASMFC indicates that the YOY has increased in Massachusetts, while in Maine's four areas there was a decrease during the same time frame.[2] The increased change in the YOY in Massachusetts dictates no need to change any of the regulations. The status quo has proven to be an effective tool to conserve lobsters in Massachusetts.

The status quo also protects the niche economic market the OCC lobstermen developed. The OCC have created a world-wide market of hard-shell large lobster. The lobstermen of the small ports of outer Cape Cod have created an infrastructure that harvests, lands, and delivers live hard-shelled lobsters to the Far East to Western Europe. The many OCC lobstermen invested in building larger half-moon pots which harvest large lobsters and invested in transportation and local cold storage to assure prompt and fresh delivery of large lobsters world-wide. These investments have been made by both first, second and third generation lobstermen. As a result, there is a great diversity as to the forms of financing of the permit holders. The banks and promissory note holders who have invested in this niche market and rely heavily on the status quo of the regulations.

If the regulations are changed in accordance with the proposed Addendum XXVII, this niche market would move to Canada. The changes in the regulations would create a maximum size that would not satisfy the demand of the Asian and European markets. The change in regulations would eliminate the OCC and move the entire supply to Canada.

The proponents of the Addendum XXVII have stated law enforcement needs to have consistency in the regulations. However, at the March 28, 2023, hearing an environmental police office stated there is no issue with enforcing the current regulations. In the Spring of 2023, federally permitted OCC lobstermen will have VTS on their vessels. If for some reason, enforcement officers are concerned with the location or exchange of lobsters on the water, they now have a simple tool to determine the location of the vessels. Modern technology will make it easier to determine if there is any type of illegal transfer of lobster through the VTS.

The current distinctive regulations serve legitimate government, conservation, economical purposes because they are adapted to the various characteristics of the different LCMA's. The proposed change to the regulations will disproportionately negatively affect the OCC lobstermen. In fact, the only study relied upon by the ASMFC indicates the YOY stock in Massachusetts has increased in the past several years. The OCC regulations have allowed the outer cape lobstermen to responsibly fish mature, large, hard-shelled lobsters, and create a niche market, without any difficulty to enforcement.

[1] According to the study relied upon by ASMFC Massachusetts YOY is the only area with an increase in YOY in these years.

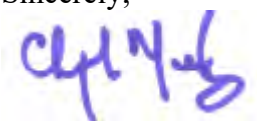
[2] ME 511; ME 512; ME 513(east);ME 513(west)

In conclusion, we are asking the ASMFC to keep the status quo and reject Addendum XXVII to Amendment 3. The changes proposed are arbitrary and capricious and serve no enforcement or conservation purpose. On behalf of the Outer Cape Cod Lobstermen, I am asking you keep the status quo.

Should you have any questions regarding this please feel free to call me at (508)717-0284.

With every best wish, I remain

Sincerely,



Christopher Markey

From:	Brendan Adams
To:	Comments
Cc:	Beth Casoni; Sarah Peake; Dana Pazolt; Sam Pickard; Jeff Souza; Steve Anderson; brockmamba@gmail.com; ostohr03@gmail.com; jturner508@gmail.com; tyev1997@hotmail.com; tessa777@comcast.net; jlobsters@comcast.net; silvalobster@hotmail.com; john@nrscapecod.com; wmcmom@aol.com; Fay Anderson; burnsfisheries@gmail.com; fvsusanlynn@comcast.net; Eric Knowles; Glen Fernandes; John Grandlund; rfjjr28@gmail.com; smleach1401@yahoo.com; lopartog@gmail.com; jlloparto@yahoo.com; maxslucarelli@gmail.com; luce.tom@gmail.com; sophie421@comcast.net; jdblack181@hotmail.com; Fvretriever@aol.com; mike_obrien27@yahoo.com; liquidwrench75@gmail.com; lobsterman16@hotmail.com; lobsterlife99@gmail.com; Christopher Markey
Subject:	[External] Public Comment For Addendum XXVII from Outer Cape Lobstermen"s Association
Date:	Saturday, April 8, 2023 9:38:20 AM

I am submitting this as public comment for the Outer Cape Lobstermen's Association. We represent the majority of the 46 OC state and 17 OC federal lobster permits.We restarted this organization due to our very serious concerns regarding the proposed ASMFC Addendum XXVII. Because of some of the business crushing options in addendum XXVII, the only option given that is reasonable to us is at this time is option A, status quo, for both issues. We already have a proven management plan here in the outer cape to protect our healthy lobster stock, and we have given up a lot to fish the way we do. Our management plan has worked very well and we want to stay with it unaltered. It appears to us that despite addendum XXVII being advertised as a conservation measure, it will in fact be a mechanism to push a standardization of rules and regulations as a matter of convenance to law enforcement. From the law enforcement aspect, they have a plethora of new tools at their disposal, such as 24 hours a day, 7 days a week, 365 days a year vessel tracking systems for all federally permitted lobster vessels which become mandatory as of May 1, 2023. Enforcement officers also have drones, AUVs, shore-based cameras, cell phone tracking data, and traditional methods, like at sea vessel boardings to enforce regulations. Education and training of our law enforcement officers for the different areas is crucial, as it would eliminate any and all gaps that could potentially be a problem, for a minimalistic budget and with our time constraints. Standardization of the lobster regulations for law enforcement should not be uniform, as different areas do not fish on the same biomass and some areas already have proven proactive management plans in place. Switching from enforcement to conservation, there was no actual data from OCLMA in addendum 27. The data that was used to create the figures involved in addendum 27 for the Outer Cape Cod Management Area was derived from LCMA 1 and from LCMA3. This data is not an accurate representation of the OCC and is extremely arbitrary. If there is no data for the Outer Cape, the prudent course of action would be to collect actual data for our zone. Do the trawl surveys even create an accurate representation of lobster stocks? The Outer Cape Lobster Management Area lands less than 7% of all lobsters landed in Massachusetts, including other pot/trap fisherman as well as federally permitted draggers fishing in federal waters the land in Massachusetts. Even though we have 100% reporting in Massachusetts, it is very vague to regulators what our percentage of large lobsters over the proposed 6 inch or 6 ¾ inch maximum gauge, and almost impossible to report the large number of v-notched lobsters under our current proved management plan in the outer Cape. Conservatively on the low end, we estimate a 25 percent or greater loss of landing and income if our current rules change. Given the astronomical cost-of-living difference between here, in the Outer Cape, and other areas lobstering off-cape as well as outside of Massachusetts, that potential 25% loss is critical for our small fleet to stay afloat. One prime example is the stark cost of living difference between Barnstable County and Coastal Maine. The difference in the cost of living between those two areas is astounding, with Barnstable County at the very least 36% more expensive, due to the lack of housing, as well as the lack of developmental land, which Maine has a vast abundance of. The 36% does not factor in many expenses, only the bare minimum. We do not have their option of driving inland and acquiring housing at a much

cheaper rate and commuting to the harbor. Our crewmen live here also, and we must pay them a living wage. Any addendum option, other than status quo, will put many of us out of business. If any other of the proposed options are chosen, each fisherman will lose tens of thousands of dollars, and the total loss of income for our local economy is immeasurable. This does not take into consideration the hundreds of thousands of dollars that each fisherman has invested into our businesses (permits only) that will be lost, by the devaluation of our permits as our catch will drop drastically, and by a huge reduction in our yearly income, forever. Our fisherman will lose not only their trucks and boats but their businesses, and then their homes here in Barnstable County if any option other status quo is chosen. We will have no other choice to leave Barnstable County and possibly even the Commonwealth of Massachusetts, we will no longer be able to afford the ever-rising cost of living. None of that is acceptable. Alternatively, at the same time the number of OCC permits will be consolidated into the hands of a few. Eventually overtime all of the permits will be owned by large investment corporations, which we unfortunately watched happen to groundfish and scallop fleet. This is not ok. Changing thousands of minimum gauges, i.e., the 3 ¼ inch minimum to a larger size by a small amount would increase of 40% of the reproductive lobster population (at a minimum) and would be a meaningful and thoughtful conservation effort. That said, we recognize that all the lobstermen in the Commonwealth have given up a lot (time, permits, trap tags, etc) and should not be penalized by addendum 27 either. Changing a minuscule number of larger maximum gauges, the 46 permits without a maximum gauge, or our very defined v-notch definition would show no effect to our lobster resource. Why don't we have ventless trap surveys in the OCC? Why was the recent observer information on lobster boats in the Outer Cape not factored into this addendum? We as the Outer Cape Cod Management Area stakeholders need a lot more data before we can make an accurate decision of our area. We would be willing to work on that collaboratively as long as our heads are not on the chopping block. The Massachusetts Division of Marine Fisheries and ASMFC need to come up with real, hard data from OUR area before making life altering decisions for us, which we not only do not need but did not ask for. If Amendment XXVII is accepted with any option other than keeping the status quo, which hand would you like us to cut off? Under our current active management plan, our fisherman have willingly enacted a 10% trap tag tax when a permit or allocation is bought and sold, effectively taking 10% of the permitted tags out of the fishery forever. The OCC zone state has 46 permits, many of them fished by small boats and small crews. More than 50% of our zone still fishes singles, with an average of 393 tags per fisherman. OCC federal has 17 permits with an average of 559 tags per fisherman. Both state and federal Outer Cape Permits are below the industry standard 800 traps per permit in LCMA1. Our zone averages out at 476 trap tags per fisherman out of a combined 63 permits (down from over 100) and has nowhere near the impact on the fishery and the stock as the other larger areas. Under our adopted management plan, we used to be able to start fishing on March 15th, then it was pushed back to April 15th due to rising concerns with the right whales, now with a tentative start date of May 15th, with a strong possibility of our fishery not opening until June 1st. We have managed our zone accordingly, but we cannot give up anymore. We are not the problem. Our choice is to stay status quo.

>

> Thank You,

>

> Brendan Adams

Outer Cape Lobstermen's Association President

From: AFPhilbrook
To: Comments
Subject: [External] Draft Addendum XXVII
Date: Saturday, March 4, 2023 11:56:24 AM

I am writing in support of implementing both issues described in the draft addendum. I believe standardizing and increasing the strictness of v-notch requirements across all LCMA's is an obvious move that will help the stock across the entire GOM. I am in full support of immediate implementation of the measure increase in LMA 1 and the decrease in LMA 3. I fish in LMA 1 and I fervently believe that this will not only increase the overall health of the stock but will also increase our overall poundage by increasing the average weight per lobster we harvest. It will also bring a higher quality product to market, thus fetching a higher price and providing more value to the marketplace.

My suggestion for implementation of the measure increase would be to change the size on January 1st and do 1/16 of an inch per year. This way we will see only a slight decrease in spring landings but will then make up the difference with an increase in fall landings.

Signed,
Abraham Philbrook
License #6792
LMA 1, Zone B
Islesford, ME

--
Abraham Philbrook
39 Woodward Heights
Bar Harbor, ME 04609

From:	Andrew Taylor
To:	Comments
Subject:	[External] It is absolutely time for a tiered licensing system . And the whole state not eeds to be back on a level playing field as far as trap limits . The longer people have fished the more traps they should be able to have if they chose . Those ...
Date:	Tuesday, February 14, 2023 12:46:17 PM

Sent from my iPhone
It is absolute time for a tiered licensing system over everything else. And also the whole state needs to be on a level playing field . Zone e should not be 100 traps less than the rest of the state. Those who have fished the longest should be allowed the top number of a trap limit say 600, and those who were not fishing or did not cut back the last trap limits should only get 400, and any newcomers to the fishery should only get 300. And be capped at these numbers until a greater license is retired . This is only fair and may get guys to better accept a trap limit.
Also with all the money being wasted there should be a permit buyback for a good amount of money . The more money paid for these permits the more people who would surrender them . This would all mean a huge reduction in end lines as well as a reduction in bait pressures and hopefully lower prices

April 8, 2023

Atlantic States Marine Fisheries Commission
Attn. Caitlin Starks
1050 N Highland St. Suite 200A-N
Arlington, VA 22201

Re: Lobster Draft Addendum XXVII

To Whom it May Concern:

I have been working on the deck of an Outer Cape lobster boat for as long as I can remember. From the elementary school years of wearing a life jacket on my Uncle's boat, to starting out on my own with a commercial student permit when I turned 12 and continuing with a regular commercial OCLMA permit before I ever had a driver's license, lobstering has shaped my life. My original OCLMA permit had a trap allocation of only 57 traps. Through many years and many hundreds of thousands of dollars, my current allocation is 511 traps, far below the standard 800 traps of an Area 1 permit for a substantially higher cost. This is my first Issue with the Draft addendum; it does not take our unique management plan for the Outer Cape that has created such a drastic increase on permit prices compared to other areas. I have personally invested everything I have into my permit and my business as a whole, so much that I cannot afford to buy a home in the current economy. I stand to lose everything I have built if the addendum is passed. This is incredibly disturbing as the addendum is backed by skewed data and is completely lacking Data from the Outer Cape management area. How can regulations for a lobster management area be made without data from that area? Furthermore, as a college graduate with a degree in marine biology and aquaculture from Roger Williams University, I was told that fisheries sciences is an estimated guess. This is incredibly concerning and upsetting when the "estimated guess" is being made without data from the OCLMA. In addition, at the public meeting in Massachusetts we were told by Massachusetts Department of Marine Fisheries director Dan McKiernan that the stock assessments that the Addendum is based off of are "not precise". "Estimated guesses" based off of stock assessments that are "not precise" are absolutely unacceptable as both a permit holder whose entire business is in jeopardy and as an individual with a scientific background. The methods of "conservation" are also unacceptable for a number of reasons, particularly because the scientific method only allows for one parameter in an experiment to be changed at a time however the addendum potentially calls for changes to V-notch definitions, minimum and maximum gauge sizes, escape vent sizes, and the number of duplicate trap tags issued. How will it be known which, if any management schemes are affecting the biomass? The simple answer is that there will be no way to tell. This addendum is simply throwing a can of paint at the wall and hoping it turns into the Mona Lisa, there is no rhyme or reason to it, no precision, no thought to the scientific method accepted and used worldwide. As cape lobsterman we account for only 7% of lobster landings in Massachusetts and rely heavily on large lobsters for our catch as well as v-notched lobsters with setal hairs. I build all of my own traps to fish primarily on these large lobsters and catch very few lobsters under 2 pounds. If a maximum gauge size is enacted for the Outer Cape

as well as the federal standard V-notch definition of 1/8 inch without setal hairs, I stand to lose 25% of my catch or more. That is unacceptable especially considering that I am fishing only 511 traps from May to December. I do not believe that anyone on the ASMFC board or any person in a blue-collar industry can afford to lose 25% of their yearly income, especially based on an addendum with so many flaws already listed. In addition, t multiple meetings, members of the OCLMA have been told that there is no settlement habitat in our area, so ventless trap surveys do not need to be conducted. To this aspect, I completely disagree as there are vast areas of cobbly bottom in our area that are ideal for settlement as well as the unique estuaries of Pleasant Bay and Nauset Inlet that act as nursery habitat for young lobsters. I do not appreciate being told that recruitment and recruitment habitat does not exist in our area because it is completely false. It is about time that fisheries scientists and managers start working more closely with the fishermen as our first-hand knowledge is completely invaluable. As fishermen, we are stewards of the resource, if the resource dies, so does our livelihoods. We want to protect it, we want to correctly manage the lobster stock, and the draft addendum is simply NOT the way to do this. As a management area, the Outer Cape proactively enacted a gear reduction, gauge increase, and fishing closures decades ago and many years before any whale related closures. Our management plan has been proven effective time and time again and as an area we would like to continue with it. We would also like to have increased data collection/research in our area since we are completely left out of the system. We are willing to help with this, especially with ventless trap surveys. However, as it stands, I feel that no action should be taken to Addendum XXVII and the current management measures should remain in effect for each management area (STATUS QUO).

Thank you for your time and consideration,

Benjamin Pickard
F/V Dragon Lady
OCLMA permit 004592
Box 1404
Wellfleet, MA 02667
lobsterlife99@gmail.com

From: WILLIAM G LACH
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Thursday, March 9, 2023 8:32:37 AM

Hi Caitlin. I have been lobersterin for about 45 years and have seen several dips in loberster populations over the years but the most recent drop is not one that I think is recoverable. The explosion of black sea bass populations can be correlated with the drop of small baby lobsters. About 8 years ago the sea bass population exploded in southern Massachusetts and as you know it takes about 8 years for a lobster to become legal size. This past year was the worst lobstering I have encounted in 45 years. I have caught many,many sea bass with baby lobsters in their stomach or hanging out of their throat. Since there are millions of these fish around now they will continue to feed on every baby lobster decimating the population where it will not recover. We continue to protect these feeding machines but will pay the consequences when they eat the ocean bare. I have a degree in Bio/Marine bio so I know how one species can affect others in an ecosystem. Is anyone looking at this thru the lens I am?

Thanks,

Bill Lach
Westport Ma
508-254-7056

From: Bob Bayer
To: Comments
Cc: JASON
Subject: [External] comments on Addendum XXVII
Date: Sunday, March 19, 2023 8:03:03 PM

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1. The settlement index is likely flawed. if settlement i is measured n the same place year after year, settlement locations are likely to have changed due to elevated water temperature. With elevated surface water temperature the time from hatch to settlement is reduced. This means that the larvae and juveniles are probably settling in other areas than in the past. In addition, feed type and availability may have changed from increased water temperature. Drop in abundance may not be related to egg production, rather feed availability.

2. Elevated water temps mean that lobsters become sexually mature at a smaller size and younger age. If this is the case, then there is no point in increasing the gauge. Fishermen I have talked with indicate that they are seeing an increase in the number of short lobsters with eggs. It would be appropriate to do a fishermen's survey of egged shorts prior to increasing the measure.
3. There needs to be another way of assessment rather than settlement. Something like a juvenile trap might be a better option.
4. It's time to be optimizing hatcheries. We don't need them now, but if and when we do need them we are ready.
5. It wasn't that long ago the Maine lobster harvest was 20 million pounds annually.

Bob Bayer
Professor Emeritus of Animal and Veterinary Sciences
Emeritus Director, Lobster Institute
UMaine
rbayer@maine.edu
ARS W1TNH

From: Bob Bayer
To: Comments; JASON
Subject: [External] dropping the gauge on larger lobster
Date: Monday, March 20, 2023 12:12:18 PM

Large lobsters produce 2 sets of eggs on one mating so that a single 4-5 inch carapace lobster produces the same number of eggs as 20 1.5 pound lobster.
I don't remember the exact number, but the study was done by Susan Waddy in Canada..
Someone should look it up. Decreasing the minimum size make sense to me...

Bob Bayer
Professor Emeritus of Animal and Veterinary Sciences
Emeritus Director, Lobster Institute
UMaine
rbayer@maine.edu
ARS W1TNH

From:	Brendan Adams
To:	Comments
Cc:	Christopher Markey; Sam Pickard; Beth Casoni; Sarah Peake
Subject:	[External] Lobster Draft Addendum Addendum XXVII Public Comment
Date:	Saturday, April 8, 2023 11:27:37 PM

My name is Brendan Adams, I fish in the Outer Cape Cod area.This is my personal public comment for lobster draft addendum XXVII. I submitted a comment earlier today on behalf of the Outer Cape Lobstermen's Association. I am going to try and keep this fairly short. Concerning all issues related to this draft addendum, I have no choice other than to say that we stay status quo. You have been told by the majority of the stakeholders that we all want status quo on this. I really hope that you take that into account. Why are we trying to fix something that isn't even broken? It makes no sense to me why we are trying to tinker with this, and the timing seems suspicious. Frankly, it really appears that this is trying to be pushed through in the dark of the night. We were not even going to get an in person meeting here in Massachusetts until people complained about it. So the asmfc was going to take public comment on a webinar, I am pretty sure that isn't kosher, from a legal stand point. The "science", if you can call it that, for the area that I fish (OCC) is an poorly crafted fairy tale at best. By extrapolating a couple areas that we abut some one did some voodoo styled math, and came up with something that is much less than best available science. Not cool. The big picture here is that an convenance for enforcement is being pushed down our throats by calling for conservation methodology. I watched the January meeting concerning this addendum, and we all know who and why this is really being pushed. This appears to be purely political. That isn't ok either, if it is even legal. Maybe instead of trying to divide us and concur, you all should have realized that we were all in this together. I think the most pressing issues to the lobster fishery are whales, wind, and industrial aquaculture. Let's not forget the people trying to push hopeless fishing gear (pop ups) on us. Spell check misspelled that, but it seems astute. All the people testing pop up gear and saying it works well are getting paid to say it works. You read between the lines and figure that out for your selves. As far as putting our lobster fishery for the whole east coast into a slot limit, the Canadians will take over parts of our market, both domestic and globally. They also will keep the lobsters we have to release, large and small. They are not going to change their fishing rules for us. Thinking that their lobsters will not make their way to our markets is also a fairy tale. Those lobsters we would be forced to throw over are not going to be crawling off into the sunrise to enjoy their golden years, they are going to end up in a cooker one way or another. Why don't you all just leave Massachusetts alone on this issue. All we do is give up time, and traps, and permits, and we never get anything back. In reality we have already done our parts conservation wise, above and beyond. We cannot give up anymore. Lets stay status quo. The management plan in our (OC) area is working just fine, please don't mess with it.

Thank You,

Brendan Adams

3/30/2023

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington. VA 22201

My name is Chad Mahoney. I have federal and state lobster permit I fish in area 1 my home port is in Hull, MA. I attended the March 29 meeting with the State and MLA. I would like to keep things the way it is for now and do more research to get more answers on how the stock looks.

Regards,

Chad Mahoney
887 Nantasket Ave
Hull, MA
02045

From:	Chip Johnson
To:	Comments
Subject:	[External] Public comment from Chip Johnson Harpswell, ME
Date:	Sunday, March 12, 2023 9:16:19 AM

Hello,

My concerns for trawl "surveys", is that otter trawl is slightly complicated and wildly different results will come from different people in charge. I spent many years on boats doing otter trawling and I've seen every mistake there is.

Lobster data needs to come from current lobster fishermen fishing traps in a controlled way, to get reliable data.

I heard someone say there are differences year to year with how many small lobsters are in traps hauled during sea sample trips, which I have participated with in the past, I can tell you there is a big difference there depending on the bait you use.

Herring = more small lobsters, pogies without bag = many less small lobsters.

Another thing is there are many more groundfish (hake, cod) showing up around where most of the lobstering occurs, that will most definitely affect lobsters, especially ones discarded while hauling traps, drifting back to the bottom again without cover.

I can tell you without a doubt, that any changes to the measure will not fix whichever problem is happening, if it is indeed a problem which I doubt. I do not see any issues. I started lobster fishing in 1989.

Bay fishing may be (but almost certainly) affected by all the poisonous lawn/weed treatments that these "new people from away" use to make their lawns beautiful, at the expense of the environment. Most have no idea what they are doing. A whole isle dedicated to toxic chemicals are available at Lowe's and Home Depot. That should not be allowed and this will be realized way too late in my opinion.

Thanks

--
Chip Johnson
C W Johnson Inc
25 Edgewater Colony Rd
Harpswell, ME 04079
207-833-6443
www.cwjohnsoninc.com

April 8, 2023
Atlantic States Marine Fisheries Commission Attn: Caitlin Starks
1050 N. Highland St. Suite 200A-N Arlington, VA 22201
Re: Lobster Draft Addendum XXVII To Whom It May Concern:
Thank you for the opportunity to comment on Lobster Draft Addendum XXVII. I christopher Pickard am a commercial lobsterman from area OCC and have been fishing there for 10 years. As it currently stands there is no data for area OCC. I feel that there should be no action taken to Addendum XXVII, and the current management measures should remain in effect for each LCMA at final approval of the addendum.
The area that I fish has had its Management plan so that we are proactive about taking care of or stock
Bottom line we need more research in our area before life crippling discussions are made

Thank you for your time,
Christopher pickard
Box 622
Wellfleet, MA 02667 pickardc508@gmail.com
F\V Playtpus
Lision number 005070

From: collamoreclinton@gmail.com
To: Comments; Clint Collamore; Rhonda Conway; PATRICE MCCARRON
Subject: [External] RN
Date: Sunday, March 5, 2023 8:09:27 AM

Good morning. Does anyone take into account that because of last year lobster prices, bait shortages, and fuel costs figures in to all of this? Lobstermen set out late, if they did at all, and a lot took up very early. This should play a significant role in the “Real Numbers.” I hope someone addresses my comments before they just go off and implement something else that may not be needed yet. I have been around the water since 1969 and trying to follow all of this stuff. It has got so ridiculous. I feel very sad for future generations trying to survive the industry. Between politics and everything else,we are not leaving them in very good shape. Shame on us. Thank you.

Clint Collamore
Waldoboro,Me.

Sent from Mail for Windows

From: dan feeney
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Friday, March 17, 2023 1:46:07 PM

Wow you are actually going to standardize your regulations on lobster sizes and pot escapements. I wonder why common sense didn't arise till now. After all you have changed the sizes for everything over the years to the financial detriment of fishermen all across the boards.
I applaud the effort but am very surprised that it might happen.

I suggest that you add one more regulation that would end the arguments for all time.

"From now on the expenses involved with regulatory changes to fishermen's lobster gear shall be born entirely by the fisheries managers and regulators salaries budget, without exception nor shall that budget be increased to subsidize any losses"

What cha think?

Sent from my iPhone

From: dan morris
To: Comments
Subject: [External] Draft Addendum XXVII
Date: Wednesday, February 15, 2023 12:05:55 PM

While I don't believe there is a need to increase the gauge for lobsters off the coast of Maine right now, I do understand that having a trigger mechanism might be helpful down the road. The drawback to them is that circumstances/environmental conditions can be so variable that a trigger, deemed a reliable indicator of population health now, might not be reliable in the future. However, if such a mechanism is enacted, I would suggest that the conditions that tripped the trigger be present for several years before taking any action. Having the conditions present for several years ensures that a knee-jerk reaction isn't undertaken with new regulations. No two years are alike generally speaking, and any perceived drop in young-of-the-year lobsters only means that the areas tested dropped, and not necessarily other, yet-to-be discovered, areas due to changing environmental conditions. Of course, we can wait for a corresponding drop in catch, which has been predicted many times, but hasn't happened to date. Waiting also puts any regulation 6 years behind the need for it.

Having said the above, an increase in the vent size alone is, in fact, a gauge increase, in reality. It would be less work in my opinion for everyone involved and is easily enforced. It also reduces the amount of lobsters being handled/measured/stressed each day.

C. H. Sawyer & Son, LLC
657 Eastern Road
Warren, ME 04864

Phone: (207) 542-7657
Fax: (314) 237-2590
Email: dan@chsawyer.com

3/13/23

Caitlin Starks
Senior FMP Coordinator
1050 N. Highland Street
Suite 200 A-N
Arlington, Virginia 22201

Good Morning,

I would like to submit a public comment to the commission concerning the Lobster Draft Addendum XXVII.

Our company has been a manufacturer of hand tools for the commercial fishing industry since its founding in 1992. We are currently a major supplier of lobster measuring gauges for all of the LCMA's which would be affected by the changes in minimum/ maximum size regulations proposed within the Draft Addendum. Our primary concern is with the implementation schedule for any changes in these regulations which could have an undesired negative economic impact on the manufacturers, suppliers and end – users (lobster fishermen, cooperatives and law enforcement agencies).

Consideration should be given as to the time between the date of notice of the change in regulation to the date the new regulation would take effect to allow an adequate time frame within the industry for the manufacture and distribution of necessary equipment and hardware in the supply chain. All members of the supply chain have an interest in avoiding the waste of resources when parts and equipment must be discarded due to obsolescence rather than replacement due to typical wear, etc.

From my understanding, under the current plan of action for implementation of most of the options available on the draft addendum, the new regulations would automatically take effect as the result of review by the ASMFC of lobster survey data in November each year if the appropriate trigger level indicated by the survey data was reached. The Commission would then notify the public and state agencies and the new regulations would take effect on the opening day of the following lobster season, May 1 of the following year. This would allow only 5 months for the industry to adjust for compliance with the new regulations. Also, as was mentioned at the hearing in Freeport, Maine, March 7 2023, states would be allowed to decide on their own regulations, provided that it would be the same standard or a more conservative standard of measures. Each state's process of passage and implementation of new regulations could shorten the time the industry would have to adjust even further, increasing the chance of a negative impact.

I propose that, **for any of the proposed lobster size regulation changes, the date of implementation and compliance to the new regulations be not less than 12 months from the date the new regulations have been published by each state** in order to avoid waste and to allow for the additional time needed for the states to pass and implement new laws and also permit a feasible time frame for industry supply chain and fishermen the time needed to change their gear for compliance.

Respectfully,
Daniel Sawyer, Owner
C. H. Sawyer & Son LLC

C. H. Sawyer & Son, LLC
657 Eastern Road
Warren, ME 04864

Phone: (207) 542-7657
Fax: (314) 237-2590
Email: dan@chsawyer.com

From: Dana and Peggy Tracy
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Wednesday, March 8, 2023 6:34:44 AM

I would like to submit my comments to the proposed addendum XXVII to be considered from a 'hands on' point of view. I will be entering my 50th year as a full-time commercial lobster harvester from the State of Maine. I have seen ups, downs, measure increases, vent changes, market fluctuations, lobsters changing their areas, and much more.

The last measure change that took place was presented as a necessary step to protect the industry. It was thought that it would nearly double the marketable lobsters to be caught and increase the per pound value. While that may have proven to be close to becoming fact the real fact is that it hurt the market for several years. Consumers now had to pay for a heavier lobster and there was a long period of adjustment to the increased price. Another increase in measure would surely have the same effect and with the increased operating expense it will be another market adjustment which will ultimately fall on the harvesters' shoulders with increased price and lower demand.

In reading the Addendum in regard to stock assessment I am very skeptical. Though I am not coming at it from a scientific point of view I have seen for 50 years what the stock is doing. The trawl surveys and ventless trap surveys never took into account the lobsters changing their habitat. I have fished around ventless traps and they are putting some where there are few lobsters at that time. An example is setting the trap on a hard
piece of bottom when the lobsters are all around it on the soft bottom. Years ago they might be on that bottom a little more but that has changed over the last decade. Again, the trawl surveys are done in the same places year after year and things have changed, of course the observations are lower--they have moved!

I am addressing this from a fisherman from Maine and it is my opinion that the Maine stock is healthy and any changes to the measure will be detrimental to not only the fishermen but the lobster stock. I base this on the fact that there is an abundance of lobsters on bottom and fear that this addendum could lead to overpopulation. There are days when my catch is about 30% of seed lobsters and many of them are very small. They are seeding out at a smaller size than I have ever seen. We can call it warming waters, increased population or what ever you want but the best thing you could do is use observers to get the best 'hands on' assessment of the industry rather than hypothesize about what might be.

In closing I would like to thank you for the time to comment and hope you will consider my years in the industry as valuable information. There may be steps to take that will bring the states in closer alignment so markets can better work but measure increases in Maine is not the answer.

Dana Tracy, Maine lobster harvester

From: Dillon Reed
To: Comments
Subject: [External] Lobster Addendum XXVII
Date: Monday, March 20, 2023 5:39:01 PM

Hello,

My name is Dillon Reed, I am a lobsterman from Friendship, Maine. I think increasing the measure and vents sizes right now would be another vital blow to our industry right now. Last year alone with the price per pound decrease and increase of fuel and bait was a very hard year for almost all of us especially the up inside guys. I feel like there is tons of lobsters around big and small and a decrease in catch could be related to the profit margin for 2022 where no one wanted to go work extra hard for nothing. I jus feel like we should make sure we know what else is going to happen with whale rules and windmills before we do a huge change like a measure increase which would hurt everyone even more so. This whole industry seems to be on edge at the moment I just can't see why to add more changes in regulations could help at all. I am sole supporter of my household of wife and two kids. I would like to be able to continue to lobster and actually make something at it. I hope there is a future for lobstering and it's not going down the drain. I've committed my life to this already and I know most other fisherman are in the same boat and there's not many other options for us. Just please consider what these changes would effect on top of the worry we are already having.

Thank you,
Dillon

Sent from my iPhone

From: wmcculebra@aol.com
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Saturday, April 8, 2023 9:56:37 PM

April 8, 2023

Donna Pickard
Massachusetts Lobster Permit # 000870

To whom it may concern, I am writing in opposition to Amendment XXVII to the lobster fisher in Massachusetts. I currently am proud to hold an Outer Cape Lobster Permit, one of 46 left in the state. I have been fortunate enough to fish with all three of my children and now fish regularly with my eldest grandson. At 81 years young, I am the oldest active member in the Outer Cape lobster industry. If the proposed amendment is passed, I will lose 25-30% of my catch, which is my primary source of income. I am disgusted with the ASMFC as well as MADMF for trying to steamroll new regulations for our zone, without any data to represent us, especially when our zone only accounts for 7% of lobsters in Massachusetts and less than 1% on the east coast. The lobsters that we do catch are primarily large lobsters 8+ pounds, and are highly converted overseas, not only due to their large size, but their heartiness in long distance shipping. Our lobster stock is highly migratory in the Outer Cape, which would be the best area for data collection to have an accurate representation of the lobster stock as the lobsters are coming from Georges Bank, Southern New England and The Gulf of Maine. At this time, due to lack of data, the only option for the Outer Cape is Status Quo, A in the Amendment 27. With more accurate research and data, only then can we make changes that will ultimately decide the fate of the citizens here in the outer cape.

Once again, I choose Option A, Status Quo, and I hope with a sound mind you do too.
Thank You,
Donna Pickard

From: doug maxfield
To: Comments
Subject: [External] Status quo
Date: Wednesday, March 15, 2023 9:25:25 PM

Doug Maxfield, area 1 fisherman. In response to tonights webinar I would like to go on record as supporting option a status quo across the board.

From: elf090971
To: Comments
Subject: [External] Lobster gauge increase
Date: Sunday, March 26, 2023 10:24:29 PM

Hi ,my name is Ed Ferent.
This proposed gauge increase will absolutely destroy the lives of the lobstermen, their families, employees and the businesses that they help bring revenue to.

We have already contributed heavily to the preservation of the industry with a larger minimum gauge ,a smaller maximum gauge, mandatory V- notching,larger vents in traps, biodegradable vents,trap limits and as of the last several years a shortened lobster season because of right whale regulations to protect their species.

These are not the only factors that have helped with conservation of the industry. We also have the price of fuel, price of bait and the availability of bait. These three factors have forced lobstermen to not go out as often as they can because it is just not economically feasible and causes fewer lobsters to be landed.

We must take all of these factors into consideration, for if we don't, we will be acting maliciously without basis in order to just regulate an industry because you can.

I ask you to do the right thing by not increasing the lobster gauge size in any way. This will help to preserve the lobstermen and their families to survive the harsh times that our industry is feeling from all sides.

I implore you to do the right thing! It will be the best for all who would be impacted.

Thank you very much for your time and the chance to voice my concern!

Ed Ferent F/V Sandi Boston,MA

From: gary hatch
To: Comments
Subject: [External] Lobster Addendum xxvll
Date: Saturday, March 11, 2023 10:30:26 AM
Importance: High

Dear Sir's; In response to your written conveyance to managing the Gulf of Me ,GB Lobster fisheries.
As in so many Of the ASMF councils actions, I find it seriously flawed !!
First I believe that you need to address the western New England fishery's

problems, as now its spilling over into the Gulf of Maine fishery!! Many of the displaced fishing industry are coming to the Gulf of Me and GB fishery to maintain a viable business.

As for your written response to the fishery, as so many Council responses to management you circumvent the real problems and push your lack of sound science onto a viable fishery to promote your governmental powers!!

First to your Addendum, This proposal not only will have a negative effect to the Near shore fishery as all it's really doing is sustaining the area three fishery that will be the benefactors of this action. The inshore fishery will not only be negatively affected by a lowered biomass to produce, as well a negative effect to overall pricing!!

On the other side the area three fishery will benefit by increasing their biomass for that fishery at the time of input of the size class into the fishery.

If you feel that your need to disrupt the inshore fishery is necessary, It would be inparitive that you make the same equal adjustment to area three fishery to circum vent this injustice. I feel you need to take all factors into account at this time to support any action??

The most evident factor would be the 50% reduction in landings this past year, This factor had nothing to do with the biomass, but with marketing and the overwhelming expense to harvest the product.

As evident with the amount of Lobster businesses for sale at this time do to the false narrative being placed on the fishery along with the degradation of our free enterprise system,

I sincerely hope that you take no action on this {GOM<<GB} fishery and promote the nessary factors to rebuild the western New England Fisheries with you time and efforts!!

Sincerely
Gary Hatch
Ghatch2002@roadrunner.com

From: hugh bowen
To: Comments
Subject: [External] Addendum xxvii comments
Date: Friday, March 10, 2023 5:41:45 PM

Using the management options cheat sheet, under " issue one 1", I am for all sub options under option B except for sub option B one, I think the maximum gauge should be smaller, 6 1/4 inches.

"Issue two", option B, I would vote for option one, 32% decline trigger. Under the management measures options, I would choose option two.

Sent from my iPhone

From: Jacob Thompson
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Friday, March 31, 2023 9:31:50 PM

I think you should eliminate lobsters to be taken by draggers and divers as a first step. Then make everyone have the same
v- notch rules then the same size measure on both the big and the small sizes including Canada.

Thanks
Jacob Thompson
Vinalhaven Maine

Sent from my iPhone

From: James Robbins
To: Comments
Subject: [External]
Date: Wednesday, February 15, 2023 6:32:50 AM

I strongly suggest cutting the trap limit in half . The lobster fishery is being way over fished

From: James Robbins
To: Comments
Subject: [External]
Date: Monday, March 6, 2023 1:45:53 PM

Instead of increasing vent size or gauge size just cut the trap limit in half . The lobster fishery is being way over fished

From: Jason Hyora
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Saturday, April 1, 2023 9:18:12 AM

Good day, this is Jason Hyora. I've been lobstering out of Chatham MA full time since 1989.I've seen a lot change in this amount of time, and we (all lobstermen) have changed and adapted to all the regs (mostly right whale related).Which most all of these regs have been expensive to switch over to and put alot of pressure upon our industry.

So, to address the latest proposals on gauge sizes, v notched lobsters, law enforcement ect.,my view and my stance is to leave things STATUS QUO!!!!! We have endured enough change and pressures from the powers that be, and are at a point in our industry where we can't afford in any way to lose even more profit due to rule changes!!!! Thank you for your consideration.! Best, Jason Hyora

From: Jason Hyora
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Saturday, April 1, 2023 10:53:35 AM

Hello again, I , Jason Hyora have just submitted comments but I failed to add a few things in, so I'm emailing you again.

On the topic of enforcement being the same in all states involved, that is preposterous! It appears to me that lack of training is the root cause of concern amongst the EPO community. A point that nobody will dispute, that I know of. To implement this part of the addendum is plainly irresponsible.

As to the size regs and potential v notch changes,these rules could potentially be extremely dangerous to the ability of many lobstermen to continue to operate viable businesses. So again, as a longtime lobsterman, and someone who cares deeply for my industry, I am asking the commission to rethink and carefully consider all the moving parts of these proposals. We have been forced to give in so much to date that I feel no change at this point is the only option. Please consider the best and only option at this time, which is NO CHANGE, STATUS QUO!!!!!!!!!! Thanks again, Jason Hyora:Chatham lobsterman.

From: swansislandcharters@gmail.com
To: Comments
Subject: [External] lobster ammendment
Date: Wednesday, March 8, 2023 5:16:33 PM

1.) I am opposed to allowing Canadian undersized lobsters into the United States if the small guage is increased. That will hurt our price at a time we will see lower landings.
2.) I would suggest basing the trigger upon a 10 year average that continues to move ahead each year.
3.) I would lower the large measure end rather than looking at increasing the small measure to increase recruitment if data is considered necessary.

4.) Lastly I would like to see ASMFC oppose offshore wind development on behalf of the lobster resource. From physical damage to lobsters at all age stages to damage of habitat, there is nothing good in offshore wind for the lobster resource.

Thank you,
jason

Capt. Jason Joyce
Swan's Island Selectman
Registered Maine Guide
CG Licensed Master 100 gross tons
Authorized Commercial Assistance Towing
F/V Andanamra M/V DEFENDER
207-479-6490
www.swansislandcharters.com
https://www.youtube.com/channel/UCuOwmhDMi5Ac0dGnDwOmgRg

From: swansislandcharters@gmail.com
To: Caitlin Starks; Comments
Subject: RE: [External] lobster ammendment
Date: Friday, March 10, 2023 11:26:32 PM

Hi there,

Thank you for the opportunity to weigh in with additional comments on Addendum 27.
1.) Has the beneficial impact of implementing Zero tolerance in all federally managed areas for v-notched lobsters been considered. No exceptions, following Maine State waters definition of zero tolerance would provide more protected seeders and likely exceed the estimated recruitment projections of raising the small measure in Area 1.
2.) Is there a trigger mechanism that returns the small measure increase in Area 1 to the previous size of 3 1/4" if eventual trap reductions are implemented in the future? Trap reductions, if implemented will have a positive effect on the population and negate the need for the small Guage increase in my opinion.

Thank you,
jason

Capt. Jason Joyce
Swan's Island Selectman
Registered Maine Guide
CG Licensed Master 100 gross tons
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207-479-6490
www.swansislandcharters.com
https://www.youtube.com/channel/UCuOwmhDMi5Ac0dGnDwOmgRg

From:	jay
To:	Comments
Subject:	[External] Lobster Massachusetts
Date:	Sunday, March 12, 2023 1:18:43 AM

I use mackerel for bait but the new regulations make it impossible to bait my traps. With only 20 mackerel allowed on the boat. This isn't fair for someone that spends 80 in fuel to catch some Lobster for My family and now have to bait lightly. If you have a Lobster permit you should be allowed more mackerel on the boat just like a boat for hire.
Thank you
Jason Romans
508-294-3862 cell

Jeff Putnam

107 Littlefield rd
Chebeague Island
Maine, 04017

April 2, 2023

Atlantic States Marine Fisheries Commission,

Thank you for putting together a very detailed package about addendum 27. I have reviewed it carefully, please consider my comments in your decision making process.

For many years now the Maine Department of Marine Resources has held meetings to notify us of the decline in settlement they are seeing through the ventless trap program and trawl surveys. I understand that while our catch numbers in GOM have remained high, it is concerning that the SNE stock decline started with reduced settlement numbers. I am in support of developing a strategy to protect the spawning stock biomass and put in place consistent conservation measures across the GOM/GBK harvesting range. Maine Lobstermen have a history of being proactive in protecting this resource. I have benefited from the older generations sustainability measures and it has always been my hope that the generations behind me will benefit from my attempts to keep the resource resilient. However I also believe that ASMFC has not given an option that goes far enough to protect V notch lobsters across the range of areas, nor has ASMFC been vocal enough in opposition during the large whale take reduction process to proposals that would cripple our industry and make drastic changes to the harvest levels. Therefore, my comments are in support of some of the measures that are proposed in addendum 27 but with stricter v notch retention restrictions and a sunset clause.

Consistency of a conservation strategy is mentioned several times. Maine has led the way in the US and Canada to protect spawning females for multiple sheds with our zero tolerance V notch definition. If ASMFC truly wants to protect SSB, the resiliency addendum objective would include Maines zero tolerance for V notch possession across all management areas. Issue 1 calls for standardization of measures, ASMFC should standardize the V notch limit to meet Maines zero tolerance. Sub option B1 recommends standardizing V notching to the most conservative measure, but then should state that the most conservative measure is zero V notch, zero mutilation. Section 2.5 says “loss of conservation benefits occur when lobsters are protected in one area but can be harvested in another”. That is the statement in the document that makes the argument in favor of standardizing the zero tolerance for V notch across the areas. I understand that this is politically challenging for ASMFC to propose, but LMA1 is being asked to give up, by all accounts, the biggest amount of volume to support the resource at least during the beginning of these measures. This would be a huge decrease in landings in LMA1 for a period of time, other areas should also shoulder the burden for the greater good of the resource. I only support a sub option that incorporates zero tolerance for V notch because the purpose of this addendum is to protect the SSB. I also would support sub option B2 mandatory V notching.

If zero tolerance for V notch possession is put into place across the GOM/GBK harvest area, then I would support a minimum measure increase. I agree that the settlement indices are

concerning and I understand that most of the catch in LMA1 is within one molt of minimum legal size, so increasing that minimum size would allow for more opportunity to increase the SSB. Under issue 2, I would support option C, to have the changes occur shortly after this addendum is passed. The only change I would make would be to increase the minimum size to 3 3/8 in step 1, no later than 2026. I believe a two step gauge increase will be less beneficial and cause more confusion and potentially enforcement issues.

I want to make clear that I feel a sunset clause for these measures is vitally important. The ASMFC has to look at the big picture of the lobster industry which includes the potential for NMFS to implement massive changes to trap limits and area closures no later than December 31 2028. LMA 1 and 3 fisherman, fishery groups and State Government Departments worked to fend off a crushing blow brought by NMFS based on a false premise of our fishery harming large whales. To the best of my knowledge ASMFC, which has a charter to protect fisheries, did not step up to support keeping the status quo of a lobstering industry during these discussions. The GOM/GBK stock assessment points out that at current fishing levels the exploitation rates are below target, the stock is stable, and over fishing is not occurring. The harvesters and shore based businesses that depend on lobstering need every group to speak against the draconian measures that NMFS has indicated are needed to meet a a false risk percentage. ASMFC should commit to oppose trap reductions or closures that are not put forward by industry itself. This is the reason that I feel a sunset clause is important. If by December 2028, we are forced into trap reductions or have huge closures in LMA 1 and 3, that would most likely decrease the exploitation rates which in turn would increase the baseline spawning stock biomass and increase juvenile lobsters . In effect the current indices and the after-2028 indices would be comparing apples to oranges making the data used in addendum 27 obsolete. The combination of a gauge increase and trap reductions/closures would be unnecessary.

In summary, if zero tolerance V notch and a Dec 31 2028 sunset clause is incorporated in addendum 27, I would support:

Issue 1 option B sub options B1, B2, B3 at zero tolerance, and B4.

Issue 2 option C, preferably with a single step increase to 3 3/8 as soon as possible.

Sincerely yours,

Jeff Putnam

Issue number one Vnotch definition. Status Quoe. If he 1/8 inch v-notch definition is standardized it needs to state that any V shaped notch coming to a point with or without setal hairs deeper than 1/8 inch. Without having the definition of a V shaped notch coming to a point (which is a true definition) any nick in the tail deeper than an 1/8 inch could be considered illegal by some and legal by others. Without having a true definition it would be impossible to enforce since it would be so subjective from officer to officer and fisherman to fisherman. If no specific definition is in place it becomes zero tolerance for any nick. A true 1/8 inch v-notch cut with a v-notch tool will last 2 molts. If v-notch was the solution then the population would not be in a decline according to the asmfc, v-notching has been going on for over 40 years since the 1978. The 47 state licenses in the OCC with their v-notch rule are not the cause of the depletion of SSB. The 5600 licenses in area 1 with their v notch definition is obviously not the solution to the SSB proven because 40 years later and the SSB is not well.

Issue number 2, Status Quo. If an option was picked I would suggest option E before it was amended by the representative from Maine. Option E was proposed due to the fact that it would have the highest positive impact in the SSB. The representative from Maine then amended option E to put a maximum gauge on OCC and lessen the maximum gauge in area3. This just proves that this is not all about the stock management but more because of a vendetta that Maine has for OCC and our management plan. OCC has a very fluid management plan that has been adhered to. There were trap reductions when it was implemented and is ever changing with a 10% trap reductions every time trap allocations get transferred. There are 47 OCC state licenses averaging 370 traps per license, that is half the allocations of every license in area 1 with roughly 5600 licenses with 800 allocations. OCC and area 3 management plans have changed over the years with trap reductions, and area 1 has had no changes in their traps and management plans since the plan was adopted.

In 1978 the Northeast Marine Fisheries Board had a comprehensive study and plan for lobster management where they stated the same as this addendum does, that the 3 ¼ minimum area 1 has takes lobsters smaller than they have a change to reproduce. The science obviously has not changed in the over 40 years from the 1978 document since the this addendum states that same. The 1978 plan wanted to get all minimum gauges to 3 ½ with a 6 step gauge increase. Area 1 stopped at the first increase and OCC stopped at the 3rd increase. Table 3 on page 59 of the Addendum shows that and area one minimum gauge increase to 3 3/8 would have a 38% increase on the SSB. Just Maine last year in 2022 lists that they landed 97,956,667lbs of lobsters. A 38% increase would be roughly 37,223,533. Table 11 on page 64 shows if OCC has a 6 inch maximum gauge it would be maximum an 8% increase. The OCC estimated to have landed less than a million lbs. 1,000,000 times 8% increase would be 80,000. A minimum gauge increase to area 1 would have a 465% positive increase in the SSB over the maximum gauge on the 47 state OCC licenses.

In any study you need to change the thing with the biggest impact in the direction you want which would be a minimum gauge increase for area 1. If you change the vnotch, minimum and maximum gauges there will be no way to see how each change has on the SSB over the next 5 plus years. You need to change one thing at a time and see how it effects the stock so that in the future if

further measures are needed for the stock you will know what has the greatest impact to increase the SSB.

Cost of living on Cape cod is 40% higher than that of Maine. There is no option to live an hr inland to fish the OCC. With the trap reductions most of us have spend hundreds of thousands of dollars to up our allocations compared the price of an area one license of roughly 20-40 thousand dollars. The change in the management plan that OCC had picked and have stuck with will devalue our licenses considerably which most of us have our houses up against.

There has to be better studies on YOY with sampling in different areas as before. Water temp is ever changing and they most likely have moved to a different area than the sampling. You need ventless trap studies including some in OCC and the east part of Cape cod bay. Food sources and water temp for the YOY larva change every year and should also be recorded at each testing site to see what environment they are now abundant in.

No lobstermen wants to see the stock collapse since it is our Lively hoods in jeopardy. But there has to be science to back up the changes and not political reasons such as the change to option E from the Maine representative.

-Jeff Souza

Massachusetts OCC state license 4th generation

From:	jer lop
To:	Comments
Subject:	[External] lobster draft addendum XXVII
Date:	Saturday, April 8, 2023 9:56:53 PM

ASMFC, MA DMF,

I am submitting a comment as a member of the Outer Cape Lobstermans Association.

In full support of the comments you already received by President Brendan Adams and Vice President Sam Pickard, and myself on the webinar, status quo is the only option for lobster management area OCC until more studys are done.

On a personal note,
My permit has surrendered approximately 85 OCC trap tags from tag transfers to get to my final allocation of 800. Also the federal permit that was once attached to my license had to be surrendered in order to obtain the greater tag allocation due to the tag transfer restrictions. I have invested approximately $1 million USD for my business which is currently thriving. Not by choice, but as i stated this is a STATE only permit. New proposed changes would cut my value in half. I would like a federal permit again to help cope with these changes if they are forced upon us. I will take a crippling blow under any unjustified changes that are represented by false and inaccurate data not done directly in the OCC management area.

More studys and data need to be gathered from area OCC. I have been in this management area my whole life and as a steward of the sea, i am very happy with its great condition.

Status Quo for more OCC Data

thank you,
Jeremy Loparto

From:	G2W2
To:	Comments
Subject:	FW: [External] Lobster public feed back
Date:	Monday, March 13, 2023 1:56:36 PM

From: jimurphy2@verizon.net <jimurphy2@verizon.net>
Sent: Thursday, March 9, 2023 8:38 PM
To: G2W2 <G2W2@asmfc.org>
Subject: [External] Lobster public feed back

Hello: Excellent presentation tonight. I was not quick enough to copy the email address to add public comments on. Can I do it here? I just have two or three things to add.
1. We all just want to have a level playing field. If the Canadians are not placing a restriction on size of their catch it hurts us.
2. I Agree with increasing the catch size if this will reduce the stress on out stock and increasing the chances of producing more young.
3 Are there any studies regarding the overall health of our lobsters?

Jim

Sent from AOL on Android

From: lobstahman8@gmail.com
To: Comments
Subject: [External] Status quo
Date: Wednesday, March 15, 2023 8:58:43 PM

Joe Edelstein area 1 out of Gloucester I agree with
Mike Goodwin, Steve Budrow let's not go backwards I'm status quo
Sent from my iPhone

From: John Drouin
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Wednesday, March 29, 2023 3:10:48 PM

Hello,

My name is John Drouin. I am from Cutler Maine. I have been a full time lobster fisherman since 1979.
I am Chair of the Maine Lobster Zone Council for zone A.
I occupy a seat on the Maine DMR Lobster Advisory Council.

I will start by saying I am AGAINST any gauge increase or vent increase for LMA 1.
I do believe it would be overwhelmingly helpful to decrease the maximum size in LMA 3 and to establish a oversize measure in the OCC. And a standard definition of a V-notch. Protection of these bigger lobsters are what Maine has for generations declared to be the most important part of the brood stock! It has made zero sense all these years to protect these lobsters, which again, are the cornerstone of the brood stock, just to be caught and sent to market by someone else.

Now I would like for you to think about the current statements that are being said from the industry as well from the regulatory bodies in Maine. We all say that Maine has the most sustainable fishery in the world!!

Again, MAINE HAS THE MOST SUSTAINABLE FISHERY IN THE WORLD!

So, if we are so sustainable, doesn't the need for an increase in the measure go against this statement?
You all know that stocks run in cycles. Are we in a down turn? Perhaps, but the conservation measures that are in place in Maine are what got us to where we are. If "Mother Nature" has other plans, then I don't believe that we can change what is going on in nature. Perhaps it is because of the slow increase in groundfish that is the reason for low recruitment numbers. Perhaps, because of the change in ocean temperatures. My point is, I don't believe that we will be able to keep the numbers as high as they were due to the change in nature.

Now, my BIGGEST reason for not changing the gauge is because I fish in the area known as the "Gray Zone", in downeast Maine. It is bad enough that I return our proven broodstock to the water only to have a Canadian fisherman catch it and send it to market at a time of the year when it will be sent to the United States, and come down US route 1...past all the fishermen that have tried to protect that lobster.
Now we will be returning to sea the lobsters that this measure is supposed to be protecting to again, be caught by a Canadian fisherman and sent to market.
SHAME ON ANY AND ALL OF YOU THAT VOTE TO INCREASE THE LOBSTER MEASURE.
And I will blame NOAA and the DMR for not acting upon the issue of the gray zone to either establish a single boundary line or to come up with an agreement to co-manage the gray zone...Mostly on NOAA since they were directed by Senator Susan Collins to work with the Maine DMR and the local people directly involved with the fisheries in the gray zone to work out a solution!

Thank you for the opportunity to speak on this extremely important issue.
John Drouin

April 7, 2023

Ms Caitlin Starks & Board:

In response to March 9th Revision of Draft Addendum XXVII Amendment 3 to American Lobster Fishery Plan (Plan), please consider this letter as my Public Comment. My name is John Godwin and I own and operate Point Lobster Co., Inc in Point Pleasant Beach NJ. Our Federal Dealer permit is #1852 and I am on the American Lobster Advisory Panel. My qualifications to be considered as a participant in the fishery can be measured by Point Lobster Co's 2022 purchases of 253,358 lbs of Massachusetts lobsters and 138,400 lbs of Maine lobsters, both having aided in the sale 1,100,00 lbs for 2022.

Thank you for the opportunity to comment on the plan. On page 3, the plan states "*Increasing consistency across management areas may help to address some assessment and enforcement challenges, as well as concerns regarding the shipment and sale of lobsters across state lines*." This rhetoric can be seen as far back as the October 2016 ASMFC Draft Addendum XXV where on page 15 it states, "*When considering changes to the gauge size, potential impacts to interstate commerce should be considered. It is likely that an implementation of gauge size changes, or any of the proposed measures in the addendum, will create increased demand and shipments of lobsters from different LCMAs, including those Areas in the Gulf of Maine and Georges Bank (GOM/GBK). Currently, the minimum and maximum sizes in place are possession limits, meaning harvesters and dealers must abide by their state's regulations. While these strict regulations improve enforcement of gauge sizes, it can complicate interstate commerce as lobsters legally caught in LCMA 1 have a smaller minimum gauge size of 3 ¼". Massachusetts, because it has lobster landed from four LCMAs, is an exception to this and is only able to enforce LCMA-specific gauge sizes at the harvester level with significant penalties for violations. Some states, such as Rhode Island and Connecticut, allow dealers to possess smaller lobsters legally harvested in other LCMAs as long as those lobsters are not sold to consumers in their state. Dealers are required to have thorough documentation regarding the origin of lobsters below the state's minimum size and these smaller lobsters must be kept separate from those lobsters legally landed in the state. States should consider adopting similar language to minimize economic disruptions in the GOM/GBK stock.*"

During the May (2-5) 2016 Spring Meeting I submitted Public Comment about this management measure. The Lobster Management Board recommended I seek relief at the State level. ASMFC was not willing to provide instructions on a State level, as the board determined it can only provide mechanisms for a state to meet its obligations under the plan. As a result, on May 12, 2016 I petitioned the NJ Fisheries Council to grant relief on the Possession limits to allow for the receiving and storage of lobsters that fall below the states minimum size but were purchased from Maine or Massachusetts legally. The motion passed but was never written into State of NJ regulation because ASMFC found the regulation to be conflicting with what the Board perceived as 'compliant'. Additionally, Senate Bill A939 was introduced to grant relief but never passed, as was Assembly Bill S1157, also never passed.

In reference to the March 9, 2023 Addendum XXVII, the Board has identified inconsistencies in regulations that should address the interstate shipment of lobsters. Beginning on page 12' **2.7.2 INTERSTATE SHIPMENT OF LOBSTERS**

Increasing consistency in regulations may address concerns regarding the sale and shipment of lobsters across state lines. With decreased landings in SNE and expanding markets for the GOM/GBK stock, there has been increased demand for the shipment of lobsters across state lines. This movement of lobster can be complicated by the fact that the gauge sizes differ across LCMAs, and many states implement the minimum and maximum gauge sizes as possession limits rather than landing limits per state regulation or law. This means the gauge sizes apply to Draft Document for Public Comment 13 anyone in the lobster supply chain, not just harvesters. While these strict regulations improve the enforcement of gauge sizes, it can complicate interstate shipment of lobsters, particularly given the minimum size in LCMA 1 is smaller than the other management areas. As a result, some dealers must sort lobster by size in order to ship product across state lines. Moving toward more consistent minimum sizes within the inshore LCMAs would help alleviate this issue by easing the ability of states to participate in the GOM/GBK lobster supply chain. This would not only reduce the burden on dealers that sort product by size but also enhance the enforcement of gauge sizes in the fishery.

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

The verbiage seen in the latest Draft clearly outlines the necessity for some level of relief on dealers. Point Lobster has records obtained from NMF/NOAA port sampling where our facility can have 1.4% of the inventory that falls below the State minimum size of 3 3/8". The annual sum of this 1.4% equates to our 2022 exposure of 15,400 lbs (1,100,000 lbs x 1.4%) that could be seen as a violation under the current law. Any law-abiding business or enforcement agent could reasonably discount 1.4% as an allowance but the possession limits do not allow for anything below the state minimum. I have performed exercises in the presence of Federal and State enforcement agents where the dealer could measure lobsters upon delivery but all parties agree that it is not a realistic goal when any truck load volume is being purchased out of state.

The impact of the current regulations was preceded by a warning in 2009 under the Federal American Lobster Management In The Exclusive Economic Zone NMF – June 2009, where on page 76 NMF/NOAA states "*However, in choosing no action alternative, differences in state and Federal regulations across multiple management areas could cause some confusion within the industry and for managers and may inhibit effective enforcement of fisheries regulations*." The summary of this letter is to provide ASMFC, NMF, NOAA, and NJDEP with a report that the varying regulations are creating confusion, and the interstate shipment of lobster has become complicated, and the enforcement Committee recommendations are accurate. ASMFC should move to a standardized measure for dealer possession.

The possession limits were intended as a harvest measure. The lack of resources and difficult nature of using the possession limit as an enforcement tool has led to a myriad of complaints filed against law abiding businesses. In 2016 NYDEC seized 1100 lbs of lobsters from a retailer in Schenectady, NY; the lobsters were legally obtained from a Massachusetts dealer but deemed 'undersized' based on NY regulations. Point Lobster has had similar experiences with enforcement, in June of 2009 we were found in possession of legally obtained lobsters that did not meet the NJ minimum. The case of State NJ v Point Lobster Co., Inc was awarded to the state where pursuant to C.F.R. 697.6(1) *any dealer must comply with the more restrictive requirement.* There is visible doubt that these regulations were intended for dealer prosecutions, but they are. ASMFC should provide the mechanisms to protect those who participate in the industry after the lobster is harvested.

Sincerely,

John Godwin

From: direction@skymate.com
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Friday, April 7, 2023 10:26:16 AM

Dear Caitlin,
My comments for Addendum XXVII align with the AOLA. The only difference I have is with Sub-Option B3. I agree that the v-notch definition should be standardized, but as zero-tolerance through all LCMAs.
Thank you.
John Moore Captain F/V Direction john.g.moore2@gmail.com

From: Jon Carter
To: Comments
Subject: [External] Comment to the ASMFC on Addendum XXVII
Date: Friday, March 24, 2023 8:55:23 PM

I am Jon Carter, Chairman of the LCMT Area 1. I believe that the LCMT should have had the opportunity to meet regarding this addendum. I contacted our commissioner, Pat Killaher last summer and asked him if we could meet. He said, at the time he didn't think it was necessary because he didn't think this was going to go anywhere but he would keep me in the loop, which didn't happen. I feel very frustrated that this has now gone to public comment without giving the LCMT the opportunity to meet and present the board with our collective input.

In the past, the LCMT was extremely active and I believe very helpful to the board. When we had an issue we would come up with several proposals on how to best deal with what was happening at the time. While I'm not against a trigger mechanism for recruitment I am against the proposal of going up on the measure for two important reasons.

1. If we go up on the measure, we give the chick market to the Canadians. I was told by a local dealer how important the chick market is to our business. Do I believe that going up on the measure will kill our fishery? No, but it would severely impact our markets, which if you paid any attention to last year, our markets are fragile, we all felt the huge financial impact.

2. If we are really worried about recruitment why wouldn't we think about putting more valuable eggs on bottom to generate more sublegal lobsters? The larger lobster gives us more bang for the buck and we've been told by science for the past 20 years that the larger lobsters have more eggs, are more viable and more apt to produce. I'm extremely surprised that the scientific community hasn't stressed that point to the board.

3. Gauge sizes have been different in all areas for many years and has worked. We don't need to change something that isn't broken.

4. Interstate shipping has been going on ever since there has been different gauge sizes. Massachusetts is the state that has the most gauge differences but I believe they have made it work.

5. No matter what we do, enforcement will always be a challenge. It is up to the States to deal with their enforcement.

In years past, we got huge benefits by talking about going down on the oversize measure. This way we are putting more eggs on the bottom and protecting our markets. The processors rely on the chick lobsters for their 3 and 4oz tails. It is their best seller. Why would we take that away from our Fishery and give it to the Canadian Fishery?

I understand that this board is made up of different people than when the LCMTs were more active and perhaps don't realize all the important work that was done to help shape this area management. I feel it's a shame that Massachusetts, New Hampshire and Maine let the LCMT process dwindle and my hope is that we can renew this with fresh blood and let it be active and helpful to the ASFMC Lobster Board. Thank you for your time.

Sincerely,
Jon Carter

From: Jon Granlund
To: Comments
Subject: [External] lobster draft addendum xxv11
Date: Wednesday, March 15, 2023 8:58:43 PM

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status quo for me outercape license # 002332 tech problems!!!!

Sent from my iPhone

From: Julian Lemai
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Monday, March 13, 2023 8:33:28 AM

I am currently a high school senior at Winnacunnet High School in Hampton, NH and I recently started researching this draft addendum to Amendment 3 for a school project in my Foundations of Democracy class with a classmate of mine. Reading through the proposed additions to Amendment 3 and their plans to provide more safeguards in place for lobster spawning stock and juvenile lobster populations I found them to be necessary ideas which should be voted in. I understand there has been some pushback from local lobster fisherman which I found totally understandable but I think in the long run these protections will help sustain their livelihoods far into the future.
Best regards, Julian Lemai and James Stewart at Winnacunnet High School

From: Justin Papkee
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Wednesday, March 8, 2023 5:43:53 PM

My name is Justin Papkee. I fish commercially for lobster, crab, and Menhaden off of Long Island, Maine. I fish in Maine state waters as well as area 1.

-I am in favor of implementing a gradual measure increase using a 32% decline in the trigger index to initiate it. The benefits of increasing the measure and allowing the majority of female lobsters to reach breeding size cannot be overlooked. Using the trigger means there already would have been a decline in the stock, and allowing more lobsters to remain in the biomass to breed would be a good thing to help combat that decline. Economically, the measure increase will also be a benefit. Initially there will be some lobsters that we would have been able to keep but cannot, but in the long term, 6 months to a year later, we will catch those lobsters and they will weigh more.

- I do not think that lobsters coming across the border into the U.S should be allowed to be smaller than the minimum sizes that can be kept by U.S. fishermen. I am completely opposed to waiving the Magnusum Stevens act to allow sub legal lobsters to come in from Canada. Allowing these lobsters into the states also goes against the idea of creating standardization of management measures.

Thank you for your time and consideration.

Best,

Justin Papkee

March 12, 2023

To whom it may concern;

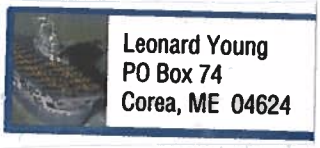
I am against the measure increase. Bargaining with other states to bring them in line with our conservation measures sounds good on paper, but we have always been more restrictive than the other states. There are states that have a larger measure than we do, are they raving about how much it helped them?

The increase in production we enjoy today got there through the demise of the ground fishery. Taking away natural predation, and the increase in water temperature. I do not believe you can stop the decrease in the lobster population with fish coming back. Add increased water temperature, which may help to some degree. I believe the water temperature also changes water currents which make it harder to pinpoint lobster settlement. Perhaps even put them on less survivable grounds. Is the benefit of raising the measure enough to out way the temporary drop in catches and possible permanent loss of market share to Canada truly there?

Perhaps the decrease in lobster production and increase in fish stocks could bring down bait prices and increase lobster prices leading to a more viable fishery.

Sincerely,

Leonard M. Young
Maine Lobster Fisherman



March 31, 2023

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Regarding: Draft Addendum XVII to the American Lobster Fishery Management Plan

Dear Caitlyn,

I believe there should be an increase to the gauge in LMA1 to 3 3/8". Since the LMA1 fishery is predominantly a recruitment dependent fishery, increasing the minimum gauge to 3 3/8" would be the most beneficial to the spawning stock biomass (SSB). Also, I would *e*ncourage no further delays, given the Addendum was initiated in 2017 and some of the management options wouldn't go into effect until 2028.

LMA1's landings involve only a narrow range of lobster sizes and the fishery is recruitment-dependent, i.e., catching primarily lobsters just over the minimum size. Ninety percent of the lobsters landed in LMA1 are under 100 mm carapace length (Shank & Kipp, Draft Addendum XVII, Appendix B). The current legal minimum size in LMA1 is below "L50", the size where 50% of the female lobsters are estimated to be reproductively mature. This means increasing the minimum closer to L50 will result in large increases to spawning stock biomass. Increasing the minimum gauge would result in a temporary loss of undersized lobsters to the fishery, but in a few years' time those lobsters will recruit into the fishery, likely as more valuable catch. The proposed increase in LMA1 minimum size to 3 3/8" carapace length would increase SSB by 38% and increase the total landings in terms of weight by 5%, according to the analysis presented in Appendix B.

I also believe that LMA3 should remain status quo, i.e., no changes are needed in maximum or minimum gauges. The size of the LMA1 fishery (landings) is roughly 30 times larger than the LMA3 fishery. The analysis in Appendix B is based on the relative size of landings in each fishery and indicates:

> "*that a maximum size of 6" in LMA3 would result in an 8% increase in SSB per recruit, and a minimum size of 3 3/8" in LMA 1 would result in a 38% increase in SSB per recruit. What this means in rough absolute terms (using 2018 landings) is 8% of roughly a 4,400,000 lb. exploitable biomass in LMA3, versus 38% of roughly a 130,000,000 lb. exploitable biomass in LMA1...In absolute terms the options in the addendum for LMA3 and LMAOCC will only have a fractional, if not immeasurable, impact on increasing stock wide SSB."* [1]

[1] Bob Glenn, MADMF as representative of the PDT "Draft Addendum XXVII on Gulf of Maine/Georges Bank Resiliency" memo to Caitlin Starks

While I prefer that LMA3 stay status quo, if the Lobster Board feels action is needed in LMA3 in addition to LMA1 gauges changes, I would support, as an alternative, a 7” entrance ring in LMA3 as a follow-on addendum. This would be a more appropriate change than decreasing the maximum gauge, which results in a permanent loss of oversized lobsters to the fishery. A change to the entrance rings would select which sized lobsters can access the trap, so it’s a valid approach to protect large individuals.

In addition to supporting an LMA1 gauge change and opposing changing the gauge in LMA3, I support a standard v-notch possession definition and reducing the initial replacement trap tag allowance from 10% to 5%

Sincerely,

Marc Palombo,
President, Calico Lobster Company

From: Matt Gilley
To: Comments
Subject: [External] Lobster draft addendum XXVII
Date: Friday, March 31, 2023 10:27:55 PM

My name is Matt Gilley I am the zone f8 council representative and live and fish out of Cundy's harbor maine. I see the reasoning for this addendum but there are still several issues that aren't addressed. There are some good aspects of this that I do think will help One of these is addressed in that of issue 1 I see options b1 and b2 helping the stock significantly. There have been studies that show lobsters over 4" in size produce 15 times the young of that of a smaller lobster. By decreasing the maximum size and making the notching more uniform I think we can achieve the results we are looking for while leaving issue 2 status quo. Eliminating the 3 1/4" measure will destroy one of the biggest market in shore fisherman have. There will be no more 1-1.25lb lobster to buy from a us fisherman. Canadians will have the entire market. The economic effects this will have will be detrimental to the fisherman. Dealers and restaurants will still be able to buy these smaller lobsters from Canada for a lesser price than ours thus flooding our market still. There is no way the board can guarantee we will get a better price for the better product we would be catching with a size increase. With a decrease in quantity and a increase in quality you would think we would get a better price. But those lobsters are just gonna be caught by our neighbors just like the shrimp are. I also think if a trigger is going to be used that landings has to be factored in somehow. It could be weighted against trawl surveys ventless traps and other studies but the ultimate goal of the industry is landings. For this to not be factored in at all makes little to no sense. The industry is still facing many uphill battles with offshore wind and whale rules pending in less then 6 years. We don't need any more hardships.
Thank you
Matthew Gilley

To the Atlantic States Fisheries Commission

I am writing in regards to the proposed regulation changes addressed in the Draft Addendum XXVII to Amendment 3. These regulation changes will surely have a negative impact to the Outer Cape lobstermen and their families and I see no other option than STATUS QUO for both Issues in this addendum.

I am a current state permit holder in the OCLMA, one of 63 active permits in the entire OCLMA and one of 46 State only permits. We are a very small group of fisherman within the smallest LMA. The Outer Cape enacted its management plan in the early 2000's which led to an increased minimum gauge size from 3 1/4 inches to 3 3/8 inches. The raise on the minimum gauge helps maintain recruitment stock and allows smaller lobsters to reach maturity and reproduction before being legal size to keep. When the management plan went into effect trap allocation reduction was implemented based off of landings. There is also a 10% trap reduction tax for any allocation transferred between permits, this has been continually reducing the number of allocation tags within the OCLMA. The average state only permit allocation is currently 393 well below the 800 standard allowed in other LMAs. Along with reduced allocation the OCLMA also experiences the longest mandatory closed season, which has now been extended as late as May 15th due to the presence of whales. These management measure that have been previously imposed have drastically decreased the fishing effort with in the OCLMA. Those changes alone are enough to warrant our current V- notch and no max gauge regulations. There is no way to standardize the regulations across the LMAs they are all unique areas that need to be regulated differently, we have already given up too much as far as allocation and fishing time due to the closure. The difference our current 1/4 v-notch and the no max gauge makes allows us to still have a profitable fishery even with the lengthy closure and reduced tag numbers, with out our current regulations you will destroy the Outer Cape state lobstermen.

If changing our measurement regulations is being done for better standardization across the LMAs then why not give all the other LMAs the same seasonal closure and allocation reduction that we have already enacted in the OCLMA. I don't think that would go over well because that's a huge hit to them, just as these changes will be a huge hit to the OCLMA. Will any of the current OCLMA permit holders be compensated for the additional loss we will be implemented to the imposed regulation changes. Many guys gave up federal permits to be able to fish strictly state water and the state regulation set, will anyone be compensated for what was giving up to obtain our current management plan. This will just be to much piled on top of the cuts we have already taken to our season length and allocation as a management area.

The most problematic concerns I have with the overall stock assessment and Addendum XXVII is the little to no data that has been collected on the Outer Cape. I am a University of Rhode Island Alum with a B.S. in Marine Biology, to me there seems to be to large of a gap in data collection and research to even entertain the idea of imposing regulation changes with insufficient data. Seems as though we have a very unique area here on the Outer Cape with an abundance of lobsters but no research into what is actually happening here. We are trying to be forced into regulatory measures adopted in other LMAs due to extensive research within those LMAs but with no research to our own OC Management area. We have been told that there is no need to look for any settlement or recruitment in the OC because it does not possess prime benthic habitat for settlement. We have also been told that there is no funding for research and that the research gear won't work in our OCLMA. Although we do not have a rocky shoreline which is considered to be the prime benthic habitat for settlement we do have rocky cobble bottom not far from shore. When looking at larval transport potential patterns OCC had the highest retention rates throughout all of Maine and Massachusetts with ~40% (H. Xue et al., 2007). So if the OCC has large population of breeding lobsters and it is retaining a large percentage of the larvae released with in the OCC then why is there no research or data being collected here to see what happens with settlement and recruitment. Maybe instead of just saying that it is not prime habitat and we don't need to look there we

should be collecting data and actually looking at what's happening instead of guessing. Its been proven over time that species in different areas and environments can adapt or evolve to survive, why is it not feasible to think that possibly the lobster settlement in the OCC happens a little deeper than the rest of the north east coast because of its unique shoreline. I can show pictures of YOY lobsters that I have found in my traps in the OCLMA.

Another concern I have with the proposed changes are the economic impacts the proposed changes will have on us Outer Cape Lobstermen. The estimation of potential impacts resulting from standardizing regulation in LMC OCC done by Tracy Pugh for Massachusetts DMF estimates a 2-4% loss to the OC Lobstermen if the 1/8 v-notch and 6.75" regulation changes are imposed. I believe these numbers are not completely accurate and are actually much higher. The imposed maximum gauge of 6.75" would cause a permanent loss, lobsters that could never be kept and never become legal to keep. These proposed regulation changes would have a substantial impact to the OCC lobstermen, and I will ask you this question, does anyone want to take a 2-4% (potentially more) pay cut to their salary? Besides the economic loss due to catch that these regulation changes will also decrease the value of our Permit/Business. Our permits/tags are an intangible asset to our business and many of us have invested hundreds of thousands of dollars to obtain them we can not afford to have our business's devalued over regulation changes that impose a minimal impact to the overall stock. With increasing costs to bait, fuel, and every other expense we have due to this inflating economy these regulation changes will be crippling to the OCC lobstermen.

With the potential for stricter regulatory measures being pushed to increase the abundance and protect the stock, has anyone studied or even thought about the carrying capacity of the American Lobster? Is it possible that the historic numbers that were seen in recent history were somewhere near the species carrying capacity. How many large females can be left in the population and still maintain a successful exploitable population. If too many large female lobsters are left on the bottom never to be kept at what point will it start to impact the size of the exploitable population. Most culling of species happens to the non productive, when an animal is past its prime, I don't think enough research is done on the larger over sized lobsters to determine how fecund they actually are. Most research on egg production and viability is done on lobsters on the smaller size scale, very rarely are any over 170 mm CL studied, those lobsters that would be considered over size under the new regulation. Are those lobsters still productive enough to warrant being left in the population? I believe they are like any other species and they're fecundity decreases passed a certain age which is why I do not believe a maximum size gauge should be implemented. Those largest lobsters should be removed to make room for more reproductive smaller ones.

And if the main concern for implementing a maximum gauge is exclusively an enforcement issue then a very simple solution to that would be to issue over sized tags to OCC trap lobstermen. Tags could be issued to individual permit holders just as our trap tags are issued with permit numbers on them, these tags could be affixed to the knuckle of an oversized lobster as it is harvested on the boat and would remain on the lobster until it was cooked. This would allow enforcement to view any over sized lobsters in any market and if they do not possess an OCC issued oversize tag than it is illegal. Very simple solution to that problem.

The overall lobster stock in the Gulf of Maine and Georges Bank has increased drastically in the past 20 years, we have seen record high landings and abundance levels, and it has all happened with the current imposed regulations. The issues that are being seen with low recruitment and YOY levels are not an issue that can be fixed by regulation changes. It is not that there are not enough lobsters reproducing, it is that they are not surviving out of the stage 4 larval phase. If it is an environmental factor than changes to regulations aren't going to fix it. If it is a predation problem changes to the regulations will not fix it. If it is a lack food source regulation changes will not fix it. Figure out what the real problem is before you change regulations that are going to negatively impact the hard working Outer Cape Lobstermen and their families.

We the Outer Cape Lobstermen have put everything we have, blood, sweat, tears, and money into our business' and we are asking to leave us be until you have sufficient research and data collected with in our management area. We want our own OCLMA research and we are willing to help get it done but please do not make a regulatory decision to our management area without having the proper data needed.

Issue 1 : STATUS QUO
Issue 2 : STATUS QUO

Thank You,
Michael O'Brien

Reference:

H Xue et al., 2008 Connectivity of Lobster populations in the Coastal Gulf of Maine Part 1:Circulation and larval Transport. Ecological Modelling. 210, 193-211

April 4, 2023

Michael Polisson, Rockport, MA stakeholder/fisherman/consultant

Comments on addendum 27

In all the hearings and discussions I have heard nothing of predator interaction with either lobster spawn or its affect on larval settlement to the bottom. This seems to be extremely relavent to whether or not to feel the need for this drastic addendum to lobster management.

All the figures and observations are at least two years old and do not consider the affects of predators.

Especially last years vast abundance of menhaden was not considered.

Sea herring eat lots of the spawn before it settles

Stripe bass are voracious in their attacks on lobsters of all sizes which make up 65% of their diet. There are pictures of stomach contents of these fish to substantiate this claim…Mass DMF has one I sent them a few years ago.

Whales are not considered either and they filter feed everything from the huge gulps of seawater they injest to feed.

There are too many things not considered in this addendum at this time so the only thing to do is postpone action on this addendum till these predator factors can be analysed and figured into the big picture.

There is no question we do not have enough CURRENT information and data to form an accurate conclusion before we make any decision on addendum 27 except **STATUS QUO STATUS QUO STATUS QUO**

Michael Polisson Rockport MA 01966 078-479-0972

THERE IS ONLY ONE ANSWER AND IT IS STATUS QUO, STATUS QUO

This addendum is totally unnessary at this time due to the following reasons:

Assumptions are based on old and faulty data provided by NOAA

No one should make a decision on data that goes back to 2017

Any type of an automatic trigger is total stupidity when it cant be automaticly reversed in the same . manner

If you have to wait until another addendum is proposed to reverse any changes that means you will have to wait another 6 year!!!!! REALLY

Settlement data is not taking into count the natural predation of predator species like Stripers which get 65% of it daily meals from lobster spawn and fry and even larger ones

Having only 11 sampling sites in MASS does not give an accurate assessment and having none in the area 2 and Outer cape areas just makes the assessment far less believable.

Using any data from NOAA is your biggest mistake as its proven their data is the most unreliable in the industry…..they cant tell a march hare from a haddock!!!!

At this time the economics and survival of the fishermen must come first!!!!

A gauge increase would devastate the industry and give Canada an additional 40% market share overseas which would be a death sentence for USA lobstermen

Talk about law enforcement in MASS is a joke as at present there are 45 unfilled vacant positions……and im told a hiring freeze is ONGOING???????

The last time we went for a gauge increase to better the reproduction rate we got screwed and the following year the Canadians went back to 3 3/16 and our

government refused…….we lost 20% of our catch the first year and the following year the Canadians stole 25% 0f our market overseas cause we had no chickens to sell!!!!

With skyrocketing bait and fuel prices and the actions of the San Diego Aquarium

You must vote in favor of our US citizens and commercial fishermen who work hard to pay taxes and your wages and feed and clothe their families

FOR ALL THE ABOVE REASONS YOU SHOULD FEED THE ADDENDUM INTO THE SHREDDER AND LEAVE EVERYTHING AS STATUS QUO STATUS QUO STATUS QUO

THANK YOU

_____

From: Michael Polisson
To: Comments
Subject: [External] virtual hearing
Date: Thursday, March 9, 2023 5:01:33 PM

Massachusetts is only having one hearing and its virtual not in person

Maine is having 4 three in person

MASS having only one and having it virtual ??????

THIS IS TOTALLY BULLSHIT

JUST ANOTHER WAY AROUD HAVING TO LISTEN TO THE STAKEHOLDERS INPUT AND CONCERNS

IF THEY CAN HAVE INPERSON FOR POGIES THAN LOBSTERS SHOULD BE TOO

COSIDERING ITS VALUE COMPARED THE THE LOWLY POGIE

HELP US OUT HERE PLEASE !!!!!!!!!!!!!!!!!!

I DON'T HAVE A PHD BUT I KNOW BULLSHIT WHEN I SEE IT

From: Michael Sinclair
To: Comments
Subject: [External] Webinar won't launch
Date: Wednesday, March 8, 2023 4:38:43 PM

Webinar will not launch for me on three devices, all devices are updated.

Typical of the government/NOAA/American States to have hearing sites that are over two hours driving time for the Southern Maine area and don't make a simple seminar like a Zoom call. Very frustrating when every town uses Zoom or other video platforms that actually work.

I am against going up on the measure for lobster and against increasing the size of the vents. Let things alone as the last few years have been troubling enough for fishermen, The sampling program needs to go where the lobsters are actually shedding which is in deeper waters and not in the shallow waters in the abundance that we once saw. The lobsters are there, this is nothing new as the sky is falling has been happening for years, check Carl Wilson, UNH, UMaine, etc, data and research in the mid 2000s. Industry was going to fail but in the 2010s, the lobster industry experienced its biggest years. This is way too premature to set triggers and to change the Maine lobstering industry. A few bad years is not a bad thing, it weeds out people and the strong survive.

No for increases in the measure or vents unless the entire industry including Canada goes to a bigger measure at the same time.

I am not for going up on an gauges or vent size unless all areas including Canada do the same so that the lobster industry is all on the same footing.

16 Newport Rd
Hull, MA. 02045
April 2 2023

ASMFC
Arlington VA.

To whom it may concern,

I attended the public hearing on wed. 29 March conducted by the Mass. Div. of Marine fisheries. The subject was to address potential changes to the lobster fishing industry. The information presented, I find, does not justify the recommended proposals.

I have held a Mass. Lob License since the mid 1950's and then a federal lobster and multi species license when first issued.

In regard to the lobster industry, my observations have seen periods of plenty and then periods of not so plenty. Cycles have come and go without regulations. Once the lobster gauge was increased a few years back, we did see increases in our catch. The lobsters had a chance to reach sexual maturity before harvesting.

Its a fishery that has few negative aspects. A passive trap that feeds, allows juveniles to exit and does not damage the end product. The trap itself is witnessed to be a ineffective devise. We don't catch the entire population.

Cycles in this fishery occur, mother nature sees to it.

(11)

16 Newport Rd
Hull, Mass
April 2 2023

Im not convinced, at this time, a downward trend in settlement should be acted on with more regulations.

Im asking for more time, to leave things as they are!

Status Quo

Respectfully

Peter M. Mahoney

From: Nicholas Otoole
To: Comments
Subject: [External] Lobster amendment
Date: Thursday, April 6, 2023 7:59:36 AM

To who this may concern

My name is Nicolas O'Toole I have an outer Cape lobster license state only permit number 001544 I just like to let you know that these new regulations are very concerning to me and the other fishers in my area we are already operating on such a thin margin of profit with the ongoing inflation in this country fuel price bait cost Traps and gear supplies have literally all tripled making what's left at the end of the season not very much for the boat owner lately A 15% cut in revenue because of these regulations. A 15% cut in revenue because of these regulations would be terrible most likely Forcing people out of business slowly .Not To mention we're just coming off a two year pandemic that made things incredibly difficult to operate . Our season it's already incredibly short and we really only harvest lobsters from June till October In-state waters once they migrate pass the 3 mile line late October our season is over I'm not gonna get into the zero data scenario for outer Cape cod that's already been made obvious but I would like to say feel free to look up my landings and take that number and Times it by 10 and that's what we're already throwing back on a daily basis with egg bearing females and the v notches deeper than a quarter inch if that's not conservation alone I don't know what is we have many days in the first half of June and July where we release 1000 pounds to keep 200 and the same thing happens all over again in October when they put the eggs back on.. Once again Outer Cape cod lobster management area is very unique and I believe it needs to be studied before you go shove new regulations down everybody's throat's that could be devastating to an already small group of permit holders that are deeply invested.Tag values And permits that range anywhere from 300 to 500 a tag I myself have invested everything I own into this business because I was forced out of ground fishing by the federal government with catch shares management system that was devastating to the small boats of Cape Cod I really have no other choice in life then lobstering. Like I said before ,please reconsider this amendment I vote for Status quo for outer Cape cod . Sincerely yours Nicholas O'Toole

To the Atlantic States Marine Fisheries Commission,

This letter is pertaining to the drafted American Lobster Addendum 27. As one of the 46 state permit holders in the Outer Cape Lobster management area, I see no other viable option than status quo. The current lobster management plan has been proven effective and successful. These new proposed regulations have been developed on data with huge gaps in the study. Being a small fleet comprised of fishing families with deep roots in the industry, we are now faced with the inability to provide for our families.

The current lobster management plan, put into place in the early 2000s, has been proven a proactive and successful means of protecting the lobster stock. Our large escape vent size prevents us from landing small lobsters that are, in fact, legal in other areas. Our minimum gauge size increased from 3 ¼ to 3 3/8 inches while other areas remain at 3 ¼". This has substantially decreased fishing of recruits while significantly increasing reproductivity upward of 40%. We have a maximum trap allocation of 800 but the average allocation per permit holder is only 393 tags. We also have a 10% trap tax that occurs during any permit or tag transfer. These regulations combined with conservation minded permit holders have created a thriving and sustainable fishery.

Outer Cape Cod is a management area yet it is being left out of the data collection to properly develop a management plan per Addendum 27. As stated at the ventless trap seminar at the MLA trade show on 3/24/23, OCC has not been included in the ventless survey due to the financial impact as well as the complications that come along with gear that will not stay put. At the public meeting in Quincy, MA on 3/30/23, when asked again about the lack of ventless trap surveys on the outer cape, there was no mention of financial or gear issues, only that the migration patterns of the lobsters make it unnecessary to survey the area. When asked about the lack of surveying in the Outer Cape such terms as "we think", "we're pretty confident" and "probably not an important dynamic" were used to describe the area. These are not science backed answers. Some other inconsistencies came about when looking into the statistics. The original data gathered and published on October 19, 2020 in the American Lobster Benchmark Stock Assessment for the recruit abundance survey (Table 54 page 216) does not match the numbers of the same chart indicated and published in Addendum 27 (Table 5 page 35). Furthermore, the bottom graph, MA-514 (Page 7), of the drafted addendum indicates Massachusetts as the only region with a favorable rise in the year of the young. Aside from evident gaps in data collection, it appears addendum 27 would make the jobs of law enforcement easier by standardizing the regulations. Each lobster management area is unique and is meant to be managed individually, not universally.

As fishermen, we are committed to preserving the resource. Our fleet has volunteered our time, money, resources, and knowledge to aid the Division of Marine Fisheries, the ASMFC, and any other organization in data collection to further ensure sustainability. Not only have we poured our blood, sweat, and tears into our careers as lobster fishermen and women, we have planned our whole lives around it. Our small fleet is predominantly made up of young families who have built businesses from the ground up. We are carrying on family traditions. We have been compliant and adaptable to the myriad of experimental regulations thrown our way all while trying to stay afloat. Addendum 27 will certainly sink us. Status quo is the only option.

Thank you,
Olivia Stohr

ASMFC Lobster Fishery Comments

Thank you for receiving my input on this very important lobster management issue. I have been fishing for lobsters since 1971, so 2023 will be my 53rd season. After fishing under a recreational license for one year, I embarked on fishing commercially for two seasons (7 month season). I fished 180 traps inside Quincy Bay and along the islands and shore of Hull out towards Nantasket and around the the Brewster Islands and back around the inner Islands. After 2 seasons I decided to return to part-time fishing with about 40 traps. I returned to fishing in Quincy Bay and the inner islands. Lobsters were fairly plentiful. I fished within 2 miles of my home port of Hough's Neck. Over a period of years my lobster catch varied, but there seemed to be a general decline. Then there was a decision by the managing agency at the time to institute a minimum gauge increase from 3-1/8 " to 3-1/4" over a period of 5 years. It has been so long since the gauge increase, I can't remember the exact year it was started. This conservation measure seemed to do two things: the minimum lobster size increased and the lobster stock was more plentiful. There were more lobsters available to catch. Of course there was another important conservation measure reinstituted. When I started fishing in 1971, there was no notching of female lobsters. At some point that changed and we began notching all berried females. This was a plus for the stock.

About 12 years ago I continued fishing part-time but I increased the number of traps I fished from 40 to approximately 75 traps. I have consistently fished the same number of traps for the past 12 years. We have seen some changes albeit over a period of years. I have seen a general decline in the lobster stock within the harbor. I attribute some of this to the ever increasing water temperatures inside the harbor. But the general number of lobsters available to catch has declined as well. I also know there are fewer lobstermen fishing around me. So my catch has even declined with less competition. I expanded my fishing grounds within the harbor inside of George's Island with limited success. This past season I ventured back out to the Brewsters, an area I hadn't fished in 50 years. I had very limited success and eventual moved my gear back inside as we had a little more movement inside in the fall.

We still have a run of lobsters in early June, but the run lasts for less than a few weeks. Previously the run could last for 5-6 weeks. The bottom line is there are fewer lobsters available for the lobstermen to catch. I still fish a 3 day set and a 4 day set each week. I know some lobstermen that have gone to 1 week sets and do okay, but they are probably catch half the lobsters in a week that they caught 6-8 years ago. When I first started fishing, we pulled our gear every other day and some pulled every day when the lobsters were running.

The fishery has changed dramatically in 53 years. The environment the lobsters live in has changed substantially. The winters are milder and the summers are hotter, so the water temperature is generally considerably warmer.

I can only speak for myself. I don't want to speak for any other lobsterman. I also know that our catch can vary from season to season. What I'm experiencing is a very noticeable general decline in the lobster stock. We benefited greatly when they instituted the last lobster gauge increase. I believe a gauge increase is essential for the fishery to remain viable in the years ahead. I'm 74 years old, so my interest is for the future of the fishery for the next generation of lobstermen. We have seen what has happened to the lobster fishery along the Long Island, Connecticut, Rhode Island, and south Cape coasts. Do we just wait for that to happen north of the Cape or do we act now when there is still an opportunity to reverse the trend?

I wholeheartedly advocate for an appropriate minimum gauge increase and possibly a reduction in the maximum gauge size, as the fishery managers feel appropriate.

Massachusetts at one time had a lobster hatchery, which released lobster fry into the ocean at designated locations. Has anyone given consideration to the idea of a hatchery or hatcheries to assist in increasing the lobster stock. The lobster fishery has a huge economic impact on our economy. Given the changing environmental conditions, we may not be able to increase the lobster stock naturally. Maybe hatcheries will be a necessity in the future.

Respectfully,

Ralph Jacobs Hough's Neck, Quincy MA
Massachusetts Permit # 004572

MC Fisheries
Raymond Joseph
10 Thompson Trace
Chatham, MA 02633

March 4, 2023

To Whom It May Concern:

I am writing to you today to express my deep concern with the proposed changes to the lobster fishery. My name is Raymond Joseph, owner of MC Fisheries, based out of Chatham Massachusetts. I currently have an Outer Cape Coastal permit 001723 which is state waters only. The proposed changes to Amendment 3 of the lobster management plan would be detrimental to lobstermen. I would also like to address some concerns with how the data was collected and calculated when deciding to change the current regulations.

The draft document claims that there has been a decline in lobster landings from 2016 to present. When analyzing this data, was there a calculation of number of traps fished for the same areas? Over the years there have been fishermen who have retired and or been preparing to sell their permits for various reasons, including but not limited to, health reasons. In preparation to sell, some lobstermen reduced the number of traps they were fishing. Was this considered when the data was collected? If there was a reduction in number of traps fished, then naturally there would be a decline in the number of lobsters landed. More data needs to be provided in order to compare the number of traps fished in correlation to the number of lobsters landed.

In addition to the question regarding traps fished, one needs to consider gear loss. Every year, fishermen face the reality of gear loss due to weather, boat traffic, and other fishermen. Has there been an accurate data collection of gear loss? With gear loss comes the need to replace said gear and that comes with a growing cost. It has not been easy to replace lost gear as the price of materials and labor continue to rise. Some years, it has been impossible to replace the lost gear and you have to fish what you have. This also contributes to the reduction in lobsters landed because the gear simply isn't there to produce. As well as the rise in cost of materials, the pandemic made it hard to find materials and traps. Even if

you could afford the traps, it became near impossible to obtain new ones. This lack of gear would also skew the data. In addition to obtaining new gear, if the regulations were to be changed, then the lobstermen would have to go through each and every trap to change how it is made. This would be a necessary step in order to have a trap that would be fishable under the new regulations. This would cause another financial hardship.

As you know, there is a difference between federal and state water permits, and the regulations that come with each. The fishermen are required to carry their permit on them when fishing in order to allow for law enforcement to be able to determine which waters and regulations they are to comply with. In past years, fishermen who had a dual permit forfeited their federal one for just a state permit. The reason for doing so was to fish state regulations that allowed for landing of larger sized lobsters. If the proposed size regulations are implemented, will there be a chance for fishermen to add a federal permit to their existing state one? This will be necessary in order for state permit holders to sustain their livelihood.

In the document, it discusses how the proposed changes would make it easier on law enforcement. It should not be the responsibility of the fishermen to make law enforcement's job easier when deciphering between state and federal waters and the size and v-notch regulations that come with each. Law enforcement officers should be provided with more training on the regulations in their management area as opposed to creating the same regulations for every permit and area. The ease of law enforcement's job should not fall on the shoulders and income of the fishermen. A change in regulations would cause a decrease in the income and financial stability of lobstermen.

I feel that it is necessary for the future of lobstermen to keep the status quo of option A. It is vital to keep the regulations as they are.

Sincerely,

Raymond Joseph
MC Fisheries

From: Richard Larrabee Jr
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Friday, March 31, 2023 9:09:38 PM

My name is Richard Larrabee Jr, I am a full-time lobsterman off of Stonington. I fish almost 100% in federal waters and I am strongly against the measure increase. I feel that any data received from NOAA can not be trusted as their organization cannot be trusted. NOAA has a record of not being truthful with fishermen about windmills, whales, or even the shrimp data. Furthermore I believe that ASMFC wants to control the Maine lobster fishery
in a way that will harm the industry. Once ASMFC gets lobsters on the same gauge Maryland, New Jersey, and other states will use the data against us as a bargaining chip for other fisheries, Fisheries that Maine should rightfully have. The State of Maine has already stolen license's from it's Poogie fisherman. This has forced them to get a 25,000 lb quota just to maintain the license and a forced choice between making more money lobstering or less money .
It is no secret that I am no fan of the ASMFC as it is set up for the fishery to fail!
The insure lobster fishery is already facing big changes as sea squirts have already taken over and suffocated the bottom, therefore causing the small lobsters are moving to deeper water. Next will be Quotas.

Richard Larrabee
F/V ROCKBOTTOM
Stonington, ME
35 years in the industry

From: Sam Pickard
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Saturday, April 8, 2023 9:33:59 PM
Attachments: image.png
image.png

Sam Pickard
P.O. Box 817
Wellfleet, Ma 02667

To whom it may concern, I am writing to you as the Vice President of the Outer Cape Lobstermen's Association, in regards to the impending changes in the lobster industry due to the proposal of Amendment 27. I am currently one of 62 permitted lobstermen in OCLMA. We are a very small group of fishermen due to the small zone in which we fish. Our state fishermen, meaning fishermen that only hold a state issued permit, not a federal permit, only account for 46 of the permits in our zone. The Outer Cape has their own proactive management plan established in the early 2000's as concerns about an impending stock crash. We increased our minimum gauge size from 3 ¼ inch, which is still Area 1s, to 3 3/8ths of an inch, decreasing the fishing demand on the recruitment stock, and increasing the reproductivity of the stock by over 40%. We also have a larger escape vent size, eliminating smaller lobsters that are still legal in other areas by being retained in our traps. When our management plan came into existence, we implemented a trap allocation based on landings. We also have a 10% trap tax whenever a permit is bought and sold. Our state allows us to have an 800 trap maximum in our zone, but due to our sustainable management plan, the average permit in the outer cape has only 393 tags, less than half than every permitted fisherman in Area 1. We also have been cut back in our fishing season. We used to be able to set our traps on March 15th, but due to regulations with the right whales, we now have to start on May 15th, effectively cutting 2 months from our already short season.

I would also like to bring to the attention of the Atlantic States Marine Fish Council as well as the Massachusetts Division of Marine Fisheries that there has been data manipulation on the raw data in Amendment 27. I have two samples, both GBK abundance indicators one from the 2020 Stock assessment, and one from the proposed Amendment 27. The raw data is compiled in the stock assessment (Table 1), with the skewed data in the Amendment (Table 2).

Table 1

RECRUIT ABUNDANCE (SURVEY)		
Abundance of lobsters 71 - 80 mm CL (sexes combined)		
Survey	*NEFSC*	
	fall	*spring*
1981	0.286	0.073
1982	0.433	0.155
1983	0.292	0.167
1984	0.407	0.046
1985	0.167	0.220
1986	0.600	0.495
1987	0.442	0.315
1988	0.405	0.242
1989	0.117	0.169
1990	0.326	0.320
1991	0.298	0.170
1992	0.566	0.128
1993	0.289	0.684
1994	0.125	0.080
1995	0.197	0.028
1996	0.378	0.012
1997	0.647	0.000
1998	0.361	0.012
1999	0.238	0.031
2000	0.445	0.268
2001	0.571	0.429
2002	0.489	0.091
2003	0.328	0.227
2004	0.277	0.074
2005	0.129	0.072
2006	0.098	0.221
2007	0.189	0.054
2008	0.126	0.134
2009	0.220	0.139
2010	0.050	0.105
2011	0.299	0.024
2012	0.096	0.082
2013	0.131	0.066
2014	0.103	0.067
2015	0.097	0.041
2016	0.104	0.111
2017	0.370	0.155
2018	0.138	0.035
2014-2018 mean	0.162	0.082
25th	0.129	0.057
median	0.288	0.108

Table 2

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

75th	0.398	0.207	75th	0.25	0.40

This data manipulation is very concerning, especially with data being lost, which brings the question of the validity of the data used as a benchmark of the amendment. The 2020 Stock assessment have very positive outlooks compared to the proposed amendment and the raw data has very different outcomes compared to the tweaked simulations. “Therefore the GOMGBK lobster stock is not depleted and overfishing is not occurring. Further, the stock is above the Fishery/Industry Target and below the effective exploitation target. The assessment does not recommend any management action at this time for the GOMGBK stock.” “Model free indicators show that the average spawning stock, full recruit and recruit abundance are nearly all above the 75th percentile.” (ASMFC 2020 Stock assessment.) To be able to have a better understanding of the lobster stock in the outer cape, we need better data, which there is none in our zone in the amendment. “For OCC, simulations were run with both LCMA 1 and LCMA 3 parameters because it is considered a transitional area.” (Amendment 27 ASMFC) Even though the other cape is a transitional area, we do have spawning locations with large numbers of Young of the Year lobsters, i.e Nauset Marsh, Pleasant bay and East Harbor in Provincetown, which the ASMFC and MADMF refuses to believe. There has been independent research in these areas not only by The Center For Coastal Studies, but also by The Friends of the Pleasant Bay. The Young of the Year trawl surveys, which is a key factor in stock assessment, has many flaws. One key flaw is the sample area, which changes not only in location but also in depth from year to year. It should also be brought to attention that these surveys are not done in areas where YOY lobsters are present. “The SASC noted that trawl surveys are limited to trawlable bottom, which is generally not considered prime lobster habitat (cobbles to boulders). While lobster abundance on trawlable bottom may not be directly correlated with abundance on untrawlable bottom, the Panel notes the ventless trap survey may bridge the gap between different habitats.” (ASMFC 2015 Stock Assessment) At the ASMFC hearing in Quincy on March 29th, Massachusetts DMF Director Dan McKiernan stated that the stock assessments are not even precise, further bringing the data into question.

The Outer Cape is a unique lobster management area, due to rapid changes in depth, water temperatures and multiple reporting areas. The MADMF charges every commercial lobster permit holder a renewal fee every year, and a portion of the fee is collected for ventless trap research. However, the Outer Cape does not receive any ventless trap surveys. When this was brought to the attention of the MADMF, Dr. Tracy Pugh, the foremost official on ventless traps and data surveys in the commonwealth stated “ The Outer Cape Zone is not part of our proposed agenda. The ventless traps will not work in the Outer Cape due to only having sandy bottom and high currents, and we do believe that there are any YOY lobsters in your zone.” Our zone is unique because we have many different benthic substrates, with the three most prevalent being sand, mud and cobbly bottom, which has been proven to be a prime YOY lobster habitat. Also we do not receive any suction sampling from the American Lobster Settlement Index, which is specifically designed to collect lobster stock data in rocky and sandy bottom conditions. The Outer Cape’s bottom conditions make an excellent diverse area to test all types of data collection (mud- trawl surveys, sand – suction sampling, and cobbly/rock- ventless traps), yet we have little to no data for our zone. The Commercial Fisheries Research Foundation, an accredited third party research organization, has partnered with fishermen to collect independent, real time data on the American Lobster population. They have integrated ventless traps to monitor lobsters and Jonah crabs in all bottoms conditions and currents all the way to the far edges of our Exclusive Economic Zone. Even though we are such a small area compared to Area 1 and Area 3, not only in square nautical

miles, but as well as trap tag allocation, we encompass three different statistical areas, 514, 521 and 526. This makes the Outer Cape an ideal research area being the epicenter between George Bank, Southern New England and the Gulf Of Maine Lobster Stocks. Thus, we have a large number of migratory lobsters in our area as well as a large potential settlement area and critical habitat for juvenile lobsters.

Furthermore, the cost of living on Cape Cod is one of the highest in the Northeast, with the average cost of living being more than 40% than New Hampshire and Maine. We do not have the luxury of living in an area where unbuildable land is readily available, or built land and houses are affordable. If this proposed amendment is passed, the Outer Cape will lose over 25% of our catch due to the loss of the large lobsters over 6 ¾ inch or 6 inch maximum gauge, as well as the large number of "legal V-notched" lobsters that we catch. We do not fish on the quantity of lobsters, but on the weight, which created a niche market. Fishermen are first and foremost stewards of the sea and conservationists of our resource, but the proposed regulation changes do not stem from conservation; they are designed to make law enforcement easier. Each area is different from the other, hence the different regulations. This is why, due to lack of data, the only viable option is option A, Status Quo. Which allows us as the Outer Cape Management Area to invest in better research and development in our zone.

Thank you for your time and consideration.

Sam Pickard,
Vice President, Outer Cape Lobstermen's Association

From: Scott Place
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Tuesday, March 28, 2023 2:01:59 PM

To whom it may concern,

With regards to Lobster Draft Addendum XXVII

I think regulation should remain as is, unchanged, the status quo.

It's called fishing not catching for a reason. It's inherently a cyclical endeavor. I've been involved with lobstering for 25 years. Some years are better than others for our landings and the price we are paid. Some individuals don't make it in this field, some persevere.

As far as I can see, your organization is working off of flawed science at best and is quite frankly trying to fix a problem that doesn't exist, or worse, that you have fabricated.

This fishery is being squeezed by so many other entities, it certainly doesn't need uncalled for regulatory changes to the product size or trap vents on top of all the regulations we are faced with in the form of whale closures and contrivances, offshore wind projects and industrialization of the ocean.

The gauge size as well as slot limit is working. The zero tolerance female v-notch is working. Undersized females are reproducing and oversized females are reproducing exponentially. If anything the protection of lobsters over 5" carapace length throughout the Atlantic for brood stock conservation should be considered and focused on.

Please find some common sense in this matter and have the current effective regulations in the overreaching draft study remain as is and unchanged.

Sincerely,
Scott Place - MA area 1 state permit, f/v Lee Faith
52 South Street
Rockport, MA 01966

Sent from my iPhone

Sean Leach

433 Great Western Rd.
Harwich, Ma 02645
508-292-7255
smleach1401@yahoo.com

April 1, 2023

To Whom this may concern,

I am writing this letter in regards to the Lobster Draft Addendum XXVII. I am a Outer Cape Lobsterman and State OCLMA Permit Holder #005024. I have been lobstering for over 20 years with my father and on my own boat as well. My father was a ground fisherman and lobsterman and I have witnessed the successes and failures of both fisheries first hand. Due the proper management of lobstering which was largely due to a proactive approach the fisherman in the industry we were able to build a good business in lobstering.

I regards to the current measures in Lobster Draft Addendum XXVII we would see changes to a already proven management model that was adopted and approved by both industry and fisheries management members. We have seen consistent increases in landings as well as "year of the young" lobsters over the past 30-40 years. Through these enacted measures businesses have flourished and good opportunities have been given to many individuals in our local community.

Those permit holders in the OCLMA which I am currently a permit holder in would see a larger then anticipated loss in revenue and income in a already shortened season. We only have the opportunity based on current regulations to fish from May-15th to January 31st. The harsh reality is in State waters this is actually a more of short derby style fishery which realistically gives a window to catch and sell lobsters of June 1st til mid to late November. This being the timeframe that we need to set traps which can take 2-4 weeks depending on weather and circumstances and also the 3 miles line being a true 3miles from shore. We have no islands or land masses that can push the state line further out like in Maine.

The Economic impacts of this measures are the most glaring for fisherman in the interest of "Conservation". Lobsterman are the more considerate fisherman in regards to maintaining their resource for future harvests. We throw back all egg bearing females as well as V notch lobsters and lobsters under or oversize depending on the LMA stipulations. That being said the financial losses that come along with this Addendum far out weigh the possible gains in conservation which also has no guarantee of being beneficial to the year of the young lobsters. What I do know is the cost fuel, bait traps, boats, repairs, insurance and overall cost of maintaining our businesses has double and tripled in these categories while the price of lobster has not followed suit. Our landings are still substantial and even with these increased costs of doing business we are still somewhat profitable.

Losing "2-4 percent of gross landings" has much greater impact when expenses and cost of doing business continue to rise. Speaking to other fisherman in the OCLMA these measures more realistically could have a more closer to 8-15% gross landing drop per boat. The lack of data to support the initial 2-4% loss is startling. The landings and observation of minority segment of the LMA is dictating the impact for all. This data could be accrued in the upcoming season easily to better understand the impacts of the LMA. Depending on each boats fixed expenses some could see a NET INCOME drop in neighborhood of 15-25%, which is the real number that affects families and permit holders.

The drop in revenue and net income for the small business in a already difficult economy with 20 year high inflation and astronomical housing costs in our area could cripple already struggling families. This Addendum was brought on the heels of the Right Whale measures which have been tabled for now but will be back for discussion in the near future. Lobsterman need this opportunity to earn as much as they can now with a future that isn't all certain. We do not know what the cost to re-rig our gear will be in the future and any chance to make money could be beneficial to save for the uncertain times ahead.

I myself between the boat, permit, and traps have invested hundreds of thousands of dollars in the past few years to build my business to sustain myself and my family. This was based on the regulations in place which have made for a sustainable fishery worth investing in and also dictated the value upon the price of said business. Loans have been taken and issued by banks based on this information and at the time that decision make sense. I am not alone in this situation I have spoken to other young families who have made the same choice to enter OCLMA and have taken on this financial burden as well. With the current regulations in place we have a chance to succeed and live on Cape Cod with our families, something that is not common anymore.

There was talk at the latest meeting in Weymouth at the Sons of Italy location meeting that these bigger lobsters 6-6.75 inch carapace lobsters have minimal value. It was said that are not sold in markets regularly therefore wouldn't be a big loss. Having worked in our family fish market in years past I agree they are not the the biggest over the counter seller. That being said it is short cited to assume that retail markets on Cape Cod are the sole distributor of OCLMA lobsters. We are in a Global economy now and our unique lobsters have the ability to be shipped interstate as well as worldwide due to there quality and shell hardness for shipping. Asian cultures domestically and worldwide are the new strong buyers of American Lobster and specifically enjoy the larger size male and female lobsters which fetches a better price then over the counter in Massachusetts. To lose the opportunity to land these lobsters we only increase the marketshare of Canadian lobsters abroad and effectively give them a monopoly on these lobsters Worldwide. I don't understand why we as American harvesters and Management members of Lobsters would willingly concede marketshare to another country for a like product. To me that seems irresponsible and a improper decision for our country which has vast trade imbalance already.

I appreciate your time reading this letter and hope that it finds you well. My current recommendation is STATUS QUO for OCLMA. I also would like to take this opportunity to offer my time and boat F/V Jessica Beth to participate in any research for OCLMA to better gain information and help with your decision making process in the future.

Sincerely yours,

Sean Leach

From: Shane Carter
To: Comments
Subject: [External] Lobster draft addendum XXVII
Date: Friday, March 10, 2023 3:40:36 PM

I am a lobsterman from Bar harbor maine. I have been lobstering for 32 years. In that time i have seen the good as well as the bad. The measures that maine adopted before my time with v-notch protection as well as a maximum gauge have built our stocks to very healthy levels. Lobsters are always moving. Lately they have migrated toward bottom and deeper water. What concerns me is the notion that recruitment is somehow lacking. The amount of juveniles we handle and feed is as great if not greater than ever. If and when our population declines that would be the time to talk of measures to deal with it. We should have the ability in this day and age to easily deal with such a problem without putting triggers into place that may not even be necessary. As far as the options go I would support b2 and b3. This would be a good step in furthering the industry. As far as issue 2 goes i am for the status quo. I do not want asmfc attempting to fix a problem that is not there. Leave it well enough alone.

Shane carter
FVEmilycatherine
Bar harbor, maine
--
Sincerely,
Shane Carter

From: MassVocals
To: Comments
Subject: [External] this is massvocals
Date: Friday, March 10, 2023 1:28:10 PM

I have a solution to the problem of lobster trapping and saving the whales
Form the rigging its time is now its simple really what we do is place a air tank on trap with each boat has its own raidio frequency locator when the boat is above the trap single is release to allow the air to fill and release into a balloon which takes a quick release and line up to boat and quick release is fasten to line and pull back to trap then hooking it to be pull up with the lobster to set the trap again you just need another air tank I give this too you long ago when sen Kerry for massachusetts was buy boats this save the whales and other wide life as well as allow the lobster to be harvest , IN Washington the court case did not place the money towards this instead they restricted fishing , if you want the plan and you want to created it anyway you wish I just sick of seeing the whales cry form being tangle up what ever I can do to help / Massvocals@comcast.net
SR Drury
Sent from Mail for Windows

From: MassVocals
To: Comments
Subject: [External] allowing lobster fishing and saving whales at same time
Date: Friday, March 10, 2023 1:38:42 PM

Listen my maine friends the DC court issue millions of dollors as to saving the whales being that you can apply for the money as they are using the money to prohibit lobster fishing but with the tracking tarps you both get to be and whales which I know you all love will be free not bound by rigger line This will work I have tried this it works , I give the idea to union of lobster fishman Years ago nothing been done their money to be made on traps everthing . how can I help my mother form bath she too is form Maine
Massvocals@comcast.net
Sent from Mail for Windows

April 8, 2023

Atlantic States Marine Fisheries Commission
Attn: Caitlin Starks
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Re: Lobster Draft Addendum XXVII

To Whom It May Concern:

Thank you for the opportunity to comment on Lobster Draft Addendum XXVII. I Stephen Pickard am a commercial lobsterman from area OCC and have been fishing there for 30 years. As it currently stands there is no data for area OCC. I feel that there should be no action taken to Addendum XXVII, and the current management measures should remain in effect for each LCMA at final approval of the addendum.

Thank you for your time,

Stephen Pickard
Box 622
Wellfleet, MA 02667
uptowngirlpt@comcast.net

To the Atlantic States Marine Fisheries Commission

I am writing in regards to the options for lobster stock management. First I'd like to address the attempt to standardize measurements throughout all of the management areas in state waters. I see this as a particular problem for Massachusetts in that the catches in each area vary significantly. For the purposes of my comment, though, I tried making a case for uniformity in Massachusetts. Using all of the sea sampling data in the state over the years 2002 -2021 I applied a single minimum size (84mm) and a single maximum size (127mm or 5"). I also wanted to look at the data in terms of molts so I added a 96mm (1 ½ ib) and a 110mm (2 ¼ lb) group. Twenty years of MA data on the Outer Cape Cod (OCC) area was gathered from at least 9 boats.

It is evident in **Table 1** that the OCC catch is spread out in a wider size range than are the other two MA areas. The impact of a minimum size there is smaller than other areas while the impact of the maximum size is greater. Vice versa is true for Southern New England (SNE) and Gulf of Maine (GOM). It even appears that the OCC catch may be impeded by the large catches at 84mm (1 lb) in the two other areas. The data in **Table 1** is divided into two ten year periods in order to assess changes in each area over many years.

Table 1. Annual average lobsters from MA sea sampling over ten year periods									
		84 mm (1lb)		96 mm (1½ lb)		120 mm (2¼ lb)		127 mm (5 in Max)	
Area	Time Frame	F	M	F	M	F	M	F	M
Gulf of Maine	2012 - 2021	670	329	90	114	45	6	7	0.5
	2002 - 2011	545	292	85	69	50	4	6	0.3
Southern New England	2012 - 2021	493	125	35	25	2	2	0.3	0
	2002 - 2011	553	114	49	14	6	0.6	0.4	0
Outer Cape Cod	2012 - 2021	85	40	155	133	91	23	30	6
	2002 - 2011	61	47	93	80	77	21	21	3

A particular unexpected observation from the data is the quantity of females compared to the quantity of males. **Table 2** adds more information to this.

Table 2. Percent egg - bearers In MA areas within ten year periods

	Gulf of Maine		So. New England		Outer Cape Cod	
Time Frame	Sublegal Egger %	Legal Egger %	Sublegal Egger %	Legal Egger %	Sublegal Egger %	Legal Egger %
2012 - 2021	**13.4**	**20**	**20.2**	**20.4**	**19.2**	**41**
2002 - 2011	**10.2**	**15**	**27.4**	**24.8**	**16.4**	**42.4**

The OCC area has approximately double the percentage of legal size egg-bearing lobsters in its population. It does not seem to me to be the problem if it has better than 40% eggers in its catch.

The comparative results of a uniform lobster regulation for all of Massachusetts indicate that it could not work without local problems.

In addition to the stock assessment is the economic impact to the OCC area. In **Table 3** I looked at the catch in the over 5" maximum size according to MA sea sampling between 2002 - 2021. Since SNE had virtually none in that size I only used GOM and OCC data.

Table 3. Greater than 5” lobsters in MA sea sampling 2002 - 2021

	Gulf of Maine			Outer Cape Cod		
	F	M		F	M	
3 lbs	524	32		2417	467	
4 lbs	386	31		2331	444	
5 ibs	108	17		909	216	
6+ lbs	68	17		561	240	
Total	1086	97		6218	1367	

The quantity of 5”+ lobsters in the OCC compared to GOM is so significant that the economic impact does not warrant a one - measure for all regulation policy. Also the male lobster numbers in the GOM indicate there isn’t much left after the catch below 5” anyways.

The following weigh out sheet is a sample from one lobster wholesaler. The value of a lobster increases in respect to size and quality (hardshell, firmshell, processor aka softs). The economic impact report needs to take this into account when calculating financial loss.

CODE	PRODUCT	PRICE	
LBC	CHIX- HARD	6.75	
LBQ	1/4 - HARD	7.00	
LBH	1/2 - HARD	7.75	
LB2	2 - 2.5 - HARD	10.00	
LB2.5	2.5-3 - HARD	9.25	
LB3	3 to 4's - HARD	9.00	
LB3	4 to 6's - HARD	9.00	
LB6	6 & UP HARD	8.00	
LBSC	SMALL CULLS HARD	5.75	
LBCU	LARGE 2+ CULLS HARD	6.50	
LBFR	FIRM U/2	5.00	
LBFL	FIRM 2+	5.25	
LBP	PROCESSOR	3.75	
		0.00	
HLFF	1/2'S - FIRM		
3/4F	3/4 - FIRM		
B2F	2-3'S - FIRM		
B3F	3-4'S - FIRM		
B4F	4-6 FIRM		
UMF	6+ FIRM		
	DEAD DISCARD	0.00	
	TOTAL CULLED WEIGHT		
	SHRINK PERCENTAGE		

Summary: If the ASMFC needs more egg production from the lobster stock there are plenty of eggers in count in the GOM 84mm (1 lb) group in **Table 1** which could be protected with a minimum size increase Furthermore there isn't a loss in catch weight since those remaining lobsters become 1 ½ lb lobsters after molting. Fishermen get a return on a minimum size increase. Maximum size is a direct financial loss to fishermen. The only gain is that those few remaining might produce more small lobsters in a future catch. The MA data however indicates that the pattern of 1 - 1 ½ lb GOM exploitation will continue since there isn't any real trap reduction. In fact, the GOM can increase their trap effort. The proposed plan would be a risky gamble which would threaten OCC businesses.

I am only able to endorse **Option A: Status Quo.** Twenty years ago the OCC fishermen put in place effort reduction measures with strict trap transfer requirements which have reduced traps in the area. The minimum size was increased. The data indicates a solid lobster resource in the OCC area. The ASMFC needs to eliminate v-notching and maximum size as ineffective and unprovable management tools. I suggest that the ASMFC copy the OCC plan.

Stephen Smith

Orleans MA

From: Steve Budrow
To: Comments
Cc: budrowfishinginc@gmail.com
Subject: [External] Lobster Draft Addendum XXVII - Comment
Date: Saturday, April 8, 2023 9:12:06 PM

To Whom It May Concern,

Draft Addendum XXVII to Amendment 3 to the American Lobster Fishery Management Plan (Addendum) makes very little sense to me in terms of conservation efforts for the stock and sustainability for our fishery. I am a MA/EEZ LMA1 lobsterman from Massachusetts who has built my life around preserving and responsibly fishing the American Lobster. If warranted, a gauge increase may support that preservation, but to allow the taking of v-notches in LMA1 under the guise of conservation is criminal and entirely counterproductive to our sustainability efforts. For Addendum Issue 1 Options, ASMFC cites 'consistency' for v-notches, but only for 1/8-inch. There should be an option for consistency across all management areas for zero-tolerance, which is what I believe needs to be done to continue to preserve the entire American lobster fishery, as LMA lines do not truly exist for the GOM/GBK stock. At the very least, maintain zero-tolerance for all of state/EEZ LMA1.

For the last 20 years we have protected these breeding females to sustain our reproducing stock, the very stock ASMFC should also be protecting. How/why are we even discussing the taking of these females? An 1/8-inch v-notch may not seem like much to you, however, as a fisherman, I am telling you for the amount of females I throw back with this size v, it would do significant damage to the LMA1 and entire lobster population if allowed to be taken – take what I throw back times the amount others throw back throughout MA, NH, and ME – that's what you need to imagine, not just an 1/8-inch v-notch. There are fishing areas we currently avoid because they are thick with v-notched females and we avoid them because it is not profitable fishing, but if you legalize this segment of the population, they will be targeted. These include the 3 to 5 lb reproducing females. We know these lobsters produce twice the eggs than those of a smaller (1.5lb) lobster, and their eggs also have a higher survival rate, so why would we want to start taking that portion of the brood stock? If ASMFC truly wants to protect the reproducing stock, they need to take a hard look at adopting a zero-tolerance regulation across all of the LMAs. The stocks mix, contrary to neat LMA lines. LMA1 boats fish alongside LMA3 boats, and the same goes for the Outer Cape. LMA1 has a higher conservation yield under zero-tolerance with a 5-inch gauge maximum than LMA3 and OCC who are allowed to take known reproducing females (v-notches). LMA1 should be the model for conservation, not LMA3 or OCC.

Zero-tolerance across all LMAs would also support and strengthen enforcement efforts. No v-notches period! If a warden walks into a fish house or a retail store and there are v-notches on the premises, it's an offense for the dealer/retailer. Currently this is an issue for whose offense is it: fisherman or dealer and law enforcement has to prove which boat it came from. Having a zero-tolerance regulation would take away the dirty practices of buying illegally caught v-notches from (current) zero-tolerance LMAs and strengthen our market. The LMA1 boats of Maine, New Hampshire and

Massachusetts have made this work, and work well for 20 years now. I personally feel that the Outer Cape and LMA3 boats should be allowed to keep their current oversized gauge and no longer be allowed to take v-notches in place of that. The LMA3 and OCC fisheries are based on a bigger lobster that we (LMA1) frankly don't really see, or don't rely on. From a fisherman's standpoint you'd be able to keep the landings strong in all management areas adopting a zero-tolerance v-notch policy and making no or a minimal change in the oversized gauge for LMAs 3 and OCC.

Marketability:
Allowing LMA1 to keep the 3.25-inch minimum size would help the marketability of US-caught lobsters. We need to stay competitive in the worldwide ‘chicken’ market. Canada has a smaller minimum gauge size than the US and would own the entire chicken market around the globe if we increase that LMA1 gauge size. This would devalue our US-caught lobsters and pigeonhole us into a small portion of the Global market, making us virtually noncompetitive against our Canadian counterparts. A chicken lobster is the desired size for your average dinner plate lobster all over the world. The giant lobsters caught in the Outer Cape and Georges Bank may be impressive to see, but they are very hard to move in the Global marketplace a good portion of the year.

Stock Strength and Sampling:
Based on the Zoom discussion/presentation I attended, I have concerns about the strength of current data practices for stock assessments, especially knowing that this is the foundation for your decision-making/gauge triggers. I strongly feel that station and at-sea sampling lack confident data in all LMAs and needs to be reassessed based on better data. How can we get a clear picture of what is really going on with our stock the way sampling is currently conducted? Right now, there is zero incentive for vessels to take at-sea samplers so the boats that do take samplers are not selected at random the way they should be. Rather, samplers target the boats willing to take samplers, so samplers use the same boats every time instead of finding new boats. Because the same boats are at-sea sampled over and over, fishing the same general area over and over, and only able to sample in MA waters and not EEZ (for MA sampling), there is an extremely poor representation of catch and the ability to catch lobsters in LMA1. Not only are lobsters migratory, but they are extremely sensitive to changes in their environment. Cold water, fresh water, warm water, seaweed, predators, chemicals, oxygen, PH balances, storm surges, tide cycles, moon cycles - no 2 years are the same, and these are just a handful of examples that affect a lobster's habitat every day. If you don't move locations at random by sampling with different fishermen, how would you know what's really taking place overall? I have seen the body of lobsters migrate 8 miles over the course of 5 days. It comes down to a simple case of here today, gone tomorrow. We would benefit far better from a random sampling group over a much larger range than the current program allows.

Massachusetts restricts their at-sea sampling to State waters only. When a sampling boat goes just beyond the state territorial line during a sampling trip, the samplers stop sampling and what if the body of lobsters is just over the line in EEZ that day?

No one on the policy side has that information. Zero samples are taken in EEZ waters, no information is recorded from those lobsters, and there's a huge data gap that could otherwise paint a much clearer and important picture of what's happening at that time. I know, because I have taken at-sea samplers from DMF.

The suction sampling in MA waters has also been cut down by DMF's own admission due to the presence of White sharks in some areas. Even a nonscientific person could see this as a real problem going forward because of the critical recruitment and young of year numbers it gave to the stock assessments, especially if years with less suction sampling are compared to years with normal suction sampling. It's also one less piece of a much bigger picture in LMA1 that we are now missing.

Trap surveys and trawl surveys can only tell you so much due to their limitations and their great variability. When catch is recorded from the ventless surveys, the bait type, moon phase, water temp, days' soak, habitat, etc. are all extremely variable – in fact, only the stations are relatively the same year after year. Because boats pay for their own bait instead of DMF supplying the bait, participating boats may use cheaper or less bait per trap. Ventless traps are also hauled at a significantly longer soak time (couple times a month) than the average lobsterman (couple times a week), which is not a good representation of life in the area because a full trap will no longer 'catch' (long soak) and neither will an empty one (void of bait/poor quality bait). The scientists in charge of these surveys should better acquaint themselves with the current fishery and use the standards of the fishery to create their surveys. If each ventless boat used the same bait, same amount of bait, hauled on a shorter soak, and were not allowed to survey known dead zones, which is a much closer picture of our actual fishery/catch, then I could find better value in the ventless surveys. I understand scientists want to standardize their tests or surveys, however the stagnant stations, allowed variability, and the lack of current fishing practices/habitat are not taken into account as the environment is ever changing and so are the lobsters we are trying to forecast with very limited means. At-Sea Sampling would open the door for a greater understanding over a much vaster expanse of the ocean with relative ease. In my personal opinion, collaboration between the lobster fleet and scientists is a key factor to have the strongest data possible. The scientific data tells a small portion in a limited amount of time and area, a fisherman can tell the story over a massive area and thousands of hours at sea hauling traps every year. Because of the concerns I have over the data used for the stock assessments, for Addendum Issue 2, it has to be status quo. The trigger mechanism is based on an incomplete picture. Also, for the person sitting behind the desk who has never built a trap or fished one, it is extremely time-consuming and costly to change out hundreds of vents, especially for those of us whose trap wire incorporates the vents into the build – it is not an easy alteration.

Thank you for your time and consideration of my comments.
Steve Budrow
Rockport, MA

From:	Thomas Bell
To:	Comments
Subject:	[External] Lobster Draft Addendum XXVII
Date:	Friday, March 31, 2023 10:02:40 AM

Some of my quick thoughts and opinions on this draft addendum:

1) The starting point for the trigger mechanism should be an averaged sample size over at least 5 or 10 years rather than starting from the height of the 2016-2018 average. And if the trigger mechanism is used at all it should be a decline of the greater percentage.

2) Far more predation research should be conducted to see what effect predators may be having on lobster recruitment. I know the consensus in scientific communities is that cod and other lobster predators have low numbers across LCMA 1 and 3 but fishermen are starting to tell a different story. In my personal experience, cod in particular seem to be making a radical comeback and I have never seen the amount of cod in my life as I have in the past couple years. This research should not only be focused on cod but other predators as well. It should also be noted that low recruitment numbers have lined up well with halibut fishermen not being able to fish in federal waters.

3) If any changes are made to gauge sizes, Canadian lobster outside of those sizes should not be allowed to be sold in the US. Canadians should not be allowed to send their product here, undermining the conservation we are trying to accomplish and gearing the marketplace towards their product in the process.

4) Trawl and ventless trap surveys should be conducted in far deeper water than they are currently. It is clear that a larger percentage of the lobster biomass seems to be staying further offshore in recent years. It would make sense if smaller lobsters are as well.

5) LCMA's overall should have much more parody with LCMA's that already have stricter gauge, vent, and V-notch requirements. Particularly in V-notching all egged lobster, zero tolerance V-notches, and much closer to parody in max gauge sizes.

Thank you.

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Sincerely,

Thomas W. Bell
B.S. Maine Maritime Academy '14
Vessel Operations & Technology
454 South Gouldsboro Road
Gouldsboro, ME 04607
(207) 479-1720
thomas.bell1280@gmail.com

From: Timothy Holmes
To: Comments
Subject: [External] Lobster Draft Addendum XXVII
Date: Wednesday, March 8, 2023 6:20:18 PM

My name is Tim Holmes, I am a lobsterman in Massachusetts.

I would like to start off by saying that I am opposed to this Addendum as written but am not opposed to conserving the lobster stock, and a trigger mechanism makes sense if it is implemented using the correct data. I have 3 major issues with this draft as written.

1) The benchmark set in Addendum XXVII only uses an average of the highest 3 years EVER on record. These three years should be considered outliers if anything and it would make more sense to disallow them from the average. In order to have an accurate average many more years should be factored in to find a benchmark. No draft should move forward without an adjustment to the number of years in the average.

2) If the gauge is increased to 3 3/8 the lobsters allowed to be imported to the USA must also be 3 3/8 and southern Atlantic Canada must also have a gauge increase to 3 3/8. Lobsters in the Gulf of Maine migrate into Canada waters and therefore our smaller lobsters will still be caught, but by Canada and then sold back into our market. If studies have not been done to take into account the impact this will have on the US lobstermen market then they must be done before anything is implemented. I fish out of Boston and we are primarily a small chicken lobster fishery, this gauge increase will be devastating to all those who fish MA state waters inside of Massachusetts Bay.

3) The whale regulations that will be implemented in the next couple of years will have a huge effect on the lobster stock due to reduced effort caused by trap reductions and massive area closures. It does not seem that any of these new regulations have been factored into this draft. There must be a pause in any new regulations on the lobster fishery until we know the significance of the new whale regulations.

Also I would like to point out that I believe the age used that a lobster is believed to be at maturity is far off by my observations on the water. Possibly more studies should be done at current water temperatures to get a more accurate age of maturity.

The American Lobster in the Gulf of Maine is NOT overfished, and overfishing is not occuring.

I hope my comments along with all the others who oppose this draft addendum are taken into account and the necessary changes are made before the commision puts a huge financial burden on an already struggling industry. Thank you.

Regards,
Tim Holmes

To ASMFC in response to Lobster Addendum XXVII:

Hello, my name is Tom Luce. The past 3 years I've been an OCLMA lobsterman and have been commercial fishing full time since 1987.

I'm against any standardization of the lobster management areas. Each LMA is different, distinct and unique in its own aspects. To name a few, the lobster sizes, lobster quality, their patterns, behaviors, the traps designs and migration timelines all vary. They all need be managed separately and in cooperation, with regard and respect to the fishermen's knowledge who work within these LMA zones.

The Lobster Addendum was noted during the Massachusetts webinar of the tremendous time and effort devoted compiling all the survey research and the accompanying data. Addendum XXVII was referred to as robust and heavily peer reviewed. And I'm sure the lobstermen are appreciative of the work commitment compiling all the research and data. But it's hard to label this study as robust when it is incomplete. The research/surveying of the Outer Cape Cod Lobster Management Area was neglected. Reasons for the lack of research were cited as unfavorable logistical conditions such as tidal and bottom composition difficulties. Also, financial concerns were mentioned as a reason for the sparse research in OCLMA. The truth of the matter is the only significant financial concern is once again potentially resting on the fishermen's shoulders. This couldn't have come at a worse time. The lobster industry is being heavily pressured and financially stressed to confront and resolve the Right Whale issue. Added pressure from the Renewable Wind Energy Industry with the future environmental impacts from the effect of wind turbines on the marine ecosystem. Also, the recent planning (initially approved and permitted by the EPA) of dumping radioactive waste out into Cape Cod Bay and its cumulative effect. And currently, the most financial concern to the fishermen is the recent rise of diesel fuel prices and its inflationary effect on supplies, equipment and labor expenses. Our current government administration's push on renewable energy is to the detriment of small businesses who use and depend on diesel fuel to power heavy equipment such as fishermen and farmers or other industries that work with raw materials at the wholesale level. Inflation generally lowers wholesale market prices at the dock due to the drop in demand. Yet, we have to endure the higher operating costs due to inflation (we can not pass these costs on to the consumer). We lose on both ends-lower market prices/higher expenses to operate.
For these reasons, I see a upcoming decline in lobster fishing effort. It is becoming more and more difficult to turn an end of the season profit.
For these concerns and many others not mentioned but highlighted by other lobstermen, I believe Option A-Status Quo is the best choice at this time.
Thank you for your time and consideration.

Tom Luce
F/V Sea Win
OCLMA

From: Walter Willey
To: Comments
Subject: [External] Vents, gauge increase
Date: Monday, March 6, 2023 2:01:30 PM

My name is Walter WilleyIV I fish Criehaven Island. I don't agree with the gauge increase,but I can live with it. But I strongly disagree with the vent increase. Because a few yrs ago , I had a crab vent in the door. Had 2. 1-7/8vents on the side's. My catch dropped off by 20 percent. So the next season I took out one of the 1-7/8 out and my catch pick up again. We are already having counters going out of the vents now, !! Thank you Sonny Willey
Sent from my iPhone

To ASMFC in response to Lobster Addendum XXVII:

Hello, my name is Tom Luce. The past 3 years I've been an OCLMA lobsterman and have been commercial fishing full time since 1987.

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For these reasons, I see a upcoming decline in lobster fishing effort. It is becoming more and more difficult to turn an end of the season profit.
For these concerns and many others not mentioned but highlighted by other lobstermen, I believe Option A-Status Quo is the best choice at this time.
Thank you for your time and consideration.

Tom Luce

Luce
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nstable, MA 02668

Caitlin Starks
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Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **American Lobster Management Board**

FROM: **American Lobster Advisory Panel**

DATE: **April 12, 2022**

SUBJECT: **Advisory Panel Report on Lobster Draft Addendum XXVII**

The American Lobster Advisory Panel (AP) met via webinar on Monday, April 10th, 2023. The purpose of the meeting was to review Draft Addendum XXVII to Amendment 3 to the American Lobster Fishery Management Plan and to gather input from the lobster advisors on the proposed management options. The addendum considers measures for Lobster Conservation and Management Area (LCMA) 1, 3 and the Outer Cape Cod (OCC) area to increase protection of the Gulf of Maine/Georges Bank (GOM/GBK) spawning stock. Addendum XXVII also considers options to modify some management measures upon final approval of the Addendum to achieve more consistency in measures within and across LCMAs. Staff provided an overview of the proposed options and summarized the public comments received on the Draft Addendum.

Lobster AP Attendance
Grant Moore (Chair, MA)
Jon Carter (ME)
Jeff Putnam (ME)
Chris Welch (ME)
Eben Wilson (ME)
Robert Nudd (NH)
John Whittaker (CT)
Arthur (Sooky) Sawyer (MA)
Todd Alger (MA)
Eric Lorentzen (MA)

The following is a summary of the AP discussion. Comments provided by AP members do not represent consensus opinions but rather individual perspectives.

Summary
AP members provided input on which of the proposed options they support and why. There was not consensus among the advisors on a preferred set of management options. However, there were several issues that the advisors agreed on. First, the advisors in attendance expressed a desire to look after the lobster resource. In particular, they agreed that the v-notch regulations have had a positive impact on the stock, and would support the standardization of v-notch definition across LCMAs. However, a number of advisors urged the Board to consider implementing a standard definition of zero-tolerance, rather than the proposed standard of 1/8” with or without setal hairs, because it would have a greater conservation value and would not significantly impact the industry.

The advisors also agreed that they want to see the lobster resource looked after. Several advisors stated that they do not want to see similar situation to Southern New England (SNE) occur in the GOM/GBK stock, and that they want to see something in place to protect the stock. However, the general sentiment among the advisors is that the current stock condition is still good and does not necessitate immediate action. Several advisors thought the declines in the surveys may be because more lobsters seem to be moving to deeper water, and those areas are not adequately sampled by the surveys.

The advisors also all expressed concerns about the economic market consequences of the proposed increase to the LCMA minimum gauge size. Many stated that allowing lobster imports from Canada that are smaller than the LCMA 1 minimum gauge size would greatly disadvantage the US fishery. Several called for a market analysis to be performed before considering this change.

Under Issue 1, five of the advisors supported Option B, with sub-option B3 (standard v-notch possession definition for LCMAs 1, 3, and OCC) but three of those advisors advocated for a zero-tolerance definition. One advisor also supported sub-options B1 (standardization within LCMAs), B2 (mandatory v-notching), and B4 (initial trap tag allowance equal to allocation).

Under Issue 2, five advisors supported status quo, arguing that more information is needed before making a decision given the proposed options would negatively impact the industry. Two advisors expressed that they are torn between the options, recognizing that the trends in recruitment are concerning and that waiting too long to take action could be dangerous. When asked which of the proposed approaches (other than status quo) under Issue 2 is preferred, the majority preferred the trigger mechanism to scheduled changes to the management measures. One person preferred scheduled changes to the measures because it would give them time to prepare for the change.

Comments on Addendum Options

Individual comments provided by advisors are summarized below.

Eben Wilson, LCMA 1: Expressed that he understands why we need to raise the minimium size, but is not excited about it. From the LCMA 1 perspective in GOM, protecting larger lobster is a huge benefit because they can produce so many more eggs. He participated in research with David Wahle, related to testing the energy in the eggs of lobsters of different sizes. The paper is not yet published but they did find that the bang for the buck is in the bigger lobsters. He also noted that v-notching is the best sustainable practice in the fishery and it is important to ensure that the bigger eggers stay out there.

Chris Welch, LCMA 1, Maine Zone G: He has participated in surveys and sea sampling, and it seems that Zone G is improving as far as biomass and data compared to rest of the state. The surveys and landings have both been increasing. They are also seeing tons of small and egged out lobsters. A lot of the lobsters they are catching now are not in the same places as 10 years

ago, yet surveys continue to be in the same areas. He is concerned that if the lobsters have moved, then surveys might not be catching that. He is In favor of status quo, but would prefer the trigger mechanism of the other options, as he is not seeing an issue in his area.

Todd Alger, SCUBA Diver: Because he is not making a living at this, he does not have the same outlook or involvement as the other advisors, but from his outside perspective, it makes sense that each area has different gauge preferences. He understands why folks want status quo and thinks that is probably ok right now. The trigger reference is based on the highest years of data, so if you go down from the highest point that is probably ok. He also noted that he sees many more sea bass than there used to be in the Boston harbor and Cape Ann areas, much more than five years ago.

Sooky Sawyer, Gloucester, MA: He is part of the Massachusetts Lobstermen's Association. He noted that MA already has a four-month closure, and more time is needed to see how that is going to play out before moving forward with this Addendum. Therefore he supports Status Quo.

John Whittaker: Because he fishes out of CT, he does not want to comment on the addendum specifically. He did state that there continues to be a small fishery in SNE, and they still want to be part of the advisory panel process.

Jeff Putnam, LCMA1: Has always had respect for the science group in ME that does the surveys. Their data means a lot to him and he trust its. He does not think we can sustain this level of fishery catch forever, so it makes sense we would eventually see a drop in catch. However, the decrease in juveniles is concerning. The objective of the addendum makes a lot of sense and we should be doing something to help the spawning stock biomass, but he does not think the process has been fully thought through, especially when it comes to the Canadian import issue. As written, that would be a big issue for the fishery. It is also an issue that some areas throw back v-notched lobster, and then they can just be caught in other areas. If the Commission wants to protect SSB it should implement a zero-tolerance definition for the v-notch for all aeras. He supports the increase in the minimum gauge in conjunction with v-notching rules.

Jon Carter, LCMT Area 1 Chairman: Having been on the LCMT for a long time, he knows the LCMT worked hard with scientific community to come up with the management plans. They developed options for measures that could be taken if something needs to happen to protect the stock, btu they never talked about increasing the minimum gauge size in LCMA 1. He also noted that the discussions were always about the maximum gauge size because the larger lobsters have many more eggs that are better quality. They did not used to see small lobsters egging out like they are now, but the quality of those eggs is inferior. He believes the zero-tolerance v-notch definition and protecting female lobsters is the way to go, and is baffled by the proposal to increase the minimum size. He noted that he tried to organize an LCMT 1 meeting, but was shot down by the Commissioner. He has questions about the way they are sampling for lobster, since the lobsters are moving offshore, and the science has not accounted for that. He does not think it makes sense that there would be less habitat in deeper water

because he has talked to many others that are seeing more settlement in deeper water. He thinks this addendum is really just about standardizing the minimum gauge size. He emphasized that this would make the US fishery less competitive than Canada because they would lose the market for the 3-inch tails that come from chick lobsters. If Canada also increases their min measure, then he could support this increase, but if we do and Canada doesn't, we will be disadvantaged. Stated that the LCMTs need to meet to discuss this. Not having an LCMT meeting goes against the process that was established for the LCMAs. He also thinks market issues need to be considered, and the LCMTs could have weighed in on that issue. For now he supports status quo.

Bobby Nudd: Related to Issue 1, he supports option B to implement some changes at the approval of the addendum. He supports sub-option B1, because it is a problem that some people in the same area can catch lobsters that others have to throw back. The v-notch definition without setal hairs is not useful because they grow back and then the lobster could be kept. He also supports sub-option B2, for mandatory v-notching because there is no reason not to notch. He attended three hearings (ME, NH and MA) and it seemed that at all of those hearings everyone spoke in support of a zero tolerance definition for the v-notch. He also fully supports sub-option B4, saying that it is very important. Environmentally, we need to be more responsible for lost and derelict gear. Reporting the gear loss in order to get a replacement tag is an important step toward this. Having extra tags also allows people to fish over their trap allocations. In NH, he says the NGOs are demonizing the lobster fishery because of lost gear and the environmental impacts. He thinks we should take any step we can toward minimizing this issue.

On Issue 2, he is really torn. He stated that as a group, the AP has a two-fold duty. The advisors represent the fishermen in their state, but they are responsible to the resource also. Without a healthy resource there are no fishermen and no future generations. He is very nervous about what happened in Long Island Sound, even though it was attributed to water quality issues. After reading a lot and talking with the biologists, they were very convincing about the quality the data to substantiate the need for this addendum. He knows a lot of NH, ME, and MA fishermen want status quo, but thinks we need to give a lot of thought to the resource and what could happen if we don't do anything, or if we do something but it is too late. He thinks the biggest thing of importance is to start taking care of the lost traps.

Grant Moore, LCMA 3: There have been over eight regulatory actions in the last 15 years. In LCMA3 and OCC, the fishery relies heavily on larger lobster. They used to catch unlimited large sizes, then went to a 7" maximum, and 6 ¾" maximum. He recommends controlling the catch through ring sizes. A decrease to the maximum gauge sizes would not be tolerable by the industry and is a huge concern. He agrees about standardizing the v-notch definition for all LCMAs. Mandatory v-notching is hard to enforce, but standardizing the definition would be a big step. On Issue 2, he is also torn about the options. He thinks about the SNE collapse, and that there was an increase in effort anyway. He does want to see something in place to protect the stock, but thinks the trigger mechanism needs to be thought out further.

Eric Lorentzen: Supports status quo for now. This seems to be moving too quickly. The whale rules in 6 years will be positive for the lobster stock. Also, the proposed measures in this addendum would put the US fishery inside a box, while Canada would be able to take both smaller and larger lobsters and process them and import them to the US.

ASMFC American Lobster Management Program
Operating Procedures

Revised November 2002

BACKGROUND

The Lobster Board is responsible for implementation of the lobster management program and is accountable to the States, Policy Board and the Commission for successfully implementing the Fishery Management Plan (FMP). The supporting committees provide input to the Board to ensure that management decisions are informed and based on sound science. This document outlines the purpose and composition of the various lobster committees. The description of each committee is taken directly from the Interstate Fishery Management Program (ISFMP) Charter and/or Amendment 3.

PURPOSE

To promote transparent and efficient American lobster management program operations.

OPERATION OF ADVISORY BODIES

The supporting lobster committees primarily draw upon the resources of agency staff members, universities, and lobster industry representatives for information and advice on the lobster fishery. Input from the various advisory bodies assists the Board in making management decisions. The most constructive and productive way for advisory bodies to assist the Board and support the management program is through consensus recommendations. It is strongly recommended that votes not be taken at the advisory body level. All efforts should be made for the group to reach consensus. Where consensus is not possible, the group should document the different points of view and justification for the differences.

BOARD MEMBER RESPONSIBILITIES

Each Board member needs to keep tabs on how the supporting committees are doing, and especially how their respective representatives are functioning. Communication, both formal and informal, between the Board and supporting committees is critical for an efficient and effective management program.

TECHNICAL COMMITTEE (TC)

Description - The Technical Committee is composed of experts in scientific and technical matters relating to the lobster stocks. The Committee is appointed and convened by the Lobster Board to provide scientific and technical advice in the process of developing and monitoring the FMP.

Composition - The Technical Committee shall be composed of one member per active

state/federal agency on the Lobster Board. A state may designate a proxy to participate in the absence of the committee member, however the Commission will only reimburse travel for one member per agency.

Sub-committees - The Technical Committee Chair, in consultation with the Board Chair, will recruit/designate special expertise, as appropriate, for Technical Committee deliberations on specific issues, including a subcommittee on economics and social sciences. All sub-committees of the Technical Committee shall report to the Technical Committee.

Leadership - The Technical Committee shall elect a Chair and Vice-Chair from among the members who are willing and able to commit the time and energy required by the job. The role of the Chair is very demanding. The Chair should be willing to do the job and state agencies must be willing to provide the Chair time to attend to TC business. The Chair should attend all Board meetings. The Chair will be in frequent contact with the FMP Coordinator

All requests for Technical Committee analyses and evaluations should be coordinated through the Chair.

The Vice-Chair of the Technical Committee shall prepare a summary after every meeting to be distributed to the Board, Technical Committee and Advisory Panel.

STOCK ASSESSMENT COMMITTEE (SAC)

Description - The Stock Assessment Subcommittee is a group of experts in fish population dynamics and is appointed and convened by the Technical Committee, as a standing committee, to prepare a stock assessment. The SAC is responsible for data analysis and preliminary preparation of a stock assessment report.

The SASC shall report back to the Technical Committee for review and evaluation of work.

Composition - The SAC shall consist of a maximum of 6 members and membership should be comprised entirely of expertise in stock assessment and fishery population dynamics. It is important to preserve a diversity of scientific viewpoints, while assuring that each SAC member has experience in stock assessment/population dynamics. The TC Chair or Vice-Chair will serve as an ex-officio member of the SAC

The Technical Committee shall identify SAC membership for Board acceptance. Membership to the SAC shall not be limited to Technical Committee members.

Leadership - The SAC shall elect a Chair from within its membership who is willing and able to commit the time and energy required by the job. The Chair will be in frequent contact with the FMP Coordinator.

Based on experience, it is possible that a candidate Chair may not step forward under these circumstances. In this case, the Board should consider:
1. A request to agency representatives who should confer with their committee members and

identify a person to be made available to assume the job, or
2. Board engage an independent person with appropriate credentials to step in as Chair.

ADVISORY PANEL (AP)

Description - The Advisory Panel is a group of people involved in the lobster fishery and are appointed and convened by the Lobster Board. The purpose of the AP is to advise the Board in the development and monitoring of the lobster management program. The AP traditionally has taken a coastwide approach to issues. The AP provides overall advice to the Board on all aspects of the management program (i.e. reference points, non-trap gear, whale interaction). In contrast, the LCMTs focus on area management only. The AP may examine, based on coastwide industry concerns, issues that emerge from individual or multiple lobster management areas which have implications in other management areas. For example, the AP may be directed by the Board to comment on the impact of implementing a gauge increase in multiple areas on different time schedules. The AP would be requested to provide comments to the Board. Meeting arrangements and staff support shall be provided by the Commission.

Leadership - A Chair and Vice-Chair should be elected and serve for a two-year term, as designated in the ASMFC Advisory Committee Charter

Composition - Industry input to lobster management program is unique with two advisory groups - the Advisory Panel and the Lobster Conservation Management Teams (LCMT). The LCMTs provide additional industry representatives focusing on local management issues. Therefore a large Advisory Panel is no longer necessary.

The Advisory Panel membership shall be reconstituted, through attrition. The new membership shall be comprised of four representatives from the states of Maine and Massachusetts, two representatives from the states of New Hampshire, Rhode Island, Connecticut, New York, and New Jersey. States may appoint advisory panel members who are also members of LCMTs. In such cases, the State's Board members need to clearly communicate to the advisors the different roles they are serving, and the distinction between the role of a coastwide advisor and an LCMT member.

Advisors shall serve a term of four years, in accordance with the Advisory Committee Charter, and may be re-appointed. However, a State may not re-appoint more than the new limits on membership.

The AP process can demand a large amount of time and it is important to have members that are willing to participate.

LOBSTER CONSERVATION MANAGEMENT TEAMS (LCMT)

Description - The Lobster Conservation Management Teams were created through Amendment 3 for each of the seven lobster management areas. The LCMTs are appointed and convened by the Lobster Board to advise the Board on each management area and recommend changes to the

management program. The lobster FMP identifies goals, objectives and a rebuilding schedule. The LCMTs provide recommendations for management measures that will accomplish the goals of the FMP while taking into consideration local fishing practices. For example, the LCMTs recommended trap limits, area closures, limits on vessel upgrades, gauge increases and vent size increases to limit effort and meet egg production goals. The LCMTs do not make recommendations on coastwide issues.

Meeting arrangements and staff support is provided by the states.

Process for Submitting Management Area Recommendations/Proposals – LCMTs and the jurisdictions adjacent to the area of concern shall be responsible for the development of recommendations for each lobster management area. Adjacent jurisdictions will be responsible for preparing a management proposal containing said recommendations. Concerns regarding conservation, enforcement, administration, and socio-economic implications should be addressed during this time period. Upon finalization of the management proposal, the area/state contact for each LCMT will forward the proposal to Commission staff for distribution to and review by the Lobster Management Board. Upon receipt of the proposal or during the next scheduled lobster Board meeting, the Board will take action on the management area proposal.

Composition - Amendment 3 identifies a minimum number of LCMT members and the states involved with the selection of members (see table on the next page). The LCMT process can demand a large amount of time and it is important to have members that are willing to participate.

Area	Minimum number of members	States involved in selection of members
1	15	ME, NH, MA
2	10	MA, RI, CT, NY
3	10	ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, NC
4	7	NY, NJ
5	7	NJ, DE, MD, VA, NC
6	6	CT, NY
OCLMA	3	MA

State personnel, including representatives from the Technical Committee, are expected to staff meetings of the LCMTs. The states should keep the Commission informed of all meetings and provide meeting summaries/minutes for all LCMT meetings.

Leadership - Each LCMT shall elect a Chair and Vice-Chair. The Commission will reimburse the Chairs of each LCMT for travel expenses to Lobster Board meetings only. The Chairs must represent the view of the LCMTs at Board meetings, not the views of the individual, state or the associations to which they belong. The state may choose to appoint a LCMT chair or other member to the AP. At AP meetings, such LCMT members would be expected to represent their personal views and/or those of industry associations or segments to which they belong.

In addition, a state contact person and technical advisor shall be appointed to each LCMT.

PLAN REVIEW TEAM (PRT)

Description - The Plan Review Team is a group of individuals who are knowledgeable concerning scientific facts, stock and fishery condition, and fishery management issues concerning the lobster stocks. The Lobster Board appoints and convenes the PRT for the purpose of conducting an annual plan review for the FMP. Consistent with applicable schedules and compliance provisions of the FMP and its addenda, the PRT will conduct a review of the stock status and states' compliance with the implementation requirements of the FMP. The PRT should function in a manner that produces the work requested by the Board. In addition, time should be allotted for the PRT to review issues and prepare recommendations for the Board.

Membership - The Plan Review Team shall be composed of approximately of six persons. The PRT members should have expertise in the lobster fishery and be willing to participate. Board members should solicit volunteers from among their staff to nominate to the PRT. The PRT members must be willing and able to commit the time and energy required.

The Technical Committee Chair or other willing Technical Committee representative, shall serve on the Plan review Team.

Leadership - The FMP Coordinator shall serve as the Chair of the Plan Review Team.

Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

May 1, 2023
2:45 p.m. – 3:15 p.m.
Hybrid Meeting

Draft Agenda

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

1.	Welcome/Call to Order (*M. Bell*)	2:45 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from February 2023	2:45 p.m.
3.	Public Comment	2:50 p.m.
4.	Review Report on the Atlantic Menhaden Fishery in Virginia *(P. Geer)*	3:00 p.m.
5.	Progress Update on Menhaden Single-species and Ecological Reference Point (ERP) Stock Assessments **Action** • Review and Consider Approval of ERP Terms of Reference *(K. Drew)*	3:10 p.m.
6.	Other Business/Adjourn	3:15 p.m.

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

MEETING OVERVIEW

Atlantic Menhaden Management Board
Monday, May 1, 2023
2:45 p.m. – 3:15 p.m.
Hybrid Meeting

Chair: Mel Bell (SC) Assumed Chairmanship: 10/21	Technical Committee Chair: Caitlin Craig (NY)	Law Enforcement Committee Representative: Matthew Corbin (MD)
Vice Chair: Conor McManus (RI)	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: February 1, 2023
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (18 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 1, 2023

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

4. Review Report on the Atlantic Menhaden Fishery in Virginia (3:00 p.m.–3:10 p.m.)

Background

- In response to the public comments from previous Board meetings, the Board requested that Virginia provide an overview of the recent developments in the state menhaden fishery **(Briefing Materials).**

Presentations

- Review of menhaden fishery in Virginia by P. Geer

5. Progress Update on Menhaden Single-species and Ecological Reference Point (ERP) Stock Assessments (3:10 p.m. –3:15 p.m.) Action

Background

- In April 2023, the Ecological Reference Point Working Group met to draft Terms of Reference **(Briefing Materials).**
- The Atlantic Menhaden Stock Assessment Subcommittee (SAS) and Ecological Reference Point Working Group discussed and recommend changing the single-species stock assessment from a benchmark to an update **(Supplemental Materials)**.

Presentations • Update on Menhaden Single-species and Ecological Reference Point (ERP) Stock Assessments by K. Drew and K. Anstead
Board Actions for Consideration • Approve Draft Terms of Reference

6. Other Business/Adjourn

Atlantic Menhaden

Activity level: High

Committee Overlap Score: High (SAS, ERP WG overlaps with American eel, striped bass, northern shrimp, Atlantic herring, horseshoe crab, weakfish)

Committee Task List

- 2023 Ageing Workshop
- 2025 Single-species and Ecological Reference Point Stock Assessments
- Annual compliance reports due August 1st

TC Members: Caitlin Craig (NY, Chair), Josh Newhard (USFWS), Holly White (NC), Keilin Gamboa-Salazar (SC), Jason McNamee (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ingrid Braun (PRFC), Micah Dean (MA), Kurt Gottschall (CT), Shanna Madsen (VMRC), Chris Swanson (FL), Ray Mroch (NMFS), Sydney Alhale (NMFS), Amy Schueller (NMFS), Alexei Sharov (MD), Garry Glanden (DE), Heather Walsh (USGS), Kristen Anstead (ASMFC), James Boyle (ASMFC)

SAS Members: Amy Schueller (NMFS, SAS Chair), Caitlin Craig (NY, TC Chair), Brooke Lowman (VA), Matt Cieri (ME), Chris Swanson (FL), Sydney Alhale (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ), Katie Drew (ASMFC), Kristen Anstead (ASMFC), James Boyle (ASMFC)

ERP WG Members: Matt Cieri (ME, ERP Chair), Jason Boucher (NOAA), Michael Celestino (NJ), David Chagaris (FL), Micah Dean (MA), Rob Latour (VIMS), Jason McNamee (RI), Amy Schueller (NFMS), Alexei Sharov (MD), Howard Townsend (NFMS), Jim Uphoff (MD), Shanna Madsen (VMRC), Kristen Anstead (ASMFC), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC MENHADEN MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

February 1, 2023

Draft Proceedings of the Atlantic Menhaden Management Board Hybrid Meeting
February 2023

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ATTENDANCE

Board Members

Megan Ware, ME, proxy for Pat Keliher (AA)
Steve Train, ME (GA)
Cheri Patterson, NH (AA)
Doug Grout, NH (GA
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
David Borden, RI (GA)
Conor McManus, RI, proxy for J. McNamee (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Matt Gates, CT, proxy for J. Davis (AA)
Rob LaFrance, CT, proxy for B. Hyatt (GA)
Jesse Hornstein, NY, proxy for B. Seggos (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Peter Clarke, NJ, proxy for T. Fote (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, AA (Acting)
Russell Dize, MD (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for J. Green (AA)
Bryan Plumlee, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Mel Bell, SC (AA)
Malcolm Rhodes, SC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Marty Gary, PRFC
Max Appelman, NMFS
Rick Jacobson, USFWS

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

Ex-Officio Members

Scott Simmons, Law Enforcement Committee Rep.

Staff

Bob Beal
Toni Kerns
Madeline Musante
Tina Berger
James Boyle
Chris Jacobs
Jeff Kipp

Guests

Mike Armstrong, MA DMF
Pat Augustine, Coram, NY
Rob Beal, ME DMR
Jessica Best, NYS DEC
Alan Bianchi, NC DENR
Ingrid Braun, PRFC
Jeff Brust, NJ DEP
Mike Celestino, NJ DEP
Benson Chiles, Chiles Consulting
Matt Cieri, ME DMR
Nicholas Coleman, Univ MD
Margaret Conroy, DE DFW
Caitlin Craig, NYS DEC
Jessica Daher, NJ DEP
Conor Davis, NJ DEP
Jacob Espittia, FL FWC

Guests (continued)

Glen Fernandes
Jared Flowers, GA DNR
Tony Friedrich, SGA
Keilin Gamboa-Salazar, SC DNR
Shaun Gehan, Gehan Law
Ben German, NOAA
Angela Giuliano, MD DNR
Willy Goldsmith, Gloucester, ME
Kurt Gottschall, CT DEEP
Marin Hawk, MSC
Jay Hermsen, NOAA
Joclyn Higgins, TRCP
Emily Hill, US FWS
Peter Himchak, Cooke Aqua
Carol Hoffman
Harry Hornick, MD DNR
Jeff Kaelin, Lund's Fisheries
Greg Kenney, NYS DEC
Ben Landry, Ocean Harvesters
Thomas Lilly, Forage Matters
Brooke Lowman, VMRC
Shanna Madsen, VMRC
Dan McKiernan, MA (AA)
Kevin McMenamin, Annapolis, MD
Meredith Mendelson, ME DMR
Steve Meyers
Kyle Miller, FL FWC
Drew Minkiewicz, Kelly Drye
Chris Moore, CBF
Paul Piavis, MD DNR
Jeffrey Pierce, Dresden, ME
Michael Pierdinock
Nicole Pitts, NOAA
Bill Post, SC DNR
Will Poston, SGA
Chad Power, NJ DEP
Sara Rademaker, American Unagi
Jill Ramsey, VMRC
Harry Rickabaugh, MD DNR
Lenny Rudow, Fish Talk Mag
Amy Schueller, NOAA
Zachary Schuller, NYS DEC
Ross Self, SC DNR
David Sikorski, Baltimore
Ethan Simpson, VMRC
Melissa Smith, ME DMR
Somers Smott, VMRC
David Stormer, DE DFW
Troy Tuckey, VIMS
Beth Versak, MD DNR
Mike Waine, ASA
Craig Weedon, MD DNR
Tim Wildman, CT DEEP
Kate Wilke, TNC
Chris Wright, NOAA
Darrell Young, MSFA
Phil Zalesak
Erik Zlokovitz, MD DNR
Renee Zobel, NH F&G

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Wednesday, February 1, 2023, and was called to order at 11:30 a.m. by Chair Mel Bell.

CALL TO ORDER

CHAIR MEL BELL: We're going to go ahead and get started here. Once again, menhaden seems to be standing between me and a meal. We don't have a lot on the agenda, so hopefully this will go fairly quickly. But we do have some business we need to conduct. First item, and this is the Menhaden Board, welcome. I'm Mel Bell, the Chair.

APPROVAL OF AGENDA

CHAIR BELL: First item is approval of the agenda. Any desired modifications to the agenda? I don't see any hands, so the agenda will stand approved by consensus.

APPROVAL OF PROCEEDINGS

CHAIR BELL: Next would be approval of the proceedings from the November 9, 2022 meeting. Any edits necessary to the minutes from the last meeting? I don't see any hands; then the proceedings will stand approved by consensus.

That takes us to Public Comment. This will be public comment for items not on the agenda. Are there any individuals in the room here that would like to make public comment? I don't see any hands, don't see anybody running up this way. All right, then we'll move to the web-based comments. Okay, we have Phil Zalesak online. Phil, if you would like to take three minutes to make a comment, we would receive those now. Are you with us Phil?

MS. TONI KERNS: Phil, we can't hear you on our end. You are unmuted, so it seems like it might be your microphone. We still don't hear you, Phil.

CHAIR BELL: In the interest of time, Phil, I know we have your written comments, so in the interest of time here we're going to go ahead and move along. But, I would point out we do have written comments that have been submitted by Phil.

CONSIDER STATE IMPLEMENTATION PLANS FOR ADDENDUM I TO AMENDMENT 3 TO THE FMP.

CHAIR BELL: Then, that takes us to the first item that we need to discuss, as far as where we need some Board action. James will brief us on that, and this would be considered a State Implementation Plans for Addendum I to Amendment 3. Go ahead, James.

MR. JAMES BOYLE: I have a very quick summary of the Plan Review Team's comments on the State Implementation Plans. As a quick recap. Addendum I was approved at the annual meeting in November last year. The Board set a deadline for Implementation Plans to be submitted by January 1, when quota allocations also took effect, and then with full implementation of the management measures in the Addendum by May 1 of this year.

PLAN REVIEW TEAM RECOMMENDATIONS

MR. BOYLE: The PRT met to review the plans and developed just a few recommendations. Overall, the PRT Is recommending the approval of all state implementation plans, after finding that they are consistent with the FMP For the May 1st deadline. There were a couple of further recommendations the PRT just wanted to make a quick note of.

In Maryland and Delaware regulatory language did not include a list of permitted gear, just because the gear types are already used within the state, already conform to the incidental catch and small-scales fisheries provision. The PRT was recommending adding language either through the regulatory or public notice process, if that's possible, that lists the permitted gears or defers to the FMP to preclude the remote possibility of new gears being introduced.

Additionally, the plans for Pennsylvania, South Carolina and Georgia are sufficient, while they don't have a directed fishery. But should one develop,

the PRT would recommend they develop new plans similarly to the agreement when Amendment 3 is implemented. That is all I have, are there any questions?

CHAIR BELL: Are there any questions? Yes, John Clark.

MR. JOHN CLARK: Not a question, I just wanted to emphasize again that our gear is listed under state law, that is why they are not in the regulations. We do have a list of permitted gear under our state's code, so I could supply that to the PRT.

CHAIR BELL: All right, thanks, John. Yes, Nichola.

MS. NICHOLA MESERVE: I do have one question about Virginia's proposed regulations, where they are adopting the 75.21 percent allocation. It didn't appear to me that that took into consideration the 1 percent that's coming off the top for episodic event set-aside, nor would it allow you to receive redistributed quota or quota transfers. But perhaps that is elsewhere in your language.

MR. PAT GEER: We've always put our allocation percentage into our regulation. Shanna wrote it, so I would probably ask her to respond to that one.

MS. SHANNA MADSEN: Sorry, tag team in. Yes, the rest of that is actually in our regulations. That section that specifically pertains to allocations, further down also has an option that talks about the 1 percent set-aside for the EESA. Then, what happens when/if that 1 percent is reallocated to the states. All that is already outlined, and I'm happy to provide that language if you want to see it.

MS. MESERVE: No, just thanks for the clarification.

CHAIR BELL: All right, great, any other questions or discussion at this point? Yes, Lynn.

MS. LYNN FEGLEY: Mr. Chair, if you're ready, I would make a motion.

CHAIR BELL: Yes, Ma'am, that would be great.

MS. FEGLEY: I would move to approve the state implementation plans for Atlantic menhaden, if there is one written throw some addendum number in there somewhere.

CHAIR BELL: Okay yes, Marty.

MR. MARTIN GARY: Just second.

CHAIR BELL: Okay, got you. Did we have that? Are we going to put it up there? Hang on one sec. Good, moving along. There it is before you. **Let me read it, the motion is to move to approve the state implementation plans for Addendum I to Amendment 3.** The motion was by Ms. Fegley, seconded by Marty Gary.

Yes, Ray, okay**. Any discussion of the motion? Any opposition to the motion? Seeing none; then the motion carries.** Thank you. It carries without opposition. Sorry, just clarification, thank you. We're moving pretty quick. Queue up, next we have another presentation by James.

CONSIDER APPROVAL OF MENHADEN TECHNICAL ADDENDUM TO ADDENDUM I TO AMENDMENT 3

MR. BOYLE: I'll get started and jump right in. As I mentioned in the last presentation, at the annual meeting last November, the Board approved Addendum I for Amendment 3, which changed the commercial allocations, including updating the timeframe used to allocate the remaining TAC after the fixed minimums from 2009 to 2011 to 2018, '19, and 2021.

However, Addendum I inadvertently did not include text to amend the time period used to redistribute relinquished quota. Therefore, staff has drafted a Technical Addendum to correct the error, which was supplied in supplemental materials. Specifically, Amendment 3, Section 4.3.2 includes the following quote.

"Any quota that is relinquished by a state will be redistributed to the other jurisdictions, i.e., those which are not relinquished quota, based on landings from 2009 to 2011." Although based on the motion

that was approved to establish the redistribution of relinquished quota at the November 2017 Board meeting, which contained "Any quota that is relinquished by a state is redistributed to the other jurisdictions based on historic landings from the time period selected by the Board in this Amendment."

It was the Board's intention for relinquished quota to be redistributed according to the same timeframe as the quota allocation. Therefore, if approved the draft Technical Addendum will replace the third paragraph in Section 3.1.2 in Addendum I, with the paragraph on the slide. The only change to that paragraph is the last sentence, where it states that "Any quota that is relinquished by a state will be redistributed to the other jurisdictions, i.e., those which have not relinquished quota, based on landings from 2018, 2019 and 2021."

If approved, the Board will need to determine an implementation timeframe, and whether or not to implement for the 2023 or 2024 fishing year. If some states have already finalized their 2023 quota, and do not have the ability to change it, it may not be possible to implement for this year. For 2023, Delaware has relinquished 1 million pounds. This table on the slide show the comparison of how 2023 quota allocations would change from the current redistribution to the new redistribution, if the Board approved the Technical Addendum and implemented it for this year, 2023. With that the Board action to consider today are the approval of the Technical Addendum and the timeline for implementation. I'm happy to take any questions.

CHAIR BELL: All right, so this is a Technical Addendum to deal with, basically an accounting issue that we need to deal with. Questions. You have the, not that long, Addendum I. It's a Technical Addendum I to Addendum I to the Amendment 3 of the Plan. It's in your supplemental materials. Questions, discussions. Yes, Kris.

MR. KRIS KUHN: I don't have a question, necessarily. But to move things along I would be willing to make a motion.

CHAIR BELL: Okay, that would be fine.

MR. KUHN: I move to approve the Technical Addendum I to Addendum I and have the measures become effective for the 2023 fishing year.

CHAIR BELL: All right, second by Nichola Meserve. Discussion. Again, specifically for 2023 right here. Okay, so any further discussion, any questions? Everybody understand how this is going to work? You all must be hungry. Okay yes, Toni.

MS. KERNS: Just a quick clarification. All states would be able to accept this change in the quota for this year. That is really the question we are asking.

CHAIR BELL: Yes, will this work for all of you all. I don't see any problems with that. Okay, so I'll just read it to the record. Move to approve Technical Addendum I to Addendum I and have the measures become effective for the 2023 fishing year. Motion by Mr. Kuhn, second by Ms. Meserve.

We've had discussion. Any further discussion? Any objection to the motion? I see no hands so the motion is approved by consensus with no objection. Thank you. You all must be hungry. Those were the two items. Did you want to mention? Go ahead. James has got a reminder here.

MR. BOYLE: Yes, just one quick note. As a reminder to the Board, I sent out recently a memo for nominations to the Stock Assessment Subcommittee for the 2025 Menhaden Benchmark Assessment. Those nominations are due by February 10, and then we'll get those approvals sorted after that. Thank you.

CHAIR BELL: We've got a few minutes, did great. We had a little technical difficulty, perhaps, in the public comment. But now I think we actually have an individual on that will hopefully work. We can now have three minutes of public comment. That's Tom Lilly. I don't know if Phil is still with us or not, but if Tom is onboard and would like to comment, three minutes would be okay.

MS. KERNS: Tom, you just need to unmute yourself. Tom Lilly, you are still self-muted, so you just need to press that microphone button to unmute yourself to give your public comment.

CHAIR BELL: Okay, well we do have written comment from Tom and written comment from Phil. It's fairly extensive, so I would encourage you to read that. Sorry for the technical issue there. All right, yes Tom, can you get unmuted?

MS. KERNS: Tom, you click the microphone button to turn it from red to green.

MR. TOM LILLY: Can you hear me?

MS. KERNS: Now I can hear you.

CHAIR BELL: Yes, we've got you.

PUBLIC COMMENT

MR. LILLY: Good morning, delegates, and thank you for accommodating a brief public comment here. I'm asking you delegates this morning to start a process to consider the ecological, social and economic consequences of moving the purse seine fishing, menhaden purse seine fishing from Virginia waters into the U.S. Atlantic Zone, or leaving it as it is.

Your ERP studies said that when menhaden are overharvested, striped bass suffer the most and first. Isn't it gross overharvesting in Chesapeake Bay occurring when you have the following situation? In Maryland, four straight years of the worst young of the year production in history. In other words, a failure of the striped bass spawning stock.

You're not really going to feel this until, you know a few years to come, when all the older fish are killed off and we don't have anything to replace them. In Virginia, the NOAA data shows the consequences of the overharvesting very clearly. Striped bass charters are down 60 percent. Striped bass trips by anglers are reduced 430,000 trips a year, 430,000 less trips by Virginians alone; families, friends and children.

Almost a half a million in trips lost. Striped bass angler spending is down 150 million dollars a year in Virginia, according to the latest numbers. That is 150 million dollars a year that Virginia small businesses are losing, because of your inaction in not preventing the overharvesting of menhaden. There have been 2,000 jobs lost in just the striped bass fishery alone in Virginia.

I ask you, isn't this the time to start the process to consider the benefits and impacts of moving the purse seine fishing into the U.S. Atlantic? If these figures aren't enough to convince you to do that and to do it now, then I have to ask the rhetorical question. What in the heck are you waiting for? Please take action right now, today, to start this process. There are a million Marylanders and another million Virginians hoping that you do this. Thank you.

CHAIR BELL: All right, thank you, Tom.

MR. LILLY: Yes, thank you for getting me on. Thank you very much.

CHAIR BELL: No problem. Is Phil still with us or not? Okay, so we have nobody else. All right, that concludes the agenda.

OTHER BUSINESS

REQUEST UPDATE OF ATLANTIC MENHADEN FISHERY ACTIVITIES IN VIRGINIA

CHAIR BELL: Under Other Business I have just one thought I would like to run by the Board. You know we've heard public comment, we just heard some. We've heard through meeting after meeting, you know kind of about the fishery of Virginia and that sort of thing. I just thought maybe it would be instructive for the Board. A lot of us may not be familiar with what all is going on in Virginia. Virginia has obviously been doing things and having Commission meetings and things.

Maybe for the next meeting, we could ask Pat Geer of Virginia, to maybe at the time just provide us with a little synopsis of what all they've had going on down there with how they've been kind of engaged in the fishery, just from their perspective of what's going on, because I couldn't really tell you exactly what is going on in Virginia.

I think that could be something we just by consensus just ask the staff to work with Virginia, maybe provide us, assuming Virginia is okay with that, just maybe provide us some idea of what all is going on down there, just give us an update. Pat, is that something that might work?

MR. GEER: Yes, we would be glad to do it. I don't think it will be a little synopsis though, it's been very time consuming. But yes, we would be very happy to do it.

CHAIR BELL: Yes, I just think that would be helpful. It would be helpful for me, just to kind of get a picture of everything, and that would be for the next meeting. If you have any objection to that, I don't think there would be. Okay, well can we just ask direction to staff to kind of work with Virginia and receive that. Then it would be ready for the next meeting. Then we can kind of have a snapshot of what is going on in Virginia. Okay, cool.

ADJOURNMENT

CHAIR BELL: If there are no other items to come before the Menhaden Board, we are wow! We will adjourn the Menhaden Board early.

(Whereupon the meeting adjourned at 11:51 a.m. on Wednesday, February 1, 2023)

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Building 96
Fort Monroe, VA 23651

Travis A. Voyles
Secretary of Natural and Historic Resources

Jamie L. Green
Commissioner

April 11, 2023

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

Mr. Beal,

Thank you for giving Virginia a chance to elaborate on recent events regarding the Atlantic Menhaden fishery in our state. The Virginia Marine Resources Commission (MRC) has jurisdiction over all commercial fishing and all marine fish, marine shellfish, marine organisms, and habitat from the Commonwealth's territorial sea to the fall line of all tidal rivers and streams (Code of Virginia § 28.2-101). Menhaden was the exception, being managed through the General Assembly (§§ 28.2-400 – 411) until 2020. This had made it difficult for the MRC to respond to certain Atlantic State Marine Fisheries Commission's mandated management actions. In particular, the General Assembly never adopted the Bay Cap of 51,000 mt in Amendment 3 of the Atlantic Menhaden Fishery Management Plan (November 2017), even after consecutive attempts during the 2018 and 2019 sessions. The reduction fleet exceeded the Bay Cap in 2019 by nearly 30% and was found out of compliance by ASMFC (October 2019). The Secretary of Commerce concurred with ASMFC's non-compliance finding (Dec 2019) and gave Virginia until June 16, 2020, to correct the non-compliance issue or face a moratorium on all state menhaden fisheries (reduction and bait). During the 2020 session, the Virginia General Assembly proposed numerous menhaden bills with SB791 and HB1448 ultimately signed by Governor Northam, effectively transferring all management authority of menhaden to the VMRC. The bills also required the creation of a Menhaden Management Advisory Committee (MMAC) to "*provide guidance to the MRC on the sustainable management of the menhaden resource and harvest of the bait and reduction fisheries in the waters of the Commonwealth, including the Chesapeake Bay*."

A timeline of all of Virginia's actions and events since the approval of Amendment 3 are described in Attachment 1. This memo will outline Virginia's activities regarding its menhaden fisheries since MRC received management authority in March of 2020.

Menhaden Management Advisory Committee

The MMAC is comprised of up to 12 non-legislative citizen members residing in the Commonwealth with knowledge of the menhaden resource and are appointed by the MRC Commissioner. Seven seats are designated for specific representatives – reduction, bait, labor, recreational angler, conservation, sportfish industry, and ASMFC TC rep. The Committee has held at least two public meetings per year since April 2020 to discuss and address various concerns. Members proposals to date have included: 1) Moving the demarcation line for the Bay from the Chesapeake Bay Bridge Tunnel to the COLREGS line; 2) Address Commercial/Recreational user conflicts in the state waters adjacent to Virginia Beach; 3) Address Commercial safety zone around the Chesapeake Bay Bridge Tunnel; 4) Hold the commercial menhaden industry responsible for fish spills as part of their quota; 5) Prohibit purse seine fishing – 1 mile from shore May 15 through September 15 to avoid spills affecting public beaches; and 6) Examine the allocation percentages between the three commercial sectors (purse seine reduction, purse seine bait, and non-purse seine bait) in the menhaden fishery. The first five proposals did not receive enough support from the membership for further consideration. However, a workgroup was formed to discuss and develop solutions regarding proposal number 6. By regulation, the annual allocation Virginia receives from ASMFC is further separated among the three sectors: purse seine reduction – 90.04%, purse seine bait – 8.38%, and non-purse bait – 1.58%, based on historical landings. The bait sectors had been meeting their allocated quota earlier each year – creating bait shortages (particularly for crab pots and chum) from Delaware to Florida. Regulatory changes that would allow transfers between the purse-seine sectors, and with cooperation between the purse-seine sectors, would allow external jurisdictions' to transfer quota to Virginia with the understanding that the purse-seine reduction sector would transfer their portions of that external transfer specifically to the purse-seine bait sector to alleviate these shortages. The regulation was adopted on a temporary basis in 2022 and made permanent in February 2023.

Petition to the Governor

In June of 2022, local and national fishing and environmental organizations joined with the Theodore Roosevelt Conservation Partnership (TRCP) to ask Governor Youngkin to "*move Omega Protein's boats out of the Bay until the science demonstrates that industrial menhaden fishing can be done without negatively affecting the broader Bay ecosystem.*" (Attachment 2). That petition was provided to Commissioner Green at the MRC's October 25, 2022, Board meeting (to forward to Governor Youngkin) and included 9194 names (50.4% of which were VA residents based on zip codes). A similar petition signed by over 2000 residents of the Eastern Shore was also provided to Commissioner Green at that time.

Fish Spills:

Spills from the purse seine fisheries typically occurs when the net snags on a bottom obstruction. Once the menhaden school is surrounded and the purse boats start pulling in the lead line, their mobility is extremely limited, and they are strongly influenced by the wind and currents. The same is true when the mother ship starts pumping the catch into the hold. Vessels sometimes drift into shallower waters, snag on the bottom, tear the net, and the catch is released. Since 2018, there have been 17 confirm fish spills associated with the purse seine fisheries (3.4 per year, 1.16 spills for every 1000 net sets) ranging in size from 5,000 to 300,000 fish. They account for 0.06% of Virginia's total menhaden quota. Prevailing winds and currents conditions may wash fish ashore depending on the location. Three spills occurred in July 2022 with fish washing ashore from each

incident in the same general area on the bayside of Eastern Shore. A non-reported spill began washing up on Silver Beach, VA on July 3rd and 4th, and was followed up by another spill on July 5th, with 19,582 menhaden washing up on the same stretch of beach. On July 25th, a purse seine vessel released their nets when they noticed red drum during pump out, resulting in 264 dead red drum and 10,000 menhaden washing ashore just to the south at Kiptopeke State Park. The red drum sampled by MRC averaged 48" TL with a weigh of 45.6 lbs. The purse seine reduction fleet took responsibility for these latter two spills and deployed contractors to clean the beaches and nearby waterways. The three spills resulted in a public backlash that involved media, county officials, legislators, and the Governor's office.

Public Interactions

There has been an increased number of public interactions regarding menhaden over the past 18 months. These interactions include increased public participation and comment during MRC's monthly Board meetings, Freedom of Information Act (FOIA) requests, and correspondence with local and state representatives. Many of these interactions have consistently been with just a few individuals and/or organizations – some of which have placed an unprecedented burden on staff time. Examples include FOIA requests (7 in the past 15 months) needing to be addressed within a certain time, individuals sending staff hundreds of pages of information to include in monthly Commissioner meeting packets, individuals requesting and provided time on the agenda to present proposals during advisory committee meetings – only to not show up for those meetings. Some individuals have been disrespectful of the Commissioner, associate commissioners, and the regulatory process during meetings, while others have been warned and/or removed by our Law Enforcement due to their inappropriate behavior at monthly Board meetings.

Governor's Response

MRC staff began working with the Governor's office in August to develop a response to the petitions requesting the removal of the purse seine reduction fleet from the Bay and the fish spills that occurred on Eastern Shore. The final response did not completely prohibit the reduction fleet from the Bay but instead tried to address safety concerns and fish spills impacts on local communities. A series of buffers were recommended. A one nautical mile coastal buffer along both the west and east sides of the Bay and Virginia Beach were proposed. The premise was to push the purse seine vessels further from shore into deeper water where tearing nets on bottom snags was less likely. The increased distance from shore could potentially reduce the chances of a spill washing ashore. Based on historical Bay purse seine effort from the Captains Daily Fishing Reports (CDFR) (2016-2020), 6.41% of the purse seine Bay effort would be displaced by this recommendation. When the Virginia Beach area was included it resulted in 2.63% of the total purse effort in state waters being displaced. These buffers did not prohibit purse seines in the Bay, they simply redirected that effort beyond one nautical mile from shore. Additionally, a 0.5 nm caution buffer was suggested on either side of the Chesapeake Bay Bridge Tunnel to reduce user conflict in heavily trafficked areas and promote overall safety in proximity of the CBBT structure. Only 0.38% of total purse seine effort (2016-2022) occurred within this buffer.

A complete prohibition on menhaden purse seine fishing was also proposed around summer holidays. If there was no purse seine effort in the Bay just prior to holidays, there would be no spills potentially impacting coastal communities. A closure of 17 days (8.43% of the 2023 Bay season) was proposed: four days prior to and including both Memorial and Labor Day and July 1-

7. It was estimated that 6.09% of the historic Bay effort would need to be displaced into the ocean with this recommendation.

These proposals were presented to the MMAC and supported by several Virginia's sportfishing organizations as a step in the right direction. However, after hearing the proposal and several hours of public comment at the December 6, 2022 Commission meeting, the Board instead voted 5-4 to support the development of a memorandum of understanding with the industry agreeing to not fish in the Bay the Saturday to Monday Memorial and Labor Day weekends, Saturday and Sunday between Memorial Day and labor Day, ½ nm on either side of the CBBT, and to work collaboratively with the Governor's office and General Assembly members to address geographic buffers along the densely populated areas of the Eastern Shore of Virginia, in the Chesapeake Bay and the Virginia Beach region.

Recent Legislation -2023

Three menhaden bills were introduced during the 2023 Virginia General Assembly session. HB1381 (Anderson) would eliminate time restrictions on regulations. Presently, § 28.2-201 of the Code of Virginia only allows MRC to adopt regulations for the management of menhaden between October 1 and December 31 unless regulatory action is necessary to address an emergency situation or to ensure compliance with the ASMFC Fishery Management Plan for Atlantic Menhaden. No other species under MRC's authority has a similar restriction. The bill was tabled in committee. HB1383 (Anderson) was also tabled. It proposed a 2-yr moratorium on menhaden reduction fishing in state waters of the Commonwealth while a report is prepared relating to the environmental impact of menhaden reduction fishing in the waters of the Commonwealth. Senator Lewis introduced SB1388, which initially directed the Virginia Institute of Marine Science (VIMS) to study 10 focus areas related to menhaden in the Chesapeake Bay and provide a report on the findings to the Chairmen of the Senate Committee on Agriculture, Conservation and Natural Resources and the House Committee on Agriculture, Chesapeake and Natural Resources no later than December 1, 2024. Significant modifications to the bill were made in committee, approved by both the House and Senate, and approved by the Governor on March 22, 2023. The modifications tasked VIMS to develop plans for studying the ecology, fishery impacts, and economic importance of menhaden populations in the waters of the Commonwealth and report to the same committees by September 1, 2023.

Memorandum of Understanding

Staff have been working with industry to address fish spills near sensitive areas and have prepared a draft document which is scheduled to be signed by all parties (reduction representatives, bait representatives, and MRC) by the end of April. If the MOU is signed by all parties, there will be several new temporal and spatial restrictions on menhaden purses seines in the Chesapeake Bay. This MOU has been developed with the goal to limit future spill incidents and to create a transparent and efficient spill response protocol. It intends to reduce user conflict and strengthen the stewardship of Virginia's shared aquatic resources amongst all user groups in the Commonwealth. The signatory's objectives are to collaboratively discuss, examine, and evaluate previous spills and the corresponding responses with the goal of ensuring that future response coordination is efficient and effective. The intent of the time and area restrictions outlined in the MOU are to reduce the possibility of fish spills during weekends and holidays when stakeholders are using public beaches. In the event of spills, restrictions will create buffers along densely

populated shorelines to ensure spills are more likely to be cleaned up before reaching shore. The Governor's office and MRC have stated firmly to the industry that compliance with this agreement is imperative and response to any violations may result in stricter regulatory actions.

The Commonwealth has a very open and transparent process for regulating and managing our fisheries. The public is welcomed at all our workgroup, advisory committee, and Commission meetings and are given ample time to provide comment regarding items on each agenda item as well as given a specific time for items not on the agenda. Our Commission members and staff take the public's comments and concerns seriously and try to respond in a timely and responsible manner. Additionally, all our meetings are broadcast live on our YouTube channel (https://www.youtube.com/@vamarineresources) and archived for the public to watch at their convenience.

Again, we thank you for the opportunity to provide this update regarding menhaden issues in the Commonwealth. We will be glad to provide any additional information you, your staff, the Menhaden Board, or Technical Committee may have on these issues.

Sincerely,

Patrick J. Geer
Chief of Fisheries Management Division
Virginia Marine Resources Commission

cc: Jamie Green, Commissioner
Senator Monty Mason, Legislative Commissioner
Bryan Plumlee, Governor's Appointed Commissioner
Shanna Madsen, VA Menhaden TC rep
Toni Kerns, ASMFC Fisheries Policy Director, Interstate Fisheries Management Program
James Boyles, ASMFC Atlantic Menhaden FMP Coordinator

Attachment 1

Timeline of Recent Events Related to Virginia Menhaden Fisheries

2017

November 2017: ASMFC approves Amendment 3 to the Atlantic Menhaden FMP reducing the Bay Cap from 87,216 mt to 51,000 mt.

2018

Jan 10 – Mar 10: Four bills were introduced to the Virginia General Assembly addressing menhaden (HB822, HB1610H1, HB1610, and SB214). None make it out of committee.

2019

Jan 9 – Feb 24: Three bills were introduced during the Virginia General Assembly addressing menhaden (HB1769, SB1046, and SB1049). None make it out of committee.

February 2019: The ASMFC Atlantic Menhaden Board decides to not find Virginia out of compliance for not adopting the Bay Cap under Amendment 3 of the Atlantic Menhaden FMP unless the Bay Cap is exceeded.

September 2019: The Virginia menhaden purse seine reduction fleet exceeds the Bay Cap by nearly 30%. MRC notified ASMFC.

October 2019: The ASMFC Atlantic Menhaden and Interstate Fisheries Management Policy Boards both vote unanimously to find Virginia out of compliance for not adopting the terms of Amendment 3.

December 2019: The Secretary of Commerce concurred with this non-compliance finding and ordered a moratorium of the Virginia menhaden fisheries effective June 17, 2020.

2020

March 12, 2020: SB791 and HB1448 are approved, transferring Atlantic menhaden management authority to VMRC, repealing a number of menhaden sections of Administrative Code, and establishes the Menhaden Management Advisory Committee (MMAC). The Committee shall consist of not more than 12 nonlegislative citizen members who shall be residents of the Commonwealth with knowledge of the menhaden resource, to be appointed by the Commissioner, including one representative of the menhaden reduction fishery, one representative of the menhaden bait fishery, one representative of a labor organization involved in the menhaden fishery, one recreational angler, one member of a Virginia-based conservation organization, one representative of the sportfishing industry, and the Virginia appointee to the Atlantic Menhaden Technical Committee of the Atlantic States Marine Fisheries Commission.

April 20, 2020: First meeting of the Menhaden Management Advisory Panel (held virtually due to COVID-19). Bylaws are approved and regulatory language for Chapter 4 VAC 20-1270-10 et seq., “Pertaining to Menhaden” is discussed and endorsed related to the transfer of regulatory authority of the species from the General Assembly to the VMRC.

April 28, 2020: The MRC Commission voted unanimously to approve amendments to Chapter 4 VAC 20-1270-10 et seq., "Pertaining to Atlantic Menhaden," for the VMRC to accept management authority from the Virginia's General Assembly, to comply the ASMFC's Atlantic Menhaden Fishery Management Plan, and to avoid a statewide moratorium of the fishery effective June 17, 2020. The Bay Cap is reduced 29% for 2020 (36,196 mt) to account for the overages in 2019.

May 12, 2020: Secretary of Commerce Ross informs Virginia that the Commonwealth’s menhaden fisheries are now in compliance with Amendment 3 of the Atlantic Menhaden Fishery Management Plan.

Nov 17, 2020: The Menhaden Management Advisory Panel meets and establishes a meeting schedule of at least twice per year – once prior to the season opening in the spring and in November. The committee selects Dr. Rob Latour as the chair and Shanna Madsen as the vice chair. Policies and procedures are adopted on how and when members can bring forward items to the committee. Members will submit ideas at least 30 days prior to the meeting and staff will work with members to collect the necessary information to present to the Committee for consideration. Items brought forward at this meeting include:

1. Move the demarcation line from the Chesapeake Bay Bridge Tunnel to the COLREGS Line. No action is taken.

2021

March 31, 2021: The MMAC meets and considers the following:

1. Address Commercial/Recreational user conflicts in the state waters adjacent to Virginia Beach – Already an informal agreement. No action taken.
2. Address Commercial safety zone around the Chesapeake Bay Bridge Tunnel. No action taken.

Nov 9, 2021: The MMAC meets and considers the following:

1. Proposal to hold the commercial menhaden industry responsible for fish spills as part of their quota. No action is taken.
2. Proposed restriction on purse seine fishing – 1 mile from shore May 15 – Sep 15 to avoid spills affecting public beaches. No action is taken.
3. Examine the allocation percentages between the three commercial sectors (purse seine reduction, purse seine bait, and non-purse seine bait) in the menhaden fishery.

A workgroup was formed to discuss the matter and come back to the full committee with recommendations.

2022

January 5, 2022: Governor-elect, Glenn Youngkin announces Glenn Wheeler (Former head of the EPA) as his Secretary of Natural Resources.

January 15, 2022. Glenn Youngkin is sworn in as the new governor of the Commonwealth of Virginia. Steve Bowman, Commissioner of VMRC retires.

January 20, 2022. Justin Worrell (Deputy Chief of VMRC's Habitat Management Division) is named acting Commissioner of VMRC.

February 8, 2022: The Virginia Senate tables SNR Wheeler's confirmation vote 19-21 and he steps down from his position effective March 15. Deputy Secretary Travis Voyles becomes Acting Secretary of Natural Resources.

February 22, 2022: The VMRC votes unanimously to approve amendments Chapter 4 VAC 20-1270-10 et seq., "Pertaining to Atlantic Menhaden", to establish the 2022 Total Allowable Catch to the Interstate Fishery Management Plan for Atlantic Menhaden and to establish all associated fishery sector allocations in response.

March 9, 2022. Menhaden Allocation Workgroup Meeting to discuss allocations between the sectors, internal, and external transfers.

April 1, 2022: Staff provide acting Secretary of Natural Resources, Travis Voyles, a synopsis on menhaden science and management.

April 11, 2022: Menhaden Allocation Workgroup Meeting to finalize procedures and regulatory changes.

May 18, 2022: MMAC meeting. Staff provide the recommendations of the Allocation Workgroup for consideration. The committee endorses the proposal.

June 14, 2022: The Virginia Saltwater Sportfishing Association in partnership with the Theodore Roosevelt Conservation partnership, state, and national fishing organizations and NGO's began a letter campaign to Governor Glenn Youngkin to move the menhaden reduction fishery out of the Chesapeake Bay.

June 27, 2022: Governor Youngkin appoints Jamie Green to be Commissioner of VMRC.

June 28, 2022: The VMRC board approved amendments to Chapter 4 VAC 20-1270-10 et seq., "Pertaining to Atlantic Menhaden", to establish a temporary reciprocal quota transfer system between the purse seine menhaden reduction sector and the purse seine menhaden bait sector during the 2022 fishing year. This will allow the purse seine sectors to transfer quota if needed

as well as move quota transfers from other jurisdictions to specific sectors (ie., purse seine bait).

July 4, 2022: Menhaden are reported washing ashore at Silver Beach in Northampton County. The fish most likely originate from a spill earlier in the week that was not reported.

July 5, 2022: Omega Protein notifies MRC that the F/V Fleeton had a net tear at 11:00 am, 0.75 nm east of Silver Beach. Given the wind and currents they are confident fish will be washing ashore and they have notified their contractors. An estimate 19,582 menhaden are removed from the beaches by Omega Protein's contractor HEPACO. Media, residents, local and state officials all express concerns with a second spill within a week as well as the dead fish remaining in a dumpster onsite for several days due to local landfill restrictions.

July 25, 2022: Omega Protein notifies MRC that the F/V Fleeton observed a number of red drum in their net while pumping fish to the hold 1 nm East of Kiptopeke State Park. The captain released the net in hopes the red drum survive. Omega Protein called up their contractors and remain on site to clean up both red drum and menhaden from the water and beach for two days. Estimates of the spill include 10,000 menhaden (6700 lbs) and 264 red drum (12,000 lbs) ranging in size from 42.8" to 53.9" and weighing between 31.8 to 56.2 lbs.

July thru September: Members of the general public begin attending the Commission's monthly meetings to voice their concerns over menhaden. During the general public comment period for each meeting one person spoke in July, 9 in August, and 15 in September. Requests from individuals included a legal response regarding fish spills, banning purse seines from the Bay, and concerns on how fish spills economically impact local beach communities.

August 2022: MRC begins consulting with the Secretary of Natural Resources and the Governor's office regarding menhaden issues to develop a response.

Sept 12, 2022: MMAC meeting to discuss and endorse Chapter 4 VAC 20-1270-10 et seq, "Pertaining to Menhaden" regarding internal purse seine sector transfers. The committee endorses the proposal.

October 25, 2022: At the monthly Commission meeting two petitions are provided requesting Governor Youngkin "*move Omega Protein's boats out of the Bay until the science demonstrates that industrial menhaden fishing can be done without negatively affecting the broader Bay ecosystem.*" (Attachment 2). The first petition is a national effort headed by Theodore Roosevelt Conservation Partnership (TRCP), local and national fishing and environmental organizations and included 9194 names (50.4% were VA residents based on zip codes, with 69 duplicates - 43 from VA). The second petition is exclusively Eastern Shore, VA residents and contains over 2000 names. Nine individuals speak regarding menhaden issues.

November 28, 2022: The Menhaden Management Advisory Committee meets to hear the Governor's proposal for addressing menhaden fish spills in the Bay by creating temporal and spatial restrictions. These actions include:

1) A 1 nm buffer around the shoreline of the entire VA portion of the Bay and Virginia Beach
2) A ½ nm buffer on either side of the CBBT to reduce user conflicts.
3) Prohibiting purse seine fishing in the Bay during summer holidays: Thursday prior to, and including Memorial Day, July 1 through July 7, and the Thursday prior to and including Labor. This would close the Bay to purse seine fishing a total of 17 days The MMAC could not reach consensus on this proposal and felt they needed more time to evaluate.

The agenda allowed for 20 minutes of public comment specifically to address proposals and concerns of two individuals. Neither individual shows up for the meeting and neither provide notification of their absence in advance.

Dec 6, 2022: Public Hearing to modify purse seine area and time restrictions. Over 350 in attendance. VMRC Staff provide the Governor's proposed actions. Dr. Latour of VIMS (and Chair of the MMAC) address the Board and explain the difficulties assessment scientists have had assessing menhaden populations. four hours of public comment from over 100 individuals proceeds. The Board did not make a motion on the presented action but instead, offered a motion to develop a MOU between the industry, Governor, and General Assembly to address geographic buffer along the densely populated areas of the Eastern Shore of Virginia, in the Chesapeake Bay and the Virginia Beach region. The industry proposed to not fish in the Bay: 1) on July 4th and any federal recognized holiday of that week; and 2) all Saturdays and Sundays between Memorial Day and Labor Day. The industry agrees to no fish within ½ nm on either side of the CBBT to minimize user conflicts. The Board adopts this measure 5-4.

2023

Jan 11, 2023: SB1388 is introduced. The initial bill requires VIMS to study the ecology, fishery impacts, and economic importance of menhaden populations in the waters of the Commonwealth. Ten focus areas are to be considered and findings reported back to the Senate Committee on Agriculture, Conservation and Natural Resources and the House Committee on Agriculture, Chesapeake and Natural Resources by December 1, 2014. The ten focus areas are: 1) current season movements of menhaden; 2) the forage needs of current populations of piscivorous fish, birds, and marine mammals where menhaden are known to inhabit; 3) the effects of climate change on menhaden recruitment and juvenile and adult abundance; 4) the evaluation of habitat changes in the Chesapeake Bay, including algal assemblages and the duration and volume of hypoxia; 5) the economic importance of menhaden to the Commonwealth's coastal communities and businesses, including the blue crab fishery and recreational fisheries; 6) the economic impact of fish spills on coastal communities along Virginia's Eastern Shore; 7) the by-catch of nontarget species by purse seine nets; 8) the evaluation of a potential tagging program for menhaden using the existing Chesapeake Bay acoustic array; 9) development of a statistically rigorous fishery observer program for

menhaden fisheries that can document catch and by-catch data along with interactions with marine mammals, sea turtles, and seabirds; and 10) review the final report of the Atlantic States Marine Fisheries Commission titled "Evaluating Alternative Designs for a Combined Aerial-hydroacoustic Survey of Atlantic Menhaden Biomass in Chesapeake Bay" and make recommendations on its utility for the Virginia portion of the Chesapeake Bay with estimates for the necessary funding to implement such an effort. The bill is modified significantly by several committees with the amendments approved by the Governor on March 22 requiring VIMS to develop plans to study the ecology, fishery impacts, and economic importance of menhaden populations in the Commonwealth and include potential methodologies, timelines, and costs by September 1, 2023.

Jan 18: HB1383 which prohibits menhaden reduction fishing in any territorial sea or inland waters of the Commonwealth for two years and requires a report relating to the environmental impact of menhaden reduction fishing in the territorial sea and inland waters of the Commonwealth be submitted to the General Assembly by July 1, 2024 is tabled by the House Agriculture, Chesapeake and Natural Resources Committee (22-Y 0-N). HB1381 which removes the restriction preventing the Marine Resources Commission from adopting regulations for the management of menhaden outside of the time period between October 1 and December 31 is also tabled by the Agriculture, Chesapeake and Natural Resources Committee (22-Y 0-N).

January to the present: Staff work with industry on developing the Memorandum of Understanding which will include working with VMRC to develop a joint transparent spill response and communications plan to include reporting, logging, and response protocols to reported spills and mutually agreed upon temporal and spatial restrictions on all menhaden purse seine gear in the Virginia portion of the Chesapeake Bay and adjacent coastal waters. The MOU is anticipated to be signed by all parties (reduction, bait, and MRC) by the end of April.

June 14, 2022

Governor Glenn Youngkin
Office of the Governor
P.O. Box 1475
Richmond, VA 23218

Dear Governor Youngkin,

As members of the recreational fishing and boating community, we ask that you move menhaden reduction fishing out of the Chesapeake Bay until science demonstrates that high volume reduction fishing for menhaden can be allowed without negatively affecting the broader Bay ecosystem.

America's anglers and boaters consistently play an integral role in the stewardship of our shared natural resources by directly funding conservation and habitat restoration efforts through licensing fees and excise taxes set up through the Sport Fish Restoration and Boating Trust Fund on fishing equipment and boat fuel. In 2021 alone, $399 million was apportioned to the states to fund fishery conservation programs.[1] This resulted in $6.26 million in funds for conservation programs specifically in Virginia, funded solely by anglers and boaters.

Our recreational fishing coalition of national and Virginia-based groups is clearly dedicated to maintaining the health of the Chesapeake Bay, the region's economy, and the broader marine ecosystem in the Atlantic. A major source of our conservation ethic is the fact that saltwater recreational fishing is an economic powerhouse, especially for Virginia where fishing is enjoyed by 600,000 anglers annually, contributing $465 million to the Commonwealth's economy and supporting 6,504 jobs.[2] The jobs created by these fisheries are the lifeblood of our coastal communities as more than 90 percent of the sportfishing and boating industry is made up of small businesses.

Atlantic menhaden play a vital role in maintaining the sportfishing economy and the Chesapeake Bay ecosystem by serving as the base of the food chain for many recreationally important species. Specifically, menhaden are critical to the diets of gamefish like striped bass, bluefish, weakfish, and more, that feed Americans and keep them coming to Virginia waters and spending money in our coastal communities. For example, the striped bass fishery is the largest marine recreational fishery in the U.S., driving $166 million in recreational fishing activity in Virginia alone. However, the economic value of striped bass fishing to Virginia has declined by over 50 percent in the past decade.[3]

[1] Certificate of Apportionment For Dingell-Johnson Sport Fish Restoration, available at: https://www.fws.gov/sites/default/files/documents/SFR%20FY22%20Certificate%20of%20Final%20Apportionment%202022Feb3_508.pdf
[2] Fisheries Economics of the United States, 2021, available at: https://media.fisheries.noaa.gov/2021-11/FEUS-2018-final-508_0.pdf
[3] The Economic Contributions of Recreational and Commercial Striped Bass Fishing, 2019, available at: https://mcgrawconservation.org/wp-content/uploads/McGraw-Striped-Bass-Report-FINAL.pdf
[4] Evaluating Ecosystem-Based Reference Points for Atlantic Menhaden, 2017, available at: https://www.tandfonline.com/doi/full/10.1080/19425120.2017.1360420
[5] ASMFC news release, 2019, available at: http://www.asmfc.org/uploads/file/5dfbd30bpr40SecretarialSupport_Menhaden_VANoncompliance.pdf

Part of the decline in the striped bass population is explained by fishing mortality being too high, and in 2014 and 2020 our coalition supported significant reductions on the striped bass fishery to address that decline. However, according to a scientific model, menhaden reduction fishing also contributes to a nearly 30 percent decline in striped bass numbers coast wide.[4] The scientific linkage between menhaden as prey and striped bass as a main predator is undeniable. Therefore, the industrial menhaden fishery in the Chesapeake plays a role in the ability of striped bass to rebuild to healthy population levels. By removing more than 100 million pounds of menhaden every year from the Chesapeake Bay, the most important striped bass nursery on the East Coast, reduction fishing in Virginia is undermining the sportfishing economy and small businesses throughout the Commonwealth.

The detrimental impact of menhaden reduction fishing on the ecosystem is so pronounced that it is prohibited in every state along the East Coast except Virginia. However, each year, over 100 million pounds of menhaden are being removed from the Chesapeake Bay and "reduced" to fish meal and oil for pet food and salmon feed by a foreign-owned company—Cooke Inc. Locally known as Omega Protein, the corporation is exporting this keystone fish to other countries as a global commodity, despite repeated signs of the negative impact it is causing to the environment and other industries dependent on a healthy marine ecosystem. In fact, the Atlantic States Marine Fisheries Commission (ASMFC) found Virginia out of compliance with the Interstate Fishery Management Plan for Atlantic menhaden in 2019, after Omega Protein exceeded the Chesapeake Bay harvest cap by 33 million pounds.[5]

Over the past decade, recreational fishing and boating organizations, coastal businesses, and hundreds of thousands of individual anglers and conservationists have called on decisionmakers to leave enough menhaden in the water to feed the wildlife that support vibrant recreational fishing, boating and other industries that boost Virginia's coastal economy. Governor Youngkin, we urge you to use your authority to move menhaden reduction fishing out of the Bay until science demonstrates that menhaden fishing can be allowed without negatively affecting the broader Bay ecosystem. Importantly, you could put this stopgap in place and still allow Omega Protein to fish in Virginia's ocean waters.

Moving menhaden reduction fishing out of the Bay will help to protect the health of the ecosystem and help grow Virginia's outdoor recreational economy, which benefits all Virginians.

Thank you for your consideration.

Whit Fosburgh

President & CEO

Theodore Roosevelt Conservation Partnership

Glenn Hughes

President

American Sportfishing Association

Frank Hugelmeyer

President

National Marine Manufacturers Association

Jim McDuffie

President & CEO

Bonefish & Tarpon Trust

Matt Gruhn

President

Marine Retailers Association of the Americas

Greg Jacoski

Executive Director

Guy Harvey Ocean Foundation

Patrick Murray

President

Coastal Conservation Association

Ellen Peel

President

The Billfish Foundation

Brett Fitzgerald

Executive Director

Angler Action Foundation

Jared Mott

Conservation Director

Izaak Walton League of America

Jason Schratwieser

President

International Game Fish Association

Ernie Padgette

President

Virginia Division of the Izaak Walton League of America

Virginia Angling Clubs

Steve Atkinson

President

Virginia Saltwater Sportfishing Association

Captain Mike Ostrander

President

Virginia Anglers Club

Chris Schneider

President

Virginia Beach Angler's Club

Joe Stephenson

President

Great Bridge Fisherman's Association

Henry Troutner

Vice President

Norfolk Anglers Club

Samuel A. Graham

President

Central Virginia Sport Fishing Association

Ed Pacheco

President

Virginia Coastal Fly Anglers

Dean Carroll

President

Eastern Shore Anglers Club

Steve Jones Jr.

President

Tidewater Anglers Club

Danny Forehand

President

Peninsula Salt Water Sport Fisherman's Association

TERMS OF REFERENCE

For the 2025 ASMFC Atlantic Menhaden
Ecological Reference Point Benchmark Stock Assessment and Peer-Review

Terms of Reference for Ecological Reference Point Assessment

1. Review and evaluate the fishery-dependent and fishery-independent data used in the Atlantic menhaden single-species assessment and the single-species assessments of the other major predator and prey species included in the ERP models, and justify inclusion, elimination, or modification of those data sets.

2. Characterize precision and accuracy of additional fishery-dependent and fishery-independent data sets, including diet data, used in the ecological reference point models.
    a. Provide descriptions of each data source (e.g., geographic location, sampling methodology, potential explanation for outlying or anomalous data)
    b. Describe calculation and potential standardization of abundance indices.
    c. Discuss trends and associated estimates of uncertainty (e.g., standard errors)
    d. Justify inclusion or elimination of available data sources.
    e. Discuss the effects of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, ageing accuracy, sample size) on model inputs and outputs.

3. Develop models used to estimate population parameters (e.g., F, biomass, abundance) of Atlantic menhaden that take into account Atlantic menhaden's role as a forage fish and analyze model performance.
    a. Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature. If using a new model, test using simulated data.
    b. Justify choice of ecological factors (e.g., predator species, other prey species, environmental factors) as appropriate for each model
    c. Describe stability of model (e.g., ability to find a stable solution, invert Hessian)
    d. Justify choice of CVs, effective sample sizes, or likelihood weighting schemes as appropriate for each model.
    e. Perform sensitivity analyses, model diagnostics, and retrospective analyses as appropriate for each model.
    f. Clearly and thoroughly explain model strengths and limitations, including each model's capacity to account for environmental changes

4. Develop methods to determine reference points and total allowable catch for Atlantic menhaden that account for Atlantic menhaden's role as a forage fish.

5. State assumptions made for all population and reference point models and explain the likely effects of assumption violations on synthesis of input data and model outputs.

6. Characterize uncertainty of model estimates and reference points.

7. Evaluate stock status for Atlantic menhaden from recommended model(s) as related to the respective reference points (if available).

8. Compare trends in population parameters and reference points among proposed modeling

approaches, including the results of the single-species benchmark assessment. If outcomes differ, discuss potential causes of observed discrepancies.

9. If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.

10. Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by next benchmark review.

11. Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species.

Terms of Reference for Ecological Reference Point External Peer Review

1. Evaluate the justification for the inclusion, elimination, or modification of data from the Atlantic menhaden single-species assessment and the single-species assessments of the other major predator and prey species included in the ERP models.

2. Evaluate the thoroughness of data collection and the presentation and treatment of additional fishery-dependent and fishery-independent data sets in the assessment, including but not limited to:
    a. Presentation of data source variance (e.g., standard errors).
    b. Justification for inclusion or elimination of available data sources,
    c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, aging accuracy, sample size),
    d. Calculation and/or standardization of abundance indices.

3. Evaluate the methods and models used to estimate Atlantic menhaden population parameters (e.g., F, biomass, abundance) that take into account Atlantic menhaden's role as a forage fish, including but not limited to:
    a. Evaluate the choice and justification of the recommended model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
    b. If multiple models were considered, evaluate the analysts' explanation of any differences in results.
    c. Evaluate model parameterization and specification as appropriate for each model (e.g., choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of M, stock-recruitment relationship, choice of time-varying parameters, choice of ecological factors).

4. Evaluate the methods used to estimate reference points and total allowable catch.

5. Evaluate the diagnostic analyses performed as appropriate to each model, including but not limited to:
    d. Sensitivity analyses to determine model stability and potential consequences of major model assumptions
    e. Retrospective analysis

6. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.

7. If a minority report has been filed, review minority opinion and any associated analyses. If possible, make recommendation on current or future use of alternative assessment approach presented in minority report.

8. Recommend best estimates of stock biomass, abundance, exploitation, and stock status of Atlantic menhaden from the assessment for use in management, if possible, or specify alternative estimation methods.

9. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

10. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

11. Prepare a peer review panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.

Tina Berger

From: Tom Lilly <foragematters@aol.com>
Sent: Thursday, April 6, 2023 9:50 AM
To: Tina Berger; Robert Beal; James Boyle; Mel Bell
Subject: [External] Fwd: Revised Comment for Menhaden Board May 1st
Attachments: YOY DNR.pdf; Watts-Northam.pdf; Caucus- Noah B..pdf; PHIL PAPER.pdf; ERP Press.pdf; Canary story.pdf; Ricmond news article.pdf

Tina This is a revised comment for the Menhaden Board meeting May 1st .....Please advise receipt. (for omitted scans please contact sender) Thanks

Our striped bass spawning stock in Chesapeake Bay has been in a crisis of reproductive failure for four years.(n.1) Our bay ospreys have suffered a similar fate (2.) The long awaited ERP conclusions state unequivocally the cause and effect between menhaden overharvesting and striped bass problems. They conclude striped bass were the most "sensitive" species to menhaden harvests and call the striped bass stock the "canary in the coal mine" (3.) yet the menhaden board did the unthinkable and increased the VA quota by 22,000 tons and left the so called " bay cap" as is.

I believe the menhaden board is aware that the collapse of the striped bass fishery in the bay over the last 10 years is the fulfillment of all the "negative consequences" your own consultant Dr Jacques Maguire predicted in 2009. He said to prevent these "consequences" the Commission had to act to zone the factory fishing away from the conflict with bay wildlife and fishermen.(n.4) But menhaden board still has not acted. They still can fix this by just moving that one foreign fishing company out of Chesapeake bay or better yet just three miles further into the US Atlantic zone. Your Director has described bay fish and wildlife as needing " Protective" action because they are in such poor condition (n.4) Every Atlantic state, including Maryland (except Virginia) has acted to protect its wildlife and fishermen by outlawing factory fishing in their state, leaving only Virginia and Maryland to suffer the consequences of the intense factory fishing in Virginia.

The negative effects in Maryland include a 48% decline in charter trips, a 70% decline in striped bass fishing, a 90% decline in bluefish and a 95% decline in trout. This is impacting 10,700 jobs in MD directly related to striped bass fishing. (n.5) The poor fishing is affecting the fun and results of the eight million days Marylanders fish in salt water a year (2016), about 480,000 days by children. Kids all over the bay are missing out because their parents have quit fishing. (n.6)

In Virginia declines in striped bass fishing have caused a loss of 1200 striped bass related jobs, a decline of $150 million in striped bass angler spending a year at Virginia small businesses and a shocking reduction in fishing for striped bass by 650,000 days a year (36,000 days fewer fishing by children) and striped bass landings have fallen 80% (n. 7)

For the last two years there have been efforts by individuals and organizations in Virginia and Maryland directed to the Virginia Legislature, the VMRC and then Governor Northam and now Governor Youngkin asking for action on the net snag/bycatch problem and for the factory fishing to be moved out of Chesapeake bay or out of Virginia into the US Atlantic zone. Governor Northam received a letter from Dr Bryan Watts about wide spread osprey nesting failures in the bay due to menhaden overharvesting. (n.2) Steve Bowman and the VMRC received a letter from the Maryland Legislative Sportsmen's Caucus with scientific opinion that the factory fishing should be moved into the US Atlantic zone and why. (n.9) Governor Youngkin received a petition with over 10,000 signatures and a letter from Theodore Roosevelt Partnership endorsed by eleven other groups including ASA, CCA, NMMA, MRAA ,AAF, IGFA, Bonefish/tarpon Trust, Guy Harvey Foundation ,Izaak Walton League and the VSSA and ten other state wide fishing groups. By representation these groups represent over a million voters in Maryland, 400,000 saltwater fishermen in Maryland and Virginia, about 400 marine fishing /businesses in each state and about 500 marinas are involved

There have also been efforts by Marylanders to have the Commission take action to protect Maryland by moving the factory fishing into the Atlantic Ocean which would prevent the factory fishing from catching thousands of menhaden schools just as they were trying to migrate to Maryland to feed our wildlife. This would prevent the bycatch of an unknown number of spawning striped bass and redfish etc. (see Richmond Times op ed) These efforts have been supported by MD charter captains, the Sportsmen's caucus, Shore Rivers organizations 3,000 members, MD Sierra Club's 70,000 members and ten state wide fishing clubs that represent at least 400,000 saltwater fisherman The NMMA that signed the TRCP petition has hundreds of marine related business in Maryland that are dependent on fishing success. Maryland fishermen, children and grandchildren spent over eight million days saltwater fishing a year according. to the last NOAA data. The fishing success has declined by at least 60%, much more in many areas.

Based on this can you advise if the Virginia MRC is going to report on whether the Virginia Governor and the VMRC have replied to these requests for action by millions of people, at least 500,000 saltwater anglers, thousands of businesses, charter captains and many respected conservation organizations ?

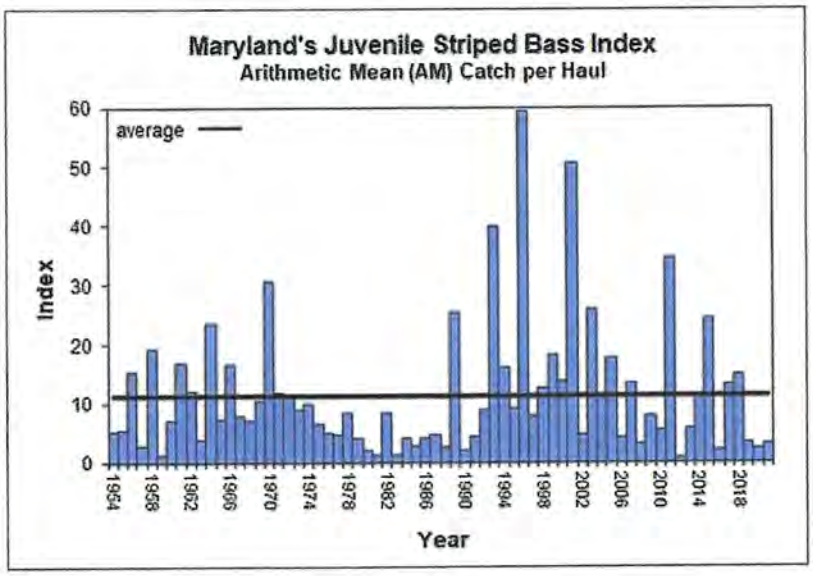
There is another thing here. We know who supports moving the factory fishing out of the bay or into the US Atlantic and why, but we do not know who is against it and why. Please ask the VMRC to report to the board how many people and organizations in Virginia and Maryland they are aware of that are against moving the industrial fishing into the ocean. The VMRC and the ASMFC menhaden board have several obvious qualitative options to control the intense factory fishing. Some of these are a reduction in the bay cap, delaying the season in Virginia to allow the forage base to rebuild and prohibiting this fishing in Chesapeake Bay or requiring it only be in the US Atlantic zone.

Please start a process to consider these options without more delay. Thank you Tom Lilly Whitehaven, MD

The coastal striped bass population has decreased in size, but is still capable of strong reproduction with the right environmental conditions. Variable spawning success is a well-known characteristic of the species. The index is slightly higher than 2020 but consecutive below average indices are a concern, and biologists continue to examine factors that might limit spawning success.

The Department of Natural Resources has monitored the annual reproductive success of striped bass in Maryland's portion of Chesapeake Bay since 1954. Photo by Stephen Badger, Maryland Department of Natural Resources

Atlantic Coast states enacted responsible conservation measures in recent years to reduce harvest and protect striped bass during spawning season. Maryland will work with other states in the Atlantic States Marine Fisheries Commission to develop additional measures to enhance the striped bass population through the Atlantic striped bass fishery management plan.



Other noteworthy observations of the survey were increased numbers of Atlantic menhaden in the Choptank River and healthy reproduction of American shad in the Potomac River. The survey also documented reproduction of invasive blue catfish in the upper Chesapeake Bay for the first time.

Twenty-two survey sites are located in four major spawning areas: the Choptank, Nanticoke, and Potomac rivers, and the Upper Chesapeake Bay. Biologists visit each site three times per summer, collecting fish with two sweeps of a 100-foot beach seine net. The index represents the average number of recently hatched striped bass, commonly called rockfish, captured in each sample.

The Virginia Institute of Marine Science conducts a similar survey in the southern portion of Chesapeake Bay.

Striped Bass Young of the Year MD DNR Reference.

From: Phil Zalesak <flypax@md.metrocast.net>
To: 'Tom Lilly' <foragematters@aol.com>
Cc: Phil Zalesak <flypax@md.metrocast.net>
Date: Fri, Feb 25, 2022 10:48 am

LINK

https://news.maryland.gov/dnr/2021/10/15/chesapeake-bay-2021-young-of-year-survey-results-announced/

The Center for Conservation Biology

William & Mary

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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

the drive
SCIENCE THREE ~~05~~

ASMFC Atlantic Menhaden Board Adopts Ecological Reference Points

From: Tina Berger <tberger@asmfc.org>
Cc: ALL ARLINGTON STAFF <allarlingtonstaff@asmfc.org>
Date: Thu, Aug 6, 2020 5:42 pm

FOR IMMEDIATE RELEASE, AUGUST 6, 2020
PRESS CONTACT, TINA BERGER, 703.842.0740

ASMFC Atlantic Menhaden Board Adopts Ecological Reference Points

Arlington, VA – The Atlantic States Marine Fisheries Commission's Atlantic Menhaden Management Board approved the use of ecological reference points (ERPs) in the management of Atlantic menhaden. By adopting ERPs, the Board will be accounting for the species' role as an important forage fish. The 2020 Atlantic menhaden benchmark assessments, which were endorsed by an independent panel of fisheries scientists, used the Northwest Atlantic Coastal Shelf Model of Intermediate Complexity for Ecosystems (NWACS-MICE) in combination with the single-species model (Beaufort Assessment Model or BAM) to develop Atlantic menhaden ERPs by evaluating trade-offs between menhaden harvest and predator biomass.

"The Board took another important step in managing Atlantic menhaden in a broader ecosystem context," stated Board Chair Spud Woodward of Georgia. "It's the culmination of more than a decade of effort by state, federal, and academic scientists to develop ERPs that reflect menhaden's role as a key food source for several fish species. These ERPs are not a silver bullet to resolve all our fisheries management issues, and the models on which they are based will continue to evolve. However, the use of ERPs for menhaden management will enhance the success of predator management by providing a more abundant forage base for rebuilding predator fish populations. It is important for us to keep those rebuilding efforts on track through the use of proven management tools such as controls on fishing mortality."

In February and May, the Board tasked the ERP Work Group with additional analyses to explore the ERPs sensitivity to a range of ecosystem scenarios (different assumptions about fishing mortality for other key predator and prey species) and Atlantic herring biomass. These analyses suggested the original scenario (ERP target and threshold outlined below) most closely approximates short-term conditions for the ecosystem. As a result, the ERP Work Group recommended using the original scenario ERPs presented in the assessment report. Moving forward, the ERPs for Atlantic menhaden are:

ERP target: the maximum fishing mortality rate (*F*) on Atlantic menhaden that sustains Atlantic striped bass at their biomass target when striped bass are fished at their *F* target

ERP threshold: the maximum *F* on Atlantic menhaden that keeps Atlantic striped bass at their biomass threshold when striped bass are fished at their *F* target

Atlantic striped bass was the focal species for the ERP definitions because it was the most sensitive predator fish species to Atlantic menhaden harvest in the model, so an ERP target and threshold that sustained striped bass would likely provide sufficient forage for other predators under current ecosystem conditions. For the development of the ERPS, all other focal species in the model (bluefish, weakfish, spiny dogfish, and Atlantic herring) were assumed to be fished at 2017 levels.

In addition to adopting ERPs, the Board discussed setting fishery specifications for 2021-2022. In 2017, the Board set the total allowable catch (TAC) at 216,000 metric tons for 2018-2019, and then maintained that TAC for 2020 with the expectation that it would be set in future years using ERPs. With the adoption of ERPs, the Board tasked the Atlantic Menhaden Technical Committee to run a projection analysis to provide a variety of TAC scenarios and their risk of exceeding the ERP *F* target to compare in setting specifications for 2021-2022. The Board will review the projection analysis at the Annual Meeting in October and then determine a TAC for 2021-2022. As stated in Amendment 3, if a TAC is not set at the Annual Meeting, the TAC from the previous year will be maintained.

For more information, please contact Kirby Rootes-Murdy, Fishery Management Plan Coordinator, at krootes-murdy@asmfc.org or 703.842.0740.

###

PR20-15

The press release can also be found here - http://www.asmfc.org/uploads/file/5f2c7891pr15AtlMenhadenERP_Adoption.pdf

Tina Berger
Director of Communications
Atlantic States Marine Fisheries Commission
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Arlington, VA 22201
703.842.0740
www.asmfc.org

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

ArcGIS StoryMaps

Go to the MH management plan - just below [illegible] chart to story map

Understanding Ecological Reference Points

Everything you need to know about the development of ERPs for Atlantic menhaden

ASMFC Communications Team

June 22, 2021

Striped bass was the fish predator species that had the strongest response to Atlantic menhaden biomass in the ERP models. As a result, striped bass could be used as a proxy for all of the predator species when evaluating tradeoffs and setting reference points.

Think of striped bass as the "canary in the coal mine." Because it is the most sensitive, menhaden levels that are sufficient for striped bass are not likely to cause a decline in other species.

Its important to note that even though the tradeoff analyses and reference points focus on striped bass, the other species (bluefish, weakfish, spiny dogfish, bay anchovy) are still included in the model and analyses. For example, an increase in menhaden abundance does not just affect striped bass, it also increases bluefish abundance. This also impacts striped bass indirectly, as bluefish are competitors and predators of striped bass.

With ecosystem models, there is more than one way to achieve the desired biomass level for a given species.

For example, if you wanted to increase the abundance of one species, you could reduce the harvest of that species directly, increase the abundance of its prey species, or even reduce the abundance of its competitors. To illustrate these tradeoffs, the Work Group produced a series of "rainbow plots".

Localized Depletion of Atlantic Menhaden in the Chesapeake Bay and
Its Impact on the Maryland Economy and Environment by
Phil Zalesak, President of www.smrfo.org
March 8, 2023

The Problem

Striped Bass, our official state fish, are dependent on Atlantic menhaden for survival based on the latest science as documented in reference (a). Although there are plenty of Atlantic menhaden in the Atlantic Ocean, there is an insufficient number in the Chesapeake Bay during the period of industrial reduction harvesting in the Bay.

An industrial reduction fishery located in Reedville, Virginia is harvesting over 3 / 4 of a billion Atlantic menhaden from the Chesapeake Bay and waters just outside the Bay. Over 1 / 4 of a billion fish are being harvested from the Chesapeake Bay and another 1 / 2 billion are being harvested right outside the Bay along the Coast. This has increased the mortality rate of Striped Bass in the Chesapeake Bay and impacted the recreational fishing industry in Maryland.

The Data

Striped Bass Metrics

Localized depletion of Atlantic menhaden occurs when there is very little migration into and out of the Chesapeake Bay and intense industrial reduction fishing is occurring at the same time. There is little migration at the entrance of the Chesapeake Bay from June until October which is the prime season for the Atlantic menhaden reduction fishery (b). See Figure 1.

The latest science has determined that there is a direct relationship between the mortality rate of Atlantic menhaden and the mortality rate of striped bass. The morality rate of striped bass increases when the mortality rate of Atlantic menhaden increases (c).

Up until 2006 there was no harvesting quota for the Atlantic menhaden reduction fishery in the Chesapeake Bay. The first quota was 110,400 metric tons. It was then lowered to 87,216 metric tons from 2014 to 2018. Finally, the quota was lowered to 51,000 metric tons in 2018 where it remains today (d).

51,000 metric tons of Atlantic menhaden is over 112,434,600 pounds or a total **244,423,043** fish.

Currently, the reduction fishery is allocated 158,137 metric tons. 51,000 metric tons or **244,423,043** fish are being harvested from the Chesapeake Bay (e). The remaining 107,137 metric tons or **513,479,173 fish** are being harvested from just outside the Bay along the Atlantic Coast. That's a total of 348,628,592 pounds or **757,888,761** fish.

There is no science which supports removing three quarters of a billion Atlantic menhaden from the Chesapeake Bay and its entrance.

The recreational harvest of Striped Bass in the Chesapeake Bay has **decline over 60%** from a high in 2006 of over 2 million fish to a little over 750,000 in 2020. See Figure 2.

The **commercial harvest of Striped Bass** in the Chesapeake Bay has **decline over 50%** from a high of over 1 million fish in 2000 to around 500,000 fish in 2020. See Figure 3.

The purse seine nets used by the reduction fishery are 150 feet long by 50 feet deep and often scrape the bottom of the Bay floor when harvesting Atlantic menhaden. The Chesapeake Bay **reduction fishery Striped Bass bycatch** could easily be **greater than total Chesapeake Bay commercial harvest for the year** as the striped bass feeding on the menhaden can't escape when the nets are scraping the bottom.

In 2020 the **Striped Bass** commercial harvest in the Chesapeake Bay was **492,400 fish** (Figure 3). The total **Atlantic menhaden** reduction harvest was **244,423,043 fish**. If the bycatch of Striped Bass is greater than to .2 % of the total number of fish caught by the reduction industry, then the **reduction fishery is killing more Striped Bass than is being harvested by the Striped Bass commercial fishermen in the Chesapeake Bay.**

We know that striped bass pursue schools of menhaden during the reduction harvesting process. So, the striped bass bycatch is more likely to be larger than .2 %. This could account for a significant reduction in the striped Young-of-Year index for the last 4 years. See Figure 4.

Striped Bass Economic Impact

During the period of 2000 – 2019, the number of **For-Hire active vessels** went from **409 to 212** for a 48% decline, and the **number of fishing trips** went from **18,199** to **9,571** for a 47% decline. The decline in Maryland For-Hire business base is documented in Figures 5 and 6.

The GDP associated with **recreational fishing** of Striped Bass in Maryland is over **$800 million dollars** and accounts for over **10,000 jobs**. See Figure 7.

The GDP associated with the **commercial sector** is **$11 million dollars** and responsible for about 600 jobs based on a 2019 Southwick Associates study (h). See figure 7.

Therefore, the recreational fishing industry in Maryland is **70 times more significant from a dollar standpoint** and **17 times more significant from an employment standpoint** compared to the commercial striped bass industry.

Bluefish and Weakfish Metrics

Commercial harvest data for Bluefish and Weakfish, which are dependent on Atlantic menhaden for their survival, are shown figures 8 and 9. The **Bluefish** commercial harvest has been **devastated** and the **Weakfish** have been **depleted** in the Chesapeake Bay.

Osprey Metrics

According to Dr. Bryan Watts of the College of William and Mary 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. This is based on 50 years of research (f).

Michael Academia, a graduate assistant at the College of William and Mary, updated this data set in 2021 and documented his findings in a paper he presented at the International Raptor Research Foundation Conference. This paper was awarded the prestigious Andersen Memorial Award at that meeting. His research can be viewed via video at https://youtu.be/IKR-DHwlZIU

Conclusion

Localized depletion of Atlantic menhaden in the Chesapeake Bay and the entrance to the Bay is devastating to the Maryland recreational fishing industry and the Chesapeake Bay marine environment

Maryland representatives to the Atlantic States Marine Fisheries Commission which manages this fishery need to demand an end to this destruction of the Chesapeake marine environment.

Your support of SJ2 is the first step in making this happen.

Recommendation

End the Atlantic menhaden reduction fishery in Virginia waters and limit reduction fishing to federal waters east of the 3 nautical mile Exclusive Economic Zone.

Action

Support Maryland Senate Joint Resolution 2 which requests the Atlantic States Marine Fisheries Commission consider prohibiting the commercial reduction fishing of Atlantic menhaden in the Chesapeake Bay.

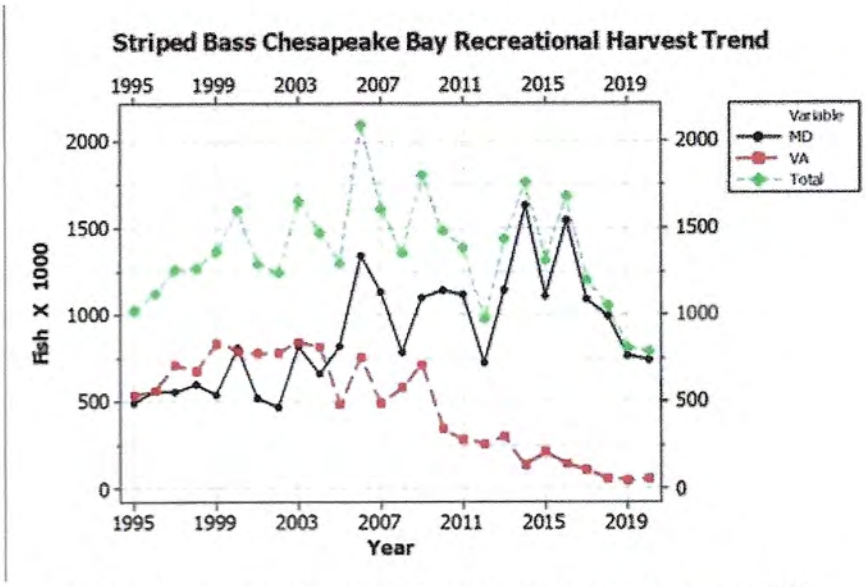
References:

(a) SEDAR 69 Ecological Reference Points Stock Assessment Report on Atlantic Menhaden dated January 2020, pages iii and 375
(b) Estimation of movement and mortality of Atlantic menhaden during 1966–1969 using a Bayesian multi-state mark-recovery model Emily M. Liljestrand, Michael J. Wilberg, Amy M. Schueller, Published online 2/2019
(c) SEDAR 69 Ecological Reference Points Stock Assessment Report, Atlantic Menhaden,January 2020, page 375
(d) Amendment 3 to the Interstate Fishery Management Plan for Atlantic Menhaden November 2017, page v
(e) ASMFC Press Release: Atlantic Menhaden Board Sets 2023 TAC at 233,550 MT & Approves Addendum to Address Commercial Allocations, Episodic Event Set Asides, and Incidental Catch/Small-scale Fisheries
(f) Dr. Bryan Watts Letter to Virginia Governor Ralph Northam, 8/20/2020

Omega Protein Purse Seine Settings and Migration

Ref: SEDAR 40 Stock Assessment Report Atlantic Menhaden, January 2015, page 10

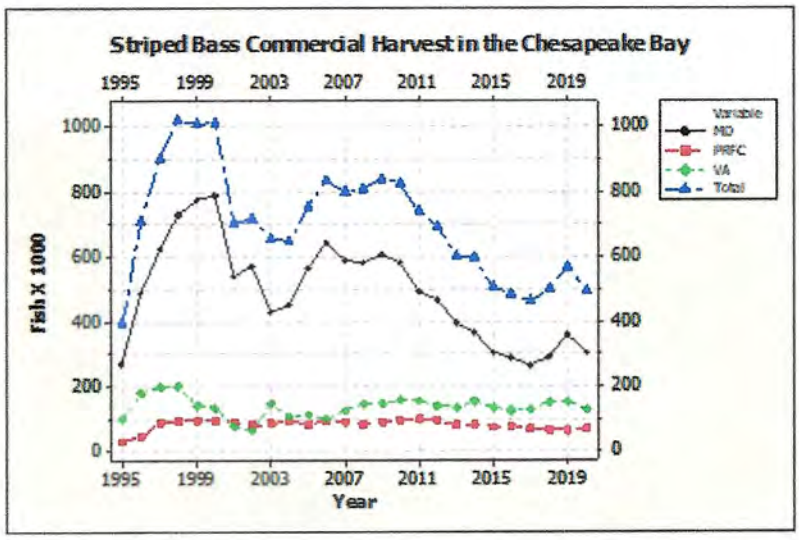
Figure 1



Draft Amendment 7 to the Interstate FMP for Atlantic Striped Bass, Table 18, page 135 - 2/2022

Figure 2

Decline in Striped Bass Chesapeake Bay Commercial Harvest



Draft Amendment 7 to the Interstate FMP for Atlantic Striped Bass, Table 15 page 132 - 2/2022

Figure 3

Chesapeake Bay 2022 Young-of-Year Survey Results

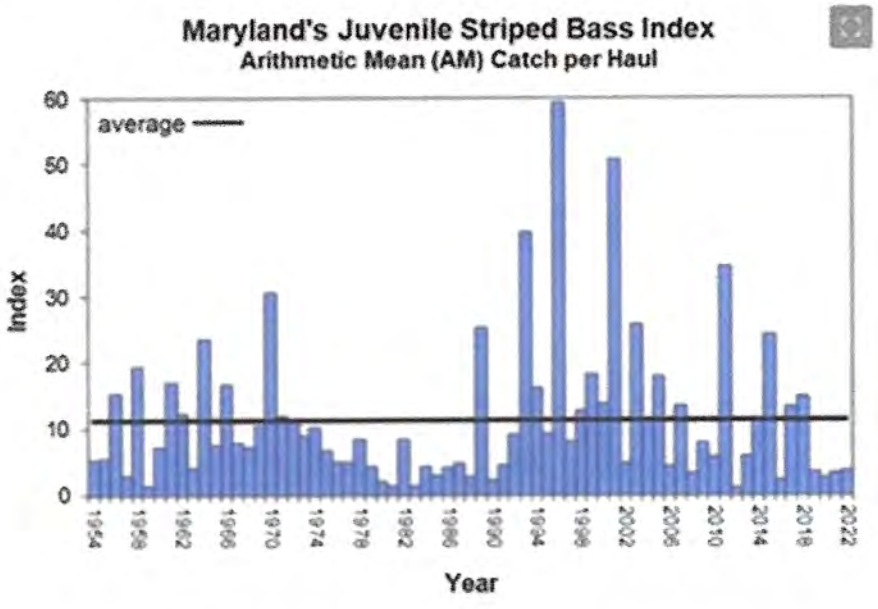
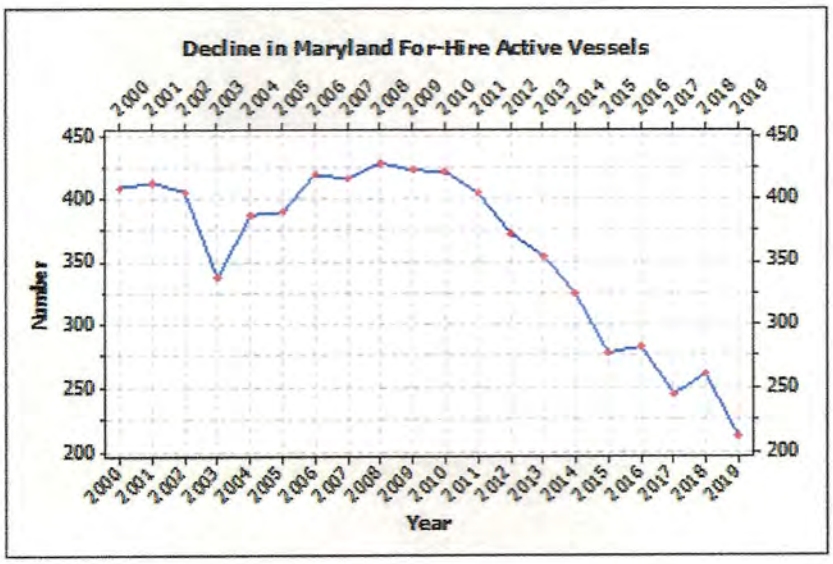


Figure 4

Decline in Maryland For-Hire Active Vessels



MD DNR, Gina Hunt email of 2/28/2020

Figure 5

Decline in Maryland For-Hire Fishing Trips

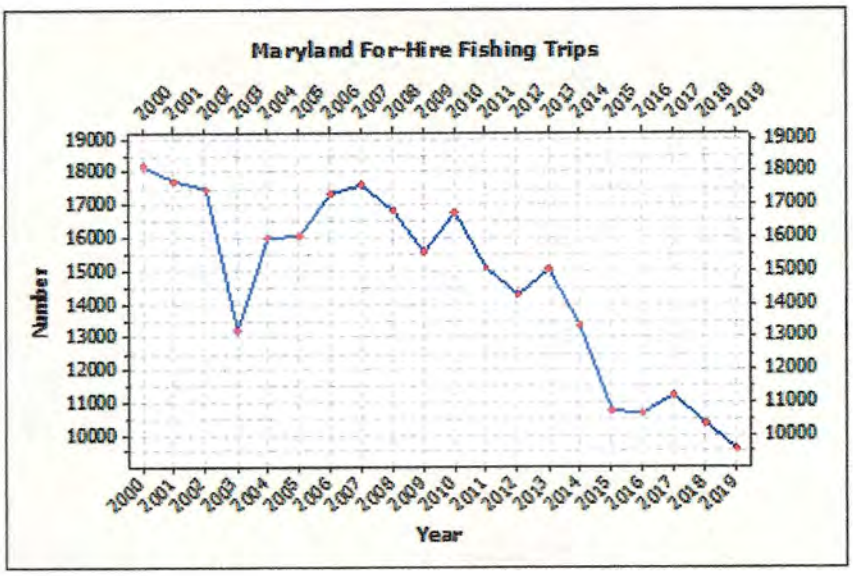


Figure 6

Striped Bass Economic Impact to Maryland (2016)

Commercial GDP: **$10,919,100**
Commercial Jobs **584**

Recreational GPD: **$802,791,200**
Recreational Jobs **10,193**

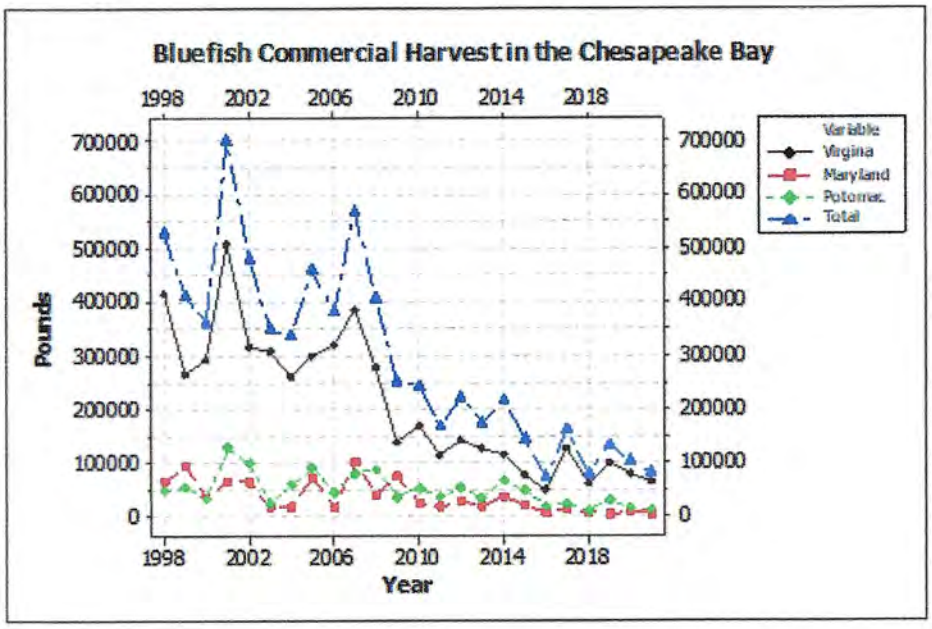
Comparisons Between the Fisheries

Table MD-8. Comparison of commercial and recreational impacts: Maryland 2016

	Commercial Fishery	Recreational Fishery	Total	Commercial Fishery	Recreational Fishery	Total
Pounds landed (000s)	1,709.4	10,919.1	12628.5	14%	86%	100%
Jobs supported	584	10,193	10,777	5%	95%	100%
Income ($000s)	$12,569.6	$496,859.8	$509,429.7	2%	98%	100%
GDP ($000s)	$17,109.7	$802,791.2	$819,900.9	2%	98%	100%

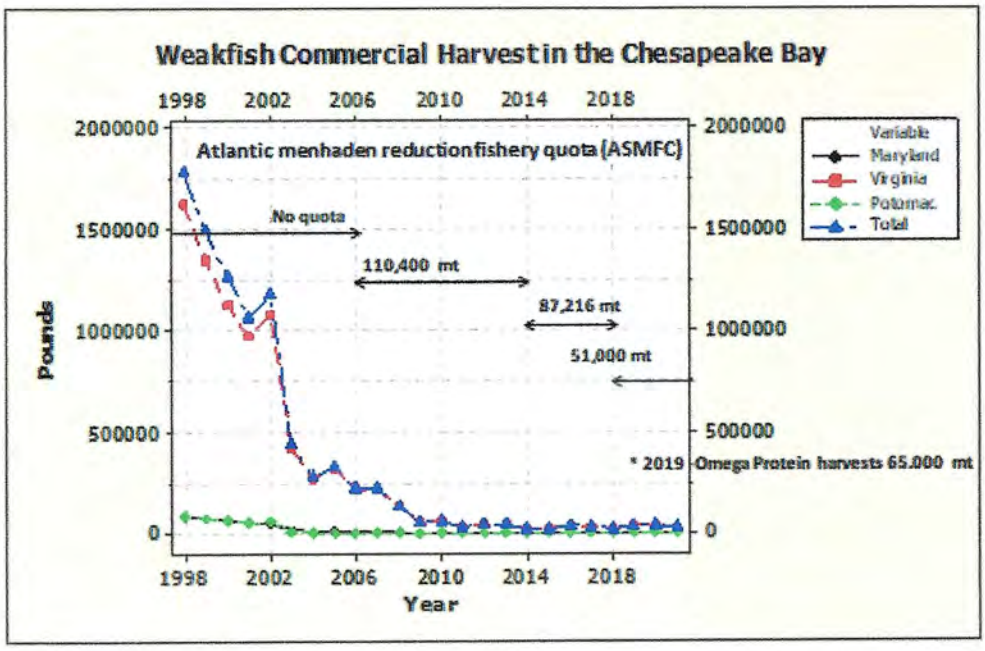
Ref: The Economic Contributions of Recreational and Commercial Striped Bass Fishing, Southwick Associates, page 26, 4/12/19

Figure 7



References: MD DNR, VMRC, PRFC

Figure 8



References: MD DNR, VMRC, PRFC, ASMFC

Figure 9

Senate Chair
JACK BAILEY
Legislative District 29
Calvert & St. Mary's Counties

Maryland Legislative Sportsmen's Caucus
James Senate Office Building, Room 402
410-841-3673 or 301-858-3673
1-800-492-7122 Ext. 3673

Senate Co-Chair
KATIE FRY HESTER
Legislative District 9

House Chair
NED CAREY
Legislative District 31A
Anne Arundel County

Maryland Legislative Sportsmen's Caucus
Lowe House Office Building, Room 161
410-841-3047 or 301-858-3047
1-800-492-7122 Ext. 3047

House Co-Chair
WENDELL BEITZEL
Legislative District 1A

The Maryland Legislative Sportsmen's Caucus

The Sportsmen's Best Friend in Annapolis

October 21, 2021

Steven G. Bowman
VMRC Chairman
Building 96, 380 Fenwick Road
Ft. Monroe, Virginia 23651

RE: "The Most Important Fish in the Sea" – IMMEDIATE ACTION

Mr. Bowman:

Each year the number of menhaden surviving the Virginia netting gauntlet to successfully reach Maryland's portion of the Chesapeake Bay is declining. This scientifically documented fact is detrimental to both avian and marine species dependent upon the "Most Important Fish in the Sea". This must change.

On October 15, 2021, a fishery biology professor from Salisbury University (Dr. Noah Bressman, PhD) formally addressed the dire menhaden issue in a statement to Maryland's DNR Secretary, et al. For the record, the Maryland's Legislative Sportsmen's Caucus within the Maryland General Assembly fully supports the position taken by Dr. Bressman and urges time-sensitive compliance by the Virginia Marine Resources Commission.

Here's what Dr. Bressman stated:

> "Currently, the Virginia-based menhaden fishery is overfishing the stock of Atlantic Menhaden in and around the Chesapeake Bay, which is preventing this important forage fish from making its way into the bay and its tributaries. As an important prey item for many important species in the bay, such as Striped Bass and Osprey, the disappearance of most of the menhaden from the bay is contributing to the disappearance of many species that rely on menhaden.
>
> Virginia has been allotted about 75% of the entire Atlantic Coast's quota, which is a drastically disproportionate amount relative to its coastline. Additionally, much of their harvesting occurs as menhaden migrate into the bay, where they enter Maryland's waters. What this essentially means is 75% of the quota for the entire Atlantic Coast is being taken in the bay or just before they enter the bay. While this may not be causing overfishing for the entire Atlantic Coast based on quotas, because all of these fish are being taken from essentially just the bay, it is having locally drastic effects on the ecosystem.

Therefore, I strongly suggest either delaying the start of the menhaden commercial season until after a significant amount of menhaden have migrated north along the Virginia coast into the Chesapeake bay (which occurs in spring/early summer), by pushing these factory fishing efforts at least 3 miles offshore into federal waters instead of along the coastline in state waters (as the fish in the state waters are most likely to migrate along the coast into the bay), pushing the commercial menhaden fishery north of the entrance to the Chesapeake bay during their migration, and/or significantly reducing the quotas of menhaden in and around the mouth of the Chesapeake bay.

These actions are necessary to ensure the long-term health of the Chesapeake Bay ecosystem and the associated fisheries and ecotourism."

What is happening to the "Most Important Fish in the Sea" is intolerable. VMRC must stand up and do what's right.

Senator Jack Bailey, Senate Co-Chair

Delegate Ned Carey, House Co-Chair

Cc:

Members, Virginia Marine Resources Commission
Dr. Noah Bressman, Salisbury University
Senator Emmett Hanger, Senate Co-Chair, Virginia Legislative Sportsmen's Caucus
Delegate James Easily Edmunds II, House Co-Chair, Virginia Legislative Sportsmen's Caucus
Jeff Crane, President, Congressional Sportsmen's Foundation
The Honorable Ann Jennings, Virginia Secretary of Natural Resources
The Honorable Jeannie H. Riccio, Maryland Secretary of Natural Resources

From: Noah Bressman noahbressman@gmail.com
Subject: Support for Action on Menhaden
Date: Oct 15, 2021 at 10:36:49 AM
To: jeannie.riccio@maryland.gov, bill.anderson@maryland.gov, lynn.fegley@maryland.gov
Bcc: foragematters@aol.com

Dear Secretary Riccio and DNR Menhaden Delegates,

As a Fish Biology Professor at Salisbury University with multiple collaborations with the MD DNR, former nominee to the Mid-Atlantic Fisheries Management Council, an avid angler, science communicator, and concerned citizen of Maryland, I write to offer my support for action on menhaden in and around the Chesapeake Bay. Currently, the VIrginia-based menhaden fishery is overfishing the stock of Atlantic Menhaden in and around the Chesapeake Bay, which is preventing this important forage fish from making its way into the bay and its tributaries. As an important prey item for many important species in the bay, such as Striped Bass and Osprey, the disappearance of most of the menhaden from the bay is contributing to the disappearance of the many species that rely on menhaden.

Currently, Virginia has been allotted about 75% of the entire Atlantic Coast's quota, which is a drastically disproportionate amount relative to its coastline. Additionally, much of their harvesting occurs as menhaden migrate into the bay, where they enter Maryland's waters. What this essentially means is 75% of the quota for the entire Atlantic coast is being taken in the bay or just before they entire the bay. While this may not be causing overfishing for the entire Atlantic coast based on quotas, because all of these fish are being taken from essentially just teh bay, it is having locally drastic effects on the ecosystem.

Therefore, I strongly suggest either delaying the start of the menhaden commercial season until after a significant amount of menhaden have migrated north along the Virginia coast into the Chesapeake bay (which occurs in spring/early summer), pushing these factory fishing efforts at least 3 miles offshore into federal waters instead of along the coastline in state waters (as the fish in the state waters are most likely to migrate along the coast into the bay), pushing the commercial menhaden fishery north of the entrance to the Chesapeake bay during their migration, and/or significantly reducing to quotas of menhaden in and around the mouth for the Chesapeake Bay. These actions are necessary to ensure the long-term health of the Chesapeake Bay ecosystem and the associated fisheries and ecotourism.

Sincerely,
Dr. Noah Bressman, PhD
Assistant Professor of Physiology
Salisbury University

Dr. Noah Bressman, PhD
Assistant Professor of Physiology
Salisbury University
Fish Biology, Biomechanics, Functional Morphology, and Behavior
Noahbressman.wixsite.com/noah
He/him/his

Begin forwarded message:

From: Noah Bressman <noahbressman@gmail.com>
Date: October 18, 2021 at 9:54:57 AM EDT
To: Tina Berger <tberger@asmfc.org>
Subject: Re: FW: Final Supplemental Materials for ASMFC 2021 Fall Meeting

Thanks, Tina! I want to clarify that the most important thing I recommend is that the board take action now to evaluate the options to increase menhaden in Chesapeake Bay. If action was started at Tuesday's board meeting, some or all of the measures could be in effect for the 2022 season. This can be accomplished using qualitative management methods, such as seasonal and area closures without additional research. It can also be accomplished by moving the fishing into the US federal zone as every state except Virginia has seen the necessity for doing. While I am always in support of more research for any topic (because I am a scientist), waiting for additional research on this issue that is already clear will likely lead to menhaden continuing to plummet in the bay, which will further reduce the capacity for striped bass to recover in the bay, especially after the recent report showing their abysmal recruitment over the last 3 years. A delay in action, such as a several years-long stock and recruitment reassessment of the bay before action, will lead to the problem getting worse before it gets better.

Sincerely,
Dr. Noah Bressman, PhD
Assistant Professor of Physiology
Department of Biology
Salisbury University

On Fri, Oct 15, 2021 at 2:47 PM Tina Berger <tberger@asmfc.org> wrote:

> Dr. Bressman – Thank you for your public comment on Atlantic menhaden management. It was sent to the Atlantic Menhaden Board today for its consideration. – Tina

Tina Berger

al Ecosystems

Leonard and David Sikorski column: Stop Omega Protein's outs ıct on the Chesapeake Bay

Leonard and David Sikorski
2022

A school of Menhaden swam off the coast of Virginia Beach.
2004, The Associated Press

By Mike Leonard and David Sikorski

By Mike Leonard and David Sikorski

For the second time in less than a month, Omega Protein — an industrial menhaden harvester — has littered the beaches along Virginia's Eastern Shore, wasting thousands of this important forage fish in the Atlantic Ocean. This latest mishap also killed hundreds of large red drum, a popular sportfish, that became entangled in the operation's net as bycatch.

Preliminary counts reported to the Virginia Marine Resources Commission indicate that as much as 12,000 pounds of 30- to 50-pound redfish were cleaned up on the water and along nearby beaches. Given red drum biology, it is highly likely those big, mature fish were in the Chesapeake Bay, and had targeted a menhaden school to build up energy for reproducing the next generation of this popular game fish.

Canadian-owned Omega Protein acknowledged that its contractor, Ocean Harvesters (based in Reedville), was responsible for the July 25 mishap that resulted in dead fish washing up on the beaches of Pickett's Harbor, Kiptopeke State Park and Sunset Beach. The company also accepted responsibility for a July 5 net failure that spilled thousands of dead menhaden along Silver Beach, another popular vacation destination about 15 miles to the north.

People are also reading...

1 **Stoney urges Richmond School Board not to fire Superintendent Kamras**

2 **Driver killed in Midlothian Turnpike crash identified**

3 **Chesterfield police email about arrested counselor never delivered to schools**

These net spills are yet another reminder: A broad coalition of local, regional and national recreational fishing and boating groups — including our organizations, the Coastal Conservation Association and the American Sportfishing Association — made a request to Gov. Glenn Youngkin. Stop the use of industrial purse seine gear in a major portion of the Chesapeake Bay "until science demonstrates" that it will not negatively affect the estuary's ecosystem.

A purse seine is defined by the National Oceanic and Atmospheric Administration as a "large wall of netting deployed around an entire area or school of fish". Virginia's stoppage of the use of this gear in the bay would bring consistency with Maryland's prohibition, enacted nearly a century ago.

These latest net spills aren't the first time Omega Protein has proven to be a bad corporate neighbor in the Chesapeake Bay. In September 2021, the company's nets tore on two separate incidents, forcing it to dump more than 400,000 dead menhaden into Hampton Roads waters.

In December 2019, the U.S. Department of Commerce found Virginia to be out of compliance after Omega Protein knowingly violated the Chesapeake Bay harvest cap (51,000 metric tons) on menhaden. This was a cautionary, coastwide limit agreed to by fishery managers.

Moreover, Cooke Inc., the parent company of Omega Protein, has paid nearly $13 million in penalties for violations related to the environment, safety, government contracting and finances, according

to a report from Good Jobs First, a group focused on corporate and government accountability in economic development.

In response to the 2021 net spills, the VMRC Menhaden Management Advisory Committee considered the development of a buffer, or area closure. This would minimize the possibility of snagging large purse seine nets in nearshore shallow waters, while also providing protection for recreational species that frequent nearshore habitats.

Unfortunately, the proposal did not move forward because it was opposed by an Omega Protein representative who cited net spills as a rare, infrequent event not in need of a solution. This year's spills have shown that these occurrences are not as rare as previously thought.

All eyes are on Virginia's fisheries managers and leadership in Richmond to curb this wasteful action. The publicly held resources of the Chesapeake Bay, as well as the sportfishing, boating and tourism economy, deserve more than promises from an international fisheries juggernaut.

Mike Leonard is vice president of government affairs for the American Sportfishing Association. He also is a member of the Virginia Marine Resources Commission's Menhaden Management Advisory Committee. Follow him on Twitter: @ASAfishing

David Sikorski is executive director of Coastal Conservation Association Maryland and chair of the Maryland Sport Fisheries Advisory Commission. Contact him at: **information@ccamd.org**

From:	Debbie Campbell
To:	James Boyle; tberger@asmfc
Cc:	rbeale@asmfc.org
Subject:	[External] Comments for consideration, inclusion in the board briefing materials, and the record for the May 1 Menhaden meetingmeeting
Date:	Saturday, April 15, 2023 6:22:10 PM

Mr. Boyle and Ms. Berger,

The matter before you is one of critical importance. As a resident of both Maryland and VA my family and I suffer mightily under a scenario that is choosing the interests and greed of a foreign- owned industrial company over the sustainability of the Chesapeake, and the preservation of our right to protection of our shores, our love for fishing, and viability of locally owned small businesses .
As you know, in 2022 there was much news about the abuse of our fishery, the bay, and our rural Eastern Shore communities.
There was economic loss for my neighbors who have vacation rentals, local restaurants, and stores like Puppy Drum Market (owned by my neighbors). There was also tremendous loss of revenue to the state for fishing licenses as the stock of stripers has collapsed, not to mention loss of income for our local sporting goods stores and small motels. And, the loss of time with our families while we traveled across the bridge for meetings and compiled teams of documentation.
Then, there is the immeasurable loss of joy because of not being able to take our children and grandchildren fishing or swimming.
I've seen the menhaden, stripers, and Osprey vanish right before my eyes over the past 10 years. I've seen the schools of menhaden dwindle I've the past 10 years. Spotting even a small school from the top of the bank has become unusual. The abundance of the past is gone.
The fish kills/spills have had tourists leaving early, and others cancelling reservations. The stench was nauseating, including during our memorial service for Silver Beach loved ones we've lost over the years.
The by-catch is obscene, including the 12,000lbs of dead, mature, breeding red drum that littered Kiptopeake State Park Beach, causing the beach to be closed. Our YMCA was temporarily closed as well. Then, there were the numerous spills at Silver Beach where my neighbors and I live. It was stomach turning to see children dodging dead fish as they tried to swim, and to have me and my neighbors scooping decaying carcuses from the beach into every container we could find. Some neighbors became ill and suspected the dead fish had something to do with it. Last year (2020) was the pinnacle of the abuse our community has suffered at the hands of this lawless industry. I can point to the written exchanges between Commissioner Bowman and Mr. Diehl about exceeding the catch limit, to the unauthorized placement of a dumpster of oozing, rotting fish at our local public wharf (Willis Wharf) following a Silver Beach cleanup by HEPACO.
The thought of the stench and rot is repulsive and I couldn't bear to be on the beach or swim in the bay after the 2022 events.
Then, there are the protected aquatic grasses that are being ripped up as the nets drag the bottom. The nets dragging the bottom is proved by VMRC's own reports, not to mention simple mathematical observation of the depth of the Bay and the vertical drop of the giant nets that are designed to suspend several feel above the sea floor. That bottom scraping, arguably dredging, is another big blow to the sustainability of the Chesapeake. In my experience, no agencies or regulators have been willing to impose serious consequences for this or any other bad behavior by the reduction industry over a period of many years (also supported by the many incident reports). My neighbors and I feel like we don't stand a chance. It is a shameful way to treat residents and natural resources.
Michael Academia's prize-winning study of Ospreys provides scientific research that stripers and Osprey are victims of the industrial reduction fishing. All of this devastation and suffering is completely unnecessary and preventable by not allowing sets unless proper distance between the bottom of the net and bay floor are established and STRICTLY enforced with strong penalties in place. We all know they're setting those gigantic nets in less than 20' of water. All can be cured by moving these operations offshore in deep water (out of state waters and East of the line for the EEZ, not the silly arbitrary line that was drawn by the CBBT and acts as a funnel to catch everything coming and going during migratory/spawning times)....That will solve most of bycatch problems and keep protected and precious bay grasses from being ripped fro the bottom.
Our spawning fish are in those schools that will be targeted relentlessly starting on May 1st, and will probably be killed by the tens of thousands. Has the technical committee investigated and determined how to eliminate snags and bycatch? If not, why not? If so, what is being mandated and strictly enforced with MEANINGFUL penalties? Put

this in effect this season. ASMFC must act because VA refuses to.
I am including incident reports presented as part of a binder of research in 2022, as well as various photos and documents. Please afford me, my neighbors, and the Chesapeake the respect of studying them carefully.

Photos will be provided separately.

Depending on you!
Debbie Campbell
410-860-0893
757-442-2603

Please include this material in the briefing book and public record for the 5/1/23 meeting.

From: Debbie Campbell <debbiescampbell@icloud.com>
Sent: Saturday, April 15, 2023 10:13 PM
To: James Boyle <JBoyle@asmfc.org>; tberger@asmfc
Cc: rbeale@asmfc.org
Subject: [External] Re: Comments for consideration, inclusion in the board briefing materials, and the record for the May 1 Menhaden meetingmeeting

3 of 3
Please forgive that I have had to send 4 separate emails (letter & 3 emails for attachments) to get my materials to you. I'm traveling for work and doing this from my phone. Here are the last attachments. I trust that you'll print these for the member's briefing books.
Kind regards.
Debbie

Dead drum, menhaden, and ripped up bay grass. Kiptopeake

Dead red drum. Kiptopeake

Base of steps leading to Silver Beach’s community beach.

Dead, rotting dead fish at Silver Beach.

I am happy to share additional photos and videos, copies of the petition presented by Christi Medice (Silver Beach neighbor, and answer any questions you may have.

Protecting the Chesapeake Bay

Column: Industrial overfishing is hurting the Bay, and Va.'s economy

By STEVE ATKINSON
Dec 10, 2022

SteveAtkinson

By STEVE ATKINSON

Virginia's saltwater anglers are an important economic engine for the coastal areas, contributing more than $700 million annually to the state's economy.

Yet, they aren't always viewed that way. After a summer of industrial ships relentlessly netting menhaden fish from the Chesapeake Bay, noisy spotter planes, repeated net spills on the Eastern Shore, contaminated beaches and

up? Why is the state allowing a foreign-owned company to pillage menhaden, the most important fish in the sea, and wreak havoc on our pristine Bay shores?

Omega Protein, owned by Cooke Seafood of New Brunswick, Canada, acknowledged to the Virginia Marine Resources Commission (VMRC) in August they are now prioritizing fishing in the Bay in an effort to catch their annual Bay quota of 112 million pounds so that the quota doesn't get cut in future years. Then there are the wasteful net spills, which occur about every summer, fouling the pristine beaches of the Eastern Shore. Does all of this sound like good stewardship of our Chesapeake Bay?

In June, we launched a campaign to bring awareness to this problem and the damage it is causing to the Bay's fragile ecosystem. We collected 11,000 signatures on a petition calling on Gov. Glenn Youngkin to move this industrial fishery out of the Bay until science can show it is not causing harm. Many citizens attended meetings of the VMRC to ask the commission members to conduct a public hearing on moving the fishery out, emphasizing

Menhaden jumped from the water as Cockrells Creek fishermen began to raise a seine net on Sept. 3, 2019. A fleet spilled almost 5,000 menhaden on Silver Beach over the July 4 weekend and an estimated 10,000 on July 25.

2019, Jonathon Gruenke/The Virginian-Pilot

After months of petitions, letters and calls for action, the administration finally proposed a 1-mile no-netting buffer along the Bay and Virginia Beach shores to reduce the likelihood of damaging net spills, which usually occur in shallow water. They also proposed additional fishing restrictions around holiday weekends during the summer tourist season.

ges to escape with no new regulations and no accountability. This is a
ing display of poor governance.

aden are inedible fish, reduced to fish meal and other byproducts and
exported for animal feed. This industrial "reduction fishery" has
ed controversy for decades and is outlawed by every other state on the
Coast. This one company gets to harvest 75% of the entire East Coast
aden quota in Virginia waters, leaving less and less fish for predators
ely on them, most notably striped bass, but also other fish, mammals
ea birds. Menhaden are not considered "overfished," but that is a coast-
designation and has nothing to do with conditions in the Chesapeake

owing Omega Protein to catch a third of its total quota from the Bay
s the ocean (where operating costs are higher), Virginia in effect is
dizing this fishery to the detriment of the Bay and local fishing
mies. Is it a coincidence that the Eastern Shore, which was the
nter of intense netting this summer, just experienced its worst
ational fishing season in recent memory? Local hotels, charter captains
ait shops are feeling the pain.

pplauded the administration for proposing to address net spills and
user conflicts, but the regulation proposal was defeated by some of the
nistration's appointments to the VMRC board. Why would Virginia
der an opportunity to improve the Bay and coastal economy? Why

should the Eastern Shore bear the burden of repeated net spills? Is the administration controlled by a lobbying firm or do they simply not care about our Bay?

For now, the assault on the Chesapeake Bay will continue until enough citizens stand up and government officials lead.

From the Archives: Mayo Island through the years

Mayo Bridge and Island

JAM

Bingo

Purse seine nets are designed as being used at a location above the sea floor as it won't scrape on the bottom which can cause net tears but also keeps it from disturbing the sea bottom pulling up sea grass and destroying the sea bottom as was seen on pictures of the fish kill\spills this past summer as well as many other times in the past. Another reason for having this "safety zone" above the sea bottom is that before the net is "pursed" or closed at the bottom it will allow game fish not targeted to escape through the bottom of the net as game fish normally dive straight down when they sense trouble and they will not be inside the net when it is pursed and hauled up which crushes\kills most of the fish within the net. A prime example of this occurred when the many Red Drum were killed this summer and washed up on the Eastern Shore beach dead as they had no way to escape as a 50′ to 60′ deep net was placed in 20′ to 30′ of water at the most.

This practice of having a safety zone is also indicated in the coveted Marine Stewardship Council (MSC) that Omega is so proud to have become a member of a few years ago which states **"Purse-seine fishing in open water is generally considered to be an efficient form of fishing. It has no contact with the seabed and can have low levels of bycatch (accidental catch of unwanted species)."** See link below

https://www.msc.org/what-we-are-doing/our-approach/fishing-methods-and-gear-types/purse-

https://www.msc.org/what-we-are-doing/our-approach/fishing-methods-and-gear-types/purse-seine

This safety zone area below the purse seine net can be seen discussed in other locations with a google search and I have seen others but this one by MSC is in direct opposition of part of their certification and is obviously not adhered to as these 50'-60' nets are used throughout the Chesapeake Bay at depths rarely seen to allow their proper deployment.

Currently the only regulation I see on the VMRC site is per Va Code 28.2-410 which only indicates mesh size not to be less than 1 ¾". As there are no designations of actual purse seine net depth regulations I would suggest that a **gear type use restriction** be set to a depth that accommodates this "safety zone" beneath the net which is currently being ignored by the VMRC as the Va Legislature was previously in charge of regulating gear type and the VMRC has not been involved in implementing these obvious "best practices" of gear type restrictions and as a regulatory body it should address this issue.

This will result in the fishery having to make a decision as to if it is worth their time to use shorter nets that don't extend to Virginia's sea bed or to fish further out in the ocean where these 50'-60' deep nets can be properly used and catch more fish.

Atlantic States Marine Fisheries Commission

Sciaenids Management Board

May 1, 2023
3:30 – 5:00 p.m.
Hybrid Meeting

Draft Agenda

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

1.	Welcome/Call to Order *(C. Batsavage)*	3:30 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from August 2022	3:30 p.m.
3.	Public Comment	3:35 p.m.
4.	Consider 2023 Black Drum Benchmark Stock Assessment and Peer Review Report **Final Action** • Presentation of Stock Assessment *(C. McDonough)* • Presentation of Peer Review Panel Report *(M. Reichert)* • Consider Acceptance of Benchmark Stock Assessment and Peer Review Report for Management Use • Consider Adopting Annual Indicators	3:45 p.m.
5.	Consider Not Conducting 2023 Atlantic Croaker and Spot Traffic Light Analyses *(T. Bauer)*	4:50 p.m.
6.	Other Business/Adjourn	5:00 p.m.

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

MEETING OVERVIEW

Sciaenids Management Board
May 1, 2023
3:30 p.m. – 5:00 p.m.
Hybrid Meeting

Chair: Chris Batsavage (NC) Assumed Chairmanship: 02/22	Technical Committee Chairs: Black Drum: Harry Rickabaugh (MD) Atlantic Croaker: Somers Smott (VA) Red Drum: Ethan Simpson (VA) Spot: Harry Rickabaugh (MD)	Law Enforcement Committee Representative: Col. Matthew Rogers (VA)
Vice Chair: Doug Haymans (GA)	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: August 4, 2022
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS (10 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2022

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

4. Consider 2023 Black Drum Benchmark Stock Assessment (3:45-4:50 p.m.) Action

Background

- The 2023 black drum benchmark stock assessment was completed in Fall 2022, which evaluated the status of black drum from the east coast of Florida north through New Jersey (**Briefing Materials**).
- The assessment was peer-reviewed at a hybrid in-person/webinar workshop by a panel of independent experts in January 2023. The Peer Review Report provides the panel's evaluation of the assessment findings (**Briefing Materials**).
- Empirical stock indicators were developed as part of this stock assessment, which are recommended by the TC, SAS, and peer review panel to be used to monitor the black drum stock annually between assessments.
- After reviewing the stock assessment, the Board may consider management response based on the assessment results.

Presentations

- Presentation of Stock Assessment Report by C. McDonough
- Presentation of Peer Review Report by M. Reichert

Board actions for consideration at this meeting

- Consider acceptance of benchmark stock assessment and peer review report for management use.
- Consider adopting indicators.

5. Consider Not Conducting 2023 Spot and Atlantic Croaker Traffic Light Analyses (4:50-5:00 p.m.)

Background

- The Traffic Light Analyses (TLAs) are updated annually for both spot and Atlantic croaker to assess changes to the populations in non-benchmark stock assessment years.
- Staff recommend skipping the 2023 Spot and Atlantic Croaker TLAs and complete the 2024 TLAs as part of the benchmark assessments. Per Addendum III, the management measures put into place in 2021 for spot and Atlantic croaker were due to be reevaluated this year. If the 2023 TLAs are skipped, ASMFC staff recommend holding measures as is for one more year, until the spot and croaker assessments are complete in 2024, and reevaluate at that time. If the Board is in consensus with staff's recommendation, the TLAs will not be conducted in 2023 and spot and Atlantic croaker management measures will remain status quo until the benchmark stock assessment is complete.
- This is recommended because the calibrated ChesMMAP trawl survey data, a key component of the TLAs, may not be available in time for the 2023 TLAs, and without this information the TLAs do not provide a complete assessment of the populations. In addition, removing the TLAs from the TCs' tasks opens more time for ASMFC and state staff to spend on the development of the 2024 benchmark stock assessments for spot and Atlantic croaker.

Presentations

- Update on 2023 Spot and Atlantic Croaker Traffic Light Analyses by T. Bauer

6. Other Business/Adjourn

Sciaenids Management Board

Activity level: High

Committee Overlap Score: Moderate (American Eel TC, Cobia TC, Horseshoe Crab TC, Weakfish TC)

Committee Task List

- Red Drum SAS – Conduct Red Drum Benchmark Assessment
- Atlantic Croaker and Spot SAS – Conduct Atlantic Croaker and Spot Benchmark Assessments
- Red Drum TC – Gather data and assist with the Red Drum Benchmark Assessment
- Atlantic Croaker TC – Gather data and assist with Atlantic Croaker Benchmark Assessment
- Spot TC – Gather data and assist with Spot Benchmark Assessment
- Atlantic Croaker TC/PRT – July 1: Compliance Reports Due
- Red Drum TC/PRT – July 1: Compliance Reports Due
- Black Drum TC/PRT – August 1: Compliance Reports Due
- Spotted Seatrout PRT – September 1: Compliance Reports Due
- Spot TC/PRT – November 1: Compliance Reports Due

TC Members:

Atlantic Croaker: Somers Smott (VA, Chair), Kristen Anstead (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Michael Greco (DE), Harry Rickabaugh (MD), Ingrid Braun (PRFC), Willow Patten (NC), Chris McDonough (SC), Dawn Franco (GA), Halie O'Farrell (FL)

Black Drum: Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Craig Tomlin (NJ), Jordan Zimmerman (DE), Ethan Simpson (VA), Chris Stewart (NC), Chris McDonough (SC), Ryan Harrell (GA), Shanae Allen (FL)

Red Drum: Ethan Simpson (VA, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Alissa Wilson (NJ), Michael Greco (DE), Matthew Jargowsky (MD), Cara Kowalchyk (NC, Vice-Chair), Joey Ballenger (SC), Chris Kalinowsky (GA), Sarah Burnsed (FL), Roger Pugliese (SAFMC)

Spot**:** Harry Rickabaugh (MD, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Stacy VanMorter (NJ), Michael Greco (DE), Ingrid Braun (PRFC), Somers Smott (VA), Morgan Paris (NC), Chris McDonough (SC), BJ Hilton (GA), Halie OFarrell (FL)

Plan Review Team Members:

Atlantic Croaker: Harry Rickabaugh (MD), Ingrid Braun (PRFC), Ethan Simpson (VA), Willow Patten (NC), Chris McDonough (SC), BJ Hilton (GA), Tracey Bauer (ASMFC)

Black Drum: Jordan Zimmerman (DE), Chris Stewart (NC), Chris McDonough (SC), Tracey Bauer (ASMFC)

Red Drum: Lee Paramore (NC), Joey Ballenger (SC), Ray Rhodes (COFC), Roger Pugliese (SAFMC), Tracey Bauer (ASMFC)

***Spot*:** Harry Rickabaugh (MD), Ethan Simpson (VA), Chris McDonough (SC), Dawn Franco (GA), Tracey Bauer (ASMFC)

***Spotted Seatrout*:** Tracey Bauer (ASMFC), Samantha MacQuesten (NJ), Lucas Pensinger (NC), Liz Vinyard (SC), Chris Kalinowsky (GA)

SAS Members:

Red Drum: Joey Ballenger (SC, Chair), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Angela Giuliano (MD), CJ Schlick (NC), Jared Flowers (GA), Chris Swanson (FL), Ethan Simpson (VA)

Atlantic Croaker and Spot: Kristen Anstead (ASMFC), Jeff Kipp (ASMFC), Tracey Bauer (ASMFC), Linda Barry (NJ), Harry Rickabaugh (MD), Brooke Lowman (VA), Somers Smott (VA), Laura Lee (NC), Margaret Finch (SC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SCIAENIDS MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia

August 4, 2022

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

Draft Proceedings of the Sciaenids Management Board
August 2022

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Draft Proceedings of the Sciaenids Management Board
August 2022

ATTENDANCE

Board Members

Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Lynn Fegley, MD, Administrative proxy
Russell Dize, MD (GA)
Pat Geer, VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls, Chair (AA)
Jerry Mannen, NC (GA)
Mel Bell, SC (AA)
Malcolm Rhodes, SC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Marty Gary, PRFC

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

Ex-Officio Members

Dawn Franco, Chair, Atl. Croaker Technical Committee
Harry Rickabaugh, Chair, Black Drum & Spot Technical Committees

Staff

Robert Beal
Toni Kerns
Tina Berger
Tracey Bauer
Lisa Carty
Emilie Franke
Lisa Havel
Chris Jacobs
Jeff Kipp
Sarah Murray
Anna-Mai Christmas Svajdlenka
Geoff White

Guests

Max Appelman, NOAA
Pat Augustine, Coram, NY
Linda Barry, NJ DEP
Jeff Brust, NJ DEP
Nicole Caudell, MD DNR
Heather Corbett, NJ DEP
James Fletcher
Anthony Friedrich, SGA
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Helen Takade-Heumacher, US FWS
Carol Hoffman, NYS DEC
Kyle Hoffman, SC DNR
Jesse Hornstein, NYS DEC
Janelle Johnson, NC DENR
Raymond Kane, MA (GA)
Kathy Knowlton, GA DNR
Kris Kuhn, PA F&B
Rob Latour, VIMS
Chip Lynch, NOAA
Shanna Madsen, VMRC
John Maniscalco, NYS DEC
Joshua McGilly, VMRC
Jack McGovern, NOAA
Dan McKiernan, MA (AA)
Steve Meyers
Chris Moore, CBF
Allison Murphy, NOAA
Lindsey Nelson, NOAA
Will Poston, SGA
Jill Ramsey, NYS DEC
Jason Rock, NC DENR
Steven Scala
Ethan Simpson, VMRC
Amanda Small, MD DNR
Somers Smott, VMRC
Scott Curatolo-Wagemann, Cornell Univ
Angel Willey, MD DNR
Chris Wright, NOAA
Daniel Zapf, NC DENR
Jordan Zimmerman, DE DFW

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

The Sciaenids Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Thursday, August 4, 2022, and was called to order at 8:00 a.m. by Chair Chris Batsavage.

CALL TO ORDER

CHAIR CHRIS BATSAVAGE: Good morning. I would like to welcome everyone to the Sciaenids Management Board meeting. My name is Chris Batsavage; I'm the Administrative Proxy from North Carolina, and I'll be serving as Chair.

APPROVAL OF AGENDA

CHAIR BATSAVAGE: We'll start off the meeting with the Approval of the Agenda. One addition that we'll make to the agenda is, Erika Burgess will be updating the Board on rule changes and new management approaches for red drum in Florida.

Are there any other changes or additions to the agenda? If not, then we will consider the agenda approved.

APPROVAL OF PROCEEDINGS

CHAIR BATSAVAGE: Next will be approval of the proceedings from the May 2022 Board meeting. Are there any edits or changes to those proceedings? Seeing none; those are approved.

PUBLIC COMMENT

CHAIR BATSAVAGE: Next up is public comment. This is an opportunity for the public to provide comment on any items related to the Sciaenids Board that aren't on the agenda today.

We have a fairly light audience in person, but I will just pause to see if there is anyone online that would like to make public comment. No public comment, so we will move on to the main parts of the agenda.

REVIEW OF THE TRAFFIC LIGHT ANALYSIS FOR SPOT AND ATLANTIC CROAKER

CHAIR BATSAVAGE: We'll start that off by the Review of the Traffic Light Analysis for Spot and Atlantic Croaker. I believe spot is up first, and Harry Rickabaugh from Maryland will be giving that presentation. Harry, whenever you're ready.

SPOT

MR. HARRY RICKABAUGH: I'll be giving the first part of the presentation, which will be the impacts on the data availability we had in both 2020 and 2021. I will then go over the spot traffic light analysis for 2022 that uses data through the 2021 fishing year. After that then Dawn will take over, our Atlantic croaker TC Chair, and she will do the 2020 traffic light analysis for Atlantic croaker, which also uses data through the 2021 fishing year.

One of the main things we're missing is the ChesMAPP Index. That survey had a vessel change and other gear and method changes, following the 2018-fishing season. Data from 2019 through 2021 is currently not available, because they have not yet done the calibrations. They have a minimum number of side-by-side tows they want to do, and are actually still doing them.

They are going to have a really good comparison tow dataset that they wanted to build before doing their comparisons, so they can back calculate the old index to match the new index we'll be using moving forward. We don't unfortunately have that data for the past three years. That is used in the Mid-Atlantic for both the adult abundance index, and as part of the juvenile index for both species. I know it is for spot, I believe both species juvenile, definitely both species for adult.

We do expect that to be available, at least they expect to have the calibration available early to mid-next year. We're hoping by this time next year we will have all three of those years then available again including 2022. This is not like some of our pandemic related deficiencies. This will be data we'll get back; we just don't currently have the

index to be able to calculate the traffic light analysis.

Some of the other surveys were interrupted. These are mainly pandemic related. The Northeast Fisheries Science Center Bottom Trawl Survey was not conducted in 2020. For those species we're using a proxy value, which is the average of 2018, 2019 and 2021. It's a three-year average. Once we get 2022, we'll probably average that one in as well, or the TC can decide if they have a better method for a proxy value. But that is what we're using for now.

SEAMAP was not conducted at all in 2020 or in the spring of 2021, so we are missing the adult abundance indices for both 2020 and 2021 for SEAMAP. That is used in the south region for both species as well. We have some missing data for both species and both regions.

Several state surveys had some minor impacts. Probably the biggest one, the one we used the most is the North Carolina 195 Survey. It did operate in 2020 and 2021, but due to limitations from the pandemic, they could not do their work offshore, in the Sounds. They had to stay closer, so especially in river sites there was some impact too, certain areas were not sampled. There is likely some bias in that, which will be discussed later.

The MRIP 2020 was affected to some degree. It varies by state, of course. We reviewed that before. 2021 data is not affected. Now I'm going to go into just the spot traffic light. As I mentioned, Dawn will go over croaker later. Just as a reminder, management action was tripped in 2020, which regulations went in place in 2021.

Addendum III requires that those management actions stay in place until 2023. This will be the first year, the evaluation we're doing right now, that would have any opportunity to relax regulations, and that would be for the 2023 fishing year. Just really quick, we've gone over these many times before, but in case there is anyone else on the Board and/or online that has not seen these before.

The traffic light for both species is split into two regions, the Mid-Atlantic Region and the South Atlantic. The Mid-Atlantic is from Virginia north, the South Atlantic is from North Carolina south. Both traffic light analyses uses what we are referring to as a harvest composite, which uses the recreational and commercial harvest data.

Then there is also an adult abundance composite, and that uses fishery independent indices, and for spot we use Age-1 plus, we split those indices out, removing any age-0 fish. We also use auxiliary information, which I'll go over later. But those are the two parts that mean they will trigger management action. We'll see a lot of these figures today. What you see here, this is for the harvest composite for spot. The top graph is for the Mid-Atlantic. Again, as a refresher, we have two thresholds. One is the 0.3 percent red. If the red bars on the bottom exceed 30 percent, at that point we're considered to be in low concern or moderate concern, I should say, level.

For spot, if two of the terminal three years are in that level, management action needs to be taken. That is where we were back in 2020. As you can see, 2018 and 2019 were just above that 30 percent threshold. Once management action is tripped, these composite indexes aren't used, and that can trip further management at a higher level, which would be that 60 percent.

If two of the terminal three years for spot were over that, we would then go into a higher level of management action, which is prescribed in the Addendum. It would be more significant than what we have in place now, but again, commercial wouldn't be used, because we put regulations in place that should artificially increase the proportion of red, because this is based on harvest, and we are restricting harvest.

Just as a note, only 2021 would be affected in this particular figure by those regulations. For spot, the Mid-Atlantic, as you can see, has seen some improvement in the proportion of red. It's still over

20 percent, but it is under that 30 percent threshold the past two years. The South Atlantic however, has remained high, with values above 50 percent for the past four years, but has remained just below that 60 percent threshold for the past three years.

This is the Mid-Atlantic composite for the adult indices, and again take a close look at that top one, you'll see it only goes through 2018, because again we're missing ChesMMAP from 2019 forward, so we can't really do a composite index. At this point we don't have any of the terminal three years in that figure.

The TC did look at the available data we had, which mostly uses the Northeast Fisheries Science Center trawl survey. As you can see, it's actually shown an improvement, it's all green in the terminal three years. But again in 2020 it is an imputed data point, it's not an actual value it's an average. We really don't know what 2020 was, and as you can see in the graph above ChesMMAP was the main contributor of that value in the terminal years.

We were seeing a difference in the inshore surveys versus the offshore surveys. In absence of having ChesMMAP, we don't really know what our proportion of red is, because we would suspect, or at least in the past that is where the highest proportion of red came from, and we're missing those datapoints at this point in time.

For now, we're considering the adult abundance metric as unknown, because we are missing that ChesMMAP datapoint. We are making a determination of where the abundance is based on just the one index. This is the same sort of look, but for the South Atlantic. One note, if you happen to look at your report that was in supplemental materials.

Unfortunately, right after that came out, I was putting this presentation together and we noticed there was a mistake in the South Atlantic composite, which again only runs through 2019. We're not really using that to evaluate management, since they are missing two terminal years. But the proportions of red were too low, and it was accidently, because there was an error in that we just did not catch in time unfortunately and I apologize for that. But the figure on your screen is correct. For the South Atlantic, again 2019 was the only one that falls in a terminal three years.

The proportion of red was under 30 percent. As you can see previously it was above. But we do not have the last two years data, because we used SEAMAP in this one. In the absence of SEAMAP, we have the North Carolina Department of Marine Fisheries Program 195. This again is for Age 1 plus fish only.

You can see it also was below the 30 percent threshold of red for the last two years, but is red not green again. When you start to see green, that's when you're at or above the long-term mean, so obviously this survey has remained below the long term mean for the previous six years. Some of the auxiliary information we look at, those are the two pieces we would use for triggering management.

I should have mentioned on the previous slide, like the Mid-Atlantic, we're considering the South Atlantic adult abundance metric is unknown as well, since we're missing SEAMAP. Some of the auxiliary information we have is shrimp trawl bycatch. We don't use this for triggering, but we do track it, to see if there are any shifts in that trend. These are estimates based on effort, which you'll see on the left. That is shrimp trawl effort.

On the right is the actual estimate of the discards in millions of fish. You'll see it is pretty variable, kind of a somewhat stable level lately. There was a spike there in 2019. This index does also use SEAMAP as a tuning index, and SEAMAP had high values in that particular year, so that was partially what bumped that up. As we can see, the effort was pretty flat between 2020 and 2021, as the estimate was as well.

For juvenile indices we again split these north to south. Both north and south for spot utilized

ChesMMAP in the north as an Age-0, and SEAMAP in the south. There are two indices in this one. But obviously since we're missing those, I did not present them, especially since they've been missing for multiple years now.

What we have here on the top is the Mid-Atlantic. This is only the Maryland Seine Survey, and as you can see there actually was an increase above the mean for the past two years. In the South Atlantic, the North Carolina Department of Marine Fisheries Program 195, it shows proportions of red, so those two regions seem to be disagreeing.

As you can see in the past, like 2017, '18 was the opposite. It doesn't seem like we're getting improvement in both regions at the same time. We're getting average to below average for an extended period now. As I mentioned earlier in the data limitation of the Program 195, it didn't sample all sites. Since it wasn't sampled in more open water Sound sites, there could be a bias in one direction or another.

I'm sure Dawn will probably touch on it with the croaker. The member from North Carolina, just aside from our traffic light analysis, they did a memo to their own department on what those impacts may be for croaker. It was actually biased high. But that same sort of analysis wasn't done for spot, so we don't know if utilization of that riverine verses more Sound areas, is different for spot like it was for croaker. But it seemed like croaker were more abundant in the riverine sites that were sampled than they were in the Sound sites.

But again, if that were true for spot, these will be overestimates. Of course, the reverse could be true, since that analysis wasn't done directly for spot . In general, looking at this table, you'll see the last three years for each metric, what the percentage of red was. As you can see, unfortunately we can't, as I mentioned, we can't use the harvest metric to increase. But we could use it as an indicator of improvement.

Obviously, if we put regulations in place, you expect lower catches. If you had higher catches, you would assume that is a sign of more abundance or availability, I should say, of the fish to the fisheries. We're not really seeing that, particularly in the South Atlantic, a moderate improvement in the Mid-Atlantic. But we're still in the red, so we're still below average.

It is hard to say with the South Atlantic how much of that is regulation driven, although there is very little change between 2020 and 2021. We don't have the full complement of indices for either the South Atlantic or the Mid-Atlantic to make a determination based on the adult or Age-1 fish, I should say, abundance.

At this point the TC is considering the traffic light analysis determination is unknown for both 2020 and 2021. For spot this would be, as I mentioned earlier, the year that we could consider a regulation change in 2023, since the regulations have been in place for two years. The TC is recommending maintaining the current regulations, in light of the adult abundance metrics being unknown, and the fact that harvest levels have not shown a significant improvement. They also have also seen mixed results from or mixed indications from the juvenile indices.

There is not enough support for us to recommend relaxing those regulations at this point in time. Also, very hopeful that we'll have that ChesMMAP time series next year, and terminal year values for all the surveys, which will put us in a much better position to see where we are, and make a more solid recommendation for the Board. That's all I have for spot. If you have any questions regarding either the changes in the, or I should say the unavailability of indices for the spot traffic light itself, I would be more than happy to answer. Thank you.

CHAIR BATSAVAGE: Thank you, Harry. Any questions for Harry on the traffic light analysis for spot? Okay, if there are no questions then we'll

pass it over to Dawn Franco to give the croaker traffic light analysis. Dawn, whenever you're ready.

ATLANTIC CROAKER

MS. DAWN FRANCO: Okay, sounds good. Good morning, everyone. What we'll talk about for croaker, as usual, is very similar to what you just heard about spot. The key things to keep in mind are the number of years for trigger mechanisms are different. We have three out of the last four years for Atlantic croaker, instead of two out of the last three, like you just heard for spot. Then also, the regulations were set to be in place for three years instead of two years, like spot had. Those are the big key differences to remember going into the presentation. Management triggered in 2020, same as spot, and regulations were put in place in 2021. Those measures cannot be relaxed.

Again, we'll keep the same pattern here. We'll go with the harvest composites first. That is recreational and commercial combined, just a reminder. The first slide is Mid-Atlantic and South Atlantic, both shown on the same slide. For the Mid-Atlantic, we've actually been above 30 percent for the eighth year in a row, and the past four years above 60 percent. Then the South Atlantic was also above 30 percent for the past eight years in a row, but with no years above 60 percent.

As Harry very eloquently just said earlier, the last year we had management measures in place, so we would expect to see a little bit more red increase in that year, because we would expect that catches were declining, because regulations were set in place. We do see that for both regions. Then moving forward, 2021 data cannot be used to trigger elevated management response, until the regulations are lifted.

But if we saw improvement, that would be a good indicator that we could relax regulations. Then we'll move into the adult abundance composite indices, and for this one we have separate slides for Mid-Atlantic and South Atlantic, to address some of the missing data issues. Again, Mid-Atlantic uses ChesMMAP, so it cannot be updated beyond 2018. This is actually the same graphic that we've shown you the past couple of years at the top. But we do have a full data series for the Northeast Fisheries Science Center minus the 2020 imputed data, of course. We looked at just that one survey, just to see some sort of updated information. We see that the three out of the past four years were actually below the long-term mean, with increases in abundance of about 32.5 percent in 2021.

Based on just that one survey, it looks like we're trending at least in a good direction, and while it's possible that 2019 could have exceeded 60 percent, you know if it was combined with another survey. It's unlikely that we had 3 out of the 4 previous years exceeding 60 percent, which is what we would need to say that we need an elevated management response.

Then this is the South Atlantic Adult Abundance Composite, and again we are missing SEAMAP data for 2020 and spring of 2021, so we cannot show an updated version of the composite beyond 2019. This is what we presented last year, same as the Mid-Atlantic, but the composite hasn't exceeded 30 percent since 2010.

Then if we look just at the one survey, the South Carolina Trammel Net that is in the composite, 2020 and 2021 we saw increases, and then the red has been below 30 percent since 2017. For this region we're likely not even exceeding 30 percent threshold in previous 3 out of the 4 years. Again, juvenile indices are not used for triggering management measures, but we do track them and provide them as supplementary data.

We do use ChesMMAP in the Mid-Atlantic juvenile abundance for Atlantic croaker. We cannot update that beyond 2018. But we can look at the other survey that is in the composite, which is the VIMS data. VIMS alone shows just the previous or the most recent two years, and we are seeing declining abundance in 2020 and 2021, and continued high red proportion is an indicator that there is poor

recruitment in those years. It's definitely something for us to keep an eye on moving forward.

Then the South Atlantic juvenile abundance is actually not a composite, it is just the North Carolina Program 195 survey, and as stated earlier, not all stations were sampled in 2020 and 2021, and as Harry mentioned, there was a study that was completed that outlined that Atlantic croaker may actually be overrepresented, and has elevated magnitude in those years.

There is a little bit of a bias for those years, because they didn't sample all areas. But we only see red exceeded 60 percent in 2018, with the past three years above average. Even 2019 that was not affected at all, it was still above the long-term mean. Those are all good indicators. Next, we have the South Atlantic shrimp trawl fishery discards.

The figure on the left is the same as what you saw. The effort is exactly the same as we saw for spot, and then the discards are slightly different, because it's different species. But the net fishing hours have been relatively low from 2020 until 2021, but pretty flat, same as the year before, and it's low compared to the rest of the time series as well.

Harry pretty much covered everything that you would need to know as background data for this. But at least we're seeing a little bit of a downtrend in recent years. This is the summary table that we provide for you that tells you all of the percentages for all of the regions, and all the composites that are used in the trigger mechanism.

Just another reminder, with regulation changes in effect in 2021, the trigger would be based solely on adult abundance starting in that year 2021 forward, as long as regulations are put in place. But because croaker is 3 out of the last 4 years, we can still look at 2018 through 2020 for making decisions.

But to propose any change, we would need to see either exceed 60 percent in 3 out of those 4 years for either region. We have status unknown for 3 out of the 4 years in the Mid-Atlantic, due to the data gaps. But we also see increases in abundance from the Northeast Fisheries Science Center Survey in recent years, indicating that we shouldn't really expect to have triggered an elevated response in that region.

Then 2 out of the 4 years in the South Atlantic for the adult abundance were mostly green, so no triggers were likely tripped there either. Then hopefully by next year we'll have all the data that we need to fill the gaps for ChesMMAP, and be able to fill in those years, and will no longer be unknown. We'll have a good idea of how everything is going in the Mid-Atlantic region for the adult abundance.

Then also we'll have more SEAMAP years to help fill in any data gaps there. With management already in place, and in place for a minimum of three years through the end of 2023, the TC recommends maintaining the current management measures and no change was recommended. That is all I have for you, but I'm happy to take any questions.

CHAIR BATSAVAGE: Thank you for the presentation, Dawn. Any questions for Dawn on the croaker traffic light analysis? Yes, John Clark.

MR. JOHN CLARK: Thank you for the presentation, Dawn and Harry. Just curious with croaker, I mean they seem to have these long population cycles. But this time it seems like the down part of their population trend, this trough, seems to be going on an extremely long time. Does that show up in the data? Is this a very long down period for the croaker, or is it pretty much typical to what you've seen in the past?

MS. FRANCO: I feel like we're definitely seeing declines with juvenile abundance. If we want to go back up and look at the adult abundance, I feel like we're actually going in a more positive direction for the adult abundance. But it's just that one survey that we were looking at in the juvenile composite for the Mid-Atlantic that's showing increasing proportion of red.

I'm hoping that we are actually getting more back on an upward trend in that cyclical pattern. But it does, yes absolutely, tend to go up and down. But we will know more when we have all of the ChesMMAP data included. In the packet, you'll see that there is a lot more information provided, and we actually threw in some other surveys, just to look at more information, as much as we could possibly look at.

It seemed like all surveys were trending in a positive direction, at least for the adult abundance composite, from memory. I don't remember exactly what all the juvenile composites said, but I believe it's only in the Mid-Atlantic that we're seeing increased red proportion in recent years. I hope that answers your question.

CHAIR BATSAVAGE: Yes, thanks, John. Good question definitely, cyclical pattern has been around a while for croaker, and yes, the trough has been pretty low. Hopefully it's turned in the right direction. I guess we'll find out in a couple years. Roy Miller.

MR. ROY W. MILLER: This question is either for Dawn or Harry. In the plots of net hours fished in trawl fisheries versus discards, did you plot discards per hour fished, combine the two to see if there is a trend in that direction?

MS. FRANCO: Unfortunately, neither one of us put together that figure. Do we know if anyone from the ASMFC staff is in the room that could answer that question?

CHAIR BATSAVAGE: Yes, go ahead, Jeff.

MR. JEFF J. KIPP: Hey Dawn, this is Jeff, and I can jump in, and I worked up those estimates on shrimp trawl discard estimates. We do have a table of the catch rates per year. I don't know off the top of my head what that trend looks like with just the catch rates alone. But we could provide that in future updates of these, if that is of interest.

MR. MILLER: I thought it would be of interest to see whether the catch per unit effort has been going down. Obviously, the discards are going down. But I presume that's in addition to bycatch devices, it's probably a reflection of net hours going down as well. I was just curious what the catch per unit effort looked like. Thanks.

MR. KIPP: Yes, if you look at those trends. I mean there is definitely some similarities between the effort and the total discards. From that alone I would suspect, without having the data in front of me, that the trend in CPUE is somewhat stable. But yes, we can definitely include those in future updates as an additional figure.

CHAIR BATSAVAGE: Yes, thanks, Jeff, and thanks for the question, Roy. I guess any additional information on kind of getting a better sense of the shrimp trawl discard trends I think would be good. Pat Geer.

MR. PAT GEER: Just following up on what Roy was saying, in a lot of the states in the southeast, the shrimp fishery, the number of licenses has been going, a lot less vessels so the effort is going down as well in that fishery. But that is a good point about looking at trawl hours. The other question I had about that was, is it the total effort for the year, Jeff, the total shrimp effort for the year? Is that what that is?

MR. KIPP: Yes, that figure shows all of the shrimp trawler effort across the South Atlantic.

MR. GEER: Is it the total landings for croaker and spot that are compared to it in that one graph?

MR. KIPP: No, that is estimated discards. That would be essentially the catch rates that we were discussing applied to those net hours, to expand it up to a total discard.

MR. GEER: Is seasonality considered in that at all?

MR. KIPP: It is considered in the models to estimate the discard rates.

MR. GEER: All right, thank you.

CHAIR BATSAVAGE: Any further questions on either traffic light analysis? I know we're on croaker, but if there are any questions folks have on spot that they've thought of, I'd entertain those as well. Okay, seeing no questions, the TC has recommended no changes to management for either spot or croaker, and spot is up for consideration in 2023 with the two years in place for the traffic light. Croaker is not.

As both analyses showed, the status is largely unknown for both, until we get the surveys they rely on back full time. Hopefully that's going to be the case in 2022. That and with ChesMMAP data available next year for the missing years, hopefully we'll have a little clearer picture of the traffic light analysis trends for both species, and I guess we'll go from there.

Unless there is an urge by anyone to make any changes based on what we have, I guess we'll just see what next year brings. All right, I appreciate the presentations and the questions by the Board.

REVIEW THE DEVELOPMENT OF A SPATIAL MODEL OF SPOT ABUNDANCE AND MORTALITY

CHAIR BATSAVAGE: We'll move on to the next agenda item, which is To Review the Development of a Spatial Model of Spot Abundance and Mortality. Dr. Rob Latour will be updating the Board on that work, so Rob, whenever you're ready.

DR. ROB LATOUR: Good morning, everyone. Thank you very much for the opportunity to speak with you this morning. I'll try to be brief, because I know you have a lot to cover. Really just want to give you an overview of what Mike and I are thinking regarding developing a spatial model for spot.

There is a broader context here, which I'll get to right here in the next slide. For probably two decades now or longer there has been some broad interest in understanding effects of environmental drivers on fish and shellfish populations in the Bay. I'm thinking back to the late nineties for some technical reports promoting ecosystem-based fisheries management that led to the fisheries Ecosystem Plan, and subsequent ecosystem modeling activities.

But the reality is, in order to sort of understand those relationship at the population level, we need Bay-wide estimates for most of the species. We really don't have those. We kind of are limited, in terms or our ability to understand environmental impacts, without estimates of abundance and survival as well.

Mike and I several years ago approached NOAA Chesapeake Bay Office leadership with the idea of developing a framework for trying to develop these estimates for a number of species, where we had the ability to estimate Bay abundance, as well as coastal abundance. That is really what I'm going to talk about here briefly this morning, is just to give you an overview of what we're thinking, and our intention to apply it to spot.

The goal or objectives is to develop a spatial model that gives us estimates of abundance and mortality rates for spot in the Bay, as well as in the coast. The idea here is to take that information and then allow linkages to environmental drivers, to understand how environmental impacts may be affecting population dynamics, and ultimately make all of this information and methodology available to the public, to facilitate additional research they can imagine.

You have a time series of abundance and mortality for a particular location that facilitates direct relationships and analyses with broadscale climate drivers or other policy-type evaluations, to understand responses of the populations on the community. As I mentioned, this was a broader framework that Mike and I had in mind.

We're grateful to NCBO for the support. An initial three-year project was kicked off two years ago, and in that project, we suggested we could tackle

two species. NCBO reached out to other management agencies, VMRC, Potomac River Fisheries Commission and Maryland DNR, possibly even outside of that domain, for ideas on which two species to select.

Right out of the gate, as you might imagine, striped bass was number one, so for the last couple of years we've been working on that, and we've made good progress. Late '21, early '22, we initiated the conversation for what would the second species be. The feedback that came was converging on spot. The reasoning was tied to a few things, one is spot represented a forage species, so this would be a way to sort of provide some insight, striped bass being the predator, spot being a prey. Maybe there is some value added there. As you all know, there is no currently accepted assessment for spot. Perhaps some of our work can help facilitate and enhance TC activities as they move forward in the coming year with their assessment activities. Our goal here is to develop this analytical product in concert with the TC, but not in a sense of competing or duplicating anything that the TC might do, when it comes to their assessment activities.

Our intention is to have a value-added enhancement that hopefully will facilitate good discussion, and possibly improvements for the assessment model that they bring forward to peer review. Real briefly, just to give you a sense of the structure, we're thinking of age-structured model, spatial, statistical catch at age, so pretty standard thing here with the nuance being this will be spatially explicit.

We'll keep track of two populations in two areas. These are all the available survey data and catch data that would normally go into the assessment. But a benefit here is both Mike and I have graduate students who will be working on the project, and my student is just beginning here PhD. She is interested in tackling some of these objectives that the TC may not have time to address, to be honest.

You know habitat modeling using the survey data, investigating questions about potential shifting of distributions or habitat utilization. Patterns and responses to environmental drivers on broadscale, and really, she wants to focus heavily on a management strategy evaluation simulation component.

Possibly evaluating in a management strategy context, the traffic light or any other harvest policies or control rules that the TC and you all as the Board might want to consider. These are some of the value-added concepts that we're thinking that may enhance the TC's activities. Kind of in a picture sense.

If you imagine on the top row here the box being the coastal zone, and on the bottom row the box being the Bay. The timeline on the bottom sort of beginning in late fall when spawning occurs, and running through the spring, summer and subsequent fall, wrapping around to the following year.

Spot are offshore spawners, so we have the coastal population that would produce recruits that would come into the estuary or the Bay, kind of in early spring. Some of those coastal fish will remain in the coast and survive, some of them will immigrate into the Bay for some seasonal residency over the warmer months, and then immigrate out in the fall to the coastal zone for spawning activity.

The two populations we're talking about is the coastal population and a Bay population that are seasonal, at least in the Bay, and the two areas are the coast and the Bay, so it's a two-box model, keeping track of spot in both areas, with the idea of estimating abundance in those areas and survival. Inherently, of course, we'll need understanding of movement. This is all familiar to you, I'm just noting here that our goal is to use all the available catch data that would normally go into an assessment, so the commercial catch at age, the recreational catch at age, MRIP, and some potential certainly for estimating discards, which I know has been a challenge in the past. This is not an exhaustive list of the indices, and incidentally as the PI of the ChesMMAP, and I promise you all, and I'm

apologizing. I feel really bad that we haven't been able to get our calibration work completed. COVID and some other challenges have delayed that process. But we will have the time series on the calibration done, and everything will be up through 2022 for you all next year.

Any other surveys that I may be missing that the Spot TC will consider, certainly will be in our discussions as well. We want to parallel the data sources as best we can. A little bit on the estimated products. We hope to estimate recruitment in each area, and abundance in each area in the first year, get a handle on fishing intensity in each area and selectivity for each of the fisheries.

Survey catchabilities and selectivity as well. Then the most kind of interesting thing might be understanding movement that describes, you know the proportion of the overall population that is in each area during each time step. What this means is our time step will be sub-year, maybe quarterly. We haven't figured that out yet, because we haven't really gotten going on this one.

But we will be looking at the data through a different lens at a much finer time scale and much finer spatial scale. We hope to glean some ideas about movement into the estuary and out of the estuary, and along the coast, you know, if possible. Next steps really are to submit data requests.

This may seem simple, but the reality is because of the need to have a very fine temporal and spatial resolution to some of the fishery dependent data, we're very mindful of confidentiality issues and nondisclosure type things. We're working through that process, to make sure that we're in compliance.

Early indications are that we think we can get the data at the level that we need. But we do need to be careful about confidentiality. Then to begin developing the model, we have a great deal of infrastructure in place, because the striped bass model has been working out for a couple years. Initially it will be similar to the striped bass model, and then tailored to spot, given spot's life history being different than that of striped bass.

Then my last slide is just to acknowledge Mandy at NCBL, and Tracey for linking us up today. An anticipated thanks to her for future relationship management with Spot TC, and of course Harry and the Spot TC, we look forward to working with you all closely, and funding from NOAA Chesapeake Bay Office with contributions from VIMS and CBL. That's all I had, it's just a really brief overview. I'll be happy to take any questions if there is time. Thanks again for the opportunity to speak this morning.

CHAIR BATSAVAGE: Thanks, Rob, appreciate the update on this work. Any questions for Rob? John.

MR. CLARK: Thanks for the presentation, Rob. I'm just curious. You had a management strategy evaluation. Our management of spot is pretty simple at this point. Do you see, like area-specific management in the Chesapeake as a result of this? What type of results do you see from a management standpoint?

DR. LATOUR: Yes, thank you, great question. My thought initially is to approach this, what would you like to do as the Management Board? I know you've been under some constraints and there has been some limitations. But given a simulation analysis, you know that opens up the door for whatever ideas that you may want to consider.

I don't want to have any of my preconceived ideas implemented without consultation with those, to make sure that they are in the realm of possibility. I think this would be the objectives of the MSC would be defined, based on conversations with you all, Spot TC members, any other constituents that have interest.

That's really an open question at the moment. Certainly, we could start with evaluating the traffic light approach, since that is the current approach in place. But if there are other harvest policies or strategies, area-based or not, we're certainly

opened to those and happy to consider those in our evaluation. That's a little bit ambiguous there. Hopefully that addresses your question.

CHAIR BATSAVAGE: Yes, thanks for that, Rob, appreciate it. Lynn Fegley.

MS. LYNN FEGLEY: Thank you Rob for the presentation. This is really a little bit in response to John Clark's question. We were highly encouraging of this effort to take on spot, as the species were being discussed. Spot is a very hot button issue in Maryland. I think it probably is in Virginia too.

We have a lot of differing uses for these fish, from being used as live line and as commercial harvest and recreational, and it's always, it's a controversial fish in Maryland. We could really use this information. I think this exercise, this analysis, is going to be extremely helpful, at least just within our state as we move forward.

DR. LATOUR: Thanks, Lynn, I appreciate the support. On my slide with estimated parameters, you'll notice that there is no discussion of reference points. I just want to emphasize and underscore that we do not view this as a competing or alternative assessment model, it's more of an enhancement to whatever the Spot TC develops as an assessment model, to fill in gaps if there are gaps, or to just provide a broader understanding of the resource population dynamics. Just wanted to emphasize that. We're not trying to compete or provide an alternative model for the TC.

CHAIR BATSAVAGE: Roy Miller.

MR. MILLER: Rob, I have always been kind of curious whether there is a linkage between Delaware Bay spot populations and croaker populations in Chesapeake Bay populations. I just wondered if you are similarly curious about that, and if you would ever consider accessing readily available data sources for Delaware Bay, and maybe the coastal bays, Delaware and Maryland for, in the case of Delaware Bay adult abundance, as determined by trawl surveys, as well as juvenile abundance determined in smaller trawl surveys. Those data sources are readily available, as you probably know. It might be interesting to see if there is a correlation between those populations.

DR. LATOUR: Yes, that is a great question. For this project, I don't anticipate going beyond two spatial areas, just because of the challenge of estimating movement. But I have another student who is supported also by NCBO, who has been working on building habitat models for a number of species, including the Sciaenids spot and croaker.

One component of her work is to try to understand if the levels of exchange or emigration out of the Chesapeake, how those have played out over time, so patterns in the relative exchange from coast to Bay over time. We've also accessed Delaware Bay data, to look at the same question there.

Interestingly, what we see for almost all the species in the Bay is a decline in the exchange, if you will, that is the relative abundance of the Bay compared to the coast is going down over time from 2008 through '18. But yet in Delaware Bay it's remaining stable for most every species, or possibly in a couple of cases increasing.

The idea here is, you know sort of indirectly evaluate potential species distributions, but how are those species that may be changing their distributions are utilizing estuaries. The story is not so positive for Chesapeake, but maybe status quo if not slight improvements for Delaware. I don't know if that answers your question directly.

I don't anticipate a spatial model in this project here this morning that we're talking about, involving all of the estuaries, getting beyond two boxes or two regions is going to be probably beyond the scope of what we can do. But there are some other things happening that are trying to evaluate the relative roles of the major estuaries on the coast.

CHAIR BATSAVAGE: Any additional questions? Tom Fote.

MR. THOMAS P. FOTE: Since New Jersey sits there in part of Delaware Bay, it always was interesting to me what comes through the canal and the transfer of stuff that comes from the Chesapeake Bay into the Delaware Bay. I mean we did some of that work on striped bass, to see the mingling. When I'm looking at this, I'm looking at it saying, this is what we should be doing for management tools.

I mean we try to do that with Long Island Sound when it came to tautog, and we basically be looking for a tautog thing to New Jersey, because we never have the money to do that to look like we can manage it in region specific. Maybe this is a good time that we should be looking at, if you're going to do this research, how do you tie it into management?

How, maybe they could start managing the species a little differently in the Bays than they do in the ocean, because the abundance or the lack of abundance. I think it would be a wasted effort in some ways if we didn't include that into the study, because you're spending a lot of money. You might as well get all you can out of the bucks you're spending, and try to accomplish a couple more things. It's just the way I feel when I look at these studies.

DR. LATOUR: Thank you for that, Tom. I think the entry point for that would be the management strategy evaluation I mentioned. If area management is on your mind as a Board, we're certainly open to considering that in the simulation. Anything else that is on your mind we're open to considering.

I think that's what gets me excited about doing this, these are value added things that can enhance the management, and the understanding of the resource for the assessment. I guess I would just say, we'll probably be having a more detailed conversation about that in the near future, as we get into the spot model.

But in the meantime, be thinking about possible management policies that are of interest to you, so that we can come up with a step that satisfies what it is that you're, you know to be able to provide you with some quantitative evaluations of these different strategies and potential tradeoffs, to equip you with more tools. Stay tuned, I guess. Thanks.

CHAIR BATSAVAGE: Chris McDonough.

MR. CHRIS McDONOUGH: Yes, Rob, thanks, that was very interesting. I have a question on whether or not you guys are going to look at or incorporate the environmental trends in the model beyond, I know you showed your figure with a seasonal transition, a lot of which is environmentally driven, going between inshore and offshore.

Is that more of a question for, you know since you're just really looking at the Bay initially. Is that kind of too fine a scale at that point, just in terms of how it is affecting population trends, because we have seen what we think are changes? Range expansion and those other things that are occurring, I'm just wondering if some component of that is being considered in the model.

DR. LATOUR: Yes, at the moment I don't think we will have formal relationship with environmental parameters, as part of the structure. I guess we'll wait and see, because that could emerge if there are relationships that become well established. But I will say that some of the parameters that we estimate will inherently reflect pressures from the environment.

Indirectly we may be able to uncover some of those relationships, or establish relationships with different parameters that we haven't really thought about. I can see sort of this facilitating kind of an indirect look at the role of environment. If the relationship is strong enough, sure we could include it as a structural component. The movement analysis is going to be challenging, given that we don't have, or we will have to rely on fishery dependent data to do that. Possible, but initially we're going to focus on just keeping it as simple as we can.

CHAIR BATSAVAGE: I guess before we move on, just a final question I have, Rob, and I might have missed this in the presentation. What is the anticipated time that you think this model will be done, and what terminal year of data are you planning on using in the model?

DR. LATOUR: I mentioned it was a three-year project. We just completed Year two. We hope to be spinning up spot here very shortly. We're a bit intentional, and we would like to kind of track with the TC's activities, as they work on developing their assessment. In theory, a year from now, we should have a lot more to say. I can't guarantee that we'll be able to get it done in a year, it might spill over into a little bit longer. But we're hoping to kind of parallel the process of the TC as they deliberate next year and move to peer review. That is the goal at this point.

CHAIR BATSAVAGE: Thanks, are you looking to use data through '22?

DR. LATOUR: Yes, yes, sorry. The terminal year, we will rely on the TC for that, because data acquisition is a challenge, it's a lot of work to put all the datasets together. Another value added or benefit will be how the TC decides their terminal year. We will probably, or undoubtedly follow whatever they decide as well.

CHAIR BATSAVAGE: Makes sense, great, thanks. Just one last check to see if there are any additional questions. Thanks again, Rob, look forward to your work on this.

CONSIDER ATLANTIC CROAKER AND RED DRUM FISHERY PLAN REVIEWS AND STATE COMPLIANCE REPORTS FOR THE 2021 FISHING YEAR

CHAIR BATSAVAGE: I'll move on to the next item on the agenda, and that is to Consider Atlantic Croaker and Red Drum Fishery Plan Reviews and State Compliance Reports for the 2021 Fishing Year. Tracey, whenever you're ready.

MS. TRACEY BAUER: Good morning, everyone, in the interest of time I will briefly go over the red drum and Atlantic croaker fishery management plan reviews. But obviously, more detail can be found in the FMP Review reports, and for Atlantic croaker specifically in the traffic light analysis report.

I will start off with red drum, and looking specifically at total landings for red drum. This figure breaks down the northern, which is New Jersey and North Carolina, and southern, which is South Carolina to Florida regions commercial and recreational landings, as the proportion of total coastwide landings.

In this figure, starting at the bottom, the bottom blue and green represent the proportion of total coastwide landings that are from the northern region, and that dark blue at the top is the proportion of total landings from the southern region. In 2021, 55 percent of the total landings came from the southern region, where the fishery is exclusively recreational, and 45 percent from the northern region.

This is very similar to 2020, when the split was 55 percent of the total landings came from the southern region, and 44 percent from the northern region. These splits are a significant change from the 2019 and really 2018 too, regional landing split, where approximately 20 percent were from the northern region, and 80 percent from the southern region.

Now I'll review the red drum recreational landings specifically. In this figure the blue bars are recreational landings in millions of pounds from the northern region, and the green portion is the recreational landings from the southern region. In the northern region, recreational landings were estimated to be 2.6 million pounds in 2021, which was only a slight increase from the previous year's estimates of recreational harvest at 2.5 million pounds. North Carolina was estimated to have the most recreational landings in the northern region, followed by Virginia. Of note, Virginia's red drum recreational landings increased by 84 percent from

the previous year. In the southern region, recreational landings were estimated to be 3.4 million pounds in 2021, very similar to 2020 estimates, which were 3.3 million pounds.

Florida is estimated to have the most pounds of recreational landings in 2021, followed by Georgia. These two figures show the recreational total removals by region, with northern removals on the top and southern on the bottom. Both figures show the number of fish landed, which is green in the northern region figure and red in the southern region figure.

The estimated dead discards, which is blue in the northern region figure and orange in the southern region figure in 10,000s of fish. In the northern region the number of fish landed in the recreational fishery was nearly 600,000 fish, which was down 13 percent from 2020. It's estimated that 8 percent of the released fish die as a result of being caught, which gives us an estimated of a little over 300,000 dead discards in 2021.

Recreational removals for the northern region are best estimated to be around 890,000 fish in 2021. In the southern region the number of fish landed in the recreational fishery was 1.2 million fish, which was a 15 percent increase from 2020. With the estimated 8 percent dead discard rate, there is an estimate of 590,000 dead discards in 2021. Recreational total removals from the southern region are best estimated to be 1.8 million fish in 2021. In both regions about one-third of all removals in 2021 were estimated to be comprised of dead discards.

This figure shows the total removals compared to the number of fish released in both the northern and southern regions. The purple bars are total removals, and the red line is releases, both in the northern region, and the maroon bars are total removals, and the orange line is releases in the southern region.

This is all in millions of fish. In 2021, 3.8 million fish were released in the northern region, compared to the estimated total harvest plus dead discards of 890,000 fish. The number of releases last year in the northern region was similar to 2019 and 2020, varying between 3.6 and 3.8 million fish.

The number of fish released in the southern region last year increased by 40 percent from 5.3 million in 2020 to 7.4 million in 2021. This is compared to the 1.8 million fish in total removed from the southern region in 2021. Very, very briefly I just wanted to touch on a note that at the July meeting the Florida Fish and Wildlife Conservation Commission approved new management regions and regulation changes for red drum in state waters.

The real changes are shown on this slide, but Erika is going to go into further details about these changes at the end under Other Business. For the PRT recommendations, the PRT found no inconsistencies among states with regard to the FMP requirements. Both New Jersey and Delaware requested de minimis status through the annual reporting process.

As a reminder, while Amendment 2 does not include a specific method to determine whether a state qualifies for de minimis, the PRT has chosen to evaluate individual states 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 approximately 0 percent of a two-year average of total landings. As another reminder, de minimis status does not exempt either state from any requirement, but it may exempt them from future management measures implemented through Addenda to Amendment 2, as determined by the Board.

Lastly, for red drum, research and monitoring recommendations can be found in the FMP review document. They didn't change too much from last year, except for the recently completed red drum simulation assessment and peer review report that has some recommendations. I will now go over the Atlantic croaker FMP review.

We'll first look at the Atlantic croaker landings. In this figure the black line is commercial landings, and the red dash line is recreational landings, both in millions of pounds. Total Atlantic croaker harvest from New Jersey through the east coast of Florida in 2021 is estimated at 3 million pounds, which is a 39 percent decrease from 2020.

The commercial fishery harvested 32 percent of the 2021 total, and the recreational fishery harvested 68 percent of the 2021 total. This was fairly similar to 2020 when the recreational fishery also harvested a majority of the total Atlantic croaker harvest. This represents a large shift in the previous ten-year average split from 2010 to 2019 of approximately equal split between commercial and recreational.

Commercial landings have declined every year since 2010 to the lowest in the time series of around 800,000 pounds in 2020. Landings increased by 21 percent in 2021, to 970,000 pounds, which was the second lowest value in the time series, 2021 recreational landings are estimated at 5.2 million fish, and 2.0 million pounds, which is a 51 percent decrease in number of fish in fish weight from 2020.

Virginia was responsible for 36 percent of the 2021 recreational landings in numbers of fish, followed by North Carolina at 20 percent. In this figure the blue bars represent landings of Atlantic croaker in millions of fish, and the red bars are fish released alive, both in millions of fish. The black line is the percent of fish that were released out of the total catch.

In 2021, anglers released 27.5 million fish, which was a slight decrease from the 31.8 million fish released in 2020. However, anglers released a greater percentage of the total recreational catch in 2021, compared to 2020, with an estimated 84 percent of total recreational croaker catch released in 2021, which is the highest percentage on record, compared to 75 percent in 2020.

For the PRT recommendations, the PRT found no inconsistency among states with regards to the FMP requirements. The PRT recommends approval of the state compliance reports and de minimis status for New Jersey, Delaware, South Carolina, and Georgia commercial fisheries, and the New Jersey and Delaware recreational fisheries.

Additional research monitoring recommendations can be found in the FMP reviewed document. Some of those recommendations include research into impacts of climate change on the range of the species, and research into Atlantic croaker juvenile discard mortality for the fisheries by each gear type, in regions where removals are highest. With that, I'll be happy to take any questions.

CHAIR BATSAVAGE: Thanks, Tracey, any questions on the FMP reviews? Lynn.

MS. FEGLEY: I just had one. Did I hear you say on red drum that the Virginia landings increased 84 percent over the previous year?

MS. BAUER: Yes, from the previous year.

MS. FEGLEY: This might be directed a little bit toward Pat too. Can you tell if that is coming from the Bay or the ocean, or what percentage of that is Chesapeake?

MR. GEER: They were everywhere. There were more juveniles than we've ever seen. I mean subadults. There is much more targeting of the bulls and the cows, which is a catch and release. It's becoming more and more popular. I can speak from first-hand the number that we were catching that year.

CHAIR BATSAVAGE: Yes, thanks, there is definitely a high availability of slot size red drum in the northern zone, at least North Carolina. Although they don't have a juvenile survey in Virginia, the juvenile survey in North Carolina has been above average the last several years. Yes, I personally wasn't surprised when I saw the recreational harvest increase to the level they did in Virginia/North Carolina. Thanks for that question, any other questions? Pat.

MR. GEER: Tracey, I just have one comment about Table 1 with the regulations for Virginia's commercial regulations. We open on the 15th of January, not the 1st.

MS. BAUER: Okay, thanks, Pat, I'll make that change.

CHAIR BATSAVAGE: Erika Burgess.

MS. ERIKA BURGESS: I wanted to request that the management change section for Florida be removed from the FMP review. That applies to the 2022 fishing year and not the 2021 year, so I don't think it's appropriate to include in there. Then when you move it to the next years, I have corrections in it for you.

MS. BAUER: Okay, thanks, Erika.

CHAIR BATSAVAGE: From online, Malcolm Rhodes.

MS. TONI KERNS: Try now, Malcolm. I think he might have hung up on himself. But I do have one quick thing if I may, Mr. Chair.

CHAIR BATSAVAGE: Oh yes, go ahead, Toni.

MS. KERNS: Erika, sometimes if we know a state is going to have a future change, we do ask, in the compliance report it asks for any changes that you think you're going to be making in your upcoming fishing year, and we do include that in the FMP review. We can make sure that it notes that it is for the 2022 fishing year, and then you can give us the corrections. But we do put any upcoming changes that states know about in the FMP review, if it is available.

MS. BURGESS: Yes, we didn't submit it in our compliance report, because we were not sure what our Commission was going to approve at the time. I just don't want, even though it says 2022, it's in the 2021 report. Things get confused. Moving into the future, I would prefer it to be removed.

CHAIR BATSAVAGE: Any additional questions? If not, looking for a motion to approve the FMP reviews. Lynn.

MS. FEGLEY: I have a motion, do you want red drum and croaker together, or do you want them separate? Separate?

CHAIR BATSAVAGE: Yes, they're separate.

MS. FEGLEY**: All right, so I'll make a motion to approve the red drum FMP review for the 2021 fishing year as amended today, the state compliance reports and de minimis status for New Jersey and Delaware.**

CHAIR BATSAVAGE: Okay, motion by Lynn Fegley, second by Doug Haymans. Any discussion on the motion? Do we need to put in the as amended today in the motion for red drum? Okay, all right. **Is there any opposition to the motion? Okay, the motion passes unanimously**. Looking for a motion for the croaker. Marty Gary.

MR. MARTIN GARY: Thanks, Mr. Chair, I would be happy to offer the croaker motion. **Move to approve the Atlantic croaker FMP review for the 2021 fishing year, state compliance reports, and de minimis status for New Jersey, Delaware, South Carolina, and Georgia commercial fisheries, and New Jersey and Delaware recreational fisheries.**

CHAIR BATSAVAGE: Second by Tom Fote. Any discussion on the motion? Any opposition to the motion? **That motion also passes unanimously.** Yes, thanks for that.

PROGRESS UPDATE ON THE BLACK DRUM BENCHMARK STOCK ASSESSMENT

CHAIR BATSAVAGE: Next on the agenda is Progress Update on the Black Drum Benchmark Stock Assessment, so I'll turn that over to Jeff Kipp. Jeff, whenever you're ready.

MR. KIPP: Yes, I'll be providing just a quick progress update here on the next few slides on the ongoing

2022 Black Drum Benchmark Stock Assessment. The major milestone the SAS has completed since I last provided an update at the May meeting was the Assessment Workshop, which was held actually at this hotel two weeks ago, July 18 through the 21st.

The overall objective of this workshop was to review the results of various assessment methods developed since the Methods Workshop in February. Some major topics covered during the workshop included finalizing our recommended stop indicator framework that will provide information on stock conditions between assessment years, and selection of the preferred assessment method, and reference points to provide management advice. A few minor changes to the preferred assessment method were recommended during the workshop, and the SAS will be meeting a final time on August 23rd via webinar to finalize the results.

For our remaining schedule looking forward, we will next hold an external peer review of the assessment in December, and then deliver the results of the assessment to this Board at the ASMFC winter meeting next year, to be considered for management. That concludes my update here and I can take any questions on the black drum stock assessment.

CHAIR BATSAVAGE: Thanks, Jeff, any questions for Jeff on the black drum assessment? Okay, seeing no questions, look forward to the results as you guys mentioned last meeting, busy time for stock assessments for the sciaenids. I think all of them except speckled trout are undergoing assessments, and speckled trout is undergoing assessment at the state level. Look forward to seeing all those results.

ELECT A VICE-CHAIR

CHAIR BATSAVAGE: Okay, next on the agenda is to elect a Vice-Chair. I'll look to Pat Geer to make a motion.

MR. GEER: Given that I served two terms as Chairman and two terms as Vice-Chair, I see no better person for this role as Mr. Doug Haymans from the great state of Georgia.

CHAIR BATSAVAGE: Okay, so move to nominate Doug Haymans as Vice-Chair of the Sciaenids Management Board. Can I get a second? Spud Woodward. **Any objection to the motion? I didn't think there would be. The motion passes unanimously.** Congratulations and thanks, Doug, appreciate it. I'll try to keep us on task in the next year and a half, so I don't leave you too much more work than you are already going to have.

OTHER BUSINESS
UPDATE ON RED DRUM MANAGEMENT AND RULE CHANGES IN FLORIDA

CHAIR BATSAVAGE: All right, we'll move on to Other Business. As I mentioned before, Erika would like to give an update on red drum management and rule changes in Florida, so Erika, whenever you're ready.

MS. BURGESS: I think our new Vice-Chair of the Board is going to follow me on this. A couple weeks ago Florida approved new regulations for red fish. This is following the release of our 2020 stock assessment, which found that through most of our state, we assess red drum within three regions of the state, that it was meeting our management target of 40 percent escapement. Sorry, we assessed on four regions.

It was not in southeast Florida, which is largely driven by the Indian River Lagoon and water quality issues within that area. Following the release of the assessment we did 12 months of public engagement and rule development, in which we learned that the public did not view the health of the fishery in the same positive light that the stock assessment did.

We wanted to look at the fishery differently, so we have moved to a new form of management, where we are evaluating the fishery with six metrics. We will continue to evaluate it with escapement, which is our proxy for SPR. We're looking at relative

abundance, habitat, harmful algal blooms, fishing effort and stakeholder feedback. We're doing a quantitative and qualitative assessment of those six metrics to develop management recommendations for now nine management regions within the state. We thought that nine regions were appropriate, because the fishery targets subadult fish within nearshore waters, and so for the Atlantic state's consideration, there are three regions. We have northeast Florida, which is a little bit larger than our former northeast management zone, Indian River Lagoon and southeast Florida.

We have reduced our bag limit in northeast Florida from 2 fish to 1 fish. We've reduced our vessel limit from 8 fish to 4 fish in that area. Within the Indian River Lagoon, we've gone to catch and release only, and we'll be at that until we believe we can sustain a fishery with achieving our 40 percent escapement.

In southeast Florida we are at a 1 fish bag limit, 2 fish vessel limit. All of those changes we believe remain in compliance, because they are more conservative than what the FMP requires, but it is a big shift for us, and if anyone is interested in knowing more about it, let me know. We are going to in the future apply the same approach to the management of snook and sea trout.

CHAIR BATSAVAGE: Thanks, Erika, those are pretty big changes for management. I'll take a couple questions, so Tom.

MR. FOTE: Yes, really a lot more restrictive. I wonder, do you expect an increase in the catch and release mortality? I always think about striped bass, we've gone that way, and all of a sudden, we've been killing more fish than we're keeping.

MS. BURGESS: I don't know if we're going to have that same concern yet with red drum at 8 percent mortality. But we have seen for our snook fishery, which has very conservative regulations that catch and release mortality does exceed harvest. But we are having large increases in population in Florida, largest increases in the nation, and all of those folks coming down from the beautiful New England and Mid-Atlantic area want to go fishing. Our resources cannot necessarily support all the people who want to take a fish home.

CHAIR BATSAVAGE: Good question, Tom, yes, I appreciate that, Erika. Marty Gary.

MR. GARY: Thanks Erika for your report out on what you're doing in Florida. I'm one of those people that comes down. I was down three times in the last year to southwestern coast. First, I guess a comment. I applaud you for how you handled the complexity of the challenges there. My question is, could you expand just very briefly on the harmful algal blooms, because that is just fascinating. I've noticed that where we go when we come down, you know that is an issue at times.

MS. BURGESS: Red tide is the primary harmful algal bloom that we're looking at this time, because we can directly link it to effects on the fishery. It produces that toxin that kills the fish, and in southwest Florida from 2017 through 2019, we had almost a three year long red tide that caused major fish kills.

We experienced it in the Panhandle as well. We're looking at changes in duration and frequency. We're seeing observed increase in both categories. We know it has effect on red drum populations particularly, because it occurs at the same time of year that we have our spawning aggregations off southwest Florida. We're monitoring those spawning aggregations, as well as our inshore population recruitment, to see how it might affect the fishery. Positive outcome, our fishery young of year surveys have not shown any long term affects from that red tide on the populations. But we're fortunate, because we do have about 20 years of data to inform us about long term affects. We don't have it for all the coast, but we do for much of southwest.

CHAIR BATSAVAGE: Appreciate that, Erika. Yes, I guess just kind of in the interest of time, if anyone else has any questions for Erika, definitely feel free to reach out to her offline. Doug Haymans.

MR. HAYMANS: Not a question for Erika, but if I could kind of trail along. Our anglers in Georgia couldn't be outdone by either South Carolina or Florida, and so this past year they've been pushing for a regulatory change for red drum, although our analyses don't show a strong need for it, we're bowing to the human dimension, and are in the process of a regulatory change.

I'll be introducing that to the Board of Natural Resources this month, with the goal of having a change effective for bag limit, vessel limit, which we've never had before, and for a captain/mate retention prohibition. We hope to have those effective in January. I'm not at liberty to really go into what we're planning until I meet with the Board, but anyway. Georgia is planning a change, and it is within the plan limits as it is now.

CHAIR BATSAVAGE: Thanks, Doug, yes, I appreciate that. Yes, I guess if things are finalized for when we meet in February, if you want to brief the Board on that like Erika did that would be great. Any other business to come before the Sciaenids Board? Tom Fote.

MR. FOTE: Yes, we're seeing the algae blooms in the freshwater lakes like we've never seen before, but on a personal note. I've lived in my house since 1979, and when I moved in, I used to have to hire somebody, I live on a Lagoon, to basically raise my pilings, because it was 9 inches or 10 inches of ice every winter, and they would push the pilings up as the tide would come in and out.

I would also find where my chairs went when they blew off the dock, because I didn't get out there in time, because I could see the bottom of the lagoon. Well, I haven't seen ice like that since 1989 that has been that thick. The ice boats that are sitting up in Island Heights, which is a whole warehouse full of iceboats, because that is what they used to do, has not moved on the Bay in something like 15, 20 years.

We also, I have not seen the bottom of my lagoon in the last eight years. When I look at it, it is always a cloudy soup. I get more menhaden up in my lagoon than I did before, but I don't see the bottom. We're all going to experience that as we get warmer water, and hopefully we don't get the red tides that you get in Florida, but yes, it's a real concern.

CHAIR BATSAVAGE: Yes, thanks, Tom, a lot of changes from habitat and climate level along the entire coast.

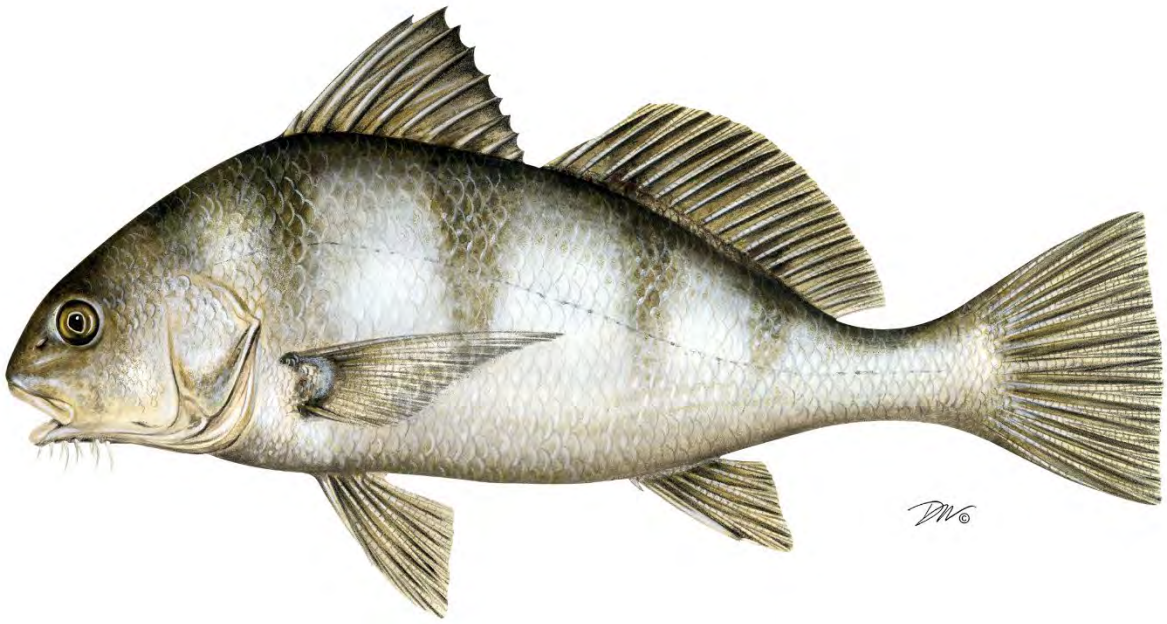
ADJOURNMENT

CHAIR BATSAVAGE: All right, well seeing no other business, I appreciate the Board's time in working through the items today. If there are no objections, I'll call the meeting adjourned. Thanks everyone.

(Whereupon the meeting adjourned at 9:25 a.m. on Thursday, August 4, 2022)

Atlantic States Marine Fisheries Commission

2023 Black Drum Benchmark Stock Assessment and Peer Review Report



For Review by the Sciaenids Management Board
May 1, 2023

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

ACKNOWLEDGEMENTS

The Atlantic States Marine Fisheries Commission (ASMFC) thanks all of the individuals who contributed to the 2023 Black Drum Benchmark Stock Assessment. The ASMFC specifically thanks members of the Black Drum Technical Committee (TC) and Black Drum Stock Assessment Subcommittee (SAS) who developed the consensus stock assessment report, the Peer Review Panel (RP) for conducting a thorough review of the stock assessment, and ASMFC staff for coordinating the assessment and peer review.

The TC and SAS would like to acknowledge all the data providers that supported the assessment through gathering and preparing data sets, and Mike Rinaldi (ACCSP) for validating and providing commercial landings data from partner agencies. Several assessment resources with open source software were crucial to this assessment including the National Oceanic and Atmospheric Administration (NOAA) Fisheries research track assessment of index-based assessment methods (https://github.com/cmlegault/IBMWG), the JABBA modeling framework (https://github.com/jabbamodel), and the Stock Synthesis modeling framework (https://github.com/nmfs-stock-synthesis).

The RP much appreciated the very collegial nature of the review deliberations. The SAS was very responsive to the RP's comments, questions, and additional tasks. The RP expresses thanks to the SAS for the significant amount of work involved in the assessment and the extensive and thorough assessment report detailing the data, analyses, exploration, and modeling. The RP also acknowledges ASMFC staff for their invaluable assistance during the review process.

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PREFACE

The 2023 Black Drum Benchmark Stock Assessment and Peer Review Report is divided into two parts:

Part A – 2023 Black Drum Benchmark Stock Assessment Peer Review
PDF pages 5-22

Part A provides a summary of the stock assessment results supported by a panel of independent experts through the ASMFC external peer review process. The Peer Review Terms of Reference provides a detailed evaluation of how each Stock Assessment Term of Reference was addressed by the Black Drum Stock Assessment Subcommittee (SAS).

Part B – 2023 Black Drum Benchmark Stock Assessment
PDF pages 23-339

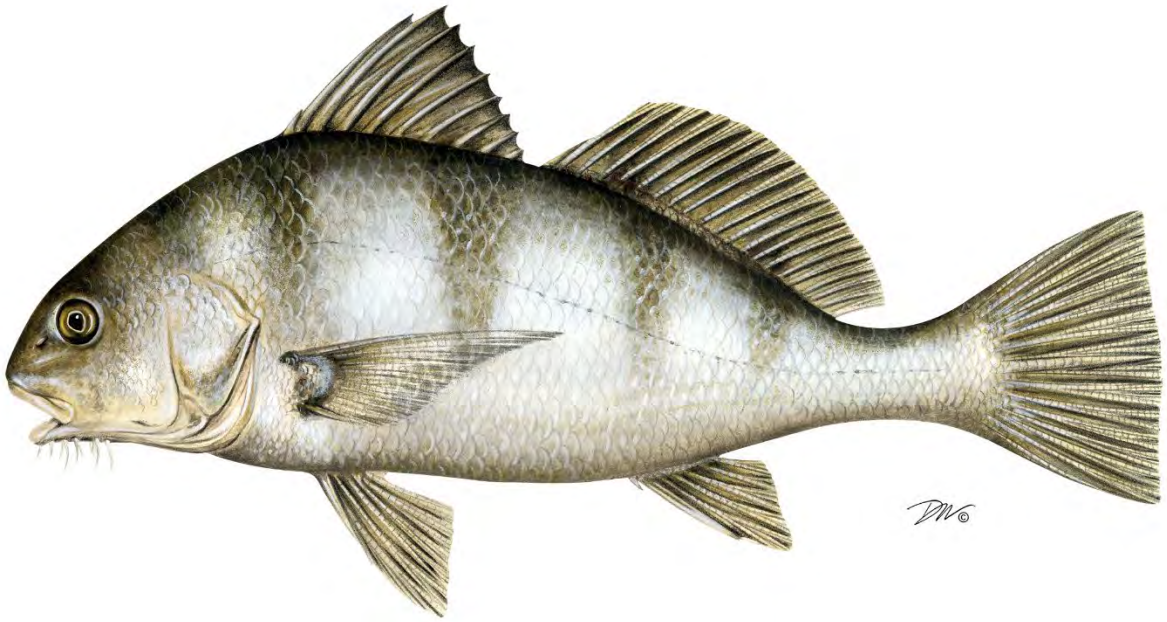
Part B includes the benchmark assessment of the black drum (*Pogonias cromis*) stock along the U.S. Atlantic coast. It was prepared by the SAS and Black Drum Technical Committee (TC). The analyses and descriptions stem from data and summary reports provided by federal and state marine resource management agencies to the ASMFC.

Part B is further subdivided into fourteen Sections, with **Sections 1-12 & 14** providing the original benchmark stock assessment as presented to the Peer Review Panel. During the Peer Review Workshop, the Peer Review Panel and SAS discussed the analyses and models used to make stock status determinations. Additional analyses were conducted during the Peer Review Workshop and the Peer Review Panel recommended a modification to the base model which the SAS supported.

Section 13 presents the Addendum to the assessment report, which provides details on the modified base model developed following the Peer Review Workshop. The Addendum includes stock status determinations used for final management advice from this stock assessment which update the stock status information in **Section 8** presented during the Peer Review Workshop.

Atlantic States Marine Fisheries Commission

2023 Black Drum Benchmark Stock Assessment Peer Review



Conducted on
January 18-20, 2023

Prepared by the
ASMFC Black Drum Benchmark Stock Assessment Peer Review Panel

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INTRODUCTION

An independent peer review of the Black Drum stock assessment was conducted during a hybrid in-person/webinar Review Workshop on January 18-20, 2023, at the ASMFC office in Arlington, VA. The Review Panel (RP) was comprised of Marcel Reichert, PhD, Maia Sosa Kapur, and Gary Nelson, PhD. Dr. Nelson was unable to attend the review meeting, but provided comments and questions prior to the Review Workshop, and contributed to this report. The Panel was assisted by the Atlantic States Marine Fisheries Commission's (ASMFC) Director of Fisheries Science, Patrick Campfield and Tracey Bauer, Fishery Management Plan Coordinator. Supporting information for the stock assessment was presented by the ASMFC Black Drum Stock Assessment Subcommittee (SAS) members Chris McDonough (SCDNR-Chair), Margaret Conroy, DE DNREC), Linda Barry (NJ DEP), Jeff Kipp (ASMFC), and Harry Rickabaugh (MD DNR). The SAS also provided additional clarification and analyses, and answered RP questions.

The RP met with SAS members via webinar on January 12, 2023, for introductions, to seek clarification on general aspects of the assessment report, and discuss areas of the assessment the Panel would like to focus on during the review. During the meeting the SAS provided a broad overview of the assessment. The RP had only a few clarifying questions and did not request additional analyses at that time. The RP concluded the focus of discussions during the Review Workshop should be on the JABBA-select model.

During the Review Workshop, the RP was able to conduct a thorough review of the Black Drum assessment. This report summarizes its findings and recommendations.

EXECUTIVE SUMMARY

The purpose of the 2023 stock assessment review was to evaluate work conducted by the Stock Assessment Subcommittee in relation to their Terms of Reference. The assessment included several advances since the previous assessment in 2015, including developments in data poor stock assessment modeling approaches and the availability of additional (new) data collected following the previous assessment. In addition, the improved data on recreational fisheries (MRIP) had a significant impact relative to the previous assessment.

Black Drum is a relatively fast-growing species with a relatively early maturity, high fecundity, and long lifespan (67 years). Black Drum harvest is dominated by recreational catches and is, both in the commercial and recreational sector, generally considered a bycatch fishery. The 2015 stock assessment concluded that Black Drum was considered not overfished and overfishing was not occurring.

The current stock assessment was completed in the fall of 2022 and had terminal year of 2020. The Review Panel concluded that the Stock Assessment Subcommittee thoroughly addressed all Terms of Reference for the assessment and documented them in detail in the Stock Assessment Report.

Along the Southeast coast of the United States, Black Drum remains essentially a data-limited stock. Given the available data (and model inputs), the Review Panel agreed with the Stock Assessment Subcommittee's recommendation to accept the JABBA-select model as most appropriate for use in stock status determination and management. However, the Review Panel recommended a different base model run that combined the two Mid-Atlantic fleets, with one selectivity, for use in stock status determination and for management advice. The Stock Assessment Subcommittee agreed with this recommendation, and the accompanying results and analyses were provided by the SAS as an addendum to the Assessment Report. The Review Panel noted this run does not change the stock status, but resulted in a more robust model.

The Review Panel agrees with the Stock Assessment Subcommittee that Black Drum is not overfished and overfishing is not occurring. The stock assessment is robust for biomass status (SB_{2020}/SB_{MSY} = 2.99, not overfished) and robust, but with higher uncertainty, for exploitation status (H_{2020}/H_{MSY} = 0.28, not overfishing). The results of the assessment using the JABBA-select model are appropriate for use in management. However, specific uncertainties specified in this report should be taken into account in terms of management risk.

Based on the uncertainty, stock status, and potential future data, the Review Panel recommends a next stock assessment to be conducted in 5 years, and advises monitoring the stock in the intermediate years using harvest trends and other information. If warranted, future assessment timing can then be adjusted. The Stock Assessment Subcommittee and Review Panel provided several research recommendations intended to improve future stock assessments.

TERMS OF REFERENCE

1. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment.

The Review Panel (RP) concluded the data collection and resulting analyses were thoroughly described and detailed by the Stock Assessment Subcommittee (SAS) in the Assessment Report. As Black Drum is a relatively data poor-stock, there were limitations that constrained assessment model choice. In addition, there were data limitations for 2020, the terminal year of the assessment, due to the COVID pandemic's disruption of annual data collection.

Life History and Biological Data

Stock definition and assessment delineation were appropriate. The assumption of a closed stock structure for the extent of the assessed population is reasonable. Note, possible recruitment from of the Gulf of Mexico may occur, and conceivably contribute to uncertainty (see details in section 4 below).

Length data from the recreational harvest was dominated by information from the southern states (NC to FL). This is where most of the recreational landings occur. Commercial length data were mostly from North Carolina, with landings from Virginia, North Carolina, and Florida dominating the commercial harvest. The RP agreed the length information was sufficient to represent the harvest and overall population for the assessment, but more comprehensive length data will improve future assessment efforts.

The availability of age data was (still) very limited, preventing an age-structured model.
The oldest fish was 67 years, collected in the 2000s; however, the oldest fish from the southern region was 48 years (collected between 2000 and 2009). Realizing this is a region-wide assessment, the RP wondered if the considerably younger maximum age information was a function of sample size in the southern range, or if that southern population indeed has a lower maximum age. This was relevant as it influences the estimate of natural mortality. The SAS indicated the relatively limited age data and fishery-independent source of aged fish was most likely the cause for the lower max. age. As this was a coastwide assessment, 67 years was selected as the maximum age for the entire population range. The RP agreed this was a reasonable assumption but highlighted the value of more comprehensive age data collection in the future.

The RP had considerable discussion on the SAS's growth modeling and the resulting Von Bertalanffy (VB) growth parameters used in the Jabba-select model. One of the RP's concerns was that the VB model did not seem to fit well to the individual data (Figure 21 in Appendix 1). The RP recommends including a refitting of the growth model in a future assessment. The RP also noted the sex-specific growth curves may have been statistically different, and perhaps treated as separate inputs in the modeling effort. However, given the generally large sample sizes in the length at age, small statistical differences may not represent a relevant "biological" difference. After some discussion the RP agreed with the SAS to combine the data for males and females in the growth model, but made recommendations for a future assessment (see also comments in JABBA-select model discussion below).

Natural mortality was estimated using the Then et al (2015) method. The SAS clarified that a subset of the Then et al data was not explored, in order to eliminate species with a life history different from Black Drum. The approach has been used in assessments of other species (e.g., Scamp, SEDAR 68). An age varying natural mortality (see Lorenzen 1996 and 2000, SEDAR 68, 2021, Lorenzen et al 2022, and Hamel and Cope, 2022) scaled to the Then estimate was explored by the SAS. However, the preferred JABBA model does not allow the use of an age varying M. The age varying mortality was included in the Stock Synthesis model, which was eventually not selected as a preferred assessment method.

Harvest

Black Drum harvest is dominated by recreational hook and line fisheries. [Add key areas.] The Review Panel asked if there was an attempt to estimate NC wave 1 MRIP numbers prior to 2005. This was not done because wave 1 numbers were generally very small with only a few years contributing more than 1% to the overall harvest.

The commercial harvest was obtained from the ACCSP data warehouse and State sources. Landings were appropriately characterized and documented. The commercial harvest is dominated by landings in Virginia, North Carolina, and Florida (Table 2 in ASMFC, 2022).

Discards and discard mortality

There was limited discard information available, and the RP asked if other methods for discards were investigated. The one data source for commercial fisheries (NC DMF Program 466) is from an area where a significant part of the commercial harvest occurs (Table 2 in ASMFC, 2022). Data for the recreational fisheries, comprising the majority of total harvest, originated from the coastwide MRIP survey information. As a result, other methods to investigate discards were not explored.

Dead discards were estimated using an 8% discard mortality across all fisheries, ages, and time periods. Although the actual overall Black Drum discard mortality is largely unknown, the RP found this estimate reasonable based on the available information, including the fact that Black Drum is a relatively “hardy” fish and is generally fished in shallow waters, possibly limiting barotrauma.

The increase in discards in the mid-2010s (Figure 19) is likely due to a change in regulations in North Carolina, where a significant part of the harvest occurs. The RP discussed the reason why a drop in recreational discards, but not in recreational harvest, occurred in 2019 and 2020 (e.g., Figure 19 of the Assessment Report). This drop may have been a result of reduced data collection during the COVID-19 pandemic or fishery regulations. However, all indications suggested the drop in discards did reflect fisher behavior in those years. The RP recommended that the trend in recreational discards relative to harvest should be monitored in future years.

Fishery-independent data sources and indices

The review of fishery-independent data sources was thorough and well documented in the Assessment Report. NEAMAP and state agency fishery-independent data sets were considered.

Sample sizes were too low for inclusion in any of the assessment models. The description of available indices and the choices for indices used in the various analyses was sufficiently detailed and justified.

The Georgia Trammel net index was not used in the base assessment model as its trends conflicted with trends from other indices. This could be because the population in Georgia is following a different pattern, or because of issues with the survey itself. The RP noted the Georgia index is based on number of fish per set. However, there was a change in the survey in 2007 that resulted in a 50% reduction in the trammel net length. A gear comparison study by GA DNR staff using Speckled Trout data indicated no difference in catchability between the nets used before and after the change in net length. However, as species behavior is likely different between Speckled Trout and Black Drum, there may have been a change in Drum catchability. This should be investigated further and may (partially) explain the apparent conflict between the GA index and other indices.

The only index used in the JABBA-select model was the MRIP index. The Assessment Report detailed the changes and calibration in the collection of recreational data, that is considered superior to previously collected data. The new method resulted in significant changes in recreational harvest and effort, and affected the continuity run of the DB-SRA model used in the previous assessment.

The RP noted that despite the improvements, recreational data still remain relatively uncertain, and are subject to management changes that may affect catchability. Regulations for other species may affect Black Drum harvest and catchability. For example, stricter regulations of other species may result in shifts toward targeting Black Drum.

The New Jersey Ocean Trawl Survey (see Figure 46 in Assessment Report) was used as an indication of range expansion only. The high variability in the time series was part of the reason the New Jersey Trawl was not used as an index or abundance.

Across survey data sets, variance was investigated in several ways. The SAS presented reasonable estimates of overall variability in the data. The inclusion or elimination of data sources was decided through in-depth analyses and the SAS thoroughly documented their decisions. The RP agreed with pertinent decisions by the SAS.

The RP agreed that all presented fishery-independent data streams, except the Georgia trammel net survey, are useful for tracking black drum populations.

2. Evaluate empirical indicators of stock abundance, stock characteristics, and fishery characteristics for their appropriateness to monitor the stock between assessments.

Fishery-independent data (indices of abundance) are generally the preferred source of information to monitor fish abundance and population trends. As no coastwide fishery-independent surveys are available for Black Drum at this time, trends in several existing surveys can be monitored for indications of changes to the population. Surveys in areas where the harvest

is largest should be considered especially informative for potential impacts of exploitation and other factors that may impact the Back Drum population.

Trends in recreational (MRIP) and commercial harvest, effort, and discards, in conjunction with management regulations, can provide information on both the exploitation pressure and potential population trends. Given the harvest is dominated by recreational fisheries and the MRIP index was used in the JABBA-select model in the assessment, monitoring of recreational data may be most beneficial.

Age information is an important interim data source and can be used as an indicator of potential recruitment pulses (year class strength) and overall changes in the population age structure. However, the RP realizes that age information may not always be readily available due to processing time of the samples.

3. Evaluate the methods and models used to estimate population parameters (e.g., F, biomass, abundance) and biological reference points.

Several models were presented for consideration in the Stock Assessment Report. Two data-poor methods were presented, both of which used catch and survey (MRIP CPUE index) data. The index data were used to determine either stock status (Skate) or relative stock health (Itarget), then both incorporated catch history to set catch advice. The iTarget and Skate models were thoroughly described, and choices made relative to data inputs and parameters were reasonable. The RP noted that iTarget-like methods are inherently oscillatory, as the population and survey will respond at a lag to management changes, and are predicated upon scientists' confidence in the input data sets. The RP suggested that future investigations of the iTarget method consider using the log-ratios of biomass (Plagyani et al, 2018) and carefully consider the length of the survey time period used (Carvalho et al, 2018). Both methods required a large amount of subjective decision making, such as the relative weight to place upon catch data. The RP agreed with the SAS's recommendation to reject both the iTarget and Skate models for use in stock status determination and management.

A depletion-based stock reduction analysis (DB-SRA) was presented as a continuity model, as this was the preferred model used in the previous Black Drum stock assessment. Based on available data and method development, two critical changes were made to the model: use of re-calibrated/estimated recreational harvest (see Assessment Report for a detailed description), and a change in the natural mortality based on the Then et al. method (see above). Both changes were appropriate and significantly improved the model.

The JABBA-Select model (Winker et al, 2020) was selected due to its ability to allow for the separation of observation and process error, to incorporate uncertainty through prior distributions on influential parameters, and to incorporate selectivity and life history attributes into the estimation of reference points. This latter point is what distinguishes JABBA-select from the previous (2015) assessment framework and is especially important, given the wide geographic range of black drum and the variation in length-based selectivity across fleets. The proportion of the population selected at length likely varies due to a combination of regulation (size minimums

vary across states), targeting (fishermen report targeting of sub-adults), and availability (preliminary tagging research suggests fish out-migrate from the Southern Atlantic as they reach maturity). The JABBA-select model was appropriately described.

The RP agreed with the SAS's recommendation to accept JABBA-select as the most appropriate model, given the data availability and inputs for use in stock status determination and management. The JABBA-select model, as expected, presented a superior representation of overall uncertainty and agreed with the DB-SRA model in terms of stock status.

The RP extensively discussed data inputs, parameter choices, priors, and other model specifics for the JABBA-Select model. The RP focused on three key considerations with respect to JABBA-Select model inputs and configuration: I) the estimation of the growth curve, II) the treatment of observation uncertainty in the MRIP CPUE index, and III) the specification of fishery fleets, particularly the definition of selectivity curves for each fleet.

The following sections summarize the chief concerns discussed during the Review, and important tasks to be revisited for the next assessment. To be clear, based upon the sensitivity analyses and discussions held during the review, we did not feel that any of these issues were alarming enough to require a change to the base model, with the exception of the Mid-Atlantic fleet disaggregation, described below. None of the sensitivity runs associated with these discussions resulted in changes to the *qualitative* stock status.

<u>Growth Curve Parameterization</u>

Parameters of the von Bertalanffy growth function (VBGF) were fit to data from the entire region, though these data were extensively filtered beforehand to remove outliers. Efforts to obtain accurate estimates of the uncertainty in the VBGF parameters when re-fitting the data to individual length-at-age data during the review were not successful. Based on a visual inspection of the data, the RP believes that a) it is plausible that there is not strong sexual dimorphism in length-at-age for Black Drum, supporting the continued use of a singular curve for the entire stock, and 2) there is likely more variability in length-at-age than is currently represented in the base model and its attendant sensitivities. The removal of outliers before VBGF estimation (done on a per-sex basis) might mask differences across space, and under-estimate the uncertainty of growth present in the population.

The RP requested that for future assessments, scientists perform the parameter estimation to a dataset of *individual* length-at-age observations by sex, without the extensive filtration (e.g., removal of outliers) and without the averaging steps described in Appendix 1 of the Assessment Report. First, it must be confirmed whether or not there is sexually significant dimorphism in length-at-age. See an example of comparing VB parameter estimates for significant differences in Kapur et al, 2020.

Regardless of the outcome, the authors must then determine whether and how to incorporate the attendant uncertainty in the length-at-age curve into their assessment. Because JABBA-Select can only use a single input growth curve, the authors could choose to run two additional sensitivity models using "high" and "low" growth scenarios, with these scenarios characterized by the 95% confidence interval around the predicted length-at-age. If the male and female curves

are quite distinct, authors could consider modifying the model inputs to a “female-only” model, with associated changes to weight-at-age, maturity-at-age, and input indices and catches.

This effort is important as the growth parameterization explicitly informs the conversion of fish lengths-at-age to weights, and therefore exploitable biomass. The impact of this uncertainty on the resultant reference points could not be evaluated within the scope of the review, and it is imperative it is addressed for the next assessment.

Note the RP's feedback is based on the understanding that the mean length-at-age data were used in the JABBA-select model. In addition to the methodological feedback, the RP recommends the SAS remove reference to the individual length-at-age parameter fits in the Stock Assessment Report.

Observation uncertainty in the MRIP CPUE index

The MRIP index, based on recreational harvest and effort data, was the only available coastwide index used in the model. The unscaled data were used to develop the CPUE time series, in numbers of fish per angler per hour. The SAS chose to provide the MRIP index as numbers, not biomass, to the JABBA-select model to avoid compounding the uncertainty in weight-at-age described above. The putative standard errors in the MRIP index were quite small, on the order of 0.063, likely due to the high number of angler intercepts that comprise the dataset. Based on work by Francis et al. (2003), the SAS decided to add an additional SE of 0.165 to bring the total input uncertainty in line with what is expected of fishery-dependent CPUE indices. The JABBA model estimated only minimal (<0.05) additional SE on top of this, and the fits to the survey, while statistically satisfactory, are generally flat, as is the process error curve. A sensitivity run with the additive SE of 0.165 removed suggested the model could indeed be more responsive to these input data, with better fits to the index, more variability in process error, and quantitative (but not qualitative) adjustments to terminal reference points. The JABBA model again estimated only minimal additional SE in this case, suggesting the large input SE of 0.165 is possibly too high. The RP recommends that assessors investigate alternative approaches to specifying the input SE for the index, as the assessment’s responsiveness to population trends is wholly dependent on the degree to which it must fit the signal in the CPUE data. One option is to use the square-root of the number of intercepts in the standardization process, to reduce the influence of the high number of data inputs.

Specification of Fishery Fleets and Selectivity Curves

Much discussion focused upon the use of the specified fishery fleets as proxies for geographic areas. This “areas-as-fleets” approach was not explicitly indicated in the report. The SAS stated that the partitioning of fleets into South and Mid-Atlantic, and the use of the inverse of the maturity curve as the descending limb of the selectivity curve for the South Atlantic, was chosen to mimic the hypothesis that fish emigrate from the South Atlantic upon maturity. Thus, the included fleet selectivity is a combination of gear selectivity and species availability, that are difficult to separate.

To be clear, the assumption of a closed stock structure for the extent of the assessed population is reasonable. However, possible recruitment from of the Gulf of Mexico as demonstrated in

other species (e.g., Karnauskas et al, 2022 for Red Snapper) may occur, and possibly contribute to uncertainty. The RP also noted that this issue is not unique to the JABBA-select model. The availability issue was discussed in the framework of Black Drum life history, including migration of various life stages to different habitats (see section 3.1.2 of the Assessment Report for details).

In the original base model, the Mid-Atlantic fleet was split into two components ('early' and 'late') corresponding to seasonal trends in availability to that fleet. The RP stated that this decision over-complicated, and could potentially bias, the model, as catches are modeled at a yearly time step. There is no reason to account for seasonal dynamics in availability. A sensitivity run showed that "collapsing" the MA fleet to a single fleet with a logistic selectivity curve had slight changes to the terminal reference points. The effects were not very large because the MA fleet accounts for a small amount of annual harvest, and the reference points in JABBA-select are weighted by fleet. The RP and SAS agreed to incorporate the change to a single MA fleet into a new base model, as this approach is more parsimonious (fewer parameters) and more in keeping with the model structure of a single year time step with no seasonal dynamics.

The original Assessment Report has a fairly sparse description of how the input selectivity curves were chosen. It appears that many parameters were specified by visual inspection of the data, or by using proxies for out-migration, such as the inverse of the maturity curve. The RP was not comfortable with these "eyeballed" approaches, particularly as the specified curves appeared to either disregard capture of small fish (in the case of the MA_Early fleet) or over-estimate availability of larger fish (SA_fleet). The RP asks that the authors formulate a more rigorous, defensible, and reproducible approach for defining selectivity curves for the next assessment. This is particularly important as the original JABBA-Select paper indicated that dome-shaped selectivity can induce bias up to 30% in derived quantities, when the underlying selectivity is in fact logistic.

A sensitivity analysis in which both SA fleets used logistic selectivity curves showed an expected, though not large, change in the harvest rate associated with maximum sustainable yield, H_{MSY}. This was particularly pronounced in years with strong recruitment pulses (e.g., 2008-2010), where the H_{MSY} was reduced compared to the base model, and the subsequent ratio (H/H_{MSY}) was therefore higher. For management, this means the specification of availability to the SA fleet has the potential to alter the perception of how exploited the stock is, particularly in years of high variability. The stock has not experienced strong variation over the time series, and is fairly long lived. Therefore, the RP does not feel this is of immediate concern to management, but is worth solidifying.

Potential approaches for revisiting selectivity include a quantile analysis, where catch-at-length data for given fleets are binned, and the inflection point of the ascending selectivity curve is the length below which 50% of the observed catches are found; optimization exercises, such a logistic regression, or nonlinear least-squares regression using the double-normal curve, to identify the parameterization of curves that best fit the observed lengths-at-capture; or a re-analysis of the tagging data, that would help elucidate potential movement rates at size (or age) amongst the modeled region. This last suggestion is a significant undertaking likely requiring a dedicated scientist, and should only be undertaken if scientists are confident that using the areas-as-fleets approach is indeed appropriate for the stock. It is worthwhile to consider the interaction between

gear selectivity, movement, and assessment selectivity (Waterhouse et al., 2014 and Hurtado-Ferro et al., 2014) as these decisions are made.

4. Evaluate the diagnostic analyses performed.

The various sensitivity runs provided information about the influence of parameter choice on model behavior and stock status, as well as explore "alternative states of nature". Several sensitivity runs included alternate selectivities for various fleets and a change in catchability in the MRIP index. These runs did not result in a significant change in biomass trend and qualitative stock status. Model explorations using sensitivity runs with different values for steepness (h) and natural mortality (M) resulted in the expected changes in the biomass and fishery trends, but also did not change the qualitative stock status.

The RP requested three additional sensitivity runs: 1) a run with the MA_early and MA_late fleets collapsed into a single fleet, with a logistic selectivity curve; 2) a run with no additive SE on the input MRIP CPUE index; 3) a run with logistic selectivity for the SA_early and SA_late fleets. The justification for these runs and results are described in more detail above.

Based upon results of the sensitivity runs, the SAS and RP agreed the base model should be modified to reflect the dis-aggregation of the MA_early and MA_late fleets as this approach is more parsimonious (fewer parameters) and more in keeping with the model structure of a single year time step with no seasonal dynamics. The observation error and SA selectivity issues will be addressed in subsequent assessments. Finally, the retrospective analysis in the JABBA-select model did not show a significant retrospective pattern and did not raise serious concerns.

5. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure the implications of uncertainty in technical conclusions are clearly stated.

Uncertainty was characterized by the use of the JABBA-Select framework that utilizes Bayesian statistics in the estimation of parameters and attendant confidence intervals; the investigation of various sensitivity runs that explored a limited number of data treatments and parameter values; and a retrospective analysis that explored the impact of recent years of data upon derived quantities. The RP was satisfied with the extent of the uncertainty characterization approaches. Discussions during the review highlighted that specification of the form and parameterization of the selectivity curve is likely the chief uncertainty, in terms of likely changes to management quantities.

6. Recommend best estimates of stock biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative estimation methods.

The RP agreed with the SAS that, given the available data, the JABBA-select model provides the best, most robust estimates for relative stock biomass and fishing mortality estimates, and is appropriate for use in management. The stock status determination using the JABBA-select model

generally agreed with the results from the updated DB-SRA model used in the previous assessment.

7. Evaluate the choice of reference points and the methods used to estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures.

The choice of reference points and the estimation method was appropriate given the data and assessment model choice. Using the recommended (new) JABBA-select base run, the median SB_{2020}/SB_{MSY} was 2.99, indicating the stock was not overfished in the terminal year of the stock assessment. The H_{2020}/H_{MSY} was 0.28, indicating the stock was not experiencing overfishing in the terminal year of the stock assessment.

The RP agrees with the SAS that the assessment is robust for biomass status (not overfished) and robust, but with a higher uncertainty, for exploitation status (not overfishing). The results of the assessment using the JABBA-select model are appropriate for use in management, but specific uncertainties as specified elsewhere in this report should be taking into account in terms of management risk. See also comments below in reference to future stock assessments.

8. Review the research, data collection, and assessment methodology recommendations provided by the Technical Committee and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

Several of the research recommendations listed in the previous assessment were, at least partially, addressed between the assessments (see Section 9: Research Recommendations in the Assessment Report). The available new information improved the current stock assessment.

The Assessment Report included several research recommendations in order of priority (Section 9). The RP agrees with the SAS's research recommendations, and advises to prioritize the following:

1) An increase in biological sampling in both the commercial and recreational fisheries. In particular, an increase in age samples representative of the coastwide population structure of Black Drum (> 1,000 age samples/year) would further strengthen the currently used assessment model, and potentially support an age-structured model. This is particularly important for areas and fisheries where biological information is relatively underrepresented. Age information can also be valuable as an important interim data source and may be used as an indicator of potential recruitment pulses (year class strength), and overall changes in the population age structure.

2) Only one coastwide index was available for the assessment. The development of additional fishery-independent indices of relative abundance would improve future assessments, especially if the indices are coastwide. Alternatively, calibrating various statewide fishery-independent indices could possibly provide a coastwide index. However, as the SAS indicated, it may be

impossible to develop such an index because of the differences in survey specifics. Furthermore, it is unlikely that surveys will be developed for Black Drum specifically. A multispecies survey could be designed with collecting Black Drum data in mind.

3) The available discard information was limited, contributing to uncertainty in the assessment. Collection of coastwide discard data, including biological data and discard mortality estimates, should be improved, especially in the recreational hook and line fishery. This is especially important given management regulations (size and bag restrictions) and because Black Drum is considered primarily a bycatch species in a multi-species fishery.

In addition, the RP recommended adding the following to the research recommendations:

1) An explanation for the reduction in large recruitment events should be investigated as it may affect the stock's resilience to harvest and other impacts on the population, including climate change and management. It may also affect the stock/recruit relationship.

2) More region-specific reproductive information, including fecundity estimates, possible age-varying spawning frequency and batch fecundity, and detailed spatial variability in length of the spawning season will improve future assessments.

3) Investigate the effect of the change in the Georgia trammel net survey methods (shortening of the net) on the catchability of Black Drum. The survey showed an abundance trend different from other surveys. It is unclear if this was a result of change in the survey or a different population trend in the Georgia region. The catchability was investigated for Speckled Trout, but not for Black Drum, that may have responded differently to the gear change.

9. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

Given the uncertainty in the model, the age structure, including a maximum reported age of 67 years, and current management of Black Drum, the RP agrees with the SAS's recommendation to conduct the next benchmark assessment in 5 years. The RP further agrees with annual monitoring of the population using the SAS proposed stock indicators, with a potential change in the assessment timing if stock indicators warrant such change.

10. Prepare a peer review panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.

The SAS completed the full analysis, including sensitivity runs and retrospective analysis, of the recommended base run in the weeks following the Review Workshop. The RP conducted a desk review of this base run and the associated analyses, and had no additional comments. The updated information is included in this final RP report.

ADVISORY REPORT

A. Biological Reference Points and Stock Status

The JABBA-Select model analyses provided terminal year spawning biomass and harvest relative to MSY based reference (SB_{2020}/SB_{MSY} and H_{2020}/H_{MSY}), as well as related uncertainty estimates. The Black Drum stock along the coast of the southeastern US is not overfished (SB_{2020}/SB_{MSY} =2.99), nor is overfishing occurring (H_{2020}/H_{MSY} = 0.28) in the terminal year (2020) of the assessment. The assessment was robust for overfished status, but exploitation status had a higher uncertainty. The population seems relatively stable in recent years given the various population trends, while the recreational harvest increased slightly overall.

B. Stock Identification, Distribution, and Management Unit

The Black Drum population off the southeastern US represents the northernmost part of the species' overall distribution. Given the available information, including genetic analyses, the stock is well defined and can be considered a closed stock. Note some limited exchange or recruitment from the Gulf of Mexico and Caribbean is likely. Given the available information on stock structure, a single, coast wide management unit for Black Drum from Florida to New Jersey is appropriate.

C. Landings

Black Drum is largely considered a bycatch fishery, but some directed effort occurs. Harvest in the area is dominated by recreational fisheries, in particular landings from the southern states (North Carolina to Florida). The commercial harvest is concentrated in Virginia, North Carolina, and Florida.

Given the stock status and the uncertainty thereof, recent trends in harvest and relative abundance indices, and the fact that this is largely a bycatch fishery, the RP concluded the recent harvest is likely sustainable. However, it is recommended that trends in harvest, abundance, as well as recruitment (lack of recent large recruitment events) should be monitored to ensure sustainability.

D. Data and Assessment

Black Drum off the southern coast of the US remains largely a data poor species. The available data for the assessment originated from the recreational and commercial fisheries (harvest, effort, discard, and limited biological data) and several fishery-independent surveys (abundance and biological data). Age and discard data were especially limited. As is common for stock assessments, additional information for parameter estimates, including discard mortality and natural mortality, came from other sources such as meta-analyses and related species.

Several models suitable for the available data were explored. The iTarget, Skate, and the Stock Synthesis models were rejected, and the JABBA-select model was deemed most appropriate and robust for stock status determination and management recommendations. The DB-SRA model

used in the previous assessment was applied for continuity, but with two significant updates: 1) use of re-calibrated/estimated recreational harvest, and 2) a change in the natural mortality based on the Then et al. method (see TOR 2). Both changes were appropriate and significantly improved the model.

The Review Panel recommended a JABBA-Select base run with combined Mid-Atlantic fleets was the most robust and appropriate for stock status determination. This base run was different than recommended in the Assessment Report and did not result in a change in the overall stock status.

E. Fishing Mortality

Fishing mortality remained relatively stable in recent years. The stock assessment indicated the stock is not undergoing overfishing, but with some uncertainty in that estimate. Harvest and bycatch trends should be monitored for changes in harvest patterns.

F. Recruitment

Black Drum is a fast-growing species with an early maturity, a long life-span (max. age of 67 years), and high life-time fecundity. Drum life-history may result in a relatively modest, but not to be disregarded, susceptibility to overexploitation. However, less frequent large recruitment events in the Mid-Atlantic have been observed in the last decade. Generally, these periodic strong year-classes provide resilience to exploitation and it is recommended that recruitment patterns should be monitored in future years.

Although there are no strong indications of consistent low recent recruitment in Black Drum, the RP mentioned that recent SEDAR stock assessments have noted several species in the region with observed recruitment failures (e.g., Red Grouper, Red Porgy, and Scamp). It has been suggested that changes in the environment may have resulted in a possible regime shift in various species. Timing of reproduction may be an important factor in species vulnerability.

G. Spawning Stock Biomass

The spawning stock biomass remained relatively stable in recent years and the stock assessment indicated with relatively high certainty the stock was not overfished. However, trends should be monitored for changes in the spawning stock biomass.

H. Bycatch

There is limited discard information available for Black Drum. The one data source for commercial fisheries (NC DMF Program 466) is from an area where a significant part of the commercial harvest occurs. The data for the recreational fisheries originated from the coastwide MRIP information. The dead discards were estimated using an 8% discard mortality across all fisheries, ages, and time periods. Although the actual overall Black Drum discard mortality is largely unknown, this seems to be a reasonable estimate based on the available information, including the fact that Black Drum is a relatively “hardy” fish and is fished in relatively shallow waters, possibly limiting barotrauma. A drop in recreational discards, but not in recreational harvest in

2019 and 2020 was noted and may have been a result of data collection during the COVID-19 pandemic and fisheries management. However, all indications suggested the drop in discards did reflect fisher behavior in those years.

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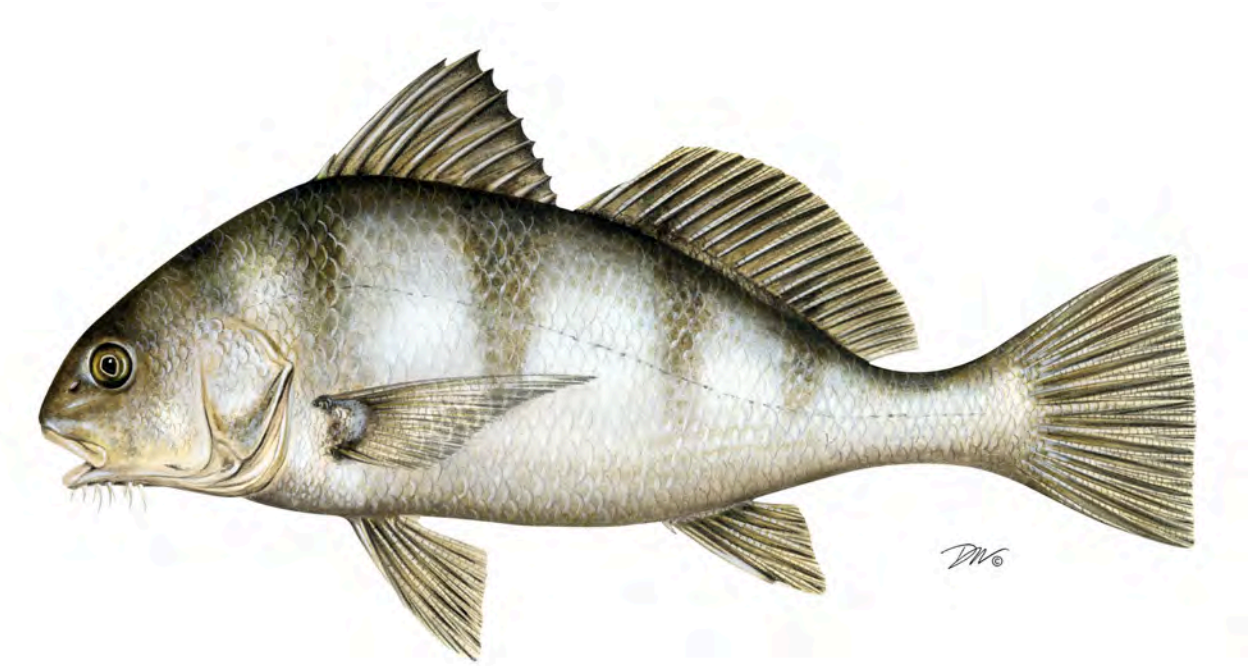
Atlantic States Marine Fisheries Commission

2023 Black Drum Benchmark Stock Assessment Report



Prepared by the
Black Dum Stock Assessment Subcommittee

May 1, 2023

EXECUTIVE SUMMARY

The black drum (*Pogonias cromis*) is the largest member of the family Sciaenidae found along the Atlantic coast of the United States. They are common from the Mid-Atlantic region to the Gulf of Mexico, but considered rare north of Delaware Bay. Adult black drum make long migrations along the U.S. Atlantic coast north/inshore in the spring and south/offshore in the fall, while juvenile black drum are more sedentary. Black drum have an unusual combination of life history characteristics as they grow quickly and are relatively long-lived. Unlike most other long-lived species, black drum are sexually mature at a relatively young age and can spawn millions of eggs annually. Multiple lines of evidence suggest that black drum on the U.S. Atlantic coast are from a common stock.

Fisheries are primarily recreational, while smaller-scale harvest in commercial fisheries occurs primarily north of South Carolina. Regionally, the majority of fishery removals have come from the South Atlantic. Mid-Atlantic removals have been variable and were largest in 2008 and 2009 when they were nearly the same magnitude (in pounds) as in the South Atlantic. Within the Mid-Atlantic, most removals have come from the period most closely associated with the spawning adult migration earlier in the year (January-August), while a smaller component has come later in the year (September-December) when primarily age-0 and age-1 fish are available to the fishery.

No coastwide management program, whether among the states or at the federal level, existed for black drum on the Atlantic coast prior to the development of the Interstate Fishery Management Plan (FMP) in 2013. In 2013, the Commission adopted the Interstate FMP for black drum, which requires all states to implement a maximum possession limit and a minimum size limit of no less than 14 inches in addition to maintaining their previous regulations. Further, the FMP establishes a management framework to adaptively respond to future concerns or changes in the fishery or population.

The first coastwide stock assessment of black drum on the Atlantic coast was completed in 2015. Depletion-Based Stock Reduction Analysis (DB-SRA) was used to provide management advice. DB-SRA was developed as a data-poor method using a fishery removal time series to estimate sustainable catch levels according to maximum sustainable yield (*MSY*)-based reference points and annual population dynamics parameters including exploitable biomass and exploitation. The stock was determined not to be overfished nor experiencing overfishing. Given DB-SRA was developed primarily to generate sustainable catch levels, this status determination was made based on several lines of evidence including the results of DB-SRA, black drum life history characteristics, vulnerability to fisheries, empirical trends from indices of abundance, and the harvest history.

This first assessment was being conducted as the FMP was implemented and the assessment data time series included a terminal year of 2012, so effects of regulations required by the FMP, most notably the first regulations in North Carolina (2014), a primary contributor of black drum catch, were not assessed during the assessment. Another notable development since this first

assessment was the redesign of effort surveys used to estimate recreational catch of black drum which led to significant increases in estimates during years before and after the assessment. This change was anticipated to change the scale of biomass and reference point estimates making the previous assessment estimates incompatible with updated recreational catch estimates.

There have been improvements in age and size composition sampling in recent years since the first assessment, but there remain limitations that preclude coastwide composition data for harvested black drum. Overall, it's clear the South Atlantic is better sampled for composition data than the Mid-Atlantic. Discard size and age composition data also remain a major data limitation for black drum assessment.

Indices of black drum abundance from several fishery-independent surveys along the coast were considered in this current assessment, mostly tracking young-of-year and sub-adult black drum abundance. Additionally, one fishery-dependent time series of catch-per-unit-effort (CPUE) was developed from recreational fishery data covering all exploitable sizes.

Empirical stock indicators were developed as part of this current stock assessment that can be monitored annually between stock assessments. These indicators included five indicators of year class strength, two indicators of multiple sub-adult age class abundances, one indicator of exploitable abundance, one indicator of range expansion, and six indicators of fishery characteristics (regional catch time series).

Empirical indicators show increased fishery removals in the last twenty years and less frequent large recruitment events in the Mid-Atlantic in the last ten years. There are no clear indications of a declining trend in recruitment or exploitable abundance from abundance indicators, with the exception of the anomalous GA trammel index, but there is a declining trend in the final two years of the recreational discard time series that may be reflective of abundance in addition to other factors. There is some indication of northern range expansion. Overall, stock indicators do not appear negative at this time, but should be monitored closely for any sign of change.

This assessment also transitioned from DB-SRA used during the first assessment to an age-structured production type model (JABBA-Select) that incorporates total fishery removal data as well as an index of relative abundance. The recreational CPUE was used as the index of abundance as it includes data on the full, exploitable age range from the entire coast.

Spawning biomass (*SB*) was estimated to increase throughout the assessment time series (1982-2020), though there were wide credible intervals indicating high uncertainty in absolute biomass estimates. Relative biomass was estimated with more certainty. Exploitation generally follows the removal time series with higher exploitation estimated during the mid-1980s and since 2000. Credible intervals of relative exploitation are also quite wide. Most of the intervals through time indicate exploitation less than the harvest rate associated with *MSY* (H_{MSYy}), but there is some low probability of exploitation exceeding H_{MSYy} during the higher exploitation years.

Overfished is defined as spawning biomass falling below spawning biomass associated with *MSY* (i.e., $SB_y/SB_{MSY} < 1$). The 2020 median relative spawning biomass estimated with the final base model was 2.99, indicating the stock was not overfished in the terminal year of the stock assessment. Overfishing is defined as exploitation exceeding exploitation associated with *MSY* (i.e., $H_y/H_{MSYy} > 1$). The 2020 median relative exploitation estimated with the final base model was 0.28 indicating the stock was not experiencing overfishing in the terminal year of the stock assessment.

Results indicate greater certainty that the stock has not been depleted to an overfished status in the terminal year of the assessment, while there is less certainty about the exploitation status. All of the 95% credible interval for the SB_{2020}/SB_{MSY} estimate is above the overfished threshold, while 2020 exploitation shows some low probability of exceeding the H_{MSY} threshold. This low risk of overfishing according to the credible intervals extends back for much of the last twenty years of the time series. A sensitivity analysis included results of several alternative model configurations to assess impact of key assumptions and uncertainties on base model estimates. Stock status estimates from all alternative model configurations are consistent with final base model estimates through time.

In addition to generally high uncertainty in model estimates, there is additional uncertainty due to data limitations. The one-way trip increasing trend in both removals and the recreational CPUE for the assessment time period may indicate that the stock either had been lightly exploited in the 1980s, which has allowed for the recent increase in exploitation of the predicted high biomass, or was overfished and rebuilding throughout the assessment time series. The latter scenario is contrary to the TC's expert opinion that the stock was not overfished at the beginning of the time period, and there were minimal regulation changes aimed specifically at black drum in the 1980s to induce a rebuilding period. However, it is also possible that recruitment overfishing is occurring or could begin to occur prior to detection with currently available data, due to sub-adult black drum accounting for the majority of removals and the lack of an index that solely tracks mature biomass. With over 30 cohorts contributing to *SSB*, recruitment overfishing may not be evident within current data streams for an extended number of years, leading to an overfished state being reached prior to removals and the recreational CPUE index indicating a sustained downward trend. The TC concurs with the model-derived stock status but acknowledges the lack of contrast in both removals and the recreational CPUE coupled with model uncertainty will require close monitoring of stock indicators and a more conservative approach to managing the fishery.

The TC recommends that a new benchmark stock assessment be completed for the black drum stock in five years (2027). However, the TC also recommends annually reviewing the stock indicators established in this assessment updated with new data to identify any concerning trends in a timely manner. Should any concerning trends occur, the TC may recommend an expedited assessment to be completed before 2027.

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TERMS OF REFERENCE

For the 2023 ASMFC Black Drum Benchmark Stock Assessment

Board Approved [October 2021]

Terms of Reference for the Black Drum Assessment

1. **Characterize precision and accuracy of fishery-dependent and fishery-independent data used in the assessment, including the following but not limited to:**
    a. **Provide descriptions of each data source (e.g., geographic location, sampling methodology, potential explanation for outlying or anomalous data).**
    b. **Describe calculation and potential standardization of abundance indices.**
    c. **Discuss trends and associated estimates of uncertainty (e.g., standard errors).**
    d. **Justify inclusion or elimination of available data sources.**

2. **Discuss the effects of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, aging accuracy, sample size) on model inputs and outputs.**

3. **Review estimates and PSEs of MRIP recreational fishing estimates. Request participation of MRIP staff in the data workshop process to compare historical and current data collection and estimation procedures and to describe data caveats that may affect the assessment.**

4. **Identify and develop simple, empirical indicators of stock abundance, stock characteristics, and fishery characteristics that can be monitored annually between stock assessments.**

5. **Develop models used to estimate population parameters (e.g., *F*, biomass, abundance) and biological reference points, and analyze model performance.**
    a. **Describe stability of model (e.g., ability to find a stable solution, invert Hessian).**
    b. **Justify choice of CVs, effective sample sizes, or likelihood weighting schemes.**
    c. **Perform sensitivity analyses for starting parameter values, priors, etc. and conduct other model diagnostics as necessary.**
    d. **Clearly and thoroughly explain model strengths and limitations.**
    e. **Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature. If using a new model, test using simulated data.**
    f. **If multiple models were considered, justify the choice of preferred model and the explanation of any differences in results among models.**

6. **State assumptions made for all models and explain the likely effects of assumption violations on synthesis of input data and model outputs. Examples of assumptions may include (but are not limited to):**
    a. **Choice of stock-recruitment function.**
    b. **No error in the catch-at-age or catch-at-length matrix.**
    c. **Calculation of *M*. Choice to use (or estimate) constant or time-varying *M* and catchability.**
    d. **Choice of equilibrium reference points or proxies for MSY-based reference points.**
    e. **Choice of a plus group for age-structured species.**
    f. **Constant ecosystem (abiotic and trophic) conditions.**

7. **Characterize uncertainty of model estimates and biological or empirical reference points.**

8. **Perform retrospective analyses, assess magnitude and direction of retrospective patterns detected, and discuss implications of any observed retrospective pattern for uncertainty in population parameters (e.g., *F*, *SSB*), reference points, and/or management measures.**

9. **Recommend stock status as related to reference points (if available). For example:**
    a. **Is the stock below the biomass threshold?**
    b. **Is *F* above the threshold?**

10. **Other potential scientific issues:**
    a. **Compare trends in population parameters and reference points with current and proposed modeling approaches. If outcomes differ, discuss potential causes of observed discrepancies.**
    b. **Compare reference points derived in this assessment with what is known about the general life history of the exploited stock. Explain any inconsistencies.**

11. **If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.**

12. **Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by next benchmark review.**

13. **Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species**

1 INTRODUCTION

1.1 Management Unit Definition

The management unit for black drum (*Pogonias cromis*) under the Atlantic States Marine Fisheries Commission's (ASMFC or Commission) Interstate Fishery Management Plan (FMP; ASMFC 2013) is defined as the range of the species within U.S. waters of the northwest Atlantic Ocean from the estuaries eastward to the offshore boundaries of the Exclusive Economic Zone (EEZ). The selection of this management unit is based on the distribution of the species along the Atlantic coast, as noted in tagging studies from Maryland, Virginia, South Carolina, and Georgia, and historical harvest patterns that have identified fisheries for black drum from Florida north through New Jersey.

1.2 Regulatory History

1.2.1 Interstate Management

No coastwide management program, whether among the states or at the federal level, existed for black drum on the Atlantic coast prior to the development of the Interstate FMP in 2013. In 2013, the Commission adopted the Interstate FMP for black drum, which requires all states to implement a maximum possession limit and a minimum size limit of no less than 14 inches in addition to maintaining their previous regulations. Further, the FMP establishes a management framework to adaptively respond to future concerns or changes in the fishery or population.

In March 2017, a report on Sciaenid Fish Habitat (Odell et al. 2017) was released, which included information on habitat for several species, including black drum, during all stages of their lives, their associated Essential Fish Habitats and Habitat Areas of Particular Concern, threats and uncertainties to their habitats, and recommendations for habitat management and research. This report is meant to be a resource when amending FMPs in the future for these species.

The Board approved Addendum I to the black drum FMP in May 2018. The addendum allows Maryland to reopen its black drum commercial fishery in the Chesapeake Bay with a daily vessel limit of up to 10 fish and a 28-inch minimum size. Maryland reopened this fishery in February 2019.

1.2.2 State Management

At this time, eight states and one additional jurisdiction (Potomac River Fisheries Commission, PRFC) have implemented harvest regulations for black drum (Table 1).

New Jersey: New Jersey has a 10,000-pound commercial trip limit with a 65,000 pound annual quota. There is a 16-inch total length (TL) minimum size limit for both the recreational and commercial fisheries, and recreational anglers are allowed three fish per person per day. These regulations have been in effect since 2001

Delaware: Delaware entered a joint management plan for black drum in Delaware Bay with the state of New Jersey in March 2010. This bi-state FMP established the same recreational size and bag limits (16-inch TL minimum size limit and three fish per person per day) and commercial quota (65,000 pound annual quota) as New Jersey for the shared waters of the Delaware Bay and River. Upon adoption of the ASMFC Interstate FMP for black drum, these regulations were extended to all Delaware waters.

Maryland: In 1994, Maryland implemented a 16-inch TL minimum size limit for both the commercial and recreational fisheries, with a recreational bag limit of one fish per person per day. Commercial harvesters had a 30,000 pound annual quota in Chesapeake Bay. Beginning in 1999, a six fish possession limit per boat was implemented for the recreational fishery in Chesapeake Bay. In addition, the Chesapeake Bay and coastal bays closed to commercial fishing for black drum. In the Atlantic Ocean, an annual total allowable landings (TAL) of 1,500 pounds was implemented for the commercial fishery. Beginning in 2019, the commercial fishery in Chesapeake Bay reopened (the coastal bays remained closed), with a minimum size limit of 28 inches TL and a daily catch and possession limit of ten black drum per vessel per day, regardless of the number of commercial licensees on board. The Atlantic Ocean annual TAL remained 1,500 pounds, with a 16-inch minimum size limit. The recreational fishery continues to have a one fish per person per day and a six fish per boat per day daily catch limit.

Potomac River Fisheries Commission: The Potomac River Fisheries Commission implemented a one fish per person per day bag limit and a 16-inch TL minimum size limit for both recreational and commercial fisheries in the Potomac River in 1993.

Virginia: The minimum size limit for black drum in Virginia's commercial and recreational fisheries has been 16 inches TL since 1987. In 1992, a one fish possession limit (recreational and commercial) per person per day was established for anyone using hook and line, rod and reel, or hand line. The commercial Black Drum Harvesting and Selling permit was created in 1987. This permit is required to land more than one black drum per day for commercial purposes. Until 1993, any harvester was able to obtain a permit, but by 1993 harvesters were required to be a registered commercial harvester to obtain the Black Drum Harvesting and Selling permit. In 1994, the issuance of the Harvesting and Selling permit became dependent on previous permit and documentation of harvest requirements for the 1988-1993 period to limit entry into the commercial black drum fishery. In addition, any harvester active in 1992 or 1993 was required to have reported that activity in order to maintain a permit in 1994. Since 2002, the annual commercial quota has been 120,000 pounds in order to cap landings.

North Carolina: North Carolina black drum regulations have been in effect since 2014. There is a commercial and recreational slot limit of 14-25 inches TL, with an allowance of one black drum over 25 inches TL. Recreational anglers are allowed ten fish per person per day. Commercial harvesters have a 500 pounds trip limit.

South Carolina: Regulations in South Carolina have been in place since 2007. South Carolina has a recreational and commercial slot limit of 14-27 inches TL and a possession limit of five fish per person per day.

Georgia: Georgia first enacted black drum regulations in 1998, with a 10 inch TL minimum size limit and a bag limit of fifteen fish per person per day for both the commercial and recreational fisheries. In 2014, the minimum size limit was raised to 14 inches TL.

Florida: Black drum regulations have been in place in Florida since 1989. Florida has a 14-24 inch TL slot limit for both the recreational and commercial fisheries, with one fish larger than 24 inches allowed for recreational anglers. There is a five fish per person per day bag limit for recreational anglers. The commercial fishery has a 500 pounds per day per person or vessel (whichever is lesser) trip limit. In 1995, gill nets and all other entangling gear were banned from use in Florida waters.

1.3 Assessment History

Prior to 2015, the only stock assessments conducted on Atlantic coast black drum were two assessments conducted at the state/regional level. The first was conducted on black drum in Florida waters (Murphy and Muller 1995) and utilized CPUE data, landings data, and state surveys. Both catch per commercial trip and number of black drum kept by recreational anglers showed decreases after 1989. Florida black drum condition appeared favorable due in part to a combination of very conservative fishing mortality (*F*) estimates, new regulations, and recent high recruitment events. The second assessment was conducted on black drum in the Chesapeake Bay (Jones and Wells 2001) and evaluated yield-per-recruit estimates under different potential mortality rates from catch curve analysis (total mortality, *Z*) and maximum age (natural mortality, *M*) and mean age-at-capture. Estimates of current *F* (*Z*-*M*) were determined to be lower than *F* that maximizes yield (F_{max}). In turn, overfishing, specifically growth overfishing, was determined unlikely under fishing practices in the Chesapeake Bay at the time.

The most recent stock assessment was completed in 2015 and was also the first coastwide stock assessment of the Atlantic coast black drum population (ASMFC 2015). This assessment relied heavily on the observed fishery removal time series and data-poor, catch-based biomass dynamics assessment approaches. Approaches used included Catch-MSY, Depletion-Corrected Average Catch (DCAC), and Depletion-Based Stock Reduction Analysis (DB-SRA). Per-recruit analyses were also conducted to estimate reference points from available life history information, but no independent, age-structured estimate of fishing mortality was available to compare to reference points.

Ultimately, DB-SRA (Dick and MacCall 2011) was selected as the preferred method to provide management advice. DB-SRA was developed as a data-poor method to estimate sustainable catch levels according to maximum sustainable yield (*MSY*)-based reference points and annual population dynamics parameters including exploitable biomass and exploitation. The analysis uses a Pella-Tomlinson surplus production model to estimate stock carrying capacity (*K*) necessary to have sustained an observed time series of fishery removals resulting in recent relative stock biomass levels. Distributions of four leading parameters are specified typically based on existing information on the assessed species, meta-analysis of multiple species, and/or expert opinion. Leading parameters include *M*, the ratio of fishing mortality associated

with *MSY* and natural mortality (F_{MSY}/M), the ratio of biomass associated with *MSY* and *K* (B_{MSY}/K), and the ratio of biomass in a recent year and *K* (i.e., depletion, B_y/K). The analyzed time series is assumed to start at the beginning of the fishery so that biomass in the first year is at carrying capacity.

The analysis implements Monte Carlo simulation to iteratively sample the leading parameter distributions and project the surplus production model forward to solve for carrying capacity given the sampled leading parameters and observed fishery removal time series. Parameter draws from iterations that don't match the sampled depletion level to a certain tolerance are rejected while those that do are retained to characterize distributions of final parameter estimates including biomass and exploitation associated with *MSY* (B_{MSY}, U_{MSY}).

A fishery removal time series including recreational harvest, recreational dead discards, and commercial landings from 1900-2012 was used in the analysis. *M* was estimated from maximum observed age, while F_{MSY}/M and B_{MSY}/K were specified according to published meta-analyses. Depletion in the assessment terminal year of 2012 (B_{2012}/K) was specified based on expert opinion from an understanding of the historical development of the black drum fishery that the stock had not been overfished while also recognizing that some depletion had taken place through observed fishery removals (uniform distribution bounded by 0.5 and 0.9).

Being a data-poor, simplistic approach intended as a stop-gap analysis until sufficient data become available to apply more data-rich methods, there are several notable limitations of the analysis. The reference point estimates are largely dependent on and sensitive to the prior information, particularly for depletion (Wetzel and Punt 2011, ASMFC 2015). The analysis does not incorporate any process error and the stock is assumed not to deviate from the deterministic production dynamics. A drawback of this analysis is the requirement to start at an unfished state, requiring the assumption about when this occurred and the use of highly uncertain data during the early years of the time series. As a production-based method, the assumptions of standard production models apply (constant productivity parameters, no lag between productivity and recruitment). The stock is analyzed as a lumped biomass resulting in potential biases if the age structure or fishery characteristics (i.e., selectivity) change during the time series.

The median B_{MSY} was estimated as 47.26 million pounds, while the median biomass in 2012 (B_{2012}) was estimated to be greater at 90.78 million pounds. The median carrying capacity estimate was 135.20 million pounds and median depletion in 2012 was estimated to be 0.70. Median U_{MSY} was estimated as 0.046 while median 2012 exploitation (U_{2012}) was estimated to be lower at 0.013. The terminal year overfishing limit (*OFL*; $U_{MSY}*B_{2012}$) was treated as a catch threshold to acknowledge uncertainty in the analysis and provide a precautionary reference point given it would be greater than *MSY* for a stock specified as not overfished. The median *OFL* was estimated to be 4.12 million pounds, greater than the observed removals in 2012 (1.09 million pounds). *MSY* ($B_{MSY}*U_{MSY}$) was treated as a catch target and the median DB-SRA estimate was 2.12 million pounds. The observed removals exceeded this catch target during

three years of the time series (2000, 2008, 2009), but were below this target in the terminal year.

The stock was determined not to be overfished nor experiencing overfishing. Given methods used in the assessment were developed primarily to generate sustainable catch levels, this status determination was made based on several lines of evidence including the results of DB-SRA, black drum life history characteristics, vulnerability to fisheries, empirical trends from indices of abundance, and the harvest history. Due to the optimistic status determinations, the ASMFC Black Drum Technical Committee (TC) recommended the next assessment be conducted in five years and provided the following high priority research recommendations, ideally to be addressed before the next assessment so more advanced methods could be applied to estimate stock status:

- Age otoliths that have been collected and archived.
- Collect information to characterize the size composition of fish discarded in recreational fisheries.
- Collect information on the magnitude and sizes of commercial discards. Obtain better estimates of bycatch of black drum in other fisheries, especially juvenile fish in South Atlantic states.
- Increase biological sampling in commercial fisheries to better characterize the size and age composition of commercial fisheries by state and gear.
- Increase biological sampling in recreational fisheries to better characterize the size and age composition by state and wave.
- Obtain estimates of selectivity-at-age for commercial fisheries by gear, recreational harvest, and recreational discards.
- Continue all current fishery-independent surveys and collect biological samples for black drum on all surveys.
- Develop fishery-independent adult surveys. Consider long line and purse seine surveys. Collect age samples, especially in states where maximum size regulations preclude the collection of adequate adult ages.

An external Peer Review Panel concurred with the results of the assessment and provided a few additional recommendations to consider for future assessments:

- Develop a protocol to alert the SAS to any major changes in harvest and *F* that could trigger a reassessment of the reference points similar to the ‘rumble strips’ approach developed by the Mid-Atlantic Fishery Management Council (MAFMC) for data-poor stocks.

- Increase age sampling along the coast. Juvenescence of the population is a good indicator of overfishing, and the availability of age data is crucial to being alerted to such changes in age structure.

- Indices, such as the South Carolina trammel net survey, could be used directly in an extended version of DB-SRA. The implementation of xDB-SRA could instead specify stock status at an earlier time period, thus allowing the most recent catches to inform population dynamics and thus stock status.

This assessment was being conducted as the FMP was implemented (2013) and the assessment data time series included a terminal year of 2012, so effects of regulations required by the FMP, most notably the first regulations in North Carolina (2014), a primary contributor of black drum catch, were not assessed during the assessment. Another notable development since this assessment was the redesign of effort surveys used to estimate recreational catch of black drum which led to significant increases in estimates during years before and after the assessment (Section 4.2.1). This change was anticipated to change the scale of biomass and reference point estimates making the previous assessment estimates incompatible with updated recreational catch estimates.

The TC met two times since the 2015 stock assessment to review updated data sets and determine need for a new stock assessment, a less formal but similar process to the 'rumble strips' approach recommended by the Peer Review Panel. The first meeting occurred in June 2019, the year before the five year recommended timeframe for the next assessment. No concerning trends were identified in available data sets and the TC recommended the assessment be postponed for at least three years, with the TC meeting a second time to consider initiating a benchmark stock assessment which would allow inclusion of new data sets and assessment methodologies.

During the 2020 FMP Review process, the Black Drum Plan Review Team (PRT) recommended the Sciaenid Management Board consider the use of a Traffic Light Analysis (TLA) to evaluate stock status in the absence of an updated stock assessment. The TLA is currently used to monitor other Sciaenid species (spot, Atlantic croaker) for potential management intervention.

The second TC meeting occurred in 2021 with the added consideration of whether the next evaluation of the black drum stock should be through a benchmark assessment or a TLA. The TC recommended initiating a benchmark stock assessment with an added component focused on development of a 'rumble strip' approach that would be easily applied, take minimal time to complete, and be reviewed annually in some formal process or structure, but not necessary to trigger any predefined action (as the TLA path would). Term of reference (TOR) 4 was included in this assessment to address this recommendation. Work could be done to extend the 'rumble strip' approach developed in this assessment to include management triggers in a TLA framework following the assessment if deemed necessary. The TC noted data remain limited and that data-poor assessment approaches would likely continue as the basis of management advice from the next assessment. The developments since the 2015 assessment discussed previously (implementation of the FMP and response by the stock, recreational catch estimate

changes) as well as potential for fishing effort shifting towards black drum due to recent regulations for other species (e.g., southern flounder) were topics discussed during both TC meetings.

2 LIFE HISTORY

The black drum is the largest member of the family Sciaenidae found along the Atlantic coast of the United States. Black drum range from Argentina to New England with infrequent reports as far north as Canada (Bleakney 1963). They are common from the Mid-Atlantic region to the Gulf of Mexico but considered rare north of Delaware Bay (Murdy et al. 1997). Black drum have an unusual combination of life history characteristics as they grow quickly and are relatively long-lived. Unlike most other long-lived species, black drum are sexually mature at a relatively young age and can spawn millions of eggs annually.

2.1 Stock Definitions

Multiple lines of evidence suggest that black drum on the U.S. Atlantic coast are from a common stock and have been summarized by Jones and Wells (1998). However, black drum form at least three distinct populations in the waters of the U.S., one encompassing the entire Atlantic coast of the U.S. and two in the Gulf of Mexico (Gold and Richardson 1998). More recent evidence using nuclear microsatellite markers indicates genetically distinct populations in the Gulf of Mexico and the Atlantic coast of the U.S. (Leidig 2014). Leidig (2014) found that along the U.S. Atlantic coast, there appears to be weak, but significant, genetic divergence among southern states, specifically between the Carolinas and Florida. An isolation-by-distance pattern was also observed from North Carolina to Florida. On a larger scale, results suggest lack of genetic divergence between Delaware and Virginia and the southern states, which may be influenced by the migratory aspect of life history patterns of black drum. This supports the management of black drum as one unified stock along the U.S. Atlantic coast and indicated the need for common management regulations among Atlantic states. Growth parameters are nearly identical for black drum captured in Florida, Virginia, and Delaware suggesting growth within populations may not vary significantly by latitude despite small differences. Tagging data has shown that large adults move from Florida to the Chesapeake Bay indicating mixing within the Atlantic coast stock (Murphy et al. 1998).

2.2 Migration Patterns

Adult black drum along the U.S. Atlantic coast make long migrations north/inshore in the spring and south/offshore in the fall. Juvenile black drum in the southeast U.S. and Gulf of Mexico appear to be more sedentary compared to the northeastern U.S., as many researchers have reported little movement of tagged fish from release sites (Music and Pafford 1984; Beaumariage and Wittich 1966; Simmons and Breuer 1962). Osburn and Matlock (1984) suggested managing Texas bays as “closed systems” for black drum due to substantial intra-bay movement and little (<14% of all tag returns) inter-bay movement. However, there is believed to be a significant proportion of adult fish that migrate extensively along the Atlantic coast. Two fish tagged in Florida in February were recaptured in the Chesapeake Bay by recreational

anglers in May and June of the same year, nearly 1,370 kilometers away (Murphy et al. 1998). Mass emigration of young-of-the-year (YOY) has been documented in Delaware Bay (Thomas and Smith 1973) and the Chesapeake Bay (Frisbie 1961) in the fall. Northward movement of adults in the spring has been attributed to a spawning migration, as it coincides with peak spawning along the Atlantic coast (Murphy et. al. 1998). Adults and juveniles have also been shown to move back and forth between areas with greater food abundances from marine protected areas as well as migrating longer distances along the Atlantic coast (Reyier et al. 2020). While black drum are known to migrate substantial distances along the eastern U.S., the amount of time spent in transport is likely low as one individual moved 229 km in five days in Virginia (Lucy and Bain 2003).

2.3 Age and Growth

Researchers have looked at various hard parts to age adult black drum. Scales have been found to be inaccurate and imprecise when ageing black drum greater than ten years of age (Richards 1973). Instead, thin sections of otoliths processed by a low speed IsoMet™ saw are the most accurate, precise, and discernible hard parts to interpret. Between-reader precision for otolith thin sections was 100% versus 27.3% for dorsal spines and 47.4% for fin rays (Jones and Wells 1998). Black drum otolith age has been validated indirectly through intra-year progression of annulus formation (Beckman et al. 1990), directly by mark-recapture studies (Murphy et al. 1998), and by radiocarbon dating (Campana and Jones 1998). Black drum age data available for the assessment are summarized in Table 2. Maximum age has been reported at 67 years old (Virginia Marine Resources Commission 2013, personal communication).

Black drum are generally considered long-lived and fast growing as they have been reported to obtain 80% of their growth potential over 20% of their life span (Jones and Wells 1998). The International Game Fish Association all-tackle world record weighed 51.36 kilograms (IGFA 2008) while the largest individual ever captured was 66.22 kilograms (Thomas 1971). Black drum exhibit similar growth rates along the Atlantic coast of the U.S. although some geographic variation in growth rate has been documented between fish in northeast Florida and Virginia (Bobko 1991). While growth in warmwater estuaries has been shown to be influenced by environmental factors (Olsen 2019), variation in growth between studies along the Atlantic coast may be more attributable to differences in spatial and temporal scale of sampling (Murphy and Taylor 1989; Bobko 1991). As reported in Bobko (1991), average length and weight of fish in Murphy and Taylor's 1989 study from Florida were significantly different from the average length and weight of Virginia fish. A small proportion (>12%) of Murphy and Taylor's sample were greater than 75 cm while Bobko did not obtain data from fish less than 83 cm. Absence of size classes can lead to different results in growth analyses and may account for the discrepancy between the two studies. Linear regressions of total weight vs. TL performed on black drum captured in Virginia (Bobko 1991) predicted weights that were significantly heavier than for those of Florida (Murphy and Taylor 1989) and Louisiana (Beckman et al. 1990). There is no evidence of sex-specific growth although maturity schedules differ by sex (Murphy and Taylor 1989; Bobko 1991). Atlantic coast black drum appear to grow

slower than fish from the Gulf of Mexico; however, they attain higher maximum sizes (Jones and Wells 1998).

Growth estimates with von Bertalanffy growth models were updated during this assessment with the available age data and are described further in Appendix 1. This growth analysis did not detect any significant difference in growth between sexes or between regions (South Atlantic vs. Mid-Atlantic), supporting the use of a single growth function to describe black drum growth along the Atlantic coast.

2.4 Reproduction

Black drum spawn in coastal bays and estuaries along the Atlantic coast from Florida to New Jersey. Black drum spawning has been documented in every calendar month for the Gulf of Mexico and the South Atlantic coast of the U.S. although spawning varies throughout their range (Leard et al. 1993). Spawning in Louisiana waters of the Gulf of Mexico occurs from February through April with peak activity occurring in February and March (Fitzhugh and Beckman 1987). On the Atlantic coast of Florida, black drum spawning occurs from January to March (Murphy and Taylor 1989). Spawning off of the southeast coast from Georgia to North Carolina has been shown to occur from November through April through detection of drumming activity for spawning aggregations (Rice et al. 2016). In the Chesapeake Bay, spawning occurs in April and May (Bobko 1991; Jones and Wells 1994). Black drum eggs were found inside the mouth of the Chesapeake Bay during mid to late May, but not after June 7th, indicating spawning completion (Joseph et al. 1964). Spawning in the Delaware Bay occurs from April through early June (DDFW unpublished data) with peak spawning occurring in the middle of May (Thomas 1971; Wang and Kernehan 1979).

Black drum are batch spawners and exhibit multiple oocyte development stages within female ovaries during spawning (Murphy and Taylor 1989; Fitzhugh et al. 1993; Nieland and Wilson 1993; Wells 1994). Discrepancies in the literature exist regarding patterns of oocyte development. Fitzhugh et al. (1993) reported asynchronous recruitment of vitellogenic oocytes while Nieland and Wilson (1993) and Wells (1994) observed group synchronous oocyte development. Spawning frequency has been estimated to be three to four days (Fitzhugh et al. 1993; Nieland and Wilson 1993). Batch size may vary with reproductive period or size of the individual. Fitzhugh et. al. (1993) and Wells (1994) found that the relationship between batch fecundity and body size to be variable in Louisiana waters, while Nieland and Wilson (1993) found that batch fecundity was positively correlated with total weight, fork length (FL), and age. Mean batch fecundity was estimated at 1.22 million to 1.6 million hydrated oocytes for black drum in Louisiana (Nieland and Wilson 1993; Fitzhugh et. al. 1993). Total fecundity, a function of the length of spawning season, spawning frequency, and batch fecundity, has been estimated at 5.5 to 26.6 million eggs per female in Virginia for black drum ranging from 985 to 1,165 mm TL (Bobko 1991). Fitzhugh et al. (1993) estimated annual fecundity for Louisiana drum between 660-876 mm as high as 32 million eggs per fish. The overall mean annual fecundity for 41 black drum sampled by Nieland and Wilson (1993) was reported as 37.67 million ova.

Developing ovaries have been found in black drum as small as 270 mm (Pearson 1929). Simmons and Breuer (1962) reported length and age at maturity to be 320 mm and two years. Murphy and Taylor (1989) examined sex specific maturity schedules and found 50% of the males in northeast Florida waters occurred at 590 mm (4 to 5 years old) were mature and that males reached 100% maturity at 675 mm (6 years old). Whereas, females achieved 100% maturity at sizes of 650 mm and ages from 5-6 years old. Fitzhugh et al. (1993) found length at first maturity to be similar to Murphy and Taylor (640 mm) with corresponding ages of 3 to 8 years.

In the previous ASMFC black drum assessment (ASMFC 2015), size and age at maturity was estimated using a logistic regression. Data for the final model were composites of South Carolina Department of Natural Resources (SC DNR), Virginia Marine Resources Commission (VMRC), and Chesapeake Bay Multispecies Monitoring and Assessment Program (CHESMMAP) data sets for length and SC DNR and VMRC data sets for age at maturity. The length distributions by data set indicated that the CHESMMAP data set was primarily younger immature fish with only a few older mature fish. This was the reason for the difference in the maturity curve for CHESMMAP data while the composite model was driven primarily by the VMRC and SC DNR data sets which had very similar maturity curves. The estimated length at 50% maturity was 675 mm TL with full maturity being reached at approximately 850 mm TL. Both males and females reached 50% maturity at approximately age-4 with full maturity occurring at age-7. Given their age range, black drum appear to mature relatively early and can have many years, if not decades of reproductive potential.

2.5 Natural Mortality

Little research has been reported on black drum mortality. The long life span of this species suggests that natural mortality is relatively low. Due to the size of adult black drum, most of the mortality caused by predation likely occurs at larval and juvenile stages. Abundance of jellyfish on spawning grounds in Chesapeake Bay is believed to be a major source of mortality on eggs and larvae. Peaks in jellyfish abundance may be responsible for episodic periods of reduced black drum recruitment (Cowan et al. 1992). Jones and Wells (1998) converted estimates of instantaneous total mortality, *Z*, to annual total mortality, *A*, of less than 13% for black drum in the Chesapeake Bay. Their estimate of total mortality may be low as current exploitation patterns are believed to be much greater than those witnessed more than two decades ago. Furthermore, their estimate assumes low *F* on young fish throughout the stock's range. It is evident from landings data that exploitation patterns differ by latitude as older, larger fish comprise a bigger proportion of harvest in the Mid-Atlantic while younger, smaller fish are harvested in greater numbers in the southeastern states. Stocks with low natural mortality, *M*, typically do not have surplus natural mortality that can be transferred to fishing mortality (Murphy and Taylor 1989). However, as stated previously, black drum differ from most species that have low natural mortality in that they mature early and are highly fecund. The reproductive strategy of broadcasting eggs over a number of suitable, but diverse, habitats up and down the Atlantic coast may enable the species to mitigate adverse environmental impacts to recruitment.

In the previous ASMFC black drum assessment (ASMFC 2015), natural mortality was estimated using Hoenig (1983) and Hewitt and Hoenig (2005) methods utilizing the von Bertalanffy parameters from the age and growth estimates. For the Hoenig (1983) estimates, natural mortality ranged from 0.063 to 0.091 depending on maximum age of individual data sets, while the Hewitt and Hoenig (2005) estimates of *M* were only slightly lower with a range of 0.0448-0.0652. For the DB-SRA model used, natural mortality was drawn from a lognormal distribution with expectation equal to the Hoenig (1983) natural mortality estimate using the maximum age observed coastwide of 67 years old (0.063). For this current assessment, the TC decided to transition to the Then et al. (2015) non-linear least squares estimator of natural mortality. This study used an updated and more robust data set than the data set used in Hoenig (1983). The non-linear least squares estimator was recommended by the authors among the methods applied in their study. The Then et al. (2015) estimator provides a higher estimate of natural mortality using the maximum age observed coastwide of 67 years old (0.1041).

2.6 Feeding and Diet

Larval black drum feed primarily on zooplankton (Benson 1982), while small juveniles feed largely on copepods, amphipods, annelids, isopods, mollusks, polychaetes, and small fish (Thomas 1971; Peters and McMichael 1990). Peters and McMichael (1990) found that as juveniles increase in size their consumption of shrimp, crabs, fish, and mollusks became more dominant, with the crossover correlating with the development of pharyngeal molars. Adult black drum are primarily benthic feeders, schooling in spatial patches where food is plentiful (Simmons and Breuer 1962), capable of crushing the shells of mollusks and crabs with their strong pharyngeal teeth (Simmons and Breuer 1962). Adult black drum feed on several commercially and recreationally important shellfish species. Captive black drum were capable of consuming more than two commercial-sized oysters per kilogram of body weight per day (Cave and Cake 1980). Plunket (2003) reported black drum fed on blue crab, mud crab, ribbed mussels, and dwarf surf clams. Delaware Bay commercial watermen associate black drum abundance (presumably adults) with large sets of blue mussels (*Mytilus edulis*) (De Sylva et al. 1962). Adult black drum sampled from the commercial and recreational fisheries in Delaware and New Jersey commonly contained blue mussels and soft-shelled clams within their stomachs (J. Zimmerman, Delaware Division Fish and Wildlife, personal communication). Black drum have also been shown to shift diet preferences dependent on both water quality and prey abundance preferring bivalves under better water quality conditions over smaller, less mobile invertebrates under poor water quality conditions (Rubio et al. 2018).

3 HABITAT DESCRIPTION

3.1 Brief Overview of Habitat Requirements

3.1.1 Spawning, egg, larval habitat

Spawning: Black drum spawn from April to June in the northern range (Joseph et al. 1964; Richards 1973; Silverman 1979). Spawning has been documented in the mouth of the Chesapeake Bay and seaside inlets on the Eastern shore (Chesapeake Bay Program 2004). The

presence of a large spring/early summer fishery during this time period in the Delaware Bay also provides evidence of spawning occurring inshore and in the spring. Evidence in Florida suggests spawning occurs in deep waters inshore, from November through April, with peaks in February and March (Murphy and Taylor 1989).

Larval: Larval black drum tend to settle in salt marshes and estuaries (Odell et al. 2017). Peters and McMichael (1990) reported black drum larvae in the bays of Florida, where salinities ranged from 22 – 30 ppt. Thomas and Smith (1973) observed larval drum disperse into the shore zone and into creeks and ditches in the Delaware Bay in June. They were typically found in areas with little or no current and often over a mud bottom. Gold and Richardson (1998) characterized black drum as estuarine-dependent in the early years. Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supported movement into lower-salinity, estuarine environments during early life stages.

3.1.2 Juvenile and adult habitats

Juvenile: Black drum juveniles have been found in salt marshes and estuaries along the coast, suggesting these areas serve as nurseries for sub-adults (Pearson 1929; Murphy and Muller 1995; Odell et al. 2017). Beach seine sampling in Florida nearshore lagoons found high numbers of juveniles, suggesting juvenile black drum remain inshore. Juveniles tolerate a wide range of salinities and temperatures but have been found often in low to medium salinities and over unvegetated mud bottoms in Florida waters (Peters and McMichael 1990). Thomas and Smith (1973) reported catching juveniles in waters with a salinity range from 0 – 28 ppt in the Delaware Bay estuary. As juveniles grow, they range into higher salinity areas, similar to adult habitat (Rooker et al. 2004). Richards (1973) correlated muddy, nutrient rich, marsh habitat during the first three months of life with rapid growth.

Murphy and Taylor (1989) noticed the capture of small drum throughout the year by recreational anglers and commercial harvesters in Florida's nearshore areas, suggesting year-round occupation of these nearshore estuarine to marine habitats. Increased abundance of black drum in recent years has occurred in South Carolina estuaries as part of a general increase in diversity and abundance of estuarine taxa that has been hypothesized to be a response to significantly warmer winters and summers over a 30 year period (Kimball et al. 2020).

Adult: Data suggests adults are euryhaline, although high salinities tend to cause stress as do sudden drops in temperature (Simmons and Breuer 1962). Adults move between estuaries and nearshore shelf waters, although they tend to move to deeper channel areas as they grow and mature (ASMFC 2011). Black drum move offshore at sexual maturity and form large, offshore schools that migrate extensively (Simmons and Breuer 1962). Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supports movement into more saline, oceanic conditions when older.

4 FISHERY-DEPENDENT DATA SOURCES

4.1 Commercial

4.1.1 Data Collection and Treatment

4.1.1.1 Landings

Modern commercial landings (1950 to present) for the Atlantic coast have been collected by state and federal agencies and are provided to the Atlantic Coastal Cooperative Statistics Program (ACCSP) where they are maintained in the ACCSP Data Warehouse. The Data Warehouse was queried in Fall 2021 for all black drum landings (monthly summaries by state and gear type) from 1950 to 2020 for the east coast of Florida (Miami-Dade/Monroe County border), and all other Atlantic states. Landings data from ACCSP were reviewed and approved by state representative partners. In cases where discrepancies occurred, data directly from state databases was preferred to ACCSP Data Warehouse values. This included data from New Jersey (2004-2018), Delaware (1985-1996, 2002, 2005), Maryland (2013-2020), Virginia (1989, 1994, 1996, 1999-2020), North Carolina (1972-1977, 2000), and Florida (2020).

Landings data collection by state is discussed below and summarized for all Atlantic states in Table 3.

Historical commercial landings reported in this assessment (1900-1949) were compiled in the previous stock assessment from U.S. Fish Commission annual reports (1900-1944) and provided by the National Marine Fisheries Service (NMFS; 1945-1949). These data were compiled to support assessment methods requiring a complete catch history.

New Jersey
New Jersey collects weights and sometimes gear type using dealer and landing reports from the black drum fishery. The New Jersey black drum fishery is one of the few in the state where recreational anglers can sell their recreational limit with no additional license, but these fish are assumed to make up a small percentage of the total catch and are not reported.

Delaware
Commercial harvesters are required to submit logbooks on a monthly basis since 1985. Total harvest, effort as trip days and net yards, port landed, and location fished are required data elements.

Maryland
Maryland Department of Natural Resources (MD DNR) has a mandatory reporting system for commercial harvesters. Catch in pounds, days fished, area fished, and amount and type of gear used were reported by month prior to 2006. A daily trip log was phased in from 2002 to 2005 with all harvesters using the daily log beginning in 2006. Effort data is only available for 1980–1984, 1990 and 1992–2020. Landings prior to 1981 are from NMFS.

Virginia
NMFS collected landings data for Virginia from 1950 through 1992. From 1973 to 1992, Virginia implemented a voluntary monthly inshore dealer reporting system, which was intended to supplement NMFS data. However, it was discovered that better inshore harvest data were required so the VMRC implemented a Mandatory Reporting Program (MRP) to collect Virginia commercial landings data that began January 1, 1993. The program currently is a complete census of all commercial inshore and offshore harvest in a daily format. Data collected are species type, date of harvest, species (unit and amount), gear type, gear (amount and length), area fished, dealer, vessel (name and number), hours fished (man and gear), crew amount, and county landed.

In 2001, several fields listed above (gear length, man hours, vessel information: name and number, and crew amounts) were added to come in compliance with the ACCSP-identified critical data elements. Also, data collection gaps in the NMFS offshore collection program were identified and all offshore harvest that was not a federally permitted species or sold to a federally permitted dealer was added to the MRP. The MRP reports are collected on daily trip tickets annually distributed to all commercially licensed harvesters and aquaculture product owners. All harvesters and product owners must report everything harvested and retained on the daily tickets. The daily tickets are put in monthly folders and submitted to VMRC. The monthly folders are provided by the VMRC and due by the 5th of the following month.

North Carolina
The NMFS, prior to 1978, collected commercial landings data for North Carolina. Port agents would conduct monthly surveys of the state's major commercial seafood dealers to determine the commercial landings for the state. Starting in 1978, the North Carolina Division of Marine Fisheries (NC DMF) entered into a cooperative program with the NMFS to maintain the monthly surveys of North Carolina's major commercial seafood dealers and to obtain data from more dealers. The NC DMF Trip Ticket Program (NCTTP) began on January 1, 1994. The NCTTP was initiated due to a decrease in cooperation in reporting under the voluntary NMFS/North Carolina Cooperative Statistics Program in place prior to 1994, as well as an increase in demand for complete and accurate trip-level commercial harvest statistics by fisheries managers. The detailed data obtained through the NCTTP allows for the calculation of effort (i.e., trips, licenses, participants, vessels) in a given fishery that was not available prior to 1994 and provides a much more detailed record of North Carolina's seafood harvest. The annual landings are reported on an annual basis of January through December. Data used to calculate the annual landings for North Carolina from 1950 to 2020 included landings from the NCTTP (1994 to 2020) and landings from NMFS (1950 to 1993). Prior to 1972, monthly landings were not recorded for North Carolina.

South Carolina
Prior to 1972, commercial landings data were collected by various federal fisheries agents based in South Carolina, either U.S. Fish and Wildlife Service or NMFS personnel. In 1972, SC DNR began collecting landings data from coastal dealers in cooperation with federal agents. Mandatory monthly landings reports on forms supplied by the DNR are required from all

licensed wholesale dealers in South Carolina. Until fall of 2003, those monthly reports were summaries collecting species, pounds landed, disposition (gutted or whole) and market category, gear type and area fished; since September 2003, landings have been reported by a mandatory trip ticket system collecting landings by species, disposition and market category, pounds landed, ex-vessel prices with associated effort data to include gear type and amount, time fished, area fished, vessel and harvester information. Validation of landings is accomplished via dockside sampling.

At a minimum, South Carolina's trip-ticket program collects data on commercial effort, commercial catch, and economical value. At a minimum, effort data includes gear types and quantity, location, and hours fished. Catch data includes species, disposition of catch, and quantity (lbs) landed. Finally economic data includes the wholesale price paid to harvesters.

Unlimited commercial harvest of black drum had been allowed in South Carolina prior to August 2007; however, since enactment of the current regulations at that time (14-27 inch slot limit and 5 fish per person per day) both the commercial and recreational fisheries are subject to those rules. The history of black drum landings in South Carolina is not very consistent with no true directed commercial fishery.

Georgia

Prior to 1982, the NMFS and its predecessor agencies had been responsible for the collection of commercial fisheries landings data in Georgia. In 1982, with funding from NMFS, the Georgia Department of Natural Resources (GADNR) began collecting weekly and monthly commercial landings data from coastal Georgia. These included catch, area, effort, gear, value, and associated data at various levels of detail depending on fishery and data needs. In 2001, Georgia implemented a trip ticket program in accordance with the minimum requirements set forth by the ACCSP partners. Additional data elements were added and the Georgia landings database was upgraded to meet the requirements. Trip level data are collected for all trips landing products in Georgia. Data collected include trip start and unloading dates, area fished, harvester and dealer, gear, species, market size, quantity, and value.

Florida

Prior to 1986, commercial landings data were collected by the NMFS from monthly dealer reports. The Florida Marine Information System or Trip Ticket (TTK) System began in 1984, which requires wholesale dealers to report each purchase of saltwater products from licensed commercial fishers on a monthly basis (weekly for quota-managed species). Conversely, commercial fishers must have Saltwater Products Licenses to sell saltwater products to licensed wholesale dealers. Each trip ticket includes the Saltwater Products License number, the wholesale dealer license number, the date of the sale, the gear used, trip duration (time away from the dock), area fished, depth fished, number of traps or number of sets where applicable, species landed, quantity landed, and price paid per pound. During the early years of the program some data fields were deleted from the records, e.g., Saltwater Products License number for much of 1986, or were not collected, e.g., gear used was not a data field until about 1991.

In addition, black drum became a "restricted species" in September 2013 so only fishers who have a Restricted Species Endorsements on their Saltwater Products License are qualified to sell black drum.

4.1.1.2 Discards

North Carolina

NC DMF Program 466 provides year-round onboard observations of protected species bycatch from commercial anchored gillnet fishing operations fishing with an Estuarine Gillnet Permit (EGNP).

Data on gear and catch characteristics by area and season are collected from onboard EGNP permitted fishing vessels that are engaged in anchored gill-net fishing operations in estuarine waters. State estuarine waters are divided into management units A, B, C, D1, D2, and E based on the division's Endangered Species Act Section 10 Incidental Take Permit (ITP) for sea turtles (Figure 1). Observer effort is based on a sea day schedule that stratifies observed trips across management units, seasons, and mesh size categories proportional to fishing effort averaged over the previous five years. For each onboard trip, observers identify and count both kept and discarded catch, and attempt to record length and weight data from as many specimens as possible. The program began in 2001, but was limited in its spatiotemporal scope (i.e., Pamlico Sound during fall flounder season). In 2004, coverage was expanded into areas A and C, but this expansion was hit or miss in years 2007 through 2012. Year-round statewide coverage of large and small mesh anchored gillnets began in 2013. In years without the expanded coverage, observations were conducted in the months of September – December, primarily in Pamlico Sound. Due to COVID-19 pandemic, onboard observations ceased in March 2020. A date for resuming onboard observations has not been set at the time of this writing.

Trips are observed per management unit based on the mean number of trips per month and management unit reported to the NCTTP for the previous five-year period. Per the sea turtle ITP, the division is required to observe a minimum of 7% (goal of 10%) of anchored large mesh gill net trips and a minimum of 1% (goal of 2%) of anchored small mesh gill net trips by management unit by season. The mesh size categories in the sea turtle ITP (large mesh = > 4-inch stretched mesh (ISM), small mesh = < 4-inch ISM) are different than the categories in the trip ticket program (large mesh = > 5-inch ISM, small mesh = < 5-inch ISM).

NOAA Shrimp Fishery Observer Program

Bycatch data from shrimp trawl fisheries in the South Atlantic collected during the NOAA Shrimp Fishery Observer Program were reviewed during this assessment due to frequent bycatch of other sciaenid species (Atlantic Croaker, spot, and weakfish) in these fisheries. However, occurrences of black drum were very low and shrimp trawl bycatch does not appear to be a significant source of mortality. Black drum were only encountered during 50 of 4,861 observed tows and were not observed during 11 of 19 years.

4.1.1.3 Biological Sampling

Delaware

Mature black drum were sampled in April, May, and June from the commercial fishery in the Delaware Bay. These months were chosen as they encompass the time of year when greater than 80% of the commercial harvest (Glanden and Newlin 2013) and greater than 90% of the recreational harvest occur (DDFW unpublished data). All fish were measured for TL to the nearest mm. Total weight (kg) and sex were recorded. Gonad weight (g) was recorded for fish sampled from 2009-2013. Sagittal otoliths were removed and placed in envelopes with sample number, location, date, fishery, and gear type. One otolith was chosen randomly from each pair and processed for age determination. Otoliths were thin sectioned on a Hillquist high speed saw and mounted on microscope slides. Slides were viewed at 24X magnification.

Maryland

The MD DNR has monitored commercial pound nets primarily in the Chesapeake Bay and mouth of the Potomac River since 1993. No cooperating harvesters could be located on the Potomac River in 2009 and sampling was not conducted in this area that year, but resumed in 2010. The lower portions of other rivers such as the Nanticoke and Honga rivers have been sampled sporadically depending on year. Each site was generally sampled once every two weeks from late May - early September, weather and harvester's schedule permitting. The commercial harvesters set their nets as part of their regular fishing activity. Net soak time and manner in which they were fished were consistent with the harvester's day-to-day operations. All black drum captured were measured to the nearest mm TL (maximum or pinched). Other data collected includes water temperature (°C), salinity (ppt), and soak time (duration in minutes).

Virginia

Commercial length frequency data were obtained by the VMRC Biological Sampling Program (BSP). Black drum lengths and weights were collected at local fish houses by gear, area fished, and individual watermen.

Fish were measured for both TL and FL (mm) and individual weight (nearest 0.01 lb). Typically in this program, otoliths, as well as sex and maturity data, are collected from a subsample of fish encountered. However, due to the infrequency of black drum encounters, sampling is more opportunistic and all fish encountered by technicians are sampled. Similarly, a subsample of collected age samples would be selected for full ageing, but considering the often limited sample size, VMRC's ageing lab processes every otolith collected throughout the year.

Major commercial gears for Virginia are pound nets, anchored and drift gill nets, trot-lines, and to a lesser degree haul seines and hand-lines. Commercial samples were taken throughout the year and from all areas where black drum were landed. Fishery-dependent length frequency data collection for black drum in Virginia began in 1989. Black drum sampling events have remained relatively infrequent throughout the lifetime of the program, but sampling does occur in a representative manner annually. Virginia has collected 3,532 length and 2,313 age samples since 1989, averaging 104 lengths and 68 ages on a yearly basis.

North Carolina

Biological samples (lengths and aggregate weights) were obtained from the NC DMF commercial fisheries-dependent sampling programs (P400s). Black drum lengths were collected at local fish houses by gear, market grade, and area fished. Individual fish were measured (mm, centerline length-CL) and total weight (0.1 kg) of all fish measured in aggregate was obtained. Subsequent to sampling a portion of the catch, the total weight of the catch by species and market grade was obtained for each trip, either by using the trip ticket weights or some other reliable estimate. The number of individuals, aggregate weight, and length frequencies of each species in a sample were expanded to represent the species quantities in the sampled catch (trip ticket). Expansion was accomplished by matching at the market grade level biological fish house sample data (mean weight or length data) to the corresponding trip ticket market grade harvest. For example, the TL frequency of a species within a catch was derived by expanding the length frequency of the individuals measured in the subsample of a market grade (culled samples) to the total market category weight of that species in the sampled trip.

Estuarine Gill Net Sampling

Sampling of the estuarine gill net fishery was initiated by the NC DMF in April 1991 to determine relative abundance, age, size, and composition of species taken in the Pamlico Sound area. Two modes of sampling were included in the project: at-sea sampling and fish house sampling as catches are unloaded to the seafood dealer. Most sampling was conducted at the fish house after harvesters landed and graded their catch. In 1994, at-sea and fish house sampling of estuarine gill nets was expanded to include all other areas within North Carolina.

Flounder Pound Net Fishery

Flounder pound net catches were typically sampled at fish houses late-August through early-December, based on availability of landings and when the season was open. Since most flounder pound net catches are culled at the fishing site, random stratified (graded) samples were collected. For each species, a representative number of random basket samples (50 lb) were obtained from each size category (jumbo, large, medium, small, etc.), with more samples for larger fish.

Long Haul Seine Fishery

During the fishing season (April-November), long haul catches were sampled at the fish house where the catch was landed. Samples may be either graded or ungraded catches (sorted by market category). For each economically important (marketable) species, as many random samples (usually 50 lb cartons) as possible were obtained from each market category.

Ocean Gill Net Fishery

Traditional, anchored, and runaround ocean gill net catches were sampled at the fish house where the catch was landed. For all gear types, the captain or crew members were

interviewed, when available, to obtain information including area and depth fished, days at sea, gear(s) used including mesh size and length of gill nets. Random samples of culled catches were taken to ensure adequate coverage of all species in the catches.

Winter Trawl Fishery

Winter trawl catches were sampled at the fish house where the catch was landed. When available, the vessel's captain or a crew member was interviewed to obtain information on area and depth fished, number and duration of tows, days on the fishing grounds, and gear(s) used (including headrope length, body mesh size, and tail bag mesh size). To ensure adequate coverage of all sizes and species in the catches, and since some culling already has taken place at sea, stratified random samples of the graded catch were taken.

Florida

The Florida FWC Fisheries Dependent Monitoring (FDM) program participates in the Trip Interview Program (TIP), a cooperative effort with the NMFS Southeast Fisheries Science Center (SEFSC), in which field biologists visit docks and fish houses to conduct interviews with commercial fishers. The goal of TIP is to obtain representative samples from targeted fisheries on the level of individual fishing trips. Sampling priority is given to federally managed fisheries and their associated catches. Biologists collect data about the fishing trip such as catch and effort, as well as biological information such as length, weight, otoliths and spines (for ageing), and soft tissues for mercury testing and DNA analysis. These data provide estimates of the age distribution of the commercial catch and can be used to validate the catch, effort, and species identifications in the trip ticket data (Chagaris et al. 2012).

For the TIP program, a representative sample is a sample that meets sound statistical criteria for (at minimum) describing a population. The populations are defined by fishery-time-area strata. For practical reasons area is defined here by area of landing, not the fishing area. Agents are assigned target numbers of measurements needed for stock assessment. Sampling targets will be assigned according to the historical landings within the fisheries (Saari and Beerkircher 2013).

For each trip, a maximum of 30 random age samples are collected per species and lengths and weights are measured opportunistically for all randomly selected fish (regardless of species). The standard procedure is to measure all fish in fork (center-line) length. Length measurements are taken to the nearest tenth cm or in mm and most weight measurements are in gutted pounds. A detailed explanation of the standard sample work-up for data collection is described in the TIP user manual (Saari and Beerkircher 2013). Black drum is on the list of species to be sampled, but they are considered low priority.

4.1.2 Total Catch

4.1.2.1 Landings

Overall, total commercial landings of black drum have been relatively small and characteristic of bycatch in fisheries directed at other species, never exceeding 700,000 pounds in a year (Figure

2, Table 4). Aside from a few anomalously large events in early U.S. Fish Commission annual reports and a period of relatively low catch during WWII years, landings of black drum generally increased from the early 1900s to the highest levels of the time series in the 1960s. Landings averaged 434,000 pounds in the 1960s. Landings then declined through the 1970s. Landings increased slightly in the late 1980s and have been relatively stable since, averaging 258,000 pounds since 1986.

Modern commercial landings (1950-2020) have primarily come from Virginia in the Mid-Atlantic (36% of the coastwide total) and North Carolina (27% of the coastwide total) and Florida (22% of the coastwide total) in the South Atlantic. Other Mid-Atlantic states have been secondary contributors including New Jersey (8% of the coastwide total), Delaware (3% of the coastwide total), and Maryland (4% of the coastwide total). Other South Atlantic states (Georgia and South Carolina) combined have contributed less than 1% of the coastwide total.

Five gear types have accounted for the majority (89%) of coastwide modern landings including gill nets (39%), fixed nets (22%), haul seines (12%), trawls (9%), and hand lines (7%). More recently, since 1992, the majority of coastwide landings have come from gill nets (66%). Landings by state and gear are further discussed in Section 4.4 when defining commercial fleets for evaluating composition sampling data.

Monthly data for landings become available in the early 1970s, but are very limited until the late 1970s (Table 5). Complete monthly data become available in the 1990s. Monthly data become available for most Mid-Atlantic landings in 1989, but the landings needed to be split into seasons (January-August and September-December) back to 1981 to be compatible with the data time series and assessment model used in this assessment (Section 7.3). Five-year averages of monthly proportions from 1989-1993 were applied to prior landings to assign these landings to months and seasons.

Since 1990, landings in the Mid-Atlantic have come primarily during the period most closely associated with the spawning adult migration to this region in the late spring and early summer (Figure 3). More limited landings have occurred in the period later in the year when primarily young fish are available to the fishery in this region. Landings in the South Atlantic have been more spread out, reported in all months throughout the year, but do indicate peaks of landings late in the year (October and November; Figure 4).

4.1.2.2 Discards

Dead discards of black drum in North Carolina estuarine gillnet fisheries estimated from Program 466 observer data are provided in Table 6. Estimates average 29,669 fish from 2004-2020 and average less than 2% of recreational removals in numbers during these years. Due to the low magnitude of these discards, lack of estimates prior to 2004, and lack of sufficient biological data for converting these estimates to weight, these data were not considered further in the assessment. These data should be revisited to evaluate any increases in discards during future stock assessments.

4.1.2.3 Size Composition

The size and age composition data available from commercial fisheries were collectively evaluated for utility in the assessment in Appendix 1 and Section 4.4.

4.1.3 Limitations and Potential Biases

Collection of commercial landings data has been designed as a census to capture total landings, but methods to collect these data have changed through time likely leading to changes in uncertainty. There are no quantitative measures of uncertainty accompanying commercial landings data, but Table 3 shows changes to landings data collection methodology by state through time. Each methodology is anticipated to be an improvement to the data collection methodology that preceded it. Commercial landings data uncertainty was an issue addressed during a Best Practices Workshop convened by SEDAR (SEDAR 2015). The recommendation produced from this workshop was to assume uncertainty decreases as the data collection methodology changes through time, resulting in time blocks of decreasing uncertainty levels from historic to current data collection methods. Data prior to 1950 are considered particularly uncertain.

4.2 Recreational

4.2.1 Marine Recreational Information Program

4.2.1.1 Introduction and Methodology

The primary source of black drum recreational catch data along the Atlantic coast is the Marine Recreational Information Program (MRIP), formerly the Marine Recreational Fisheries Statistics Survey (MRFSS). MRIP consists of three general surveys to estimate recreational catch, the Access Point Angler Intercept Survey (APAIS), the Fishing Effort Survey (FES), and the For-Hire Survey (FHS). The APAIS is a “dockside” survey where interviewers intercept anglers at public water access points returning from fishing trips to collect information on species targeted during the trip, catch, and fishing area. Data are used to estimate species-specific catch rates by disposition, characterize the size structure and weight of fish harvested, and determine the proportion of fishing effort occurring in three general areas of marine waters (inland, state seas from the coastline out to three miles, and the federal EEZ beyond three miles from the coastline). Dispositions include harvested and either available for inspection (i.e., landed, Type A catch) or unavailable for inspection (e.g., fileted at sea, Type B1 catch) and released alive (Type B2 catch). The FES is a mail-based survey that collects data on fishing effort by anglers from U.S. households fishing from shore and private/rental boats to estimate total fishing effort. The FHS is the counterpart to the FES that collects data on fishing effort by for-hire charter boat and headboat captains through a telephone survey. Components of the MRIP survey have undergone design changes since the start of the program in 1981, with a brief description of survey design changes below. Interested readers who would like more details on the survey design changes are encouraged to review the resources available through the NMFS Office of Fisheries Statistics (www.fisheries.noaa.gov/recreational-fishing-data/about-marine-recreational-information-program).

MRIP implements a stratified sampling design, stratifying by state, year, wave (bimonthly period starting with January-February as wave 1), and fishing mode (shore, private/rental boat, party boat, and charterboat). Catch rate data collected during the APAIS for each stratum are applied to total effort data from the FES and FHS to estimate total harvested catch (Type A+B1 catch) and total catch released alive (Type B2 catch). Total effort directed at black drum is estimated from all effort using data on species targeted during the trip collected during the APAIS. Area data collected during the APAIS are used for post-stratification of estimates by area.

Biological data collected during the APIAS sampling include FL and weight of Type A fish. Both are collected opportunistically but field interviewers are instructed to measure and weigh up to fifteen fish of each available species from each angler interviewed. The individual fish are to be selected from the total landed catch at random to avoid any size-bias in the resultant sample. These data are used to estimate harvest in weight and the size composition of harvested fish. No hard parts (e.g., otoliths) are collected for age data.

Two significant changes have occurred to the MRIP survey methodologies since the previous assessment based on external reviews and recommendations. The APAIS was redesigned in 2013 to improve the sampling design and the use of APIAS data in catch estimation methods. This included expanded sampling into the nighttime, a recommendation from the previous stock assessment due to anecdotal reports of nighttime black drum fisheries. In 2018, the telephone-based effort survey used historically to collect effort data from U.S. households (Coastal Household Telephone Survey-CHTS) was replaced with the current mail-based FES. Since the terminal data year of the previous black drum stock assessment (2012) was before these changes, all estimates used in the assessment were based on the old APAIS design and CHTS effort data. A calibration study indicated the transition to the FES generally resulted in significant increases in effort estimates and, therefore, total catch estimates relative to the CHTS. MRIP now provides all estimates prior to these design changes with calibrations applied to correct for both the APIAS redesign changes (estimates prior to 2013) and the transition to the mail-based FES (estimates prior to 2018) and this is the first assessment to report these calibrated black drum catch estimates.

In addition to these calibrations handled internally by MRIP, black drum total catch estimates were adjusted with several post hoc methods within this assessment to improve the data and make them compatible with assessment approaches.

MRIP only provides released alive catch estimates in numbers because no biological data are available from this catch. These catch estimates were converted to weight estimates during the previous stock assessment to support biomass dynamics assessment methods by borrowing individual weight observations from harvested fish according to regulatory history and life history of black drum. Fish released alive in the South Atlantic were assumed to be the same size as fish harvested during periods when there were no regulations and anglers could indiscriminately harvest (and release) a mix of sizes from the sub-adult size range available to this fishery. Individual weight observations were borrowed from harvested fish within South

Atlantic states during pre-regulatory periods, averaged, and applied to released alive catch estimates in the same state.

In the Mid-Atlantic, where life history controls sizes available to the fishery, the year was split into an early period (waves 2-3, March-June) when the catch is from the mature spawning stock and would not be affected by the 16 inch minimum size limits, a middle period (wave 4, July-August) that is a more transitory period with mature fish emigrating and young, small fish becoming available, and a late period (waves 5-6, September-December) when primarily YOY fish remain available. Individual weight observations were borrowed from these periods, averaged, and applied to released alive catch estimates during the same period.

Mean weight data were updated during this assessment for periods that had additional data since the previous assessment. Additionally, the late period in the Mid-Atlantic, which is most likely to see regulatory impacts to the released alive size structure, was further limited to years before 16 inch minimum size limits went into effect in each state, which was not done in the previous assessment. Mean weight data are reported in Table 7. Individual weight observations were limited (<10) in New Jersey, Maryland, and Virginia during the late period and were borrowed from Delaware to estimate mean weight. Figure 5 shows released alive catch estimates using mean weight data from the previous assessment and updated data during this assessment.

There are some occurrences where harvested black drum were reported and no biological data (i.e., Type A fish) were available, resulting in non-zero harvest estimates in numbers and missing harvest estimates in weight. MRIP applies an initial imputation methodology, but not all occurrences are addressed. For black drum, this occurred in 1988 and 1992. Following the approach in the previous stock assessment, individual weight observations were pooled from like strata until ten or more observations were available to calculate a mean weight. Data were subsequently collapsed over wave groupings (1-3 or 4-6), modes, and finally years with similar regulations until at least 10 observations were available. The mean weight was then applied to the harvest estimate in numbers to generate a harvest estimate in weight. The addition of these estimates to the harvest time series is shown in Figure 6.

Finally, the FHS was not implemented until 2000 and 2004 in Florida and all other Atlantic coast states, respectively. For-hire effort was estimated through the CHTS prior to this survey. To calibrate pre-FHS catch estimates to the FHS effort, effort-based ratios estimated in the SEDAR 64 stock assessment (Dettloff and Matter 2019) were applied to the estimates. Due to the small proportion of black drum caught by for-hire modes, these calibrations had minimal effect on the coastwide estimates of harvested black drum (Figure 7) and released alive black drum (Figure 8).

4.2.1.2 Effort

Directed black drum trips, defined here as trips where anglers identified black drum as the primary or secondary species targeted during their trip, were relatively stable and low through the 1980s and 1990s (Figure 9). Directed trips then followed an increasing trend through the

remainder of the time series with some notable increases from 2008-2011, 2013-2014, and 2017-2018.

There have been similar trends in South Atlantic states which account for the majority of directed black drum trips (Figure 10). Mid-Atlantic states show more variable trends.

4.2.1.3 Catch Rates

Catch rate data collected during intercepts of anglers by the APAIS were used to generate an index of abundance. The intercept data set includes catch rate data for all species caught, and a method for identifying intercepts that are informative of black drum abundance is necessary to filter the data set. Two methods for selecting intercepts were evaluated, a cluster analysis following the methods of Shertzer and Williams (2008) and the directed trips method. The cluster analysis identifies other species that are caught frequently with black drum during intercepted angler trips. The assumption underlying this cluster analysis method is that species caught frequently on the same trips as black drum cohabitate and are vulnerable to the same gear while species rarely or never caught on the same trips as black drum do not cohabitate. If anglers caught species that cohabitate with black drum, they were fishing in black drum habitat and could have caught black drum making that trip an informative trip for black drum relative abundance. Intercepts with anglers reporting black drum catch and/or catch of co-occurring species are retained in the data set while all other intercepts are assumed not to be representative of black drum abundance and are excluded from the data set. The directed trips method selects any intercepts when the anglers identify black drum as either the primary or secondary species targeted during their trip and any additional intercepts that reported catching black drum. As with the previous assessment, 1981 data were dropped from the data set due to wave 1 in Florida, a period of relatively high catch in later years, not being sampled in this year. Intercepts of headboat anglers were also excluded from the data set due to low sample sizes and discontinued sampling of this mode by MRIP in the South Atlantic (Section 4.2.2.1).

The delta method (Lo et al. 1992) was used to generate an index of abundance from the data set using each selection method. The delta method uses two generalized linear models (GLMs), a Gaussian GLM to model log-transformed positive observations of the response variable, catch (Type A1+B1+B2) per angler hour, and a binomial GLM to model the proportion of observations that are positive (i.e., caught at least one black drum). The final index is the product of the year effects from the two GLMs. A bias correction is applied to the positive model year effect to account for transformation from log space back to CPUE. Variables considered for effects on catchability in initial GLMs were state, mode, area, wave, and angler avidity. Mid-Atlantic states were collapsed into two groupings, Chesapeake Bay states (VA and MD) and Delaware Bay states (DE and NJ), due to low sample sizes. Angler avidity was defined as the median number of days fished in the past two months across anglers on a trip and was categorized in 10 day increments. Model selection was completed by dropping any explanatory variables that accounted for less than a 0.5% reduction in model deviance.

The cluster analysis was the method used during the previous black drum stock assessment (ASMFC 2015). However, it became apparent during this assessment that shifts in angler behavior since the previous assessment have resulted in inflated catch rates with the cluster analysis data set. Anglers have reported targeting black drum at a greater rate in recent years resulting in a greater proportion of intercepts in the cluster analysis data set being directed black drum effort (Figure 11). This directed black drum effort is more successful than effort where anglers did not report targeting black drum and is more likely incidental effort from intercepts directed at the associated species identified with the cluster analysis (Figure 12). The increasing proportion of directed effort is particularly apparent in NC and SC after 2015, resulting in an index that abruptly shifts in 2016 relative to the directed trips index (Figure 13). Therefore, the cluster analysis methodology was not pursued further and the directed trips methodology was selected to generate an index data set.

A total of 22,993 trips were retained for the directed trips data set. Sample sizes by factor are provided in Table 8. The same variables were retained in both GLMs and included year, state, mode, and wave (Table 9 and Table 10). Residual plots show no residual patterning for the positive observation (Figure 14) or proportion positive (Figure 15) GLMs. Both the nominal and standardized indices generally increase through time (Table 11 and Figure 16). The standardized index shows less interannual variability than the nominal index, a lower relative abundance from the late 1990s through the early 2000s, and a lower rate of increase since 2010. CVs of the standardized index are quite small, averaging 0.074. To generate a weight-based CPUE for potential use in biomass dynamics assessment approaches, an annual mean weight was calculated for each catch disposition (harvest and released) from the total catch (total catch weight/total catch numbers) and an overall annual mean weight was estimated as an average across dispositions weighted by proportion of total catch accounted for by each disposition. The overall mean weight was multiplied by the numbers-based index to generate a weight-based CPUE (Table 11). The weight-based CPUE follows a similar trend as the numbers-based CPUE, but with more interannual variability (Figure 17).

4.2.1.4 Total Catch

Annual catch in terms of harvest, releases, dead discards, and total removals (harvest + dead discards) are presented here. Catch in numbers is reported, but catch in weight, the unit used in biomass dynamics assessment approaches, is the primary focus. Dead discards were calculated based on an 8% discard mortality rate for released black drum, consistent with the previous stock assessment and based on rates estimated for a similar species (i.e., red drum).

4.2.1.4.1 Harvest

The transition from the CHTS to the FES resulted in a significant increase in calibrated harvest estimates relative to the estimates used in the previous stock assessment (Figure 18). With calibrations applied for both the APAIS changes and effort survey methodology changes, estimates increased an average of 270% during the time series of the replaced, telephone-based CHTS (1981-2017). The calibrated estimates follow a similar trend, but indicate a relatively dampened peak in 2008, an anomalous estimate given considerable attention in the

previous stock assessment, and diverge from the uncalibrated estimates in the last few overlapping years.

Final harvest estimates decreased in the late 1980s and remained below 3 million pounds through the mid-1990s (Table 12, Figure 19). Harvest increased in the late 1990s and became relatively stable in the early to mid-2000s (average of 4.9 million pounds from 2000-2007). Harvest was highest around 2010, with the three highest harvests exceeding 7.5 million pounds in 2008, 2009, and 2011. Harvest decreased after 2011 and was slightly higher than harvest in the early to mid-2000s through the remainder of the 2010s (average of 5.2 million pounds from 2012-2020).

Florida has accounted for the majority of harvest in most years, followed by North Carolina (since the mid-1990s) and South Carolina (Figure 20). Harvest in Mid-Atlantic states has been variable, with higher proportions coming from New Jersey since 2000. Harvest has been roughly split between inland and coastal waters, with very little harvest from offshore waters (Figure 21). The majority of black drum have been harvested by anglers fishing from private and rental boats followed by anglers fishing from shore (Figure 22). Charter boat harvest has been variable and small, while there has been very little harvest by party boat (i.e., headboat) anglers. Harvest occurs throughout the year and varies seasonally among years (Figure 23).

Proportional standard error (PSE) for harvest estimates is higher in the 1980s, exceeding 40% in several years (Table 12, Figure 24). PSEs then decline and remain below 40%. Estimates with PSEs below 40% are considered valid inputs for stock assessment models, while estimates with values between 40% and 60% should be used with caution, and any estimates with PSEs >60% should be used with extreme caution (ACCSP 2016). Although below 40%, estimates from 2015-2017 had high PSEs (>29%) relative to surrounding years.

4.2.1.4.2 Releases

The transition from the CHTS to the FES resulted in a significant increase in calibrated released alive estimates (Figure 25). With calibrations applied for both the APAIS changes and effort survey methodology changes, estimates increased an average of 342% during the time series of the replaced, telephone-based CHTS (1981-2017). The calibrated estimates follow a similar trend, but indicate a period of relatively lower releases in the early 2000s, a period of relatively higher releases in the early 2010s, and a noticeably higher relative estimate in 2017.

Final release estimates generally increase from the lowest levels in the early 1980s (average of 25 thousand fish and 56 thousand pounds from 1981-1984) until plateauing at the highest level in the mid-2010s (average of 5.1 million fish and 10.8 million pounds from 2015-2018) and then decline sharply during the final two years of the time series (Table 12, Figure 19, Figure 26).

Florida accounted for the majority of releases in earlier years, though this has been declining through time (Figure 27). Releases have been increasing from the Carolinas in recent years. Releases have been roughly split between inland and coastal waters, with very little releases in offshore waters (Figure 28). The majority of black drum have been released by anglers fishing

from private and rental boats followed by anglers fishing from shore (Figure 29). Black drum have been released throughout the year, with a majority being released later in the year (September-December; Figure 30).

PSEs are high in the 1980s during years of near zero release estimates, exceeding 40% in most years and 60% in the first three years (Table 12, Figure 24). PSEs then decline for the remainder of the time series as this component of catch increases and remain below 40%.

4.2.1.4.3 Dead Discards

Dead discards are calculated with a constant mortality rate and, therefore, follow the same trend as releases with a lower magnitude (Table 12, Figure 26). Dead discards increase from an average of 5 thousand pounds during the early 1980s (1981-1984) to a peak of 867 thousand pounds in the mid-2000s (2015-2018).

4.2.1.4.4 Total Removals

Total recreational removals have primarily been from harvest and, therefore, the trend and magnitude follow the harvest closely (Table 12, Figure 31). However, dead discards have accounted for an increasing proportion of removals, averaging 11% over the last decade vs. an average of 0.5% in the 1980s, leading to a more rapid increase in total removals in recent years relative to the harvest alone.

4.2.1.5 Size Composition

4.2.1.5.1 Harvest

The mean size of black drum harvested along the coast was relatively stable prior to the requirement of coastwide regulations implemented in the FMP (2014; Figure 32). This mean size varied from 11.95 inches FL in 1995 to 16.78 inches FL in 2004 and averaged 14.71 inches FL from 1981-2013. Following the implementation of the FMP in 2014, and driven by North Carolina's implementation of the first black drum regulations in the state, there was an increase in mean size to an average of 17.34 inches FL from 2014-2020. Harvest shifted from a bimodal distribution during the pre-FMP period with distinct peaks at sizes typical of age-0 and age-1 fish to a more unimodal distribution post-FMP with harvest primarily of age-1+ fish (Figure 33). The descending tail of the distribution is similar during both periods.

Mid-Atlantic states harvested larger and more variable sizes than South Atlantic states (Figure 34). The impacts of varying state-specific regulations on harvested sizes can be seen in Delaware (16 inch TL minimum size and 3 fish bag limit in 2010), North Carolina (14 inch TL minimum size, 25 inch TL maximum size, 10 fish bag limit in 2014), South Carolina (14 inch TL minimum size, 27 inch TL maximum size, 5 fish bag limit in 2007), and Georgia (10 inch TL minimum size and 15 fish bag limit in 1998). There was a decrease in sizes harvested in VA around the mid-1990s, though this change doesn't coincide with any regulation changes for the recreational fishery.

There is also more seasonal influence on the size structure in the Mid-Atlantic region. Mature adults are the primary catch during waves earlier in the year when spawning adults migrate to this region, while primarily age-0 and age-1 fish are available to fisheries in this region later in the year (Figure 35).

These size composition data are further evaluated and discussed in Section 4.4.

4.2.1.5.2 Discards

MRIP cannot sample black drum released alive for biological data, so there are no size composition data available for this component of the catch and removals (i.e., dead discards).

4.2.1.6 Limitations and Potential Biases

All data provided by anglers during the APAIS, including catch and species targeted during the trip, is voluntary.

The COVID-19 pandemic disrupted APAIS sampling and led to some imputation of catch rate data with data from surrounding years to estimate total catch in 2020. The proportion of catch rate data imputed from surrounding years varied among states from 0% to 99% for harvest estimates and from 0% to 32% for released alive estimates (Table 13). These imputed catch rate data were excluded from the data set used to calculate CPUE.

The MRIP was not designed to generate index of abundance data, so there are some limitations to consider with the CPUE data set. There is the potential for biases in targeting data if anglers are influenced by their catch when reporting targeted species following the trip. For example, an angler going out on a fishing trip without a particular target that happens to catch black drum may be influenced to report black drum as the intended target species when returning from the trip while the same angler would not have reported this if no black drum were caught. This situation would inflate the catch rates if it were a common occurrence. The MRIP design changes that have occurred through time (e.g., site selection methodology, inclusion of nighttime sampling) are accounted for in total catch estimates through calibration factors, but raw intercept data used for the index are not adjusted for these changes. This could be an area of future research by using the MRIP site-use weighting factors which are only available since 2004. As with any fishery-dependent index of abundance, there is the potential for temporal changes in catchability and hyperstability. These could occur due to advances in technology, increased knowledge of black drum fishing practices, etc.

4.2.2 Other Recreational Catch Data

4.2.2.1 Southeast Region Headboat Survey

Headboats in the South Atlantic have been sampled by the Southeast Region Headboat Survey since 1983 to generate catch estimates for this recreational fishing mode. Black drum were rare encounters in this fishery with harvest estimates totaling 1,999 fish from 1983-2020. Therefore,

these data were not considered further in the assessment, but should be revisited to evaluate any increases in catch during future stock assessments.

4.2.2.2 Historical Recreational Catch

4.2.2.2.1 1981 Wave 1 Catch

The MRFSS started estimating catch coastwide in wave 2 (March-April) of 1981. This start misses the wave 1 period in Florida which has been a period of relatively high catch in later years. Best practice recommendations from SEDAR (SEDAR 2015) were followed to estimate 1981 wave 1 Florida catch to fill in total annual catch for this year. Stratum-specific wave 1: waves 2-6 harvest estimate ratios from 1982-1984 were highly variable (CVs>1), so the average wave 1 harvest from 1982-1984 (370,659 pounds) was used as a proxy for the 1981 wave 1 harvest estimate. This accounts for 31% of Florida's 1981 total harvest and 23% of the coastwide 1981 total harvest. Estimates of black drum releases from 1982-1984 for wave 1 in Florida were zero in each year, so no additional catch was added to the 1981 released alive estimate.

4.2.2.2.2 Catch Prior to 1981

Recreational catch estimates prior to the MRFSS were developed during the previous stock assessment to support assessment methods requiring a complete catch history. Estimates from 1950-1980 were generated by extrapolating state-specific CPUE during the early years of the MRFSS (1981-1985) to total effort estimates from historical surveys on saltwater fishing participation. This assumes recreational CPUE prior to 1981 is static. Due to the change in MRIP methodologies since the previous stock assessment and resultant increases to catch estimates, these historical catch estimates were updated with CPUE data from the newly calibrated MRIP catch estimates. In addition to the updated CPUE data, an alternative set of years to average CPUE across was explored.

Within each state, all years from 1981 up to the year before regulations were implemented (Table 1) were used for average CPUE to extrapolate historical effort estimates. This alternative was considered based on the assumption that implementation of regulations (e.g., bag limits) would be the driver of CPUE changes which allowed for more years of CPUE data during the early part of the MRIP when data are most uncertain. The alternative CPUE data resulted in slightly increased harvest estimates with a similar trend (Figure 36). Similarly, these alternative data resulted in slightly increased release estimates, but with a trend more similar to the harvest catch estimates. These catch estimates using alternative CPUE data (Table 14) were considered an improvement and were used in place of the catch estimates with static CPUE years across states. There are no measures of precision for these estimates and they are considered less certain than the estimates from the designed survey used by MRIP in subsequent years.

Estimates prior to 1950 were extrapolated back to 1900 (Table 15, Figure 37), the assumed start of the catch history in the previous assessment, using exponential regression on the increasing harvest estimated from 1950-1975. Recreational dead discards were assumed to be zero in

these early years due to the low estimates in the 1950s. These estimates are also considered less certain than modern estimates from MRIP.

4.2.2.3 Supplemental Biological Sampling

There are several recreational fishery monitoring efforts by state agencies conducted aside from the general MRIP survey. The primary purpose of these efforts has been to provide supplemental age-length key data for generating age composition data. These data are further evaluated and discussed in Section 4.4.

New Jersey
Sampling occurs at one tournament in the peak of the New Jersey black drum fishery season. The volunteers or staff are staged near the weigh-in stations. They only sample fish from the harvesters who are willing work with them. This means that the sampling is not inclusive of all fish and most likely less inclusive of the smaller fish. The weight and length are recorded and, if possible, otoliths are extracted.

Delaware
Mature black drum were sampled in April, May, and June from the recreational fisheries in the Delaware Bay. These months were chosen as they encompass the time of year when greater than 90% of the recreational harvest occur (DDFW unpublished data). All fish were measured for TL to the nearest mm. Total weight (kg) and sex were recorded. Gonad weight (g) was recorded for fish sampled from 2009-2013. Sagittal otoliths were removed and placed in envelopes with sample number, location, date, fishery, and gear type. One otolith was chosen randomly from each pair and processed for age determination. Otoliths were thin sectioned on a Hillquist high speed saw and mounted on microscope slides. Slides were viewed at 24X magnification.

The racks of 519 recreationally-harvested fish were sampled from 2008 – 2021 with 503 used for age determination. Sample sizes ranged from 10 in 2016 to 93 in 2009. The average length of sampled fish was 930 mm (min. 422 mm TL, max. 1,371 mm TL) while the average age was 11.5 years (min. 2 years, max. 57 years).

Virginia
Beginning in 2007, the VMRC operates a recreational carcass recovery program known as the Marine Sportfish Collection Project. The goal of this project is to both supplement the Biological Sampling Program with species that are traditionally scarce in the commercial sector, and serve to characterize VA's recreational fishing activity. Chest freezers are established near the fish cleaning stations at a rotating series of marinas and boat ramps in the Chesapeake Bay region, depending on seasonality and freezer availability. Each freezer is marked with an identifying sign and a list of target fish species. Cooperating anglers place the filleted carcasses, with head and tail intact, in a bag, drop in a completed donation form, and then place the bag in the freezer. Each fish is identified to species, the fish length is measured, sex is determined when possible, and the otoliths are removed. These otoliths are incorporated into the subsampling

scheme of VMRC's ageing lab, with their original recreational status recorded for later reference.

Black drum recovered through this program can be subdivided into two groups, those caught and subsequently donated within the bay, and those recovered from the eastern shore of Virginia. Within the bay, a wide range of sizes have been donated to the program, ranging from sub-legal to greater than 50 inches. These fish have ranged from less than 1 year of age to 64 years of age. The second group, those from the Eastern shore, primarily consists of large adult fish that are regularly greater than 40 inches. These fish vary in age from their early 40s to early 60s.

The number of black drum collected by the Marine Sportfish Collection Project has varied greatly from year to year, with a peak of 228 fish donated in 2008 and only 9 fish donated in 2020. Overall, 1,022 black drum have been recovered through this program since 2007, ranging in length from 192 to 1,350 mm.

North Carolina

In 2014, the NC DMF initiated a formal Carcass Collection Program. The objective of the project is to develop a statewide freezer collection program in order to obtain fishery-dependent length, sex, and age samples of recreationally important fish. Since the beginning of the program, the NC DMF has maintained eight operational freezer sites where carcass collection occurs. Sites include tackle stores, fishing piers, shore access points and local NC DMF offices. NC DMF staff make scheduled checks to freezers to collect carcasses and resupply freezers with collection bags and information cards. Fish samples collected from the freezers are processed and entered into the NC DMF biological database. Information collected includes species of fish, length of fish, sex, otoliths for ageing and catch information (fishing mode, date, location etc.).

Samples of black drum collected annually have ranged from 12 (2020) to 142 (2017) with a total of 224 collected from 2014 to 2020. The majority of black drum collected in the carcass collection program are age-2 with some age-1 to age-4 fish. This range of ages is consistent with the size of fish that can be legally harvested in the 14 to 25 inch TL slot limit. One age-13 fish was collected; anglers may retain one fish over 25 inches TL.

South Carolina

Inshore Fisheries-Dependent Biological Sampling Programs

Given the limited information on the size and age of recreationally harvested fish from South Carolina waters, the SC DNR Inshore Fisheries Research Section conducts two fishery-dependent biological sampling programs, namely a fishery-dependent freezer fish program and a fishery-dependent tournament sampling program. Both are designed to collect biological information on the size, age, and sex composition of recreationally harvested priority species. Black drum are included as a priority species of interest for both programs.

Freezer Fish Program

Since 1995, Inshore Fisheries has operated a freezer drop off program for recreationally important inshore finfish, enabling us to obtain fish from areas and habitats not always represented in SC DNR monthly field sampling. Chest freezers are located near collaborating marinas, landings, or bait shops along the South Carolina coast. Participating anglers place the filleted rack with head and tail intact in one of the provided bags, drop in the completed catch information card, and deposit the bag in the freezer. Freezers are checked periodically by SC DNR staff and provided fish racks are brought back to SC DNR facilities for processing. Once in the lab, fish are identified to species, lengths are recorded, sex and maturity status are determined when possible, genetic samples are collected, and otoliths are removed. Otoliths are aged annually with each recreational capture day considered an independent collection event.

The average size black drum donated was 437.5 mm TL (min. 247 mm TL, max. 1,210 mm TL) with a total of 597 length samples. The age range was 0-47 years with ages 1-3 accounting for the majority (85%) of the ages and an average age of 1.6 years with a total of 570 age samples. There were 266 males and 279 females.

Tournament Program

Inshore Fisheries began participating in Recreational Angler tournaments in 1986. Inshore staff act as weigh master at tournaments and collect biological samples from fish of participating anglers. Similar to the freezer fish program, fish are identified to species, lengths are recorded, sex and maturity status are determined through gross and histological sampling, genetic samples are collected, and otoliths are removed.

The average size black drum sampled through tournaments was 552 mm TL (min. 232 mm TL, max. 1,225 mm TL) with a total of 514 length samples. The age range was 0-34 years with ages 1-4 accounting for the majority (85%) of the ages and an average of 3.3 years with a total of 470 age samples. There were 232 males and 267 females.

State Finfish Survey

Implemented in 1988, the State Finfish Survey (SFS) was designed to address specific data gaps, within the MRFSS, as identified by SC DNR staff. These data gaps included the lack of length data from species of concern to the SC DNR and the lack of seasonal and area-specific catch frequencies. Another concern was the lack of catch and effort data from private boat anglers, which make up a majority of the angling trips in South Carolina coastal waters. These data gaps were initially addressed by interviewing inshore anglers targeting red drum and spotted seatrout at specific sample locations. Since 2002, more emphasis has been placed on acquiring length data from all finfish retained by anglers (including black drum), canvassing at additional sampling locations, and interviewing all private fishing boats within all South Carolina coastal areas. Broadening the scope of the survey may decrease some of the bias associated with the previous SFS protocol.

Sampling is conducted at public and selected private (with owner's permission) boat landings from January through December using a questionnaire and interview protocols similar to those of the MRFSS. However, the SFS questionnaire focuses on vessel surveys rather than individual angler surveys and primarily targets private boats. Interviews are obtained from cooperative anglers at each sampling site. If an angler is unwilling to participate, they can decline to be interviewed. Assigned Creel Clerks interview as many anglers as time allows at any given site.

The sampling schedule is determined by "needs assessments" of the SC DNR Marine Resources Division and creel clerks. Individual Creel Clerks are assigned to a sampling region and will determine their daily sampling schedules based on local conditions (i.e., weather, landing closures, or events), additional job duties, and research and management initiatives. Attempts are made to assess all sampling sites equally, and individual creel clerks randomly rotate between all sampling locations within their region. Creel clerks will remain at landings with fishing activity. If landings have little or no fishing activity creel clerks will move on to alternative sampling locations in close proximity.

The SFS uses a questionnaire and interview protocol similar to MRFSS/MRIP, with the same staff conducting both surveys since 2013. Data collected for the SFS questionnaire include:

1. Mode fished (i.e., private, charter, shore)
2. Specific body of water fished
3. Area fished (inshore, 0-3 miles, > 3 miles)
4. Utilization of artificial reef/reef name
5. Resident county of boat owner
6. Species targeted
7. Number of anglers participating on the vessel
8. Amount of time spent fishing for the trip
9. Expense of the trip (all anglers)
10. Angling trips the previous year, average of all anglers participating
11. Catch and disposition by species (includes both landed and released fish)
12. Length measurements obtained, with anglers permission, for retained species; 1988 – March 2009: length measurements mid-line length (ML); April 2009 – present: TL measurements

Intercept data are coded and key entered into an existing Access database. Queries are used to look for and correct anomalous data and a component of the database records are checked against the raw intercept forms.

For the period January 1988 through February 2013, data are available from each month of the year. Beginning in 2013, SFS staff took on the duty of conducting the MRIP survey in SC and as a result the traditional SFS survey only operates during the months of January and February (no MRIP sampling during this period). Intercepts of black drum during January and February are low and serve limited utility for assessment, but traditional SFS data from March-December are generally included in MRIP landings reported for South Carolina since 2013.

The SFS collects information on both the nature of individual fishing trips and biological information on the species captured during the trip from cooperating anglers. Trip level information includes the date, location (intercept site, fishing location, and locale (estuarine, nearshore, offshore), fishing mode (private, shore, charter, etc.), purpose of the trip, target (primary and secondary) species, and angler information such as the number of anglers, hours fished, and average number of trips during the previous year across anglers in the party. Recorded biological information includes the species caught and the number and dispositions of caught fish. For those fish harvested, length information is verified for creel clerks, and provide an analogous data set to that obtained from the harvested fish encountered by the MRFSS/MRIP APAIS. For released fish, the creel clerks obtain information on the number of legal sized fish released and the number of illegal (i.e., outside the slot limit for black drum) fish released as well as self-reported size information from the anglers on these released fish.

Charterboat Logbook Program

The SC DNR issues licenses to charter vessels on a fiscal year (July 1 – June 30). In 1993, SC DNR's Marine Resources Division (MRD) initiated a mandatory trip-level logbook reporting system for all charter vessels to collect basic catch and effort data. Under state law, vessel owners/operators purchasing South Carolina Charter Vessel Licenses and carrying anglers on a for-hire basis, are required to submit trip level reports of their fishing activity. Logbook reports are submitted to the SC DNR Fisheries Statistics section monthly either in person, by mail, fax, or scan and beginning in 2016, electronically through a web-based application. Reporting compliance is tracked by staff, and charter vessel owners/operators failing to submit reports can be charged with a misdemeanor. The charterboat logbook program is a complete census and should theoretically represent the total catch and effort of the charterboat trips in waters off of SC.

The charterboat logbook reports include: date, number of anglers, fishing locale (inshore, 0-3 miles, >3 miles), fishing location (based on a 10x10 mile grid map), fishing method, hours fished, target species, depth range (minimum/maximum), catch (number of landed vs. released fish by species), and estimated landed pounds per vessel per trip. The logbook forms have remained similar throughout the program's existence with a few exceptions: in 1999 the logbook forms were altered to begin collecting the number of fish released alive and the number of fish released dead (prior to 1999 only the total numbers of fish released were

recorded) and in 2008 additional fishing methods were added to the logbook forms, including cast, cast and bottom, and gig. Furthermore, the fishing method dive was added in 2012.

After being tracked for compliance, each charterboat logbook report is coded and entered, or uploaded into an existing database. Since the inception of the logbook program, a variety of staff have coded the charterboat logbook data. From approximately 1999 to 2006, only information that was explicitly filled out by the charterboat owners/operators on the logbook forms were coded and entered into the database. No efforts were made to fill in incomplete reports. From 2007 to present, staff have tried to fill in these data gaps through outreach with charterboat owners/operators by making assumptions based on the submitted data (i.e., if a location description was given instead of a grid location – a grid location was determined; if fishing method was left blank – it was determined based on catch, etc.). From 1999 to 2006, each individual trip recorded was reviewed to look for anomalies in the data. Starting in 2007, queries were used to look for and correct anomalous data and staff began checking a component of the database records against the raw logbook reports. Coding and QA/QC measures prior to 1999 were likely similar to those used from 1999 to present; however, details on these procedures are not available since staff members working on this project prior to 1998 are no longer with SC DNR. Data are not validated in the field and currently no correction factors are used to account for reporting errors via paper submission; however, the online system is built with error messages and constraints to prevent common reporting mistakes and overlaps in the data. Recall periods for logbook records are typically one month or less. However, in the case of delinquent reports, recall periods could be up to several months. The electronic reporting application has already shown a decrease in recall bias.

As a census of the catch and effort of the South Carolina charterboat owners/operators, the SC DNR charterboat logbook program serves as a mechanism to understand temporal changes in angler behavior with regards to fishing practices, fishing locations, and within year timing of fishing activities for this sector of the South Carolina recreational fishery. Cursory investigations of the charterboat logbook data suggests shifts in charterboat owner/operators behavior through time, with an increase in the rate of catch-and-release fishing practices as well as a shift to more effort to nearshore waters, which given black drum life history suggests increasing fishing pressure on the adult component of the black drum stock found along coastal South Carolina.

Georgia

In the fall of 1997, the GADNR initiated the Marine Sportfish Carcass Recovery Project. This project takes advantage of the fishing efforts of hundreds of anglers by turning filleted fish carcasses that anglers would normally discard into a source of much needed data on Georgia's marine sportfish. Chest freezers are placed near the fish cleaning stations at 20 locations along coastal Georgia. Each freezer is marked with an identifying sign and a list of target fish species. Cooperating anglers place the filleted carcasses, with head and tail intact, in a bag, drop in a completed angler information card, and then place the bag in the freezer. Each fish is identified to species, the fish length is measured, sex is determined when possible, and the otoliths are removed. Otoliths have been aged through 2017.

The average size black drum donated is 399.8 mm FL (min. 216 mm FL, max. 1,300 mm FL). Most of the donated fish have been aged between 0 and 3 years with a maximum age of 49 years. The number of black drum collected by the Carcass Recovery Project ranged from 8 in 2005 to 183 in 2019 and 2020 with an average of 63.3 fish collected each year. A total of 1,518 black drum has been processed by staff between 1997 and 2020. To date, 975 black drum have been aged.

Florida

The following program objectives are described in Vecchio et al. (2022) and GSMFC (2006).

Representative Biological Sampling Program (REPBIO/MARFIN)

The Representative Biological (RepBio) sampling program conducts supplemental biological sampling along the Gulf and Atlantic coast of Florida. The survey began a pilot phase in 2018 and was fully implemented in January of 2019, along the Gulf coast of Florida. A randomized draw process is used to ensure representative collection of biological samples, along with a species list that prioritizes collection of biological samples from data-poor, state-managed, and federally managed species when encountered. Interviews of recreational anglers are conducted at fishing access points identified via the MRIP Site Register and assigned via a weekly draw by sub-region. Biological sampling of harvested species includes collection of length measurements (midline length in mm), whole weight (in kg) and collection of aging structures (otoliths or spines) (Vecchio et al. 2022).

Opportunistic Biological Sampling (FIN-BIOSTAT)

The Fisheries Information Network (FIN) is a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine commercial and recreational fisheries of the Southeast Region. This region includes Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Texas, and the U.S. Virgin Islands. The FIN consists of two components: Commercial Fisheries Information Network (ComFIN) and the Southeast Recreational Fisheries Information Network [RecFIN(SE)] (GSMCFC 2006).

Opportunistic biological sampling was conducted at angler intercept sites along the Atlantic coast of Florida. Sampling assignments were conducted opportunistically to maximize the number of biological samples collected, primarily from busy charter landing sites. While the sampling sites were not selected using a randomized methodology, the fish sampled were not sampled in a biased manner. Biological sampling of intercepted fish included collection of length measurements (midline length in mm), whole weight (in kg) and collection of aging structures (otoliths or spines). Species targeted (though sampling will not be limited to these) for increased levels of sampling (FIN Biological Sampling document) and processing are red snapper, king mackerel, southern flounder, gulf flounder, and greater amberjack.

Since 2003 only 56 black drum were sampled by supplemental recreational sampling programs on Florida's Atlantic coast. Most were sampled opportunistically for length and age, and some

include weight and sex. Samples that were not weighed were previously filleted (n=21). Sample sizes varied from 1 to 19 fish (average = 4.7 fish/year) measured each year.

4.3 Total Fishery Removals

The following is a review of fishery removal data summarized across sectors. These data represent a primary data source for the assessment.

Black drum removals have come predominately from harvest in recreational fisheries along the coast (Table 16, Figure 38). Total removals increased through the mid-1970s, peaking at 4 million pounds in 1976, then declined for several years into the early 1980s. Removals during this time period are predicated on the saltwater participation and static CPUE data used to estimate historical recreational catch. The smaller component of removals, commercial landings, also increased in this early period, but peaked earlier (mid-1960s) before declining. There were very few recreational dead discards during these earlier years.

A large pulse of removals occurred in the mid-1980s, averaging 3.9 million pounds from 1983-1987, and then declined to the lowest level since the 1940s in 1990 (945 thousand pounds). Removals increased through the 1990s and were variable, but with no discernible trend through most of the 2000s. Removals increased sharply to the highest levels in 2008 and 2009. Removals then declined and were variable, but with no discernible trend throughout the 2010s. Recreational dead discards steadily increased from very low levels in the 1980s while commercial landings have been relatively stable since the 1990s.

Regionally, the majority of removals have come from the South Atlantic (Figure 39). Mid-Atlantic removals have been variable and were largest in 2008 and 2009 when they were nearly the same magnitude as in the South Atlantic. Within the Mid-Atlantic, most removals have come from the period most closely associated with the spawning adult migration earlier in the year (January-August), while a smaller component has come later in the year (September-December) when primarily age-0 and age-1 fish are available to the fishery (Figure 40).

4.4 Fishery Removal Composition Data Evaluation

Black drum catch size and age composition data were identified as primary limitations during the previous stock assessment that precluded models designed to track the length or age structure of the population through time (ASMFC 2015), the ideal models for a long-lived species exploited at various life stages such as black drum. There were several research recommendations provided during the assessment focused on addressing these limitations, but these recommendations were generalized and did not tie directly to any analyses conducted during the assessment. Several aspects of the available catch composition data were evaluated in this assessment to (1) better understand spatial and temporal limitations to characterizing complete catch composition, (2) identify subsets of data that might be informative to the assessment, and (3) support detailed research recommendations.

Methods

The first step of this evaluation was to identify an appropriate fleet structure for all coastwide black drum harvest. Commercial fleets were structured with a pragmatic approach considering composition sampling coverage (or lack thereof) and magnitude of harvest over the last ten years of the assessment time series (2011-2020; Table 17). All commercial harvest north of Maryland was grouped into a fleet (North Gill Net fleet). Of the states grouped, only DE and NJ are considerable contributors to commercial harvest. While NJ harvesters have caught a considerable portion of their harvest with fixed nets (primarily pound nets), DE harvesters have caught black drum almost exclusively with gill nets and this is the only gear that has been sampled for composition data by DE. No other states in this fleet have conducted commercial harvest composition sampling. Due to close spatial proximity of DE and NJ, assuming harvesters from both these states, regardless of gear, are harvesting from the same size structure aggregation is considered a more appropriate assumption than grouping NJ fixed net harvest with states further to the south that sample composition data from these gears.

Similar to the North Gill Net fleet, harvesters from the Chesapeake Bay states (MD and VA) are assumed to be harvesting from the same size structure aggregation of black drum due to the close spatial proximity of these states. VA accounts for a considerable portion of recent black drum commercial harvest, while MD does not and is not likely to have a measurable impact to composition data regardless of how it's harvest is grouped. These states were not collapsed further with the North Gill Net fleet because harvesters have generally used different gill net mesh sizes in DE and VA (J. Zimmerman, DE DFW, and E. Simpson, VMRC, personal communication), the dominant gear category in both these states. Further, Chesapeake Bay states have conducted composition sampling from various gears that contribute to the harvest and comparison of size distributions from these data indicate differences in size selectivity (Appendix 1: Figure 3). Therefore, Chesapeake Bay states' harvest was grouped into gear-specific fleets including a gill net fleet (MDVA Gill Net fleet), fixed gear fleet (MDVA Fixed fleet), and hook and line fleet (MDVA Hook&Line fleet).

Commercial harvest in NC was separated from harvest in Chesapeake Bay states due to differences in size distributions available to fisheries in these states, with primarily mature adults available to the Mid-Atlantic fisheries, including VA and MD, and primarily immature, sub-adults available to the South Atlantic fisheries, including NC. NC conducts composition sampling according to a predefined fishery structure. However, due to sampling limitations in some of these fisheries in recent years and minor contributions of these fisheries to commercial harvest, they were collapsed into better-sampled fisheries based on similarities in size distribution of the harvest (Figure 41). Specifically, the ocean gill net fishery and the dominant estuarine gill net fishery both harvest strongly bimodal size distributions and were collapsed into the NC Gill Net fleet. The long haul fishery, trawl fishery, and the dominant fixed gear fishery harvest similar dome-shaped size distributions and were collapsed into the NC Fixed fleet.

FL is the only other South Atlantic state that has contributed considerable commercial harvest in recent years. The other South Atlantic states of GA and SC were grouped with FL, but this

grouping will not have an impact on composition data given how small these states' landings have been. FL and NC harvest was separated due to different regulatory histories. FL commercial harvest has been caught with two major gear categories in recent years, cast nets and hook and line gears (Table 18). Commercial harvest composition sampling has occurred, but has been opportunistic and inconsistent between these gear categories through time. A comparison of length distributions between these gear categories and the recreational harvest with hook and line gears during a period with relatively consistent composition sampling indicates the recreational harvest size distribution falls between the size distribution of harvest by each commercial gear category (Figure 42). Therefore, the FL commercial fishery collectively across all gears was assumed to be harvesting from the same size distribution available to recreational anglers and all commercial harvest was combined into a single fleet (South All Gear fleet) with its length distribution to be characterized by the recreational harvest size distribution as a proxy.

Percentages of coastwide annual commercial harvest by each fleet (excluding confidential data years) are provided in Table 19.

Recreational harvest fisheries were structured by state due to differences in regulations through time, a dominant gear (hook and line) used in these fisheries within states, and consistent MRIP sampling among states through time. Recreational harvest by state is in Table 20.

As a first metric for the evaluation of composition data, length samples were tabulated by fleet and compared to a threshold of thirty samples. A sample size of thirty serves as a general rule of thumb for minimum sample size necessary to estimate parameters of a normal distribution. Per capita thresholds (e.g., one in a thousand harvested fish measured for length) were considered but not recommended due to lack of guidance on an appropriate threshold and ease of understanding and fulfilling raw sample size thresholds during sampling. Two comparisons were made for recreational fleets, one with samples collected by MRIP and one with the addition of samples collected by supplemental recreational sampling programs considered to collect length data representative of the recreational harvest.

As a second metric, age samples were tabulated and compared to thresholds recommended by Coggins et al. (2013) for age-length key data sample sizes sufficient to estimate mortality levels. An analysis of growth along the coast with age-length data indicated no significant differences in regional growth (Appendix 1), so it was considered appropriate to collapse all age-length data along the coast for an age-length key. Two comparisons were made, one comparing total sample size to a threshold range of 500-1,000 samples and one comparing length bin-specific sample sizes to a threshold of 10 samples. Length bins were specified according to the methodology in Coggins et al. (2013). Total sample sizes less than 500 and bin-specific sample sizes less than 10 were considered insufficient, total samples sizes between 500 and 1,000 were consider likely to be sufficient, and total samples sizes greater than 1,000 and bin-specific samples sizes of at least 10 were considered sufficient.

A supplementary analysis on age sample size using data collected directly from black drum was conducted to identify an optimal sample size according to the methodology in Quinn and Deriso (1999). This analysis calculates the total sample size required (**across all ages in the catch**) to estimate age composition at various levels of precision (CVs) for each age, based on variability of length-at-age in previously collected data. The increase in sample size (i.e., sampling cost) for, say, the most prevalent age in the data, can be compared against the associated increase in precision of estimated catch for this age to identify the best balance of these two sampling considerations. Using the VA fishery-dependent age data from the last five years of the assessment time series, age-10 fish were sampled most frequently (Table 21). Using a criterion established by VMRC (H. Liao, VMRC, personal communication) to stop increasing sample size when more than 100 additional samples are required to decrease the coefficient of variation (CV) by 0.01 indicates an optimal total sample size of 606 age samples (Table 22). This sample size, or the closest sample size without exceeding this sample size, can then be viewed for other ages in the catch to determine the associated level of precision for the respective age's catch estimate. The optimal sample size identified here produces a CV for catch of age-10 fish of 0.12 and a weighted average CV of ≈0.14 for the 10 most frequent ages in the data (according to the closest sample size not exceeding that identified for age-10). This sample size aligns well with the threshold range recommended by Coggins et al. (2013).

A third and final metric was the ability to track cohorts in age composition data. To track cohort progression through years, age composition data needed to meet three criteria as follows:

1. There are multiple-year data available;

2. There are multiple ages (especially older ages) in the data within each year;

3. The abundance of younger ages cannot be extremely higher than the older ages, otherwise, the changes in abundance of the older ages may not be observed.

First, we had age composition data from 2008 to 2019, providing an opportunity to track cohort progression through 12 years. Second, we collapsed the length data and age-length data over gears and states by year to increase the age range in age composition data. Finally, we used ages older than age-3 so that we may be able to observe the change in abundance of older ages.

Results

MRIP length sampling appears insufficient for characterizing the size structure of the recreational harvest in South Atlantic states during the early part of the time series, but sufficient since the early 1990s in FL and NC (Table 23). Sampling generally remains insufficient in GA and SC until the mid-2010s. Sampling is insufficient for characterizing the size structure of the harvest in Mid-Atlantic states in almost all years, including recent years. If collapsed to the regional level due to similar regulations (all Mid-Atlantic states have 16 inch minimum size limits which would not impact the primary fishery on spawning adults in the spring), sampling remains insufficient in the Mid-Atlantic. This is supported by the PSEs associated with MRIP catch-at-length estimates for the Mid-Atlantic region. 70% of the harvested fish over the last

ten years have PSEs for their length estimates greater than 60%, while 18% do in the South Atlantic (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division [March 9, 2022]). However, adding supplemental data may provide sufficient data at the regional level in the Mid-Atlantic since 2006 (Table 24). Supplemental sampling may also support sufficient data for SC back to the mid-1990s.

NC commercial harvest has been sufficiently sampled since about 1999 and FL MRIP sampling has been sufficient as a proxy for the other South Atlantic commercial landings since the early 1990s (Table 25). Commercial length sampling for Mid-Atlantic fleets has been inconsistent and insufficient in most years, including in recent years. Given relative magnitude of commercial landings (Table 19), the MDVA Gill Net fleet represents the greatest limitation in characterizing the size distribution of coastwide commercial landings in recent years.

Age sampling has improved since the previous stock assessment (terminal year of 2012) and total sample sizes are likely sufficient since 2014 (Table 26). Coverage across the size range available to South Atlantic fisheries has generally been sufficient and consistent for the last ten years of the assessment time series, while coverage of the size range available to Mid-Atlantic fisheries has been less consistent (Table 27). The year 2018 appears the best sampled and serves as a standard to evaluate coverage of the size structure in surrounding and future years.

The age composition data from 2008 to 2019 identified four strong cohorts, Year-class 2001, 2005, 2007, and 2011 (Figure 43). Among them, Year-class 2001 can be tracked for 11 of 12 years. Year-class 2015 could be a strong cohort and we may be able to track its progression in the coming years.

Discussion

There have been improvements in sampling in recent years, but there remain limitations that preclude coastwide composition data for harvested black drum. Overall, it's clear the South Atlantic is better sampled for composition data than the Mid-Atlantic. TC members identified barriers to sampling, particularly in Mid-Atlantic states, that may preclude meeting the thresholds identified in this evaluation that should be considered for assessment moving forward. The black drum fisheries in Mid-Atlantic states are primarily short pulse fisheries and limit the number of fish caught and, therefore, the likelihood of intercepting these fish during sampling. There are also cost-benefit barriers due to low priority and value of black drum and difficulties processing (i.e., handling, storing, transporting the large, mature fish caught in these states).

It is important to note that this evaluation only included black drum harvest. Black drum discards, a portion of which die due to interaction with the fishery, have become an increasingly large portion of the total fishery removals through time. There are currently no direct data to characterize the size and age structure of recreational discards. Discard size and age composition data remain a major data limitation for black drum assessment.

The sample size thresholds applied in this evaluation should generally be viewed as liberal thresholds for black drum due to two reasons. First, the threshold of thirty used for length

sample sizes has generally been discussed in terms of truly random sampling. Fish species including black drum often aggregate with like-sized individuals, resulting in a lack of independence among individuals sampled during a sampling trip (Nelson 2014). This clustered population structure results in individual length observations containing less power than would be obtained from an individual observation from a randomly distributed population. Secondly, the simulated populations Coggins et al. (2013) used to provide guidance on sample size thresholds were simulated with a CV for length-at-age of 0.10. Available black drum age data indicates a weighted average CV across the age range (weighted by frequency of occurrence in the data set) of 0.14, with higher CVs for the younger ages and typically lower CVs for older age classes (Table 2). The greater variability in black drum growth would require greater sample sizes to achieve the same precision of estimates (e.g., mortality) obtained from the populations simulated by Coggins et al. (2013).

With the above caveats in mind, adequate sample sizes for composition data depend on numerous factors such as survey design, variance in the population being sampled, and desired precision of estimates; therefore, these likely vary across black drum fisheries. The thresholds used here, particularly for length sample sizes, were constant and meant to serve as approximations to visualize patterns in sampling intensity. These sample size thresholds should be refined and tailored to respective fisheries and desired levels of precision in composition data to serve as future sampling targets. Simulation analyses specific to black drum, similar to those employed by Coggins et al. (2013) are one avenue for this future research.

Despite the limitations on coastwide composition data, results from the cohort tracking analysis provide information that can be used to verify indices of abundance. The relative abundances among ages within each year provided information about cohort progression; however, the absolute abundance of each cohort among years provided no information about mortality. This is mainly because the sample sizes of effort to catch certain cohorts varied dramatically among years. For example, there were 19, over 60, and over 80 fish of Year-class 2001 appearing in 2008, 2009, and 2010 age composition, respectively, presenting a positive correlation between the ages and number of fish in those ages. In addition, a catch curve within one year may be used to estimate morality when recruitment is relatively consistent among years. However, our cohort analysis indicated that the recruitment of black drum varied dramatically, and as a result, we found no catch curve within each year can be used to estimate mortality.

Research recommendations from this evaluation are provided in Section 9.

5 FISHERY-INDEPENDENT DATA SOURCES

Indices of black drum abundance from ten fishery-independent surveys were considered in the assessment. These included all the indices used in the previous assessment and two indices not used in the previous assessment, the New Jersey Ocean Trawl Survey and the NEAMAP Trawl Survey. The New Jersey Ocean Trawl Survey index was not used in the previous assessment because it surveys the northern fringe of the population which resulted in high variability including ten years with no black drum observations. Since the previous assessment, this survey

has encountered black drum more consistency and was reconsidered for developing stock indicators. The NEAMAP Trawl Survey index was not considered in the previous assessment due to a short time series that started in 2007. The time series has added eight years to the original six years of data available in the previous assessment and was reconsidered during this assessment for developing stock indicators.

Methods to calculate indices of abundance are provided in Table 28. All fishery-independent indices of abundance are provided in Table 29 and described further below.

5.1 Northeast Area Monitoring and Assessment Program

5.1.1 Data Collection and Treatment

5.1.1.1 Survey Methods

Northeast Area Monitoring and Assessment Program (NEAMAP) has two cruises a year, occurring in the spring and fall. Each cruise samples approximately 150 stations broken down into 15 regions ranging from Cape Hatteras, NC north to Cape Cod, MA.

NEAMAP samples nearshore waters to a depth of 60 feet and includes the sounds to 120 feet. At each station the net is trawled along the bottom for 20 minutes, at a speed of 2.9-3.3 knots. Sampling sites are selected for each cruise of the NEAMAP SNE/MA Near Shore Trawl Survey using a stratified random design. Prior to each survey, a SAS program is used to randomly select the cells to be sampled from each region / depth stratum during that cruise. Again, the number of cells selected in a particular stratum is approximately proportional to the surface area of that stratum. Once these 150 'primary' sampling sites (i.e., those to be sampled during the upcoming cruise) are generated, the program selects a set of 'alternate' sites. In instances where sampling a primary site is not possible due to fixed gear, bad bottom, vessel traffic, etc., an alternate site is selected in its stead. If an alternate site is sampled in the place of an untowable primary site, the alternate site is required to occupy the same region / depth stratum as the aberrant primary site. Usually, the alternate site chosen is the closest towable alternate to that primary.

To assure comparability with the Northeast Fisheries Science Center (NEFSC) trawl survey, NEAMAP adopted the bottom trawl developed for the NEFSC by the joint Mid-Atlantic/New England Trawl Survey Advisory Panel. A 4-seam, 3 bridle, 400 x 12 cm net with a "cookie sweep" footrope and 2.54 cm knotless liner in the cod end with Thyboron Type IV 66 inch doors is used.

During science operations, trawl monitoring sensors provide near-real-time measures of gear performance, enabling the captain and crew to adjust tow speeds and scope to obtain the optimum fishing geometry of the net. Equally important, these data are saved to computer files which, when combined with tow distance information from the GPS, allow subsequent data analyses (such as the generation of abundance estimates) to be performed on an area-swept basis. Such analyses provide standard adjustments for tow-to-tow differences in tow speed, tow duration, current speed, and so on. NEAMAP Mid-Atlantic uses a suite of net monitoring

sensors to assure that tows are conducted in a consistent manner and that the net is fishing within specified limits.

5.1.1.2 Biological Sampling Methods

After the completion of each tow, the catch is sorted by species and modal size groups. For species of management interest, a subsample from each size group is selected for detailed processing. Experience shows that a subsample of 3-5 individuals (3 for very common species, 5 for all others) per species-size group per tow is sufficient for this full processing. The data collected from each of these subsampled specimens includes: length (to the nearest mm), total weight (g), sex (macroscopic), and eviscerated weight (g).

Stomachs are removed and those containing prey are preserved onboard for subsequent diet analysis at the shore-based Virginia Institute of Marine Science (VIMS) laboratory. Otoliths or other appropriate ageing structures (e.g., vertebrae, scales, spines, etc.) are removed from each subsampled specimen for later age determination.

For all species, managed and unmanaged aggregate weights are recorded by species-size group, and individual length measurements (which also yield count data) are taken for either all or a representative subsample.

5.1.1.3 Catch Estimation Methods

Abundance estimates are presented as the (back-transformed) geometric mean, using only the strata of importance for each species. Black drum captured in this survey are captured almost exclusively in the fall and are nearly all smaller (<30cm). These smaller fish have nearly all been age-0 so the fall index may be used as representing primarily YOY abundance.

5.1.2 Trends

The fall index has varied without pattern, but with high variability within a small range of values (Figure 44).

5.2 New Jersey Ocean Trawl Survey

5.2.1 Data Collection and Treatment

5.2.1.1 Survey Methods

The survey area consists of New Jersey coastal waters from Ambrose Channel, or the entrance to New York Harbor, south to Cape Henlopen Channel, or the entrance to Delaware Bay, and from about the 3-fathom isobath inshore to approximately the 15-fathom isobath offshore (Figure 45). This area is divided into 15 sampling strata. Latitudinal boundaries are identical to those that define the sampling strata of the NMFS Northwest Atlantic groundfish survey. Exceptions are those strata at the extreme northern and southern ends of New Jersey. Where NMFS strata extended into New York or Delaware waters, truncated boundaries were drawn

which included only waters adjacent to New Jersey, except for the ocean waters off the mouth of Delaware Bay, which were also included.

Longitudinal boundaries consist of the 5, 10, and 15-fathom isobaths. Where these bottom contours were irregular, stratum boundaries were smoothed by eye. As a result, the longitudinal strata boundaries for the New Jersey survey area are similar, but not identical, to the corresponding NMFS boundaries.

Each stratum is divided by grid lines into blocks which represent potential sampling sites; each block is identified by a number assigned sequentially within each stratum. The dimensions of mid-shore (5-10 fathoms) and offshore (10-15 fathoms) blocks are 2.0 minutes longitude by 2.5 minutes latitude; inshore (3-5 fathoms) blocks were 1.0 minutes longitude by 1.0 minutes latitude. Inshore block dimensions were smaller because inshore strata were narrower and of much less area compared to mid- and offshore strata; small block size permits a greater number of potential sampling sites than would be possible with the larger dimensions. This is important for statistical analysis and follows the strategy of NMFS for their groundfish survey. Dimensions of blocks transected by stratum boundaries have less area than described above; blocks reduced in area by more than one-half were generally not assigned a number.

Sampling sites in 1988-91 were determined by blindly picking disks numbered to correspond to stratum blocks and mixed to assure randomness. In 1992 this method was replaced by using a computer to generate random numbers.

Samples are collected with a three-in-one trawl, so named because all the tapers are three to one. The net is a two-seam trawl with forward netting of 12 cm (4.7 inches) stretch mesh and rear netting of 8 cm (3.0 inches) and is lined with a 6.4 mm (0.25 inch) bar mesh liner. The headrope is 25 m (82 feet) long and the footrope is 30.5 m (100 feet) long.

The trawl bridle is 20 fathoms long, the top leg consisting of 0.5 inch wire rope and the bottom leg comprised of 0.75 inch wire rope covered with 2 3/8-inch diameter rubber cookies. A 10-fathom groundwire, also made of 0.75-inch wire rope covered with 2 3/8-inch diameter rubber cookies, extends between the bridle and trawl doors.

Prior to August 2015, the trawl doors were wood with steel shoes, 8 ft x 4 ft 2 in, and weighed approximately 1000 lbs each. They were replaced by Thyboron type 11, 60” otter trawl doors with 1.81 m2 area and 328 kg weight. During this same cruise, a SIMRAD PX and PI net monitoring system was incorporated with sensors measuring wing spread, vertical net opening and bottom contact.

Prior to the January 2011 survey cruise, surface and bottom water samples were collected with a 1.2 L Kemmerer bottle for measurement of salinity and dissolved oxygen, the former analyzed with a conductance meter and the latter by the Winkler titration method. Surface and bottom temperatures were measured with a thermistor. These water samples were collected prior to trawling for each biological sample. Starting January, 2011, water chemistry data is collected via a YSI 6820 multiparameter water quality SONDE from the bottom, mid-point and surface of the

water column. Parameters collected included depth, temperature, dissolved oxygen and specific conductance. All water chemistry data continued to be collected prior to sample trawling.

Trawl samples are collected by towing the net for 20 minutes, timed from the moment the winch brakes are set to stop the deployment of tow wire to the beginning of haulback. Enough tow wire is released to provide a wire length to depth ratio of at least 3:1, but in shallow (< 10 m) water this ratio is often much greater, in order to provide separation between the vessel and the net. Following haulback, the catch is dumped into a 4 x 8-ft sorting table where fishes and macroinvertebrates are sorted by species into plastic buckets and fish baskets.

5.2.1.2 Biological Sampling Methods

The total weight of each species is measured with an electronic scale, to the hundredths of a kilogram, and the length of all individuals comprising each species caught, or a representative sample by weight for large catches, is measured to the nearest cm FL or TL, depending on tail shape, is measured for all fishes except stingrays, which have disk width measured instead. For invertebrates, carapace width is measured on crabs, carapace length (in mm) on lobster, mantle length on squid, and shell length on whelks. Catches containing large numbers of relatively small specimens are often mixed and the mix subsampled by weight. The mix is then sorted and measured and species components later extrapolated, based upon their representation in the subsample, to determine contribution to the total catch.

5.2.1.3 Catch Estimation Methods

The index for the NJ Ocean Trawl survey was subset temporally to just the October cruises since this period caught black drum more consistently than any of the other cruises (January, April, June, and August). The data were further subset to reflect the spatial occurrence of this species in this survey primarily in the sampling strata with depths up to 60 feet, known as the inshore and midshore strata, leaving out the offshore strata (> 60 to 90 foot depth). Length frequency distributions show that the October survey catches mostly young-of-year fish as the size ranges from 2 to 42 cm with the majority measuring less than 30 cm. The index is calculated as a stratified arithmetic mean catch and biomass per tow of the subset data.

5.2.2 Trends

Within the first 10 years of the survey through 1998, black drum were rarely encountered with 8 of those 11 years showing 0 catches for this species. However, since 1999, black drum have been encountered in 18 of the 21 years through 2019, with this species showing up in every year since 2011. The mean CPUE showed an increasing trend from 1999 through 2009, with biannual spikes from 2005 to a time series high of 1.73 in 2009 after which it moderated from 2012 through 2019 with index values ranging from 0.05 to 0.50 (Table 29, Figure 46). Spatial trends of the species occurrence in this survey show black drum occurring further north within the last 2 decades (Figure 47). Within the first 11 years of the survey, no black drum were encountered north of Ship Bottom, NJ. Within the following 2 decades, this species has been caught from Ship Bottom north to the survey's northernmost sampling stratum off Sandy Hook.

The catches have increased in these northern strata within the last decade (2010-2019) over the catches seen from 2000-2009. These results seem to indicate a northerly extension of black drum distribution within the last two decades and strengthen the case for using this survey's data as a range expansion indicator.

5.3 PSEG Seine Survey

5.3.1 Data Collection and Treatment

The Public Service Enterprise Group's (PSEG) Baywide Beach Seine Survey was initiated in 1995 to complement the New Jersey Department of Environmental Protection's (NJDEP) seine survey, providing sampling beyond the geographical boundaries of the respective study area to more fully characterize target species abundance and distribution patterns within the estuary. To enhance compatibility with the results being generated from the existing agency sampling program, the sampling gear and deployment procedures for the Baywide Beach Seine Survey were developed following the methods described in Baum (1994), and through personal communications with subsequent NJDEP principal investigators.

5.3.1.1 Survey Methods

Beach seine sampling was conducted during daylight once per month in June and November, and twice per month during July through October. Daylight is defined as the period one hour after sunrise to one hour before sunset. Samples were taken at 40 fixed stations in the Delaware Bay and lower River. Sampling at all stations was conducted within the period of two hours before to two hours after high slack water specific to that particular location.

Seine hauls were taken with a 100 x 6-ft (30.5 x 1.8-m) bagged haul seine with a 1/4-inch (6.25 mm) nylon mesh, identical to the gear employed by NJDEP in the beach seine program conducted upstream of the present study. The seine is set perpendicularly from shore, by boat, until the bag is reached, at which time the remainder of the net is set in an arc-like fashion back to shore. The direction of the set was chosen relative to prevailing tidal current, wind, and surf conditions to produce the most effective net deployment. The standard sampling effort was a single haul at each station.

5.3.1.2 Biological Sampling Methods

With each collection, finfish were identified to the lowest practical taxonomic level (usually species), counted, and measured. A subsample of 100 specimens of each target species was measured to the nearest mm FL was measured for all species with emarginated or forked caudal fins; for other species, TL was measured.

5.3.1.3 Catch Estimation Methods

A YOY index of abundance from 1995-2020 was developed from this survey. Length data was only available for 56.5% of the black drum caught in the time series, but only 4 of 1000 fish were greater than 300mm TL (which were removed from the data set), so all data are assumed to track YOY abundance. Stations were collapsed into two areas, the DE side of the bay and the

NJ side of the bay, to incorporate this variable as a factor in the GLM. Stations north of the confluence with the Salem River were excluded from the data set since their sampling was suspended in 2016, and only three black drum were captured at these stations during the entire time series. A negative binomial GLM was used to develop the index of abundance. The unit of effort was black drum caught per net set. Year, month, and area were included in the final GLM as factors. There were no patterns in residuals. The dispersion parameter is 1.25.

5.3.2 Trends

The standardized index showed high interannual variability, with no clear trend over the time series (Table 29, Figure 48).

5.4 Delaware Trawl Survey

5.4.1 Data Collection and Treatment

5.4.1.1 Survey Methods

16-ft Trawl Survey

The Delaware Division of Fish and Wildlife (DE DFW) has conducted a 16-foot bottom trawl survey in the Delaware Estuary for juvenile finfish since 1980. The survey uses a 4.9-m semi-balloon otter trawl, consisting of a 5.2-m headrope and a 6.4-m footrope with a 3.8-cm stretch-mesh number 9 thread body. A 1.3-cm knotless stretch-mesh liner is inserted in the cod-end. The net is equipped with 30.5-cm x 61-cm doors constructed of 1.9-cm marine plyboard doors with 1.3-cm x 5.1-cm shoes. The doors are towed via bridle warps of 30-m no-lay line. Tows are made against current for ten minutes. The survey is conducted monthly at 39 fixed stations in the Delaware Estuary (Delaware waters) from April through October.

30-ft Trawl Survey

The DE DFW also conducted a 30-foot trawl survey in the Delaware Bay from 1966-71, 1979-84, and 1990 - present. The net used has a 9.3-m headrope and a 12.0-m footrope. It is comprised of 7.6-cm stretch-mesh in the wings and body, with a (5.1-cm) stretch-mesh cod-end. The net is attached to the trawl doors with 12.0-m leglines. The doors were 1.37-m x 0.71-m and were constructed of 1.9-cm virgin pine lumber, with 5.1-cm x 1.9-cm milled steel shoe bottom runners. Tows are made using the 19-m R/V First State, which tows for twenty minutes against the current. Sampling was conducted from March through December at nine fixed stations on the Delaware side of the Delaware Bay.

5.4.1.2 Biological Sampling Methods

Upon completion of each tow, the sample was emptied on the deck and sorted by species. Aggregate weights were taken for each species. Species represented by less than 50 individuals were measured for FL to the nearest half-centimeter. Species with more than fifty individuals were randomly sub-sampled (50 measurements) for length with the remainder being enumerated.

5.4.1.3 Catch Estimation Methods

16-ft Trawl Survey

A geometric mean for each year of the CPUE (defined as catch per tow) is the selected index of abundance for YOY. The TC decided to subset the survey data to the years 1990-2020 due to a vessel change in 1990. Only tows in August, September, and October were included because catches in other months were low and consisted of adults. The index was not standardized.

30-ft Trawl Survey

A geometric mean for each year of the CPUE (defined as catch per nautical mile) is the selected index of abundance for YOY. The TC decided to subset the survey data to the years 1990-2020. Catch rates in the first year of the survey (1966) were extremely high and there was concern that factors other than abundance contributed to the peak. There were also breaks in sampling in the 1980s and the survey continued in 1990 with a new vessel.

Only tows in August, September, October, November, and December were included because catches in other months were very low and consisted of adults. Adults which comprise the spawning ages seen in the spring are typically close to shore (where the adult trawl does not go) and are large enough to evade towed gear like trawls most of the time. The index was not standardized.

5.4.2 Trends

16-ft Trawl Survey

CPUE is provided in Table 29 and Figure 49. CPUE has ranged from 0 in 1997 and 2010 to 0.004 in 1993. The index shows moderate interannual variability with stable, but low relative abundance from 2008 to 2020. Most frequently the catch per tow is zero as is seen in Figure 50 which shows the frequency histogram. The trawl survey samples primarily migrating fish as the YOY are more prevalent in the tidal tributaries of the Bay (where this survey does not sample consistently) where they stay until they decide to migrate southward. Additionally, black drum are somewhat structure oriented which may take them out of the path of the trawl.

30-ft Trawl Survey

CPUE is provided in Table 29 and Figure 51. CPUE has ranged from 7x10-6 in 1992 to 0.03 in 1995. The index shows high interannual variability with stable, but low relative abundance from 2008 to 2020. Most frequently the catch per tow is zero as is seen in Figure 52 which shows the frequency histogram. Black drum are somewhat structure oriented which may take them out of the path of the trawl. Additionally, the YOY are more prevalent in the tidal tributaries of the Bay where they stay until they decide to migrate southward, while this survey samples in the Bay and is not close to shore.

5.5 Maryland Coastal Bays Seine Survey

5.5.1 Data Collection and Treatment

5.5.1.1 Survey Methods

The MD DNR has conducted the Coastal Bays Fisheries seine survey in Maryland's Coastal Bays since 1972, sampling with a standardized protocol since 1989. The survey samples shallow regions of the Coastal Bays frequented by juvenile fishes.

A 30.5 m X 1.8 m X 6.4 mm mesh (100 ft X 6 ft X 0.25 in. mesh) bag seine was used at 18 fixed sites in depths less than 1.1 m (3.5 ft) along the shoreline. A 15.24 m (50 foot) version of the previously described net was used at site S019 due to it is restricted sampling area. However, some sites necessitated varying this routine to fit the available area and depth. GPS coordinates were taken at the start and stop points as well as an estimated percent of net open. Other site parameters recorded include: depth, bottom substrate, SAV percent coverage, dominate SAV type, water temperature, salinity, dissolved oxygen, secchi depth, and tide state.

Shore beach seine sampling was conducted at 19 fixed sites once per month in June and September from 1993 – 2020, and in July or August and September prior to 1993.

5.5.1.2 Biological Sampling Methods

Fishes and invertebrates were identified, counted, and measured for TL in millimeters. At each site, a sub-sample of the first 20 fish (when applicable) of each species were measured and the remainder counted. A total of 620 black drum were captured in the survey from 1989 – 2020 (years with standardized sampling methodology), with annual catches ranging from zero (for three years) to 77.

5.5.1.3 Catch Estimation Methods

An index of YOY abundance was calculated for 1989-2020 using only September sampling trips and includes only black drum 230mm TL or less. Ninety-five percent of all black drum encountered were captured during September trips. In the absence of age data, length frequency was examined using five-millimeter bins to determine a likely break point of age-0 fish. Length frequency declined from the 175 mm bin to the 230 mm bin. There were no fish captured in the 235 mm bin and only one or two fish in each of the 240, 245, and 250 mm TL bins, with no fish in the next four bins. Seven fish that were 275 mm TL or grater were assumed to be age-1+. While the five fish from 240 to 250 mm TL bins may have been age-0 fish, the decision was made to use the more conservative 230 mm TL cutoff to subset the data. The YOY index is calculated as the geometric catch per haul of the subset data.

5.5.2 Trends

The geometric mean catch per haul was highly variable and showed no significant trend (Table 29, Figure 53). There were three years of zero catch all within the first five years of the index.

The index generally increased through 2000 and has remained variable at a moderate level in recent years.

5.6 North Carolina Fishery Independent Gill Net Survey – Program 195

5.6.1 Data Collection and Treatment

5.6.1.1 Survey Methods

The NC DMF independent gill net study (Program 915) started in 1998 on the New, Neuse, Pamlico and Pungo river systems (River Independent Gill Net Survey (RIGNS). Sampling in Pamlico Sound (The Pamlico Sound Independent Gill Net Survey (PSIGNS) was initiated in May of 2001 (Figure 54). Sampling in the RIGNS was dropped after 2000 and resumed in 2003 to present. The PSIGNS has sampled continuously since 2001. Sampling in the Cape Fear and New river systems began in April 2008. The goals of the program are to provide CPUE data for coastal fishes, to supplement age, growth, and reproduction studies, to evaluate catch rates and species distribution for use in management plans, and to characterize habitat use. The survey provides annual or seasonal indices of abundance in major North Carolina estuaries for key estuarine species including black drum. CPUE data from fishery independent surveys standardizes effort to provide a relative index of abundance to track stock trends.

Survey in all regions uses a stratified random design. Strata includes area and depth (greater or less than six feet). Cape Fear sampling is an exception as it does not sample deep strata due to currents. For each grid selected, both the shallow and deep strata are sampled with a separate array (or gang) of nets. An array of nets consists of 30-yard segments of 3, 3½, 4, 4½, 5, 5½, 6, and 6½ in stretched mesh webbing (240 yards of gill net). Catches from this array of gill nets comprise a single sample, with two samples (one for the shallow strata, one for the deep strata) collected for each sampling trip. If adverse weather conditions or other factors prevented the primary grid in an area from being sampled, alternative grids for that area are randomly selected to increase flexibility and ensure completion of sampling requirements each month. The period of December 16 through February 14 was dropped after the first complete year of sampling, beginning in 2003, due to low catch rates and safety concerns associated with fewer daylight hours and cold water and air temperatures occurring during that period. Soak times are standardized to 12 hours and are set at dusk and fished at dawn, with the exception of a 4-hour dusk time soak occurring in the Southern IGNS during the months of April through September (shortened soak times in the southern region began in July 2008).

Nets were deployed parallel or perpendicular (depending on region) to the shore based on the strata and common fishing techniques for each area. Gear was typically deployed within an hour of sunset and fished the following morning with effort made to keep all soak times within 12 hours. The 12-hour soak time allowed for uniform effort and kept the study in compliance with the terms and conditions of NMFS biological opinions to the USFWS under Endangered Species Act Section 7 Consultations F/SER/2000/01313, F/SER/2003/00306, F/SER/2007/00902, F/SER/2009/00925, and F/SER/2010/06460. This action was taken to minimize interactions with endangered and threatened sea turtles. All gill nets are constructed with a hanging ratio of 2:1

and a vertical height between six and seven feet (deep nets changed to 10 feet depth in 2005). Each net is inspected upon retrieval for damage caused by blue crabs, boats, snags, and general wear. Based on the net configuration and depths set, all gill nets are floating and fish the entire water column.

Physical and environmental conditions including surface and bottom water temperature (°C), salinity (ppt), dissolved oxygen (mg/L), bottom composition, and a qualitative assessment of sediment size are recorded upon retrieval of the nets on each sampling trip. All attached submerged aquatic vegetation (SAV) in the immediate sample area is identified to species and density of coverage is estimated visually when possible. Additional habitat data recorded includes distance from shore, presence or absence of sea grass or shell, and substrate type.

All core sampling used to generate standardized index occurs from February 15 to December 15. Within each region, each area and depth strata is sampled twice per month (only once during partial months of February and December). For example, for a complete month in Pamlico Sound, 32 core samples are completed (8 areas x twice a month x 2 samples: Figure 2). The same number would be completed for the Pamlico and Neuse IGNS. For the Southern IGNS (New and Cape Fear rivers) 12 samples are completed each full month, comprised of eight from New River (2 areas-upper and lower x twice a month x 2 samples-shallow and deep) and 4 from Cape Fear (1 area x four times a month x 2 shallow samples). Sampling intensity changes are noted in potential biases and uncertainties section.

5.6.1.2 Biological Sampling Methods

All black drum are enumerated and an aggregate weight (nearest 0.01 kilogram (kg)) is obtained for each net (mesh size) fished. All individuals are measured to the nearest millimeter TL. Specimens are also retained and taken to the lab where age structures (otoliths) are removed, sex, and maturity stage of gonads are determined. All aging is conducted following the black drum protocol in Program 930 (P930).

5.6.1.3 Catch Estimation Methods

Relative Abundance by Year

An index of relative abundance and associated standard errors were developed using data from 2003 to 2019. Data from the New and Cape Fear rivers were not used due to the short time-series; only data from the Pamlico Sound and Pamlico, Pungo, and Neuse rivers was used. The index was based on data collected from February to December from shallow (<6 ft) and deep (>6 ft) samples. Catch rates of black drum were calculated annually and expressed as an overall abundance along with corresponding length frequency distributions. The overall abundance was defined as the number of black drum captured per sample (240-yards of gill net). Due to disproportionate sizes of each strata and region, the final abundance estimate was weighted. The total area of each region by strata was quantified using the one-minute by one-minute grid system and then used to weight the observed catches for calculating the abundance index.

Relative Abundance by Age Class and Year
An index of relative abundance and associated standard errors were developed using data from NC DMF Program 915 from 2003 to 2019. Data from the New and Cape Fear rivers were not used due to the short time-series; only data from the Pamlico Sound and Pamlico, Pungo, and Neuse rivers was used. The index was based on data collected from February to December from shallow (<6 ft) and deep (>6 ft) samples. Catch rates of black drum were calculated annually and expressed as an overall abundance by age class. A six-month age-length key with length cut-offs (January - June and July - December) was used to convert TL of black drum caught to an estimated age based on a January 1 birthday. The overall abundance for each age class was defined as the number of black drum captured per sample (240-yards of gill net). Due to disproportionate sizes of each strata and region, the final abundance estimates were weighted. The total area of each region by strata was quantified using the one-minute by one-minute grid system and then used to weight the observed catches for calculating the abundance index.

5.6.2 Trends

Relative Abundance by Year
A total of 5,259 black drum have been caught in the survey from 2003 to 2019. The annual weighted black drum index of abundance has ranged from a high of 1.12 in 2016 to a low of 0.32 in 2013 (Table 29, Figure 55). Proportional Standard Error (PSE) has ranged from 10 to 36. Black drum caught in the survey had a mean size of 12 inches TL and ranged from four to 31 inches TL (Figure 56). A total of 1,480 age structures have been collected from the survey from 2011 to 2019. Ages have ranged from zero to 23 years; however, 86% of the fish were age-0 and age-1.

Relative Abundance by Age Class and Year
A total of 5,259 black drum have been caught in the survey from 2003 to 2019. Ageing structures were obtained from 1,480 black drum from the survey. Ages have ranged from 0 to 23 years old; however, only fish up to age-3 were included in the analysis due to the small sample size. The six-month age-length key indicated good separation for fish up to age-2. The annual weighted index of abundance has ranged from 0.04 to 0.66 for age-0, 0.02 to 0.91 for age-1, 0 to 0.52 for age-2, and 0 to 0.49 for age-3 black drum (Table 30). Proportional Standard Error (PSE) was lower for age-0 and age-1 fish and ranged from 11 to 50. PSEs ranged from 0 to 100 for age-2 and age-3 fish. Overall, the index was able to track four strong cohort progressions through the time-series (2005, 2007, 2011, 2015; Figure 57).

5.7 South Carolina Trammel Net Survey

5.7.1 Data Collection and Treatment

5.7.1.1 Survey Methods

The SC DNR established the SC DNR trammel net survey in the fall of 1990 as a survey of lower estuary, generally moderate- to high-salinity, salt-marsh edge and oyster reef habitats; these habitats dominate the coastal South Carolina estuarine shoreline environment. The survey was designed to provide relative abundance indices for key estuarine species (primarily red drum),

as the habitat sampled serves as a primary habitat for a host of recreationally important estuarine species. The survey indexes the relative abundance of numerous species throughout the five major estuaries found along the South Carolina coast and has been used in the previous benchmark stock assessments as an index of relative abundance for black drum.

The SC DNR trammel net survey employs a stratified random sampling design. On each sampling day (one stratum is sampled per day), trammel nets are typically set at 10-12 sites, although weather, tide, or other constraints sometimes hinders this target. Sites are selected at random (without replacement) from a pool of 27-55 possible sites per stratum, with the exception that adjacent sites (unless separated by a creek or other barrier) cannot be sampled on the same day to avoid sampling interference.

Fish are collected using a 183 x 2.1 m trammel net fitted with a polyfoam float line (12.7 mm diameter) and a lead core bottom line (22.7 kg). The netting comprises an inner panel (0.47 mm #177 monofilament; 63.5 mm stretch-mesh; height = 60 diagonal meshes) sandwiched between a pair of outer panels (0.9 mm #9 monofilament; 355.6 mm stretch-mesh; height = 8 diagonal meshes). The trammel net is set along the shoreline (10-20 m from an intertidal marsh flat, <2 m depth) during an ebbing tide using a fast-moving Florida net boat. Each end is anchored on the shore, or in shallow marsh. Once the net has been set, the boat makes two passes along the length of the enclosed water body at idle speed (taking <10 minutes), during which time the water surface is disturbed with wooden poles to promote fish entrapment. The net is then immediately retrieved and netted fish are removed from the webbing as they are brought on board and placed in a live-well. Once the net has been fully retrieved, all fish are identified to species and counted. Measurements (TL and SL) are taken from all individuals of target species (including black drum), and from up to 25 individuals of non-target species. Most fish (>95%) are released alive at the site of capture once length measurements are obtained. Any black drum greater than 150 mm TL released at the site of capture and not previously tagged are tagged, with disc belly tags.

Additional data collected during each collection includes location (site nested in stratum nested in area; latitude and longitude) and a suite of physical and environmental variables. Physical and environmental variables recorded include depth (m), air temperature (°C), water temperature (°C), salinity (PSU), dissolved oxygen (mg L^{-1}), and tidal stage.

At present (2021), seven strata, from south to north, are surveyed: Port Royal Sound (PR), ACE Basin (AB), Ashley River (AR), Charleston Harbor (CH), Wando River (LW), Cape Romain (CR), and Winyah Bay (WB). These seven strata are found in the five primary South Carolina estuaries, Port Royal Sound (PR), St. Helena Sound (AB), Charleston Harbor (AR, CH, LW), Cape Romain and Bulls Bay (CR), and Winyah Bay (WB). Note however, the time series of sampling in each estuary has varied through time. Limited historical data is also available from additional strata and areas within current strata but are generally excluded from the development of relative abundance indices due to temporal length of surveys in these areas.

5.7.1.2 Biological Sampling Methods

Life history sampling of priority species, including black drum, is performed through the application of length distribution subsampling, with the number sacrificed for life histories studies varying depending on the species. Sacrificed black drum have several additional biological variables ascertained (e.g., weight (g) and macroscopic reproductive stage) and biological samples retained (e.g., otoliths for age and growth studies, scales for age and growth studies and ageing methodology comparisons, gonad tissues for histological determination of reproductive status, and muscle tissues for contaminant analysis).

5.7.1.3 Catch Estimation Methods

The index of abundance for the South Carolina trammel net index was initially estimated as the nominal mean CPUE of the number of fish per set using the combined data set of all ages and lengths for all estuarine strata as well as for each strata individually. A normalized arithmetic mean CPUE index was then calculated with the index normalized to the average catch from 2010-present. Z-scores for both nominal and normalized indices were estimated (Z, calculated using average and standard error of catch form 2010-present) as well as confidence intervals and relative standard error (CV).

The age-specific indices were calculated for two different groups (age-0 and age-1) using monthly size cut-offs based on the length distribution for each age group (age-0, age-1, and age-2+). Abundances for each group (based on the monthly size cut-offs) were then used to estimate CPUE. Both nominal and normalized indices were calculated for each age group.

5.7.2 Trends

The SC DNR trammel net survey catches black drum in all months of the year and the catch index was calculated as an index of relative abundance using the arithmetic mean as well as a normalized arithmetic mean with the relative index normalized to the average catch from 2010 to present. Additionally, age-specific indices were calculated for age-0 and age-1. Since the trammel survey samples estuarine shallow water (< 2 m) habitats it catches primarily age-1 black drum, with the age-1 index having very similar trends to the overall abundance index (Figure 58, Figure 59).

The overall trend for the combined age index showed peaks in abundance occurring in 1992, 2000, 2002, 2016 and 2019 (Table 29, Figure 58). These peaks in abundance for the combined index corresponded to similar peaks in the age-1 abundance index which showed peaks in abundance for all of those years (Figure 59).

The age-0 index had peaks in 1999, 2007, and 2015, which did track a few of the larger cohorts seen in the age-1 index, but was not as variable as the age-1 index (Figure 60).

5.8 Georgia Marine Sportfish Population Health Survey (MSPHS) – Trammel Net

5.8.1 Data Collection and Treatment

5.8.1.1 Survey Methods

To determine the relative abundance of various inshore finfish species, the trammel net survey was conducted in Altamaha and Wassaw sounds from September through November 2003-2020 (Figure 61). In the Altamaha River Region, 25 stations were sampled each month from a pool of 64 total stations using a stratified random station design. In a given survey month, each selected station is sampled one time. In Wassaw Sound, 25 stations were selected and sampled from a pool of 38 total stations using a stratified random station design. In a given survey month, each selected station is sampled one time.

All sampling occurred during the last three hours of ebb tide and only during daylight hours. Station pools in both survey areas were determined by initial surveys, which identified locations that could be effectively sampled with survey gear.

Survey gear is a three panel trammel net. From 2003-2007, the net was 182.9 m (600 ft) long by 2.1 m (7 ft) deep. The net was shortened to 91.4 m (300 ft) long by 2.1 m (7 ft) deep in 2007. The two outer panels are 35.6 cm (14 in) stretched mesh, and the inner panel has 7 cm (2.75 in) stretched mesh. The net has a 2.5 cm (1 in.) diameter float rope and a 75 kg (165 lb) lead line. An 11.3 kg (25 lb) anchor chain is attached to each end of the lead line, and a large orange bullet float is attached to each end of the float line.

A sampling event consists of a single net set. The net is deployed by boat starting at the bank following a semicircular path and ending back on the same bank. Net deployment is performed against the tidal current. Immediately after deployment, the net is actively fished by making two to three passes with the boat in the area enclosed by the net. After the last pass is made, the net is retrieved starting with the end that was first set out. As the net is retrieved, catch is removed and put inside a holding pen tied to the side of the boat.

A minimum of 25 stations are sampled in each sound system during each month of the sampling season (September – November). The time series covers 2003-present. Effort appears lower in 2003–2008 because only sites that are in the current station pool are used for analysis.

5.8.1.2 Biological Sampling Methods

After the net is fully retrieved, all catch is processed for information and released. The catch is identified to species and counted. All finfish specimens are measured, centerline in millimeters. In addition to catch information, temporal, spatial, weather, hydrographic and physio-chemical data are collected during each sampling event.

5.8.1.3 Catch Estimation Methods

Age-at-length data for the months of September—November from Georgia's Marine Sportfish Carcass Recovery Program were used to evaluate the ages of black drum encountered in the

trammel net survey. In the case of black drum, specimens collected during the survey most often represented age-0 fish, with 87% of all fish captured were at or below 280 mm FL. Although this process involved considerable subjectivity and ignored possible interannual variability in average growth rates, there was little likelihood that any significant error was introduced as only a very small fraction of the specific aged cohort individuals fell within the zone of overlap. Most of the data used to construct juvenile indices were drawn from months when no overlap at all is present. All fish greater than 280 mm FL were excluded for analysis.

Given the short sampling period of the trammel net sampling (September-November) all three months in each survey were used in these estimates. After partitioning out age-specific cohort individuals, numbers of individuals caught were logarithmically transformed (ln(n+1)) prior to abundance calculations, as this transformation has repeatedly been shown to best normalize collection data for aggregative organisms such as fishes. Annual juvenile CPUE indices were calculated as the weighted geometric mean catch per net set. Strata-specific means and variances were calculated and then combined, weighted by stratum areas according to the formulae supplied by Cochran (1977). Since stratum areas are quite variable, use of a weighted mean provided an index that more closely mirrors actual population sizes than a simple mean. Resulting average catch rates (and the 95% confidence intervals as estimated by + 2 standard errors) are then back-transformed to the weighted geometric means. CV is expressed as the log transformed mean catch divided by the standard deviation, E(Yst) / STD (Cochran 1977).

5.8.2 Trends

CPUE by year for 2003 through 2020 are provided (Table 29). Since 2009, CPUE has varied widely for black drum in the trammel net survey ranging from a survey low of 0.02 in 2011 to a survey high of 0.22 in 2012 (Figure 62). CPUE is higher during the earlier years of the survey however there is a higher standard error associated with these survey years due to reduced effort. Essentially this survey is a measure of annual recruitment and is largely driven by spawning success and environmental effects on larval/juvenile fish survivability through the winter/spring/summer. The index generally tracks well with annual MRIP estimates with a one-year lag.

5.9 Florida Fishery Independent Monitoring Program 183-m Center Haul Seine

5.9.1 Data Collection and Treatment

5.9.1.1 Survey Methods

The objectives of the 183-m center bag (haul) seine technique are to: 1) estimate abundance of sub-adult and adult fishes which inhabit shoreline habitats within select Florida estuaries; 2) obtain data on size composition, habitat use, and spatial and temporal distribution of sub-adult and adult fishes; and 3) provide data and biological samples for use in species-specific studies (FWC FWRI 2020b). The seine is deployed by boat to crew members on the shoreline. Samples collected with 183-m seines in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with 183-m seines in the northern and southern IRL were post-stratified by the presence or absence of

overhanging shoreline vegetation. Samples collected with this gear were not stratified by habitat type in Cedar Key, Apalachicola Bay, and northeast Florida (Figure 63).

All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset) (FWC FWRI 2020a). Additional sampling details are described in the FIM program's Procedure Manual (FWC FWRI 2020b).

The median number of sets for the 183-m seine in IR is 264 and has ranged from 237 (2001) to 410 (2011) sets.

5.9.1.2 Biological Sampling Methods

Environmental data consisting of water chemistry, habitat characteristics, and physical parameters such as current and tidal conditions were recorded for each sample. All fish and selected invertebrate species captured were identified to the lowest practical taxonomic level, counted, and a random sample of at least 10 individuals were measured (standard length for teleosts, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp) (FWC FWRI 2020a). Standard lengths (SL) are taken to the nearest mm. A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC FWRI 2020b).

5.9.1.3 Catch Estimation Methods

Using data from stratified-random sampling (SRS), an age-1+ (post-YOY) index of abundance from the 183-m seine was developed for black drum in the Indian River Lagoon (IRL). Study areas included in the analyses were selected based upon adequate sample sizes of the target species or years of available data. Therefore, only data from the 183-m seine in the IRL is considered. It is not recommended to combine northeast Florida (JX) with the IRL due to habitat differences. JX is primarily a riverine system with only river sampling, whereas black drum in the IRL are encounter in the bays.

A simplified age-1+ index was developed by using black drum standard lengths (SL mm) sampled by the 183-m seine survey in the IRL (1999-2020). The standard lengths of age-1+ are assumed to be at least 150 SL mm from January to June (Figure 64) to minimize overlap with age-0 fish.

Indices of abundance

An age-1+ yearly index of abundance in the IRL from January 1 to June 1 is estimated by standardizing CPUE data (catch per set) from the 183-m haul seine. Possible covariates include year, month, strata (bay and sampling zone), shore type (terrestrial, other), bottom type (mud, other), bottom vegetation (submerged aquatic vegetation and/or algae, other), secchi depth, salinity, dissolved oxygen, wind speed, and pH. Continuous variables (secchi depth, salinity, dissolved oxygen, wind speed, and pH) were natural log transformed (ln [X+1]) prior to the analysis to normalize the data. Covariates other than year were removed if there were less than

10 positive observations for each level. There were less than 10 positive sets in years 2000, 2001, and 2006, however these years were retained for continuity in the index.

Correlation analysis did not reveal any significant collinearity between covariates and nonlinear effects were not readily apparent. Plots of mean CPUE versus year by zone and bay suggest there may be an interaction between year and zone/bay.

Zero inflation and overdispersion (the relationship between the variance and the mean) is common for CPUE data. Thus, a negative binomial error distribution (NB model) was preferred that can accommodate such a high degree of overdispersion and zero inflation.

A full negative binomial model had a dispersion of 1.36. For the negative binomial, a backward stepwise model selection routine used both the change in deviance and change in AIC to identify covariates for removal. Covariates were removed that either resulted in a lower deviance or a lower AIC value. This method selected pH, followed by dissolved oxygen and bottom type for removal. The remaining covariates of the final negative binomial were year, strata, month, bottom vegetation, shore type, secchi depth, and windspeed and the dispersion was 1.37.

Confidence intervals were estimated by simulating the distribution of the predicted means using 10000 randomly generated residuals; each residual was a random normal deviate times the standard error for its predicted mean on the log scale. These estimates were back-transformed to numbers per set and the distribution was described in term of percentiles and a mean. Model estimates are then compared with the nominal stratified random sample mean.

5.9.2 Trends

Nominal and standardized annual indices of age-1+ black drum abundance show similar trends (Table 29, Figure 65). An increase after 2012 may be primarily driven by two strong cohorts in 2011 and 2012; however, the CV of the index is greater than 30% in all years and close to 50% in some years. This high level of uncertainty may indicate that this index is uninformative and does not adequately capture changes in abundance.

6 STOCK INDICATORS

In TOR 4 the TC was tasked with identifying and developing simple, empirical indicators of stock abundance, stock characteristics, and fishery characteristics that can be monitored annually between stock assessments. Multiple index data sets were proposed and evaluated according to both their correlation with each other and their ability to detect trends. There were several groups of indices evaluated as possible indicators of abundance and, to some extent, indicators of stock characteristics. Both recreational and commercial catch indices were evaluated as indicators of fishery characteristics.

6.1 Data Sets

The indices evaluated include: MRIP CPUE, FL Haul Seine, GA Trammel, SC Trammel, NC Gillnet, MD Seine, DE 16ft Trawl, DE 30ft Trawl, PSEG Seine, NJ Ocean Trawl, and NEAMAP. Descriptions of these indices can be found in Section 4 (MRIP CPUE) and Section 5 (fishery-independent indices).

Various indices track different life stages and characteristics. MRIP CPUE tracks exploitable abundance over a wide range of ages while the other fishery-independent indices are narrowly focused on size/age groups. NC Gillnet tracks sub-adult abundance (age-0 through age-3). SC Trammel tracks YOY through age-1. The FL Haul Seine tracks sub-adults with the exception of YOY fish (ages-1 through age-3). PSEG Seine, MD Seine, GA Trammel, DE 16ft Trawl, and DE 30ft Trawl all track YOY. NEAMAP and NJ Ocean Trawl also track YOY fish, but were evaluated as a measure of range expansion and not necessarily as a measure of year class strength.

Catch time series evaluated include recreational harvest, recreational released alive, and commercial landings for South Atlantic and Mid-Atlantic separately due to the differences in size/age structure components of the population present in these regions. Descriptions of these time series and their data collection can be found in Section 4.

6.2 Data Exploration and Analysis

6.2.1 Correlation Analysis

As part of the analysis to provide context on potential indices as abundance indicators, the TC sought to measure the strength of association between the indices using correlation analysis. Correlation is a bivariate analysis to measure the strength and direction of association between two indices. Correlation coefficient ranges between -1 and +1 with highest strength (perfect degree of association) at the ends of the range weakening as the correlation coefficient value goes towards 0 which is no correlation. A positive correlation coefficient indicates that the indices move in similar directions.

Methods

Pearson's correlation, Kendall rank correlation, and Spearman's rank correlation were all considered as methods of measurement. For Pearson's correlation, both variables are assumed to be continuous, normally distributed, have a linear relationship, homoscedasticity, and an absence of outliers. Spearman's and Kendall correlations assume only that pairs of observations are independent, two variables have a monotonic relationship and are measured on an ordinal, interval, or ratio scale. Spearman's and Kendall correlations are rank correlations, meaning that they measure monotonic relationships while Pearson's measures linear relationship. The Spearman's rank correlation test does not assume any particular distribution of the data and thus is appropriate correlation analysis when the variables are measured on a scale that is at least ordinal, but not necessarily normally distributed. It determines whether the variables are monotonically related.

Shapiro-Wilks Normality Test

Because the choice of correlation test and power test depend in part on whether the variables are normally distributed, Shapiro-Wilks tests for normality were performed for each of the indices utilizing the Shapiro.test() function in R (Table 31). Significant non-normality was determined using p-values with an alpha level set at 0.05. For most of the indices (9 out of 16), the Shapiro-Wilks test indicated that the populations may not be normally distributed.

Spearman's Rank Correlation

Associations between the chosen stock indicator indices were evaluated using Spearman's rank analysis (Spearman 1904). Spearman's rank analysis is a non-parametric test for a monotonic relationship between two variables. Each index value is ranked relative to the other values and the rankings are compared to the ordered rankings of another index. Spearman's rho, the association statistic, is more robust to outliers than Pearson's correlation coefficient due to a conversion of each index value to an ordered rank (Croux and Dehon 2010). Spearman's rho requires the less restrictive assumption of a monotonic relationship, as opposed to the assumed linear relationship for the Pearson's correlation coefficient, does not assume normal distribution of the variables, and does not assume continuity. Because the populations may not be normally distributed, Spearman's rank correlation is more appropriate than the other methods considered. The strength of the association is determined by the Spearman's rho with a value of -1 indicating a perfect negative association, +1 indicating a perfect positive association, and 0 indicating no association. Statistical significance of the Spearman correlation is determined by the p-value relative to a selected alpha level. An alpha level of 0.05 was selected for these tests.

The indices were initially grouped by predominant size range within each survey between YOY and mixed-age, which included YOY fish as well as older and larger individuals. The YOY indices included fishery-independent surveys from the Mid-Atlantic region (DE 16' Trawl, DE 30' Trawl, MD Seine, NEAMAP Trawl, NJ Ocean Trawl, and PSEG Seine) plus Georgia's Trammel net index. Mixed-age indices included MRIP, NC P915 Gill Net, and SC Trammel. The FL Haul Seine index was evaluated in preliminary correlation analyses, but ultimately dropped from the analysis due to concerns using this index as a measure of abundance as indicated by the large CVs (Section 5.9.2) and power analysis results (Section 6.2.2). Pairwise comparisons were run within each group of indices as well as across both groups.

Age-specific indices were available from the NC P915 Gill Net (YOY through age-3) and SC Trammel (YOY and age-1) surveys. Pairwise comparisons were performed with these surveys' YOY indices to each of the other YOY indices. The age-1 to age-3 indices were lagged from one to three years and evaluated in pairwise comparisons with the YOY indices to identify possible associations attributable to YOY fish recruiting to the older indices.

In another analysis, correlation among all YOY indices including the YOY portion of mixed-age indices were analyzed.

Finally, YOY and mixed-age correlations were determined in a pairwise fashion between the groups.

Results

YOY Index Association

There were positive associations among all the Mid-Atlantic YOY indices (MD Seine, DE 30' Trawl, DE 16' Trawl, PSEG Seine, NEAMAP Trawl and NJ Ocean Trawl) with significant correlations found in 6 pairwise comparisons: MD Seine with DE 16' Trawl, MD Seine with PSEG Seine, DE 30' Trawl with DE 16' Trawl, DE 30' Trawl with PSEG Seine, DE 16' Trawl with PSEG Seine, and NEAMAP Trawl with NJ Ocean Trawl (Table 32). The Spearman's Rho values either met or exceeded 0.5 in four of these associations. As these surveys sample overlapping or nearby areas, the positive and significant correlations are not surprising. Within the South Atlantic YOY indices, there were no significant correlations with each other. The GA Trammel index had negative associations with the other two South Atlantic indices (SC Trammel YOY and NC P915 Gill Net YOY) as well as showing negative associations with three of the Mid-Atlantic indices. The SC Trammel YOY index showed a negative association with the previously mentioned GA Trammel and the DE 30' Trawl, and a positive association with the other indices. Surprisingly it showed a positive, mildly correlated but significant association with the NJ Ocean Trawl.

Mixed-Age Index Association

There was only one significant correlation within the mixed-age indices: SC Trammel with NC P915 Gill Net with a Spearman's Rho value of 0.51 (Table 33). As these surveys occur in adjoining states, their positive association is not surprising.

Mixed-Age and YOY Index Association

There were only two significant correlations when mixed-age and YOY indices were compared (Table 34). Both involved the MRIP index and were only mildly positively associated: Spearman's Rho values of 0.36 with MD Seine and 0.46 with NJ Ocean Trawl.

Lagged and YOY Index Association

There were a total of 14 significant correlations between the age lagged indices and YOY indices, all of which were positive (Table 35). Of these associations, 11 resulted in Spearman's Rho values exceeding 0.50. The SC Trammel age-1 index lagged by one year showed significant correlations with the SC Trammel YOY, NC P915 Gill Net lagged indices for age-1 and age-2, the PSEG Seine, and the NJ Ocean Trawl. The NC P915 Gill Net age-1 index lagged by one year showed significant correlations with, (as previously mentioned) SC Trammel age-1 lagged index, NC P915 Gill Net's indices for YOY and for age-2 lagged by two years, DE 30' and 16' Trawl indices, and PSEG Seine. The NC P915 Gill Net index for age-2 lagged by two years showed significant correlations with the NC P915 Gill Net YOY index, DE 16' Trawl index, and PSEG Seine index. The NC P915 Gill Net index for age-3 lagged by three years showed only a significant correlation with NC P915 Gill Net's index for YOY.

Discussion

All significant correlations were positive indicating that these indices are showing similar trends in abundance. Among all the indices, the NC P915 Gill Net age-1 index lagged by one year and the PSEG Seine index had the greatest number of significant associations with other indices with six each. Many of the correlations involved survey indices arising from the same general area (or in the cases of the lagged indices, within the same survey for different ages). However, strong correlations were seen between the lagged South Atlantic indices and those for Delaware Bay, possibly indicating the YOY in Delaware Bay recruit into the age-1 plus cohorts in the South Atlantic. This theme is echoed in the NJ Ocean Trawl index's moderate but significant correlations with SC Trammel's indices for YOY and age-1 lagged by 1 year. The GA Trammel index showed no significant associations with any of the other indices. The declining trend shown over time in this index contrasts with the more positive trends seen in the other indices and is borne out by the negative Spearman's Rho values seen in several of the pairwise comparisons. The NEAMAP Trawl index was only significantly correlated with NJ Ocean Trawl index which is unsurprising as the two surveys' sample areas overlap considerably along the New Jersey coast.

6.2.2 Power Analysis

Index data sets were evaluated for ability to detect trends in abundance using two power analysis methods, a traditional power analysis and a simulation-based power analysis. Power analysis estimates the statistical power of detecting a specified change in abundance over a specified time period and provides additional context on using these data sets as indicators of abundance changes between stock assessments.

Methods

Simulation Power Analysis

A simulation-based power analysis, following the methods in Schrandt et al. (2021), was also performed for a single index, the FL Haul Seine (age-1+), as an illustrative example. These methods better accommodate observed counts (catch data) that may be overdispersed and zero-inflated by assuming alternative error distributions, such as the negative binomial. These methods can also accommodate multiple sources of random variation (e.g., within and between study sites), where random effects models (i.e., mixed effects models) are recommended.

A generalized linear mixed model (GLMM) framework was applied that assumed a negative binomial error structure. Since analytical power formulae are unavailable for these models, power was estimated via Monte Carlo simulation. First, a negative binomial GLMM with year, secchi depth, and wind speed as continuous independent variables, bottom vegetation (SAV/Algae, Other) and shore type (Terrestrial, Other) as covariates, and nested random effects of strata (bay + zone) by each year and month combination was fit to observed data. The predicted catch rate, averaged over years, and the estimated overdispersion parameter were assumed to be representative of expected annual catch rates and variability. These values were used as a starting point in the simulation.

Next, exponential changes in population abundances of +/- 50% over five years were simulated given the starting abundance estimated using observed data. Error was incorporated into the sampling process by drawing simulated samples (number of sets for six months over five years) from a negative binomial distribution with means (expected counts that decrease or increase, year after year) and overdispersion parameters from the initial negative binomial model fit to observed data.

For each simulated data set, a negative binomial model was fit with year as a continuous predictor variable (expressed as an integer ranging from 1 to 5) and the estimated slope associated with year along with its 95% confidence limits was extracted. This process was repeated 5,000 times for each level of percent annual change. The simulated populations were representative of those under average wind speed and secchi depth.

A measure of coverage and significance was estimated from the 5,000 estimated slopes associated with each level of percent annual change, as defined by Schrandt et al. (2021): "Coverage was assigned a 1 for the simulation replicates for which the true slope (the known, simulated annual percent increase or decrease) was contained within the 95% confidence interval (CI) of the estimated slope, and a 0 if it was not. Significance was assigned a 1 for the simulation replicates for which the upper 95% CI of the slope estimate was <0 (indicating a negative trend) or the lower 95% CI of the slope estimate was >0 (indicating a positive trend), and 0 otherwise. This step provided a measure of how often we detected a statistically significant temporal trend. Power for each replicate was calculated by multiplying the binary variables coverage and significance." Average power of the 5,000 replicates indicates how well the model correctly detected a temporal trend.

All data analyses were conducted in R v. 4.0.2 (R Core Team, 2020) using the package "glmmTMB" (Brooks et al. 2017) for model fitting.

Traditional Power Analysis

The traditional power analysis used the methods proposed by Gerrodette (1987; 1991). The analysis estimates the probability of making a type II error (β; incorrectly accepting the null hypothesis of no trend) when applying linear regression to the data set given the variability in the data (i.e., CV). Power is defined as 1-β, ranging from 0 to 1, and indicates greater power to detect a trend as it increases from 0 to 1.

The power analysis can evaluate decreasing and increasing trends, with the latter being more difficult to detect. However, a decreasing trend would be more likely to initiate action in response to between-assessment review of the indicators (e.g., trigger an expedited assessment) and was the focus of this power analysis. The power analysis can also evaluate exponential or linear change, with the latter being more difficult to detect (though preliminary analysis suggested differences within a few percentage points). Exponential change was the focus of this analysis because it assumes the index data are lognormally distributed (as opposed to normally distributed for linear change), a common assumption for these data sets in stock assessment models. The time period for this analysis was set to five years which is the default

increment between assessments of Commission-managed species. The median CV during the index time series (Table 37), as a representation of previously observed observation error, was used as a measure of data variability at the beginning of the projected declining trend. The CV for the index was assumed to be dependent on 1/sqrt(index), as proposed for CPUE data in Gerrodette (1987). This relationship results in an increasing CV as the index declines, making it more difficult to detect a decreasing trend than the other relationships proposed (CV=sqrt(index) and constant CV). The power to detect a 50% decline in abundance and the percent decline that can be detected with a power of 0.8, a power benchmark commonly set for indices of abundance (ASMFC 2017, 2020), is reported for each data set.

Results

For the FL Haul Seine using the simulated power analysis, the power to detect a 50% decline in abundance was estimated to be 0.11 (Table 36). This index could not detect any decline with a power of 0.80 but could detect a 10-fold increase in the population with a power of 0.88. These results are based on a mean starting relative abundance of 0.23 and a theta (dispersion parameter as calculated as mean + (1/theta)*mean^2) of 0.14.

For the indices analyzed in the traditional power analysis, power to detect a 50% decline in abundance ranged from 0.14-1.0 (Table 37). The NJ Ocean Trawl index, which is being proposed as an indicator of range expansion, had the lowest power, while the MRIP CPUE, used as the primary index in modeling approaches, had the highest power. Indices tracking multiple age classes, with the exception of the FL Haul Seine survey, had greater power (>=0.6), while indices tracking only YOY abundance had lower power (<0.40). Similarly, indices tracking multiple age classes could detect smaller five-year declines (<65 %) with a power of 0.80 than YOY indices (>85% decline). Notably, the NJ Ocean Trawl index could not detect any decline with a power of 0.80.

Discussion

Although the traditional power analysis could be more readily applied to index data sets during this assessment, the lognormal distribution assumption underlying this analysis may be violated as these index data can be more variable than expected under this distribution (overdispersed). The comparison of power analysis methods for the FL Haul Seine index demonstrated the effect of this violation, with the simulation-based power analysis assuming a negative binomial distribution estimating lower power than the traditional power analysis. If this is the case for other index data sets, the traditional power analysis may overestimate absolute power and may serve as a better understanding of relative power among data sets. For example, we may expect to see trends earlier in the indicators that track age classes beyond just YOY, while YOY indicators generally have similar, lower power to detect trends. The power analysis suggests the range expansion indicator should be viewed as a more qualitative indicator not likely to reflect quantitative trends in the underlying population abundance. Expanding the simulation-based power analysis to other indicator data sets should be a future research priority.

These analyses also highlight some of the concerns with using the FL Haul Seine survey index as an indicator as this index had power estimated with the traditional power analysis comparable

to the noisier indices tracking only YOY abundance and lower than other indicator options that track multiple age classes. The power estimated with the simulation-based power analysis was quite low and indicated this survey is unlikely to detect declining trends between assessments.

6.2.3 Recreational Released Alive Analysis

The number of black drum estimated to have been released alive by recreational anglers has trended down over the last two years of the time series (Figure 19). This trend was seen in both regions, though the trend in the South Atlantic drives the overall trend due to the much greater magnitude of catch in this region (Figure 74). Although this trend is from the time series high and the estimate in the terminal year remains above the time series mean, it is important to understand the drivers of this trend in the case that it continues in post-assessment updates of the indicators. This trend could be indicative of abundance declines, specifically YOY and age-1 abundance since most of these fish must be released due to minimum size limits, declines in effort, or a combination of both. Therefore, these estimates were evaluated at finer temporal and spatial resolutions than the final indicator structure to better understand this indicator and the trends being observed.

First, the total released alive catch was broken down by state for the states contributing the vast majority of the catch to the coastwide total (NC, SC, and FL; Figure 66). The trend in catch is similar across states, with declines from 2018-2020 and extending back to 2016 in NC and 2015 in SC. The initial increase in released alive catch in NC is likely driven by the coincidental implementation of a minimum size in 2014 that protects YOY fish and an above average year class measured in the NC Gillnet survey, while the initial increase in SC is likely driven by a strong year class measured in several FI surveys (2015; NC Gillnet, SC Trammel, PSEG Seine, DE 16ft Trawl surveys) and the cohort analysis. As a measure of effort, directed trips (trips targeting black drum) show less consistent patterns with variability among years and states (Figure 67). There was a decline in trips in FL which appears to at least partially account for the trend in catch in this state but declines in effort are less apparent in NC and SC. Dividing the catch by number of trips shows variable CPUE in FL, but more steady declines in NC and SC (Figure 68).

The estimates were then broken down by wave due to increasing vulnerability of YOY fish to the recreational fishery throughout the calendar year to determine if angler behavior may have changed to avoid these sub-legal fish in recent years leading to effort-driven declines in seasonal catch. The seasonal data show the latest waves (September/October and November/December) are the primary contributors to the total released alive catch in NC and SC, presumably YOY fish becoming vulnerable to the recreational fishery (Figure 69). There was not as clear a seasonal pattern in released alive catches in FL. There are some differences between the primary waves in NC and SC, but they generally follow a declining trend since around the period the annual totals started declining. CPUE during these waves in NC and SC shows steady declines (Figure 70).

While these declines may be an abundance signal, other extraneous factors may be causing or contributing to the declines. For example, angler behavior changes not captured by the number

of trips (e.g., gear size changes, location changes) may have affected effort leading to a decline in catch. It's also important to note that these declines are from time series highs and the 2019-2020 values are still relatively high. In addition, the noticed decline occurred in 2019 and 2020. Because the COVID-19 pandemic regulations disrupted the APAIS, MRIP filled gaps in the 2020 catch data with data collected in 2018 and 2019 (Section 4.2.1.6). Therefore, it is difficult to determine how much of the 2020 indications are due to the proxy data carrying forward what was seen in 2019 and how much was truly 2020. We recommend this trend be monitored closely between assessments.

6.3 Selected Indicators

A number of the studied time series could be used to indicate stock abundance, stock characteristics, or fishery characteristics. Data sets recommended for stock indicators are discussed below.

Abundance Indicators

The selected abundance indicators included MRIP CPUE, SC Trammel, NC Gillnet, MD Seine, DE 16ft Trawl, DE 30ft Trawl, PSEG Seine, and the GA Trammel (Table 38).

Stock Characteristics Indicators

The NJ Ocean Trawl has been selected as an indicator of range expansion, a stock characteristic (Table 38).

Fishery Characteristics Indicators

Catch, a fishery characteristic, is characterized by time series including MRIP recreational harvest (pounds), MRIP recreational released alive (numbers), and commercial landings (pounds; Table 38).

6.3.1 Results – Indications Since Previous Assessment

Abundance Indicators

The abundance indices for subadult and ages 0-1 are holding steady. The YOY abundance indices are highly variable but seem to have had fewer and lower highs in the period after 2010 than in the period before. Several of the Mid-Atlantic surveys (DE Trawls, MD Seine) and the GA Trammel saw greater recruitment events in the 1990s and 2000s than they did in more recent years. Other YOY indices such as the PSEG Seine are more stable. The MRIP CPUE is increasing (Figure 71).

Stock Characteristics Indicator - Range Expansion

The NJ Ocean Trawl is currently the lone range expansion indicator. The trawl caught very few black drum in the 1990s. However, in the 2000s there were some relatively high catches with high variability but with even the low catches being higher than in the 1990s. A moderate level of catch occurred in the 2010s without the highs of the 2000s, but above the 1990s level (Figure 72).

Fisheries Characteristics Indicators - Catch

The recreational harvest is holding steady with three relatively low years in 2018, 2019, and 2020 (Figure 73).

Recreational released alive had been increasing until the last two years where number of fish released alive trended down significantly (Figure 74).

Commercial landings have been lower and steady in recent years (Figure 75).

6.4 Discussion

The indices with the highest power to detect a -50% change are the MRIP CPUE, NC Gillnet, and SC Trammel. MRIP has significant positive correlation with MD Seine and NJ Ocean Trawl. There is quite a bit of positive correlation within the Mid-Atlantic, though the power of each index alone to detect -50% change is only moderate at 0.23-0.38.

The GA Trammel index was the lone YOY-only index in the South Atlantic and its trend was not correlated with other indices in the South Atlantic or Mid-Atlantic. Although this index appears to be tracking an abundance signal different than the abundance signal elsewhere along the coast, there is no clear explanation for the difference at this time and the TC believes this index should continue to be monitored with this caveat in mind.

Though the NJ Ocean Trawl was selected as an indicator of range expansion, it was not selected as an abundance indicator due to the fact that it had the lowest power with an inability to detect a decline with a power of 0.80 and a power of only 0.67 to detect a 99.5% decline. In addition, in the correlation analysis of YOY and lagged, it had significant low positive correlation with SC age-0 and age-1 and significant fairly high positive correlation with NEAMAP and no significant correlation with any other of the indices.

Likewise, NEAMAP was not selected as an abundance indicator since it correlated significantly only with NJ Ocean Trawl, and was seen as redundant with the NJ Ocean Trawl indicator (spatial overlap, high correlation). It lacks the historical perspective provided by the NJ Ocean Trawl, and so is not recommended for as a range expansion indicator at this time either.

FL Haul seine was considered, but because of the low power to detect decreases despite being a multi-age index, it was not selected as an indicator.

No single index seems to have high power to detect change along with broad correlation with other indices. Therefore, multiple indicators have been selected for abundance.

Though the catch indices (recreational harvest, recreational released alive, and commercial landings) are good indicators of the fishery characteristics, there are many extraneous pressures on these indices (market, regulations on other species, changing popularity of the species, etc.) that preclude them from being appropriate abundance indicators.

7 METHODS

Six assessment methods were applied to available black drum data sets. Four of these methods are described in the following section. The final two methods, Simple Stock Synthesis and a Stock Synthesis model fit to length data, are described in Appendix 2. Results from the Simple Stock Synthesis model were similar to the DB-SRA model described below. The Stock Synthesis model fit to length data was still in a state of development at the end of the assessment and needs further development before being considered as a potential candidate for management advice. Some results from the Simple Stock Synthesis model are discussed in Section 7.4 as they supported understanding of model behaviors with various data sets included.

7.1 Index-based methods

For this assessment, two index-based management methods were investigated: Itarget and Skate. Both methods were included in the 2020 Index-Based Methods Working Group (IBMWG) topic-based Research Track Assessment which evaluated several index-based methods to provide catch advice and determine stock status for stocks exhibiting strong retrospective patterns with age-structured stock assessments (MAFMC 2020). This assessment utilized relevant portions of the R code created by the IBMWG (available at https://github.com/cmlegault/IBMWG) and followed similar analyses within these methods. The data inputs included total removals (commercial and recreational landings plus recreational dead discards; Table 16) and the MRIP CPUE index (fish per angler hour) in pounds for the years 1982-2020 (Table 11). These methods and the analyses are described in the following sections.

7.1.1 Itarget Method

The Index target (Itarget) method was proposed in Geromont and Butterworth (2015a) as a management procedure for data-poor fish stocks and utilized catch history and a CPUE index of abundance for data inputs. This method compares the most recent five-year average index to a target index value based on a multiple of the average index over a specified reference period in the index time series. With the goal of the stock's relative abundance achieving the target level, the catch advice, or total allowable catch (*TAC*), is calculated by adjusting (up or down based on the comparison of the recent index average to the target index) the average catch of the same reference period as the survey index. The formulas for the *TAC* for the succeeding year (*y+1*) are shown below:

$$TAC_{y+1} = 0.5C_{reference}\ \{1+[(I_{recent} - I_{threshold}) / (I_{target} - I_{threshold})]\}\ for\ I_{recent} >= I_{threshold}$$

and

$$TAC_{y+1} = 0.5C_{reference}\ [(I_{recent} / I_{threshold})^2]\ for\ I_{recent} < I_{threshold}$$

where:

$C_{reference}$ = average catch over the reference period

I_{recent} = average of most recent 5-year average of the index

$I_{threshold}$ = 0.8 * average index over the reference period

I_{target} = index multiplier * average index over the reference period

For this assessment, the initial analysis utilized the same reference period timespan (the latest 25 years) and the same initial index multiplier (1.5) as the IBMWG (Figure 76). Using these parameter inputs, the recent catch (5.88 million lbs) is higher than the target catch (4.05 million lbs) and the recent index (0.99) is below the target index (1.39). However, the TC was concerned that the index multiplier may be too high considering that the resulting target index has been surpassed only once (with 1989's value of 1.59, which may be anomalous) and the stock is believed to have been in a relatively good condition during the data time series. The next highest index value of 1.24 occurred in 2009 while most of the other index values fall below 1.00 (only 9 index values exceeded 1.00 in the 39-year time series). The index multiplier can be tuned to individual fisheries to reflect expert opinion on depletion and stock status, and resource behavior (Geromont and Butterworth 2015b). To address this concern, additional runs were conducted using a range of index multipliers from 1.00 through 1.40 in 0.05 increments (Figure 77). With the index multiplier values of 1.00 and 1.05, the recent average index was >= the target index and the target catch was higher than the reference period average catch. With the index multiplier values >= 1.10, an increasing target index exceeded the recent index, and a decreasing target catch fell below the reference period average catch.

Another set of runs used a similar range of index multipliers (1.00-1.40) but extended the reference period to the full 39-year time series (1982-2020) of the data. With the additional years, the reference period average index fell to 0.88, the threshold index to 0.70, and the reference period average catch to 4.72 million pounds. In this scenario, reference period average catch remained below target, and the recent index remained above the target index for index multiplier values from 1.00 through 1.10 (Figure 78). With index multiplier values greater than 1.10, an increasing target index exceeded the recent index, and a decreasing target catch fell below the reference period average catch.

A final set of runs used a 34-year reference period from 1982–2015 which excluded the last 5 years, as directed angler effort had shown a marked increase since 2016. The same range of index multipliers (1.00-1.40) as the previous two runs was used. The reference period average index fell again to 0.86 as did the threshold index (0.69). The reference period average catch of 4.45 million lbs was the lowest of the three runs. As with the runs using the full time series, reference period average catch remained below target, and the recent index remained above the target index for index multiplier values from 1.00 through 1.10 (Figure 79). With an index multiplier of 1.15, the recent index basically equaled the target index, and the reference period average catch was only slightly higher than the target catch. With index multiplier values greater than or equal to 1.20, an increasing target index exceeded the recent index, and a decreasing target, catch fell below the reference period average catch.

7.1.2 Skate Method

The Skate method was developed by the New England Fishery Management Council (NEFMC) for use in evaluating the stocks of 7 skate species within the Northeast Skate Complex FMP. This method utilizes a time-series of catch and a survey index to produce catch advice. Relative fishing mortality is calculated from the median value of annual catch (smoothed over 3 years) divided by the annual 3-year moving average index over the entire time series minus the years since the previous assessment (8 years since the terminal year of 2012 for data in the 2015 ASMFC Black Drum Stock Assessment). The catch advice is calculated by multiplying the relative fishing mortality with the terminal 3-year moving average survey index. Biomass reference points are derived from survey data with the B_{MSY} proxy defined as the 75th percentile of the survey biomass time series through the previous assessment (NEFMC 2020). The biomass threshold is calculated as 0.5 * B_{MSY} proxy. Fishing mortality reference points are derived from the percent change of the 3-year moving average survey biomass of the terminal year from that of the previous year. If the terminal year value shows a decline by more than the average CV of the survey time series, fishing mortality is deemed to be above F_{MSY} and overfishing is occurring (NEFMC 2020). The acceptable biological catch generated by this method was considered by the IBMWG as a possible overfishing limit, so the annual catch target (*ACT*) became the IBM-generated catch advice reduced by 25% to account for unspecified scientific uncertainty (MAFMC 2020).

This assessment utilized the MRIP CPUE index and total removals history from the years 1982-2012 (the terminal year of data from the previous black drum stock assessment) for the reference period. The biomass target (75th percentile index value) was 0.97 with the biomass threshold calculated at 0.48. The survey time series CV was 26.76. Following the NEFMC Northeast Skate Complex FMP protocol for determining stock status, the 2018-2020 average index (0.991) is above both the biomass threshold (0.485) and the B_{MSY} proxy (0.970), and it increased by 3.5% over the 2017-2019 index value of 0.957 (Table 39; Figure 80). Thus, the black drum stock would not be considered overfished nor would overfishing be occurring. However, a plot of the smoothed catch with the estimated *ABC* and *ACT* levels shows the annual removals have been over both levels since 2008 (Figure 80), suggesting that the stock may have been experiencing overfishing for the past 13 years, a contradiction from the determination from the index-only findings.

An examination of the relative *F* over the time series seemed to show a consistent increase in exploitation since 2000 as the relative *F* values from that year forward are all higher than those from the years before 2000 (Figure 80). A run using only the years 2000-2012 for the reference period yielded the following results: B_{MSY} proxy = 1.093, biomass threshold = 0.547, median relative *F* = 6,983.381, *ABC* = 6.92 million lbs, and *ACT* = 5.19 million lbs. The terminal smoothed index value was slightly lower than the increased B_{MSY} proxy but still higher than the biomass threshold (Figure 81). With the increased *ABC* and *ACT* levels, the catch history now falls mostly in between these levels for the last 11 years. Using only the recent years' (2000-2012) data yielded results more consistent between the index and catch history, i.e., the stock is not overfished nor experiencing overfishing based on the index calculations.

7.2 Depletion-Based Stock Reduction Analysis

7.2.1 Background and Data

The black drum DB-SRA developed for management advice during the previous assessment in 2015 was updated during this assessment as a continuity run and bridge to the previous assessment, and also as a potential analysis to inform stock status determination in this assessment. See Section 1.4 and ASMFC (2015) for background information on this analysis.

There were two changes to the inputs for the DB-SRA that have occurred since the previous assessment. The first is that the removal time series was changed based on the changes to the MRIP survey design and resultant calibrations applied to all historical estimates (Section 4.2.1). These calibrations resulted in significant increases in the magnitude of removals relative to the previous assessment (Figure 82). Additionally, removal data since the previous assessment (2013-2020) were added to the analysis and the removals have remained around the higher levels observed towards the end of the previous assessment. The second change was the update of the Hoenig (1983) natural mortality estimator by Then et al. (2015) that was adopted in this assessment (Section 2.5).

The DB-SRA was first updated with just the new removal data using the Hoenig (1983) natural mortality estimate from the previous assessment as the mean for the input distribution (Figure 83) to isolate the effect of the new removal data in the continuity analysis (***New_Catch*** continuity run). Other input distributions, F_{MSY}/M, B_{MSY}/K, and B_{2012}/K, also remained the same as specified in the previous assessment. This included changing the depletion input (B_{2012}/K) from the terminal year in the previous assessment (2012) to a year earlier than the terminal year in this assessment to maintain consistent prior information on depletion levels. An additional run of the DB-SRA (***Then_M*** continuity run) is included here with the Then et al. (2015) natural mortality estimate used as the mean of the input distribution (Figure 84) and the new removal data to complete the continuity analysis and provide a candidate analysis for stock status determination in this assessment with the best available information for inputs.

7.2.2 Results

Ten thousand iterations were conducted in each of the updated DB-SRA runs and >98% of the iterations were retained for final distributions from each run (9,834 for the ***New_Catch*** run and 9,964 for the ***Then_M*** run).

Exploitation with just the new removal data was generally estimated to have been lower in years before 1998 and higher since relative to the estimates in the previous assessment (Figure 85). This effect is driven by the updated relative removals (scaled to time series mean) being lower in early years and generally higher in later years relative to the removal data in the previous assessment (Figure 86). The higher natural mortality in the ***Then_M*** run indicates reduced longevity (fewer fish living to older ages) and less standing stock (i.e., a smaller carrying capacity – Table 40), resulting in a greater proportion of the biomass removed by the fisheries and higher exploitation. These estimates are similar to the previous assessment in

years prior to 1970, but have regularly exceeded estimates from the previous assessment since the 1970s, much earlier than the ***New_Catch*** run.

The median U_{MSY} estimates were very similar between the previous assessment and the ***New_Catch*** run, but much higher with the higher natural mortality (Table 40). For both continuity runs, the annual exploitation was estimated to be below U_{MSY} throughout the time series, a departure from the previous assessment when a large pulse of harvest estimated by MRIP in the Mid-Atlantic recreational fishery in 2008 resulted in exploitation exceeding U_{MSY}. Exploitation decreased sharply after 2009 and was well below U_{MSY} in the terminal year of the previous assessment across runs. Exploitation increased since the terminal year of the previous assessment and was at its highest sustained level of the time series, but has remained below U_{MSY} including in the terminal year of this assessment.

The stock was estimated to be less depleted (B_y/K) with just the new removal data in years prior to the 2000s relative to the previous assessment, but then estimates converge on the estimates from the previous assessment due to a greater rate of depletion from higher exploitation during these years (Figure 87). With the higher natural mortality, the stock is slightly less depleted due to a greater estimate of the intrinsic rate of population increase parameter (*r*, Table 40) allowing for a more resilient stock able to replenish biomass lost to removals through annual production. Depletion in the terminal year of the previous assessment is very similar across runs. Depletion has steadily continued since the previous assessment and both continuity runs estimate very similar depletion in the terminal year of this assessment.

B_{MSY} and *K* estimates increased significantly from estimates during the previous assessment due to the increased magnitude of the removal data. These parameter estimates are greater with the lower natural mortality used in previous assessment. Biomass in the terminal year remains above B_{MSY} for both continuity runs (Figure 88). This biomass condition is strongly influenced by the input choice for depletion.

As with the biomass parameters, the catch reference points established in the previous assessment also increased significantly in magnitude. The median 2012 *OFL*, established as a catch threshold, increased from 4.12 million pounds to 10.80 and 13.34 million pounds for the ***New_Catch*** and ***Then_M*** runs, respectively. In all runs, the 2012 removals were below the interquartile range of their respective *OFL* estimates. The 2020 *OFL* was lower than the 2012 *OFL* within each continuity run due to the continued depletion of biomass, but the removals in 2020 were below interquartile ranges of these threshold 2020 *OFL* estimates. The median *MSY* estimate, established as a catch target, increased from 2.12 million pounds in the previous assessment to 5.57 and 6.81 million pounds for the ***New_Catch*** and ***Then_M*** runs, respectively. Removals exceeded the median *MSY* estimates from continuity runs more frequently than in the previous assessment during overlapping years (Figure 89). In the previous assessment, removals only exceeded the median *MSY* in three years (2000, 2008, 2009). In the continuity runs, removals exceeded median *MSY* during eight and five years prior to 2013 in the ***New_Catch*** and ***Then_M*** runs, respectively. Removals exceeded the median *MSY* from the ***New_Catch*** run every year since the previous stock assessment except 2019, while removals

exceeded the median *MSY* from the ***Then_M*** run during three years since the previous assessment (2013, 2016, 2017). These results indicate a greater exploitation according to the updated removal data that has extended into years since the previous assessment, but not an overfishing condition according to the reference point structure adopted in the previous assessment.

7.3 JABBA-Select

7.3.1 Model Background

JABBA-Select was developed as an extension to the Just Another Bayesian Biomass Assessment (JABBA) surplus production modeling framework (Winker et al. 2018) as a means of incorporating life history and fishery selectivity information into an age-structured production type model (Winker et al. 2020). JABBA is a state-space Bayesian modeling framework that is well suited to handle both observation and process error in the dynamics of the modeled stock through state-space formulations while incorporating existing information and uncertainty about model parameters adequately through the use of Bayesian prior distributions. JABBA-Select requires the same data sets as a surplus production model including a time series of total fishery removals and an index of abundance. Further, the model requires information on biomass depletion at the start of the modeled time series, life history inputs including von Bertalanffy growth parameters describing growth, maturity parameters, length-weight relationship parameters, natural mortality, steepness of the Beverton-Holt stock-recruitment relationship, and unfished stock size, and selectivity patterns for each index of abundance, fishing fleet, and selectivity period within each fishing fleet. Inputs are summarized in Table 41 (fixed inputs) and Table 42 (input prior distributions).

The extension of JABBA-Select uses several key components that increase flexibility relative to typical biomass-aggregated production models like JABBA to make it more suitable for stocks exploited under selectivity patterns that differ from their maturity patterns and change through time. The model uses a reparameterization of the surplus production *r* parameter, H_{MSY} or harvest rate associated with *MSY*, and the parameter defining the shape of the surplus production curve, *m*, to link a traditional Pella-Tomlinson surplus production model with age-structured per-recruit models. If there are multiple fleets fishing with different selectivity patterns, the overall annual H_{MSY} (H_{MSYy}) represents fleet-specific H_{MSYs}s (where $_s$ is fleet *s* with a unique selectivity pattern) by averaging $H_{MSYs}s$ weighted by the fleets' relative contributions to total fishery removals in year *y*. Further, $H_{MSYs}s$ can vary through time due to regulation changes. These two effects can result in time-varying H_{MSYy} which is akin to time-varying *r* in a traditional surplus production model.

JABBA-Select also links the surplus production model and age-structured per-recruit models to account for distortion of biomass from an index of abundance tracking biomass (exploitable biomass; *EB*) that is not equal to spawning biomass (*SB*). If selectivity-at-age is different than maturity-at-age, *SB* will change at a different rate than *EB* across different levels of relative *SB* (i.e., depletion). This effect needs to be accounted for when fitting to the index of abundance to avoid biasing production which is a function of *SB*. The age-structured per-recruit models are

used to estimate this relationship by calculating the ratio of *SB* and *EB* according to the maturity and selectivity, respectively, as *SB* changes in response to varying *F* levels. For example, if immature biomass is selected, *EB* will increase relative to *SB* as fishing mortality increases and *SB* becomes more depleted (Figure 90). This relationship is estimated prior to fitting the surplus production model using the means of the *M* and *h* priors and is treated as a fixed input assumed constant. Any deviations from this relationship are expected to be handled through process error (Winker et al. 2020).

The modeling procedures start off with a Monte Carlo simulation to generate a prior distribution for the production model parameters H_{MSY} and *m*. One thousand samples of *M* and *h* are drawn from prior distributions and used along with the other life history and selectivity inputs to iteratively solve for MSY-based reference points *MSY*, F_{MSY}, and SB_{MSY} with the per-recruit models by finding the *F* that maximizes yield. Unfished spawning biomass (SB_0) is solved by setting *F* to zero. These pre-recruit model parameters are used to calculate the surplus production parameters H_{MSY} and *m* that are implicit of the age-structured processes using equations 1 and 2, respectively.

$$\text{Equation 1: } H_{MSY} = \frac{MSY}{SB_{MSY}}$$

$$\text{Equation 2: } \frac{SB_{MSY}}{SB_0} = m^{\left(-\frac{1}{m-1}\right)}$$

Due to the correlation typical of surplus production model parameters, JABBA-Select uses the samples from the simulation to generate a multivariate normal prior so these parameters can be estimated jointly in the production model. If there are multiple fishing fleets and/or selectivity periods, ratios of H_{MSY} for the first fleet (H_{MSY1}) and subsequent fleets/selectivity periods ($H_{MSYs>1}$) from the simulation are fit to a gamma probability density function. The estimated shape and scale parameters are used in conjunction with the multivariate normal prior for H_{MSY1} and *m* to generate priors for the $H_{MSYs>1}$ parameters. The *m* parameter is generally less sensitive to different selectivity patterns than H_{MSY} (Winker et al. 2020), so the *m* parameter used in the subsequent surplus production model is an average across all fleets selectivity patterns when there are multiple fleets.

The surplus production model is then applied to observed catch and index time series in a Markov chain Monte Carlo (MCMC) analysis to update the prior distributions and estimate posterior distributions of key management parameters (e.g., MSY reference points, proxy per-recruit reference points such as $SB_{40\%}$).

Annual production is estimated in the first year (P_{init}) with equation 3.1 and all subsequent years (P_y) with equation 3.2:

$$\text{Equation 3.1: } P_{init} = \psi e^{\eta_y - 0.5\sigma_\eta^2}$$

$$\text{Equation 3.2: } P_y = \left(P_{y-1} + \frac{\sum_s \Upsilon_{s,y-1} H_{MSYs}}{1-m^{-1}} P_{y-1}\left(1 - P_{y-1}^{m-1}\right) - \frac{\sum_s C_{s,y-1}}{SB_0}\right) e^{\eta_y - 0.5\sigma_\eta^2}$$

where ψ is a scaling for initial biomass depletion in the first year, η_y is the lognormal process error term for year *y*, σ_η^2 is the process variance, $C_{s,y-1}$ is the removals of fleet *s* in year *y-1*, and $\Upsilon_{s,y-1}$ (i.e., $\frac{C_{s,y}}{\sum_s C_{s,y}}$) is a multiplier to weight H_{MSYs} relative to removals by fleet *s* in year *y*. The process error allows for deviation from deterministic formulations due to stochasticity in recruitment, natural mortality, selectivity, etc.

Annual spawning stock biomass is estimated with equation 4:

$$\text{Equation 4: } SB_y = P_y SB_0$$

Indices of abundance are predicted with the observation equation 5:

$$\text{Equation 5: } \ln\left(I_{i,y}\right) \sim Normal(\ln\left(q_i EB_{i,y}\right), \sigma_{\varepsilon y,i}^2)$$

where $I_{i,y}$ is the relative abundance index *i* in year *y*, q_i is the catchability coefficient for abundance index *i*, $EB_{i,y}$ is the *EB* for index *i* in year *y* predicted from equation 4 according to the expected relationship between the EB_i and *SB* ratio and the depletion of *SB*, and $\sigma_{\varepsilon y,i}^2$ is the total observation variance in year *y* for index *i*. Observation error consists of three additive components that can be switched on or off in any combination. The first component is the externally estimable SE (e.g., from a standardization model), the second component is an additional input SE that can account for sources of error that can't be estimated externally such as interannual variability in catchability, and the third component is an internally estimable SE when fitting to the index in the model.

The JABBA-Select modeling framework is executed in R (R Core Team 2020, version 4.0.2) with a 'Prime' file that sets up all model specifications, passes these to the model source code (JABBA_SELECTv1.1.R), within which the MCMC part of the analysis is implemented in JAGS (Plummer 2003, version 4.3.0). The JABBA GitHub repository (https://github.com/JABBAmodel) was used to download source code, view examples, and guide development of the black drum configuration.

A sciaenid species similar to black drum, silver kob (*Argyrosomus japonicus*), was used for the application of JABBA-Select in Winker et al. (2020) as well as the example in the GitHub user guide. Winker et al. (2020) also applied simulation analysis to test the performance of JABBA-Select as an estimation model (EM) relative to three other EMs, a state-space formulation of a traditional Pella-Tomlinson surplus production model and two traditional age-structured production models, one with a deterministic recruitment function and one with a stochastic recruitment function. Four operating models (OM) were used to simulate known populations including a base OM with the dynamics similar to the EMs (i.e., correctly specified EMs), an OM with higher natural mortality and lower steepness, an OM with dome-shaped fishery selectivity instead of logistic fishery selectivity, and an OM with a one-way trip trajectory (declining abundance) that contains little information about the stock's productivity. All OMs included a change in fishery selectivity part way through the time series. All EMs were configured to model the change in selectivity (the surplus production model was configured for this by way of a

time-varying index catchability coefficient) and the same configuration of each EM was applied to simulated data from each OM as separate scenarios, thereby introducing misspecification in the later three scenarios. Notably, in the case of the one-way trip scenario, similar to the situation faced in this assessment with black drum data sets, JABBA-Select estimated absolute quantities SB_y and *MSY* with reduced accuracy relative to the base scenario, but was less affected when estimating the relative quantity SB_y/SB_0. Collectively across scenarios, JABBA-Select was shown to perform at least as well as the traditional age-structured production models and better than the traditional surplus production model. JABBA-Select was able to consistently produce unbiased estimates of H_{MSYs} parameters. JABBA-Select was also a superior performer for adequately characterizing uncertainty of stock status estimates.

7.3.2 Configuration for Black Drum

Note: The model configuration described in this section has been revised in response to the recommendations of the Peer Review Panel. Changes are fully detailed later in this report in Section 13: Addendum to the Stock Assessment Report.

The modeled time series was 1982-2020. The start year was chosen as 1982 because this is the first year with index of abundance data and to exclude an anomalous seasonal breakdown of removals in the Mid-Atlantic in 1981 (Figure 40, see fleet structure below).

Fishing Fleets
Coastwide fisheries of black drum were split into three fishing fleets due to expected differences in selectivity patterns. The first fleet included all South Atlantic states where primarily sub-adult fish are available to the fisheries (SA fleet). Mid-Atlantic states were grouped and split into two seasonal fleets, a fleet fishing January-August when primarily spawning adults are available to the fisheries (MA_early fleet) and a fleet fishing September-December when mature fish have largely emigrated from the area and primarily young fish (age-0 and age-1) remain available to the fisheries (MA_late fleet).

The SA fleet accounts for the majority of removals through time, while the MA_early fleet is the second largest fleet and the MA_late fleet only accounts for small and variable removals (Table 16).

There are no existing estimates of selectivity for black drum on the Atlantic coast. The process to specify length-based selectivity included four guidelines:

1. Inspect available length composition data and regulation history to identify likely changes in selectivity.

2. Combine length data across a constant selectivity period and scale proportion-at-length to the maximum proportion-at-length across the length range to inform ascending

selectivity in fisheries encountering immature fish (SA fleet, MA_late fleet) and descending selectivity in fisheries not encountering the full sub-adult size range (MA_late fleet).

3. Use 1-maturity-at-length for emigration from sub-adult fisheries (SA fleet, dome shaped selectivity) and maturity-at-length for recruitment to mature spawning adult fisheries (MA_early fleet, logistic selectivity).

4. Assume an ascending selectivity shifted slightly left of length composition data (all from harvested fish) for fisheries encountering immature fish (SA fleet and MA_late fleet) to account for dead discards of sub-legal fish.

SA Fleet

Length data from the South Atlantic were combined across periods with constant regulations from 1981-1988 (no state regulations), 1989-1997 (FL implemented a slot size limit and bag limit in 1989), 1998-2006 (GA implemented a minimum size and bag limit in 1998), 2007-2013 (SC implemented a slot size limit and bag limit in 2007), and 2014-2020 (NC implemented a slot size limit and bag limit in 2014, GA increased the minimum size). MRIP data were prioritized due to the statistical design of the survey and the majority of removals coming from recreational fisheries, but supplementary fishery-dependent data were included as a secondary check, with some cautions. Supplementary data do not have the spatial, temporal, or designed coverage of MRIP and can include biases (e.g., citation data representative of trophy fisheries, not general harvest). Periods prior to 2014 showed little evidence of a selectivity change in the South Atlantic overall, while data after 2014 showed a clear reduction in selectivity of smaller sizes (Figure 91). Based on these comparisons, the SA fleet was broken into two selectivity periods, 1982-2013 and 2014-2020.

Dome shaped selectivity for the first period ascends, reaching 95% selectivity at 220 mm, plateaus at full selectivity for 300 mm, and descends following 1-maturity-at-length (Table 41 and Figure 92). Selectivity approaches zero near 800 mm. Ascending selectivity shifts to the right in the second selectivity period, reaching 95% selectivity at 375 mm, and is then equal to selectivity in the first period for larger sizes (Figure 93).

MA_early Fleet

Mid-Atlantic state size regulations (only minimum size limits of 16 inches, ≈400 mm) are assumed not to have affected removals during the early period in the Mid-Atlantic when mature spawning adults are available to the fisheries, so selectivity is assumed constant for this fleet. The available length data become noticeably more noisy for this fleet and the maturity ogive is considered a better approximation of selectivity. Logistic selectivity follows the maturity-at-length, reaching 95% selectivity at 740 mm (Table 41 and Figure 94).

MA_late Fleet

Length data from the late period in the Mid-Atlantic were combined across periods with constant regulations from 1981-1986 (no state regulations), 1987-1993 (VA implemented a 16 inch minimum size in 1987), 1994-2000 (MD implemented a 16 inch minimum size in 1994), 2001-2009 (NJ implemented a 16 inch minimum size in 2001), 2010-2020 (DE implemented a 16 inch minimum size in 2010). MRIP data were again prioritized here due to the statistical design of the survey and the majority of removals coming from recreational fisheries. There were also no supplementary data for this fleet prior to 1994. The limited data were categorized into less than 16 inches and $\geq$ 16 inches to determine any indication of selectivity changes due to 16 inch minimum size limits. There was a clear shift in these categories during the dominant catch wave (wave 5) after 1993 (Table 43). Interestingly, this time period aligns with MD's implementation of the minimum size limit despite MD being a relatively small contributor to removals of this fleet. Given this shift, the MA_late fleet was broken into two selectivity periods, 1982-1993 and 1994-2020.

Dome shaped selectivity in the first period ascends, reaching 95% selectivity at 180 mm, plateaus for a small range, then descends sharply (Table 41 and Figure 95). Selectivity for sizes larger than ≈300 mm remains at 1% due to intermittent occurrences of larger fish in the size composition data. Selectivity in the second period shifts slightly to the right and increases for the larger sizes (Figure 96), matching that of the MRIP CPUE (see below) due to more widespread minimum size limits and reduced vulnerability of more available small fish.

Index of Abundance

The numbers-based MRIP CPUE was used as an index of coastwide abundance (JABBA-Select includes options for numbers-based and weight-based indices of abundance). The SEs estimated for this index from the standardization analysis were considered underestimated (median=0.063; Table 11), so an additional fixed SE (0.165) was added resulting in a median SE corresponding to a CV of 0.176. This is the center of the range of CVs (0.15-0.20) typical of CPUE data sets (Francis et al. 2003). Both the NC Gillnet and SC Trammel survey indices were considered during model development, but ultimately excluded due to the limited biomass range tracked and poor model diagnostics indicative of inability to relate the *EB* tracked by these indices to *SB*.

The MRIP CPUE was estimated using catch rate data from the entire coast and represents a mix of the three fishing fleets with its own unique selectivity (Table 41 and Figure 97). Selectivity was set as a hybrid between the two dominant catch fleets, SA and MA_early. Selectivity for the sub-adult portion of the size range (< ≈620 mm) follows selectivity of the SA fleet in the first period. The bulk of the black drum spawning migration occurs over three months in the Mid-Atlantic (April-June; Figure 3) with these large, mature fish being relatively unavailable the remaining three quarter of the year, so the descending selectivity descends to 0.25 and remains constant for all mature sizes. Catch rate data include all dispositions caught by the fishery (harvested, released alive, released dead), so regulations are assumed not to have changed the

selectivity of this total catch (i.e., no significant change in angler behavior affecting sizes caught such as gear changes), just the selectivity of fish retained for harvest.

Selectivity patterns collectively across fleets and the MRIP CPUE are shown in Figure 98.

Life History Fixed Inputs

Fixed inputs for life history information included von Bertalanffy growth parameters describing growth updated during this assessment (Appendix 1), maturity parameters from the previous assessment using coastwide and sex-aggregate data, and length-weight relationship parameters from the previous assessment (Table 41 and Figure 98). Length-based maturity parameters were used from age-based maturity converted to length with growth model parameters. There were no coastwide length-weight relationship parameters, so those from the model with the highest R^2 were used (NC DMF data).

Prior Distributions

The lognormal prior distribution for unfished spawning biomass (Table 42, Figure 99) was specified as an uninformative prior converted from bounds (i.e., uniform distribution) using the methods of Winker et al. (2018) due to the superior convergence properties of lognormal priors. The same bounds used for carrying capacity in the previous assessment were used here, a lower bound equal to maximum observed annual removals (2008, unchanged from previous assessment) and an upper bound equal to one hundred times the maximum observed removals. These bounds correspond to the stock being exploited to extinction and only 1% of the biomass being removed during the year of greatest observed exploitation, a level unlikely for a stock that has been identified as in need of management. These bounds also correspond to a CV of the converted lognormal distribution of 1.66, near the center of the range of CVs recommended in the JABBA-Select user guide (1.00-2.00).

The prior distribution for depletion in the start year (Table 42, Figure 99) was specified as a beta distribution from the two available options (beta and lognormal) because of this distribution being bounded between 0 and 1. The distribution was set to be as uninformative as possible while maintaining the expert opinion from the previous assessment that the stock was lightly exploited and had not been overfished. That is, the mean and CV were set so that the density of the distribution was concentrated between 0.4, the location of B_{MSY}/K common of many species (Thorson et al. 2012), and 1, while being centered between the bounds used for the uniform distribution of terminal depletion in DB-SRA during the previous assessment (0.5 and 0.9).

The lognormal prior distribution for natural mortality (Table 42 and Figure 99) has a mean equal to the estimate updated during this assessment with the Then et al. (2015) estimator and maximum observed age (67, also the maximum age used in per-recruit model calculations). The CV is the same used in Winker et al. (2020) (0.25). The beta prior for steepness of the Beverton-Holt stock-recruitment relationship (Table 42, Figure 99) was specified according to meta-analysis by Shertzer and Conn (2012) of demersal marine species displaying a periodic reproductive strategy. The bootstrapped estimates were used as a better approximation of uncertainty.

Both the additional observation variance and process variance were estimated within the model using default uninformative prior specifications for these parameters (inverse gamma with both gamma scaling parameters = 0.001; Winker et al. 2018).

The Monte Carlo simulations of H_{MSY} and *m* and resultant multivariate normal prior distribution are provided in Figure 100. H_{MSY} ratios for subsequent fleets and selectivity periods are provided in Figure 101. For black drum, the *m* parameter was largely robust to selectivity pattern with the exception of the first selectivity period of the MA_late fleet (Figure 102). This impacts the average slightly in the direction of a lower productivity (i.e., higher *m*).

Reference Points

MSY-based reference points were estimated internally in JABBA-Select and are recommended for stock status determination. Uncertainty in productivity parameters, *h* and *M*, were incorporated into the analysis and accounted for in MSY-based reference point estimates. Specifically, overfished is defined as spawning biomass falling below spawning biomass associated with *MSY* ($SB_y/SB_{MSY} < 1$). Overfishing is defined as exploitation exceeding exploitation associated with *MSY* ($H_y/H_{MSYy} > 1$). The JABBA-Select model was applied in the assessment with the primary objective being to estimate stock status. Given high uncertainty in absolute biomass estimates and that *MSY* estimates are in terms of *SB* with no way to monitor in real time what portion of the removals is *SB*, the TC does not recommend using point estimates of *MSY* for application as catch targets in the fisheries.

MCMC Settings and Diagnostics

Three parallel Markov chains were run with 20,000 iterations each. The first 5,000 iterations of each chain were discarded as a burn-in period and every 3rd iteration after the burn-in period was retained from each chain for posterior distribution estimates. Convergence to posterior distributions was evaluated by visual inspection of trace plots and results of the Geweke convergence test and the Heidelberger and Welch diagnostic test. The Geweke convergence test evaluates the null hypothesis that MCMC chains are from a stationary distribution by comparing the mean of the first 10% of the chain to the mean of the last 50% of the chain, rejecting the null hypothesis if these means are significantly different according to a specified alpha level (e.g., 0.05). The Heidelberger and Welch diagnostic test similarly evaluates the null hypothesis that a sampled value comes from a stationary distribution using a test statistic. Model fit to the index data is assessed by standard deviation of the normalized residuals (SDNR) being $\leq \approx 1$ (Francis 2011), visual inspection of residual plots, and residual runs test.

7.3.3 Results

Note: The model results described in this section have been revised in response to the recommendations of the Peer Review Panel. Changes are fully detailed later in this report in Section 13: Addendum to the Stock Assessment Report.

Base Model Estimates

The model converged to posterior distributions for each parameter according to stable behavior of the chains in trace plots (Figure 103) and the results of the Geweke and Heidelberger and Welch tests (Table 44, all p-values>0.05).

The model fit the general trend of the MRIP CPUE, but there were two periods of positive residuals around 2000 and at the end of the time series (Figure 104). Despite these residuals, the runs test p-value (0.145) indicated random residuals and the SDNR was 0.51. Annual process error deviates did not follow any systematic trending that would clearly indicate model misspecification (Figure 105).

Parameter posterior distributions are compared to prior distribution in Figure 106. The posterior to prior variance ratio (PPVR) is provided to assess the degree of influence the data have on the posterior distribution. The smaller the PPVR, the more the posterior is influenced by the data and the less it is influenced by the prior distribution. The posterior to prior mean ratio (PPMR) is provided to assess the direction in which the posteriors are influenced by the data relative to the prior, with values <1 indicating shifts of the posterior to the left, values >1 indicating shifts of the posterior to the right, and a value of 1 indicating no movement. The SB_0, H_{MSY1}, and *m* parameters were more strongly influenced by the data, while the depletion parameter (*psi*) was more strongly influenced by the prior. The influence the data did have on the depletion parameter indicated a more depleted stock (PPMR<1). The data indicated a larger stock that is slightly more productive (higher H_{MSY1} and lower *m*). The estimated process error parameter was small and typical of a long-lived stock with many ages contributing to the spawning stock biomass (Winker 2018). The additional observation error parameter was also small and resulted in a median total observation error corresponding to a CV of 0.182.

The spawning biomass was estimated to increase throughout the time series, though there were wide credible intervals indicating high uncertainty in absolute biomass estimates (Table 45, Figure 107). Relative biomass was estimated with more certainty (Table 45 and Figure 108).

Exploitation generally follows the removal time series with higher exploitation estimated during the mid-1980s and since 2000 (Table 46 and Figure 108). Credible intervals of relative exploitation are also quite wide. Most of the intervals through time indicate exploitation less than H_{MSYy}, but there is some low probability of exploitation exceeding H_{MSYy} during the higher exploitation years.

The base model is interpreting the increasing trend in both MRIP CPUE and fishery removals as indication that the stock was lightly exploited in earlier years allowing for surplus biomass to recruit to the less vulnerable spawning stock and build up over time (Figure 108). Some positive anomalies in biomass during the late 2000s and early 2010s (Figure 105), likely due to some strong year classes that were not fully exploited to the threshold level, appear to have offset the increased removals and a more drastic increase in exploitation to allow for the trend to continue increasing, albeit at a reduced rate that starts to flatten out from the increased exploitation since about 2000 (Figure 108).

Retrospective Analysis
A retrospective analysis was conducted with a five-year peel from the assessment terminal year. Mohn's rho values were calculated according to the methodology of Hurtado-Ferro et al. (2014).

Estimates from the retrospective with Mohn's rho values are provided in Figure 109. Mohn's rho values range from -0.02 for relative biomass estimates to 0.074 for relative exploitation estimates. These values indicate a more conservative pattern with a tendency to underestimate relative biomass and overestimate relative fishing mortality as years are peeled from the time series. The magnitude of the Mohn's rho values indicate no significant retrospective bias according to the rule of thumb proposed by Hurtado-Ferro et al. (2014) for long-lived species (-0.15 – 0.20).

Sensitivity Analysis
A sensitivity analysis was conducted by running alternative model configurations to assess impact of key assumptions and uncertainties identified by the TC. Nine alternative configurations were included in the analysis (Table 47).

Three configurations included alternate assumptions on the key life history parameters influencing productivity, *h* and *M*. The ***low M*** configuration included a natural mortality prior distribution with a mean (0.068) lower than the base model (0.1041) and closer to the Hoenig (1983) estimate used in the previous assessment (0.063). Attempts were made to lower the mean to 0.063, but a small number (3%) of *M*-*h* draws with low *M* and high *h* caused errors in the per-recruit calculations that cascaded through the modeling software and 0.068 was the lowest mean that avoided these errors. The alternative prior distribution includes a significant portion of its density at or below the 0.063 mean value used in the previous assessment (Figure 110). The ***ll h*** configuration included a steepness prior distribution parameterized with the likelihood estimates from Shertzer and Conn (2012) as opposed to bootstrapped estimates. These parameters included a slightly larger mean (increased from 0.72 to 0.75) and greater precision (CV decreased from 0.25 to 0.20). The ***low h*** configurations included a steepness prior distribution with a mean decreased by 0.1 from 0.72 to 0.62.

Four configurations included alternate selectivity assumptions. The ***MRIP sel*** configuration decreased the selectivity for the largest sized fish from 0.25 in the base model to 0.1 due to uncertainty in vulnerability of spawning adults relative to sub-adults that account for the majority of recreational catch. The ***SA adults*** configuration increased the selectivity for the largest sized fish from 0 in the base model to 0.06 based on small reported catches of these sized fish and potential for small scale directed fishing at trophy sized fish such as tournaments and charter boat operations. The ***SA descend*** configuration shifts descending selectivity of the SA fleet to the left by 100 mm, reducing the size range available to this fishery. The ***MA_early sel*** configuration shifted selectivity of the MA_early fleet to the right of the selectivity pattern in the base model due to available length composition data peaking at larger sizes than full maturity.

The last two configurations dealt with the start year depletion assumption and uncertainty about a potential shift in catchability for the MRIP CPUE in recent years. The ***uni dep*** configuration included a beta prior distribution parameterized as a uniform distribution over the full range of values 0 to 1 (mean=0.5, CV=0.577). This configuration was included due to the use of a uniform prior distribution on the depletion assumption for DB-SRA in the previous assessment. One distinction due to the constraints of the JABBA-Select software is that the beta distribution can only be parameterized as a uniform distribution over the full range of values (including overfished levels <0.4) whereas the DB-SRA uses a true uniform distribution with bounds that were set at levels representative of a stock that is not overfished (0.5 and 0.9). The ***MRIP q*** configuration included a second catchability coefficient parameter for the MRIP CPUE allowing for a unique catchability coefficient in years after 2015. This configuration was included due to the positive residuals since 2016 in the base model and the apparent shift in catchability identified and discussed in Section 4.2.1.3. This configuration acknowledges the possibility that the directed trips data set used to calculate the MRIP CPUE did not completely account for the apparent change in catchability. This configuration was also considered for the base model, but was not selected due to lower deviance information criterion (DIC) of the final base model presented here, indicating the additional *q* parameter was not justified by improved fit to the data, and a similar group of residuals around 2000 that changed after the same amount of time being observed at the end of the time series.

Sensitivity configurations estimated median SB_{MSY} similar to the base model, but with varying high levels of uncertainty about the magnitude of this biomass (Figure 111). As for relative biomass, all configurations estimate very similarly with a few notable departures (Figure 112). The ***uni dep*** configuration estimates a more depleted stock at the beginning of the time series. When no prior information is passed to the model, the model interprets the increasing MRIP CPUE as indication of a stock rebuilding from a depleted state. This is contrary to all other data sets and the TC's belief of stock status at the time and this run is considered a more unlikely "state of nature". The biomass increases more rapidly during the 1980s, then follows the trend of the base configuration with the median estimate in the terminal year indicating a spawning biomass above SB_{MSY} that falls just within the base model 95% credible interval. The ***MRIP q*** configuration estimates a similar trend as the other configurations for most of the time series, but then starts to diverge with a declining trend in the last decade. Lastly, the ***low M*** and ***low h*** configuration, both of which suggest lower productivity, estimate similar increasing trends, but shifted down to slightly lower relative biomasses.

The ***uni dep*** configuration estimates a similar trend in exploitation but with greater relative exploitation including several years with the median estimates exceeding 1 (Figure 113). Both exploitation (Figure 114) and productivity (H_{MSY}) estimates (Figure 115) are impacted. The lower relative biomass estimated for this configuration with the same observed removals leads to a greater proportion of stock biomass removed by fishing. This configuration also estimates a lower H_{MSY} resulting in greater differences in relative exploitation between this configuration and base model. Greater estimates of relative exploitation from the ***low M*** and ***low h*** configurations are primarily due to lower H_{MSY} estimates informed by lower productivity in the priors of these configurations. The ***low M*** configuration estimated median relative exploitation

that exceeded 1 in two years (2000 and 2016) and shows greater divergence from the base model since the SA fleet selectivity change in 2014. Alternate selectivity configurations show some sensitivity of exploitation estimates during periods of the time series, with SA fleet selectivity shifted to a smaller dome and fishing mortality concentrated on immature fish that haven't had a chance to contribute to spawning biomass (***SA descend***) resulting in smaller H_{MSY} and SA fleet selectivity increased for the largest sizes (***SA adults***) spreading fishing mortality from sub-adult fish to some mature adults resulting in greater H_{MSY} estimates.

7.4 Methods Discussion

Both the Itarget and Skate methods showed initial promise for a data limited species with their requirements of only a catch history and a survey index of relative abundance as inputs. However, the one-way upward trajectories for both the MRIP CPUE index and the black drum catch history defied expectations that would normally show decreases in relative abundance with an extended period of increasing harvests and created complications for applying these index-based methods to black drum. Notably, catch advice and interpretation of overfishing status from the methods was sensitive to treatment of early years of data with smaller removals and low exploitation that, according to the CPUE, did not have adverse effects on abundance.

For the Itarget method, if the stock is believed to be near its carrying capacity, lower values for the index multiplier would be justified. However, if the stock is much more depleted (current expert opinion is that depletion is between 0.4 and 1), a higher index multiplier would be warranted. Yet these higher multipliers set target catch levels at much lower levels than have been landed within the last decade. If the index values showed a corresponding decreasing trend with the increased removals, the catch advice supplied by the Itarget method would seem more relevant.

For the Skate method, using only the recent years' (2000-2012) data yielded results more consistent between the index and catch history, i.e., the stock is not overfished nor experiencing overfishing based on the index calculations. However, the TC was not comfortable with the possibly arbitrary decision to exclude the data prior to 2000.

The use of an index derived from fisheries-dependent data (MRIP, upon which a significant portion of the catch history was based) instead of a purely fisheries-independent survey may have complicated the efficacy of these methods as they are both meant to use the relationship between an independent index and catch history to derive catch advice that ultimately allows a stock to achieve or maintain a target abundance level. The uncertainties related to the lack of a fisheries-independent index of relative abundance, specification of the actual depletion status of the stock (to define the appropriate index multiplier for Itarget), and the conflicting signals of stock status between the index and catch history in Skate, all led the TC to reject these methods for this assessment. These methods with their current data inputs may be useful as annual indicators to show current relationships between stock and removals (Itarget) and the ongoing trend of relative *F* (Skate), but further research is needed that could be applied after the stock assessment.

For the model-based approaches, trends in abundance over time differed between the DB-SRA and Simple Stock Synthesis model (Appendix 2) compared to the JABBA-Select model. The DB-SRA and Simple Stock Synthesis models both had a decline in abundance over time while abundance in the JABBA-Select model increased over time. Such different trends are due to the inputs, assumptions, and structure used for each model.

The DB-SRA model used in the previous assessment and the Simple Stock Synthesis model both assume the black drum population started at an unexploited state in 1900 and abundance was at 70%, on average, of the unexploited state at or near the end of the time series. When combined with the increase in removals, especially in the last 20 years, and no information on abundance changes, this assumption and the structure of these two models results in a declining trend in abundance over time. For both models, the lowest abundance occurred in 2020, the final year in the current assessment.

The JABBA-Select model is based on a surplus production model and uses the MRIP CPUE and removal data as inputs. JABBA-Select does not require the assumption that the modeled time series starts when the stock is unexploited and does not make an assumption about depletion at or near the end of the time series, but rather makes an assumption about depletion at the start of the time series (here 1982) with use of a prior distribution (beta distribution with density constrained in a not overfished state). The MRIP CPUE index generally increased during 1982-2020, which implies that black drum abundance increased during this time. Also during this time period there was an increase in removals. Given these inputs and the structure of the JABBA-Select model, the abundance estimates from this model generally increased over time so that abundance in 2020 is not the lowest but is one of the highest estimates during 1982-2020.

One of the primary differences between the DB-SRA and Simple Stock Synthesis models compared to the JABBA-Select model is the inclusion of the MRIP CPUE index. When trying to include the MRIP CPUE in the Simple Stock Synthesis model, the fit to the MRIP index was poor (Appendix 2: Fig. 10) and there were opposite trends in abundance implied by the depletion assumption compared to the MRIP CPUE index (Appendix 2: Fig. 10). The DB-SRA model produced a declining trend in abundance similar to the Simple Stock Synthesis model and would also have an opposite trend in abundance compared to that implied by the MRIP CPUE index.

As part of our modeling decisions, the TC felt that the MRIP CPUE did generally track population abundance and was the only index thought to track the entire coastwide stock. The MRIP CPUE had a non-decreasing trend similar to all of the fishery-independent indices. Therefore, we had no reason not to include the MRIP CPUE index in this assessment, especially as the inclusion of abundance indices was one of the improvements suggested by the reviewers during the previous benchmark assessment. In addition to including the MRIP CPUE index, the JABBA-Select model (1) differentiates between exploitable biomass and spawning biomass, which are different for black drum due to life history and exploitation patterns, and accounts for this difference when estimating annual production as the ratio of these two biomasses changes, (2) requires one less assumption about biomass depletion than DB-SRA and Simple Stock Synthesis, (3) does not require use of early, uncertain catch data, and (4) accounts for changes to fishery

selectivity through time and resultant impacts to productivity. Finally, the DB-SRA and Simple Stock Synthesis models were created to provide advice on catch limits, not determine stock status. Therefore, we chose to use the JABBA-Select model over the DB-SRA or Simple Stock Synthesis models for stock status determination.

8 STOCK STATUS

Note: The stock status determinations described in this section have been revised in response to the recommendations of the Peer Review Panel. Changes are fully detailed later in this report in Section 13: Addendum to the Stock Assessment Report.

Overfished is defined as spawning biomass falling below spawning biomass associated with *MSY* ($SB_y/SB_{MSY} < 1$). Overfishing is defined as exploitation exceeding exploitation associated with *MSY* ($H_y/H_{MSYy} > 1$).

The 2020 median relative spawning biomass estimated with the base model was 2.92, indicating the stock was not overfished in the terminal year of the stock assessment (Table 45). The 2020 median relative exploitation estimated with the base model was 0.29, indicating the stock was not experiencing overfishing in the terminal year of the stock assessment (Table 46).

Results indicate greater certainty that the stock has not been depleted to an overfished status in the terminal year of the assessment, while there is less certainty about the exploitation status. Figure 116 shows the time series of stock status estimates with uncertainty around terminal year determinations. All of the 95% credible interval is above the overfished threshold, while exploitation shows some low probability of exceeding the threshold within the 95% credible interval. This low risk of overfishing according to the credible intervals extends back for much of the last twenty years of the time series. The sensitivity analysis included some configurations that estimated median relative exploitation that exceeds the threshold in recent years, while no sensitivity configuration estimated median relative biomass below the threshold since the 1980s.

There are several important points of context to consider with this stock status determination estimated from the JABBA-Select model:

- Empirical indicators show increased fishery removals in the last twenty years and less frequent large recruitment events in the Mid-Atlantic in the last ten years. There are no clear indications of a declining trend in recruitment or exploitable abundance from abundance indicators, with the exception of the anomalous GA trammel index, but there is a declining trend in the final two years of the recreational discard time series that may be reflective of abundance in addition to other factors. There is some indication of northern range expansion. Overall, stock indicators do not appear negative at this time, but should be monitored closely for any sign of change.

- The one-way trip increasing trend in both removals and the MRIP CPUE for the assessment time period may indicate that the stock either had been lightly exploited in the 1980s, which has allowed for the recent increase in exploitation of the predicted high biomass, or was overfished and rebuilding throughout the assessment time series. The latter scenario is contrary to the TC's expert opinion that the stock was not overfished at the beginning of the time period, and there were minimal regulation changes aimed specifically at black drum in the 1980s to induce a rebuilding period. However, it is also possible that recruitment overfishing is occurring or could begin to occur prior to detection with currently available data, due to sub-adult black drum accounting for the majority of removals and the lack of an index that solely tracks mature biomass. With over 30 cohorts contributing to *SSB*, recruitment overfishing may not be evident within current data streams for an extended number of years, leading to an overfished state being reached prior to removals and the MRIP CPUE index indicating a sustained downward trend. The TC concurs with the model-derived stock status but acknowledges the lack of contrast in both removals and the MRIP CPUE coupled with model uncertainty will require close monitoring of stock indicators and a more conservative approach to managing the fishery.

9 RESEARCH RECOMMENDATIONS

The TC recommends that a new benchmark stock assessment be completed for the black drum stock in five years (2027). However, the TC also recommends annually reviewing the stock indicators established in this assessment updated with new data to identify any concerning trends in a timely manner. Should any concerning trends occur, the TC may recommend an expedited assessment to be completed before 2027.

The TC is hopeful that high priority research recommendations identified below will be addressed/initiated prior to completion of the next benchmark stock assessment. Progress will lead to advances that can better inform stock status in future stock assessments, but the TC also acknowledges many of these as long-term efforts needed to develop ongoing time series to enable transition to more advanced/complex stock assessment models.

HIGH PRIORITY

- Develop fishery-independent adult surveys. Consider purse seine and long line surveys with bait and sampling areas appropriate to target black drum. Collect age samples, especially in states where maximum size regulations preclude the collection of adequate adult ages. ***long-term***
- Conduct a high reward tagging program to obtain return rate estimates. Continue and expand current tagging programs to obtain total mortality, catch and release mortality, and growth information and movement-at-size data. ***long-term***
- Increase biological sampling in commercial fisheries, particularly gill nets in Virginia (see Section 4.4), to better characterize size and age composition of commercial landings. These data would help improve data sets for selectivity estimates and eventual extensions to length/age-structured assessment approaches. ***long-term***

- Increase biological sampling in recreational fisheries, particularly harvest in the Mid-Atlantic region and releases coastwide (see Section 4.4), to better characterize size and age composition of recreational catch. These data would help improve data sets for selectivity estimates and eventual extensions to length/age-structured assessment approaches. ***long-term***
- Continue all current fishery-independent surveys recommended as stock indicators for black drum and collect biological samples for black drum on all surveys. ***long-term***
- Evaluate use of MRIP site-use weighting factors to improve CPUE estimates. ***short-term***
- Skate and Itarget with their current data inputs should be evaluated as annual indicators to show current relationships between stock and removals (Itarget) and the ongoing trend of relative *F* (Skate). ***short-term***
- A process should be developed for appropriately combining MRIP and supplemental recreational sampling program data for characterizing the size structure of the recreational harvest. The process needs to consider spatial information, as there are likely spatial effects within states' supplemental sampling programs (e.g., VMRC Freezer Program representing Eastern Shore harvest). ***short-term***

MODERATE PRIORITY

- Age otoliths that have been collected and archived (≈ 500 sub-adults samples from GA). ***short-term***
- Improve sampling of concentrated, targeted nighttime fisheries in the Mid-Atlantic region (e.g., Delaware Bay). Although the MRIP APAIS design changed to expand to nighttime sampling, data are too limited (e.g., only four potential nighttime black drum intercepts in DE APAIS data) to evaluate whether this change was sufficient for black drum fisheries. ***long-term***
- The recreation released alive trend and harvest trend provided a mixed signal. In order to identify which factor, a change in stock abundance vs. a change in fishing behavior, drove the mixed signal, we analyzed the released alive data by breaking them down by wave. However, such an analysis may provide limited information on fishing behavior change, therefore, we recommend to directly collect such information via a one-time pilot study (≈three years) during existing creel surveys (e.g., MRIP APAIS). For example, anglers may report if they know where, when, and how to catch legal black drum (potentially increasing catch rate) meanwhile deliberately avoiding catching sublegal fish (potentially decreasing released alive quantity). Anglers don't need to share their specific skills during the creel survey by simply checking a box before "When", "Where", and "How" along with targeted species data currently collected. Such information may potentially provide better information to understand drivers of these trends in the future stock assessment. ***short-term***
- Conduct tagging study to determine survival, migration, and contribution of YOY fish spawned in the Mid-Atlantic to the overall sub-adult stock. ***long-term***

LOW PRIORTY

- Expand simulation-based power analysis to other index data sets used for stock indicators of black drum. ***short-term***
- Conduct reproductive studies that provide updated estimates and an expanded spatial coverage, including: age and size-specific fecundity, spawning frequency, spawning behaviors by region, and movement and site fidelity of spawning adults. ***long-term***
- There is uncertainty about selectivity between gill net types fished (anchor and drift) in Virginia and the appropriateness of combining these gears into a fleet. There are no composition data collected from drift gill nets, so this remains an uncertainty that should be researched in the future. ***short-term***

Lastly, the TC acknowledges some progress, summarized below, has been made on research recommendations from the previous stock assessment.

PARTIALLY ADDRESSED

- Collect genetic material (i.e., create "genetic tags") over a long time span to obtain information on movement and population structure, and potentially estimate population size. ***See Section 2.1 and Leidig 2014.***
- Obtain better estimates of harvest from the black drum recreational fishery (especially in states with short seasons). ***MRIP changes discussed in Section 4.2.1.1 were generally seen as improvements to catch estimates, though the exception remains nighttime fishery sampling identified as a moderate research recommendation above.***
- Collect information on the magnitude and sizes of commercial discards. Obtain better estimates of bycatch of black drum in other fisheries, especially juvenile fish in south Atlantic states. ***An ongoing observer program now provides monitoring of the primary suspected commercial black drum discard fishery (Section 4.1.1.2). Recent estimates have been small in comparison to total fishery removals, but this source of catch should continue to be monitored in future stock assessments for signs of increase. South Atlantic shrimp trawl fishery observer data were also reviewed during this assessment and do not indicate these fisheries are a significant source of black drum fishery removals.***

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11 TABLES

Table 1. History of jurisdictional regulations specific to black drum. Bold indicates changes to existing regulations.

Year	Jurisdiction	Recreational		Commercial			Notes
		Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
1987	VA	16" min		16" min	1/person/day commercial limit without Black Drum Harvesting and Selling permit		
1989	FL	14" min 24" max*	5/person/day, *including 1 fish >24"	14" min 24" max	500 lbs/day/person or vessel (whichever is lesser)		
1992	VA	16" min	**1/person/day**	16" min	1/person/day commercial limit without Black Drum Harvesting and Selling permit		
1993	PRFC	16" min	1/person/day	16" min	1/person/day		
1994	VA	16" min	1/person/day	16" min	1/person/day commercial limit without Black Drum Harvesting and Selling permit		**Limited entry in the commercial fishery**
1994	MD	16" min	1/person/day	16" min		30,000 lbs (Ches. Bay)	
1995	FL	14" min 24" max*	5/person/day, *including 1 fish >24"	14" min 24" max	500 lbs/day/person or vessel (whichever is lesser)		**No gill nets or other entangling nets shall be used in any Florida waters**

Table 1. Continued.

Year	Jurisdiction	Recreational		Commercial			Notes
		Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
1998	GA	10" min	15/person/day	10" min	15/person/day		
1999	MD	16" min	1/person/day **Max of 6/vessel (Ches. Bay)**	16" min		**1,500 lbs (Atlantic Ocean)**	**Ches. and Coastal bays closed to commercial harvest**
2001	NJ	16" min	3/person/day	16" min	10,000 lbs	65,000 lbs	
2002	VA	16" min	1/person/day	16" min	1/person/day commercial limit without Black Drum Harvesting and Selling permit	**120,000 lbs**	
2007	SC	14" min 27" max	5/person/day	14" min 27" max	5/person/day		Commercial fishery primarily bycatch
2010	DE	16" min	3/person/day	16" min	10,000 lbs	65,000 lbs	Regulations only for DE River and DE Bay
2013	DE	16" min	3/person/day	16" min	10,000 lbs	65,000 lbs	**Effective for all DE waters**
2014	GA	**14" min**	15/person/day	**14" min**	15/person/day		
2014	NC	14" min 25" max*	10/person/day	14" min 25" max*	500 lbs/trip		*One fish over 25" may be retained
2019	MD	16" min	1/person/day Max of 6/vessel	16" min Atlantic **28" Ches.**	**10/vessel/day from Chesapeake Bay**	1,500 lbs (Atlantic Ocean)	Coastal bays closed to commercial harvest

Table 2. Summary statistics for black drum age data collected along the coast.

Age	Mean Total Length (inches)	CV Total Length (inches)	n	Age	Mean Total Length (inches)	CV Total Length (inches)	n
0	9.02	0.157	1,515	32	45.61	0.062	39
1	13.67	0.214	3,474	33	45.85	0.050	38
2	18.08	0.130	1,194	34	45.27	0.045	32
3	22.25	0.126	465	35	46.04	0.058	34
4	25.93	0.103	216	36	46.89	0.061	25
5	29.50	0.086	154	37	46.54	0.051	31
6	31.10	0.077	167	38	45.53	0.079	36
7	32.31	0.083	187	39	45.52	0.075	44
8	33.61	0.074	192	40	46.51	0.054	55
9	34.62	0.056	270	41	46.65	0.053	27
10	35.42	0.051	219	42	47.16	0.055	31
11	36.09	0.051	179	43	46.65	0.045	26
12	37.00	0.045	116	44	48.67	0.058	24
13	37.35	0.084	116	45	46.75	0.041	32
14	37.28	0.063	104	46	47.27	0.053	21
15	38.85	0.062	90	47	48.01	0.071	36
16	39.48	0.055	92	48	47.73	0.051	14
17	39.82	0.051	115	49	47.60	0.075	20
18	39.82	0.084	65	50	46.19	0.101	13
19	40.38	0.055	69	51	47.63	0.080	18
20	41.48	0.078	47	52	48.46	0.040	11
21	41.75	0.052	40	53	50.47	0.069	5
22	42.07	0.065	34	54	49.15	0.053	9
23	42.71	0.060	58	55	47.83	0.076	7
24	43.44	0.066	41	56	47.77	0.027	3
25	43.01	0.056	36	57	47.78	0.063	2
26	44.04	0.050	24	58	46.50	NA	1
27	44.66	0.056	30	60	48.23	NA	1
28	44.22	0.054	42	61	50.98	NA	1
29	44.61	0.041	25	64	51.87	0.019	2
30	43.54	0.084	21	67	44.02	NA	1
31	44.83	0.052	48				

Table 3. Commercial landings data collection methodology by state.

	1950-1977	1978-1985	1986-1988	1989	1990-1993	1994	1995-2000	2001-2003	2004	2005	2006	2007-today
ME DMR												
NH FGD												
MA DMF												
RI DFW												
CT DEEP												
NY DEC												
NJ DEP												
DE DFW												
MD DNR												
VMRC												
NC DMF												
SC DNR												
GA DNR												
FL FWC												
	Annual summaries		Monthly summaries		Mixed (trip reports and monthly summaries)		Trip reports (all fisheries)					

Table 4. Total commercial landings of black drum along the U.S. Atlantic coast from 1900-2020.

Year	*Pounds*	*Year*	*Pounds*	*Year*	*Pounds*	*Year*	*Pounds*	*Year*	*Pounds*
1900	0	1925	253,330	1950	269,400	1975	319,911	2000	240,184
1901	58,330	1926	35,540	1951	332,700	1976	188,653	2001	184,992
1902	187,520	1927	98,113	1952	239,800	1977	176,969	2002	555,499
1903	0	1928	140,937	1953	291,600	1978	174,465	2003	289,312
1904	453,080	1929	148,933	1954	554,700	1979	165,345	2004	162,751
1905	0	1930	98,689	1955	260,200	1980	141,397	2005	131,179
1906	0	1931	214,139	1956	311,600	1981	241,603	2006	225,931
1907	0	1932	107,235	1957	286,700	1982	221,878	2007	293,104
1908	0	1933	123,059	1958	138,800	1983	195,235	2008	404,705
1909	0	1934	126,500	1959	345,400	1984	162,611	2009	286,163
1910	0	1935	72,000	1960	339,100	1985	121,857	2010	212,998
1911	0	1936	252,700	1961	393,500	1986	346,246	2011	190,986
1912	0	1937	196,500	1962	597,400	1987	245,421	2012	238,344
1913	0	1938	288,300	1963	528,900	1988	294,404	2013	292,882
1914	0	1939	26,300	1964	281,700	1989	140,276	2014	261,363
1915	0	1940	9,900	1965	401,500	1990	201,132	2015	241,286
1916	0	1941	16,800	1966	664,100	1991	245,665	2016	227,546
1917	0	1942	32,200	1967	392,500	1992	210,156	2017	291,429
1918	536,332	1943	0	1968	453,600	1993	252,520	2018	246,840
1919	0	1944	33,800	1969	286,300	1994	292,933	2019	257,397
1920	60,680	1945	243,800	1970	228,400	1995	270,741	2020	188,417
1921	68,809	1946	94,000	1971	316,200	1996	312,550		
1922	0	1947	184,900	1972	187,076	1997	313,849		
1923	61,454	1948	192,100	1973	170,096	1998	134,622		
1924	0	1949	81,900	1974	188,044	1999	335,031		

Table 5. Percentage of coastwide commercial landings of black drum without month data. Increasingly dark green color indicates increasing monthly coverage.

1950	100.00%	**1971**	######	**1992**	0.27%	**2013**	0.00%
1951	100.00%	**1972**	79.22%	**1993**	3.08%	**2014**	0.00%
1952	100.00%	**1973**	82.42%	**1994**	0.50%	**2015**	0.00%
1953	100.00%	**1974**	87.32%	**1995**	3.43%	**2016**	0.00%
1954	100.00%	**1975**	85.56%	**1996**	0.00%	**2017**	0.00%
1955	100.00%	**1976**	95.41%	**1997**	0.00%	**2018**	0.00%
1956	100.00%	**1977**	92.67%	**1998**	0.00%	**2019**	0.00%
1957	100.00%	**1978**	30.32%	**1999**	0.00%	**2020**	0.00%
1958	100.00%	**1979**	25.82%	**2000**	0.00%		
1959	100.00%	**1980**	6.44%	**2001**	0.00%		
1960	100.00%	**1981**	27.48%	**2002**	0.00%		
1961	100.00%	**1982**	26.37%	**2003**	0.00%		
1962	100.00%	**1983**	54.86%	**2004**	0.00%		
1963	100.00%	**1984**	57.99%	**2005**	0.00%		
1964	100.00%	**1985**	51.28%	**2006**	0.00%		
1965	100.00%	**1986**	66.10%	**2007**	0.00%		
1966	100.00%	**1987**	55.99%	**2008**	0.00%		
1967	100.00%	**1988**	60.66%	**2009**	0.00%		
1968	100.00%	**1989**	20.99%	**2010**	0.00%		
1969	100.00%	**1990**	2.15%	**2011**	0.00%		
1970	100.00%	**1991**	0.00%	**2012**	0.00%		

Table 6. Black drum dead discard estimates (number of fish) from North Carolina commercial estuarine gillnet fisheries.

Year	Dead Discards
2004	15,881
2005	12,851
2006	9,035
2007	15,630
2008	127,861
2009	7,189
2010	1,694
2011	13,348
2012	793
2013	39,359
2014	30,429
2015	86,517
2016	87,059
2017	17,130
2018	4,655
2019	32,841
2020	2,099

Table 7. Mean weight data used to convert MRIP released alive estimates in numbers to weight. A single asterisk indicates data were borrowed from DE waves 5-6 and two asterisks indicate data were borrowed from VA waves 5-6.

State & Waves	2015 Assessment			Current Assessment		
	Years	Mean Weight (lbs)	n	Years	Mean Weight (lbs)	n
NJ waves 2-3	1981-2012	23.92	81	1981-2020	36.99	248
NJ wave 4	1981-2012	7.59	6	1981-2020	17.58	14
NJ waves 5-6	1981-2012	33.29	3*	1981-2000	NA	0*
DE waves 2-3	1981-2012	36.29	40	1981-2020	32.35	126
DE wave 4	1981-2012	2.75	33	1981-2020	5.24	41
DE waves 5-6	1981-2012	0.89	63	1981-2009	0.69	62
MD waves 2-3	1981-2012	37.82	15	1981-2020	48.42	37
MD wave 4	1981-2012	43.72	20	1981-2020	50.69	30
MD waves 5-6	1981-2012	NA	0**	1981-1994	NA	0*
VA wave 2-3	1981-2012	29.87	52	1981-2020	37.56	205
VA wave 4	1981-2012	20.14	12	1981-2020	15.67	24
VA waves 5-6	1981-2012	5.68	46	1981-1987	13.31	3*
NC all waves	1981-2012	1.52	4,145	1981-2013	1.59	4,622
SC all waves	1981-2006	2.17	598	1981-2006	2.55	606
GA all waves	1981-1997	1.53	686	1981-1997	1.74	668
FL all waves	1981-1988	2.02	500	1981-1988	1.96	476

Table 8. Sample sizes of recreational fishing trips from the directed trips data set by factor considered in the standardization of MRIP CPUE.

Year	Area			Angler Avidity (hours)						Mode			Wave						State					
	State Seas (≤3 miles)	EEZ (>3 miles)	Inland	[0,10)	[10,20)	[20,30)	[30,40)	[40,50)	[50,62]	Charter	Private /Rental Boat	Shore	1	2	3	4	5	6	FL	GA	NC	NJ and DE	SC	VA and MD
1982	27	1	52	51	17	5	3	2	2	0	37	43	0	4	33	12	27	4	45	19	4	0	12	0
1983	41	1	132	140	23	4	2	0	5	31	73	70	11	15	70	36	22	20	79	20	0	1	5	69
1984	31	2	99	91	24	8	3	1	5	1	50	81	11	23	30	13	20	35	105	15	0	0	8	4
1985	63	29	107	155	16	12	6	2	8	27	87	85	6	17	74	29	24	49	71	50	4	1	6	67
1986	14	11	271	237	31	15	2	5	6	42	204	50	18	23	98	65	48	44	86	109	8	5	18	70
1987	39	3	248	247	29	9	2	2	1	33	202	55	16	50	63	58	67	36	75	132	26	2	23	32
1988	7	3	73	66	11	3	0	1	2	2	59	22	26	22	34	1	0	0	53	20	1	0	5	4
1989	10	2	89	79	12	7	0	2	1	9	78	14	10	9	16	26	24	16	28	51	3	0	11	8
1990	14	15	74	81	11	4	1	3	3	3	76	24	8	13	33	15	13	21	51	13	8	2	7	22
1991	31	5	132	119	26	15	7	0	1	7	105	56	12	10	20	22	39	65	95	36	23	6	3	5
1992	30	3	176	162	27	15	1	3	1	11	127	71	0	29	55	32	37	56	111	44	14	0	13	27
1993	80	20	194	203	53	13	8	11	6	13	135	146	19	35	72	28	55	85	171	24	47	5	16	31
1994	126	11	220	256	50	24	12	8	7	13	187	157	42	73	52	57	47	86	235	25	68	0	12	17
1995	288	6	205	355	81	40	11	7	5	12	164	323	34	56	49	44	142	174	140	29	263	3	19	45
1996	262	12	211	364	66	20	19	6	10	12	188	285	12	43	51	88	162	129	120	13	292	2	39	19
1997	125	11	194	240	58	13	7	5	7	8	197	125	7	46	67	75	72	63	124	15	124	7	47	13
1998	225	7	244	314	88	36	18	11	9	8	214	254	35	59	48	65	145	124	244	14	166	7	27	18
1999	338	12	401	537	118	52	18	17	9	17	359	375	73	93	65	112	207	201	403	23	254	1	61	9
2000	261	9	389	470	102	37	19	9	22	16	358	285	55	119	100	103	161	121	364	72	164	2	47	10
2001	214	8	503	514	122	39	15	21	14	16	411	298	69	72	93	122	192	177	428	45	198	14	24	16
2002	229	6	450	494	109	35	31	8	8	22	398	265	34	77	100	175	178	121	284	51	265	24	34	27
2003	262	11	506	577	110	48	21	13	10	39	433	307	57	95	166	135	178	148	316	96	273	24	37	33
2004	189	3	392	397	112	34	20	7	14	17	339	228	39	48	111	76	173	137	254	47	207	20	29	27
2005	160	6	335	414	48	16	9	10	4	55	265	181	56	53	112	57	102	121	213	41	136	64	30	17
2006	210	10	413	485	93	29	11	9	6	38	390	205	66	109	111	90	125	132	283	46	153	59	73	19
2007	386	7	469	636	128	46	22	17	13	30	406	426	48	82	140	100	150	342	372	63	277	40	59	51
2008	386	17	748	838	175	71	37	9	21	81	597	473	74	105	299	154	259	260	381	103	376	133	75	83
2009	232	10	559	588	121	46	15	17	14	76	432	293	69	123	239	101	153	116	290	51	201	111	72	76
2010	294	8	606	662	130	50	33	14	19	43	522	343	110	99	195	139	202	163	397	60	322	48	43	38
2011	528	4	478	783	122	51	27	19	8	58	344	608	46	84	143	95	367	275	305	22	526	69	47	41
2012	346	3	502	611	154	39	29	10	8	61	419	371	81	90	119	131	177	253	253	50	457	35	47	9
2013	312	6	362	490	94	50	22	14	10	10	320	350	52	72	164	103	138	151	178	38	294	45	86	39
2014	295	2	445	548	103	58	13	12	8	36	375	331	40	43	190	98	181	190	273	38	251	40	104	36
2015	371	6	476	619	146	44	19	14	11	38	435	380	29	67	171	115	256	215	203	62	330	55	143	60
2016	341	5	731	803	149	69	21	22	13	102	638	337	92	88	211	154	286	246	233	103	373	14	299	55
2017	382	9	763	838	171	69	29	23	24	79	645	430	49	154	220	162	275	294	245	99	425	25	294	66
2018	406	11	835	983	155	54	37	14	9	139	646	467	49	173	278	206	342	204	211	109	448	68	338	78
2019	259	13	823	811	154	68	30	21	11	96	700	299	46	119	294	184	288	164	196	107	338	66	305	83
2020	243	16	705	689	159	57	28	20	11	113	592	259	44	40	170	219	229	262	180	75	386	26	261	36

Table 9. Deviance summary table for the final positive observation GLM used to estimate MRIP CPUE.

Factor	Df	Resid. Df	Resid. Dev	Deviance	% Deviance Reduced
NULL	1	16,855	13,644	13,644	-
year	38	16,817	13,261	383	2.59
mode	2	16,815	13,052	209	1.52
state	5	16,810	12,942	110	0.78
wave	5	16,805	12,842	101	0.71

Table 10. Deviance summary table for the final proportion positive observation GLM used to estimate recreational CPUE.

Factor	Df	Resid. Df	Resid. Dev	Deviance	% Deviance Reduced
NULL	1	22,992	26,679	26,679	-
year	38	22,954	26,419	260	0.81
state	5	22,949	24,264	2,155	8.07
wave	5	22,944	23,241	1,023	3.82
mode	2	22,942	23,098	143	0.53

Table 11. Recreational CPUE estimated from MRIP APAIS data selected with the directed trips method.

Year	n	Proportion Positive	Numbers-Based CPUE			Weight-Based CPUE
			Nominal Index	Standardized Index	Standardized Index CV	Index
1982	80	0.713	0.249	0.247	0.096	0.378
1983	174	0.598	0.168	0.234	0.101	0.897
1984	132	0.682	0.244	0.281	0.096	0.751
1985	199	0.573	0.422	0.228	0.073	0.933
1986	296	0.720	0.309	0.330	0.078	0.952
1987	290	0.762	0.279	0.277	0.156	0.594
1988	83	0.446	0.171	0.250	0.124	0.590
1989	101	0.832	0.301	0.318	0.121	1.591
1990	103	0.650	0.248	0.272	0.091	0.596
1991	168	0.774	0.303	0.309	0.087	0.773
1992	209	0.746	0.268	0.302	0.077	0.891
1993	294	0.721	0.286	0.299	0.071	0.652
1994	357	0.700	0.271	0.271	0.063	0.788
1995	499	0.790	0.477	0.309	0.065	0.555
1996	485	0.843	0.386	0.307	0.072	0.838
1997	330	0.818	0.402	0.342	0.065	0.997
1998	476	0.794	0.332	0.337	0.057	0.970
1999	751	0.807	0.388	0.352	0.061	0.835
2000	659	0.754	0.388	0.346	0.060	1.046
2001	725	0.728	0.393	0.344	0.062	0.823
2002	685	0.756	0.411	0.355	0.059	0.800
2003	779	0.751	0.353	0.323	0.064	0.749
2004	584	0.680	0.294	0.266	0.066	0.854
2005	501	0.667	0.291	0.282	0.062	0.675
2006	633	0.698	0.327	0.332	0.058	1.050
2007	862	0.785	0.473	0.394	0.055	0.897
2008	1,151	0.731	0.369	0.346	0.059	1.095
2009	801	0.659	0.336	0.338	0.058	1.237
2010	908	0.689	0.338	0.325	0.058	0.802
2011	1,010	0.715	0.428	0.336	0.060	0.805
2012	851	0.730	0.380	0.314	0.063	1.093
2013	680	0.722	0.462	0.375	0.062	0.813
2014	742	0.706	0.406	0.345	0.060	0.844
2015	853	0.720	0.490	0.387	0.057	1.041
2016	1,077	0.758	0.513	0.412	0.058	1.003
2017	1,154	0.752	0.458	0.390	0.056	0.957
2018	1,252	0.728	0.472	0.391	0.058	0.944
2019	1,095	0.719	0.433	0.390	0.058	0.972
2020	964	0.763	0.434	0.365	0.140	1.057

Table 12. Black drum recreational catch data from the MRFSS/MRIP time period.

Year	Harvest				Released Alive			Dead Discards	Total Removals	
	Number	Number PSE	Pounds	Pounds PSE	Number	Number PSE	Pounds	Pounds	Pounds	% Dead Discards
1981	573,206	0.24	1,645,760	0.33	29,080	0.78	55,210	4,417	1,650,177	0.3
1982	835,033	0.30	1,277,641	0.29	3,400	1.03	8,686	695	1,278,336	0.1
1983	881,917	0.26	3,447,000	0.28	31,861	0.72	61,566	4,925	3,451,925	0.1
1984	1,108,633	0.27	2,957,380	0.48	36,368	0.56	99,978	7,998	2,965,378	0.3
1985	790,724	0.21	3,378,976	0.31	65,736	0.41	123,277	9,862	3,388,839	0.3
1986	1,925,455	0.48	5,706,344	0.54	160,277	0.34	308,765	24,701	5,731,045	0.4
1987	1,206,446	0.41	2,621,030	0.45	153,819	0.46	297,507	23,801	2,644,831	0.9
1988	442,169	0.24	1,082,395	0.20	88,864	0.53	170,728	13,658	1,096,053	1.2
1989	269,659	0.28	1,585,848	0.40	77,526	0.39	152,454	12,196	1,598,044	0.8
1990	308,587	0.29	721,464	0.27	147,434	0.31	277,257	22,181	743,645	3.0
1991	599,109	0.27	1,704,244	0.38	393,172	0.25	778,461	62,277	1,766,521	3.5
1992	657,468	0.19	2,151,294	0.20	212,341	0.24	411,014	32,881	2,184,175	1.5
1993	757,859	0.26	1,815,101	0.30	628,905	0.29	1,215,118	97,209	1,912,310	5.1
1994	710,829	0.16	2,483,012	0.18	445,868	0.24	880,583	70,447	2,553,458	2.8
1995	1,274,729	0.19	2,218,969	0.17	488,675	0.14	949,080	75,926	2,294,895	3.3
1996	868,496	0.13	2,090,661	0.15	473,343	0.19	1,571,600	125,728	2,216,389	5.7
1997	486,143	0.16	1,730,315	0.19	594,796	0.22	1,419,995	113,600	1,843,915	6.2
1998	864,886	0.20	2,867,573	0.20	1,095,887	0.20	2,778,588	222,287	3,089,860	7.2
1999	1,379,761	0.11	3,908,975	0.15	1,381,018	0.14	2,637,856	211,028	4,120,003	5.1
2000	1,856,802	0.19	6,679,779	0.19	1,047,135	0.18	2,090,586	167,247	6,847,026	2.4
2001	1,415,566	0.19	4,207,530	0.18	1,537,390	0.24	2,855,750	228,460	4,435,990	5.2
2002	1,625,540	0.13	4,243,122	0.15	1,110,556	0.18	1,925,485	154,039	4,397,161	3.5
2003	2,873,788	0.23	7,066,793	0.20	1,017,935	0.12	1,951,942	156,155	7,222,948	2.2
2004	992,899	0.17	4,243,320	0.24	1,135,547	0.36	2,585,777	206,862	4,450,182	4.6
2005	1,238,842	0.21	3,315,984	0.18	1,183,849	0.21	2,476,053	198,084	3,514,068	5.6
2006	1,153,278	0.20	4,115,605	0.22	1,418,715	0.20	4,025,619	322,050	4,437,655	7.3
2007	2,098,926	0.13	4,995,036	0.16	2,723,416	0.15	5,971,005	477,680	5,472,716	8.7
2008	2,277,842	0.12	10,716,306	0.14	2,770,784	0.15	5,275,213	422,017	11,138,323	3.8
2009	1,750,360	0.23	9,043,543	0.20	2,093,287	0.21	5,005,542	400,443	9,443,986	4.2
2010	1,863,550	0.13	5,772,021	0.14	2,806,086	0.20	5,771,077	461,686	6,233,707	7.4
2011	2,867,610	0.22	7,668,210	0.25	2,046,444	0.18	4,091,363	327,309	7,995,519	4.1
2012	1,196,197	0.17	3,374,032	0.17	1,980,435	0.22	7,683,926	614,714	3,988,746	15.4
2013	2,783,783	0.12	6,307,931	0.14	2,642,403	0.16	5,465,736	437,259	6,745,190	6.5
2014	1,251,561	0.17	5,221,523	0.17	3,688,016	0.17	6,852,215	548,177	5,769,700	9.5
2015	890,095	0.14	4,780,158	0.30	5,179,832	0.13	11,545,462	923,637	5,703,795	16.2
2016	2,041,701	0.33	6,713,322	0.34	4,922,569	0.17	10,241,996	819,360	7,532,682	10.9
2017	1,743,542	0.26	6,344,762	0.29	5,018,452	0.15	10,246,312	819,705	7,164,467	11.4
2018	1,440,745	0.15	5,144,020	0.15	5,375,863	0.11	11,298,446	903,876	6,047,896	14.9
2019	1,438,609	0.12	4,169,758	0.11	3,469,125	0.12	8,053,561	644,285	4,814,043	13.4
2020	1,254,912	0.13	5,500,339	0.14	2,583,158	0.12	5,619,316	449,545	5,949,884	7.6

Table 13. MRIP 2020 black drum recreational catch estimates with percentage of imputed data from surrounding years due to COVID-19 sampling restrictions.

State	Harvest (pounds)			Released Alive (number)		
	Harvest	PSE	Percentage Imputed Data	Released Alive	PSE	Percentage Imputed Data
NEW JERSEY	535,249	43.9	99%	10,474	64.5	32%
DELAWARE	90,950	69.1	89%	8,301	33.5	32%
MARYLAND	53,825	68.1	0%	1,997	72.7	0%
VIRGINIA	251,724	60.7	20%	142,394	48.4	11%
NORTH CAROLINA	612,932	16.5	17%	704,357	18.9	8%
SOUTH CAROLINA	493,001	19	13%	678,836	16.9	7%
GEORGIA	298,894	31.8	33%	239,371	46.2	5%
FLORIDA	3,163,767	22.3	12%	797,425	27.4	26%

Table 14. Historical recreational catch estimates of black drum (1950-1980) estimated with saltwater angler participation data and MRIP CPUE data.

Year	Harvest	Released Alive		Dead Discards	Total Removals	
	Pounds	Number	Pounds	Pounds	Pounds	% Dead Discards
1950	1,226,337	92,478	183,424	14,674	1,241,011	1.2
1951	1,264,558	95,360	189,141	15,131	1,279,690	1.2
1952	1,302,780	98,243	194,857	15,589	1,318,369	1.2
1953	1,341,002	101,125	200,574	16,046	1,357,048	1.2
1954	1,379,223	104,007	206,291	16,503	1,395,727	1.2
1955	1,417,445	106,890	212,008	16,961	1,434,406	1.2
1956	1,455,667	109,772	217,725	17,418	1,473,085	1.2
1957	1,493,888	112,654	223,442	17,875	1,511,764	1.2
1958	1,532,110	115,537	229,158	18,333	1,550,443	1.2
1959	1,600,076	94,475	198,762	15,901	1,615,977	1.0
1960	1,638,459	96,721	203,508	16,281	1,654,739	1.0
1961	1,794,716	121,530	246,596	19,728	1,814,443	1.1
1962	1,746,258	119,390	242,557	19,405	1,765,662	1.1
1963	1,784,971	121,489	244,059	19,525	1,804,495	1.1
1964	1,893,028	134,511	269,459	21,557	1,914,585	1.1
1965	2,019,890	146,840	290,466	23,237	2,043,127	1.1
1966	2,079,971	151,207	297,078	23,766	2,103,737	1.1
1967	2,247,594	163,777	324,060	25,925	2,273,519	1.1
1968	2,289,103	168,170	331,206	26,497	2,315,599	1.1
1969	2,388,793	176,840	349,880	27,990	2,416,784	1.2
1970	2,492,137	176,733	337,950	27,036	2,519,173	1.1
1971	2,968,108	191,334	371,794	29,744	2,997,851	1.0
1972	3,078,942	196,946	377,257	30,181	3,109,122	1.0
1973	3,272,770	213,662	417,703	33,416	3,306,187	1.0
1974	3,538,029	232,333	456,550	36,524	3,574,553	1.0
1975	3,635,545	238,051	466,435	37,315	3,672,860	1.0
1976	3,445,112	226,475	445,338	35,627	3,480,739	1.0
1977	3,160,219	206,970	411,616	32,929	3,193,149	1.0
1978	2,882,733	195,813	390,005	31,200	2,913,933	1.1
1979	3,056,911	200,326	399,695	31,976	3,088,886	1.0
1980	2,642,363	184,061	371,098	29,688	2,672,051	1.1

Table 15. Historical recreational catch estimates of black drum (1900-1949) extrapolated with exponential regression.

Year	*Harvest Pounds*	*Year*	*Harvest Pounds*
1900	145,186	1925	423,273
1901	151,535	1926	441,782
1902	158,162	1927	461,101
1903	165,078	1928	481,264
1904	172,297	1929	502,310
1905	179,831	1930	524,275
1906	187,695	1931	547,201
1907	195,902	1932	571,130
1908	204,469	1933	596,105
1909	213,410	1934	622,172
1910	222,743	1935	649,379
1911	232,483	1936	677,776
1912	242,649	1937	707,415
1913	253,260	1938	738,349
1914	264,335	1939	770,637
1915	275,894	1940	804,336
1916	287,959	1941	839,509
1917	300,551	1942	876,220
1918	313,694	1943	914,536
1919	327,411	1944	954,528
1920	341,729	1945	996,269
1921	356,672	1946	1,039,835
1922	372,269	1947	1,085,306
1923	388,548	1948	1,132,765
1924	405,539	1949	1,182,300

Table 16. Regional total fishery removals of black drum (pounds). Asterisks indicate confidential data that have been redacted.

Year	*Mid-Atlantic January-August*			*Mid-Atlantic September-December*			*South Atlantic*			*Total*
	Recreational		*Commercial Landings*	*Recreational*		*Commercial Landings*	*Recreational*		*Commercial Landings*	
	Harvest	*Dead Discards*		*Harvest*	*Dead Discards*		*Harvest*	*Dead Discards*		
1981	0	0	65,433	366,219	0	967	1,279,541	4,417	175,203	**1,891,780**
1982	0	0	57,648	0	0	852	1,277,641	695	163,378	**1,500,214**
1983	1,539,971	0	105,541	0	0	1,559	1,907,028	4,925	88,135	**3,647,160**
1984	77,375	2,231	92,927	0	0	1,373	2,880,005	5,767	68,311	**3,127,989**
1985	225,757	0	61,584	594	130	910	3,152,626	9,732	59,363	**3,510,696**
1986	1,205,067	110	225,546	24,789	0	3,332	4,476,487	24,591	117,368	**6,077,291**
1987	381,902	0	135,420	3,948	2	2,000	2,235,180	23,798	108,001	**2,890,252**
1988	57,594	0	175,998	0	0	2,600	1,024,801	13,658	115,806	**1,390,457**
1989	604,115	0	83,009	1,796	0	1,486	979,936	12,196	55,781	**1,738,320**
1990	18,176	0	156,974	3,275	306	2,849	700,013	21,874	41,309	**944,777**
1991	89,681	1,127	192,910	9,529	19	1,825	1,605,034	61,132	50,930	**2,012,186**
1992	273,501	0	162,882	186,654	0	2,756	1,691,139	32,881	44,518	**2,394,331**
1993	0	0	117,612	13,903	507	1,184	1,801,198	96,702	133,724	**2,164,830**
1994	4,328	1,266	223,139	36,180	137	207	2,442,504	69,044	69,587	**2,846,391**
1995	284,546	12,474	123,808	2,229	3,352	1,092	1,932,193	60,100	145,841	**2,565,636**
1996	105,830	63,413	163,315	8,130	1,023	13,144	1,976,701	61,292	136,091	**2,528,939**
1997	10,275	22,974	203,857	38,485	307	13,002	1,681,555	90,318	96,990	**2,157,764**
1998	234,582	60,825	88,170	17,125	2,258	2,497	2,615,866	159,204	43,955	**3,224,482**
1999	14,214	0	190,293	138,965	155	4,433	3,755,796	210,873	140,305	**4,455,034**
2000	31,164	0	117,445	38,679	457	5,895	6,609,936	166,790	116,844	**7,087,210**
2001	366,253	9,171	86,104	15,367	7,356	1,619	3,825,910	211,933	97,269	**4,620,982**
2002	102,841	8,398	36,314	149,471	11,408	13,231	3,990,810	134,234	505,954	**4,952,661**
2003	607,404	17,479	119,415	122,953	2,286	11,511	6,336,436	136,390	158,386	**7,512,260**
2004	1,106,347	39,301	*	25,189	786	*	3,111,784	166,775	*	**4,612,933**
2005	472,325	34,038	73,759	9,630	6,274	7,130	2,834,029	157,772	50,290	**3,645,248**
2006	1,382,108	133,367	*	1,126	11,152	*	2,732,371	177,531	*	**4,663,586**
2007	790,407	89,732	130,547	202,031	5,464	1,509	4,002,598	382,484	161,047	**5,765,820**
2008	4,990,002	35,160	82,187	110,744	21,548	961	5,615,560	365,310	321,557	**11,543,028**
2009	4,683,317	121,199	116,681	11,929	16,716	4,305	4,348,297	262,528	165,177	**9,730,149**
2010	660,999	46,933	126,645	17,363	5,141	1,416	5,093,659	409,612	84,937	**6,446,705**
2011	1,428,764	60,820	108,624	226,610	16,000	3,980	6,012,836	250,489	78,382	**8,186,505**
2012	75,504	327,395	127,045	611	2,458	2,533	3,297,917	284,861	108,766	**4,227,090**
2013	188,279	36,214	128,301	34,163	5,851	8,455	6,085,489	395,194	156,126	**7,038,072**
2014	132,453	45,763	117,601	16,819	15,928	958	5,072,251	486,486	142,804	**6,031,063**
2015	486,115	175,181	138,857	16,575	37,001	879	4,277,468	711,454	101,550	**5,945,081**
2016	197,401	70,059	109,343	50,965	905	470	6,464,956	748,396	117,734	**7,760,228**
2017	301,120	97,751	66,684	212,197	12,135	580	5,831,445	709,819	224,165	**7,455,896**
2018	1,070,865	78,290	116,859	5,890	12,393	658	4,067,265	813,192	129,323	**6,294,735**
2019	339,116	100,566	155,547	3,182	6,963	184	3,827,460	536,756	101,666	**5,071,439**
2020	727,660	55,339	60,510	204,088	7,323	1,895	4,568,591	386,884	126,013	**6,138,302**

Table 17. Percentage of coastwide black drum commercial landings contributed by each state over the last ten years of the assessment time series (2011-2020). Asterisks indicate confidential data that have been redacted.

State	Percentage
RI	0.01
CT	*
NY	0.08
NJ	4.2
DE	*
MD	0.62
VA	32.53
NC	38.64
SC	0.02
GA	*
FL	14.14

Table 18. Percentage of black drum commercial landings by gear type over the last ten years of the assessment time series (2011-2020) from states accounting for at least 1% of the landings. Asterisks indicate confidential data and/or data less than 0.5% of the coastwide landings redacted to protect confidentiality.

State	Gear Type Name	Percentage of State Landings	Percentage of Coastwide Landings
New Jersey	FIXED NETS	*	*
	GILL NETS	19.02	0.8
	HAND LINE	*	*
	HOOK AND LINE	*	*
	NOT CODED	*	*
	PURSE SEINES	*	*
	TRAWLS	12.78	0.54
Delaware	GILL NETS	*	*
	HOOK AND LINE	*	*
	NOT CODED	*	*
Virginia	DREDGE	*	*
	FIXED NETS	2.64	0.86
	GILL NETS	90.87	29.57
	HAND LINE	*	*
	HAUL SEINES	*	*
	HOOK AND LINE	1.69	0.55
	LONG LINES	*	*
	NOT CODED	*	*
	OTHER GEARS	*	*
	TRAWLS	*	*
North Carolina	BY HAND	*	*
	DIP NETS AND CAST NETS	*	*
	DREDGE	*	*
	FIXED NETS	26.08	10.08
	GILL NETS	70.5	27.24
	HAUL SEINES	*	*
	HOOK AND LINE	*	*
	LONG LINES	*	*
	NOT CODED	*	*
	POTS AND TRAPS	*	*
	RAKES, HOES, AND TONGS	*	*
	SPEARS AND GIGS	1.36	0.53
	TRAWLS	*	*
Florida	BY HAND	*	*
	DIP NETS AND CAST NETS	25.7	3.63
	GILL NETS	*	*
	HAND LINE	*	*
	HAUL SEINES	11.16	1.58
	HOOK AND LINE	58.98	8.34
	NOT CODED	*	*
	POTS AND TRAPS	*	*
	SPEARS AND GIGS	*	*
	TRAWLS	*	*

Table 19. Percentage of coastwide black drum commercial landings contributed by each fleet. Color coding is by year, with color gradients from dark green cells indicating the greatest contributors to dark red cells indicating the smallest contributors. Note years with one or two confidential records are not included. Asterisks indicate confidential data that have been redacted.

Year	North Gill Net	MDVA Gill Net	MDVA Fixed	MDVA Hook&Line	NC Gill Net	NC Fixed	South All Gear
1989	9%	31%	10%	10%	1%	14%	25%
1992	12%	63%	2%	2%	1%	2%	18%
1993	16%	18%	11%	1%	3%	37%	12%
1994	21%	52%	2%	1%	6%	5%	12%
1995	20%	25%	1%	1%	21%	27%	7%
1998	9%	55%	3%	0%	14%	6%	12%
1999	38%	18%	2%	0%	27%	10%	5%
2001	12%	29%	1%	4%	28%	14%	10%
2005	10%	45%	1%	5%	23%	11%	4%
2007	14%	*	*	*	39%	11%	4%
2012	13%	39%	2%	1%	31%	9%	6%
2013	14%	31%	1%	1%	31%	12%	10%
2014	11%	33%	1%	0%	13%	7%	35%
2016	23%	23%	1%	2%	25%	15%	12%
2017	8%	13%	1%	1%	48%	15%	14%
2018	16%	28%	1%	3%	33%	11%	8%
2019	7%	44%	3%	7%	17%	14%	8%

Table 20. Recreational harvest of black drum (thousands of fish) by state and year.

Year	New Jersey	Delaware	Maryland	Virginia	North Carolina	South Carolina	Georgia	Florida
1981	0	9	0	2	0	31	14	518
1982	0	0	0	0	3	19	15	799
1983	3	0	16	14	0	102	34	712
1984	0	0	2	1	0	31	34	1,041
1985	0	1	1	3	18	24	94	651
1986	18	101	4	6	30	39	121	1,606
1987	0	6	1	8	90	40	80	981
1988	0	0	0	1	13	16	67	344
1989	0	0	6	4	1	49	69	141
1990	0	11	0	2	8	18	38	231
1991	0	5	0	1	18	8	82	485
1992	0	0	0	8	30	26	38	555
1993	0	7	0	3	98	31	43	575
1994	0	0	0	12	132	9	27	530
1995	0	0	5	12	931	62	40	225
1996	0	0	0	6	469	94	12	287
1997	0	0	0	1	107	71	21	286
1998	0	1	3	5	105	35	13	703
1999	0	1	1	9	374	131	18	845
2000	0	4	1	9	294	339	149	1,061
2001	9	3	0	2	401	25	24	951
2002	7	8	6	7	847	126	54	569
2003	32	0	3	17	1,268	614	77	864
2004	20	1	1	4	297	71	61	536
2005	21	2	0	9	465	278	37	426
2006	65	38	1	1	276	273	55	444
2007	42	9	0	46	876	240	99	787
2008	117	21	0	71	926	97	169	877
2009	69	1	0	42	450	46	42	1,101
2010	13	4	7	5	650	85	138	962
2011	23	1	0	127	1,259	30	26	1,402
2012	1	0	0	8	556	91	43	497
2013	11	2	0	6	1,512	144	65	1,044
2014	0	1	2	11	109	97	48	984
2015	11	0	1	2	276	37	48	515
2016	6	0	0	6	459	256	96	1,218
2017	18	1	1	17	356	242	64	1,045
2018	40	9	1	4	135	197	129	926
2019	8	1	5	7	156	349	158	756
2020	28	5	14	17	213	198	101	678

Table 21. Percentage of age samples for the top ten most frequently sampled ages in the VA fishery-dependent age data from 2016-2020.

Age	Past CAA %
3	8.11
4	5.54
9	9
10	9.1
11	6.82
12	4.06
14	4.65
15	3.86
16	4.06
17	7.02
Total	62.22

Table 22. Total sample size (across all ages in the catch) and associated CV of the catch-at-age estimate for the most prevalent age (age-10).

Sample Size	CV
569	0.1
533	0.14
568	0.12
606	0.12
560	0.15
554	0.2
594	0.18
596	0.2
559	0.2
585	0.14

Table 23. Number of length samples collected by MRIP from black drum harvested by recreational anglers. Cells shaded in red indicate sample sizes less than 30. Cells shaded in gray indicate no estimated harvest.

Year	Mid-Atlantic	NJ	DE	MD	VA	NC	SC	GA	FL
1981	1	NA	0	NA	1	NA	3	8	19
1982	NA	NA	NA	NA	NA	1	10	13	58
1983	31	1	NA	20	10	NA	3	17	64
1984	4	NA	NA	3	1	NA	13	18	112
1985	42	NA	1	12	29	2	4	71	61
1986	55	1	13	1	40	5	11	134	65
1987	32	NA	3	0	29	45	17	171	69
1988	1	NA	NA	NA	1	16	15	44	50
1989	16	NA	NA	13	3	1	21	96	11
1990	8	NA	7	NA	1	6	5	5	9
1991	9	NA	8	NA	1	22	3	5	50
1992	15	NA	NA	NA	15	7	20	33	39
1993	23	NA	21	NA	2	61	16	16	57
1994	3	NA	NA	NA	3	121	5	23	86
1995	5	NA	NA	0	5	390	14	19	31
1996	7	NA	2	NA	5	339	40	2	49
1997	3	NA	2	NA	1	144	66	6	40
1998	4	NA	1	0	3	167	21	6	93
1999	1	NA	0	1	0	248	44	7	177
2000	4	NA	1	1	2	178	37	44	138
2001	10	7	1	NA	2	173	6	18	176
2002	19	2	11	1	5	219	15	43	77
2003	17	3	NA	2	12	198	21	78	95
2004	19	14	1	2	2	127	13	30	79
2005	19	10	3	NA	6	89	17	18	68
2006	53	41	9	2	1	104	155	32	69
2007	23	5	6	NA	12	191	105	79	110
2008	83	67	15	NA	1	363	50	112	174
2009	86	42	29	NA	15	191	26	37	141
2010	19	10	6	0	3	258	19	76	136
2011	24	11	7	NA	6	567	13	17	82
2012	21	6	13	NA	2	237	16	25	60
2013	17	3	7	NA	7	154	48	21	77
2014	11	1	4	2	4	33	41	42	88
2015	17	9	4	2	2	75	20	31	52
2016	20	7	4	2	7	114	111	65	61
2017	17	3	1	2	11	161	140	50	62
2018	42	10	20	2	10	128	162	53	59
2019	29	6	6	2	15	106	148	63	48
2020	58	10	29	1	18	215	136	67	91

Table 24. Number of length samples collected by MRIP and supplemental sampling programs conducted by state agencies from black drum harvested by recreational anglers. Cells shaded in red indicate sample sizes less than 30. Cells shaded in gray indicate no estimated harvest.

Year	Mid-Atlantic	NJ	DE	MD	VA	NC	SC	GA	FL
1981	1	NA	0	NA	1	NA	3	8	19
1982	NA	NA	NA	NA	NA	1	10	13	58
1983	31	1	NA	20	10	NA	3	17	92
1984	4	NA	NA	3	1	NA	13	18	212
1985	42	NA	1	12	29	2	4	71	78
1986	55	1	13	1	40	5	24	134	65
1987	32	NA	3	0	29	45	45	171	69
1988	1	NA	NA	NA	1	16	20	44	50
1989	16	NA	NA	13	3	1	35	96	11
1990	8	NA	7	NA	1	6	11	5	9
1991	9	NA	8	NA	1	22	20	5	50
1992	15	NA	NA	NA	15	7	26	33	39
1993	23	NA	21	NA	2	61	24	16	57
1994	3	NA	NA	NA	3	121	24	23	86
1995	5	NA	NA	0	5	390	23	19	31
1996	7	NA	2	NA	5	339	96	2	49
1997	3	NA	2	NA	1	144	142	6	40
1998	4	NA	1	0	3	167	54	6	93
1999	16	NA	0	1	15	248	92	7	177
2000	59	NA	1	1	57	178	182	44	138
2001	11	7	1	NA	3	173	52	18	176
2002	27	2	11	1	13	219	178	43	77
2003	17	3	NA	2	12	198	111	78	96
2004	19	14	1	2	2	127	51	30	79
2005	19	10	3	NA	6	89	49	18	68
2006	53	41	9	2	1	104	188	32	70
2007	63	5	6	NA	52	191	132	79	112
2008	343	67	49	NA	227	363	62	112	174
2009	247	42	123	NA	82	191	54	37	141
2010	165	10	89	0	66	258	39	76	136
2011	126	11	76	NA	39	567	30	17	83
2012	55	6	31	NA	18	237	27	25	63
2013	70	3	43	NA	24	154	66	21	97
2014	149	1	27	2	119	33	45	42	103
2015	79	9	4	2	64	75	22	31	71
2016	119	7	15	2	95	114	127	65	61
2017	54	3	1	2	48	161	174	50	63
2018	194	10	62	2	120	128	173	53	61
2019	130	6	54	2	68	106	167	63	61
2020	105	10	67	1	27	215	138	67	100

Table 25. Number of length samples collected from commercial harvest by fleet and year. Cells shaded in red indicate sample sizes less than 30. Cells shaded in gray indicate no recorded harvest.

Year	North Gill Net	MDVA Gill Net	MDVA Fixed	MDVA Hook&Line	NC Gill Net	NC Long Fixed	South All Gear*
1989	0	25	12	0	0	0	11
1990	0	4	35	0	0	0	9
1991	0	87	22	0	0	0	50
1992	0	39	0	0	0	0	39
1993	0	11	84	0	0	0	57
1994	0	129	5	0	26	19	86
1995	0	1	5	0	19	145	31
1996	0	28	35	0	19	182	49
1997	0	203	7	0	25	65	40
1998	0	77	18	1	27	44	93
1999	0	201	10	NA	116	472	177
2000	0	110	12	0	247	516	138
2001	0	104	46	5	170	243	176
2002	0	39	35	17	579	1,254	77
2003	0	4	25	0	384	193	96
2004	0	0	73	0	271	94	79
2005	0	11	14	0	394	84	68
2006	0	3	14	0	1,070	783	70
2007	0	3	15	0	1,557	346	112
2008	0	0	14	0	1,972	1,016	174
2009	63	1	39	0	1,012	126	141
2010	84	23	14	1	471	190	136
2011	59	0	5	0	1,165	216	83
2012	23	20	16	0	1,199	254	63
2013	45	26	48	0	1,039	174	97
2014	58	7	39	0	693	60	103
2015	90	0	20	0	473	99	71
2016	0	392	59	0	794	297	61
2017	63	0	48	28	1,097	80	63
2018	86	74	49	57	472	196	61
2019	6	2	46	16	287	248	61
2020	45	3	28	0	246	19	100

*South All Gear fleet sample sizes are from a proxy data set (MRIP length sampling).

Table 26. Number of black drum age samples collected by state, region, and coastwide. Cells shaded in red indicate samples sizes less than 500, cells shaded in yellow indicate samples sizes of 500 to 1,000, and cells shaded in green indicate sample sizes greater than 1,000.

Year	Coastwide	Mid-Atlantic	South Atlantic	NJ	DE	MD	VA	NC	SC	GA	FL
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0
1983	22	0	22	0	0	0	0	0	0	0	22
1984	101	0	101	0	0	0	0	0	0	0	101
1985	27	0	27	0	0	0	0	0	1	0	26
1986	46	0	46	0	0	0	0	0	46	0	0
1987	73	0	73	0	0	0	0	0	73	0	0
1988	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0
1991	26	0	26	0	0	0	0	0	26	0	0
1992	38	0	38	0	0	0	0	0	38	0	0
1993	87	0	87	0	0	0	0	0	87	0	0
1994	29	0	29	0	0	0	0	0	29	0	0
1995	16	0	16	0	0	0	0	0	16	0	0
1996	52	0	52	0	0	0	0	0	52	0	0
1997	66	0	66	0	0	0	0	0	66	0	0
1998	83	6	77	0	0	0	6	0	46	31	0
1999	141	80	61	0	0	0	80	0	42	19	0
2000	182	42	140	0	0	0	42	0	113	27	0
2001	148	86	62	0	0	0	86	0	35	27	0
2002	242	70	172	0	0	0	59	0	135	37	0
2003	180	36	144	0	0	0	11	0	76	67	1
2004	68	18	50	0	0	0	14	0	29	21	0
2005	62	28	34	0	0	0	8	0	26	8	0
2006	51	15	36	0	0	0	7	0	27	9	0
2007	139	57	49	0	0	0	35	0	24	23	2
2008	409	206	176	0	26	0	171	0	10	166	0
2009	317	171	83	0	97	0	61	0	25	58	0
2010	394	211	172	0	129	0	71	0	19	153	0
2011	368	115	205	0	90	0	19	175	13	13	4
2012	458	55	387	0	33	0	19	307	11	45	24
2013	422	108	294	0	58	0	42	178	24	51	41
2014	670	178	468	0	62	0	102	393	7	47	21
2015	576	144	397	0	78	0	55	358	2	16	21
2016	1,108	400	702	0	11	0	372	571	20	106	5
2017	812	153	618	0	59	0	63	562	31	20	5
2018	735	320	373	0	105	0	215	350	11	0	12
2019	558	139	419	0	47	0	92	375	19	0	25
2020	208	73	74	0	67	0	6	64	1	0	9

Table 27. Number of black drum age samples collected along the coast by length bin and year. Length bins were converted from data in millimeters and were structured according to the methodology in Coggins et al. 2013. Cells shaded in red indicate sample sizes less than ten and cells shaded in green indicate sample sizes of at least ten.

Bin (inches)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
4.5276	0	0	0	0	0	0	3	5	0	0
6.1024	0	5	7	3	4	5	18	15	3	0
7.6772	70	47	38	99	129	96	139	73	51	8
9.252	44	35	12	25	58	60	54	17	35	2
10.827	23	63	14	79	47	90	83	49	69	4
12.402	7	40	31	37	22	65	39	20	43	5
13.976	8	98	57	128	45	208	85	51	102	17
15.551	23	71	79	62	43	128	100	63	74	13
17.126	7	10	37	15	18	35	70	26	11	8
18.701	13	12	27	21	11	22	52	45	21	14
20.276	2	3	4	3	3	7	12	12	11	2
21.85	5	5	8	6	11	12	12	22	14	2
23.425	1	1	0	4	3	3	5	14	2	1
25	14	1	0	2	8	3	5	8	8	0
26.575	4	1	1	8	4	12	4	18	8	3
28.15	3	0	2	8	1	3	5	6	3	2
29.724	12	6	17	26	8	9	19	22	13	18
31.299	5	8	14	18	15	16	7	14	7	4
32.874	19	9	13	34	31	82	9	26	9	8
34.449	24	5	11	24	26	105	11	49	15	8
36.024	4	4	5	9	17	54	8	17	5	4
37.598	6	4	5	16	8	52	15	45	16	11
39.173	2	0	1	1	6	7	2	12	11	4
40.748	2	0	2	3	8	10	3	25	9	7
42.323	1	2	1	1	2	2	1	11	5	1
43.898	10	5	4	4	6	9	4	16	10	1
45.472	6	5	8	6	4	4	1	8	2	0
47.047	3	2	0	1	0	1	1	1	1	0
48.622	2	0	0	1	2	1	2	1	0	0
50.197	0	0	3	2	0	1	1	1	0	0
51.772	0	0	0	0	1	0	1	1	0	0
53.346	0	0	1	0	0	0	0	0	0	0
54.921	0	0	0	0	0	0	0	0	0	0
56.496	0	0	0	0	0	0	0	0	0	0
58.071	0	0	0	0	0	0	0	0	0	0
59.646	0	0	0	0	0	0	0	0	0	0
61.22	0	0	0	0	0	0	0	0	0	0
62.795	0	0	0	0	0	0	0	0	0	0

Table 28. Methods used to calculate black drum indices of abundance.

Survey	Index calculation method	Details
MRIP CPUE	Delta method (Lo et al. 1992)	CPUE~year+state+mode+wave Presence ~year+state+mode+wave
NEAMAP Trawl	Stratified geometric mean	$\overline{\log Y_s} = \frac{\sum_{k=1}^{n} \log(Y_k + 1)}{n}$ $\overline{Y} = e^{\sum_{s=1}^{N} N_s \overline{\log Y_s}}$
NJ Ocean Trawl	Stratified arithmetic mean	$\overline{Y} = \frac{1}{N} \sum_{s=1}^{N} N_s \overline{Y_s}$
PSEG Seine	Negative binomial GLM	Catch~year+month+area
DE 16ft Trawl	Geometric mean	$\overline{\log Y} = \frac{\sum_{k=1}^{n} \log(Y_k + 1)}{n}$ $\overline{Y} = e^{\overline{\log Y}}$
DE 30ft Trawl	Geometric mean	$\overline{\log Y} = \frac{\sum_{k=1}^{n} \log(Y_k + 1)}{n}$ $\overline{Y} = e^{\overline{\log Y}}$
MD Seine	Geometric mean	$\overline{\log Y} = \frac{\sum_{k=1}^{n} \log(Y_k + 1)}{n}$ $\overline{Y} = e^{\overline{\log Y}}$
NC Gill Net	Stratified arithmetic mean	$\overline{Y} = \frac{1}{N} \sum_{s=1}^{N} N_s \overline{Y_s}$
SC Trammel	Stratified arithmetic mean	$\overline{Y} = \frac{1}{N} \sum_{s=1}^{N} N_s \overline{Y_s}$
GA Trammel	Stratified geometric mean	$\overline{\log Y_s} = \frac{\sum_{k=1}^{n} \log(Y_k + 1)}{n}$ $\overline{Y} = e^{\sum_{s=1}^{N} N_s \overline{\log Y_s}}$
FL Haul Seine	Negative binomial GLM	Catch~year+strata+month+bottom vegetation+shore type+secchi depth+windspeed

Table 29. Fishery-independent indices of abundance for black drum on the Atlantic coast.

Year	FL Haul Seine Survey		GA Trammel Net Survey		SC Trammel Net Survey		NC Gill Net Survey		MD Seine Survey		DE 16 FT Trawl Survey		DE 30 FT Trawl Survey		PSEG Seine Survey		NJ Ocean Trawl Survey		NEAMAP Trawl Survey	
	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV	Index	CV
1989									0.00	0.00							0.00	0.00		
1990									0.00	0.00	0.01	0.96	0.09	0.75			0.00	0.00		
1991					0.47	0.31			0.15	0.72	0.04	0.43	0.10	0.66			0.02	1.00		
1992					0.56	0.31			0.93	0.24	0.01	0.99	0.04	0.70			0.01	1.00		
1993					0.39	0.19			0.00	0.00	0.89	0.15	1.19	0.38			0.03	0.74		
1994					0.14	0.24			0.04	0.98	0.11	0.29	0.19	0.44			0.00	0.00		
1995					0.10	0.25			1.10	0.18	0.53	0.16	1.77	0.29	0.34	0.32	0.00	0.00		
1996					0.08	0.24			0.20	0.53	0.15	0.29	0.90	0.42	0.20	0.35	0.00	0.00		
1997					0.08	0.18			0.23	0.64	0.00	0.00	0.08	0.61	0.05	0.49	0.00	0.00		
1998					0.14	0.13			0.94	0.20	0.15	0.26	0.14	0.48	0.43	0.37	0.00	0.00		
1999	0.25	0.48			0.86	0.18			0.39	0.43	0.20	0.22	0.48	0.32	0.28	0.33	0.20	0.79		
2000	0.22	0.48			0.35	0.14			1.47	0.18	0.45	0.17	0.82	0.34	0.36	0.32	0.00	0.00		
2001	0.15	0.47			0.12	0.16			0.44	0.31	0.49	0.17	0.38	0.53	0.94	0.29	0.06	0.85		
2002	0.45	0.40			0.33	0.12			0.98	0.17	0.23	0.26	0.11	0.58	0.29	0.25	0.31	0.43		
2003	0.48	0.40	0.18	0.34	0.20	0.14	0.83	0.25	0.74	0.31	0.28	0.22	0.43	0.37	0.23	0.26	0.00	0.00		
2004	0.43	0.39	0.24	0.25	0.19	0.16	0.35	0.19	0.16	0.54	0.02	0.49	0.06	0.52	0.16	0.28	0.07	0.41		
2005	0.19	0.44	0.32	0.19	0.08	0.16	0.37	0.24	0.21	0.43	0.69	0.18	0.83	0.31	0.44	0.24	0.94	0.46		
2006	0.16	0.45	0.35	0.15	0.26	0.11	0.71	0.10	0.15	0.43	0.01	0.99	0.24	0.43	0.03	0.46	0.05	1.00		
2007	1.28	0.38	0.21	0.28	0.30	0.18	0.63	0.20	1.12	0.20	0.32	0.21	1.49	0.33	0.60	0.23	1.45	0.22	0.21	0.32
2008	1.54	0.38	0.11	0.42	0.29	0.15	1.02	0.13	0.08	0.66	0.05	0.39	0.28	0.42	0.19	0.27	0.09	0.89	0.19	0.38
2009	0.30	0.42	0.22	0.18	0.26	0.13	0.59	0.19	0.42	0.35	0.09	0.33	0.14	0.37	0.08	0.33	1.73	0.77	0.66	0.15
2010	0.58	0.41	0.02	0.53	0.12	0.14	0.40	0.32	0.08	0.66	0.00	0.00	0.20	0.45	0.09	0.32	0.00	0.00	0.11	0.41
2011	0.41	0.40	0.03	0.46	0.12	0.24	0.62	0.17	0.37	0.39	0.03	0.52	0.09	0.54	0.45	0.24	0.46	0.60	0.28	0.27
2012	0.84	0.36	0.14	0.23	0.19	0.16	0.39	0.15	0.42	0.32	0.05	0.41	0.13	0.48	0.27	0.26	0.11	0.46	0.09	0.41
2013	2.23	0.36	0.02	0.63	0.23	0.23	0.32	0.16	0.33	0.35	0.08	0.30	0.51	0.35	0.50	0.24	0.05	0.63	0.21	0.35
2014	2.05	0.36	0.08	0.35	0.30	0.25	0.59	0.20	0.51	0.32	0.24	0.25	0.77	0.44	0.17	0.27	0.07	0.26	0.20	0.86
2015	2.24	0.37	0.07	0.33	0.40	0.13	0.80	0.36	0.16	0.42	0.38	0.23	0.32	0.35	0.74	0.23	0.49	0.78	0.30	0.58
2016	1.33	0.35	0.13	0.28	0.42	0.12	1.12	0.14	0.36	0.32	0.12	0.32	0.15	0.37	0.18	0.27	0.05	1.00	0.05	0.52
2017	2.58	0.36	0.12	0.27	0.19	0.11	0.92	0.20	0.48	0.34	0.11	0.30	0.28	0.41	0.37	0.24	0.36	0.91	0.41	0.30
2018	1.22	0.36	0.11	0.28	0.21	0.14	0.37	0.14	0.62	0.37	0.21	0.27	0.82	0.34	0.61	0.23	0.44	0.51	0.40	0.37
2019	1.50	0.35	0.12	0.29	0.35	0.16	0.75	0.15	0.04	0.98	0.10	0.32	0.16	0.41	0.08	0.33	0.23	0.41	0.11	0.45
2020	1.59	0.41	0.05	0.35	0.15	0.20			0.42	0.21	0.23	0.24	0.48	0.35	0.57	0.23			0.63	0.29

Table 30. Annual weighted black drum index of relative abundance (number per set, ages 0-3) from the NC DMF Independent Gill Net Survey (Program 915) in the Pamlico Sound and Neuse, Pamlico, and Pungo river systems from 2003–2020*. N=number of samples; Index=black drum per gill net set; SE=Standard Error; PSE=Proportional Standard Error. *Sampling in this program was suspended in February 2020 due to COVID-19 restrictions.

		Age-0			Age-1			Age-2			Age-3		
Year	N	Index	SE	PSE	Index	SE	PSE	Index	SE	PSE	Index	SE	PSE
2003	476	0.11	0.03	27	0.12	0.04	33	0.52	0.15	29	0.04	0.01	25
2004	640	0.06	0.03	50	0.18	0.04	22	0.00	0.00	.	0.08	0.05	63
2005	608	0.29	0.08	28	0.02	0.01	50	0.04	0.02	50	0.01	0.01	100
2006	640	0.13	0.03	23	0.57	0.06	11	0.01	0.00	0	0.00	0.00	.
2007	640	0.31	0.08	26	0.12	0.03	25	0.18	0.07	39	0.02	0.01	50
2008	640	0.04	0.01	25	0.90	0.12	13	0.04	0.02	50	0.04	0.03	75
2009	640	0.36	0.10	28	0.05	0.01	20	0.15	0.04	27	0.03	0.01	33
2010	640	0.27	0.13	48	0.09	0.02	22	0.01	0.01	100	0.03	0.01	33
2011	618	0.46	0.10	22	0.11	0.02	18	0.02	0.01	50	0.03	0.02	67
2012	628	0.09	0.03	33	0.27	0.04	15	0.02	0.01	50	0.00	0.00	.
2013	628	0.10	0.03	30	0.09	0.02	22	0.10	0.03	30	0.03	0.01	33
2014	628	0.38	0.10	26	0.11	0.03	27	0.04	0.02	50	0.05	0.03	60
2015	626	0.66	0.25	38	0.11	0.04	36	0.02	0.01	50	0.00	0.00	.
2016	628	0.17	0.04	24	0.91	0.13	14	0.03	0.01	33	0.00	0.00	.
2017	628	0.24	0.06	25	0.33	0.06	18	0.28	0.12	43	0.05	0.02	40
2018	628	0.10	0.03	30	0.13	0.03	23	0.06	0.02	33	0.06	0.02	33
2019	628	0.14	0.05	36	0.56	0.10	18	0.02	0.01	50	0.02	0.01	50
2020*													

Table 31. Results for the Shapiro-Wilk Test Statistic to determine whether populations are normally distributed. Significant p-values are highlighted in yellow.

Survey Index	Age Type	Shapiro-Wilk Test Statistic	p-value
DE 16' Trawl	YOY	0.383	0.000
DE 30' Trawl	YOY	0.279	0.000
GA Trammel	YOY	0.926	0.163
MD Seine	YOY	0.885	0.003
MRIP	Mixed-Age	0.975	0.541
NC P915 Gill Net	Mixed-Age	0.927	0.196
NC P915 Gill Net	YOY	0.895	0.056
NC P915 Gill Net	Age-1 Lagged	0.770	0.001
NC P915 Gill Net	Age-2 Lagged	0.737	0.001
NC P915 Gill Net	Age-3 Lagged	0.906	0.136
NEAMAP Trawl	YOY	0.886	0.072
NJ Ocean Trawl	YOY	0.607	0.000
PSEG Seine	YOY	0.940	0.134
SC Trammel	Mixed-Age	0.858	0.001
SC Trammel	YOY	0.534	0.000
SC Trammel	Age-1 Lagged	0.891	0.005

For alpha > 0.05, null hypothesis not rejected (population normally distributed)
For alpha <=0.05, null hypothesis rejected (population may not be normally distributed)

Table 32. YOY index correlation results. Significant p-values are highlighted in yellow. P-values in red font indicate ties in rankings and are not exact.

YOY Indices	GA Trammel			SC Trammel YOY			NC P915 Gill Net YOY			MD Seine			DE 30' Trawl			DE 16' Trawl			PSEG Seine			NEAMAP Trawl		
	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n
SC Trammel YOY	-0.06	0.81	18																					
NC P915 Gill Net YOY	-0.19	0.47	17	0.37	0.15	17																		
MD Seine	0.10	0.70	18	0.07	0.72	30	0.17	0.52	17															
DE 30' Trawl	-0.08	0.75	18	-0.04	0.83	30	0.16	0.54	17	0.23	0.21	31												
DE 16' Trawl	0.05	0.85	18	0.05	0.79	30	0.39	0.13	17	0.41	0.02	31	0.83	0.00	31									
PSEG Seine	-0.35	0.15	18	0.26	0.19	26	0.17	0.52	17	0.45	0.02	26	0.50	0.01	26	0.65	0.00	26						
NEAMAP Trawl	-0.03	0.92	14	0.25	0.38	14	0.41	0.17	13	0.38	0.18	14	0.28	0.33	14	0.32	0.26	14	0.42	0.13	14			
NJ Ocean Trawl	0.21	0.41	17	0.37	0.05	29	0.45	0.07	17	0.16	0.39	31	0.15	0.42	30	0.17	0.37	30	0.31	0.13	25	0.72	0.01	13

Table 33. Mixed-age index correlation results. Significant p-values are highlighted in yellow.

Mixed-Age	SC Trammel			NC P915 Gill Net		
	ρ	p-value	n	ρ	p-value	n
NC P915 Gill Net	0.51	0.04	17			
MRIP	0.35	0.06	30	0.46	0.06	17

Table 34. YOY and mixed-age index correlation results. Significant p-values are highlighted in yellow. P-values in red font indicate ties in rankings and are not exact.

YOY & Mixed-Age Indices	GA Trammel			MD Seine			DE 30' Trawl			DE 16' Trawl			PSEG Seine			NEAMAP Trawl			NJ Ocean Trawl		
	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n
SC Trammel	0.07	0.79	18	0.01	0.95	30	0.00	0.99	30	0.05	0.81	30	-0.06	0.75	26	-0.25	0.39	14	0.19	0.32	29
NC P915 Gill Net	0.01	0.98	17	-0.03	0.90	17	-0.01	0.96	17	0.15	0.57	17	-0.12	0.65	17	-0.15	0.63	13	-0.11	0.67	17
MRIP	-0.29	0.24	18	0.36	0.04	32	0.27	0.14	31	0.21	0.26	31	0.31	0.12	26	0.03	0.91	14	0.46	0.01	31

Table 35. Lagged age and YOY index correlation results. Significant p-values are highlighted in yellow. P-values in red font indicate ties in rankings and are not exact.

	SC Trammel Age-1 Lagged			NC P915 Gill Net Age-1 Lagged			NC P915 Gill Net Age-2 Lagged			NC P915 Gill Net Age-3 Lagged		
	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n	ρ	p-value	n
GA Trammel	0.08	0.74	18	-0.05	0.86	16	0.11	0.69	15	-0.21	0.48	14
SC Trammel YOY	0.48	0.01	30	0.19	0.47	16	0.18	0.51	15	0.48	0.08	14
SC Trammel Age-1 Lagged												
NC P915 Gill Net YOY	0.09	0.73	17	0.54	0.03	16	0.59	0.02	15	0.63	0.02	14
NC P915 Gill Net Age-1 Lagged	0.67	0.00	16									
NC P915 Gill Net Age-2 Lagged	0.69	0.00	15	0.88	0.00	15						
NC P915 Gill Net Age-3 Lagged	0.30	0.30	14	0.49	0.08	14	0.47	0.09	14			
MD Seine	0.22	0.24	30	0.32	0.22	16	0.26	0.35	15	-0.25	0.39	14
DE 30' Trawl	-0.03	0.87	30	0.57	0.02	16	0.34	0.22	15	0.26	0.38	14
DE 16' Trawl	0.07	0.71	30	0.69	0.00	16	0.58	0.02	15	0.21	0.48	14
PSEG Seine	0.56	0.00	26	0.66	0.01	16	0.54	0.04	15	0.25	0.39	14
NEAMAP Trawl	0.10	0.74	14	0.24	0.45	14	0.03	0.94	11	0.25	0.49	10
NJ Ocean Trawl	0.44	0.02	29	0.32	0.23	16	0.33	0.23	15	0.26	0.36	14

Table 36. Simulation based power analysis results for the FL Haul Seine survey index. This index was unable to detect a decline (evaluated from 10% to 90%) with a power of 0.80.

Index	Years	Life Stage Tracked	Initial Relative Abundance	Overdispersion Parameter	Power to Detect -50% change	-% Change Detected with Power=0.80	+% Change Detected with Power=0.80
FL Haul Seine	1999-2020	Age-1+	0.23	0.14	0.11	-	>900%

Table 37. Traditional power analysis results for index data sets considered for indicators. Data sets with an asterisk next to the median CV had at least one year with no black drum catch that was excluded from the time series. Two asterisks in the final column indicate inability to detect a decline with a power of 0.80 and the value in the parentheses is the power to detect a 99.5% decline.

Index	Years	Life Stage Tracked	Median CV	Power to Detect -50% change	-% Change Detected with Power=0.80
MRIP	1982-2020	Exploitable Abundance	0.063	1.00	24.5
NC Gillnet	2003-2019	Sub-Adult Abundance	0.186	0.60	63.5
SC Trammel	1991-2020	YOY/Age-1	0.163	0.69	57.0
PSEG Seine	1995-2020	YOY	0.273	0.38	84.5
MD Seine	1989-2020	YOY	0.355*	0.28	97.0
GA Trammel	2003-2020	YOY	0.286	0.36	87.5
DE 16ft Trawl	1990-2020	YOY	0.286*	0.36	87.5
DE 30ft Trawl	1990-2020	YOY	0.419	0.23	99.5
NEAMAP	2007-2020	YOY	0.375	0.26	98.5
FL Haul Seine	1999-2020	Age-1+	0.394	0.25	99.0
NJ Ocean Trawl	1989-2019	NA *(Range Expansion)*	0.743*	0.14	NA (0.67)**

Table 38. Selected Indicators

Selected Indicators			
Abundance		Stock Characteristics	Fishery Characteristics
MRIP CPUE	Coastwide	NJ Ocean Trawl	MRIP rec harvest
PSEG Seine	Mid-Atlantic		MRIP rec released alive
MD Seine	Mid-Atlantic		commercial landings
DE 16ft Trawl	Mid-Atlantic		
DE 30ft Trawl	Mid-Atlantic		
NC Gillnet	South Atlantic		
SC Trammel	South Atlantic		
GA Trammel	South Atlantic		

Table 39. Annual MRIP CPUE index values, 3-year moving average of the index, % change from the previous year's moving average value, annual total removals, 3-year smoothed removals and relative *F* for black drum from the Skate method.

Year	Annual Index	3-Year Moving Average Index	% change from previous	Annual removals	catch_3yr_smooth	Relative F
1982	0.378392914			1,500,214		
1983	0.897491699			3,647,160		
1984	0.750900932	0.6755952		3,127,989	2,758,454	4,083.00
1985	0.933019012	0.8604705	27.36	3,510,696	3,428,615	3,984.58
1986	0.952098399	0.8786728	2.12	6,077,291	4,238,659	4,823.93
1987	0.593584107	0.8262338	-5.97	2,890,252	4,159,413	5,034.18
1988	0.58957066	0.7117511	-13.86	1,390,457	3,452,667	4,850.95
1989	1.591410086	0.924855	29.94	1,738,320	2,006,343	2,169.36
1990	0.595860217	0.9256137	0.08	944,777	1,357,851	1,466.97
1991	0.773355141	0.9868751	6.62	2,012,186	1,565,094	1,585.91
1992	0.890844157	0.7533532	-23.66	2,394,331	1,783,764	2,367.77
1993	0.65239466	0.772198	2.50	2,164,830	2,190,449	2,836.64
1994	0.78804678	0.7770952	0.63	2,846,391	2,468,518	3,176.60
1995	0.554842079	0.6650945	-14.41	2,565,636	2,525,619	3,797.38
1996	0.838001625	0.7269635	9.30	2,528,939	2,646,989	3,641.16
1997	0.9971404	0.7966614	9.59	2,157,764	2,417,446	3,034.47
1998	0.969649505	0.9349305	17.36	3,224,482	2,637,062	2,820.60
1999	0.834844033	0.933878	-0.11	4,455,034	3,279,093	3,511.27
2000	1.045977059	0.9501569	1.74	7,087,210	4,922,242	5,180.45
2001	0.822732192	0.9011844	-5.15	4,620,982	5,387,742	5,978.51
2002	0.799780941	0.8894967	-1.30	4,952,661	5,553,618	6,243.55
2003	0.749062046	0.7905251	-11.13	7,512,260	5,695,301	7,204.45
2004	0.853785281	0.8008761	1.31	4,612,933	5,692,618	7,107.99
2005	0.674538907	0.7591287	-5.21	3,645,248	5,256,814	6,924.80
2006	1.050325207	0.8595498	13.23	4,663,586	4,307,255	5,011.06
2007	0.896642437	0.8738355	1.66	5,765,820	4,691,551	5,368.92
2008	1.095461676	1.0141431	16.06	11,543,028	7,324,144	7,222.00
2009	1.236682902	1.0762623	6.13	9,730,149	9,012,999	8,374.35
2010	0.802450319	1.044865	-2.92	6,446,705	9,239,961	8,843.21
2011	0.804794056	0.9479758	-9.27	8,186,505	8,121,120	8,566.80
2012	1.0934962	0.9002469	-5.03	4,227,090	6,286,767	6,983.38
2013	0.812755557	0.9036819	0.38	7,038,072	6,483,889	7,174.97
2014	0.843829337	0.9166937	1.44	6,031,063	5,765,408	6,289.35
2015	1.041010468	0.8991985	-1.91	5,945,081	6,338,072	7,048.58
2016	1.002706843	0.9625155	7.04	7,760,228	6,578,791	6,835.00
2017	0.956757365	1.0001582	3.91	7,455,896	7,053,735	7,052.62
2018	0.943726214	0.9677301	-3.24	6,294,735	7,170,286	7,409.39
2019	0.971618396	0.9573673	-1.07	5,071,439	6,274,024	6,553.41
2020	1.056752558	0.9906991	3.48	6,138,302	5,834,825	5,889.60

Table 40. DB-SRA parameter estimates from the previous 2015 stock assessment and both continuity runs during this assessment. All catch and biomass parameters are in millions of pounds.

Quantity	*Run*	*Estimate Quantile*		
		25%	***50%***	***75%***
MSY	2015 Assessment	1.60	2.12	3.05
	New_Catch	4.23	5.57	8.12
	Then_*M*	5.24	6.81	9.91
2012 OFL	2015 Assessment	2.60	4.12	6.98
	New_Catch	6.99	10.80	18.34
	Then_*M*	8.62	13.34	22.95
2020 OFL	New_Catch	6.16	9.97	17.60
	Then_*M*	7.80	12.60	22.25
U_{MSY}	2015 Assessment	0.033	0.046	0.062
	New_Catch	0.033	0.046	0.063
	Then_*M*	0.054	0.074	0.099
2012 Exploitation	2015 Assessment	0.007	0.013	0.020
	New_Catch	0.011	0.018	0.028
	Then_*M*	0.013	0.023	0.037
2020 Exploitation	New_Catch	0.016	0.028	0.046
	Then_*M*	0.020	0.035	0.059
B_{MSY}	2015 Assessment	34.58	47.26	69.61
	New_Catch	91.37	123.58	177.80
	Then_*M*	70.06	95.85	139.81
2012 Biomass	2015 Assessment	57.75	90.78	156.97
	New_Catch	153.63	241.02	400.86
	Then_*M*	117.13	187.95	316.73
2020 Biomass	New_Catch	135.10	222.10	382.20
	Then_*M*	105.86	175.75	304.18
K	2015 Assessment	93.50	135.20	203.76
	New_Catch	250.86	354.64	518.14
	Then_*M*	189.29	275.74	412.61
2012 Depletion (B_{2012}/K)	2015 Assessment	0.600	0.704	0.802
	New_Catch	0.600	0.699	0.796
	Then_*M*	0.601	0.701	0.799
2020 Depletion (B_{2020}/K)	New_Catch	0.525	0.649	0.767
	Then_*M*	0.537	0.664	0.782
r	2015 Assessment	0.049	0.070	0.099
	New_Catch	0.050	0.071	0.099
	Then_*M*	0.079	0.112	0.156

Table 41. Fixed input parameters used in JABBA-Select per-recruit model estimates. All size inputs are in millimeters.

Parameter	*Description*	*Value*
a_{min}	Minimum age	0
a_{max}	Maximum age	67
L_{inf}	von Bertalanffy growth asymptotic length	1,156
k	von Bertalanffy growth coefficient	0.133
a_0	von Bertalanffy growth age at size 0	-1.77
a	length-weight relationship alpha (grams vs mm)	3.20E-05
b	length-weight relationship beta (grams vs mm)	2.8977
a_{50}	age at 50% maturity	4.1
a_{95}	age at 95% maturity	5.7
$SL_{50,1}$	SA_1 size at 50% ascending selectivity	185
$SL_{95,1}$	SA_1 size at 95% ascending selectivity	220
$SL_{desc,1}$	SA_1 size descending selectivity starts	520
$SL_{width,1}$	SA_1 width descending selectivity	90
$SL_{min,1}$	SA_1 constant selectivity following descent	0
$SL_{50,2}$	SA_2 size at 50% ascending selectivity	330
$SL_{95,2}$	SA_2 size at 95% ascending selectivity	375
$SL_{desc,2}$	SA_2 size descending selectivity starts	520
$SL_{width,2}$	SA_2 width descending selectivity	90
$SL_{min,2}$	SA_2 constant selectivity following descent	0
$SL_{50,3}$	MA_early size at 50% ascending selectivity	620
$SL_{95,3}$	MA_early size at 95% ascending selectivity	740
$SL_{50,4}$	MA_late_1 size at 50% ascending selectivity	180
$SL_{95,4}$	MA_late_1 size at 95% ascending selectivity	190
$SL_{desc,4}$	MA_late_1 size descending selectivity starts	210
$SL_{width,4}$	MA_late_1 width descending selectivity	20
$SL_{min,4}$	MA_late_1 constant selectivity following descent	0.01
$SL_{50,5}$	MA_late_2 size at 50% ascending selectivity	190
$SL_{95,5}$	MA_late_2 size at 95% ascending selectivity	220
$SL_{desc,5}$	MA_late_2 size descending selectivity starts	250
$SL_{width,5}$	MA_late_2 width descending selectivity	20
$SL_{min,5}$	MA_late_2 constant selectivity following descent	0.25
$SL_{50,6}$	MRIP CPUE size at 50% ascending selectivity	185
$SL_{95,6}$	MRIP CPUE size at 95% ascending selectivity	220
$SL_{desc,6}$	MRIP CPUE size descending selectivity starts	520
$SL_{width,6}$	MRIP CPUE width descending selectivity	90
$SL_{min,6}$	MRIP CPUE constant selectivity following descent	0.25

Table 42. Input prior distributions used in the JABBA-Select model.

JABBA-Select Parameter	*Description*	*Prior Distribution*	*Prior Distribution Parameters*
SB_0	Unfished Spawning Biomass (pounds)	Lognormal	Mean = 222,111,320 CV = 1.66
$\Psi = SB_{1982}/SB_0$	1982 Spawning Biomass Depletion (psi)	Beta	Mean = 0.70 CV = 0.17
M	Natural Mortality	Lognormal	Mean = 0.1041 CV = 0.25
h	Beverton-Holt Stock-Recruitment Steepness	Beta	Mean = 0.72 CV = 0.25
q	MRIP CPUE catchability coefficient	Uniform	Lower bound = 1e-29 Upper bound = 1,000
σ^2_{est}	Estimated additional observation variance	Inverse-gamma	Shape = 0.001 Scale = 0.001
σ^2_{η}	Process variance	Inverse-gamma	Shape = 0.001 Scale = 0.001

Table 43. Percentage of MRIP recreational harvest in waves 5 and 6 less than 16 inches during constant regulation time periods in the Mid-Atlantic.

Time Period	Percentage of catch <16"	
	Wave 5	Wave 6
1981-1986	90	NA
1987-1993	95	37
1994-2000	45	100
2001-2009	41	36
2010-2020	32	83

Table 44. **Estimated and derived (NA p-values) parameters with p-values for posterior distribution convergence tests.** *Note: Table has been updated in Section 13.4 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

Parameter	***LCI***	***Median***	***UCI***	***Geweke p-value***	***Heidelberger and Welch p-value***
SB_0	129	396	1,542	0.60	0.44
SB_{1982}/SB_0	0.336	0.588	0.827	0.84	0.74
m	0.438	0.716	1.180	0.91	0.99
$H_{MSY,1}$	0.009	0.032	0.110	0.98	0.42
$H_{MSY,2}$	0.011	0.043	0.147	0.95	0.41
$H_{MSY,3}$	0.039	0.157	0.540	0.78	0.69
$H_{MSY,4}$	0.005	0.020	0.073	0.73	0.92
$H_{MSY,5}$	0.022	0.092	0.331	0.72	0.88
q	0.000	0.000	0.000	0.83	0.43
σ^2_{est}	0.000	0.002	0.008	0.97	0.33
σ^2_{η}	0.001	0.003	0.019	0.62	0.12
SB_{MSY}	37	122	476	NA	NA
MSY_1	1	4	17	NA	NA
MSY_2	1	5	23	NA	NA
MSY_3	5	19	84	NA	NA
MSY_4	1	2	11	NA	NA
MSY_5	3	11	51	NA	NA

Table 45. Spawning biomass estimates from the JABBA-Select model. *Note: Table has been updated in Section 13.4 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

Year	SB (millions of pounds)			SB/SB_{MSY}			SB/SB_0		
	LCI	Median	UCI	LCI	Median	UCI	LCI	Median	UCI
1982	66	228	847	1.010	1.857	2.940	0.330	0.574	0.825
1983	67	235	870	1.056	1.908	3.015	0.346	0.588	0.836
1984	68	238	898	1.080	1.944	3.075	0.353	0.600	0.847
1985	69	243	925	1.100	1.979	3.141	0.362	0.611	0.858
1986	73	249	955	1.126	2.031	3.259	0.373	0.628	0.888
1987	72	251	974	1.130	2.037	3.271	0.372	0.632	0.889
1988	73	256	1,011	1.149	2.076	3.338	0.382	0.645	0.900
1989	77	263	1,040	1.196	2.141	3.423	0.395	0.665	0.927
1990	79	268	1,058	1.230	2.184	3.496	0.407	0.680	0.939
1991	82	275	1,081	1.276	2.244	3.588	0.426	0.698	0.958
1992	83	281	1,102	1.311	2.290	3.652	0.437	0.711	0.970
1993	83	285	1,114	1.336	2.324	3.666	0.446	0.722	0.974
1994	83	290	1,135	1.367	2.362	3.726	0.455	0.733	0.984
1995	86	296	1,159	1.407	2.412	3.787	0.469	0.751	1.014
1996	89	302	1,174	1.458	2.476	3.845	0.485	0.768	1.036
1997	95	309	1,195	1.500	2.538	3.931	0.499	0.787	1.065
1998	97	316	1,212	1.544	2.592	4.016	0.515	0.803	1.092
1999	98	323	1,214	1.583	2.632	4.067	0.526	0.815	1.111
2000	99	324	1,223	1.596	2.649	4.095	0.534	0.820	1.117
2001	95	323	1,226	1.585	2.628	4.063	0.528	0.815	1.112
2002	96	324	1,231	1.581	2.632	4.043	0.531	0.815	1.111
2003	93	321	1,220	1.582	2.613	4.007	0.526	0.810	1.100
2004	88	318	1,212	1.550	2.569	3.957	0.514	0.798	1.081
2005	92	322	1,228	1.576	2.610	3.996	0.526	0.810	1.104
2006	98	330	1,252	1.633	2.686	4.128	0.547	0.830	1.136
2007	104	338	1,277	1.687	2.754	4.218	0.562	0.849	1.168
2008	105	339	1,289	1.701	2.772	4.246	0.569	0.855	1.176
2009	101	335	1,290	1.667	2.738	4.178	0.560	0.845	1.157
2010	97	334	1,306	1.657	2.725	4.150	0.553	0.840	1.150
2011	99	338	1,312	1.681	2.751	4.193	0.559	0.848	1.154
2012	100	339	1,331	1.680	2.763	4.210	0.561	0.851	1.167
2013	106	348	1,376	1.736	2.842	4.346	0.581	0.874	1.204
2014	108	351	1,395	1.766	2.890	4.404	0.591	0.886	1.225
2015	111	358	1,430	1.792	2.945	4.543	0.602	0.903	1.252
2016	117	364	1,451	1.815	2.995	4.642	0.614	0.915	1.277
2017	115	363	1,457	1.815	2.982	4.609	0.610	0.913	1.277
2018	113	362	1,455	1.809	2.964	4.592	0.608	0.907	1.270
2019	111	359	1,455	1.796	2.940	4.529	0.599	0.902	1.263
2020	108	357	1,444	1.776	2.921	4.556	0.591	0.894	1.274

Table 46. Exploitation estimates from the JABBA-Select model. *Note: Table has been updated in Section 13.4 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

Year	H			H/H_{MSY}		
	LCI	Median	UCI	LCI	Median	UCI
1982	0.002	0.007	0.023	0.035	0.180	0.748
1983	0.004	0.016	0.054	0.034	0.178	0.782
1984	0.003	0.013	0.046	0.063	0.340	1.511
1985	0.004	0.014	0.051	0.063	0.345	1.551
1986	0.006	0.024	0.083	0.073	0.401	1.840
1987	0.003	0.012	0.040	0.038	0.214	0.993
1988	0.001	0.005	0.019	0.018	0.104	0.487
1989	0.002	0.007	0.023	0.015	0.082	0.385
1990	0.001	0.004	0.012	0.011	0.064	0.305
1991	0.002	0.007	0.025	0.027	0.148	0.697
1992	0.002	0.009	0.029	0.029	0.160	0.752
1993	0.002	0.008	0.026	0.035	0.198	0.922
1994	0.003	0.010	0.034	0.041	0.231	1.076
1995	0.002	0.009	0.030	0.030	0.166	0.766
1996	0.002	0.008	0.028	0.031	0.172	0.783
1997	0.002	0.007	0.023	0.027	0.148	0.670
1998	0.003	0.010	0.033	0.039	0.215	0.973
1999	0.004	0.014	0.045	0.064	0.350	1.564
2000	0.006	0.022	0.072	0.114	0.627	2.790
2001	0.004	0.014	0.048	0.059	0.321	1.433
2002	0.004	0.015	0.052	0.075	0.406	1.819
2003	0.006	0.023	0.081	0.096	0.518	2.316
2004	0.004	0.015	0.052	0.042	0.225	1.028
2005	0.003	0.011	0.040	0.040	0.219	0.984
2006	0.004	0.014	0.048	0.035	0.191	0.857
2007	0.005	0.017	0.056	0.057	0.307	1.357
2008	0.009	0.034	0.110	0.073	0.391	1.711
2009	0.008	0.029	0.097	0.057	0.308	1.383
2010	0.005	0.019	0.066	0.074	0.401	1.775
2011	0.006	0.024	0.082	0.077	0.419	1.856
2012	0.003	0.012	0.042	0.048	0.262	1.149
2013	0.005	0.020	0.067	0.094	0.523	2.274
2014	0.004	0.017	0.056	0.064	0.353	1.528
2015	0.004	0.017	0.053	0.051	0.283	1.231
2016	0.005	0.021	0.066	0.079	0.440	1.916
2017	0.005	0.021	0.065	0.073	0.400	1.735
2018	0.004	0.017	0.056	0.048	0.265	1.154
2019	0.003	0.014	0.046	0.045	0.251	1.111
2020	0.004	0.017	0.057	0.052	0.286	1.277

Table 47. Sensitivity configurations included in the sensitivity analysis of the JABBA-Select model.

Name	Description
low M	Natural mortality prior distribution mean decreased from 0.1041 to 0.068
ll h	Steepness prior distribution using likelihood parameters; mean increased from 0.72 to 0.75 and CV decreased from 0.25 to 0.20
low h	Steepness prior distribution mean decreased from 0.72 to 0.62
MRIP sel	MRIP CPUE constant selectivity for largest sizes decreased from 0.25 to 0.10
SA adults	SA fleet constant selectivity for largest sizes increased from 0 to 0.06 for both selectivity periods (SA_1 and SA_2)
SA descend	SA fleet descending selectivity start shifted 100 mm to the left from 520 mm to 420 mm for both selectivity periods (SA_1 and SA_2)
MA_early sel	MA_early fleet ascending selectivity shifted to the right; 50% selectivity parameter increased from 620 mm to 686 mm and 95% selectivity parameter increased from 740 mm to 808 mm
uni dep	Start year depletion prior distribution changed from beta distribution with mean 0.70 and CV 0.17 to uniform distribution over range 0 to 1 (beta mean=0.5, beta CV=0.577)
MRIP q	Additional MRIP CPUE catchability coefficient estimated for years 2016-2020

12 FIGURES

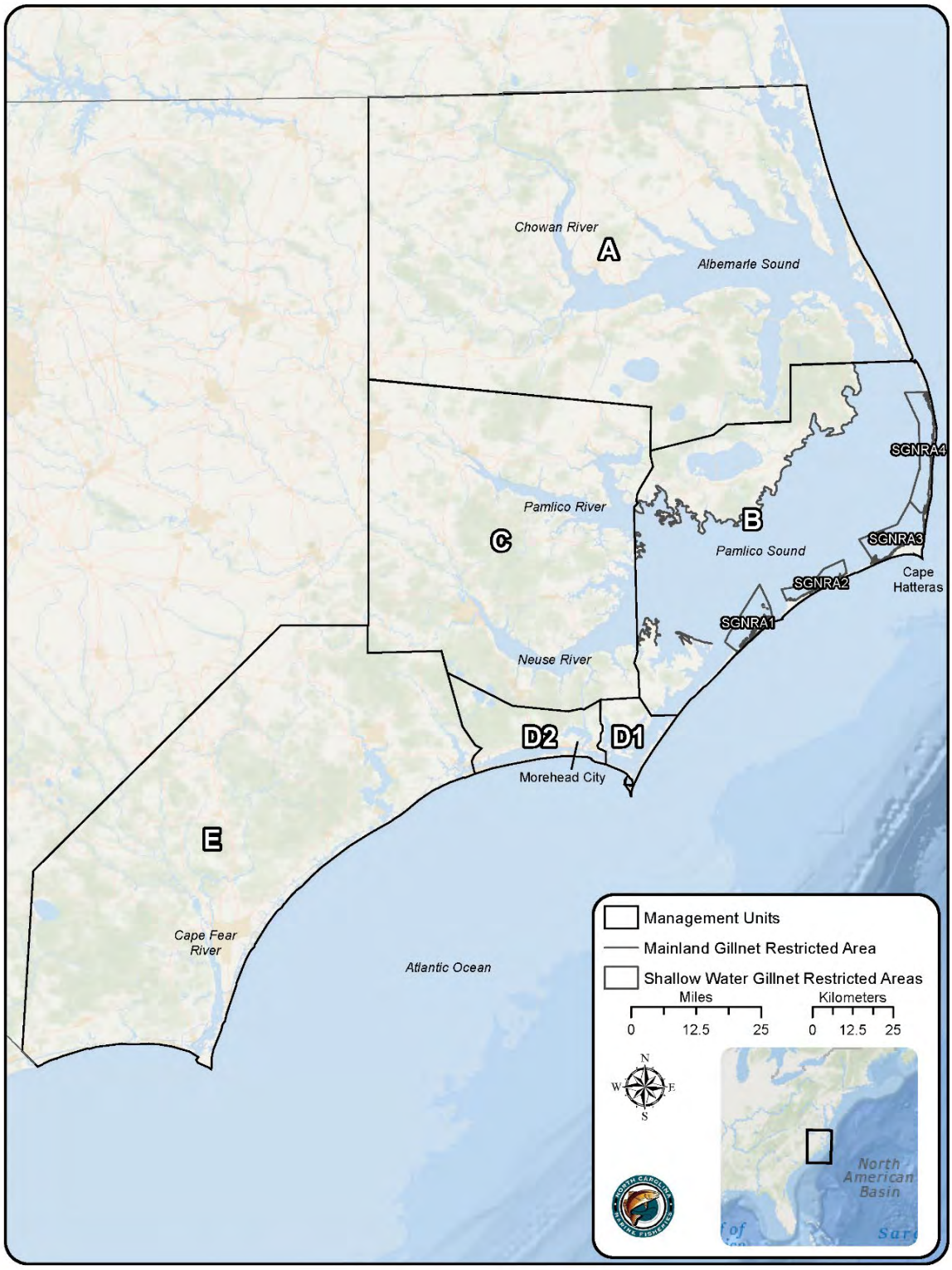

Figure 1. Incidental Take Permit Sea Turtle Management Areas.

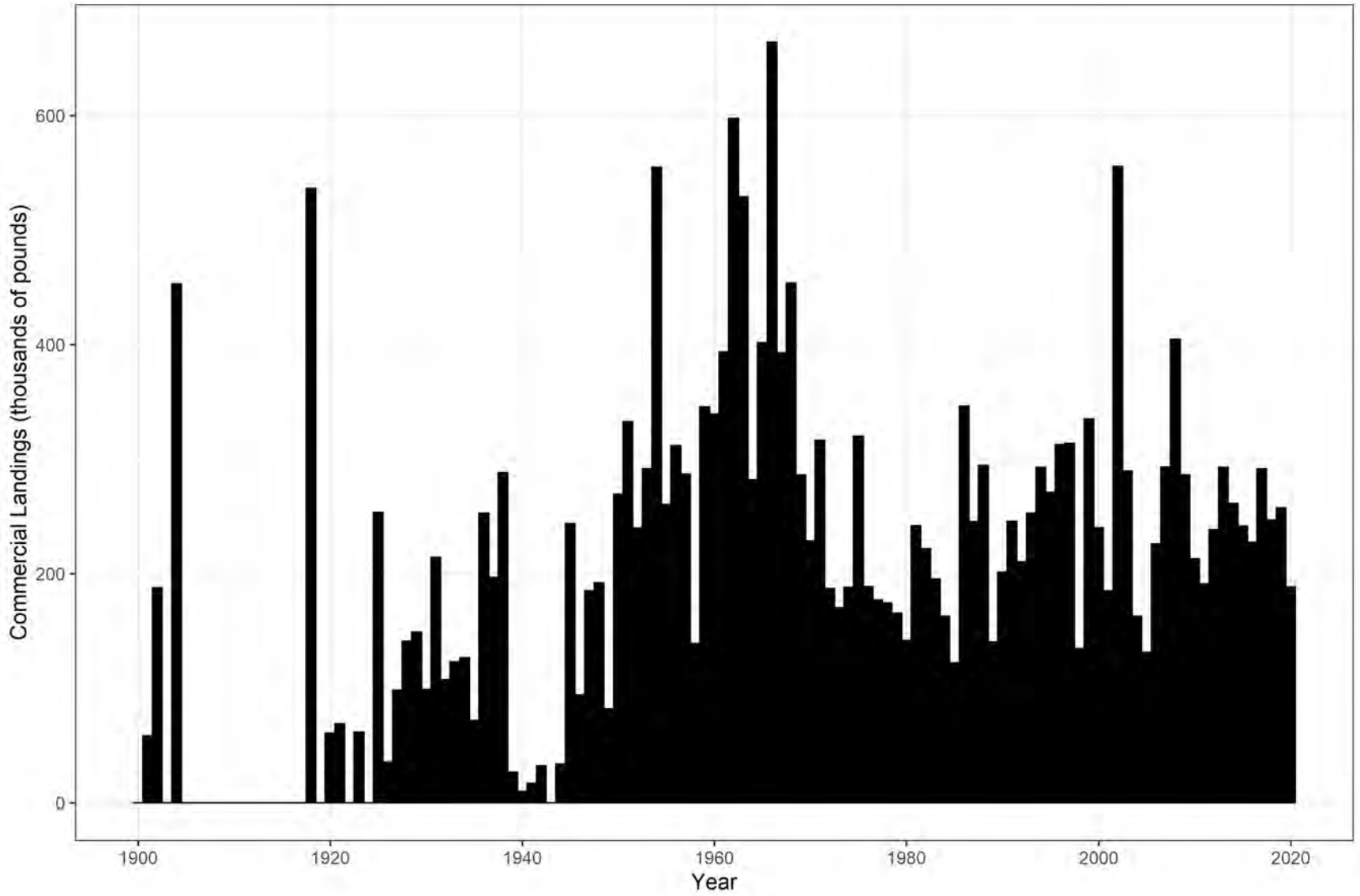

Figure 2. Total commercial landings of black drum along the U.S. Atlantic coast from 1900-2020.

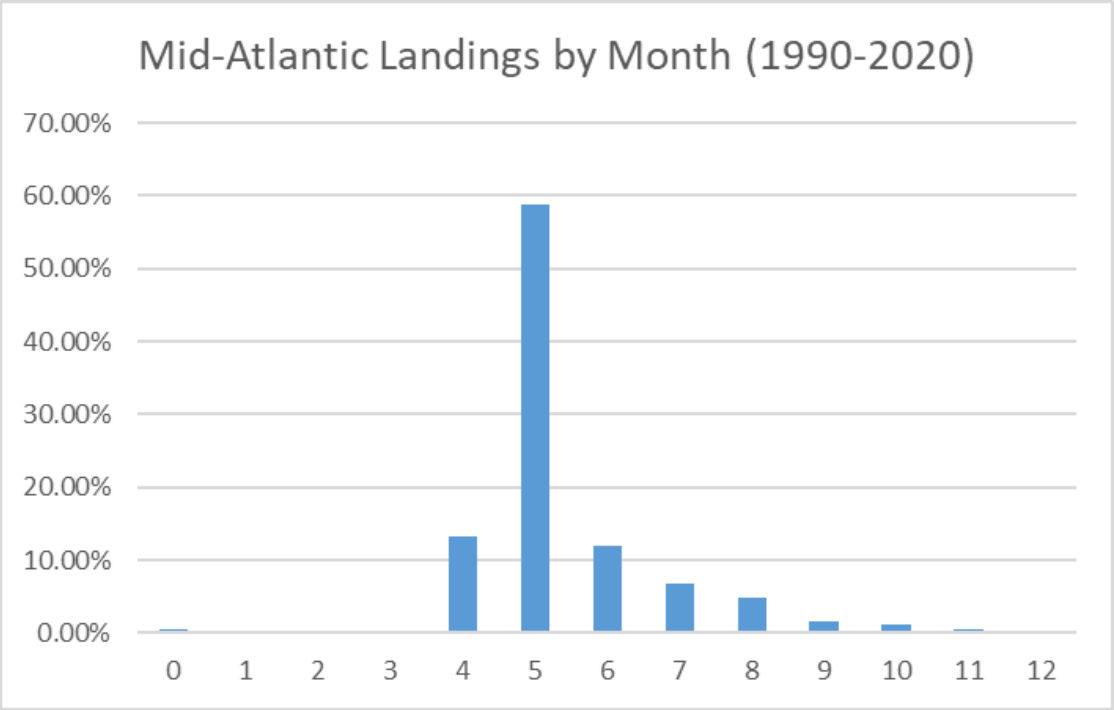

Figure 3. Percentage of Mid-Atlantic commercial landings of black drum from 1990-2020 by month.

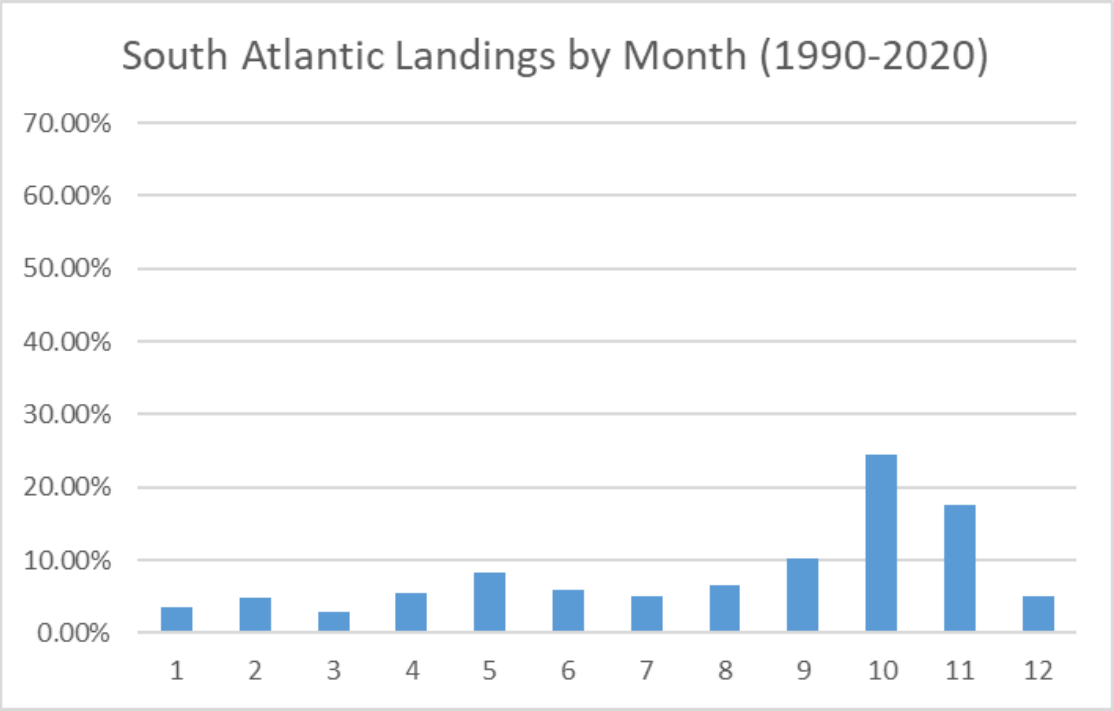

Figure 4. Percentage of South Atlantic commercial landings of black drum from 1990-2020 by month.

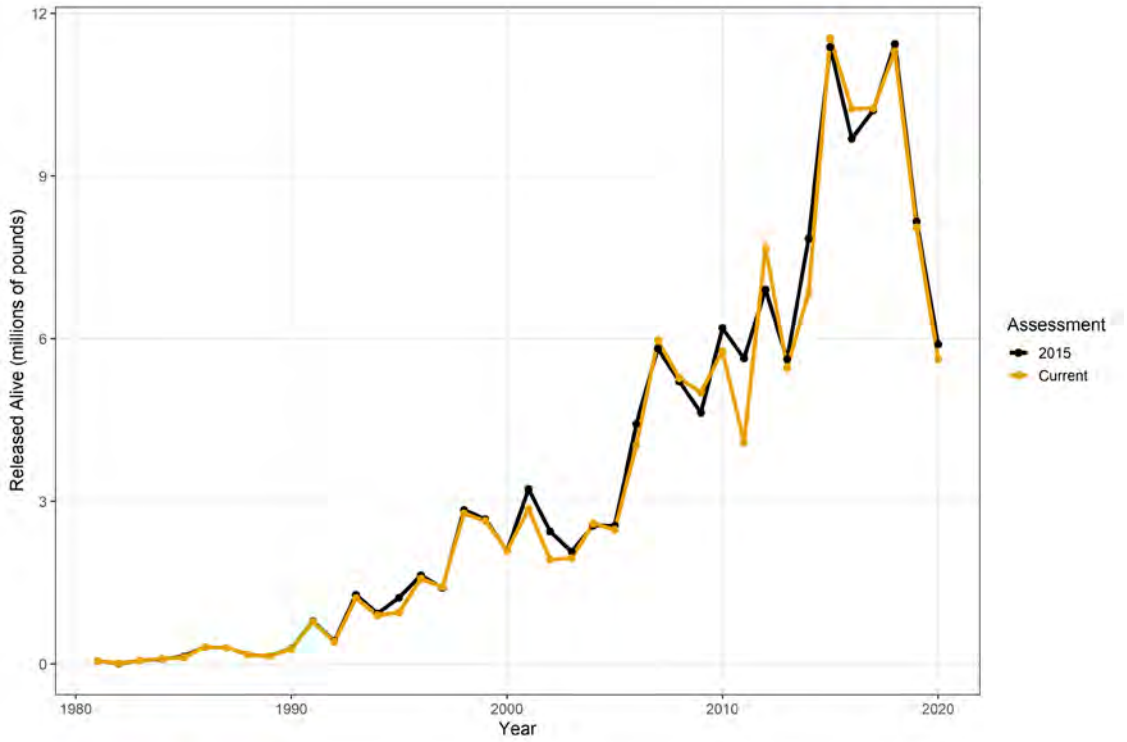

Figure 5. Weight estimates of recreational black drum releases compared between assessments.

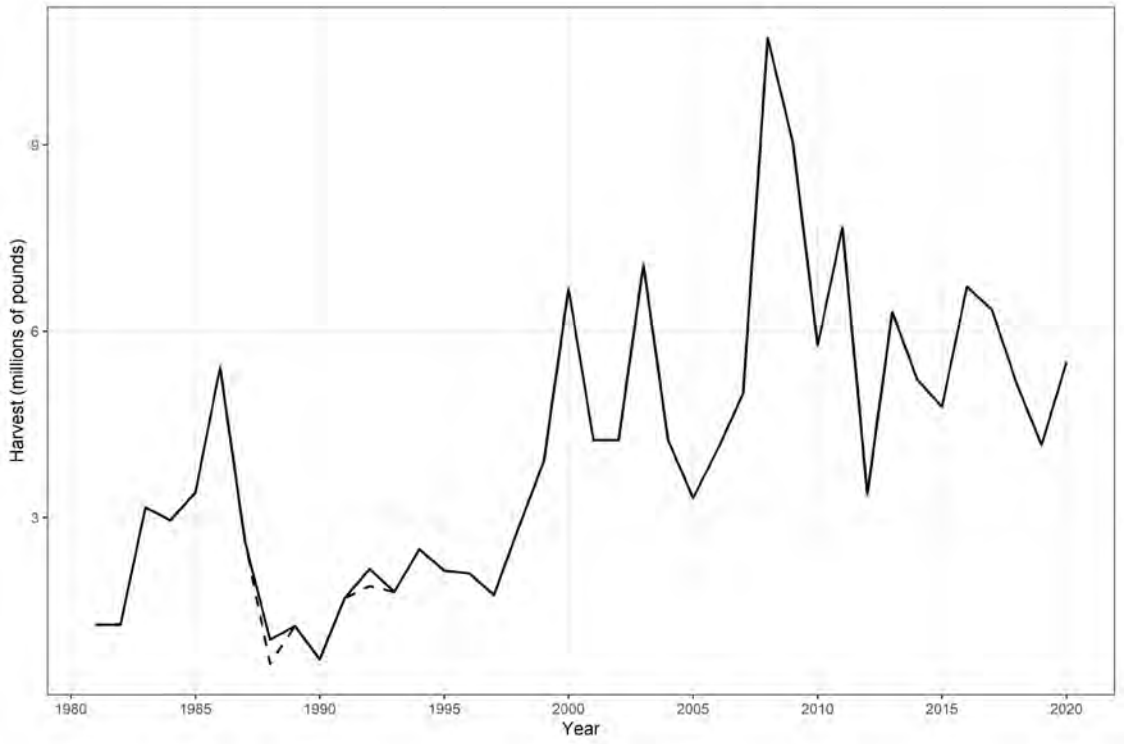

Figure 6. Black drum recreational harvest estimates with missing weight-based harvest estimates from MRIP (dashed line) and proxy harvest estimates added (solid line).

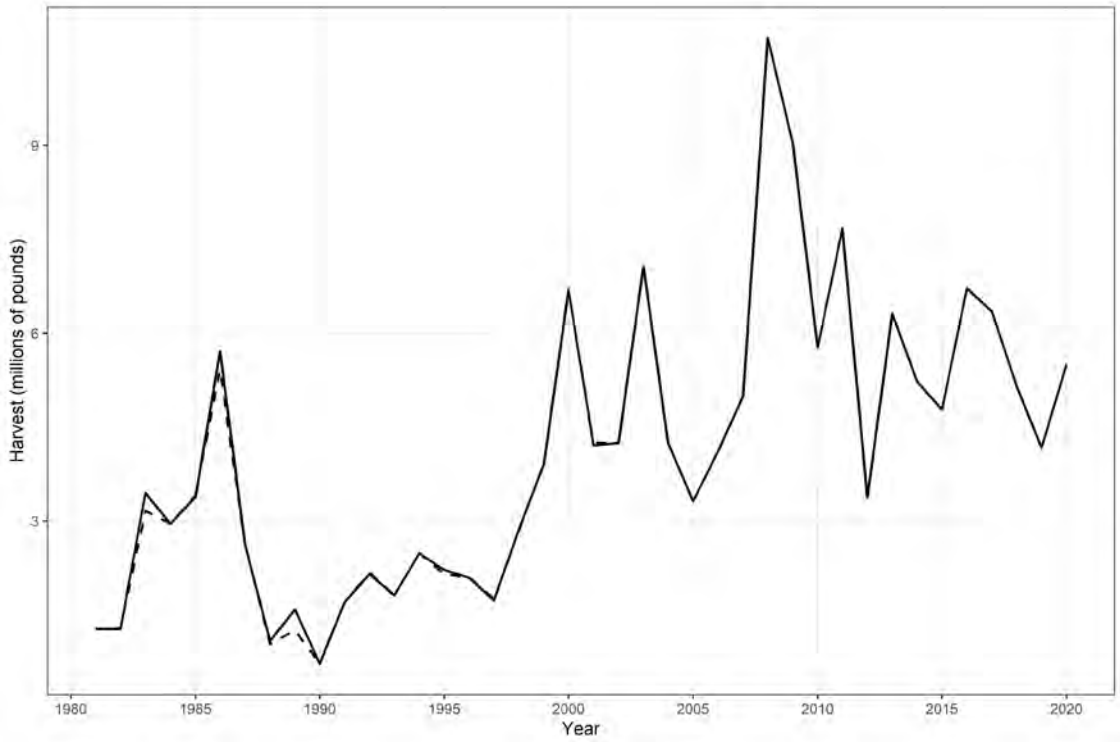

Figure 7. Back drum harvest estimated by MRIP (dashed line) compared to estimates calibrated to FHS effort (solid line).

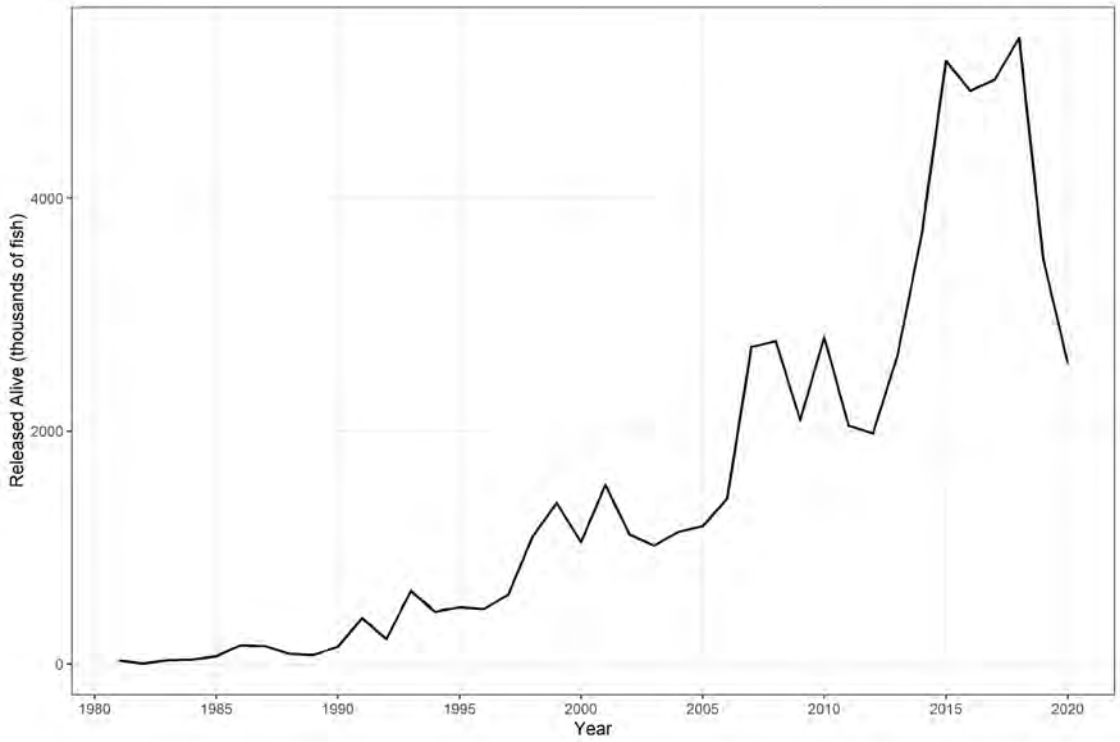

Figure 8. Back drum releases estimated by MRIP (dashed line obscured by solid line due to similarities of estimates) compared to estimates calibrated to FHS effort (solid line).

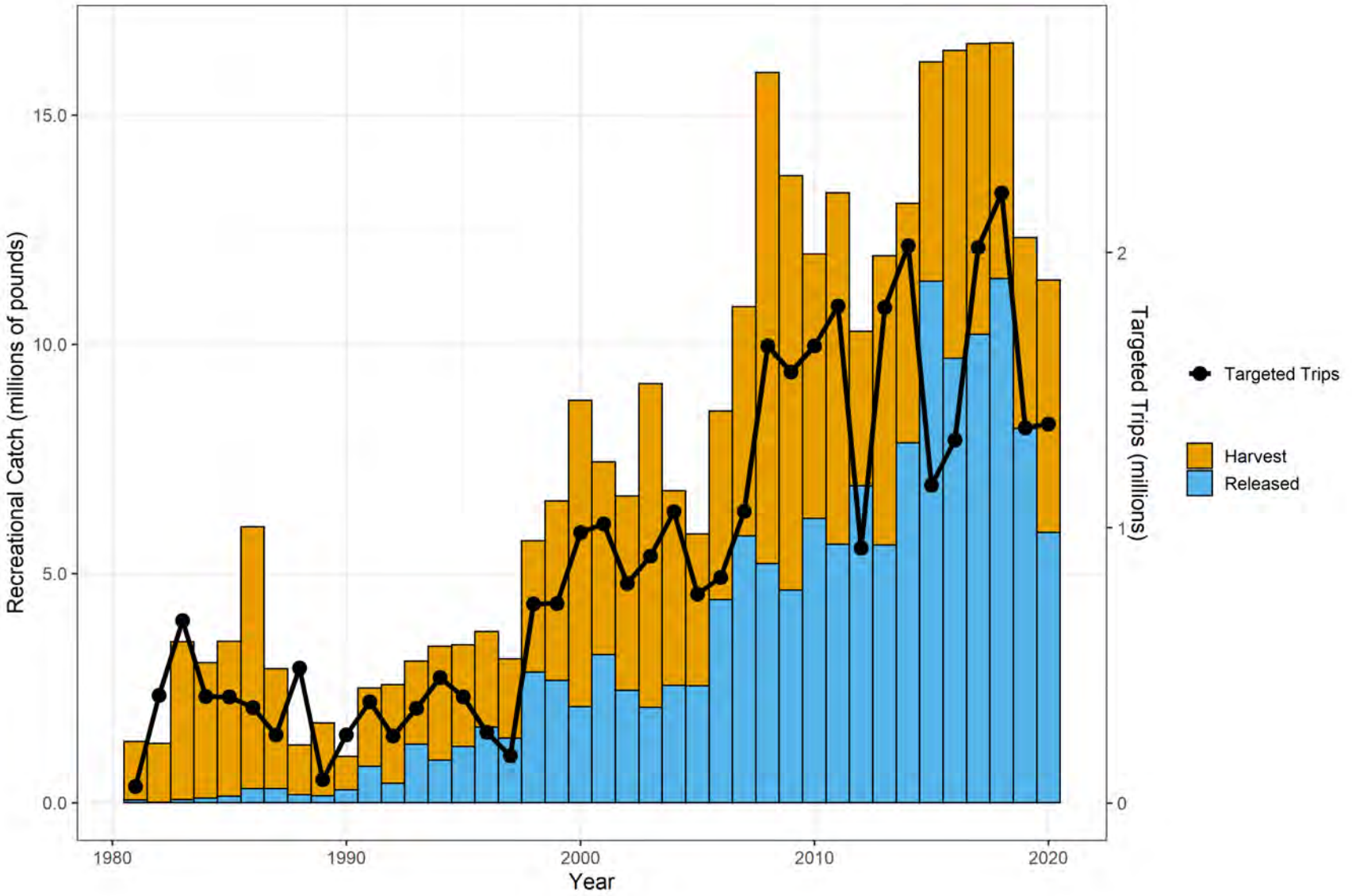

Figure 9. MRIP estimates of coastwide recreational fishing trips directed at black drum and total catch.

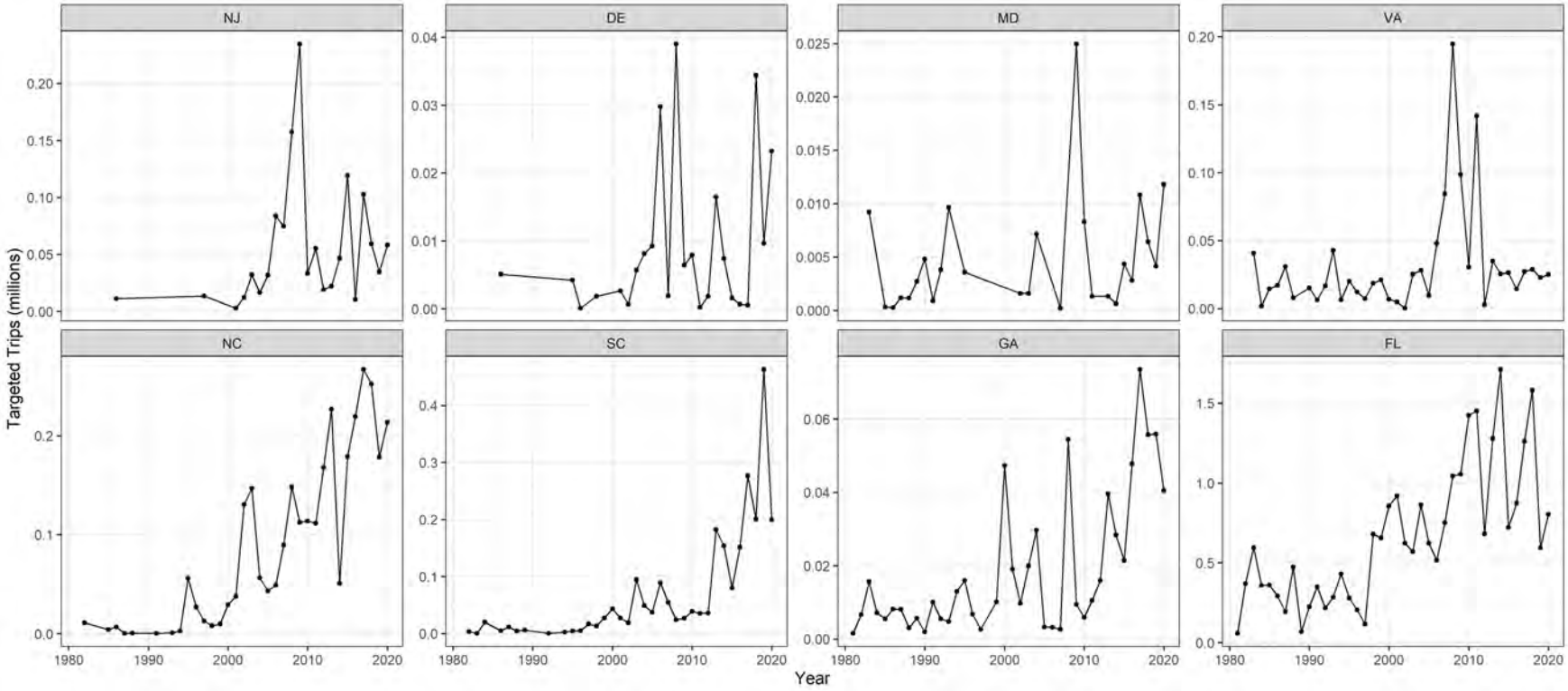

Figure 10. MRIP estimates of state-specific recreational fishing trips directed at black drum.

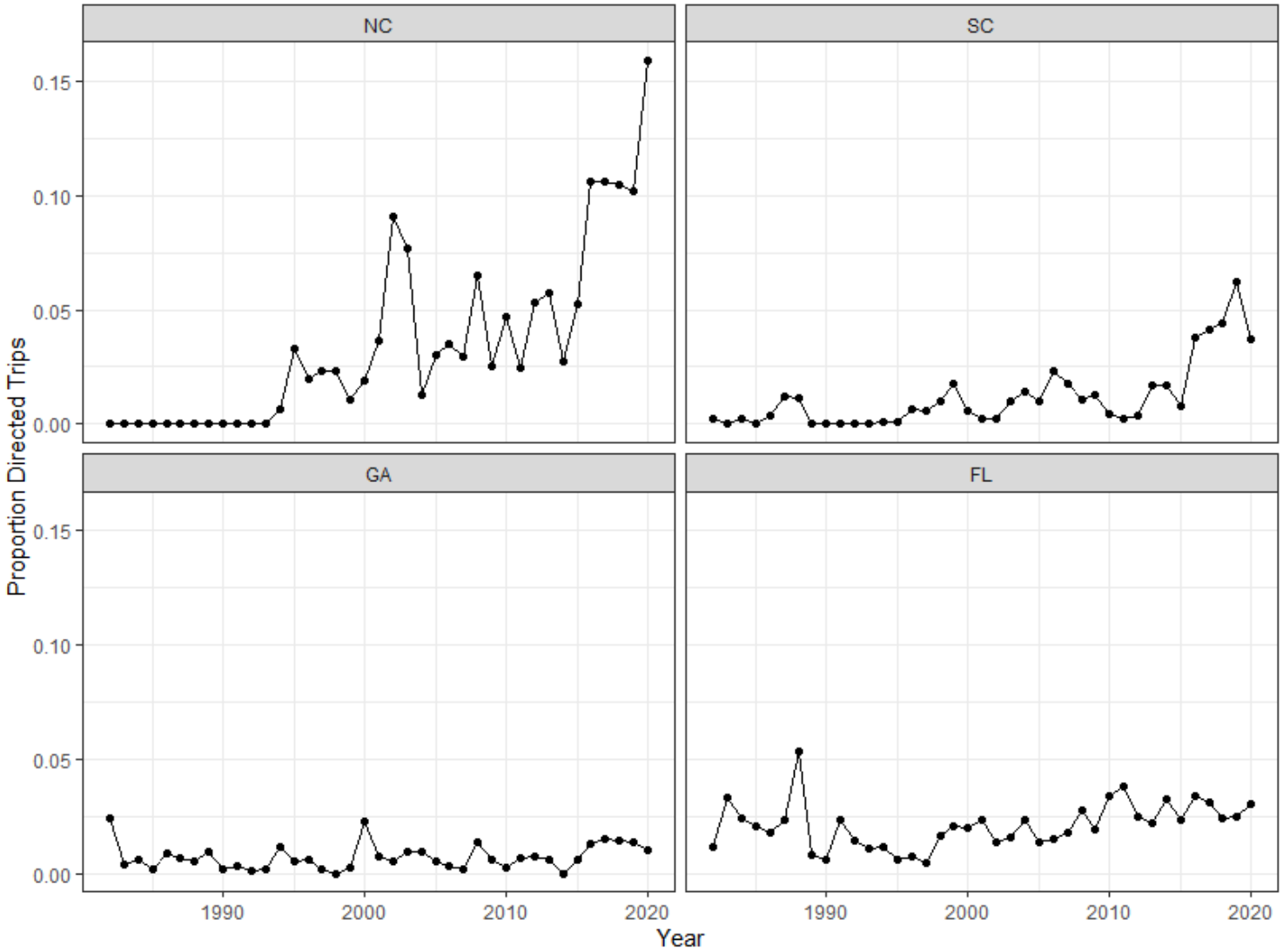

Figure 11. Proportion of South Atlantic APAIS intercepts retained in the cluster analysis data set for MRIP CPUE that identified black drum as a primary or secondary target species of the trip.

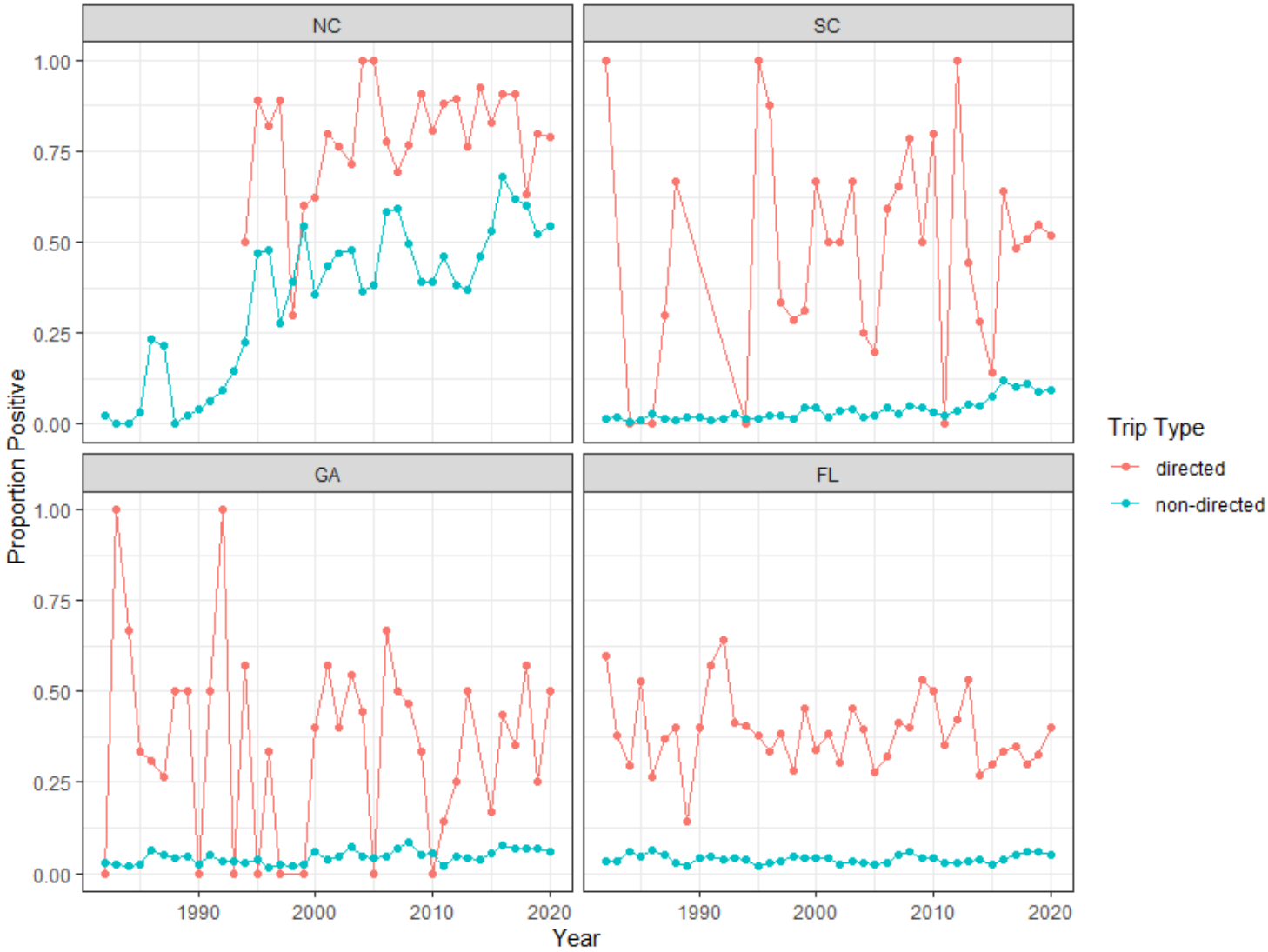

Figure 12. Proportion of South Atlantic APAIS intercepts retained in the cluster analysis data set for MRIP CPUE that caught black drum for trips that confirmed black drum as a target species and trips that did not confirm black drum as a target species.

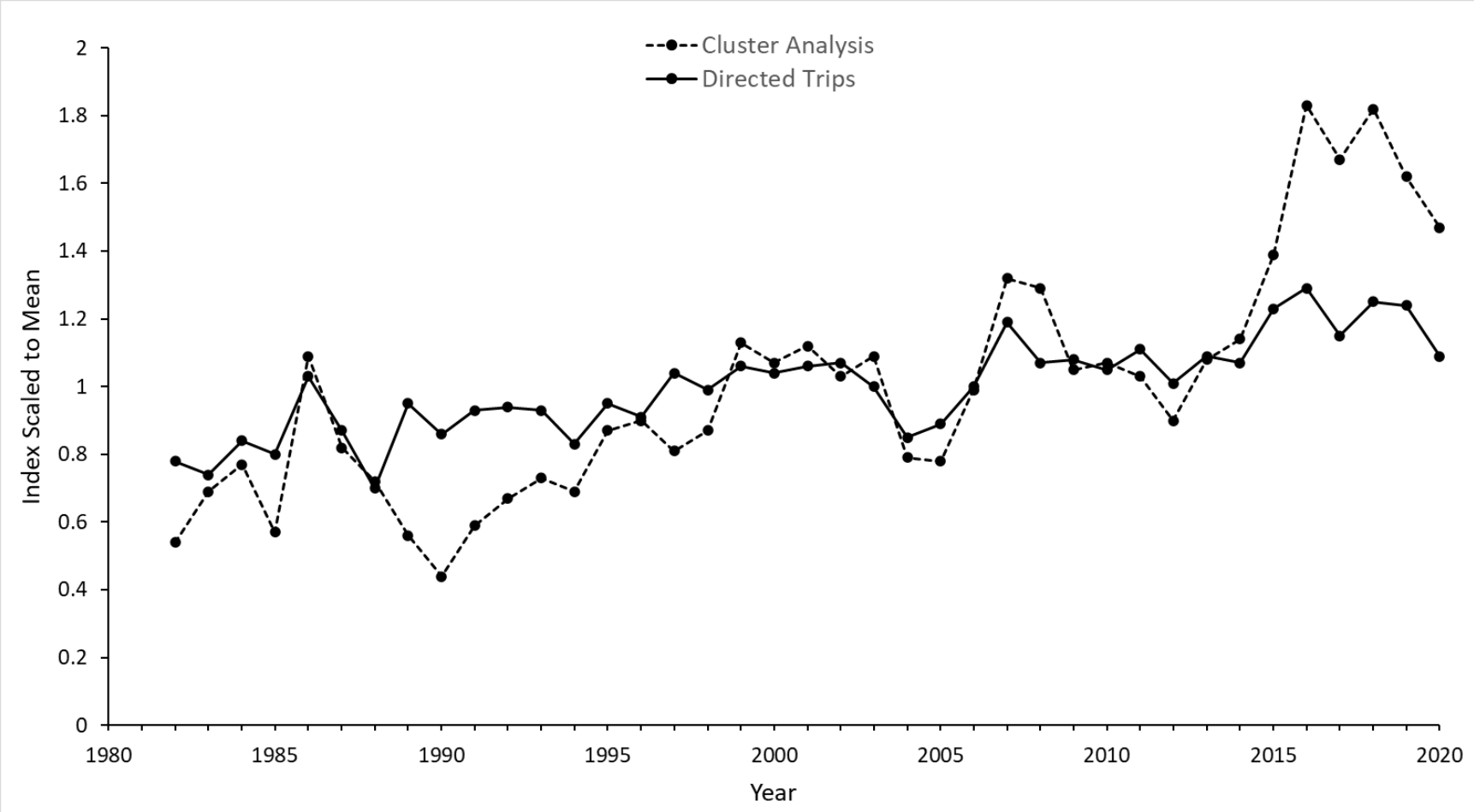

Figure 13. Comparison of MRIP CPUE estimated from the cluster analysis data set and directed trips data set.

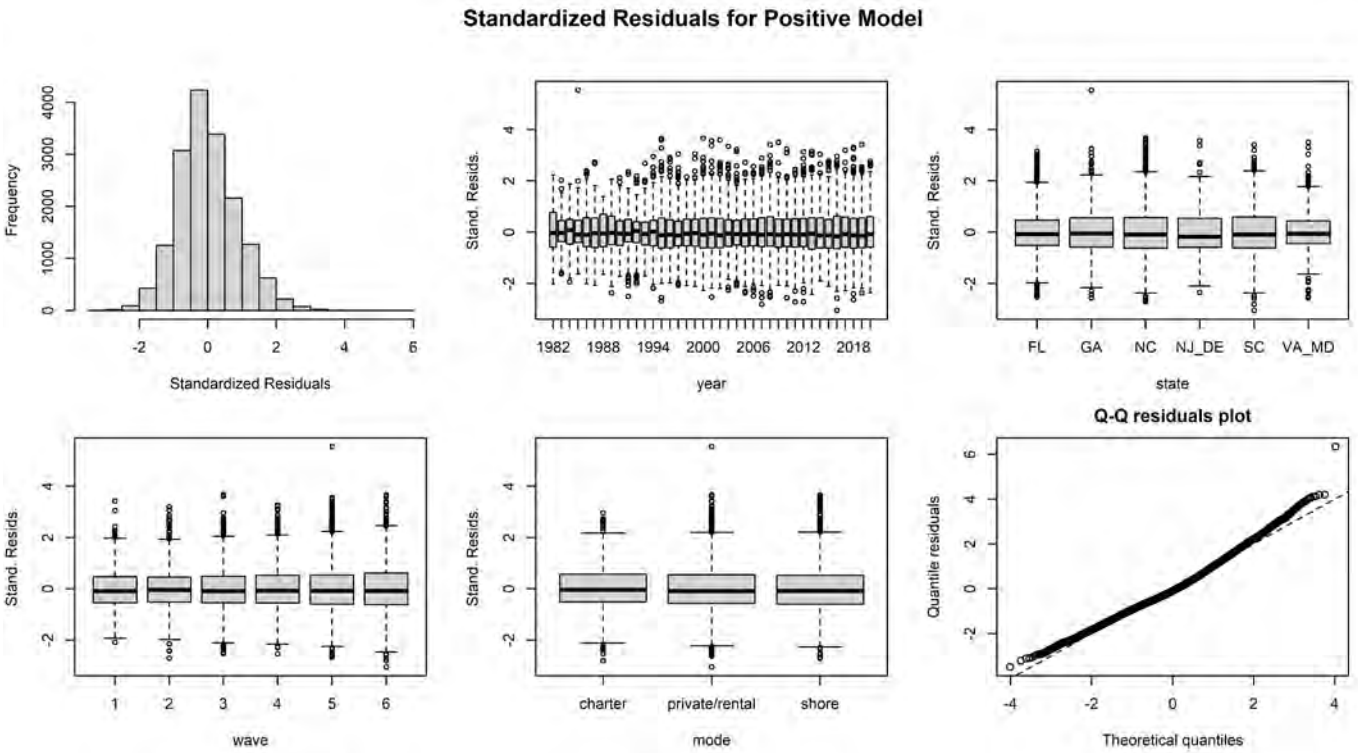

Figure 14. Residual plots for the positive observation GLM used to estimate MRIP CPUE.

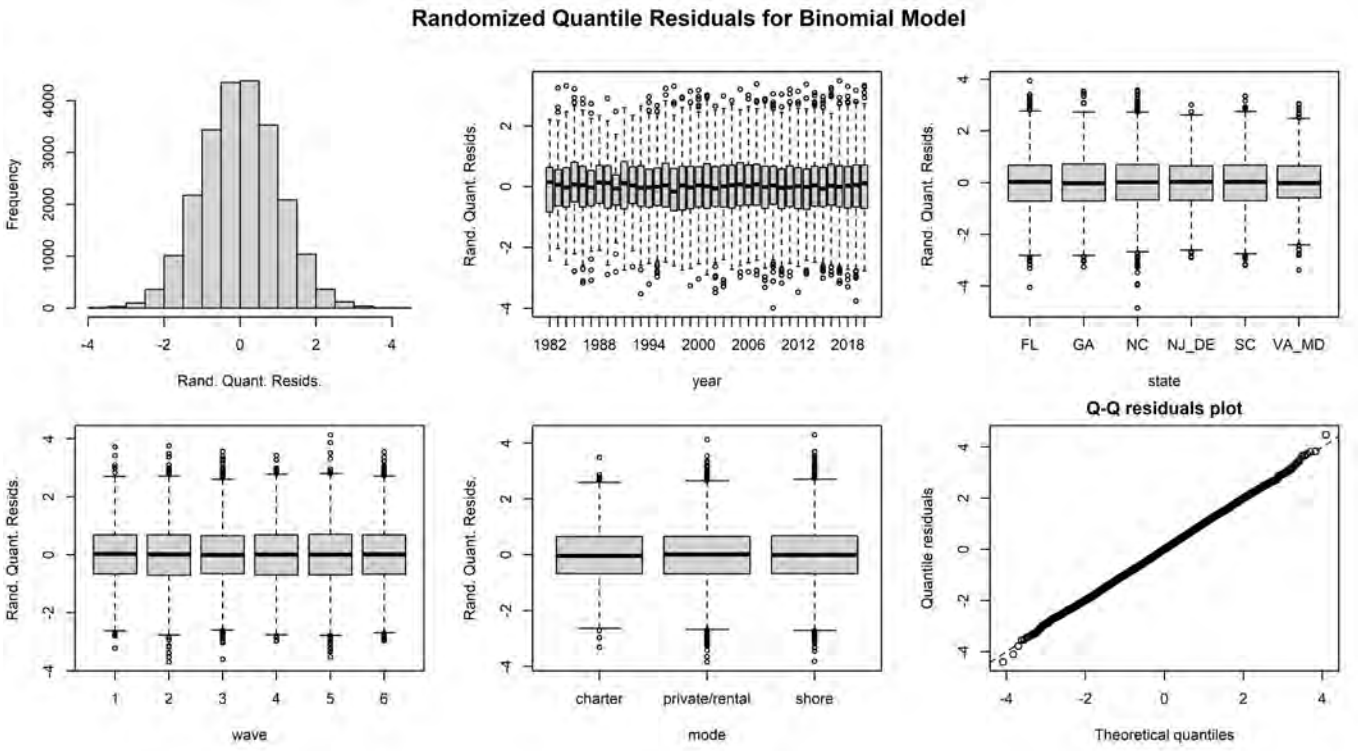

Figure 15. Residual plots for the proportion positive GLMN used to estimate MRIP CPUE.

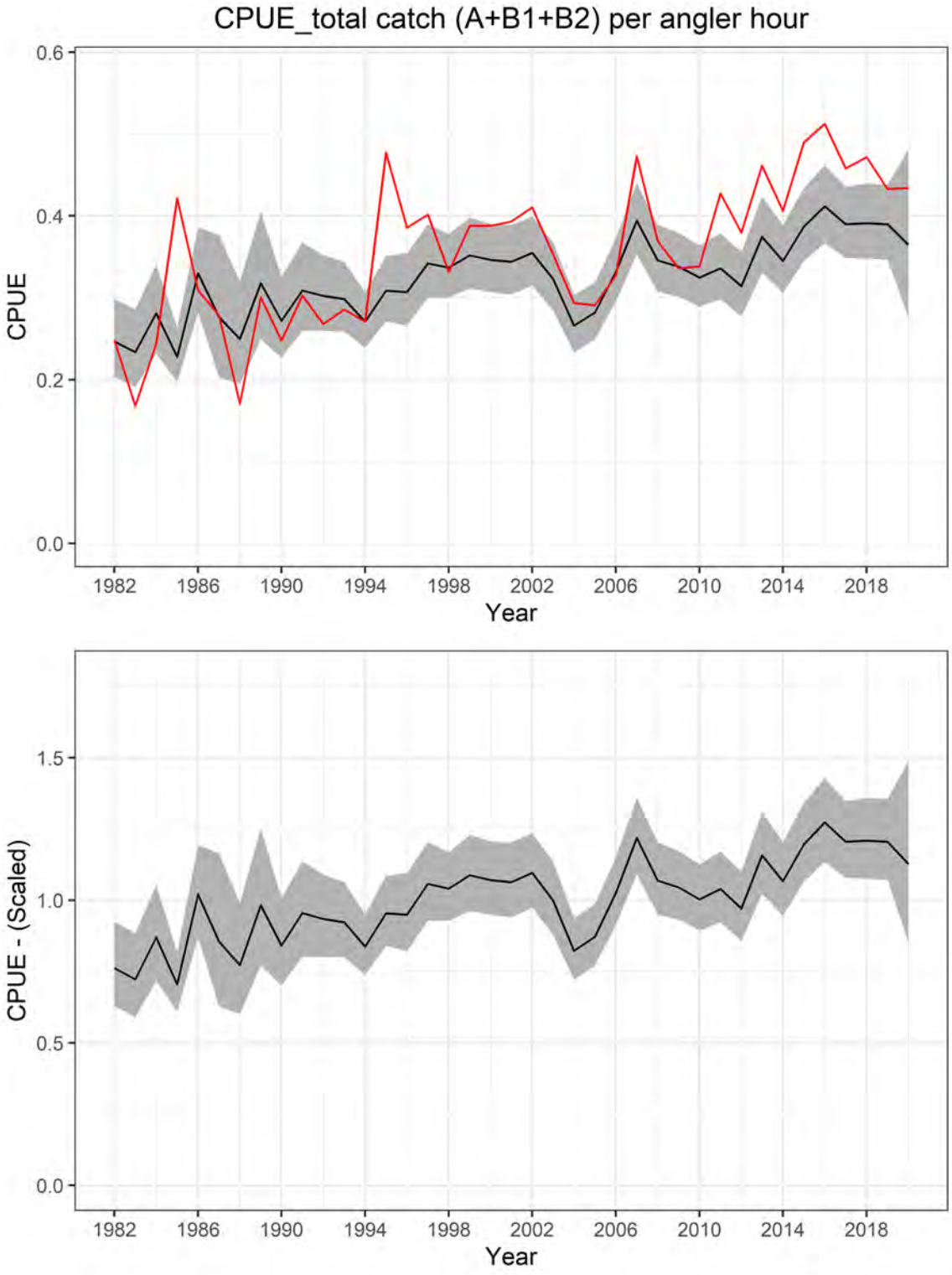

Figure 16. Recreational CPUE estimated from MRIP APAIS data selected with the directed trips method. The upper panel shows the nominal (red line) and standardized (black line) indices on their original scale and the lower panel shows the standardized index scaled to the time series mean. Shaded regions are 95% confidence intervals of the standardized index.

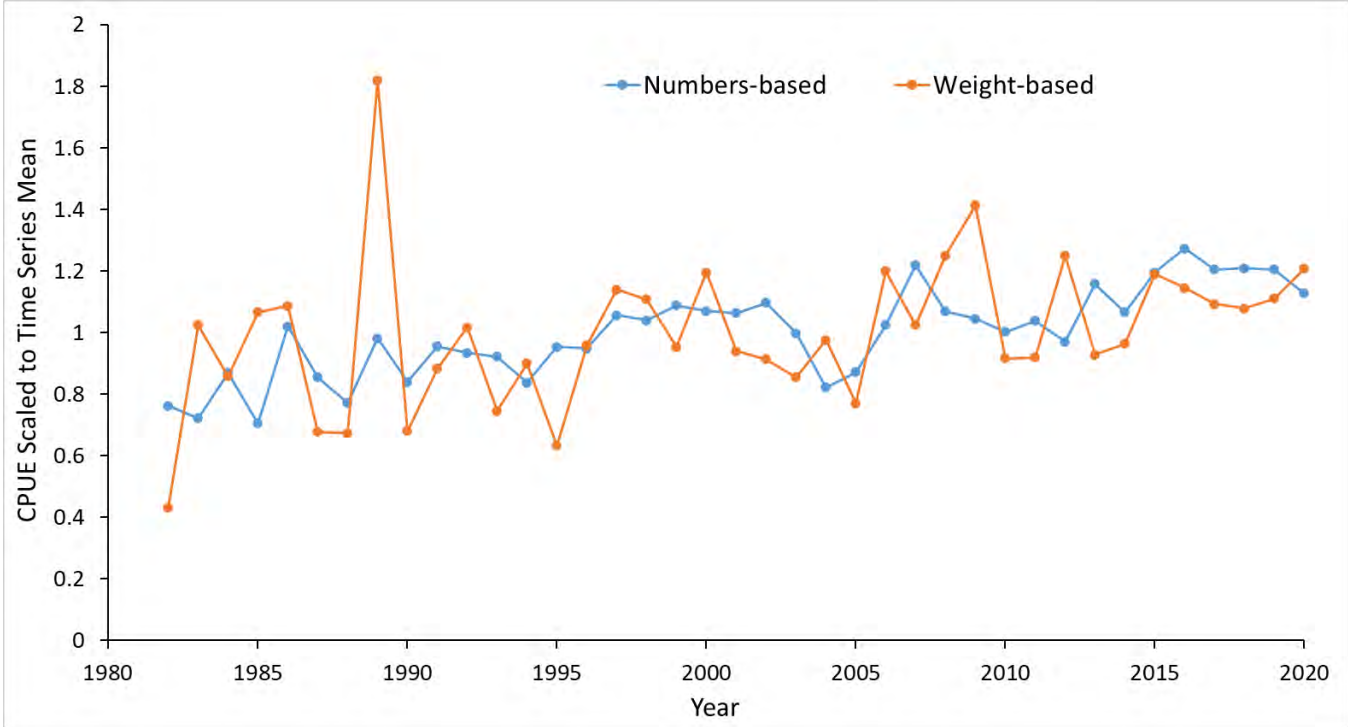

Figure 17. Comparison of numbers-based and weight-based recreational CPUE estimated from MRIP APAIS data selected with the directed trips method.

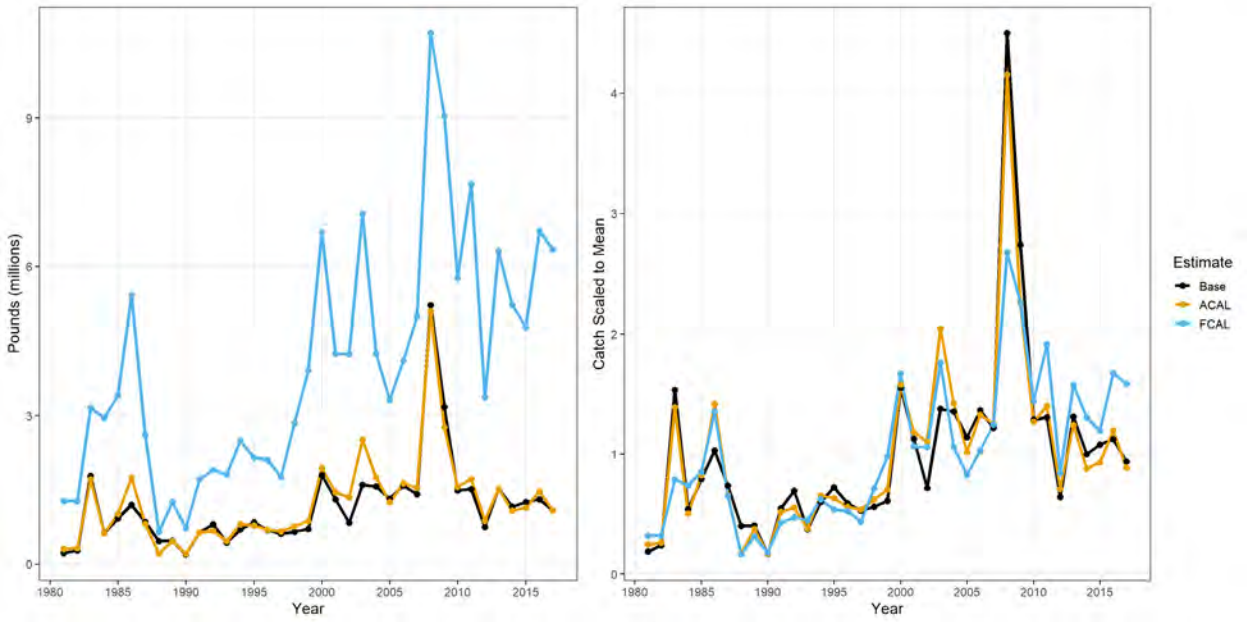

Figure 18. MRIP recreational harvest estimates of black drum before survey methodology change calibrations (Base), following calibration for changes to the APAIS (ACAL), and final estimates following calibrations for both changes to the APAIS and effort survey methodology (FCAL). Estimates on the right are divided by their time series mean to show differences in trends among estimates.

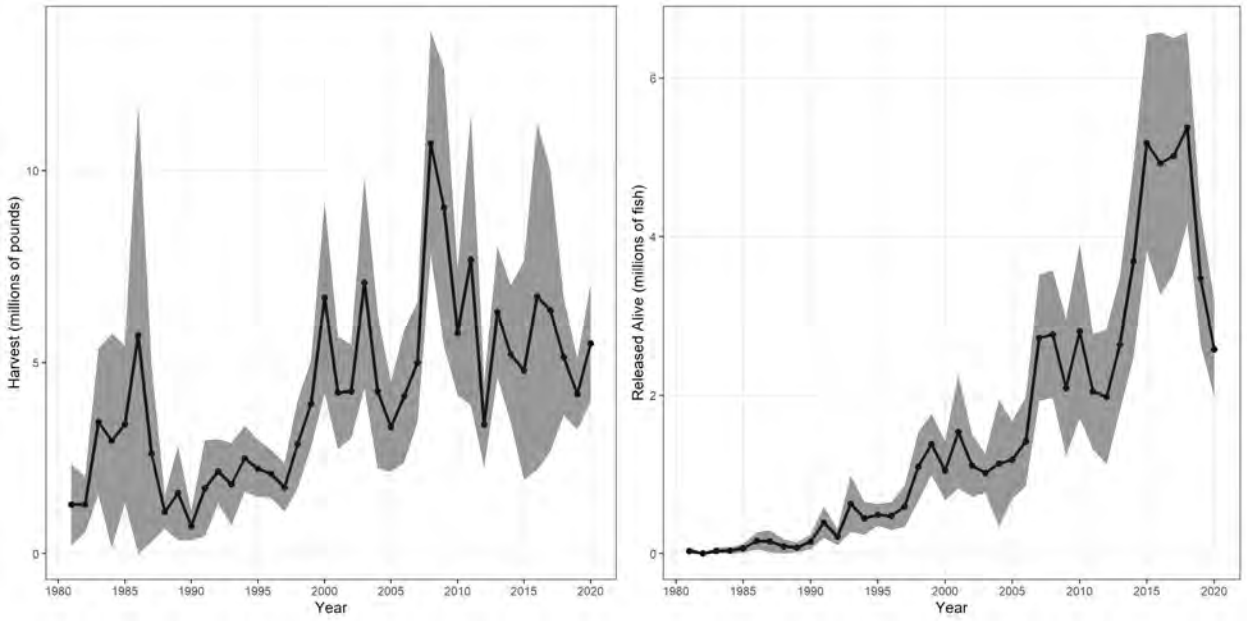

Figure 19. MRIP recreational catch estimates of black drum with 95% confidence intervals.

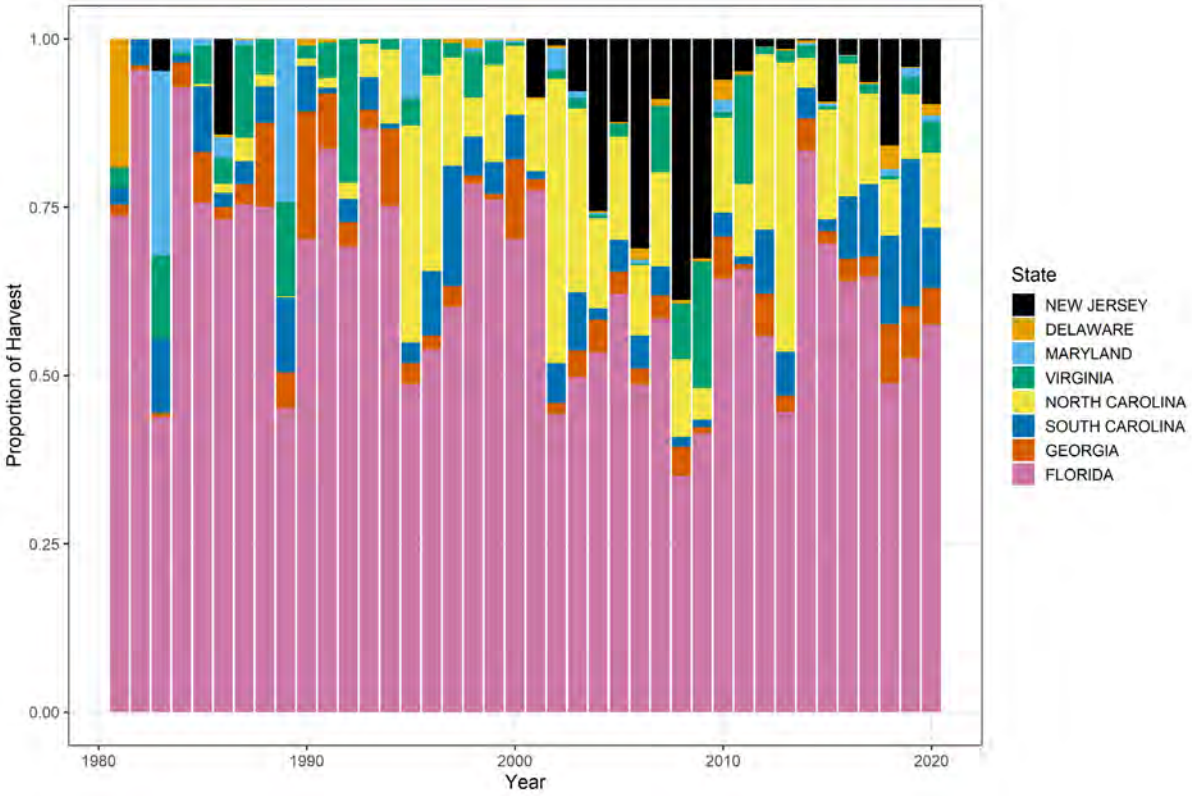

Figure 20. State proportional recreational harvest of black drum.

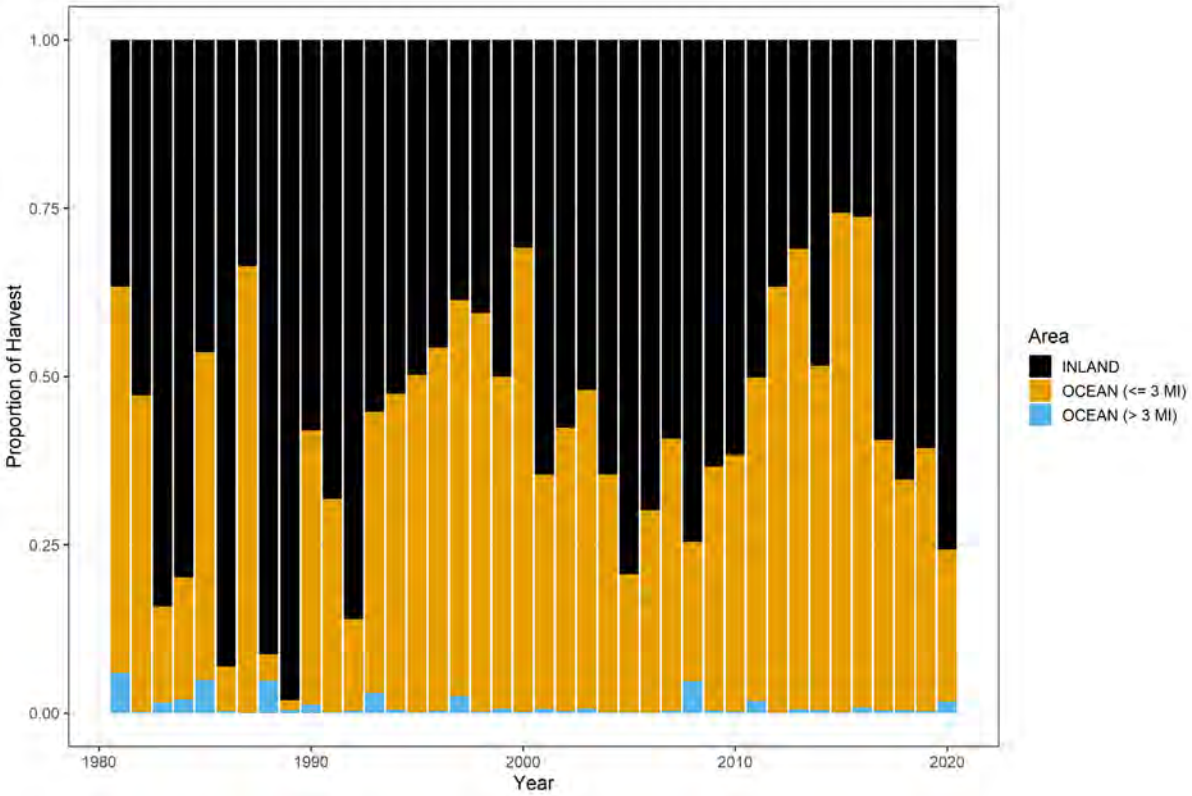

Figure 21. MRIP area proportional recreational harvest of black drum.

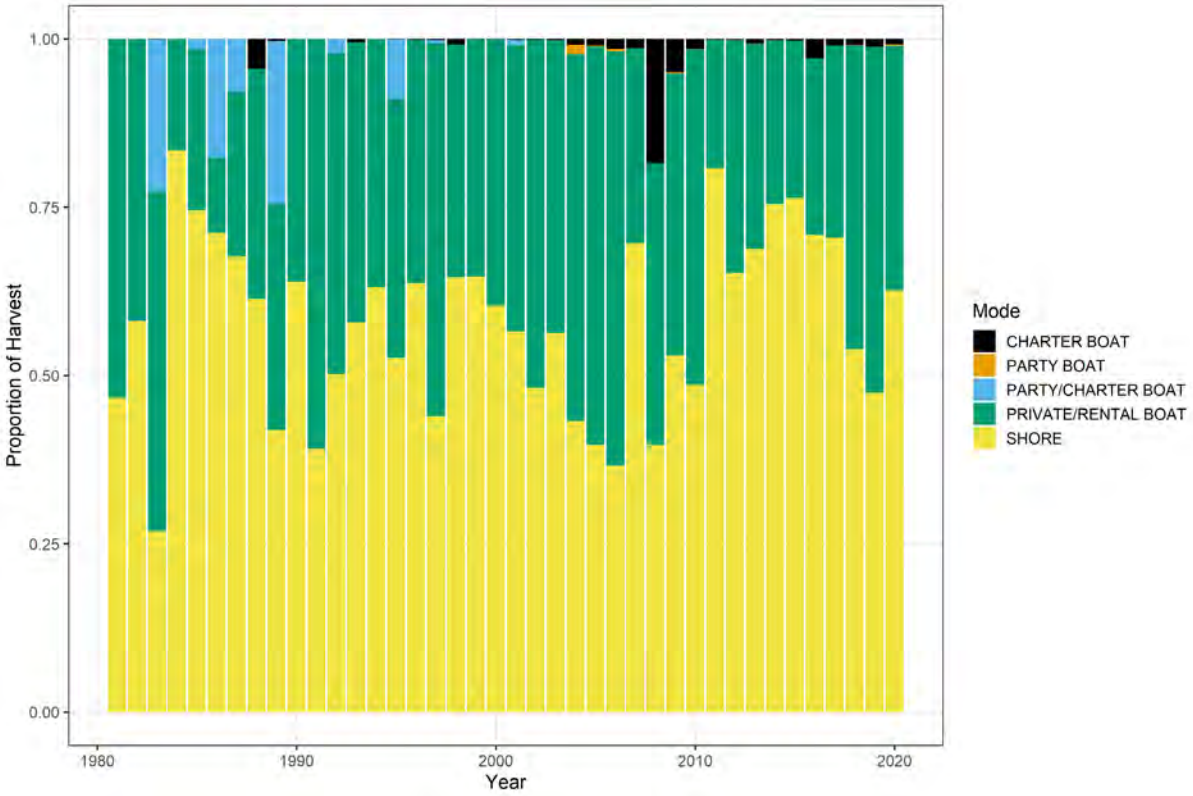

Figure 22. MRIP mode proportional recreational harvest of black drum.

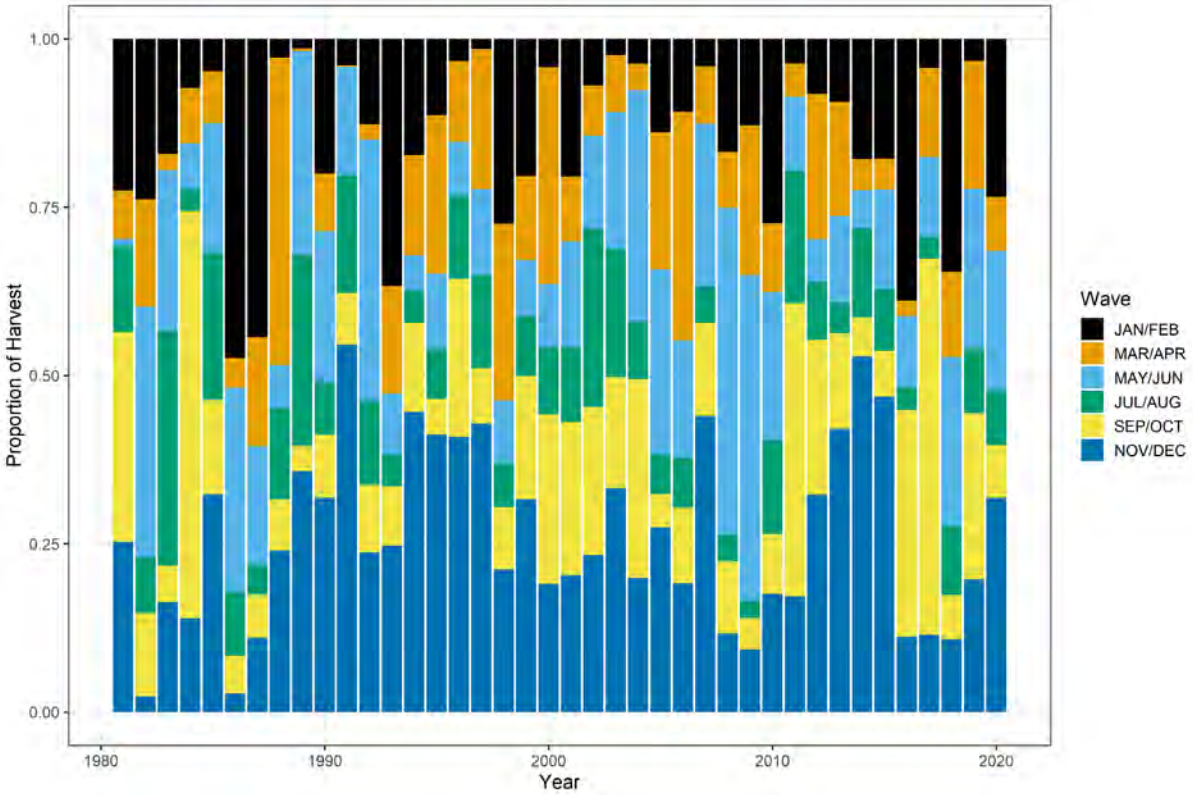

Figure 23. MRIP wave proportional recreational harvest of black drum.

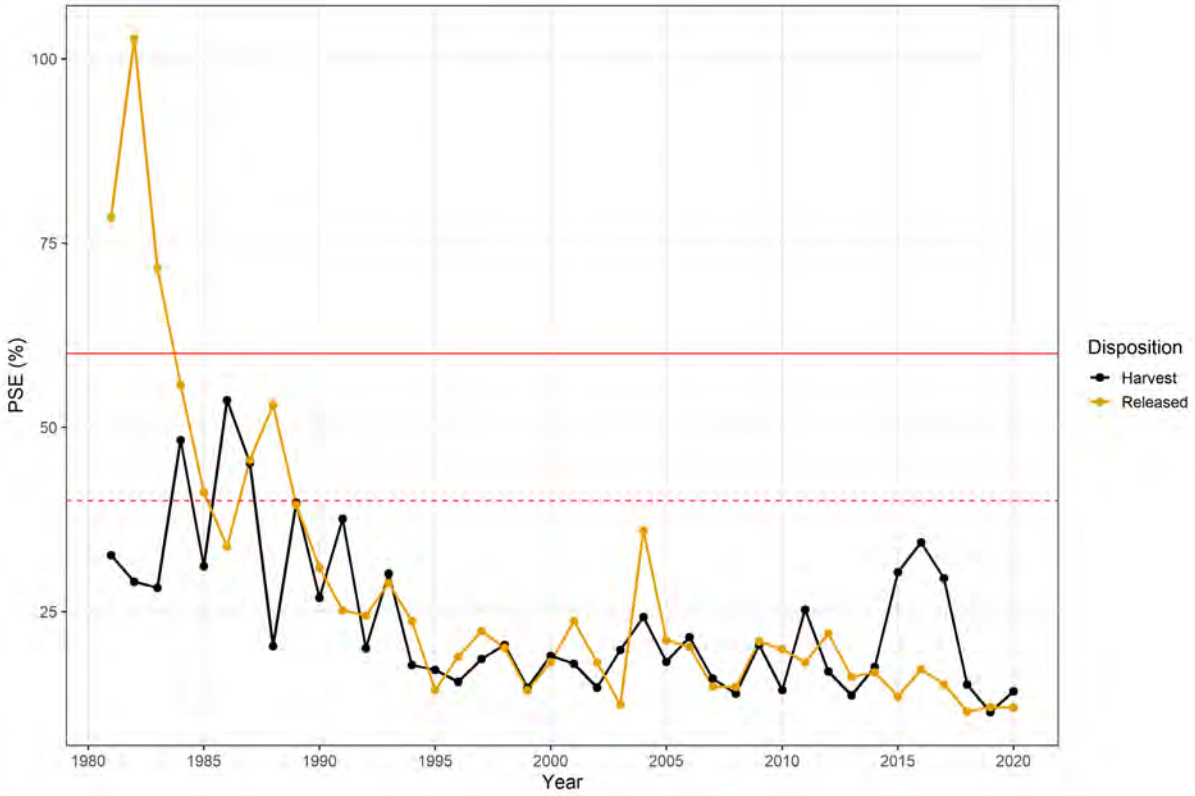

Figure 24. MRIP proportional standard errors (PSEs) for recreational catch estimates. The dashed red line indicates a PSE of 40% and the solid red line indicates a PSE of 60%.

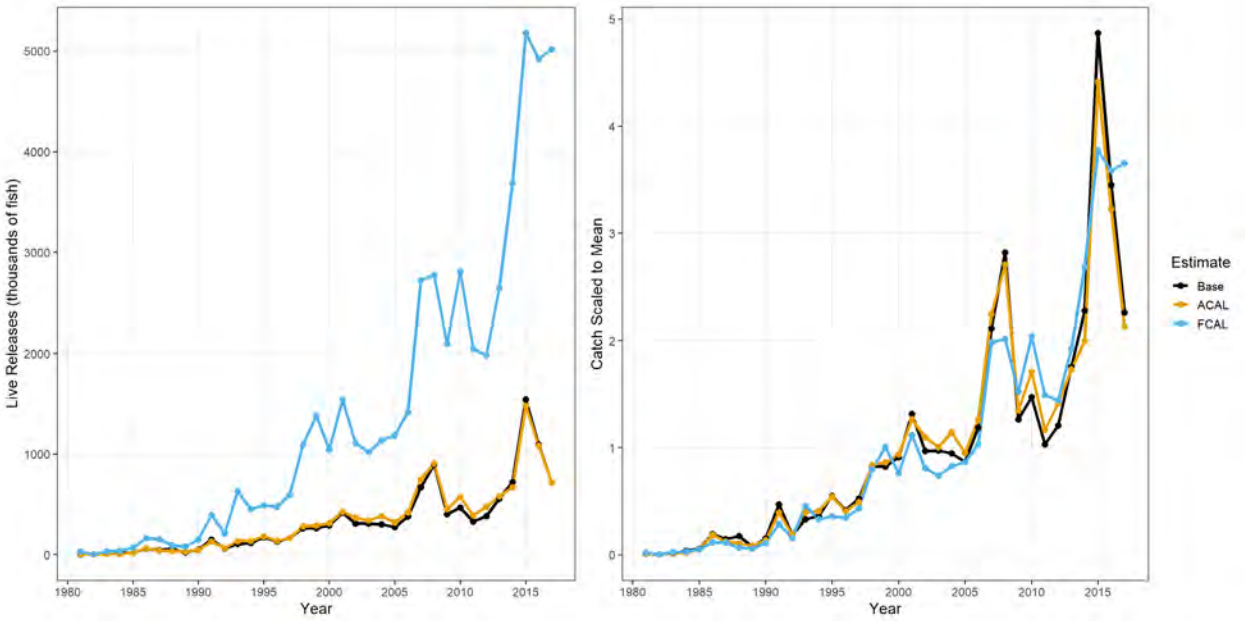

Figure 25. MRIP recreational release estimates of black drum before survey methodology change calibrations (Base), following calibration for changes to the APAIS (ACAL), and final estimates following calibrations for both changes to the APAIS and effort survey methodology (FCAL). Estimates on the right are divided by their time series mean to show differences in trends among estimates.

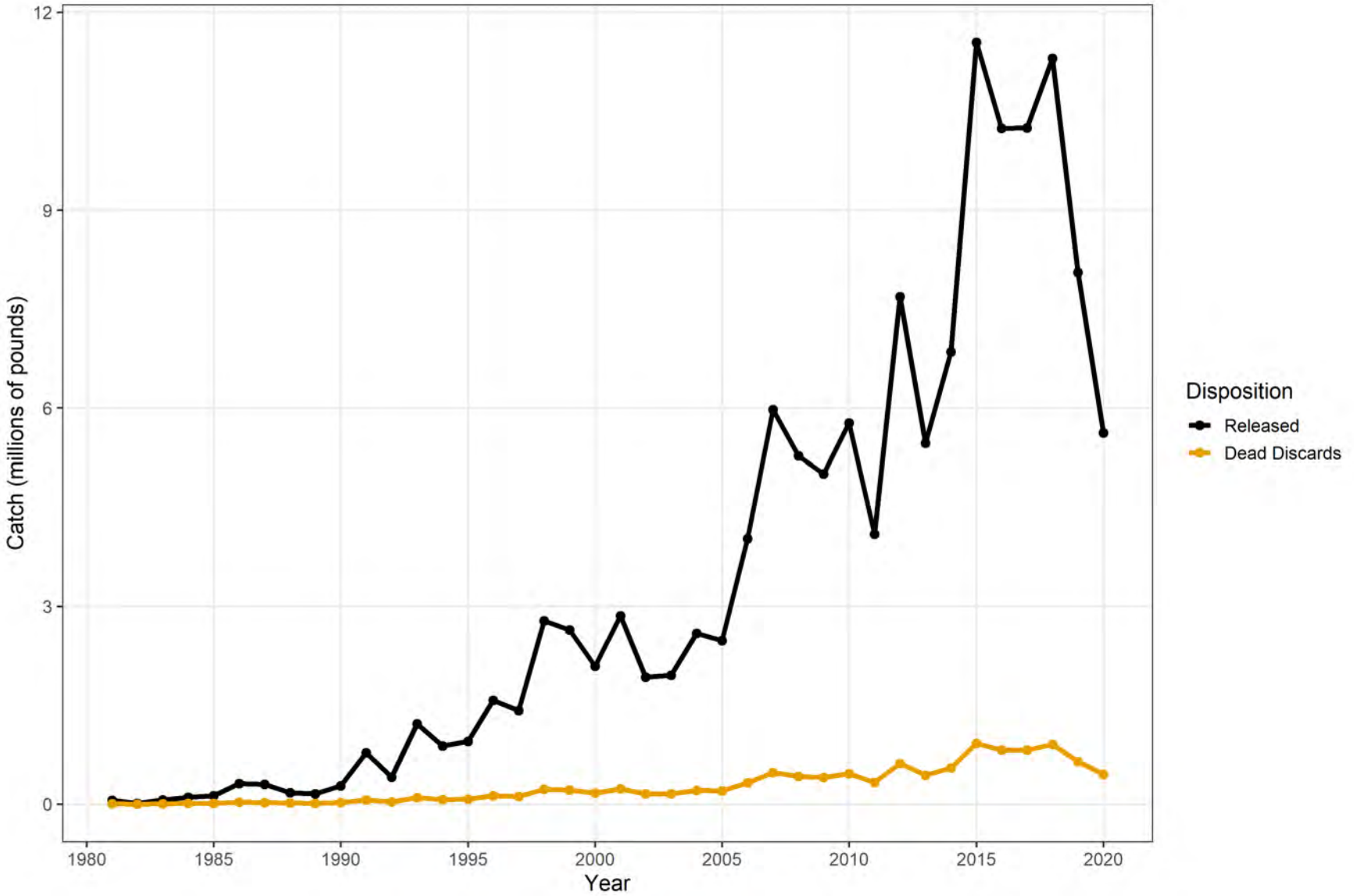

Figure 26. Black drum recreational releases and dead discards estimated in pounds from MRIP released alive estimates in numbers.

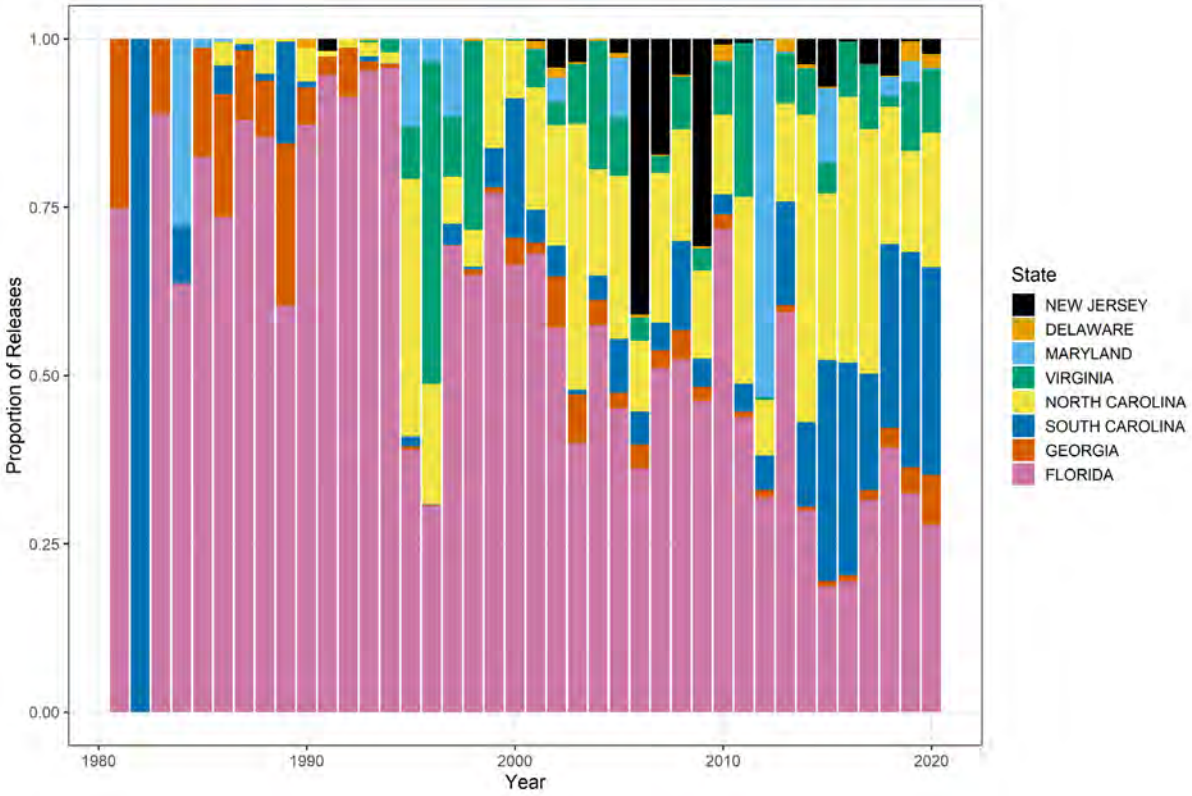

Figure 27. State proportional recreational releases of black drum.

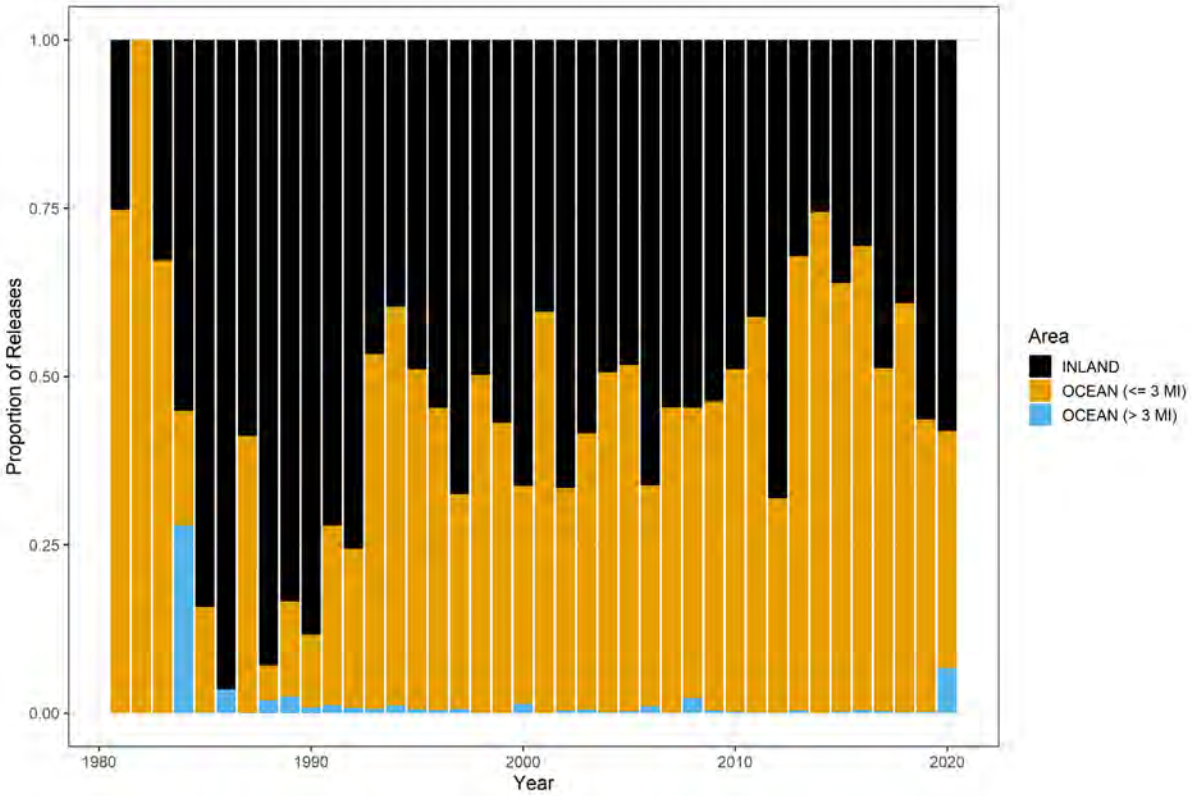

Figure 28. MRIP area proportional recreational releases of black drum.

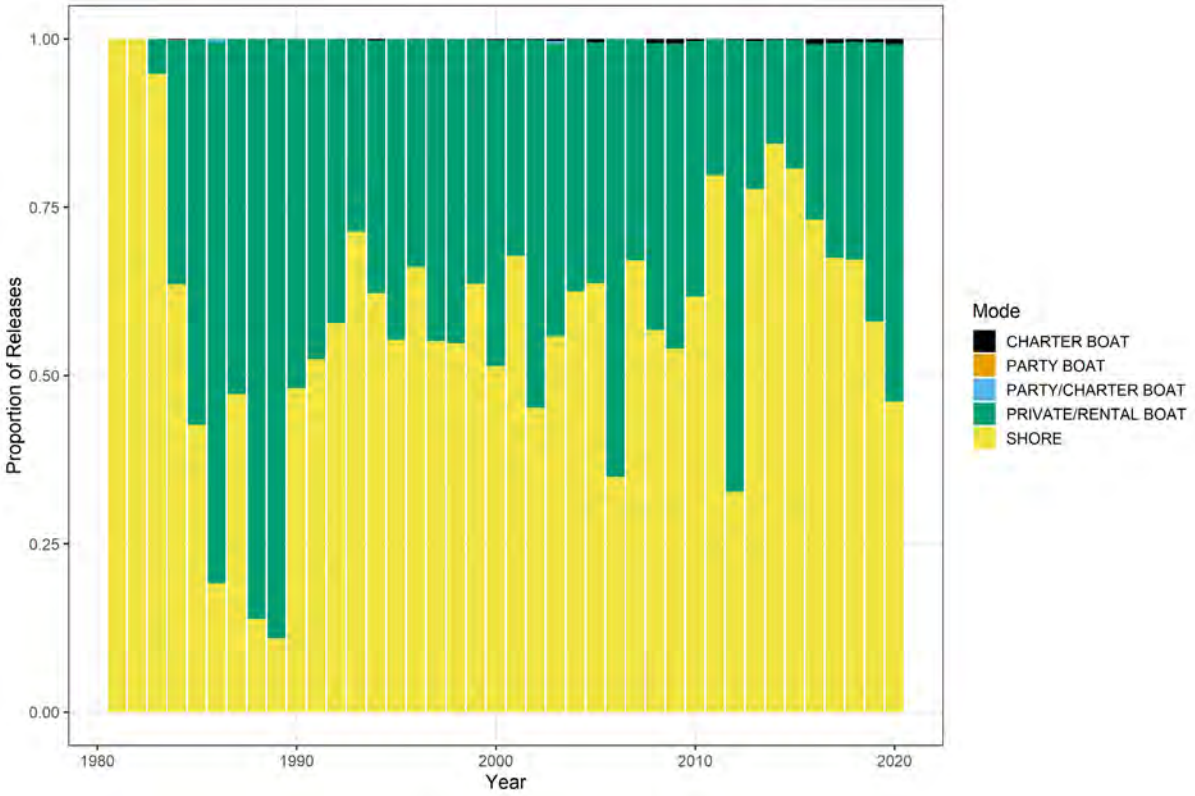

Figure 29. MRIP mode proportional recreational releases of black drum.

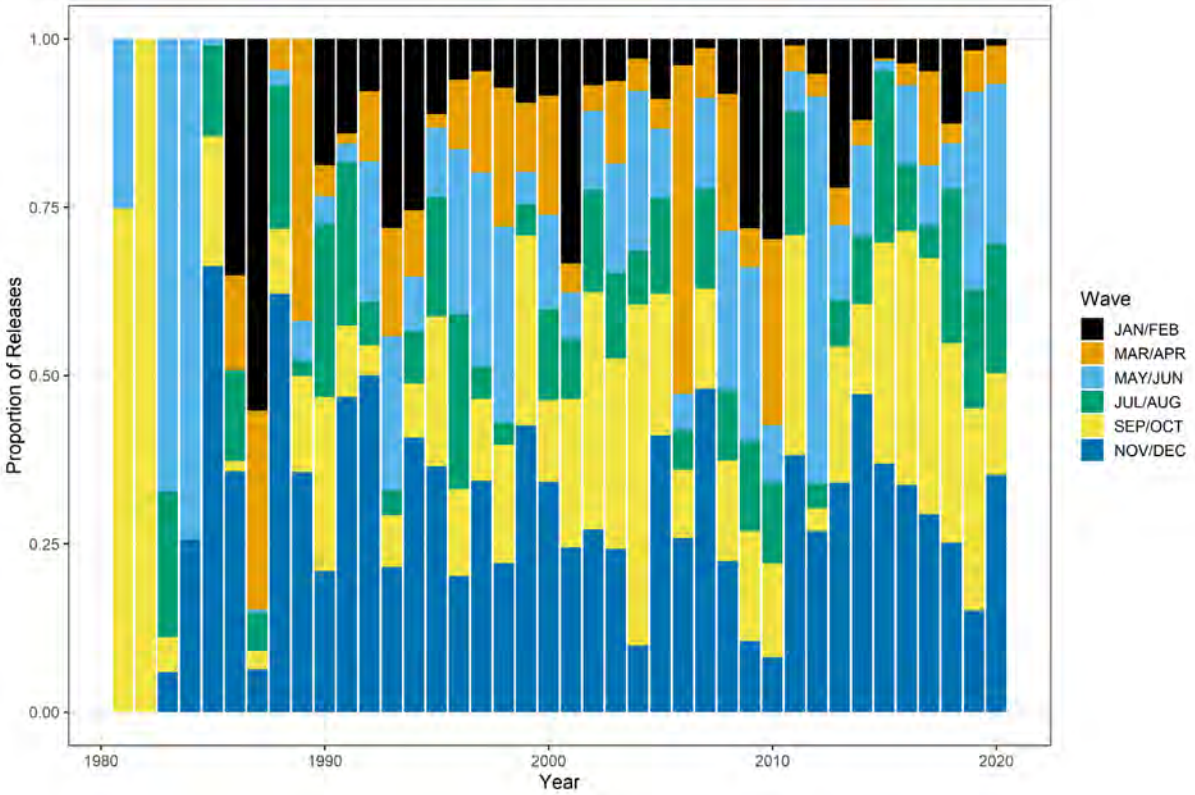

Figure 30. MRIP wave proportional recreational releases of black drum.

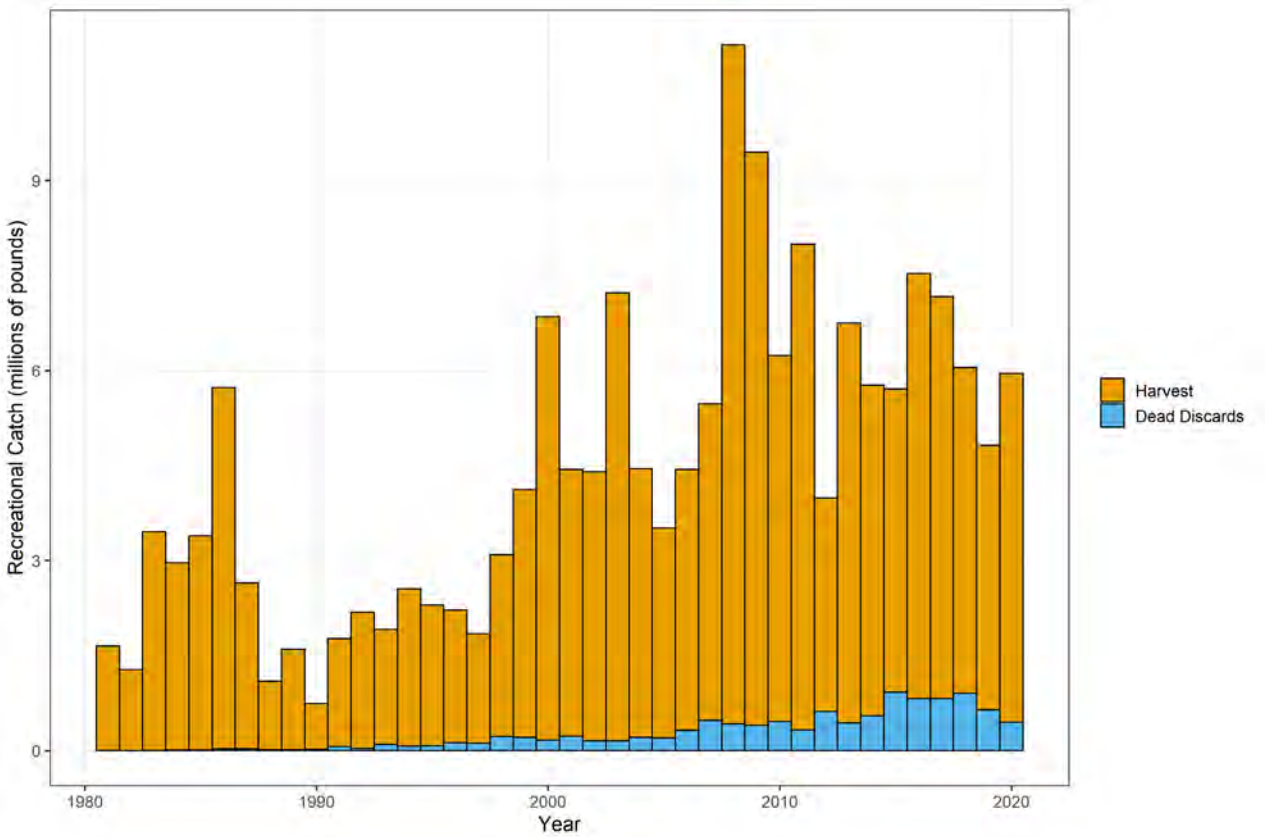

Figure 31. Recreational fishery removals from the MRFSS/MRIP time period.

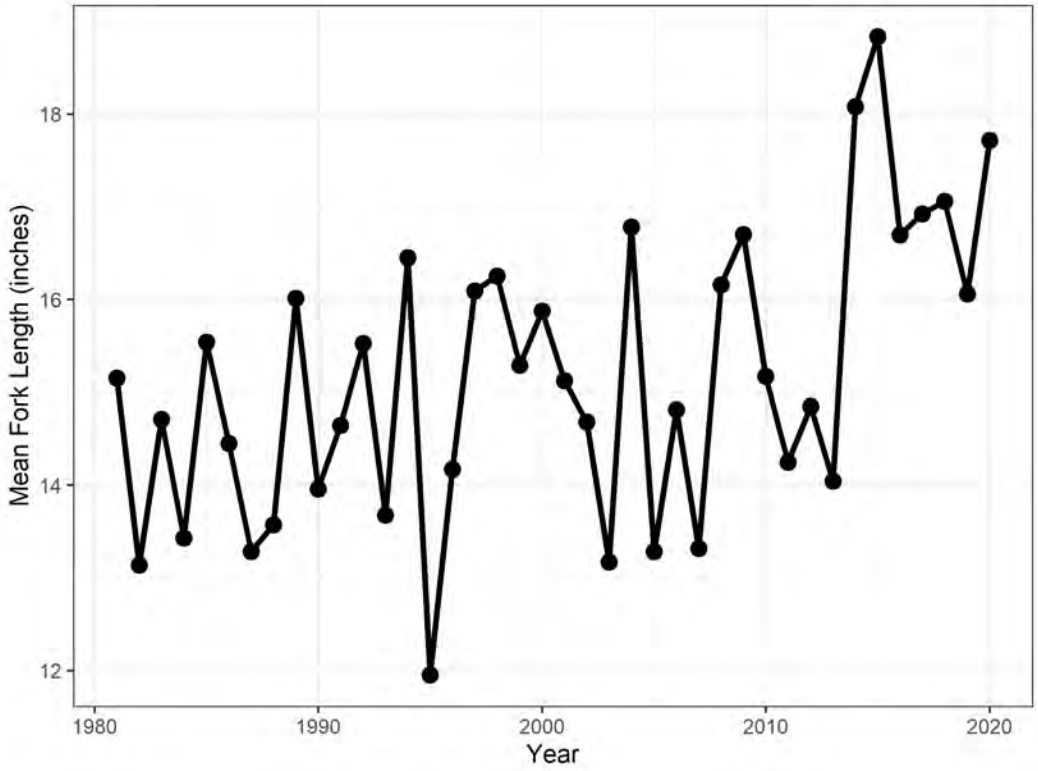

Figure 32. Mean fork length of black drum harvested in the recreational fishery.

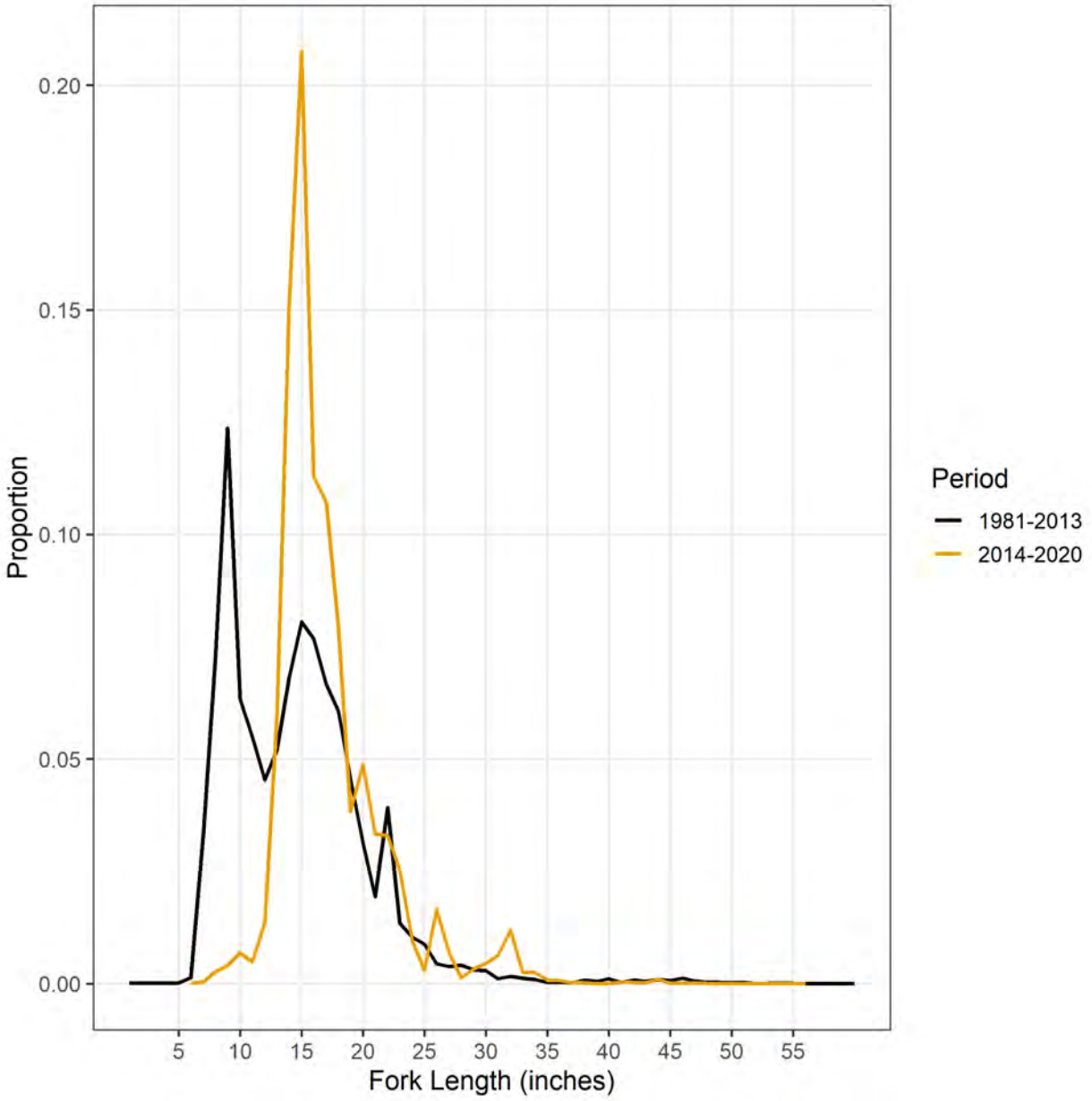

Figure 33. Size distribution of black drum harvested in the recreational fishery before and after the implementation of the FMP.

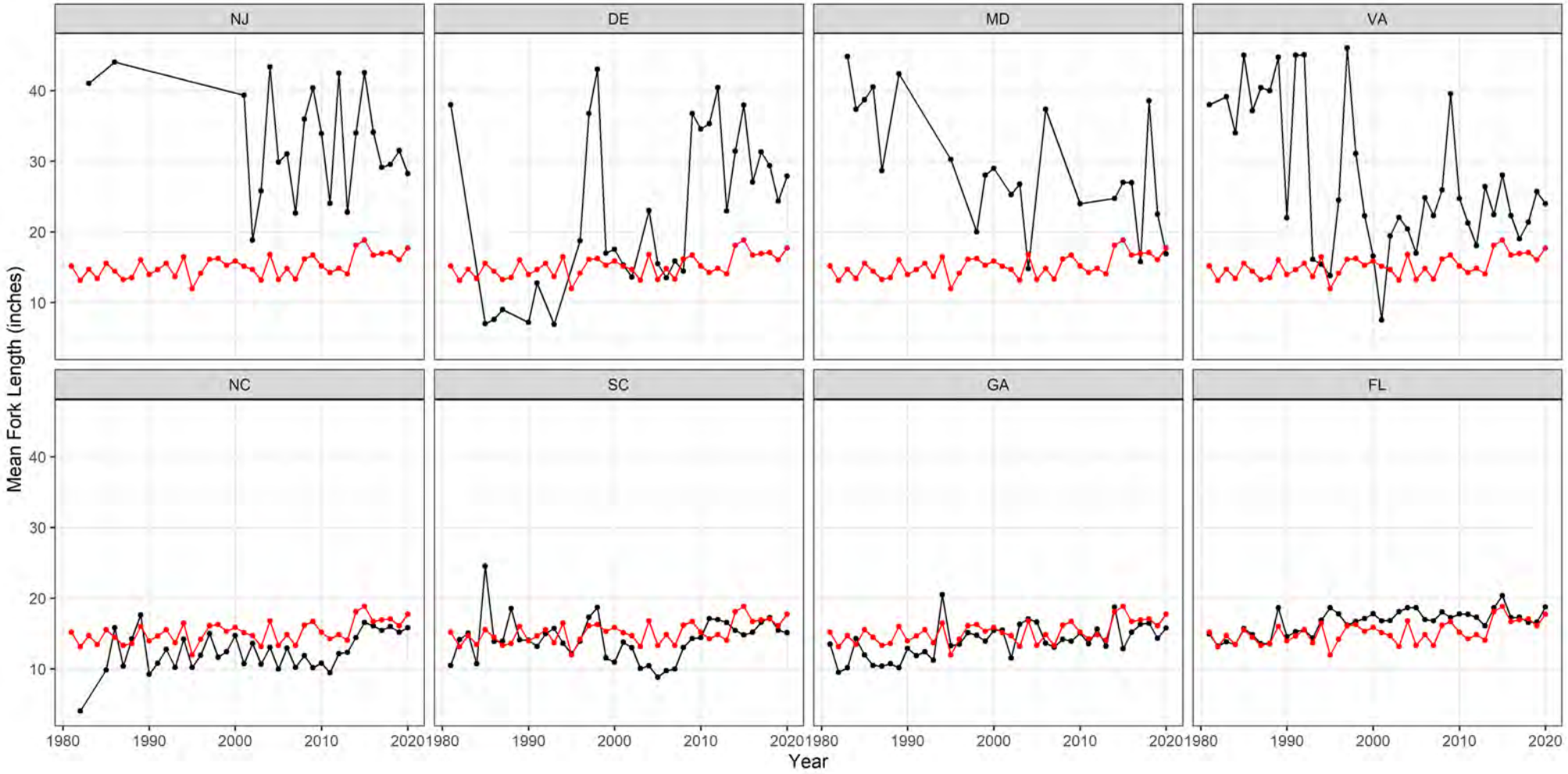

Figure 34. Mean fork length of black drum harvested in the recreational fishery in each state (black line) compared to all harvest coastwide (red line).

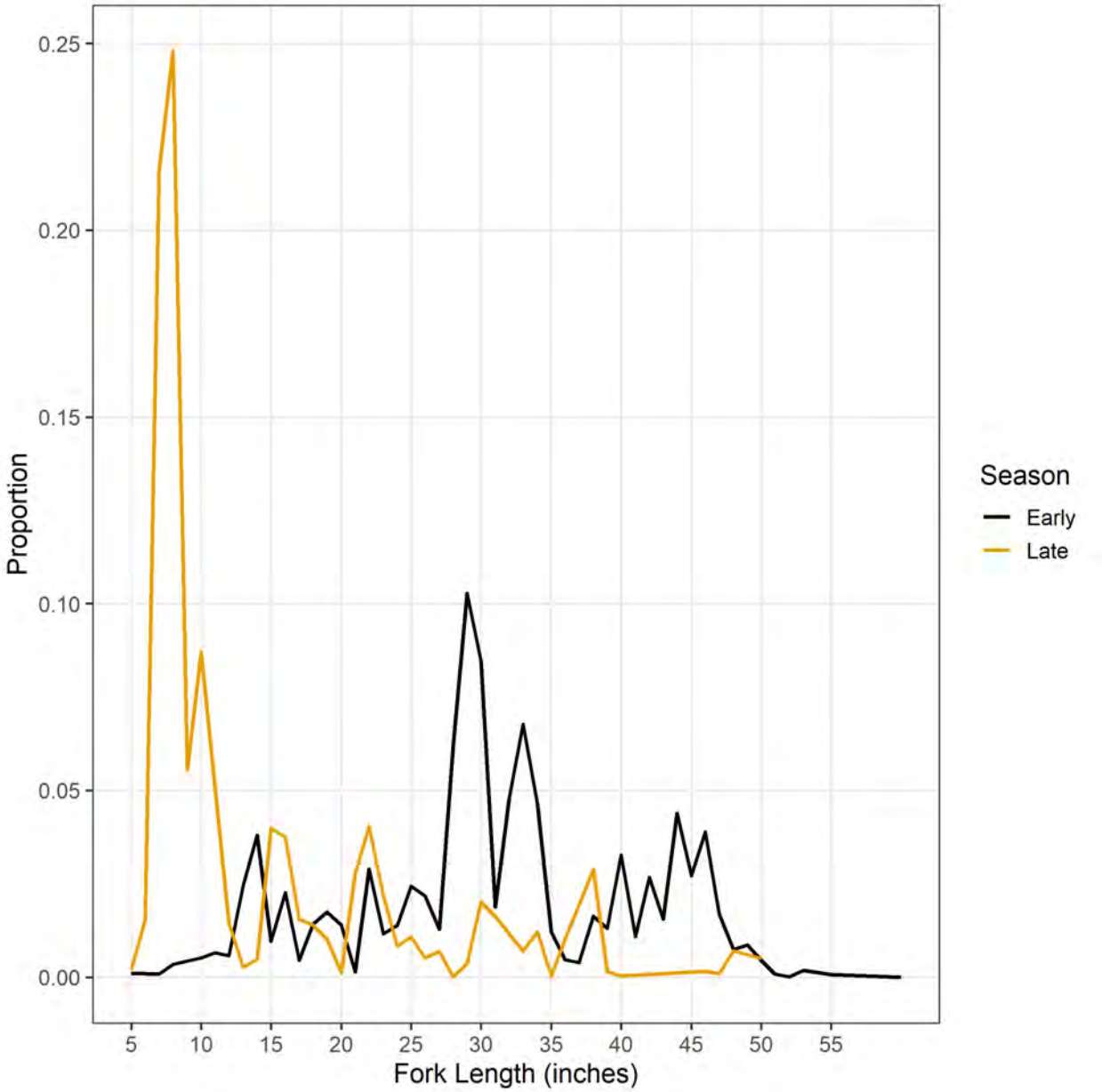

Figure 35. Size distribution of black drum harvested in the Mid-Atlantic recreational fishery earlier in the year (waves 2-4, March-August) and later in the year (waves 5-6, September-December).

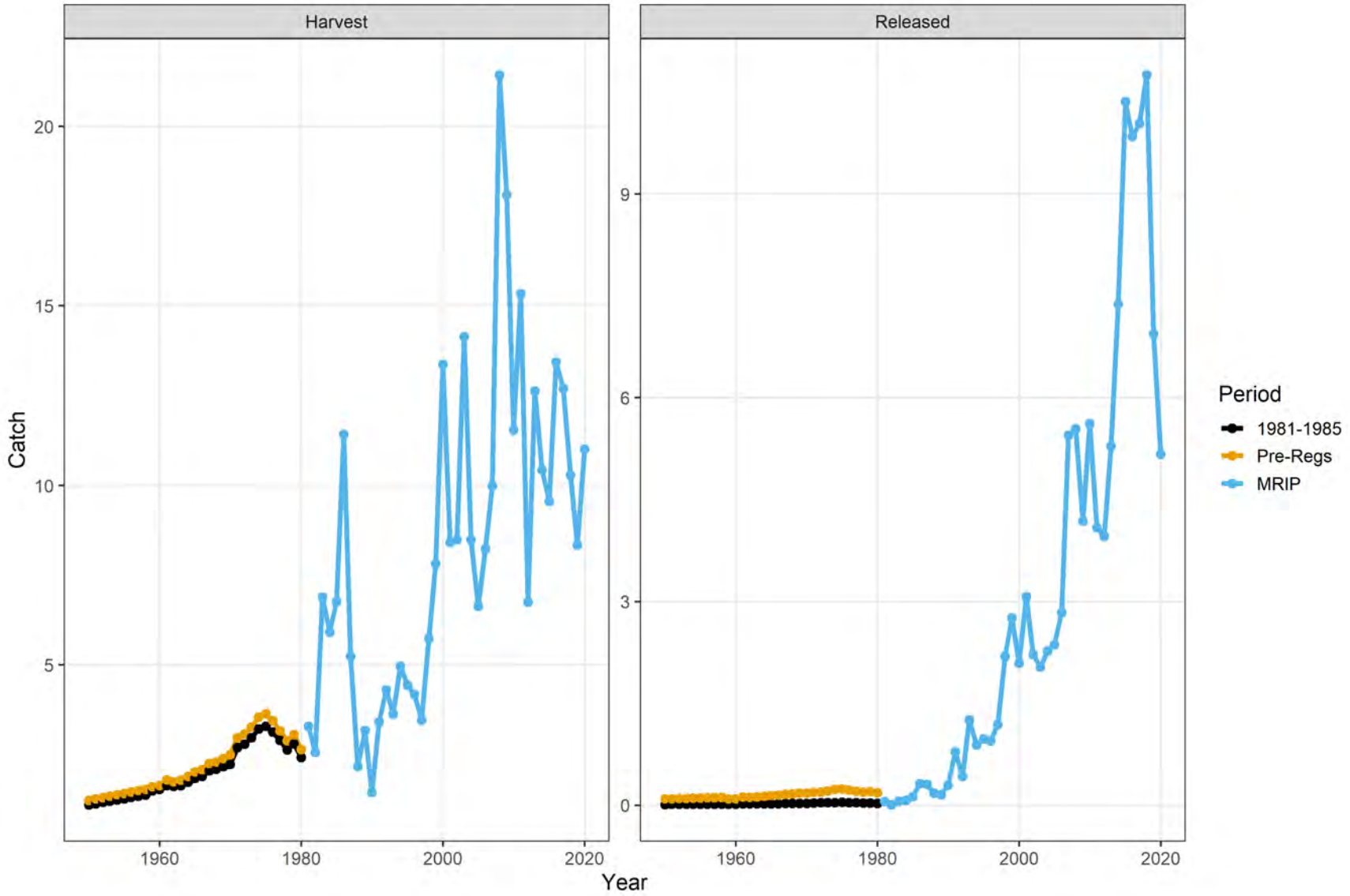

Figure 36. Historical recreational catch estimates using MRIP CPUE data from 1981-1985 for all states and MRIP CPUE data from all years before implementation of regulations in each state. Estimates after 1980 are from MRIP.

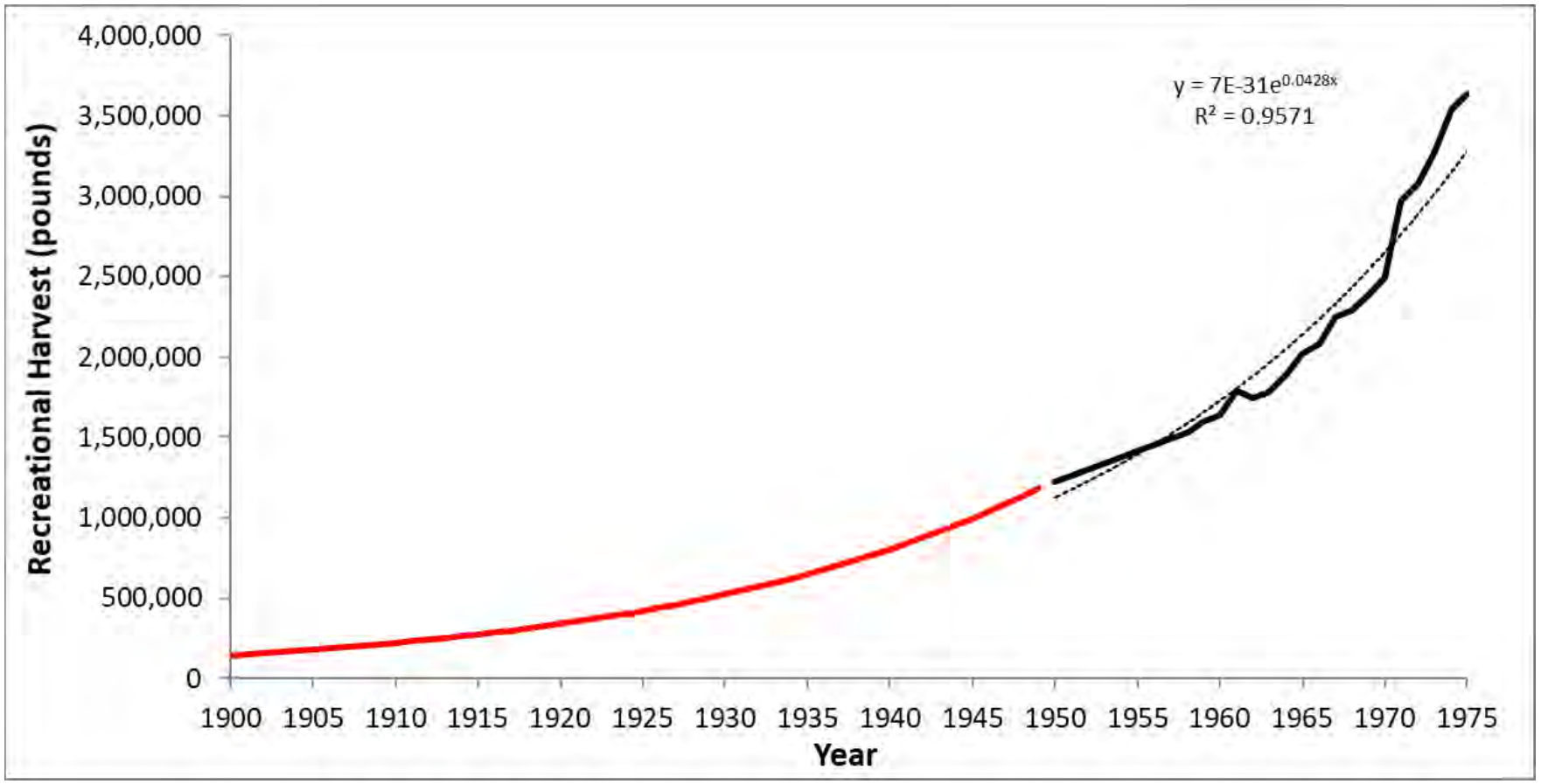

Figure 37. Black drum recreational harvest estimates from 1900-1975. The dashed line is the estimated trendline from the exponential regression fit to historical estimates from 1950-1975 (solid black line). The red line indicates estimates extrapolated with exponential regression.

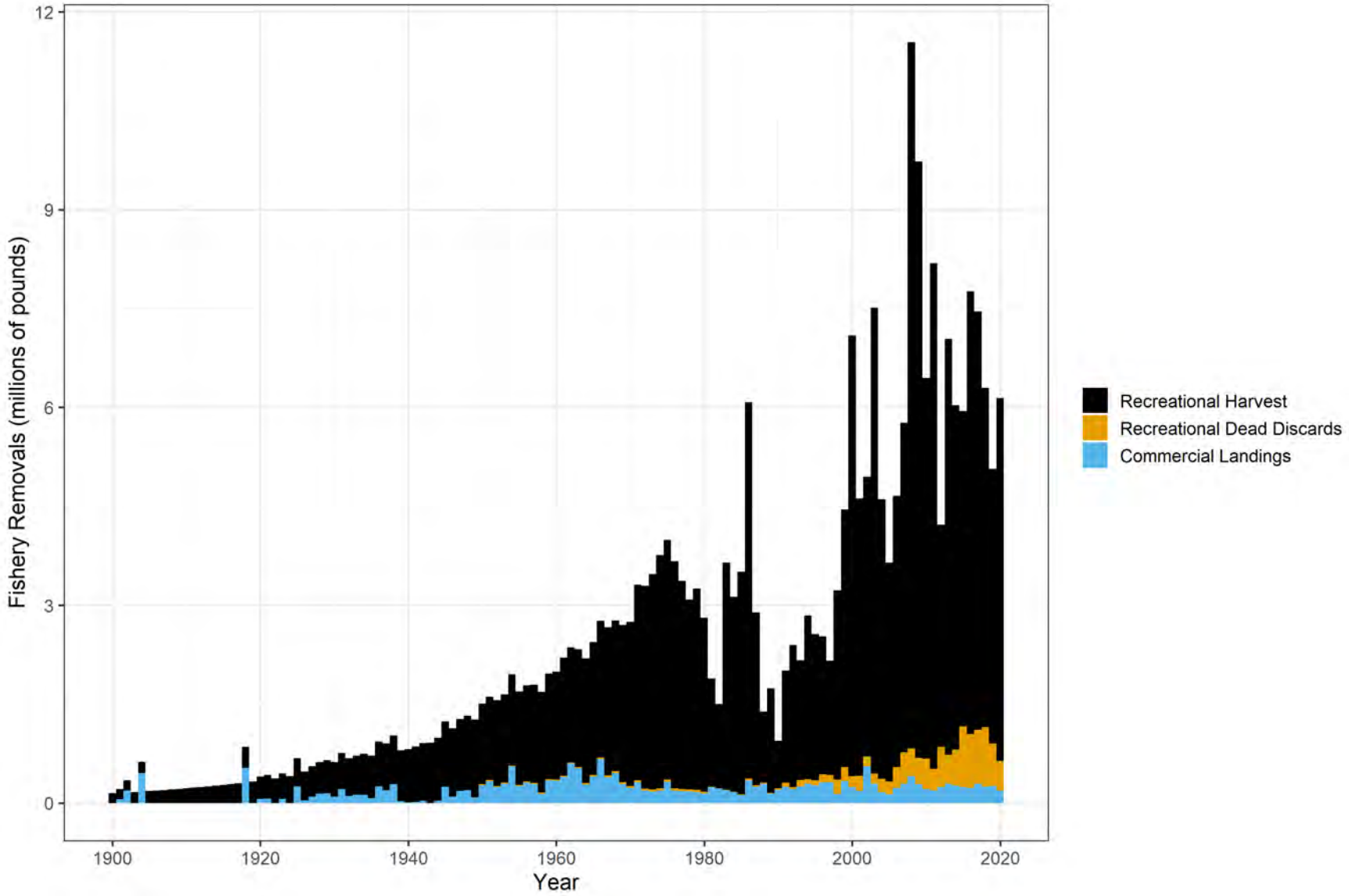

Figure 38. Total fishery removals of black drum by sector and disposition from 1900-2020.

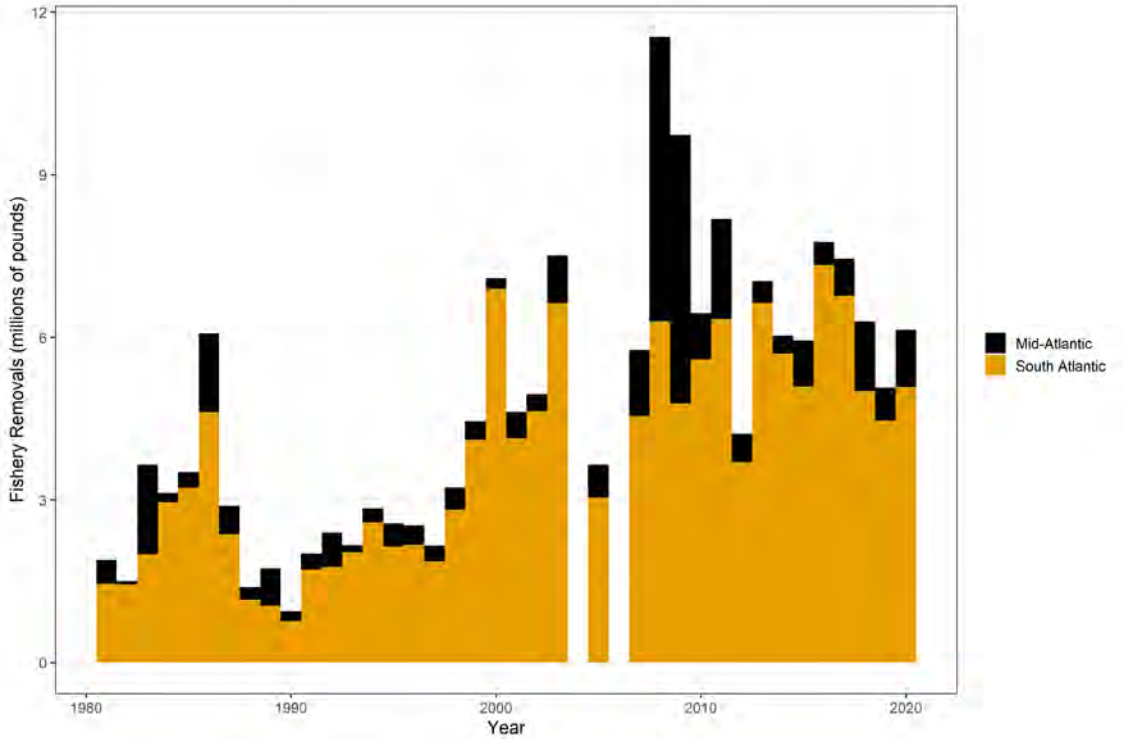

Figure 39. Total fishery removals of black drum by region from 1981-2020. Missing values indicate confidential data that have been redacted.

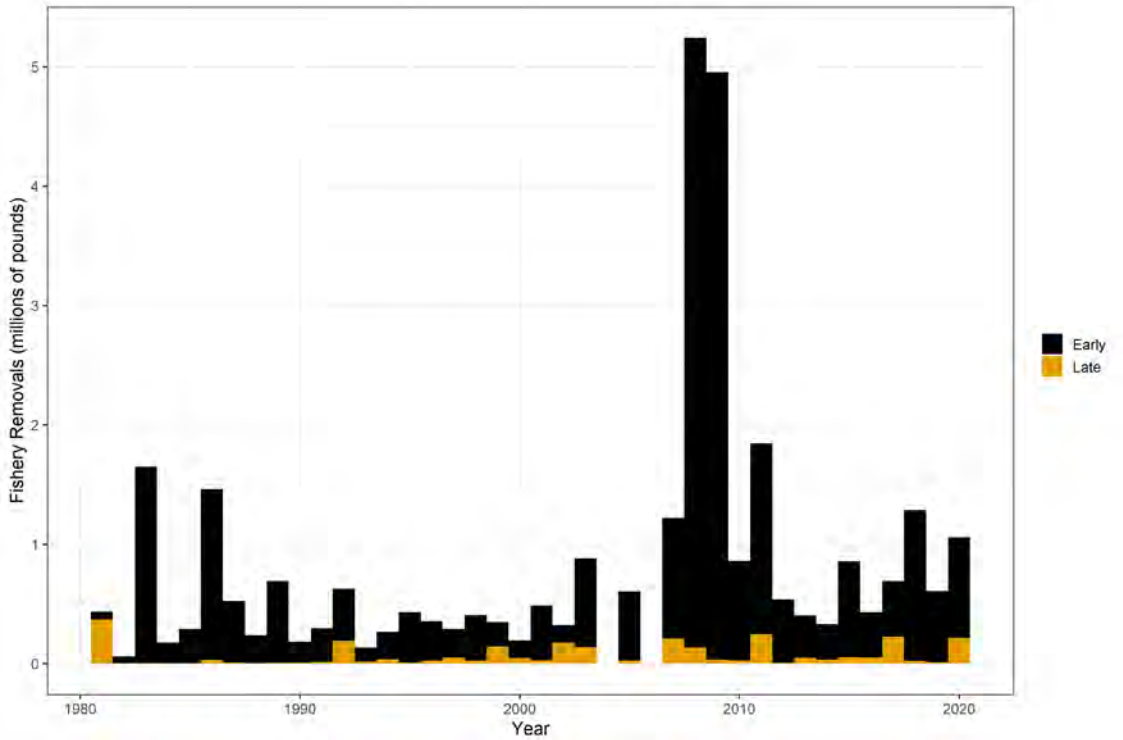

Figure 40. Total fishery removals of black drum in the Mid-Atlantic by season from 1981-2020. The early season is January-August and the late season is September-December. Missing values indicate confidential data that have been redacted.

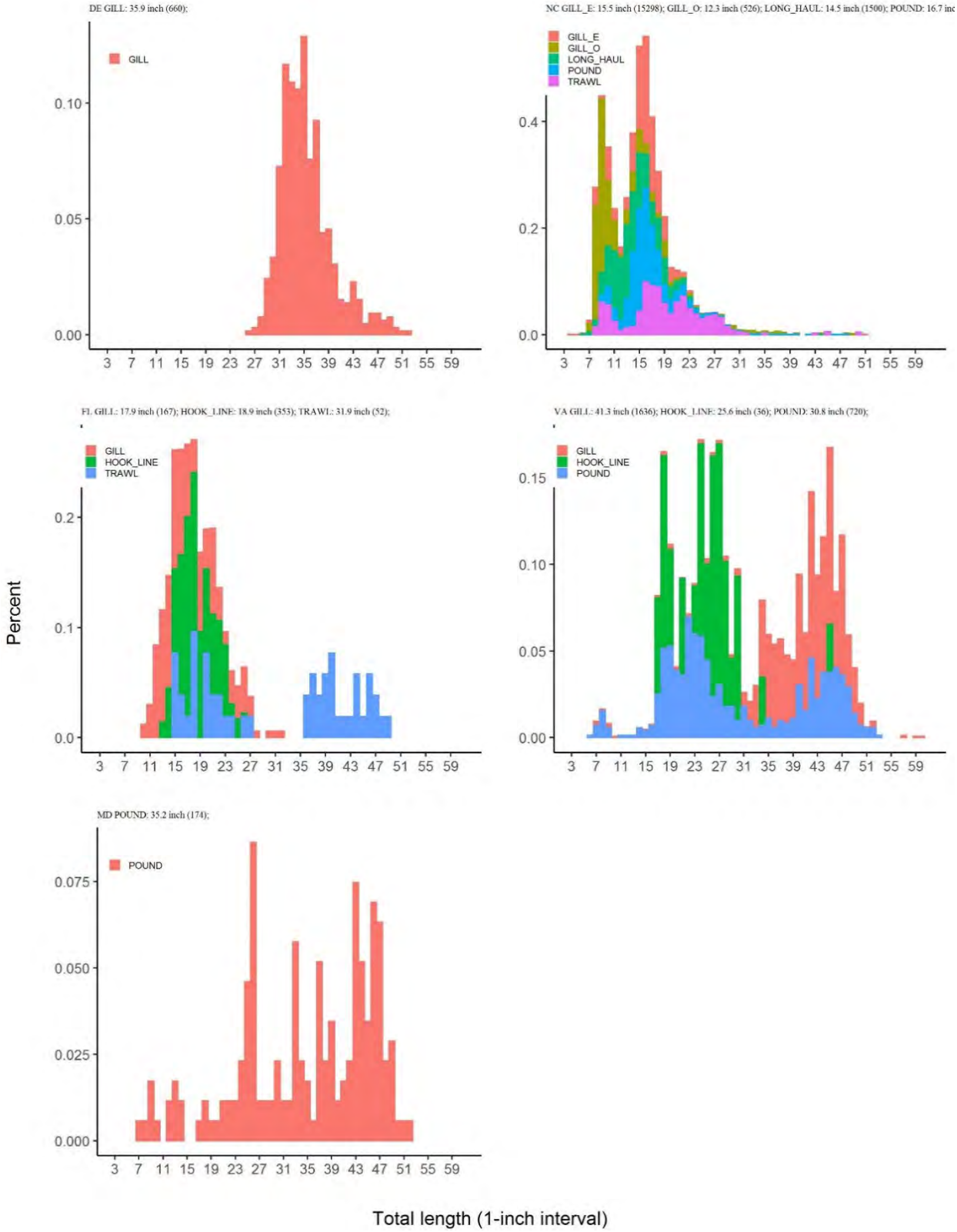

Figure 41. Length frequency distribution landed by commercial gear within each state.

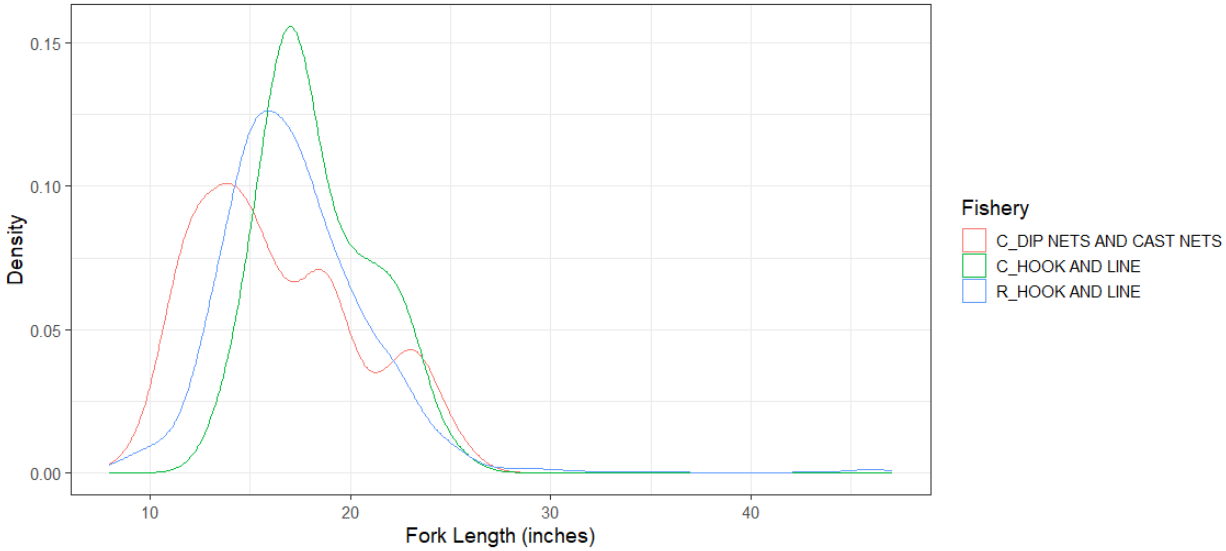

Figure 42. Size distributions of FL black drum harvest from the recreational fishery (R_HOOK AND LINE) and two major commercial gear categories (C_DIP NETS AND CAST NETS, C_HOOK AND LINE) during 1996-2003.

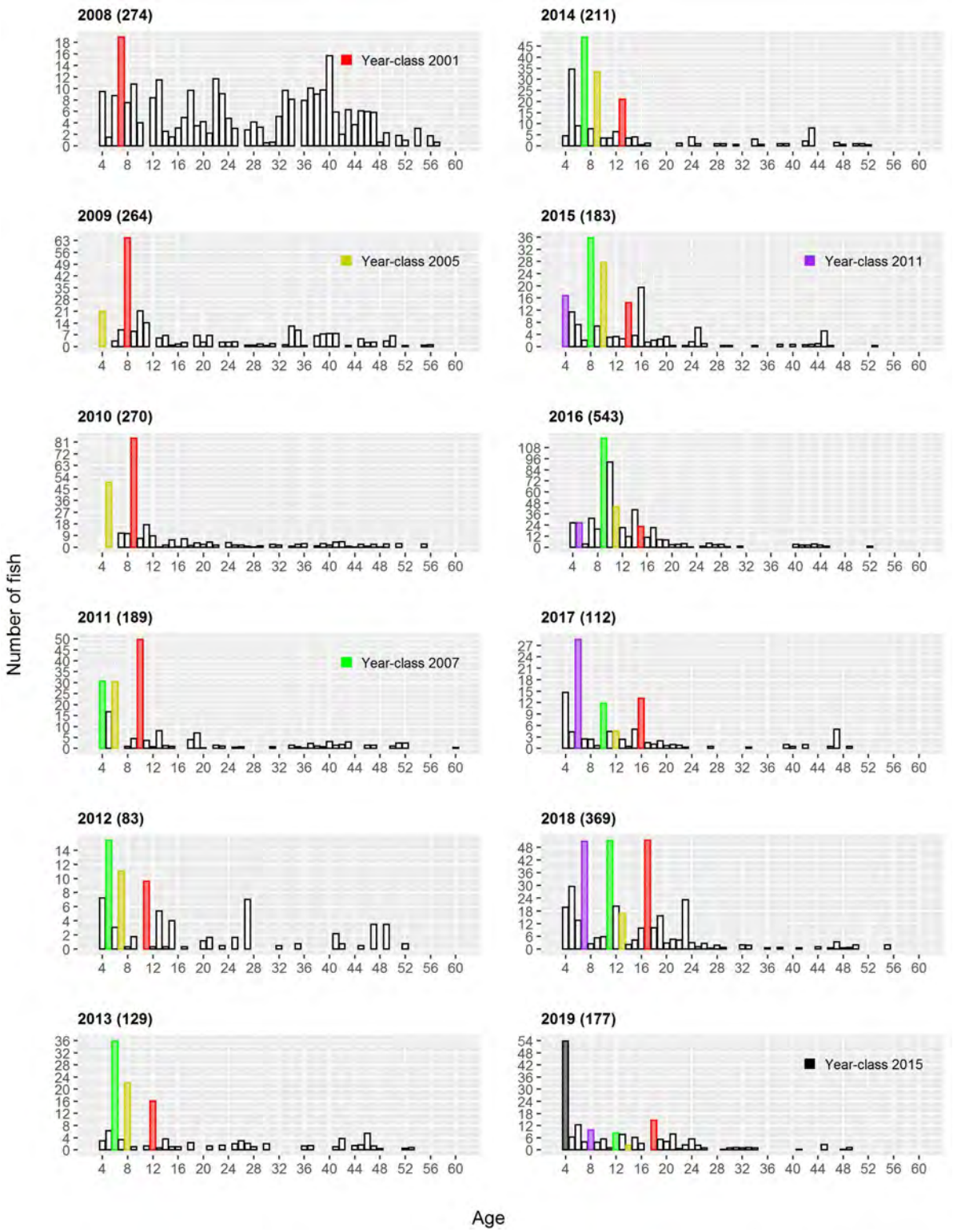

Figure 43. Coastwide annual age distributions from 2008 to 2019 with removal of fish younger than age-4. Four strong cohorts are identified, they are Year-class 2001 (Red), 2005 (Yellow), 2007 (Green), and 2011 (Pink). Year-class 2015 (Blue) could be a strong cohort.

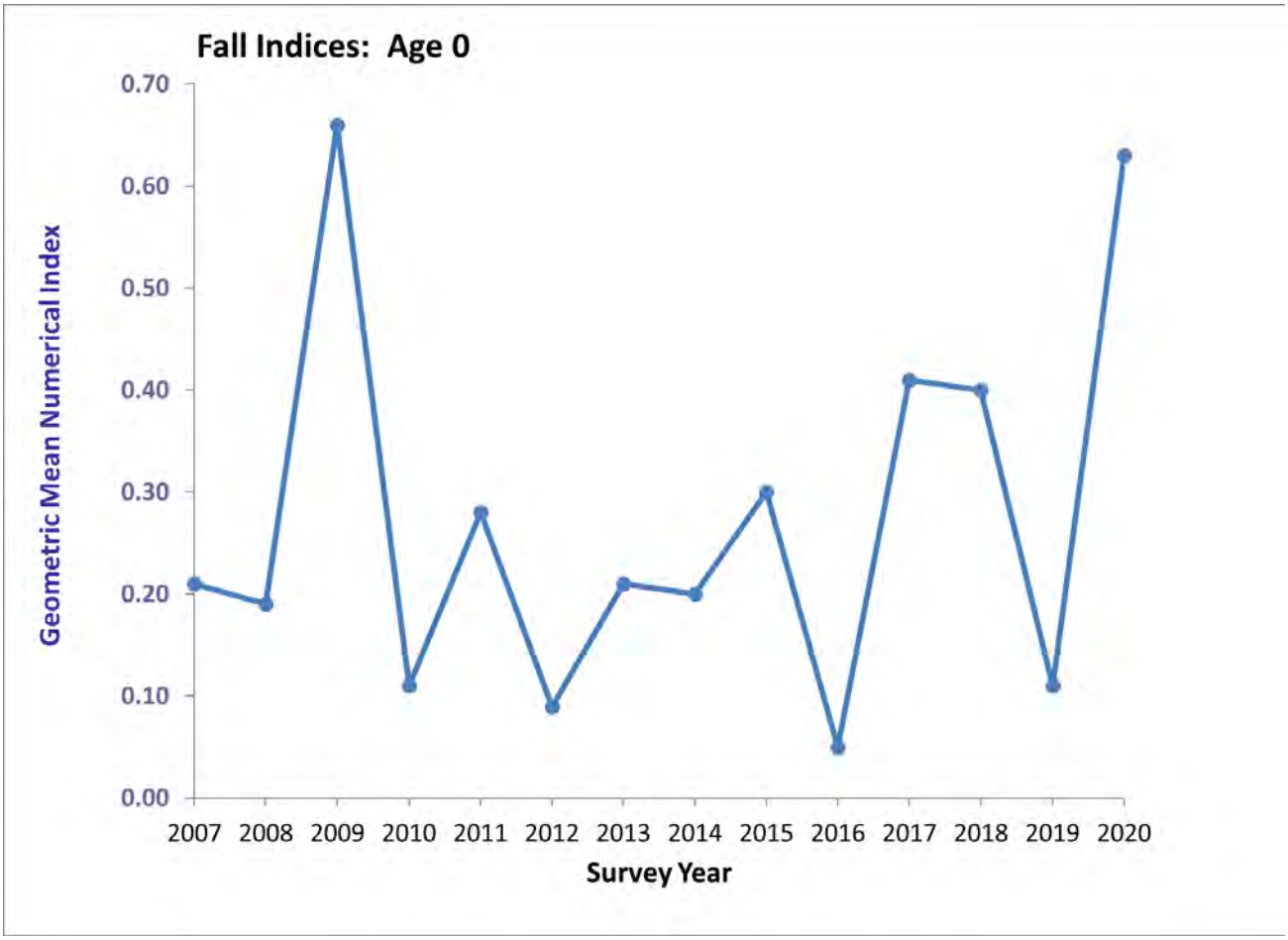

Figure 44. Northeast Area Monitoring and Assessment Program (NEAMAP) black drum geometric mean YOY index from 2007-2020.

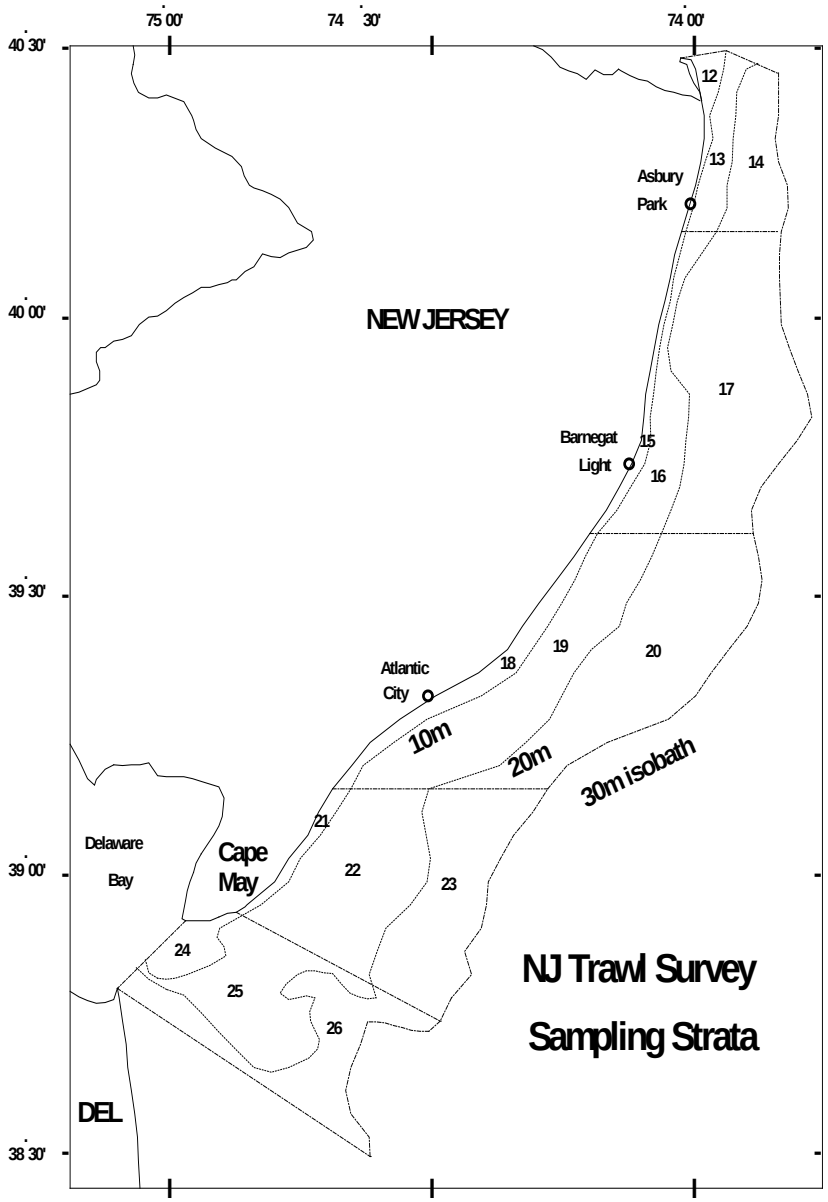

Figure 45. New Jersey Ocean Trawl Survey sampling strata.

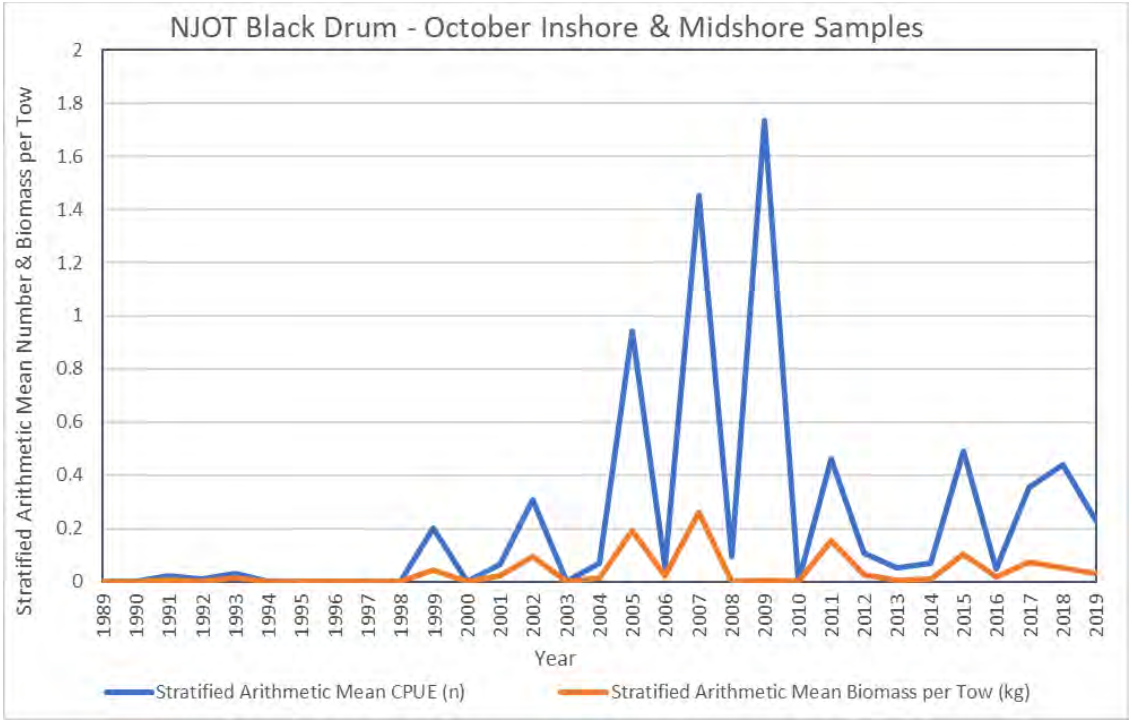

Figure 46. Black drum mean CPUE in blue and mean biomass per tow (kg) in orange from New Jersey Ocean Trawl Survey's October cruises subset to sampling strata <= 60' depths.

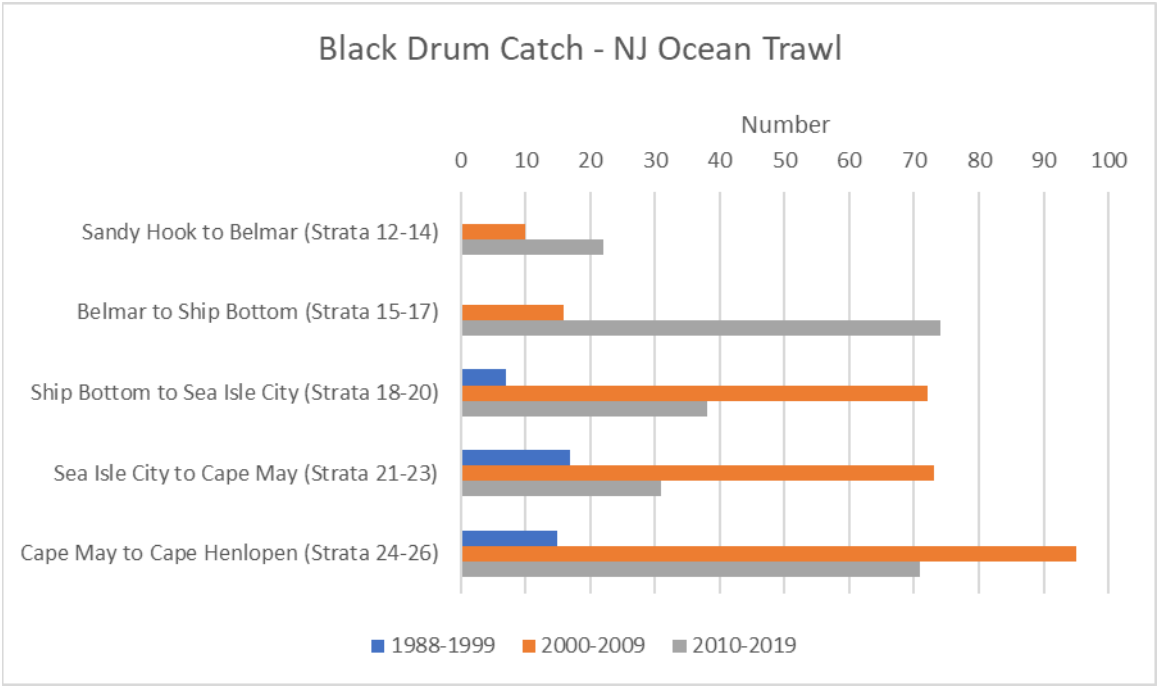

Figure 47. Black drum catches in total number for the New Jersey Ocean Trawl Survey (all cruises) by stratum groupings from north to south on the Y-axis. Catches are subset by decade with the earliest (1988-1999) in blue, 2000-2009 in orange, and 2010-2019 in gray.

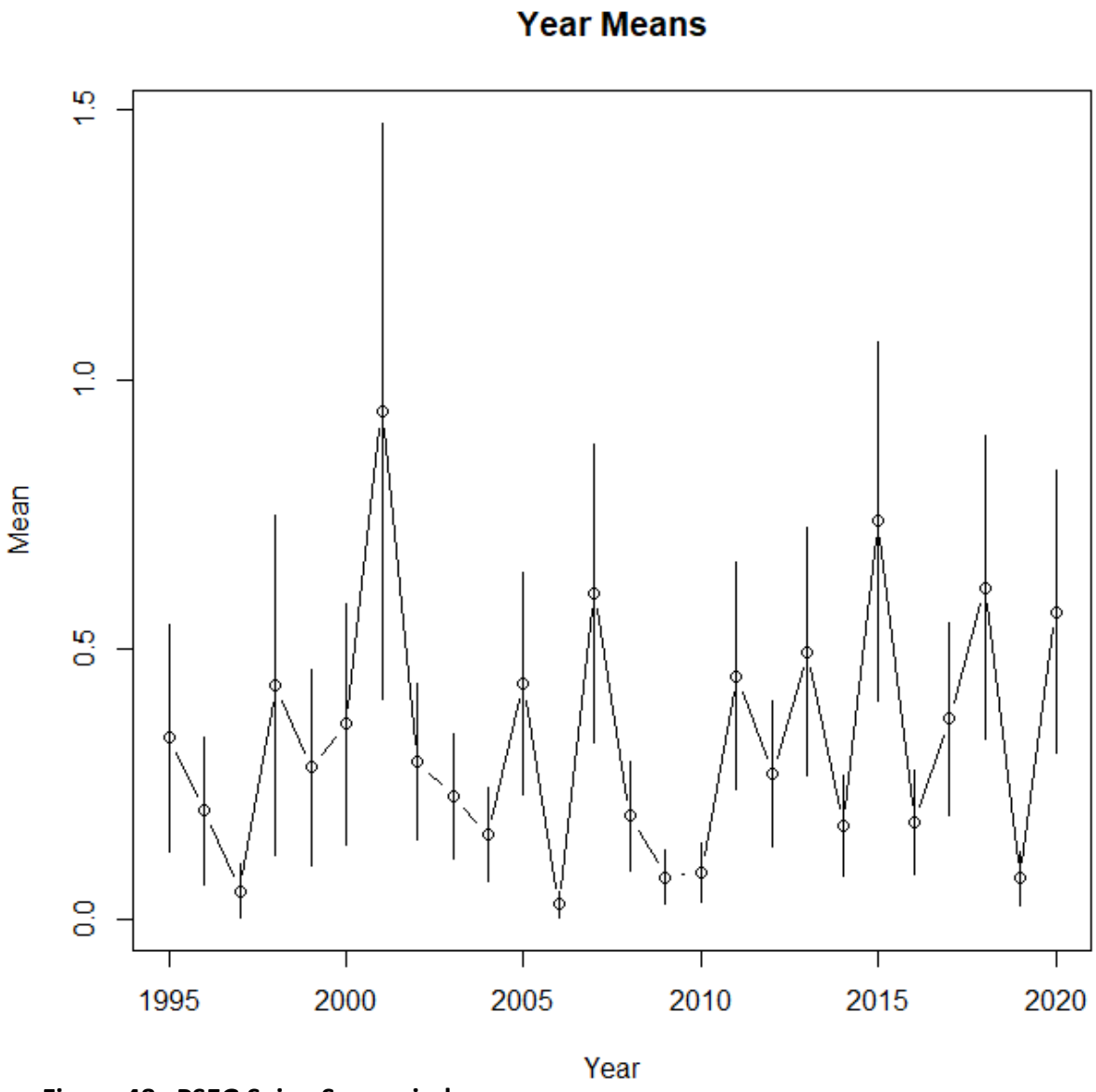

Figure 48. PSEG Seine Survey index.

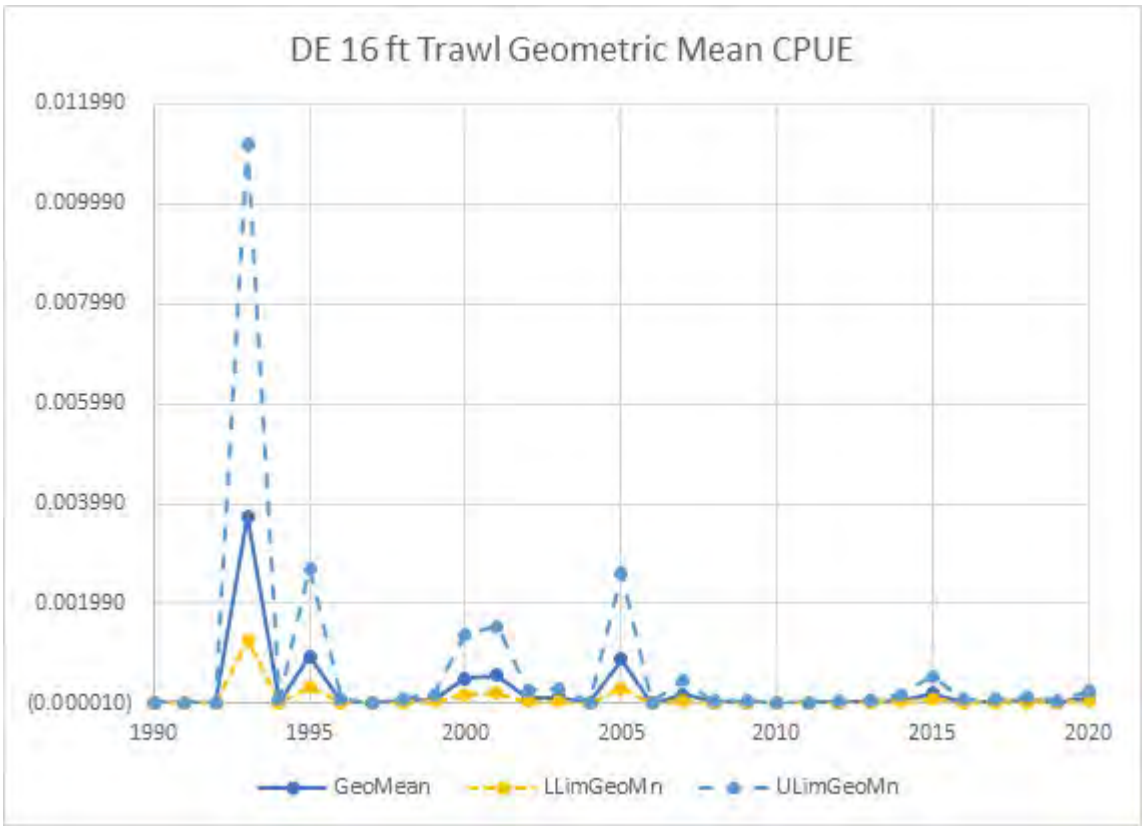

Figure 49. Geometric mean of black drum in number of fish per tow from the Delaware 16 ft Trawl Survey from 1990-2020.

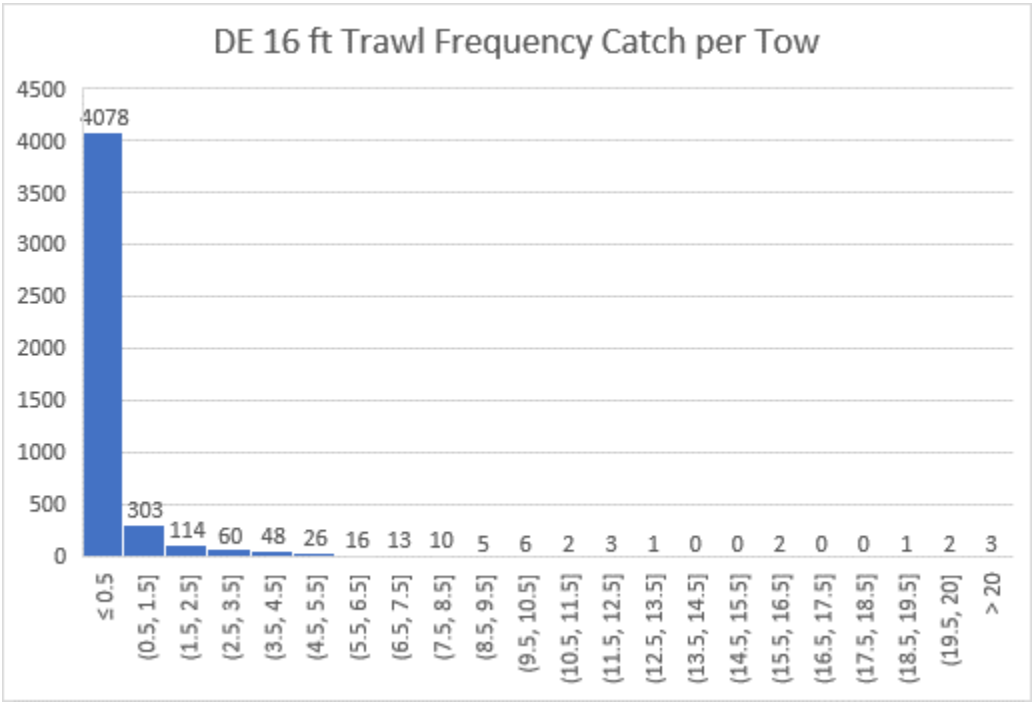

Figure 50. Frequency of number of fish per tow of black drum in the Delaware 16 ft Trawl Survey.

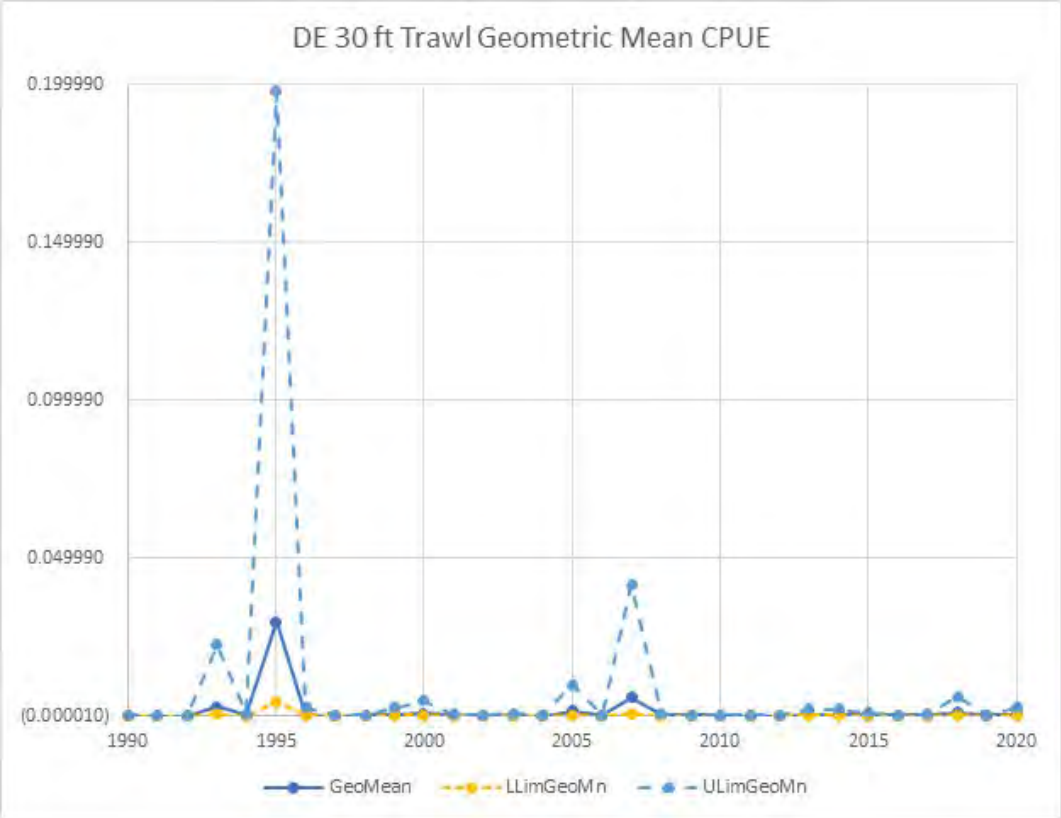

Figure 51. Geometric mean of black drum in number of fish per tow from the Delaware 30 ft Trawl Survey from 1990-2020.

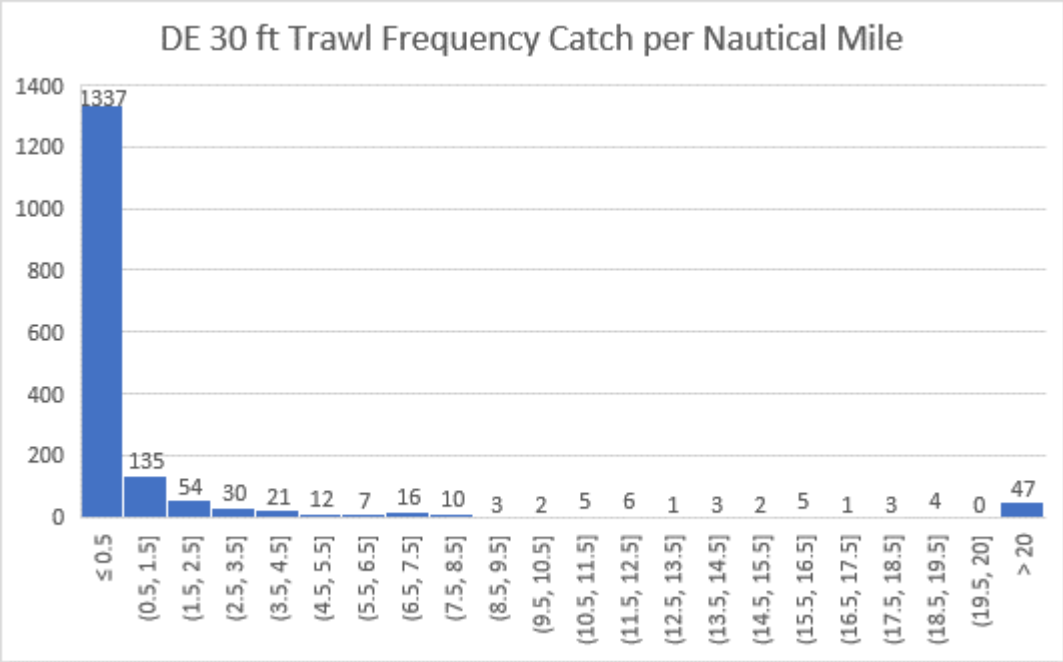

Figure 52. Frequency of number of fish per tow of black drum in the Delaware 30 ft Trawl Survey.

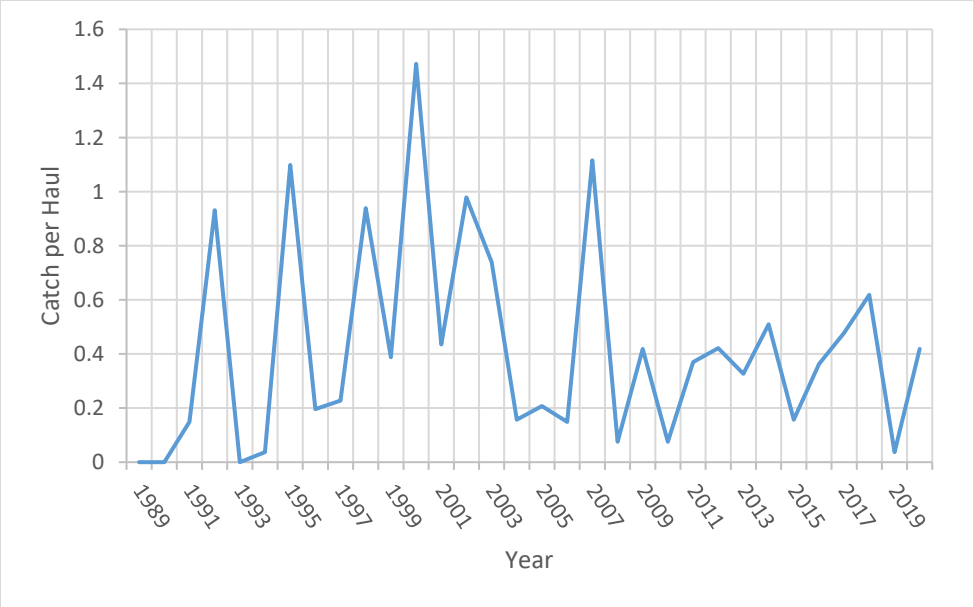

Figure 53. Geometric mean catch per haul of young of the year black drum from the Maryland Coastal Bays Seine Survey, 1989-2020.

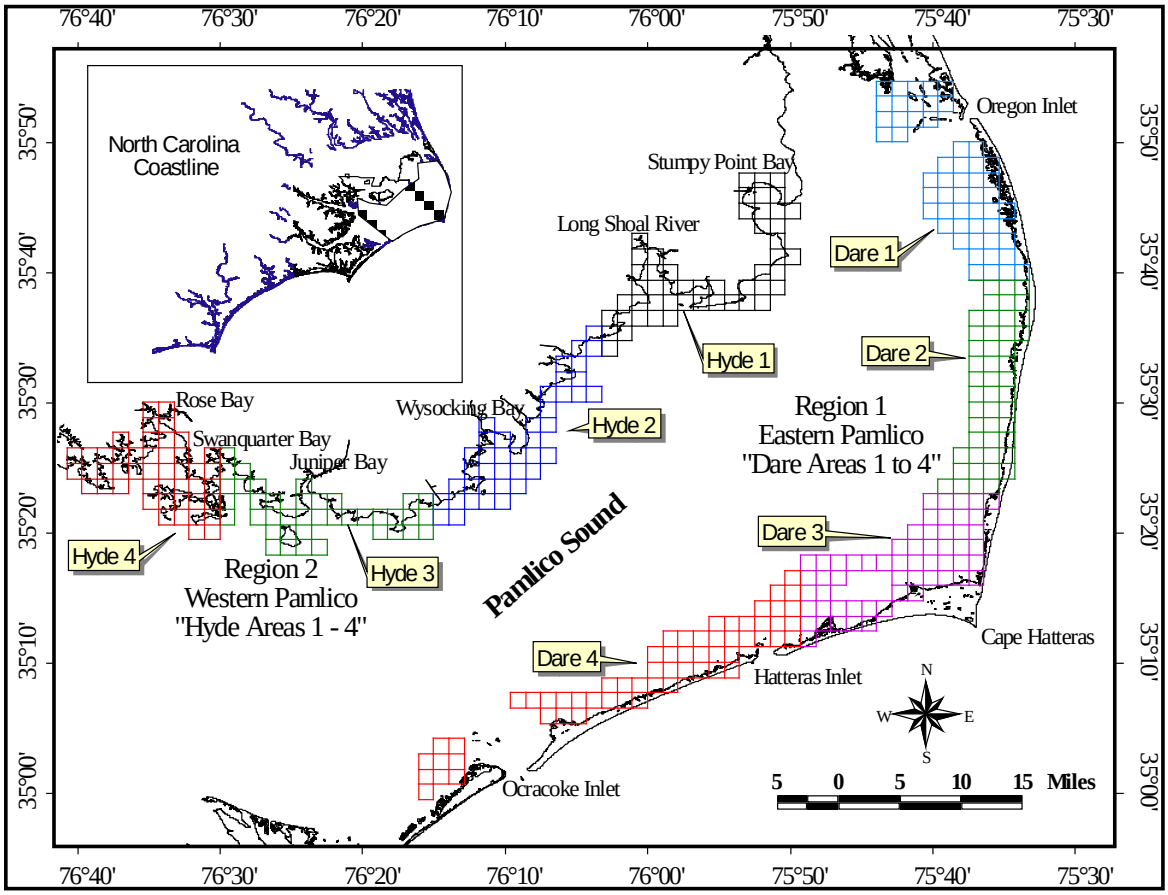

Figure 54. The region and areas sampled as part of the Pamlico Sound Independent Gill Net survey.

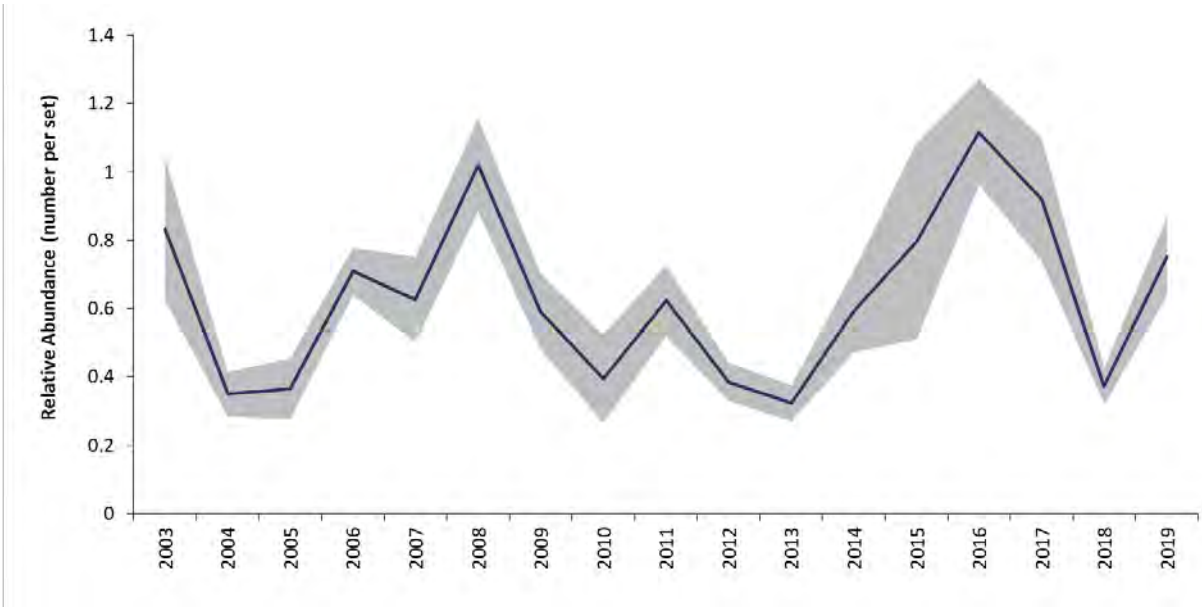

Figure 55. Annual weighted black drum index of relative abundance (number per set) from the NC DMF Independent Gill Net Survey (Program 915) in the Pamlico Sound and Neuse, Pamlico, and Pungo river systems from 2001–2020*. Shaded area represents + one standard error. *Sampling in this program was suspended in February 2020 due to COVID-19.

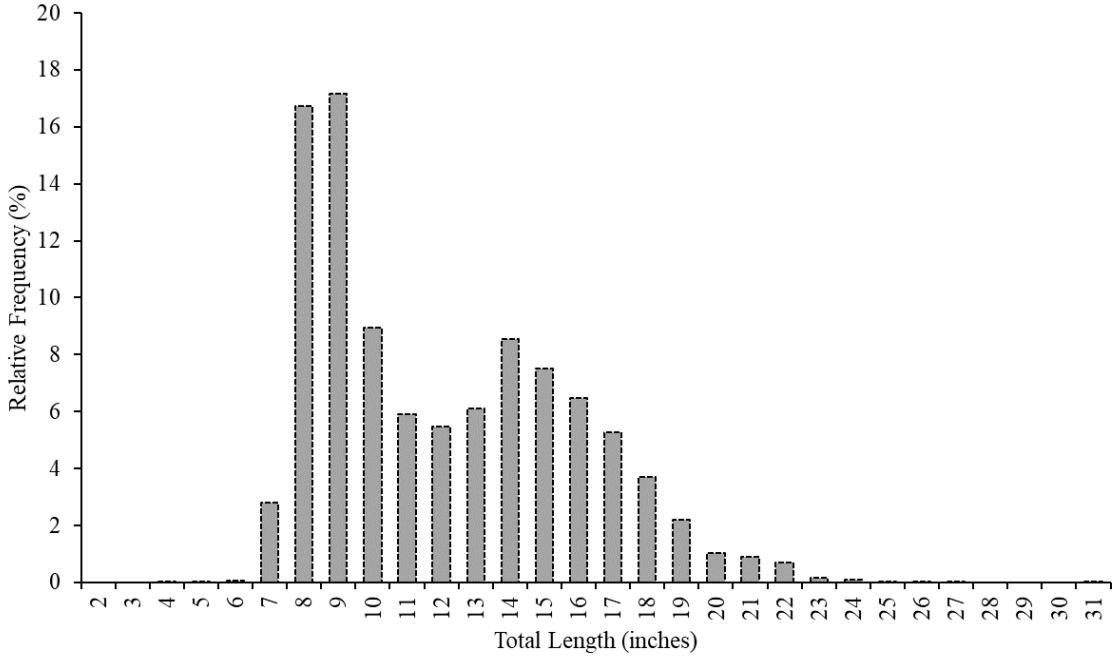

Figure 56. Relative frequency (%) of black drum by size class in total length (inches) from the North Carolina Independent Gill Net Survey (Program 915).

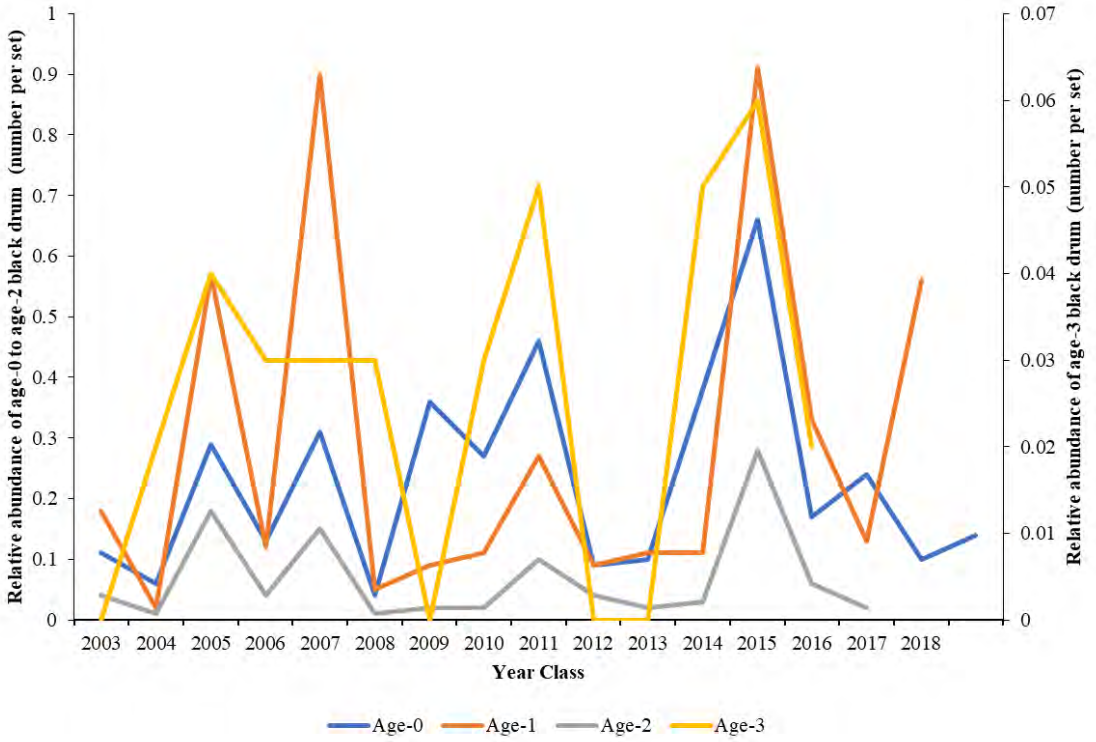

Figure 57. Annual weighted black drum index of relative abundance (number per set) from the NC DMF Independent Gill Net Survey (Program 915) in the Pamlico Sound and Neuse, Pamlico, and Pungo river systems from 2003–2019. Values lagged to track cohort progression.

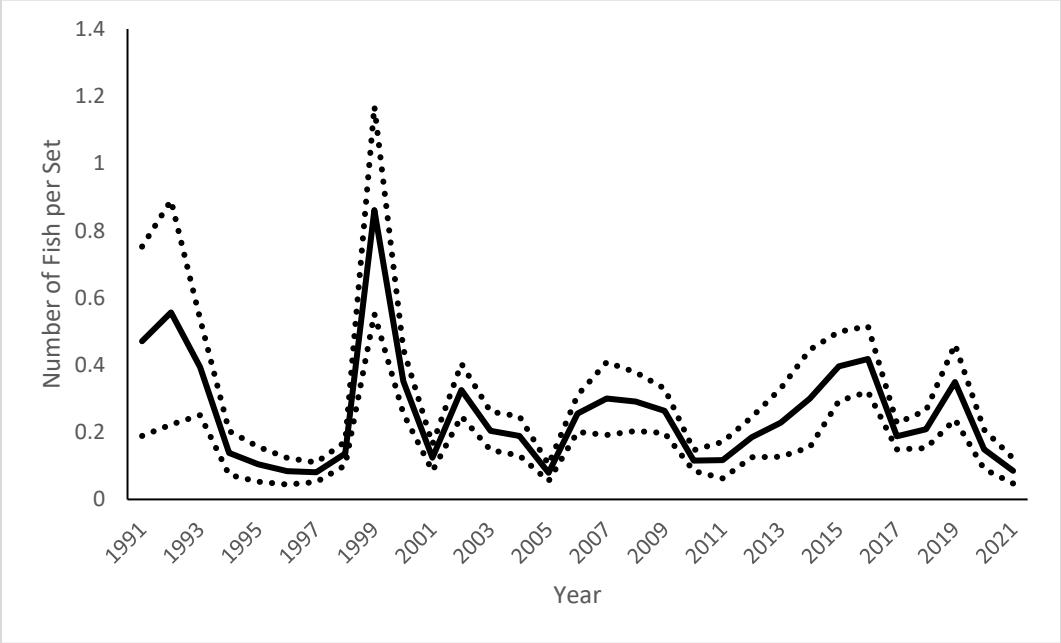

Figure 58. South Carolina Trammel Survey index of relative abundance of black drum (number of fish per set) from 1991-2021 for all ages combined. The dotted lines represent the 95% confidence intervals.

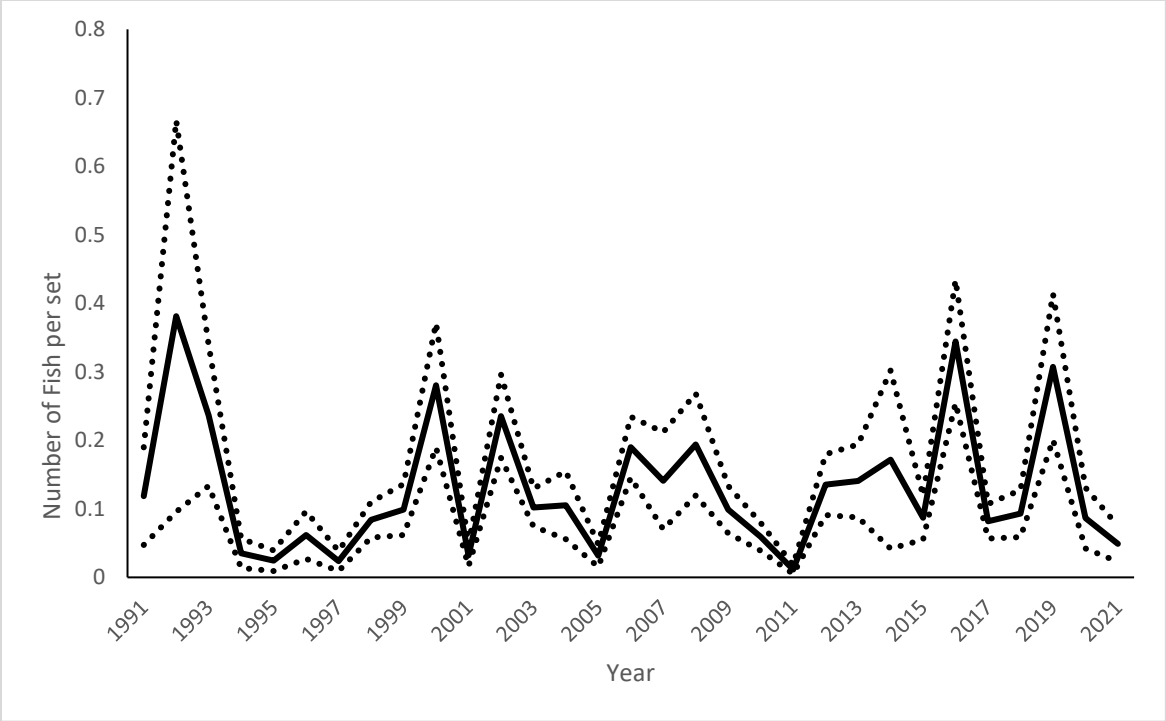

Figure 59. South Carolina Trammel Survey index of relative abundance of age-1 black drum (number of fish per set) from 1991-2021. The dotted lines represent the 95% confidence intervals.

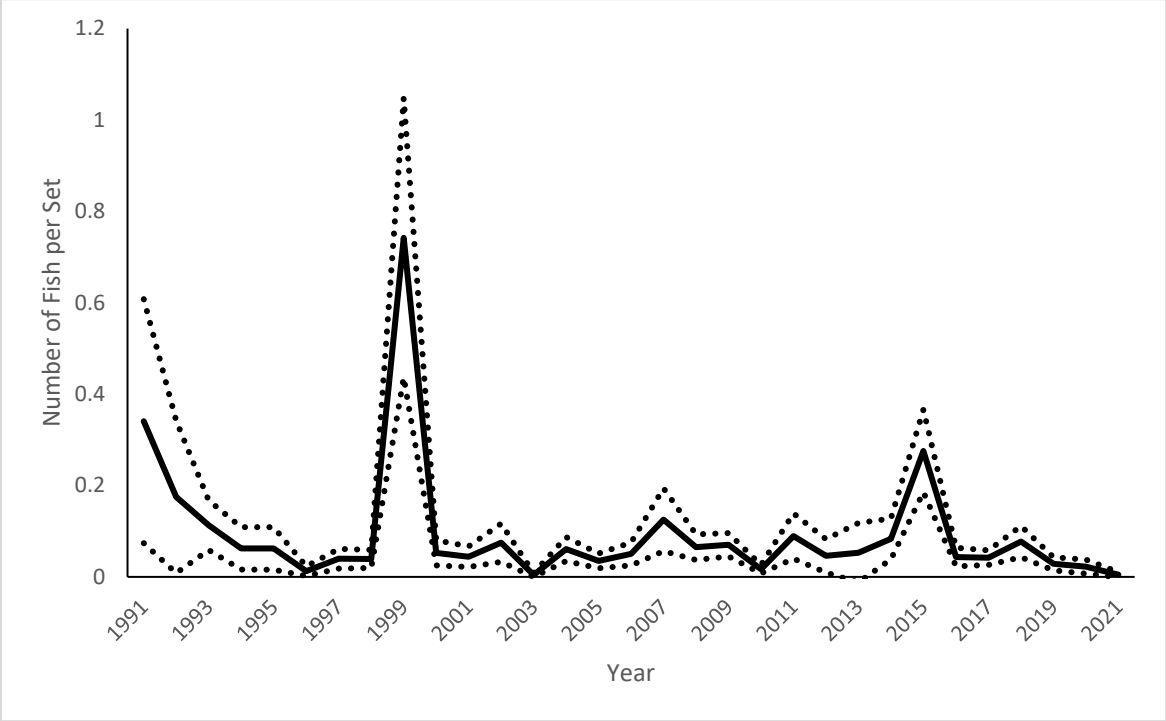

Figure 60. South Carolina Trammel Survey index of relative abundance of age-0 black drum (number of fish per set) from 1991-2021. The dotted lines represent the 95% confidence intervals.

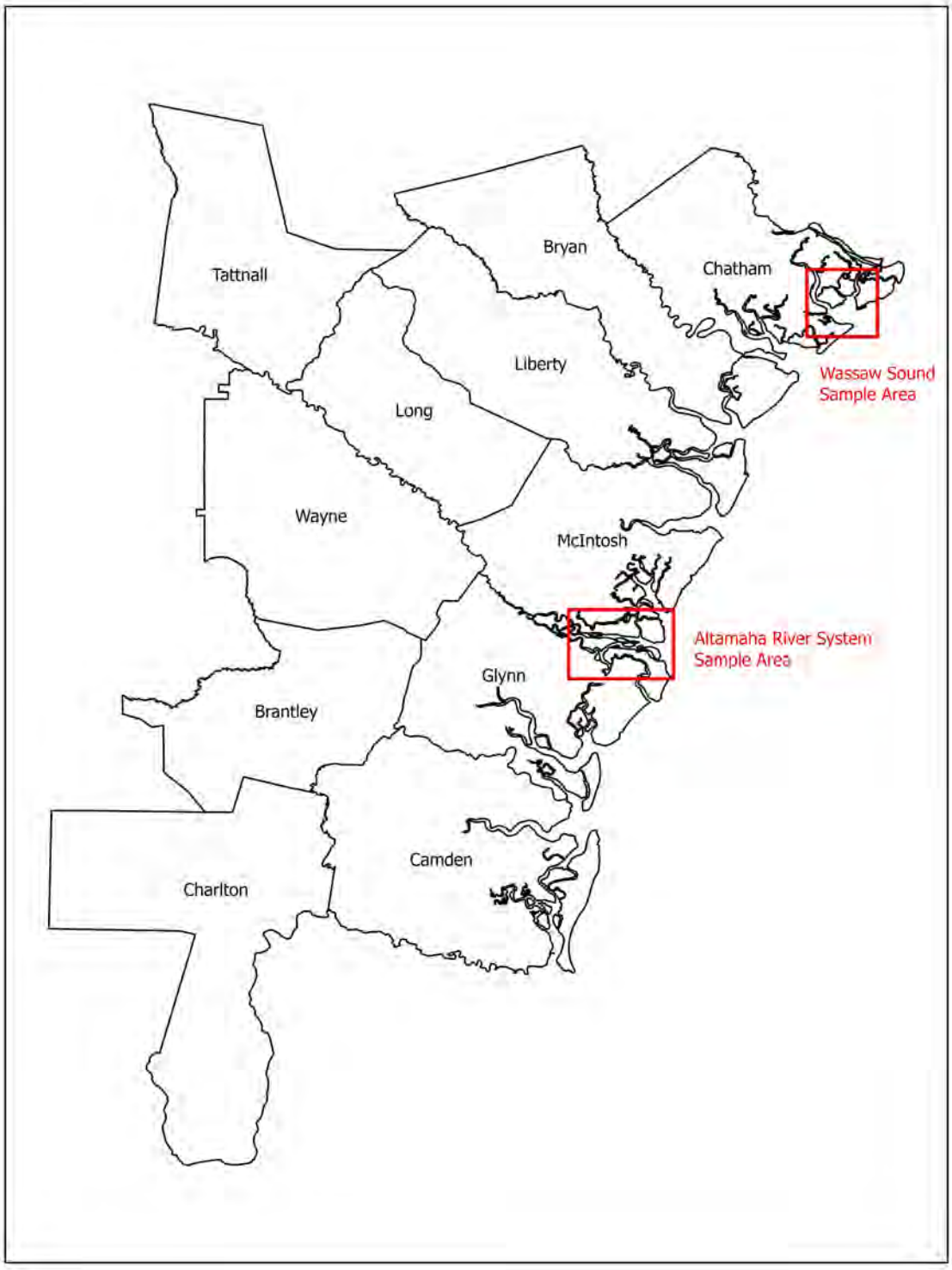

Figure 61. Georgia Trammel Net Survey sampling areas.

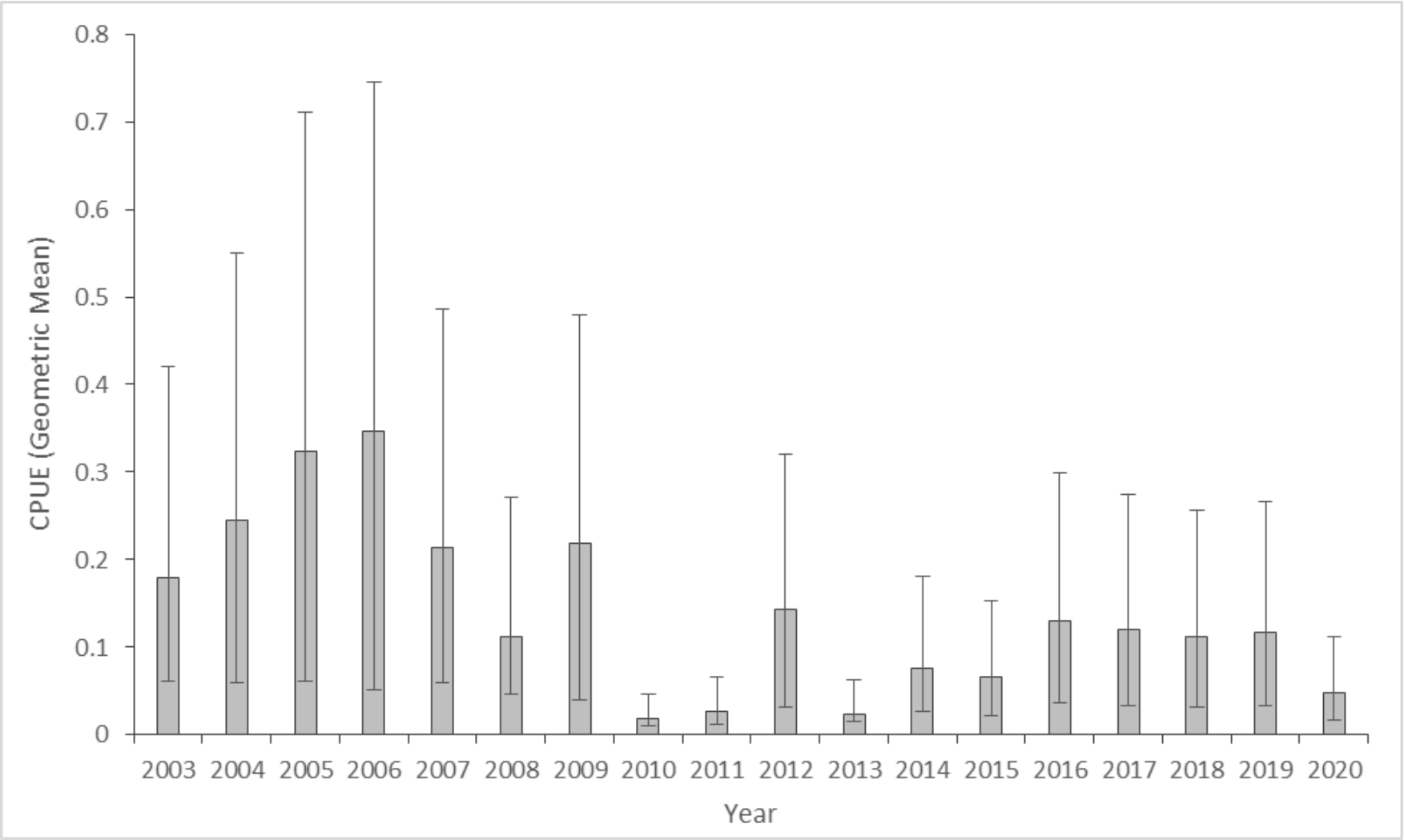

Figure 62. Annual geometric mean of black drum in the Georgia Trammel Net Survey (number of fish per set), 2003-2020. Error bars represent standard error.

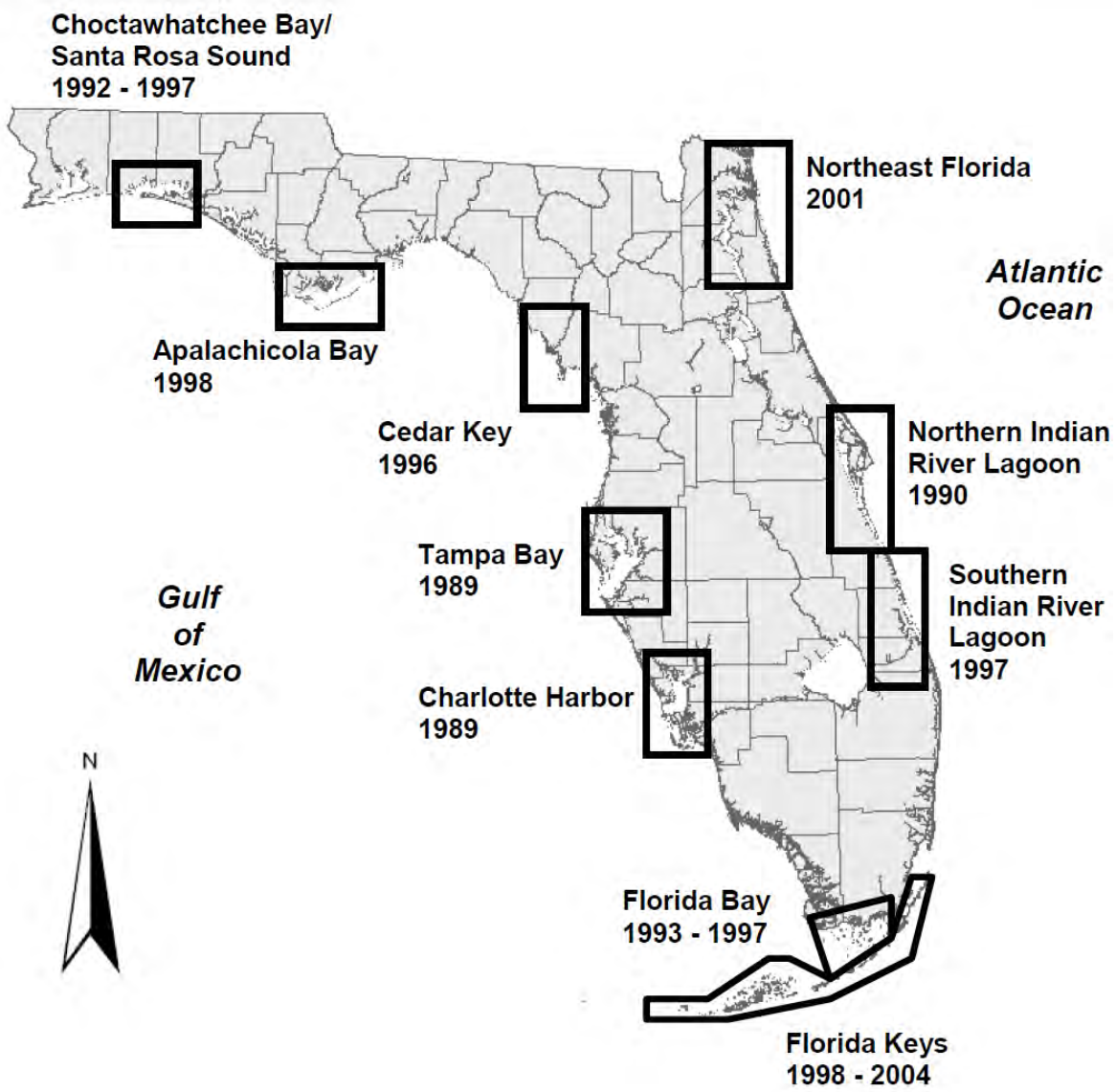

Figure 63. Locations of Fisheries-Independent Monitoring program field laboratories. Years indicate initiation of sampling. If sampling was discontinued at a field lab, the last year of sampling is also provided (FWRI 2020).

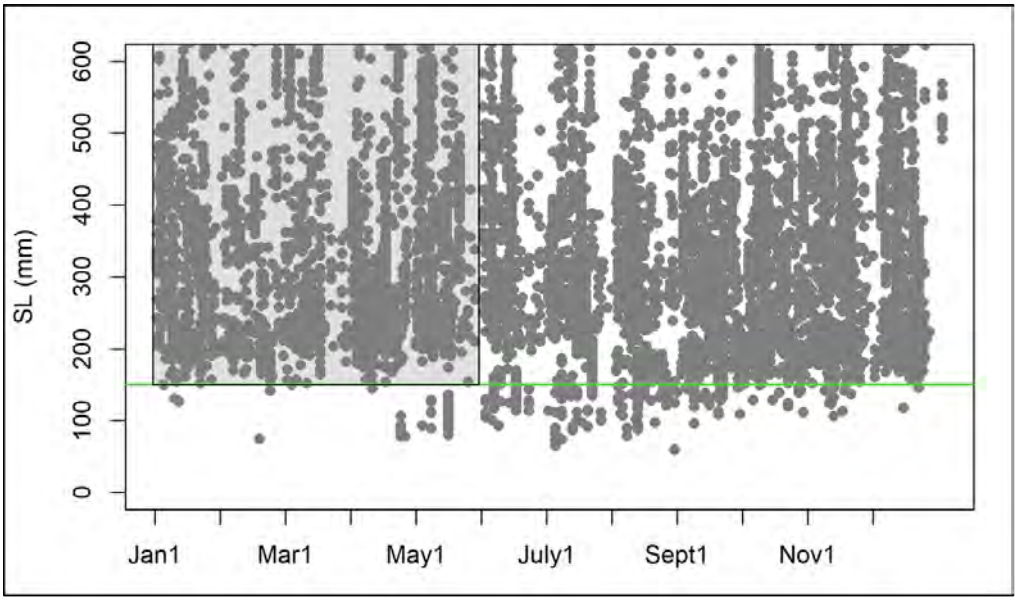

Figure 64. Black drum standard lengths (SL mm) sampled by the 183-m seine survey in the IRL (1999-2020). Post-YOY minimum length is assumed to be 150 SL mm (green line) from January 1 to June 1 (shaded region). The shaded region identifies sampled black drum that were used to develop an age-1+ index of abundance.

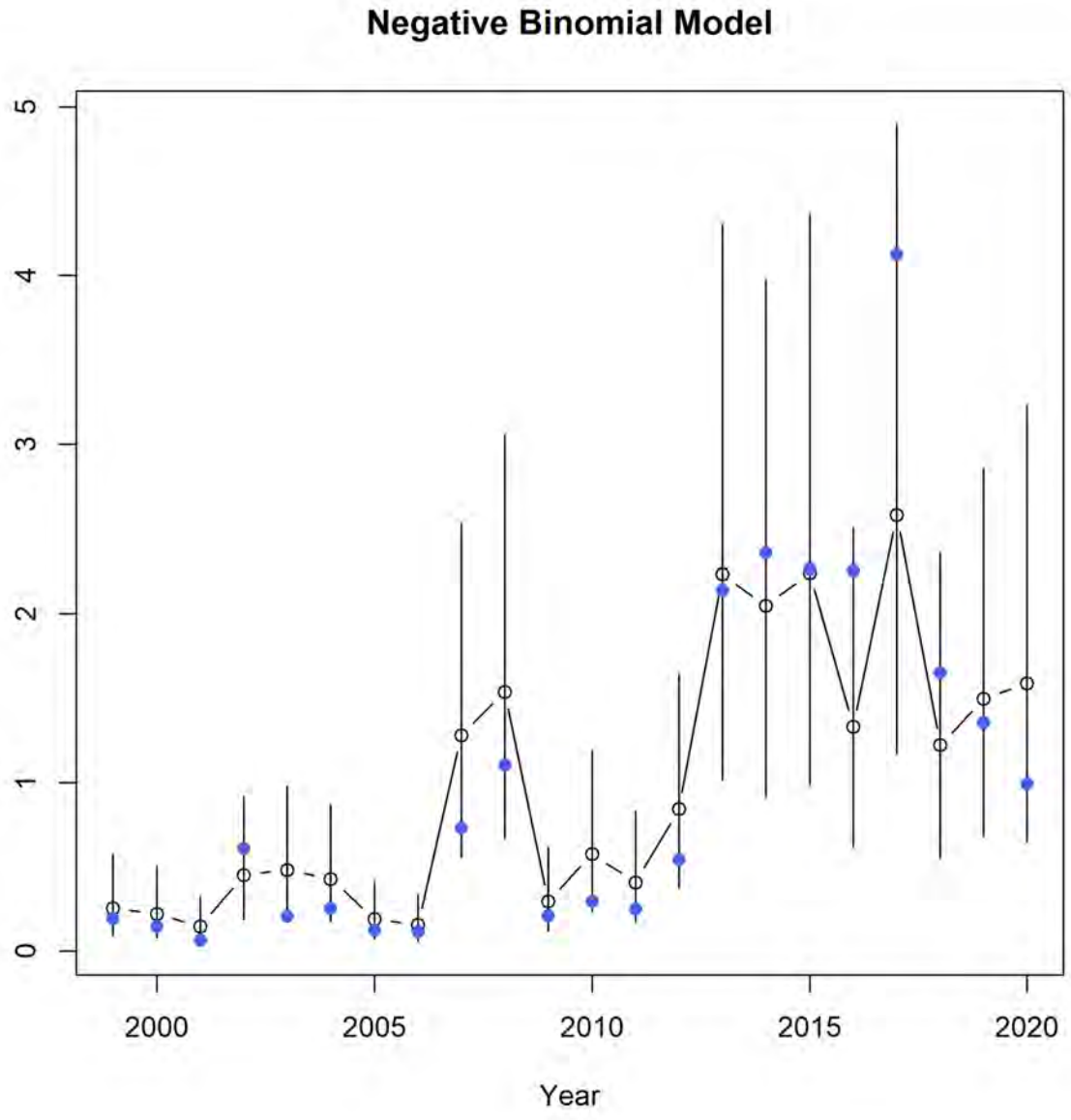

Figure 65. Black drum age-1+ FIM index (183-m seine) from the IRL, 1999-2020. Means relative to the overall mean and 95% confidence intervals of a standardized CPUE index assuming a negative binomial error structure are shown by the black open points and lines, respectively. Nominal means by year relative to the overall mean are shown by the blue closed points.

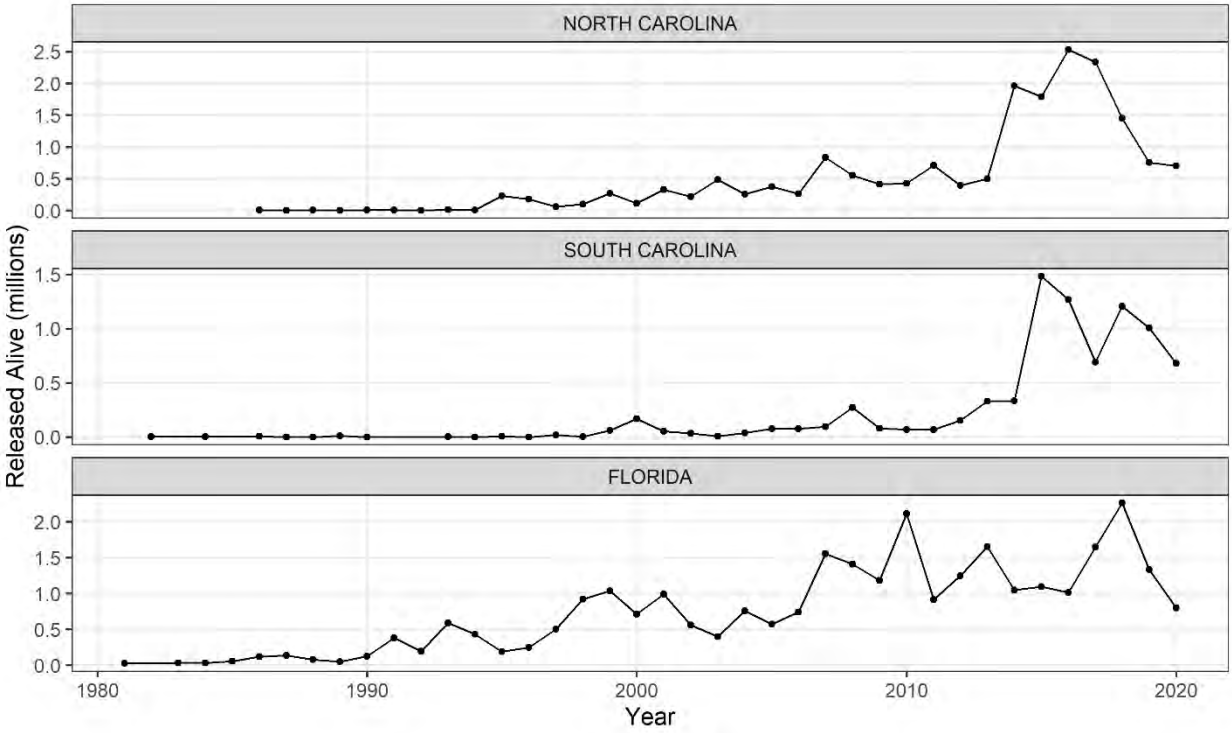

Figure 66. MRIP estimates of released alive black drum for the primary contributor states.

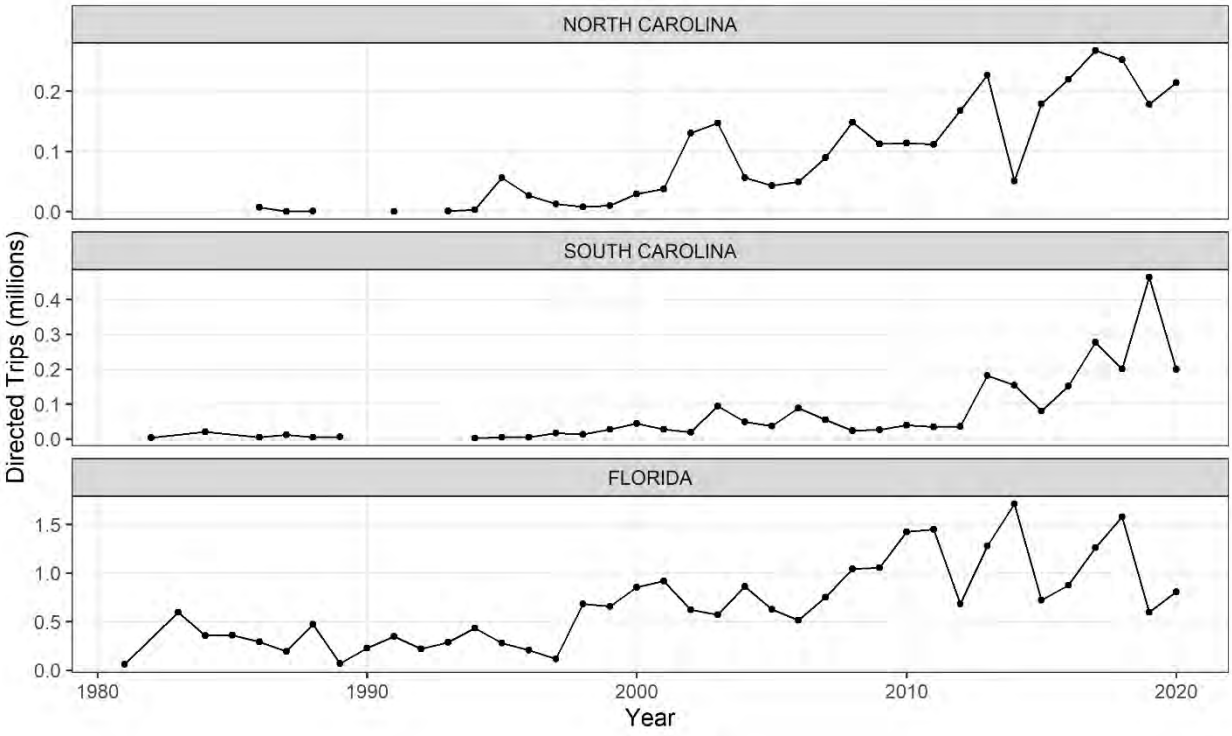

Figure 67. MRIP estimates of directed black drum trips for the primary contributor states.

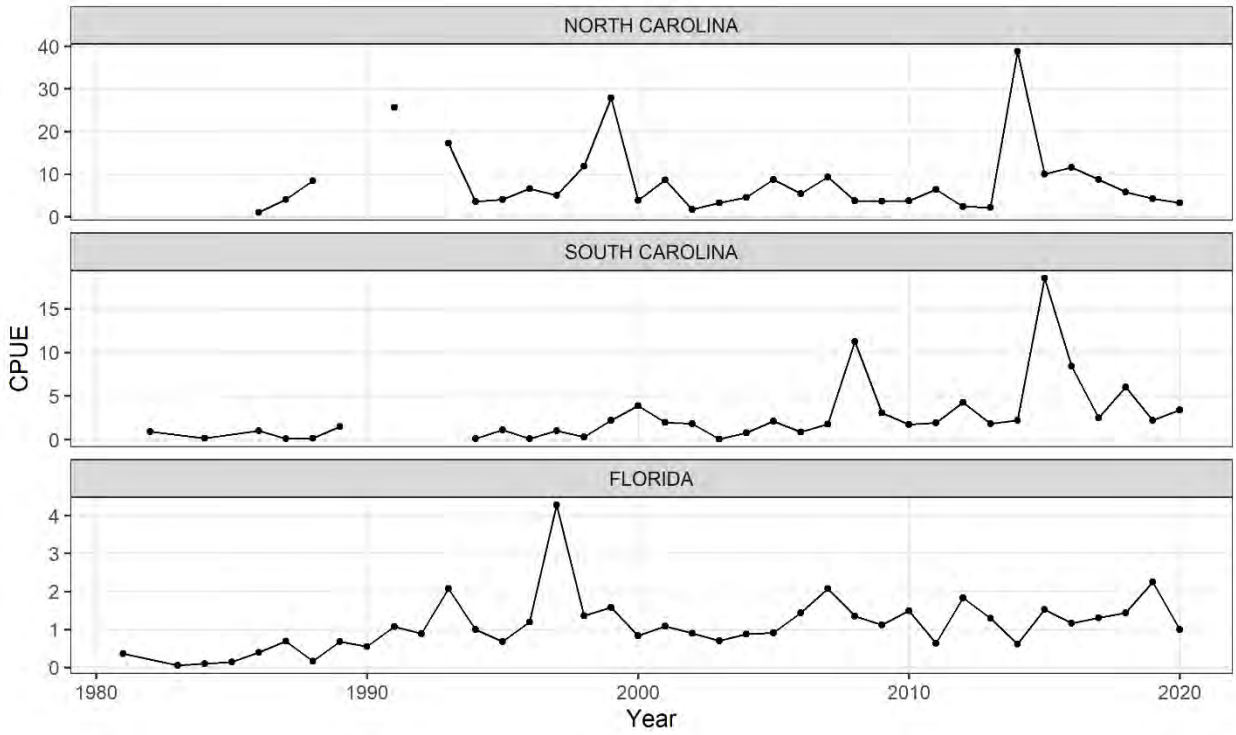

Figure 68. Estimates of CPUE (released alive black drum per directed trip) for the primary contributor states.

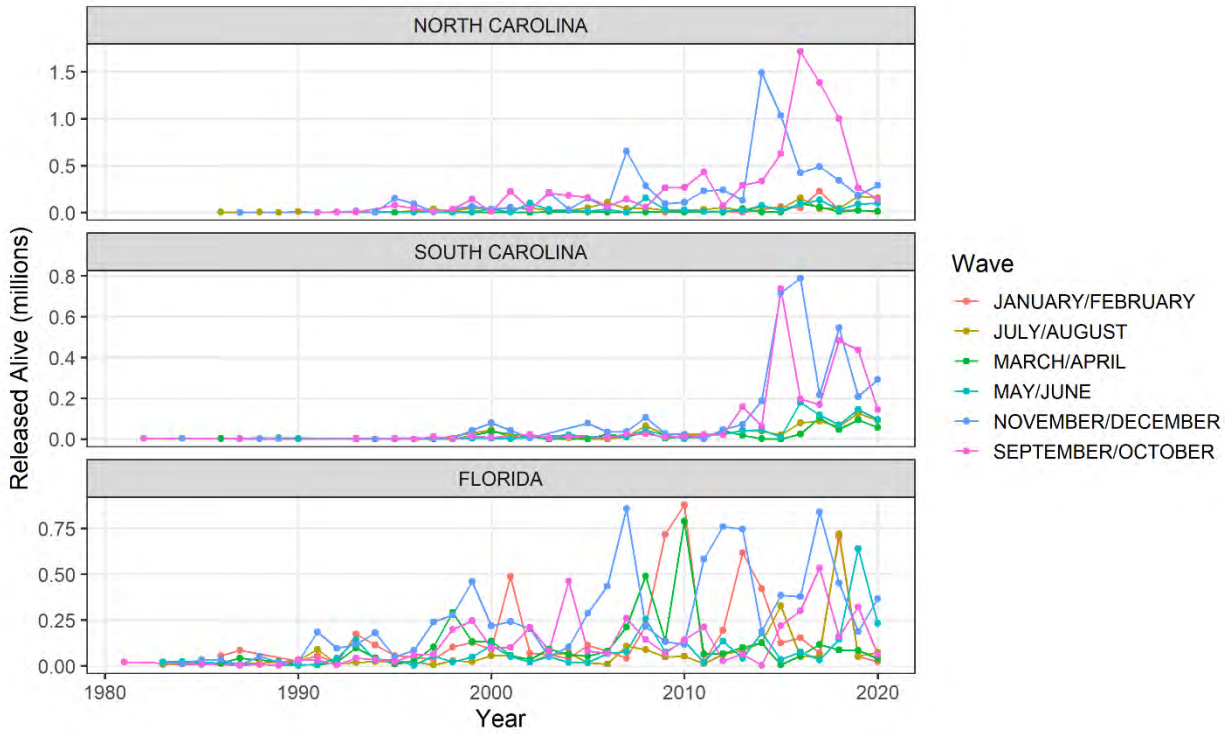

Figure 69. MRIP estimates of released alive black drum by wave for the primary contributor states.

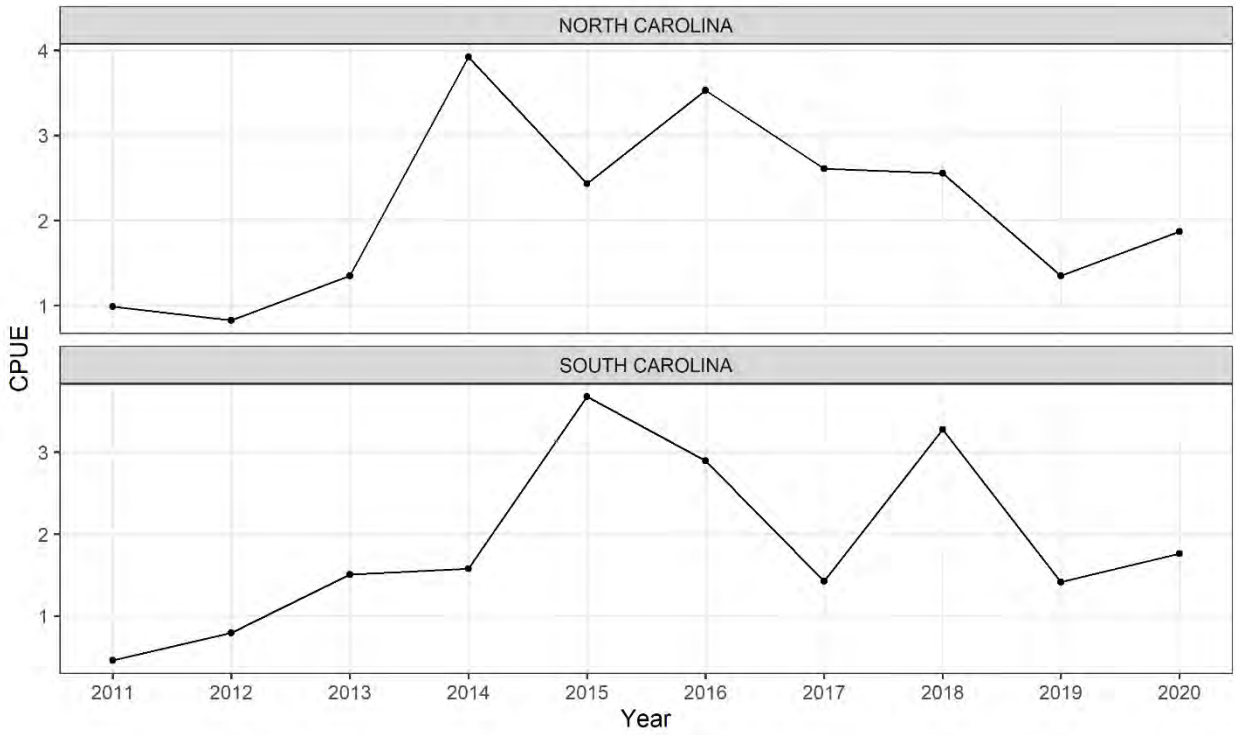

Figure 70. Estimates of CPUE (released alive black drum per directed trip) for NC and SC from September-December.

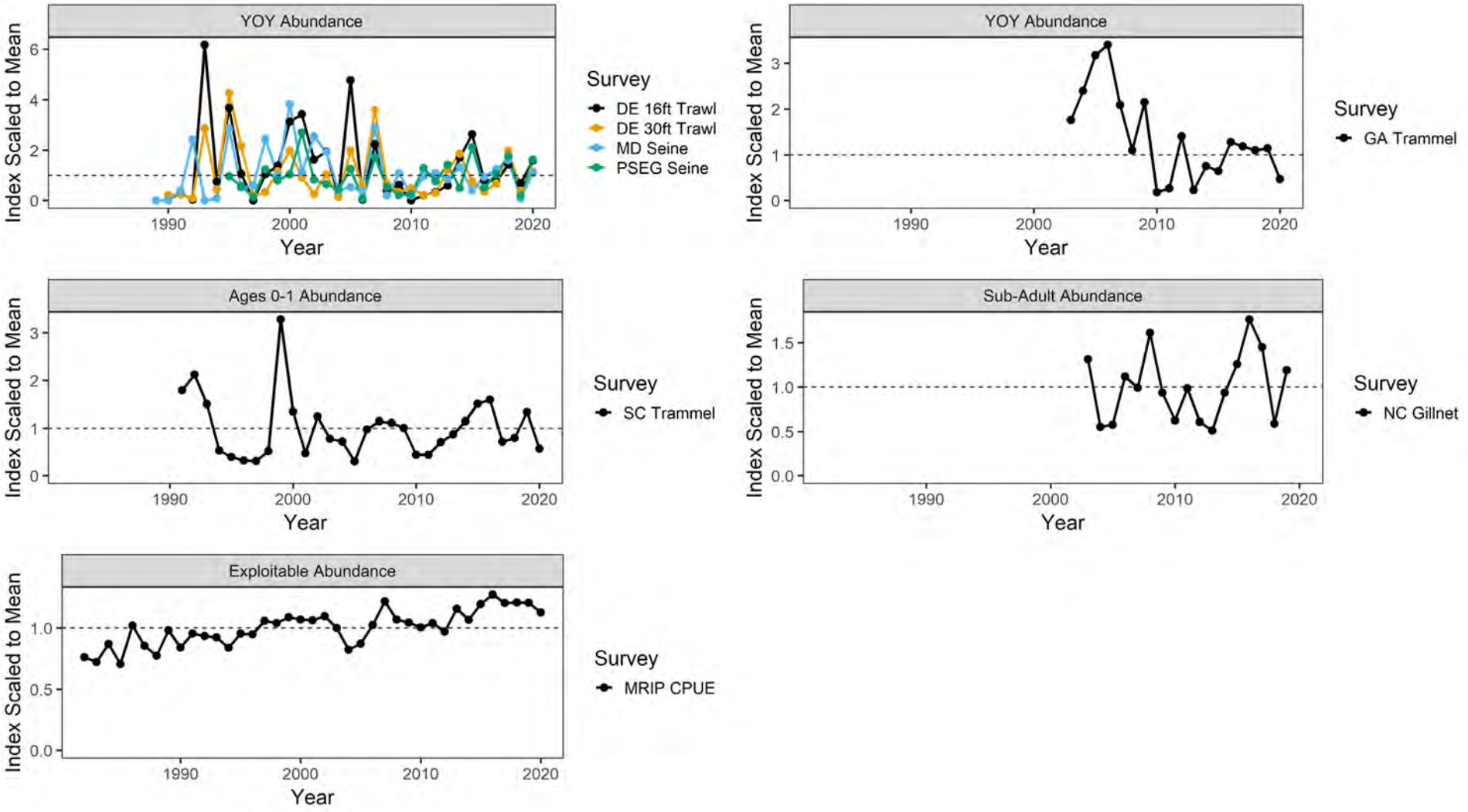

Figure 71. Abundance Indicators. The GA Trammel YOY index, the lone YOY index in the South Atlantic, is included on a separate panel because it is not similar to other YOY indices (all from the Mid-Atlantic) according to correlation analyses.

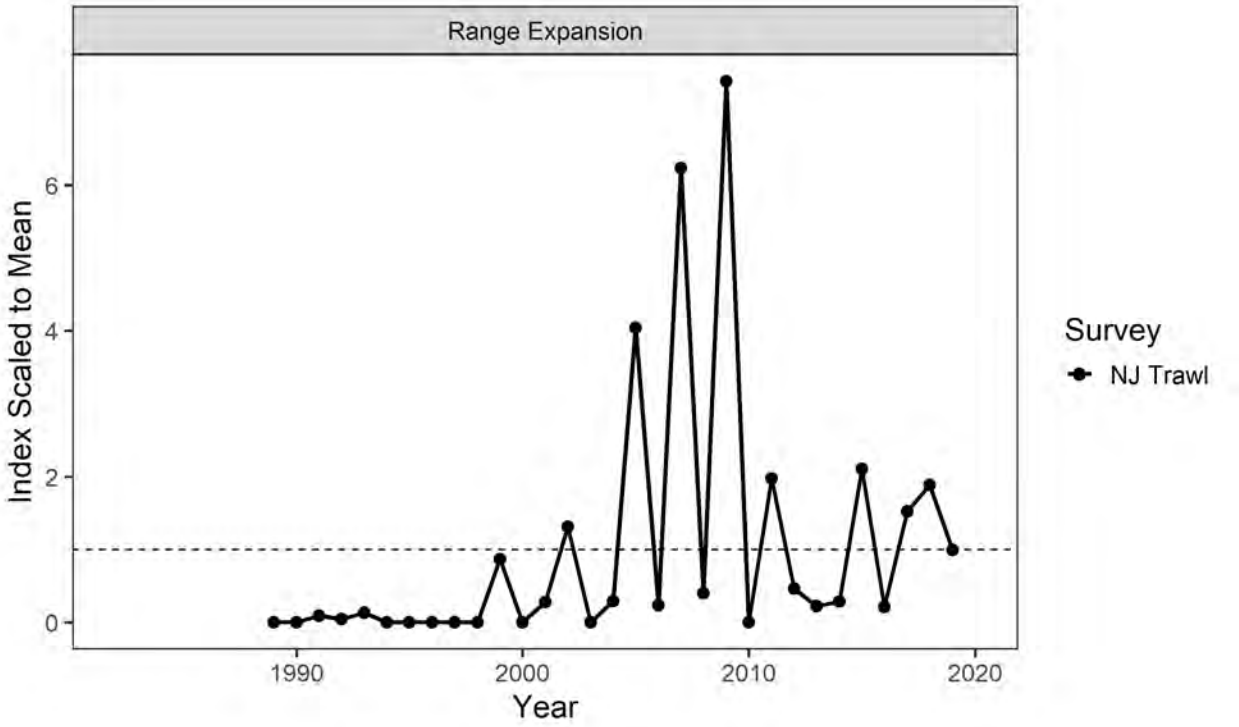

Figure 72. Range Expansion Indicator - NJ Ocean Trawl.

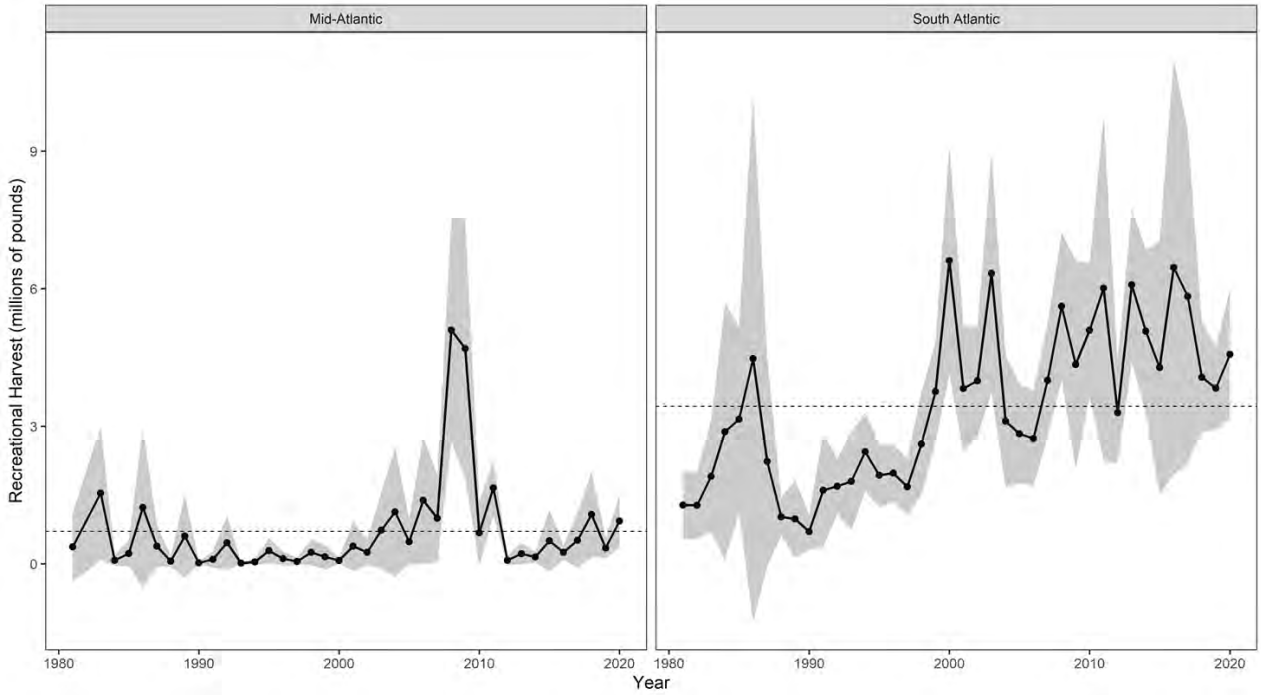

Figure 73. MRIP Recreational Harvest in millions of pounds for Mid-Atlantic and South Atlantic

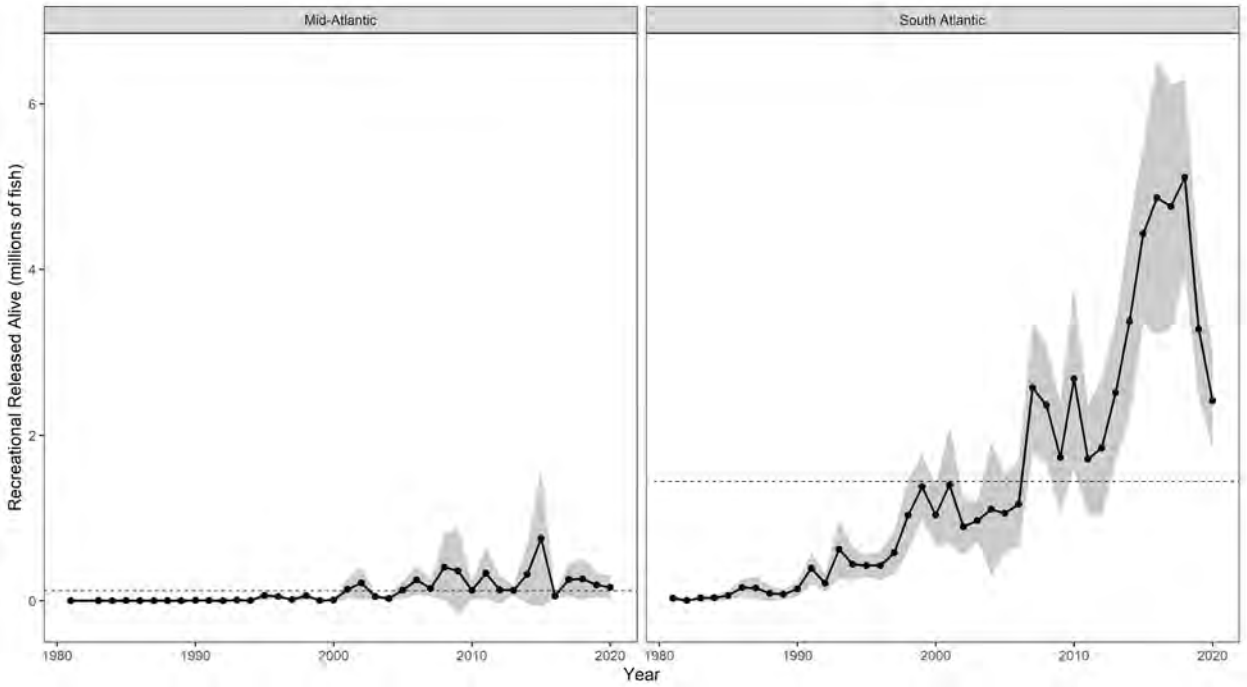

Figure 74. MRIP Recreational Released Alive in millions of fish for Mid-Atlantic and South-Atlantic

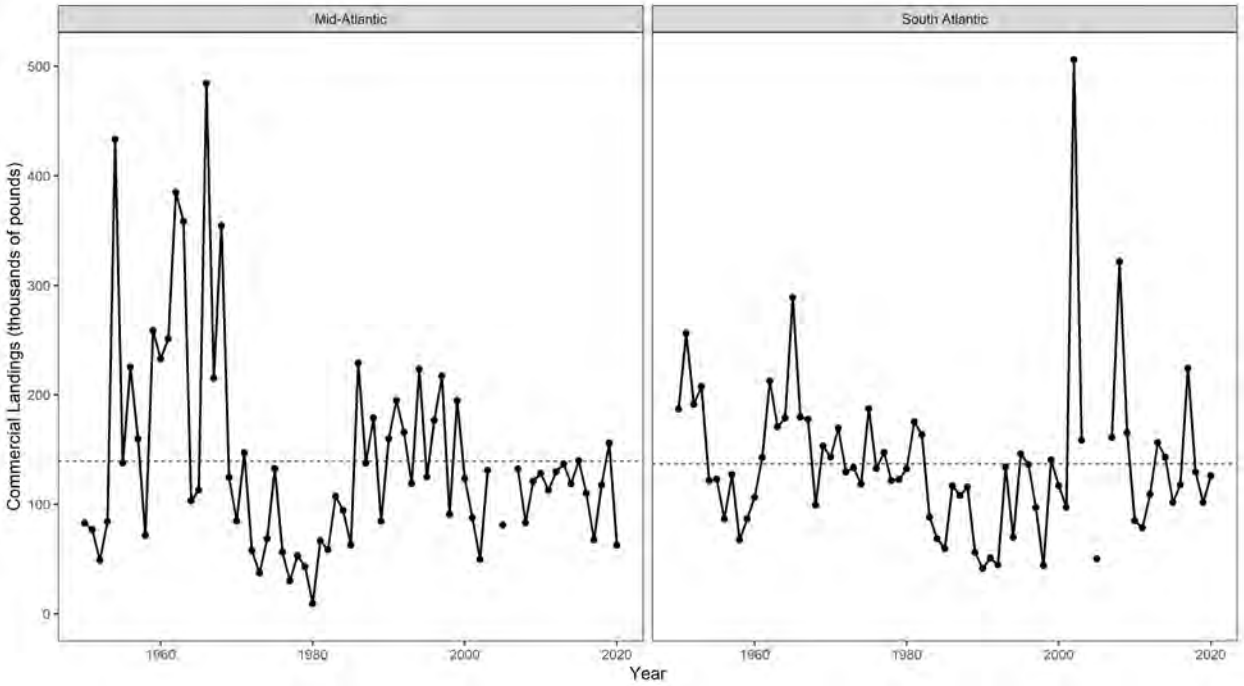

Figure 75. Commercial landings in thousands of pounds for Mid-Atlantic and South Atlantic. Missing values indicate confidential data that have been redacted.

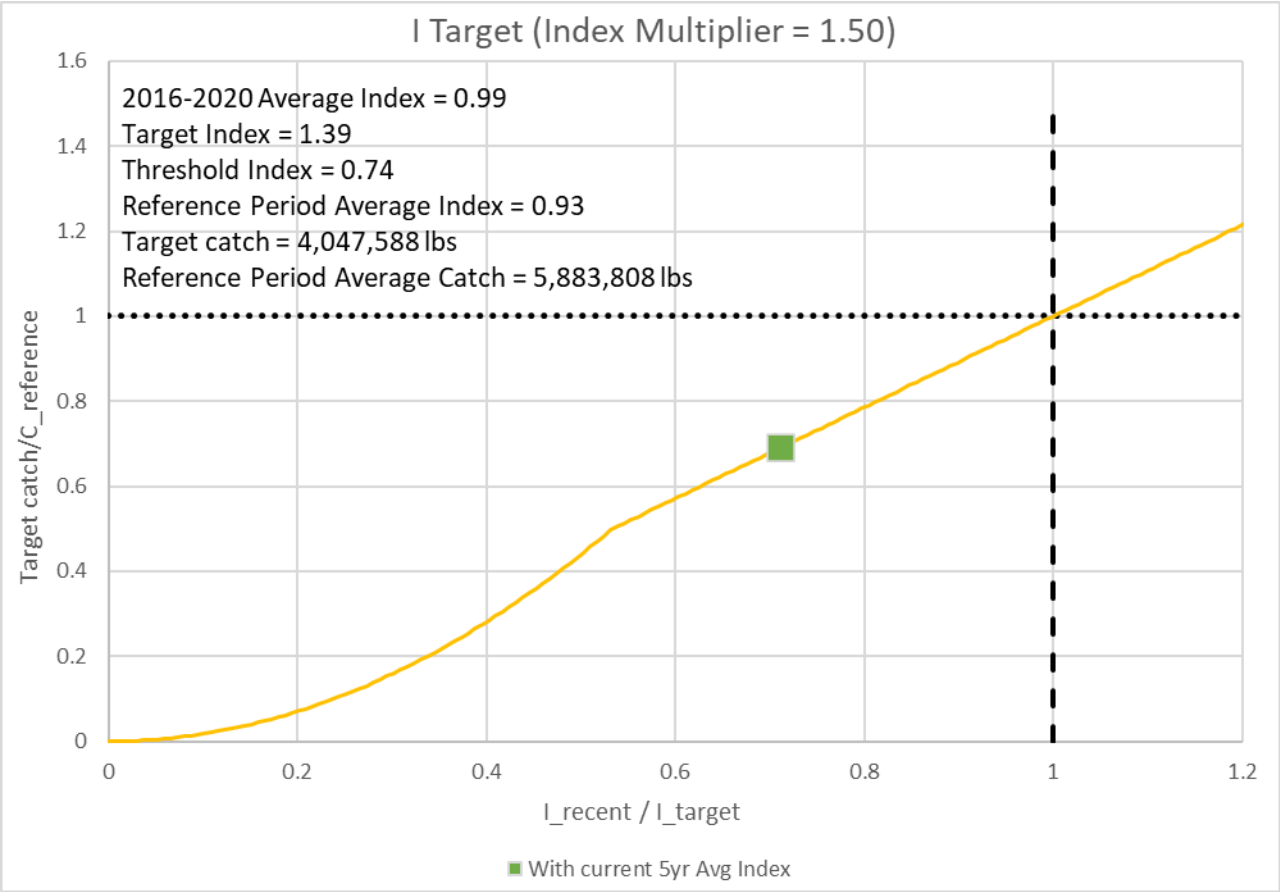

Figure 76. Itarget method's relationship between target catch and relative index (orange line) using the last 25 years (1996-2020) as the reference period and 1.5 as the index multiplier. The green square shows the corresponding X and Y values of this relationship with the current 5-year average index.

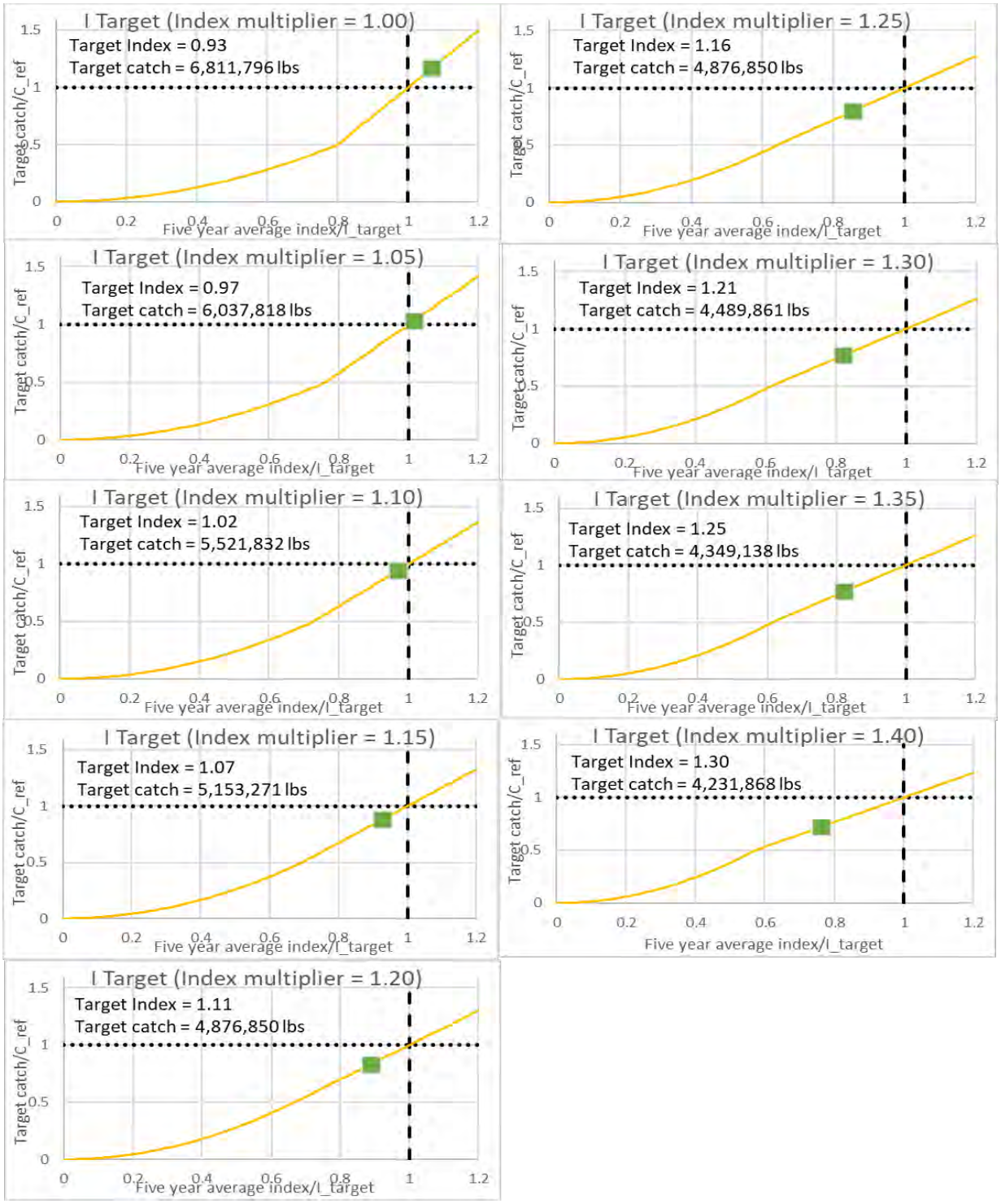

Figure 77. Itarget method's relationships between target catch and relative index (orange line) using the last 25 years (1996-2020) as the reference period and 1.00 – 1.40 as the index multiplier. The green square shows the corresponding X and Y values of this relationship with the current 5-year average index (0.99). The reference period average index and catch and the threshold index are the same as those shown in Figure 76.

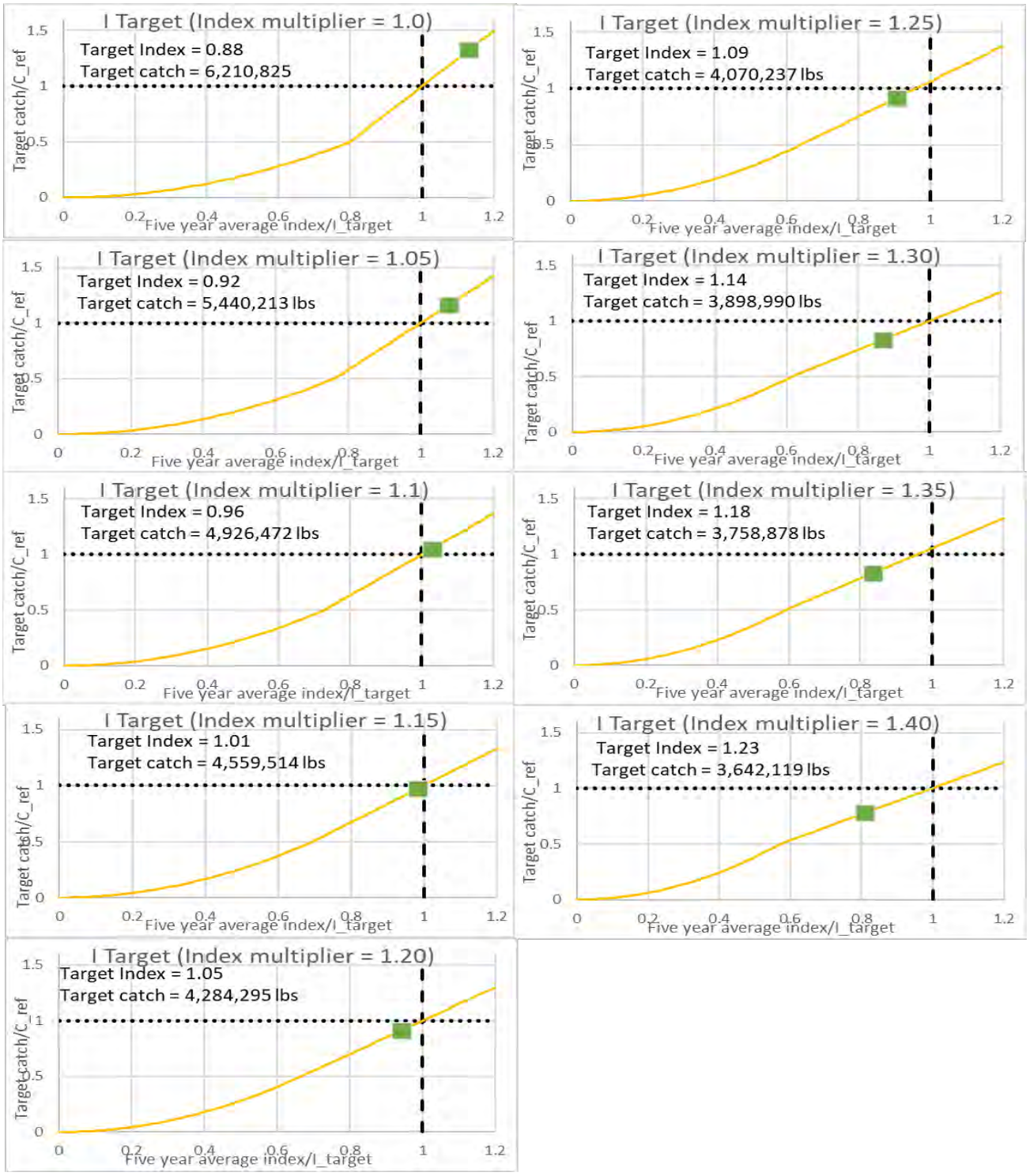

Figure 78. Itarget method's relationships between target catch and relative index (orange line) using the full time series (1982-2020) as the reference period and 1.00 – 1.40 as the index multiplier. The green square shows the corresponding X and Y values of this relationship with the current 5-year average index (0.99). The reference period average index = 0.88; reference period average catch = 4.72 million lbs; and the threshold index = 0.70.

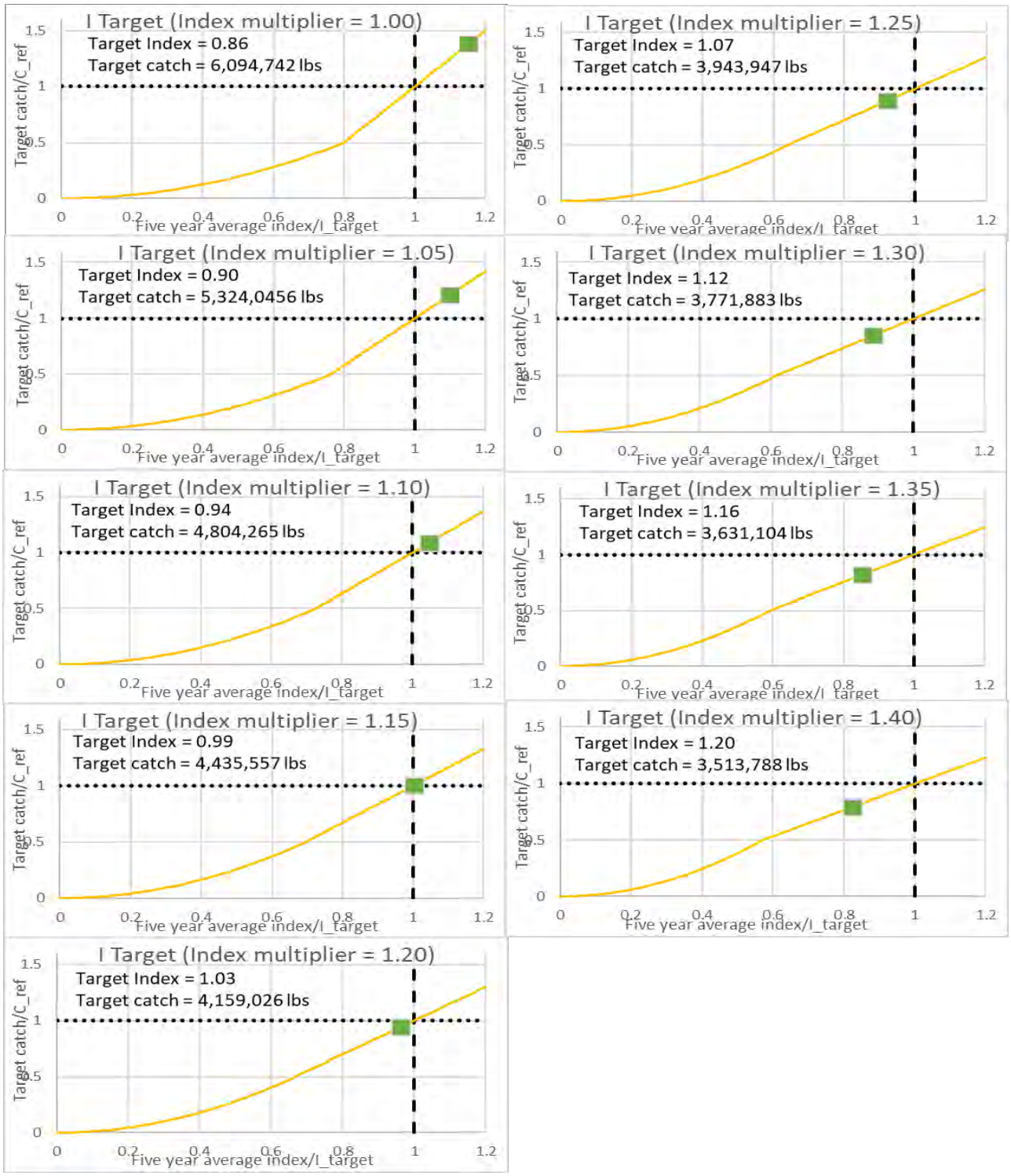

Figure 79. Itarget method's relationships between target catch and relative index (orange line) using the earliest 34 years (1982-2015) as the reference period and 1.00 – 1.40 as the index multiplier. The green square shows the corresponding X and Y values of this relationship with the current 5-year average index (0.99). The reference period average index = 0.86; reference period average catch = 4.45 million lbs; and the threshold index = 0.69.

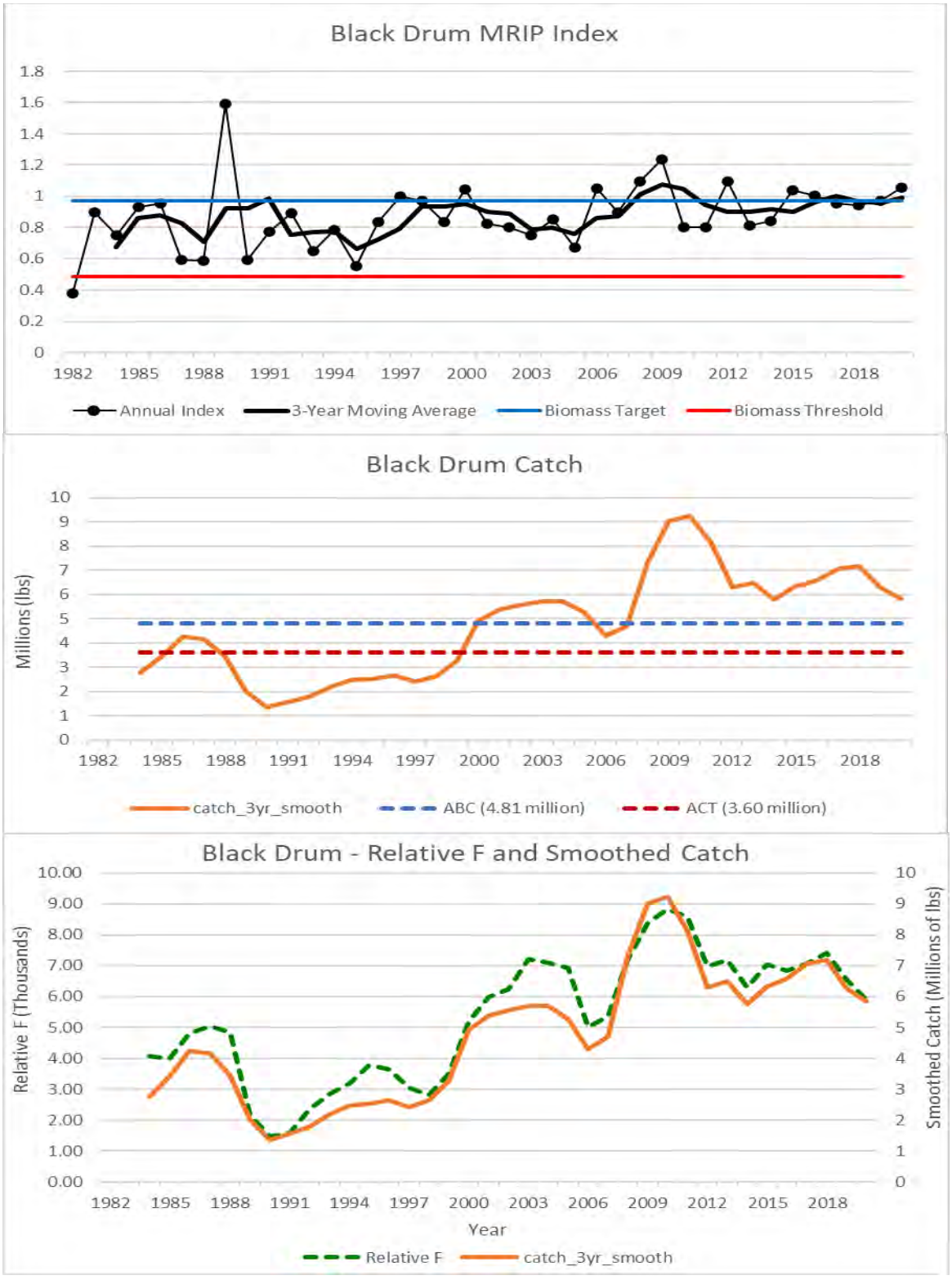

Figure 80. MRIP CPUE index (annual and smoothed) with biomass target and threshold levels (top), smoothed catch with ABC and ACT levels (middle), and relative *F* with smoothed catch (bottom) for black drum with the Skate method.

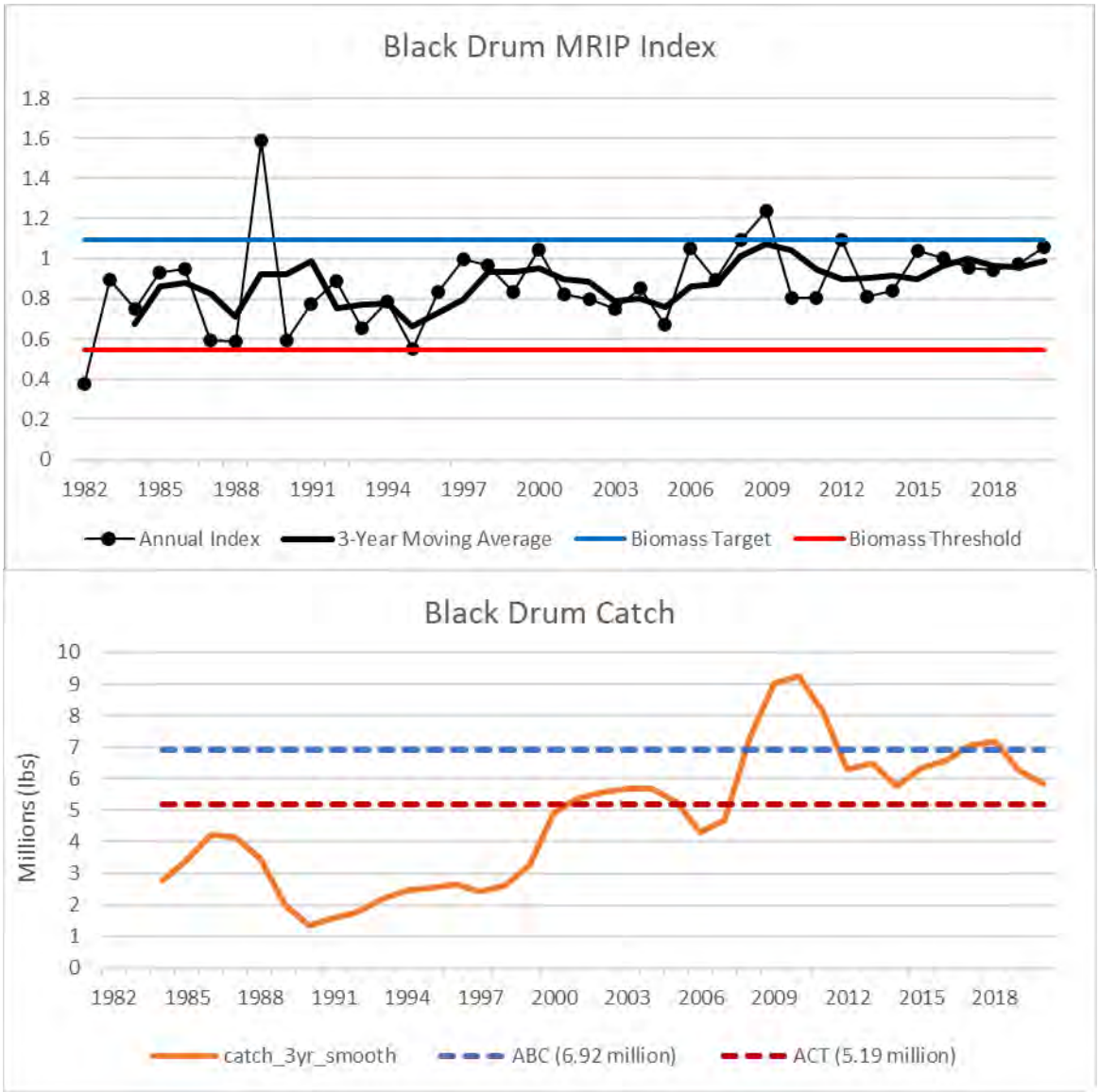

Figure 81. MRIP CPUE index (annual and smoothed) with biomass target and threshold levels (top), and smoothed catch with ABC and ACT levels (bottom) for black drum with the Skate method using only the years 2000-2012 for determining biomass target and threshold levels and median relative *F*.

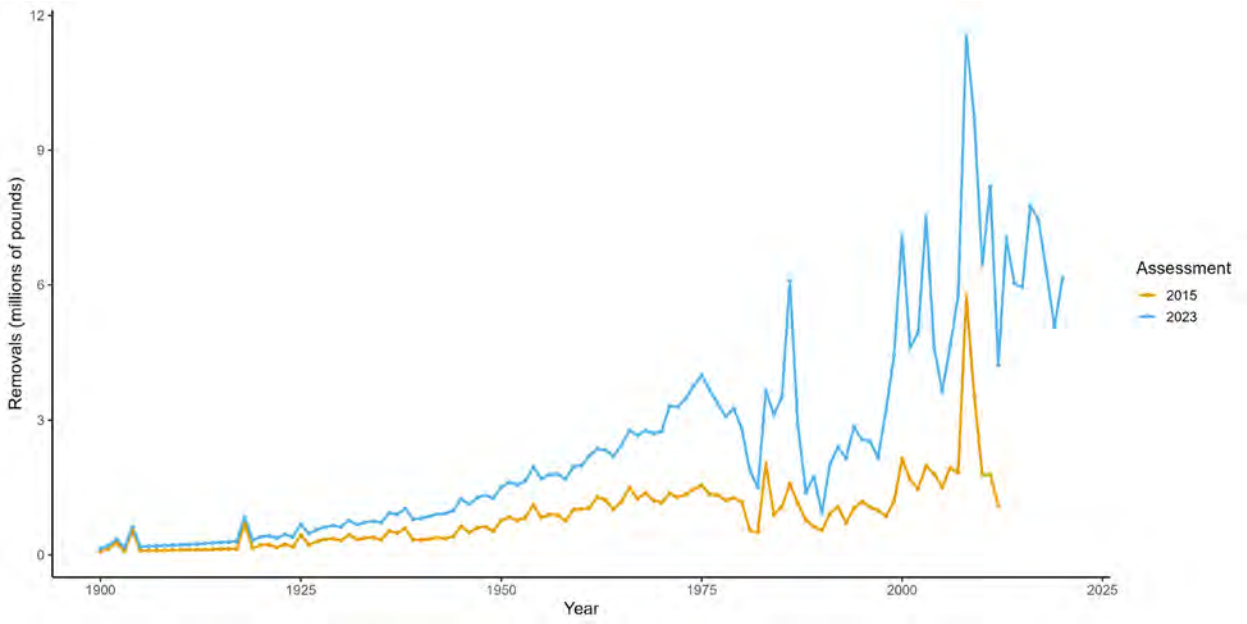

Figure 82. Fishery removal data time series of black drum used in DB-SRA during the current 2023 assessment (blue line, 2020 terminal data year) and the previous 2015 assessment (yellow line, 2012 terminal data year).

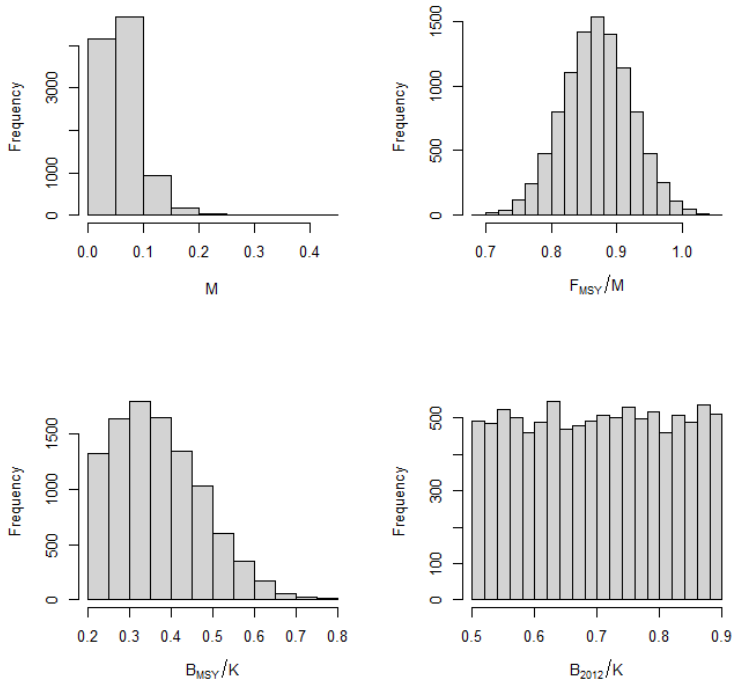

Figure 83. Input distributions for DB-SRA parameters used in the *New_Catch* continuity run with the Hoenig (1983) natural mortality estimate used in the previous assessment.

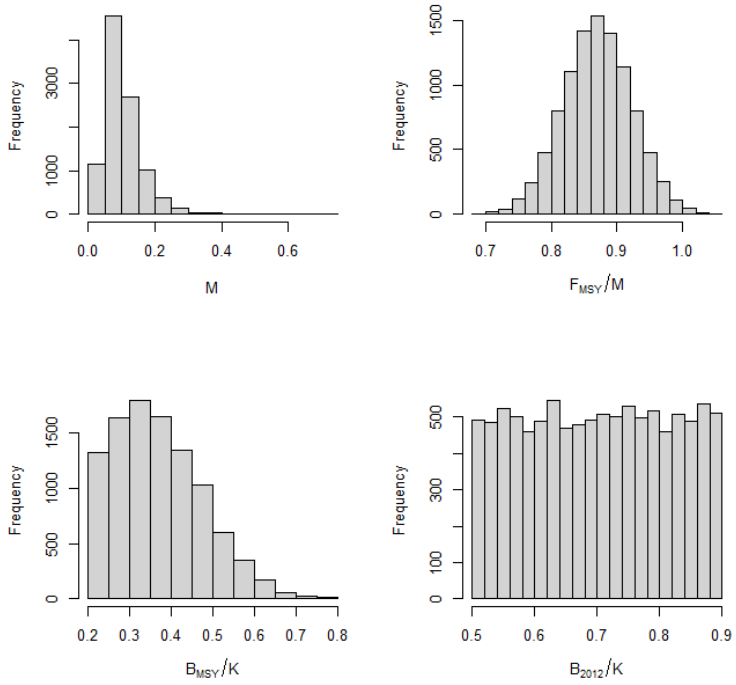

Figure 84. Input distributions for DB-SRA parameters used in the *Then_M* continuity run with the Then et al. (2015) natural mortality estimate adopted in this assessment.

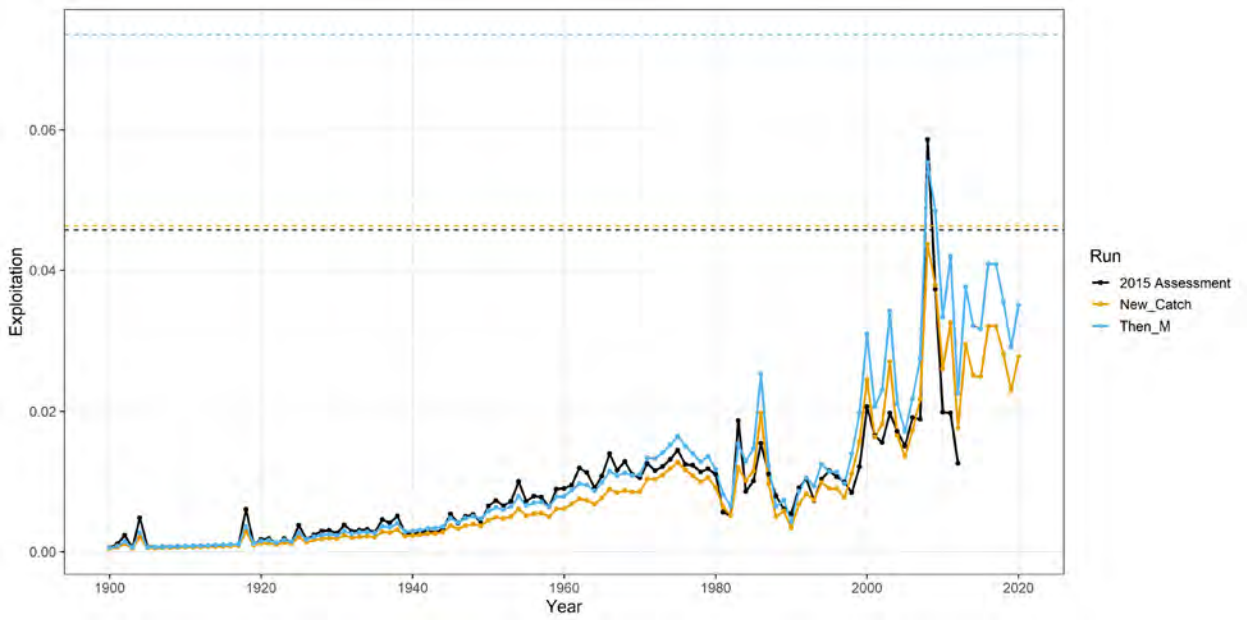

Figure 85. Median exploitation (solid lines) and U_{MSY} estimates (dashed lines) from the DB-SRA during the 2015 assessment and updated through 2020 in this assessment.

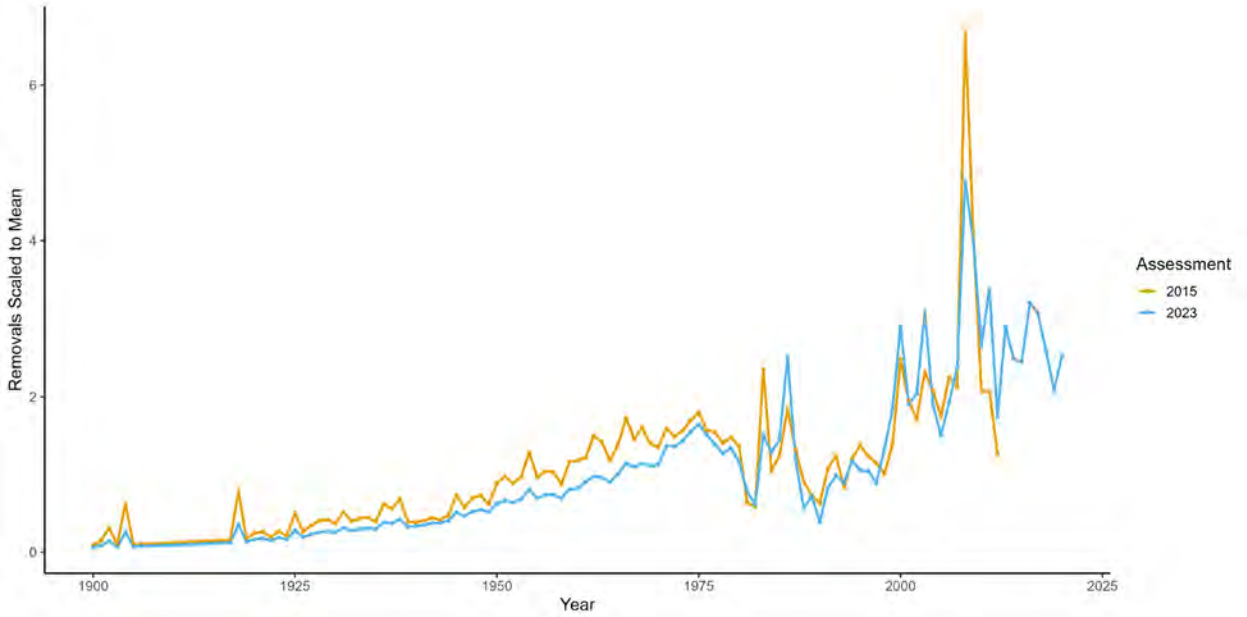

Figure 86. Fishery removal data time series of black drum used in DB-SRA during the current 2023 assessment (2020 terminal data year) and the previous 2015 assessment (2012 terminal data year) scaled to the time series mean.

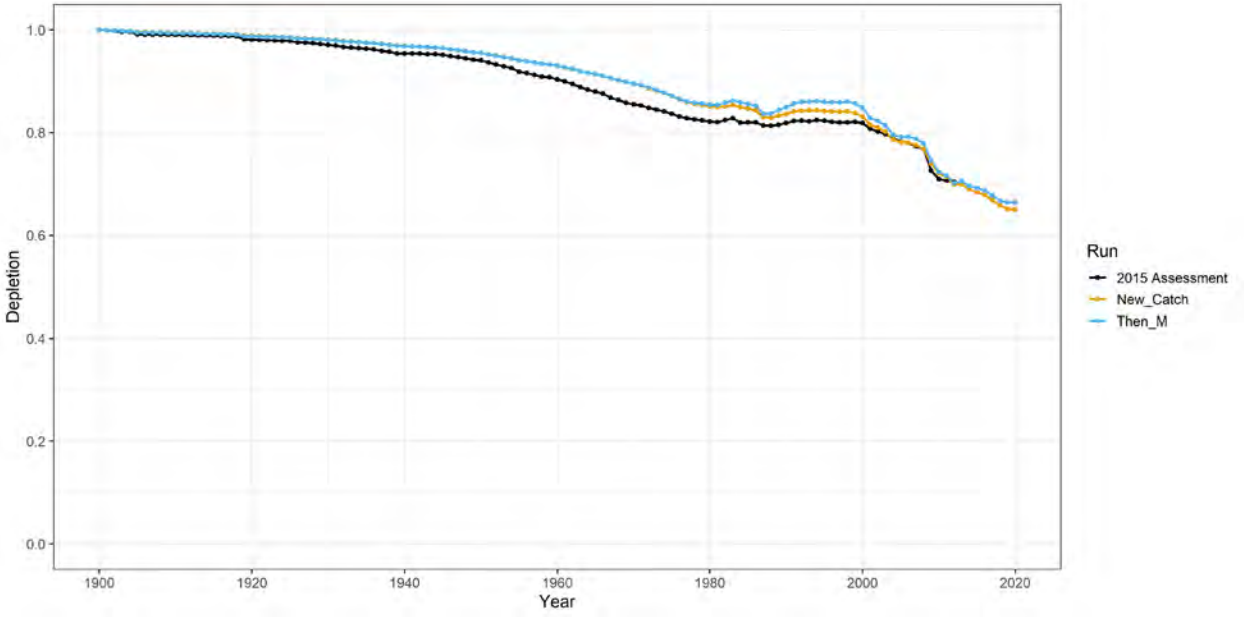

Figure 87. Median depletion (B_y/K) estimates from the DB-SRA during the 2015 assessment and updated through 2020 in this assessment.

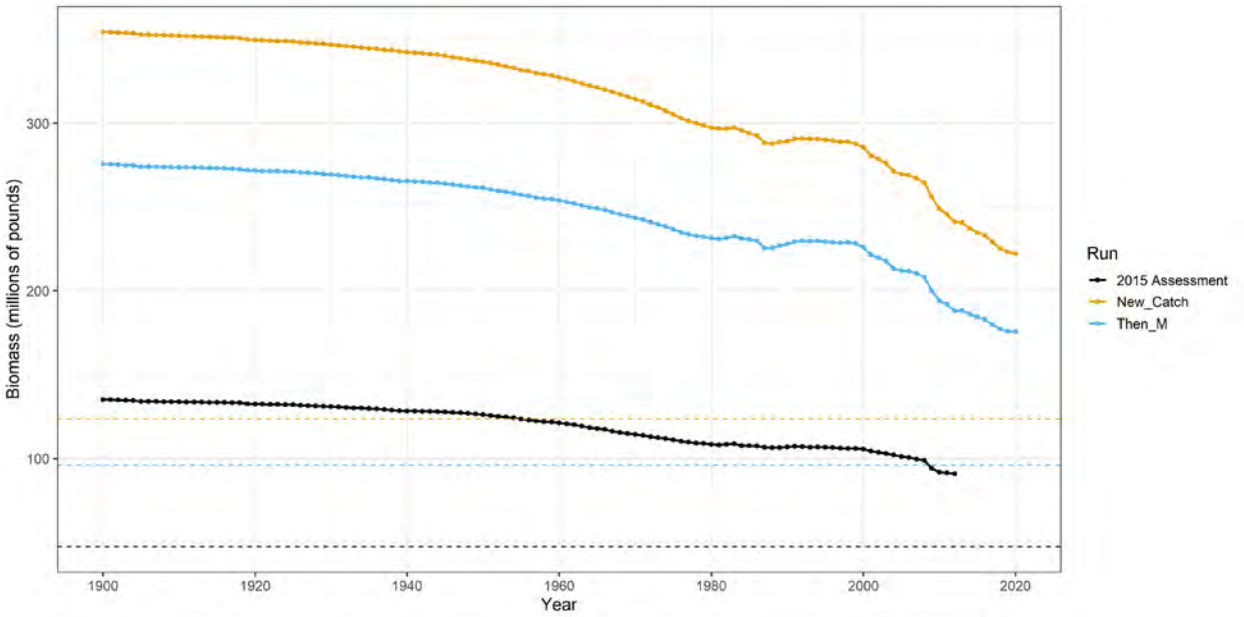

Figure 88. Median biomass (solid lines) and B_{MSY} estimates (dashed lines) from the DB-SRA during the 2015 assessment and updated through 2020 in this assessment.

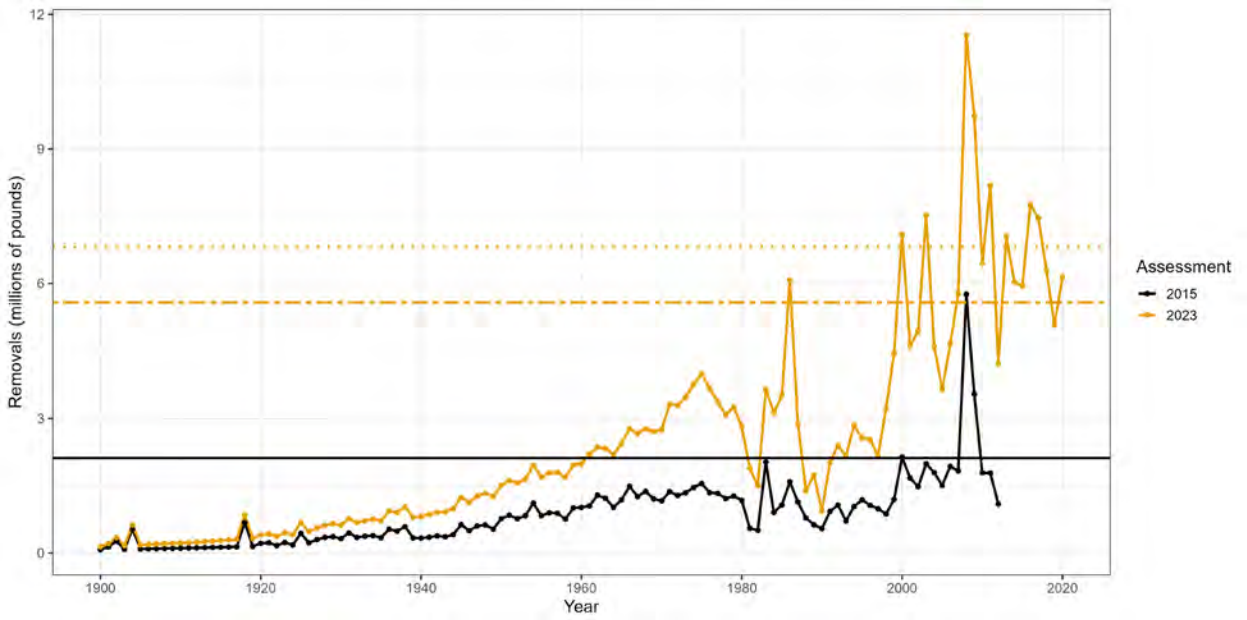

Figure 89. Fishery removal data time series of black drum used in DB-SRA during the current 2023 assessment (2020 terminal data year) and the previous 2015 assessment (2012 terminal data year) compared to median MSY estimates during each assessment (horizontal lines). The lower dot-dashed line is the MSY estimate from the *New_Catch* continuity run and the dotted line is the MSY estimate from the *Then_M* continuity run.

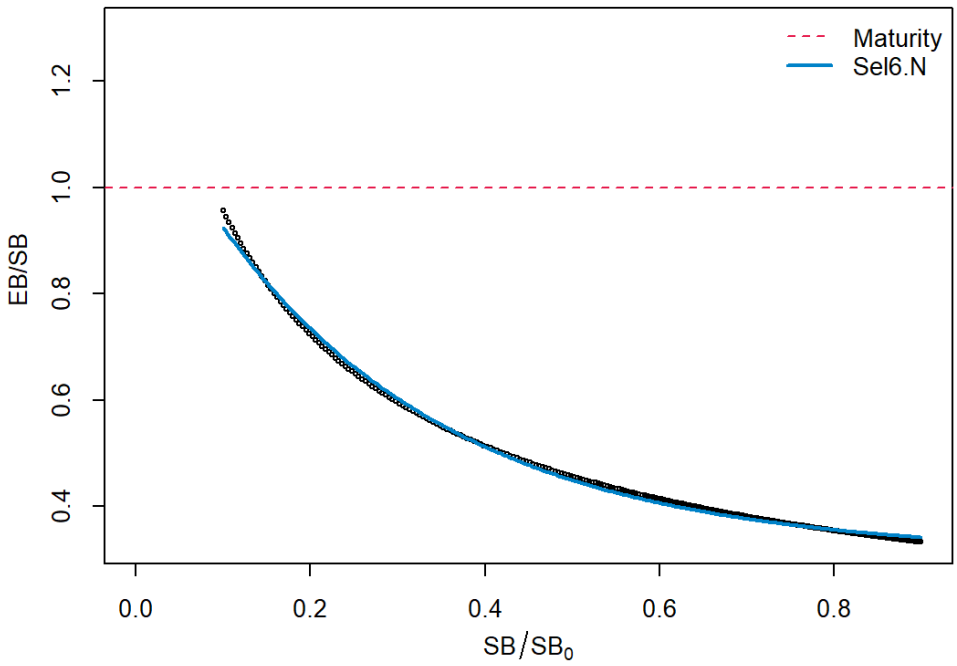

Figure 90. Ratio of biomass tracked by MRIP CPUE (exploitable biomass, *EB*) and spawning biomass (*SB*) relative to the spawning biomass depletion for the JABBA-Select model. Circles are expected values according to the per-recruit models and the solid blue line is predicted values from equation 12 in Winker et al. 2020. The dashed line indicates the relationship if selectivity were equal to the maturity ogive.

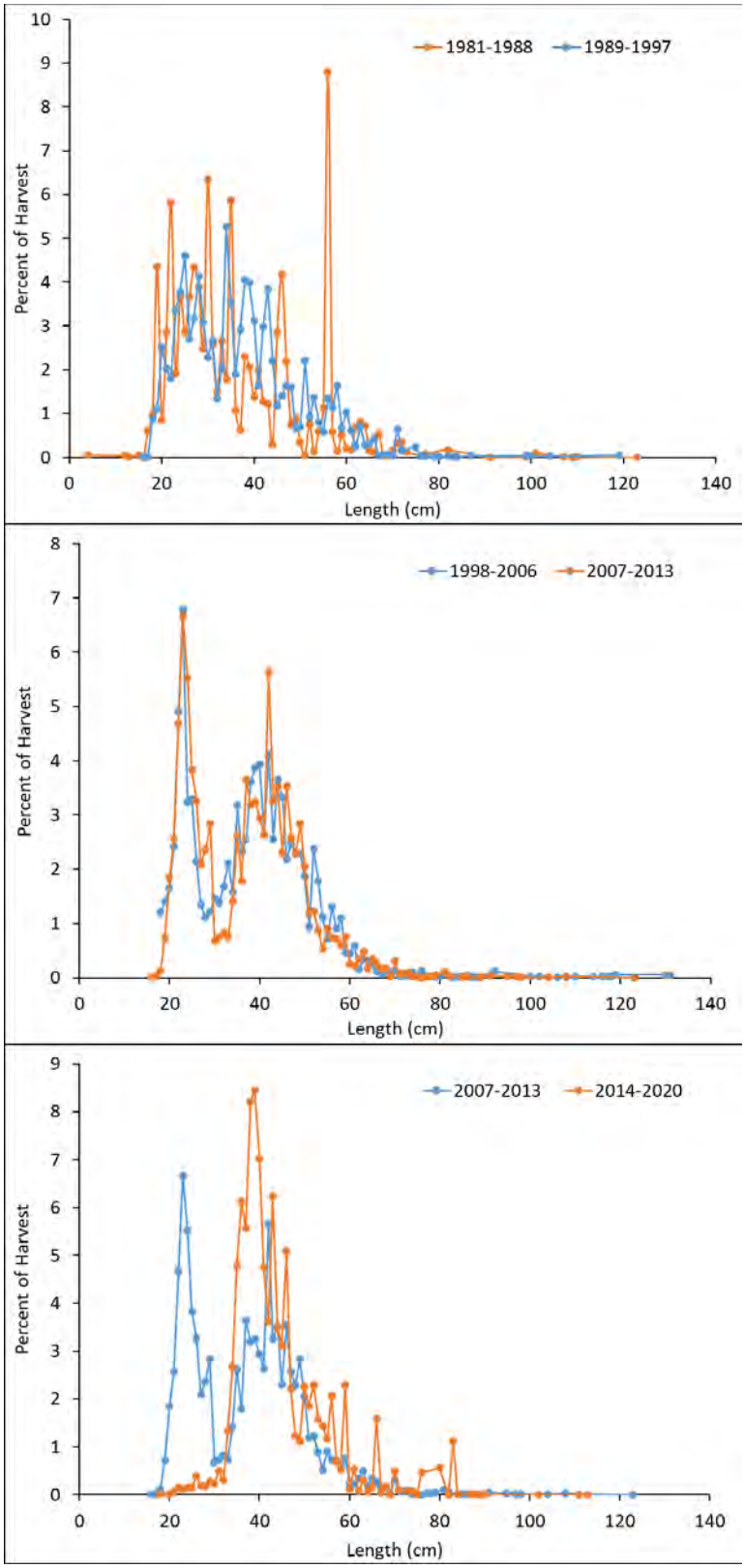

Figure 91. Comparison of MRIP length composition data aggregated over constant management periods in the South Atlantic.

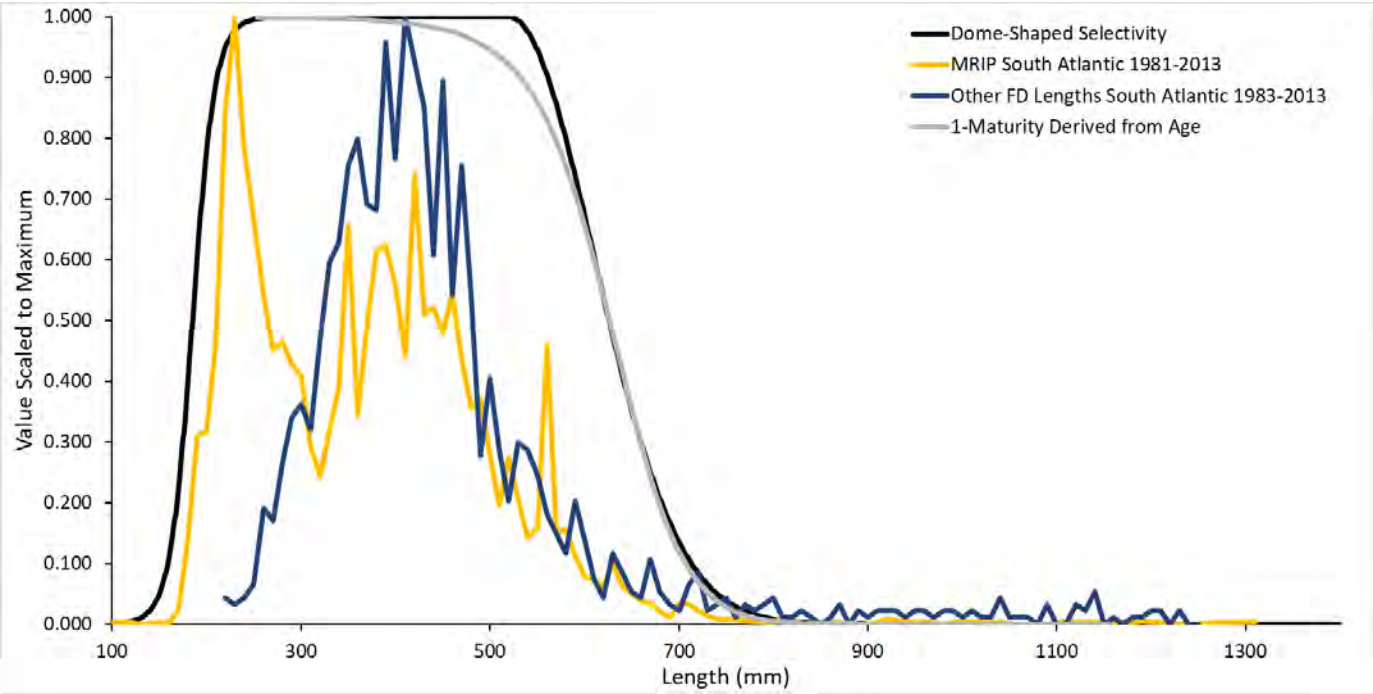

Figure 92. Length selectivity used for the first selectivity period of the SA fleet (SA_1) in JABBA-Select compared to data used to specify selectivity.

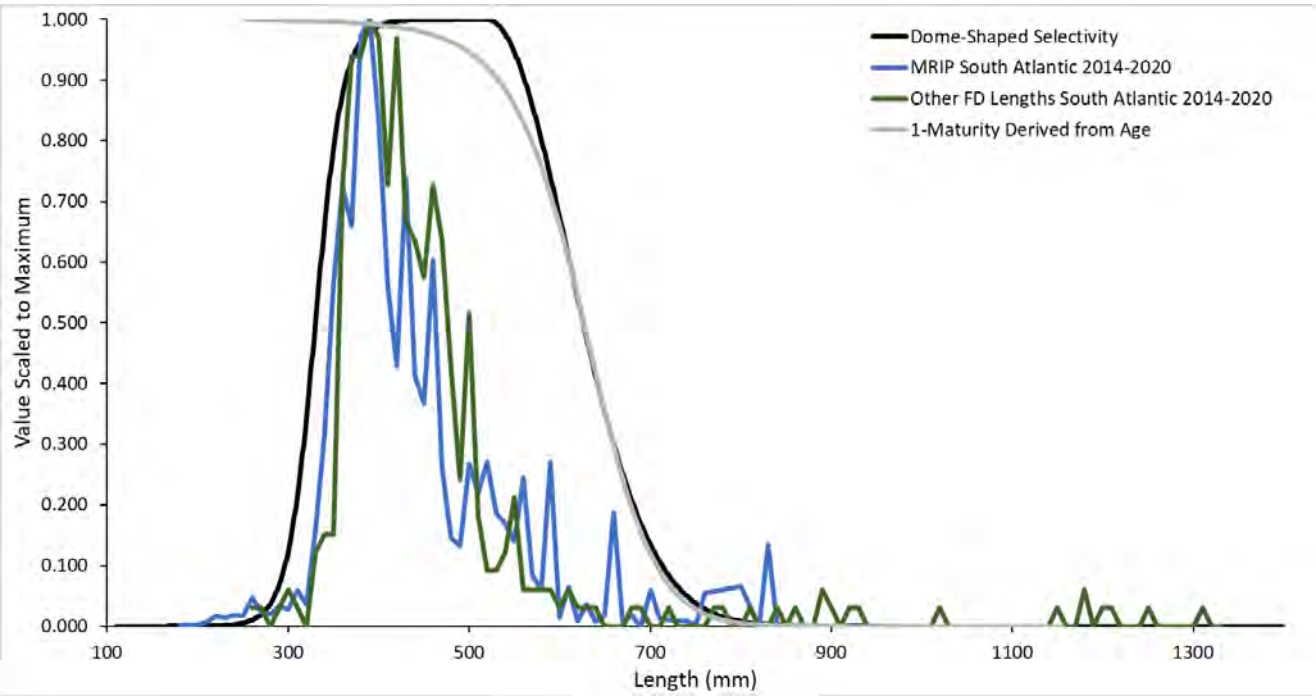

Figure 93. Length selectivity used for the second selectivity period of the SA fleet (SA_2) in JABBA-Select compared to data used to specify selectivity.

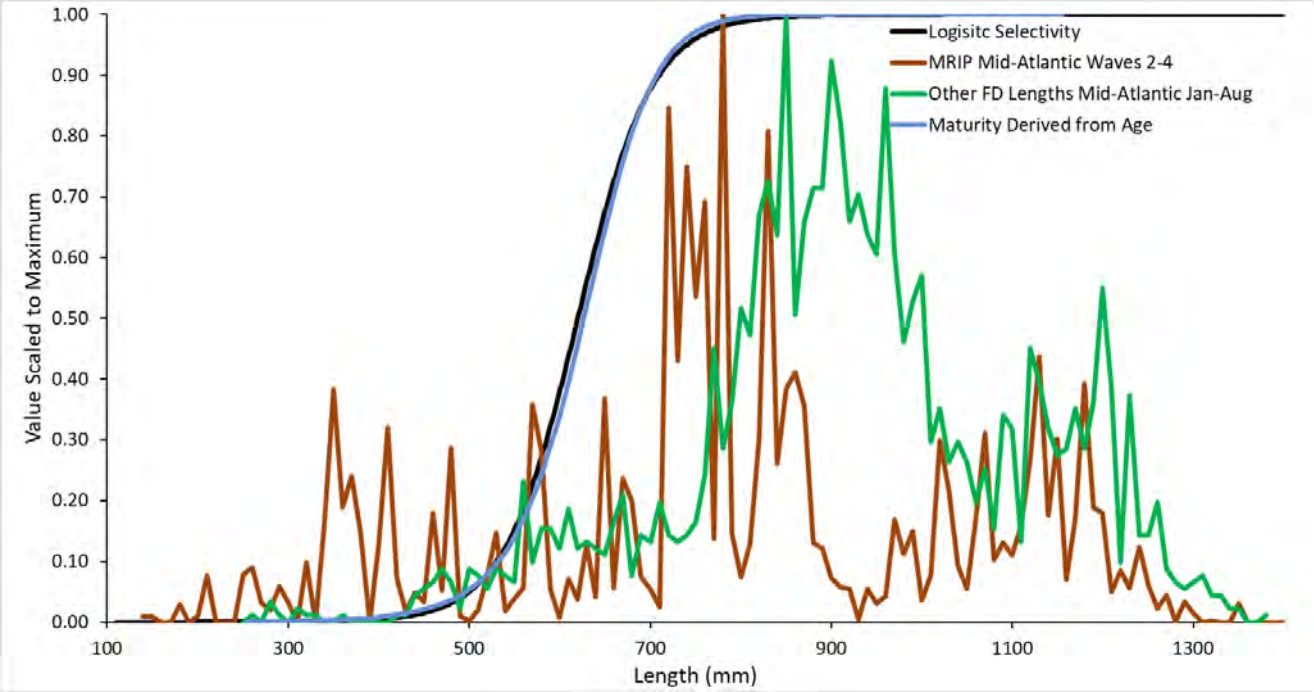

Figure 94. Length selectivity used for the MA_early fleet in JABBA-Select compared to data used to specify selectivity.

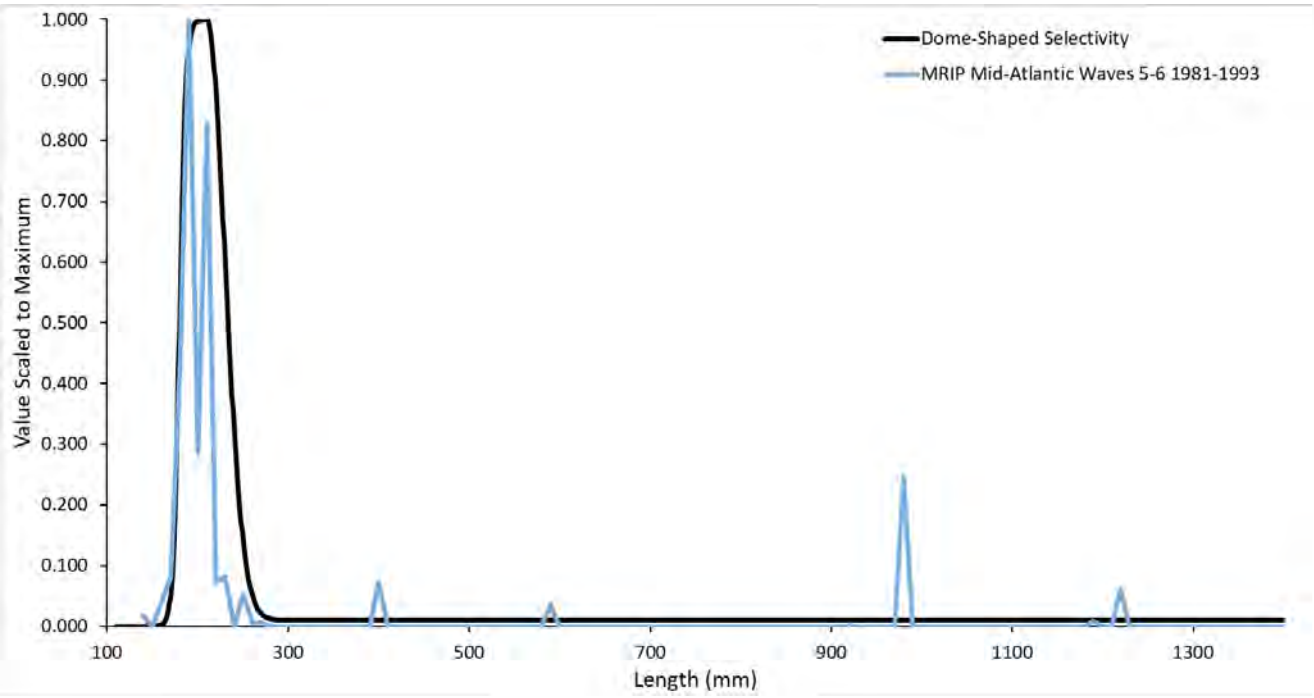

Figure 95. Length selectivity used for the first selectivity period of the MA_late fleet (MA_late_1) in JABBA-Select compared to data used to specify selectivity.

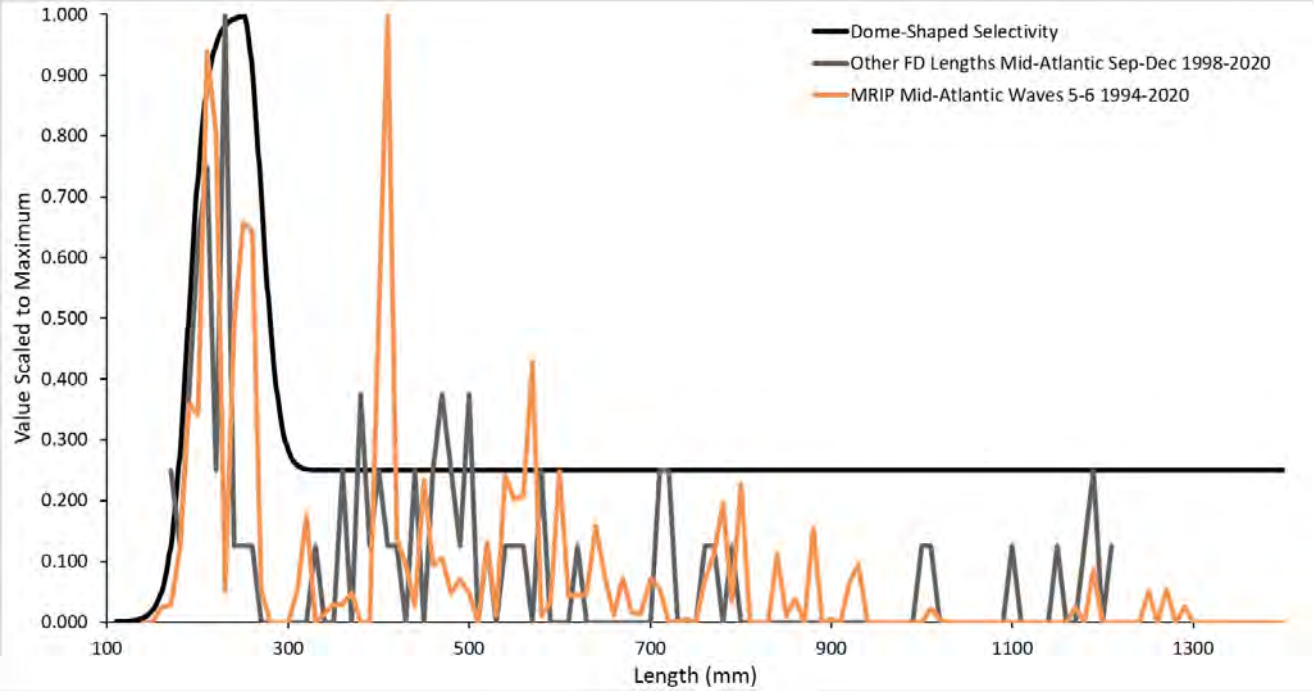

Figure 96. Length selectivity used for the second selectivity period of the MA_late fleet (MA_late_2) in JABBA-Select compared to data used to specify selectivity.

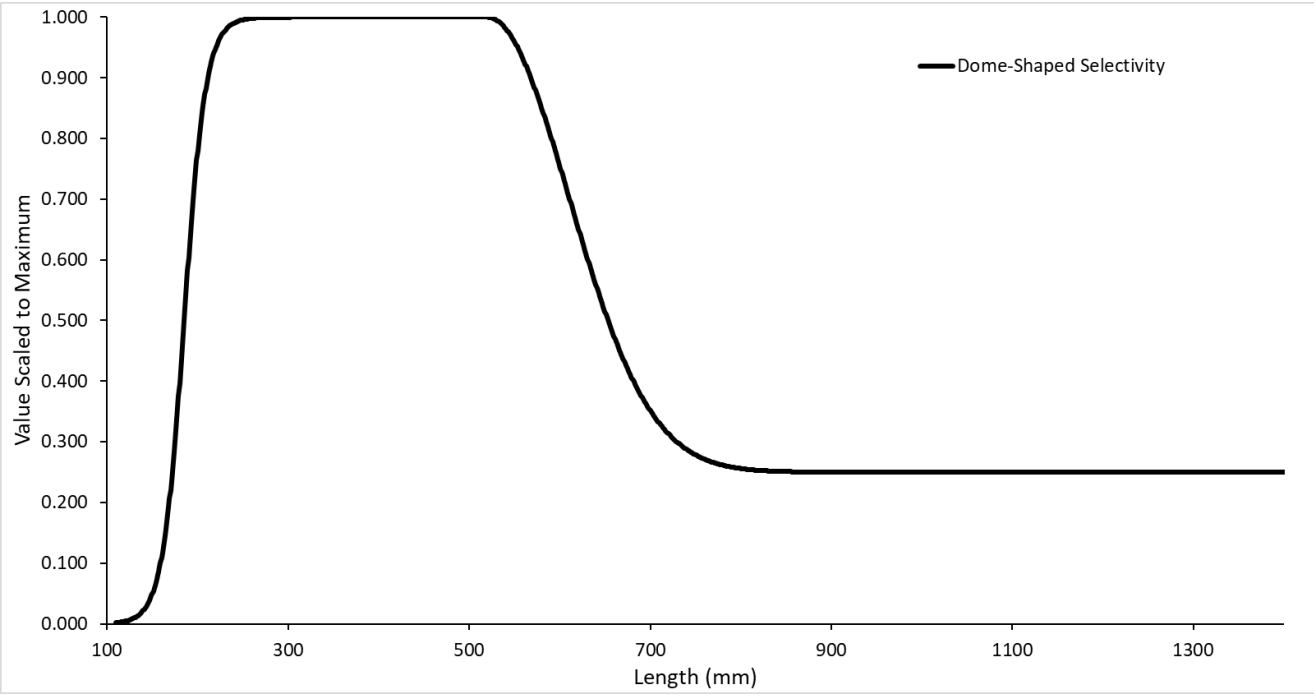

Figure 97. Length selectivity used for the MRIP CPUE in JABBA-Select.

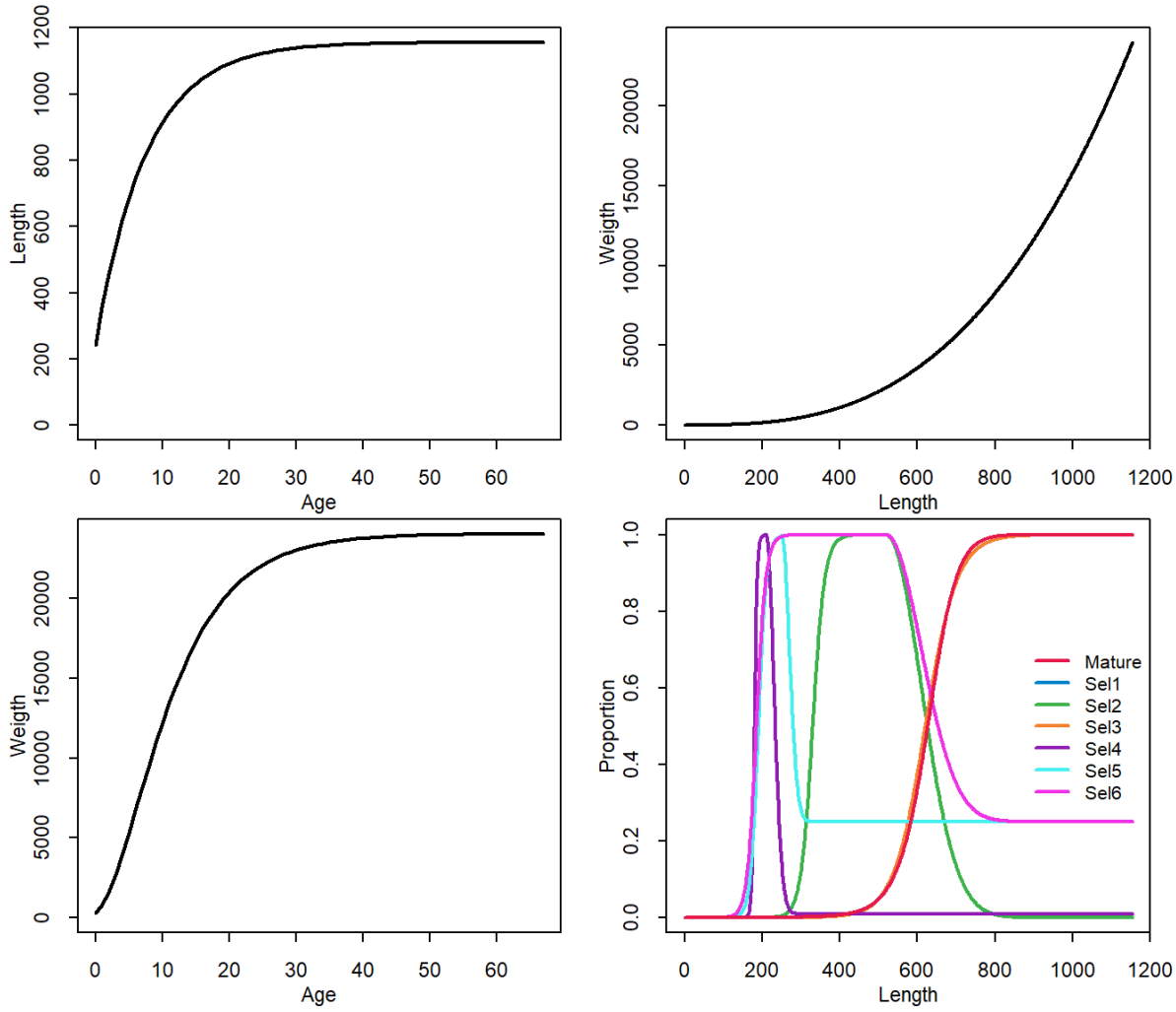

Figure 98. Life history and selectivity patterns used in JABBA-Select. Selectivity patterns are for the first selectivity period of the SA fleet (SA_1, Sel1), the second selectivity period of the SA fleet (SA_2, Sel2), the MA_early fleet (Sel3), the first selectivity period of the MA_late fleet (MA_late_1, Sel4), the second selectivity period of the MA_late fleet (MA_late_2, sel5), and the MRIP CPUE (Sel6).

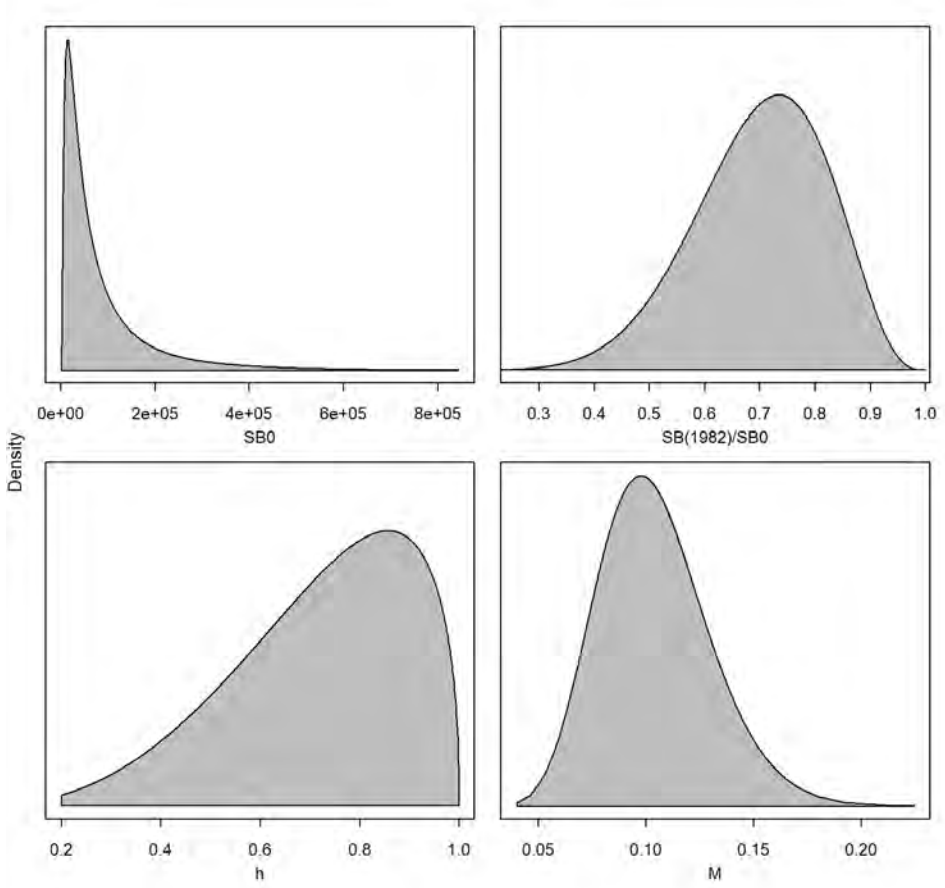

Figure 99. Input prior distributions used in JABBA-Select for unfished spawning biomass (metric tons), depletion in the first year, Beverton-holt stock-recruitment relationship steepness, and natural mortality.

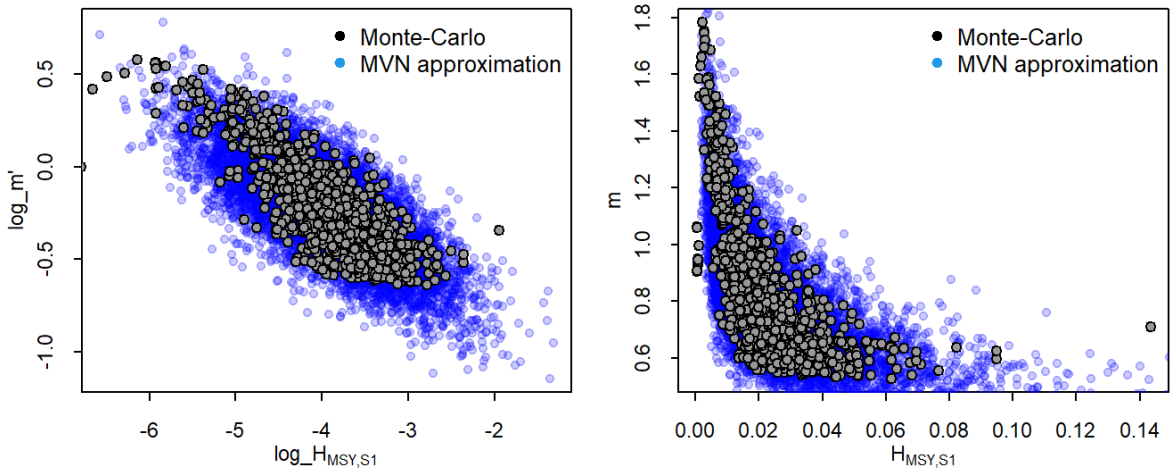

Figure 100. Multivariate normal (MVN) prior distribution of log($H_{MSY,s1}$) and log(m) generated from the per-recruit model Monte Carlo simulations using JABBA-Select (left) and converted from the log scale (right).

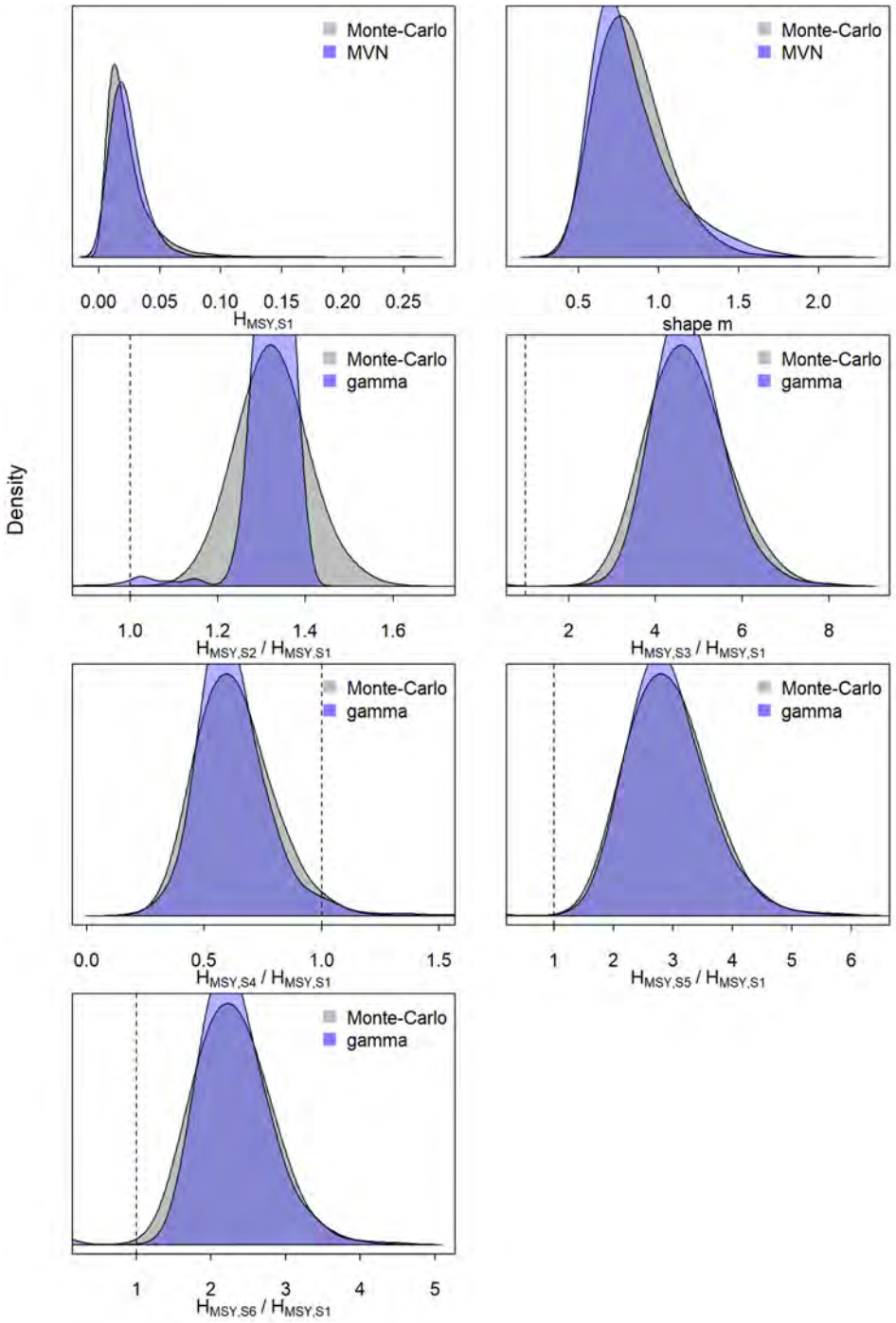

Figure 101. Distributions of $H_{MSY,s1}$ (first selectivity period of the SA fleet, SA_1), m, and ratios of other fleet-specific H_{MSY}s to $H_{MSY,1}$ from the per-recruit model Monte Carlo simulations using JABBA-Select (grey) and prior distributions generated from multivariate normal (MVN) prior distribution ($H_{MSY,s1}$ and m, top panel) and gamma prior distribution (H_{MSY} ratios, other panels) in purple. $H_{MSY,s2}$ is for the second selectivity period of the SA fleet (SA_2), $H_{MSY,s3}$ is for the MA_early fleet, $H_{MSY,s4}$ is for the first selectivity period of the MA_late fleet (MA_late_1), $H_{MSY,s5}$ is for the second selectivity period of the MA_late fleet (MA_late_2), and $H_{MSY,s6}$ if for the MRIP CPUE.

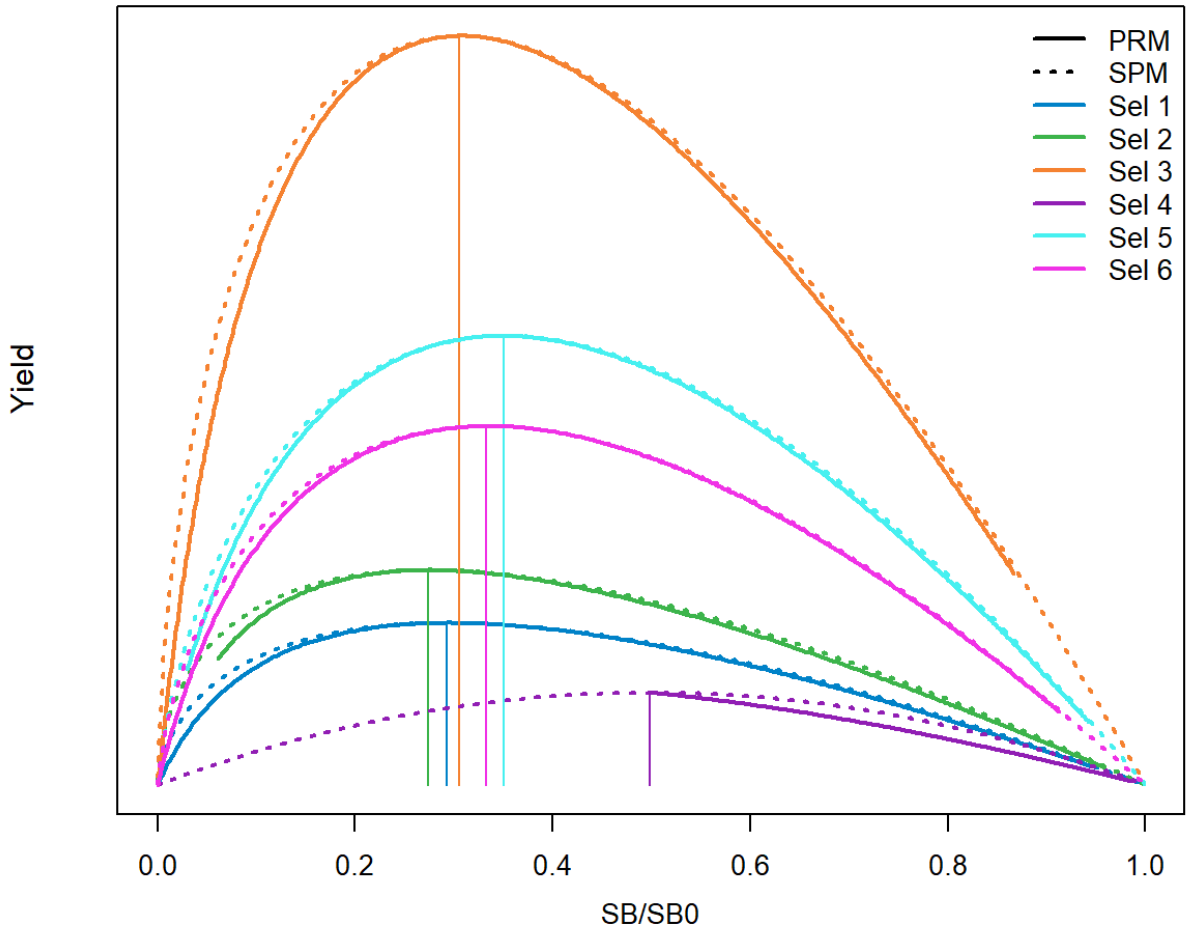

Figure 102. **Yield curves associated with each of the black drum selectivity patterns used in JABBA-Select produced from the per-recruit models (solid curves) and the surplus production function (dashed curves). The solid vertical lines indicate the relative spawning biomass where yield is maximized (i.e., SB_{MSY}/SB_0). Sel 1 is the first selectivity period of the SA fleet (SA_1), Sel 2 is the second selectivity period of the SA fleet (SA_2), Sel 3 is the MA_early fleet, Sel 4 is the first selectivity period of the MA_late fleet (MA_late_1), Sel 5 is the second selectivity period of the MA_late fleet (MA_late_2), and Sel 6 is the MRIP CPUE.**

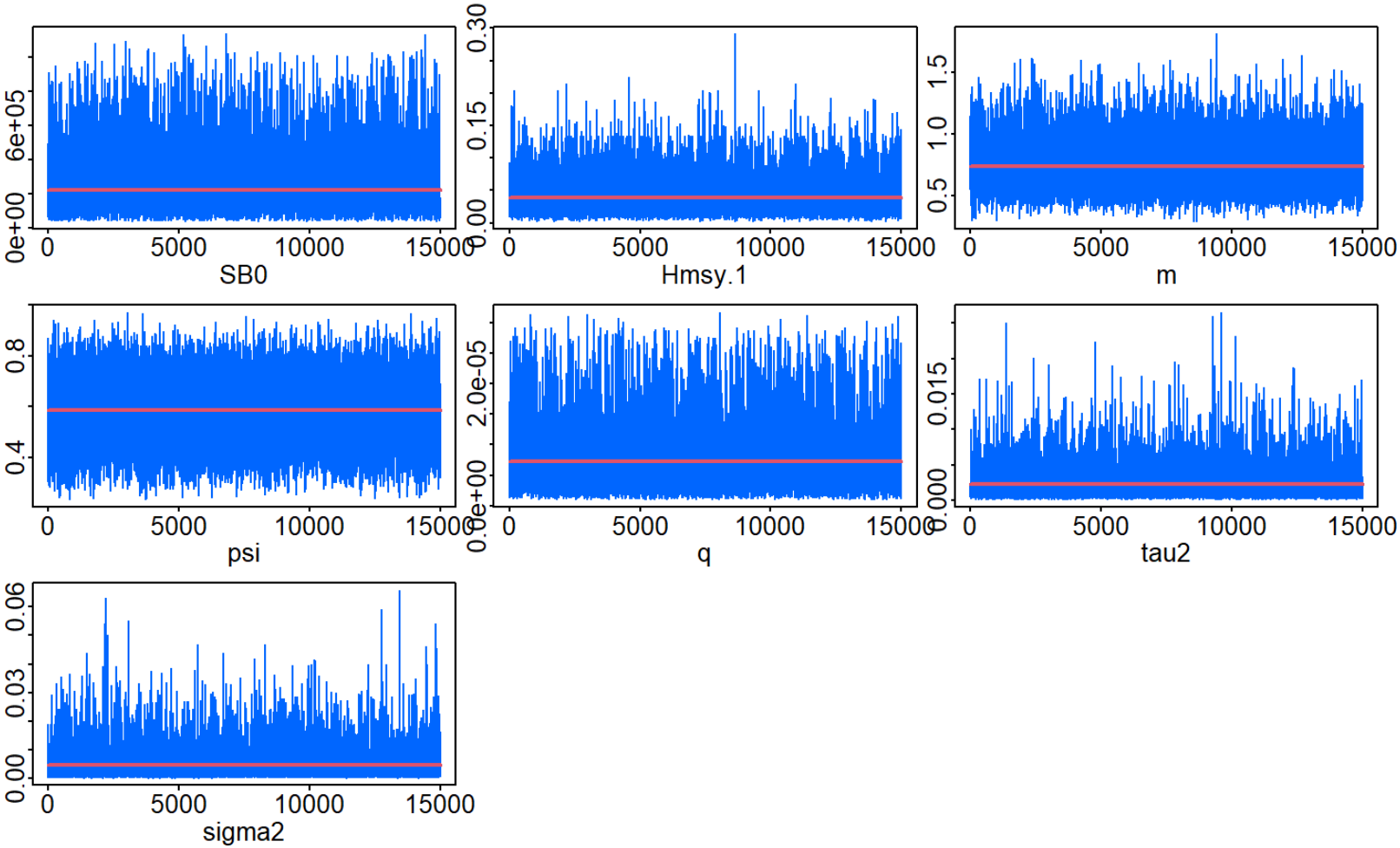

Figure 103. Trace plots of the Markov chains from the JABBA-Select model. SB_0 is in metric tons. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

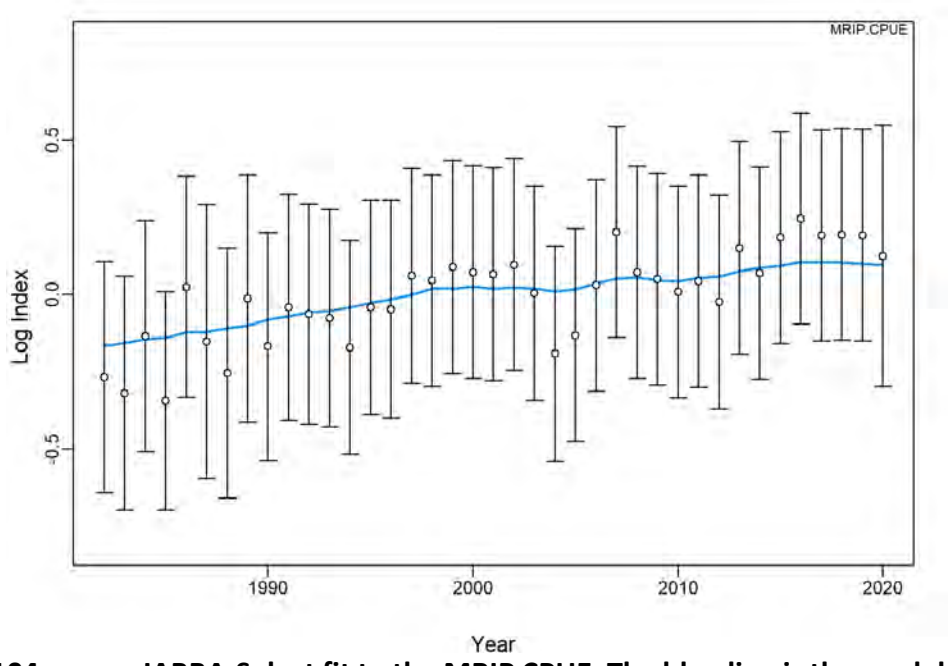

Figure 104. JABBA-Select fit to the MRIP CPUE. The blue line is the model predictions of the observed CPUE (circles). Error bars are 95% confidence intervals of observed CPUE based on total observation error. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

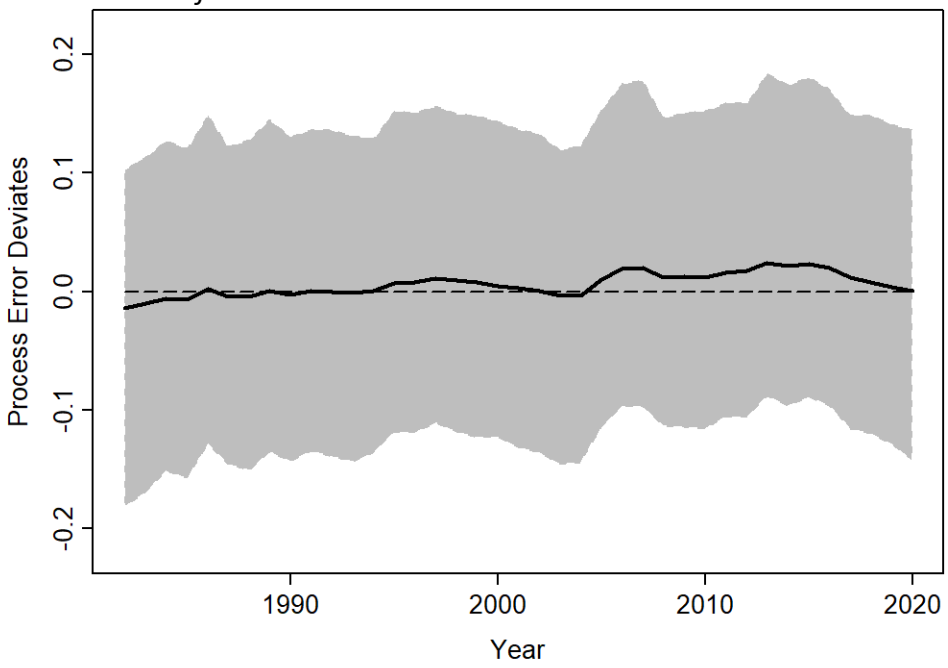

Figure 105. Annual process error deviates (i.e., difference between deterministic expectation of log(*SBy*) and stochastic realization of log(*SBy*)) estimated in JABBA-Select. The solid line is the median and the shaded region is the 95% credible interval. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

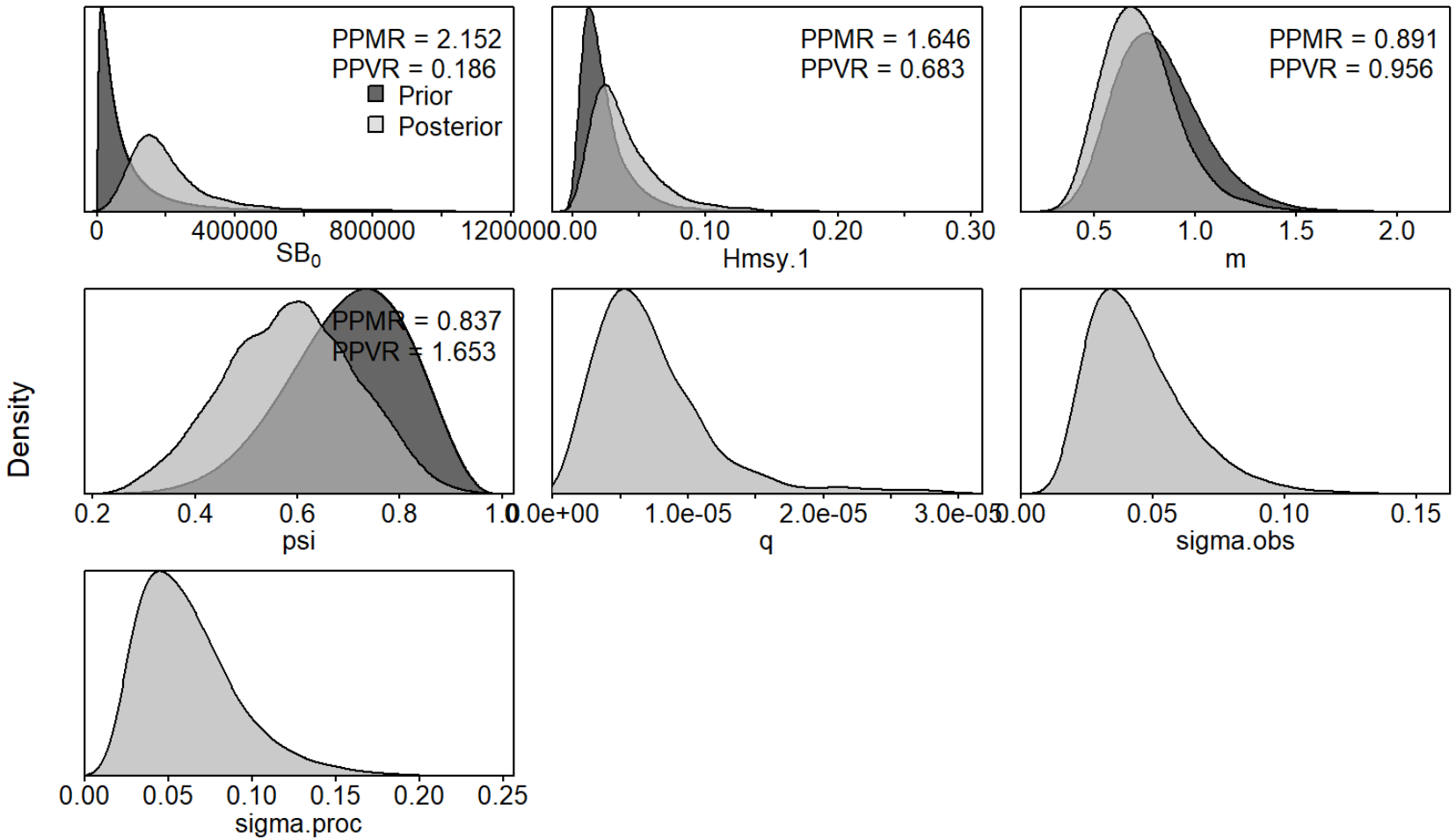

Figure 106. Prior and posterior distributions of parameters estimated in JABBA-Select. SB_0 is in metric tons. PPVR is the posterior to prior variance ratio and PPMR is posterior to prior mean ratio. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

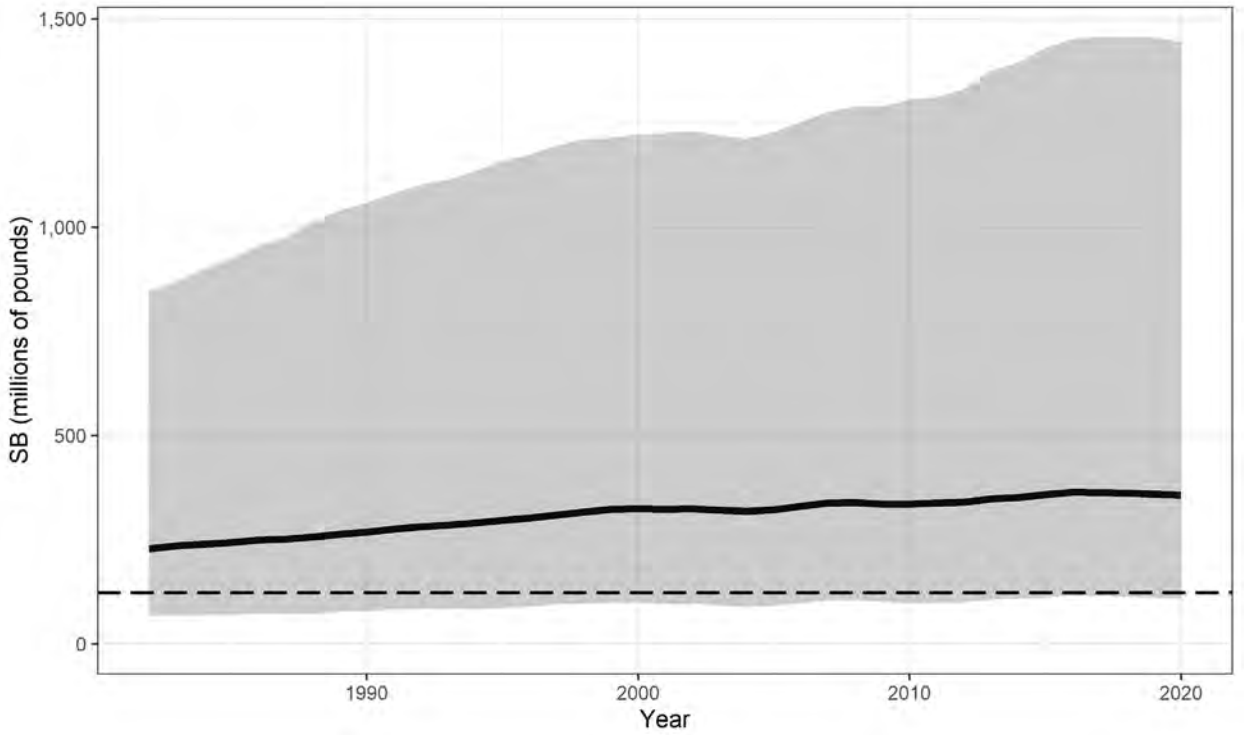

Figure 107. Spawning biomass estimated in JABBA-Select. The solid line is the median and the shaded region is the 95% credible interval. The dashed line is the median SB_{MSY} estimate. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

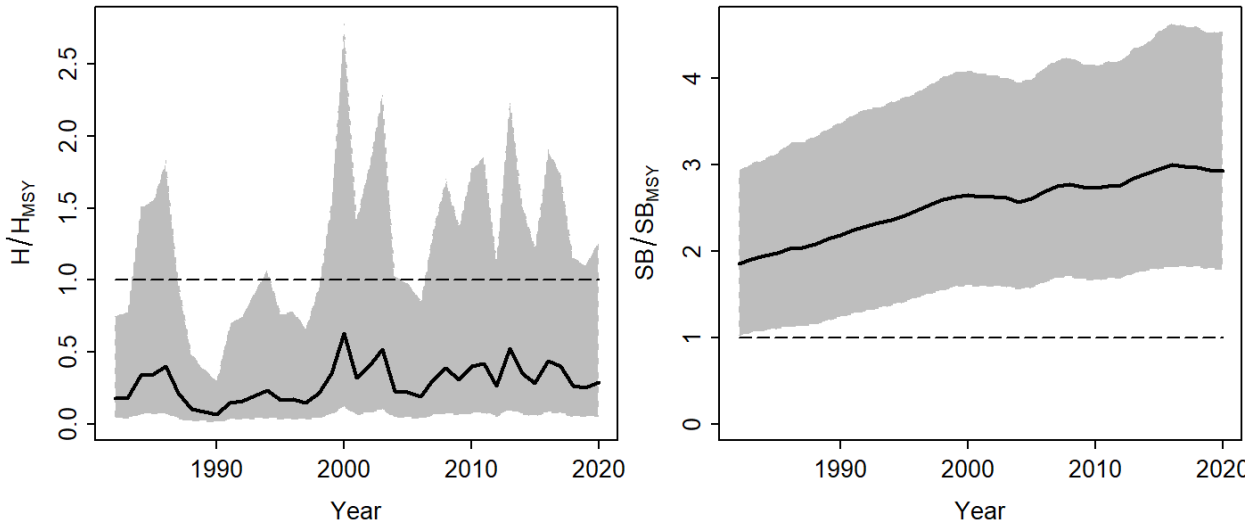

Figure 108. Exploitation (left) and spawning biomass (right) relative to threshold reference points estimated in JABBA-Select. The solid line is the median and the shaded region is the 95% credible interval. The dashed line indicates the estimate at its respective threshold level. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

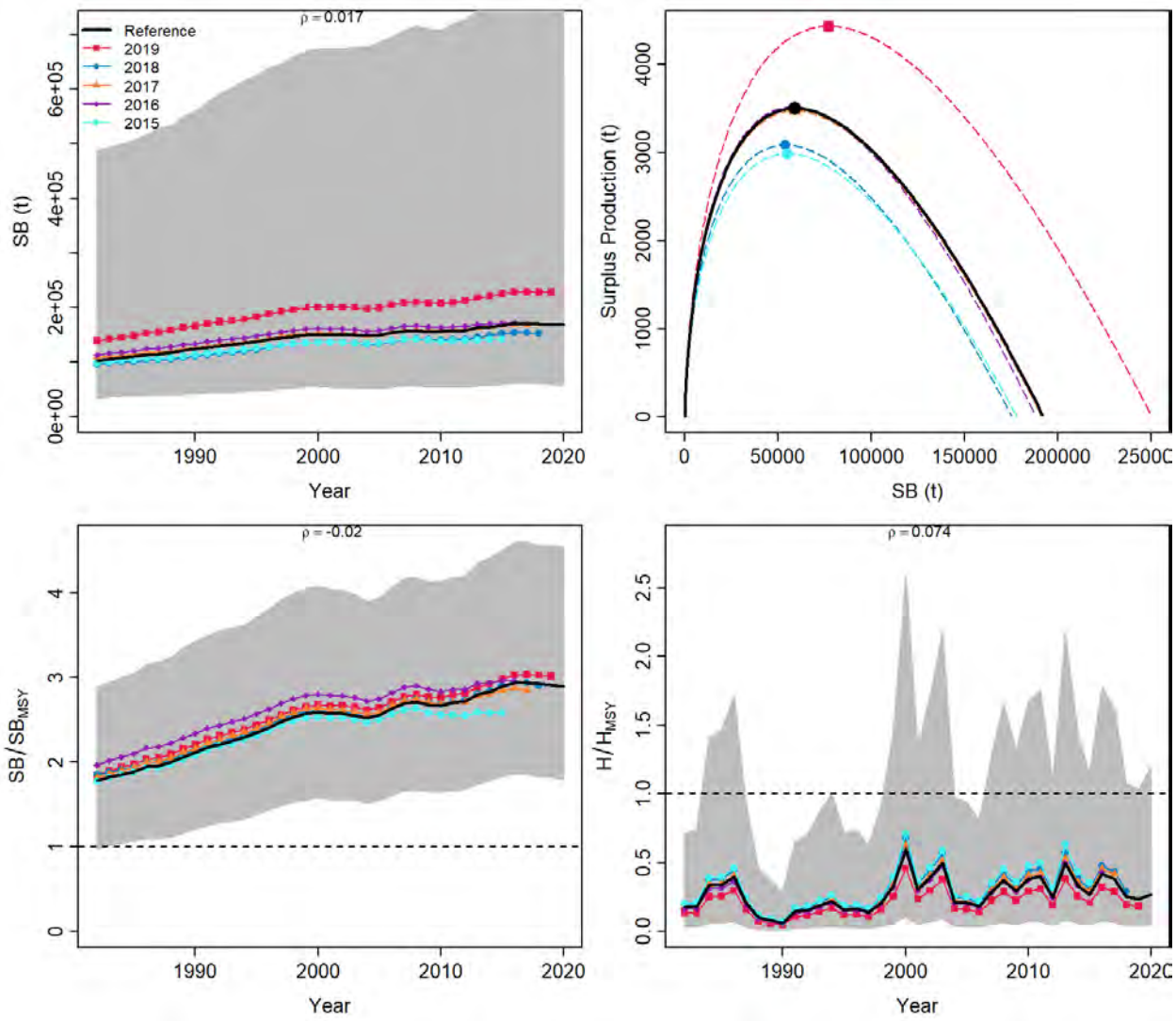

Figure 109. **Estimates from JABBA-Select retrospective analysis. Mohn's rho values are printed at the top of each panel for the respective parameter.** *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

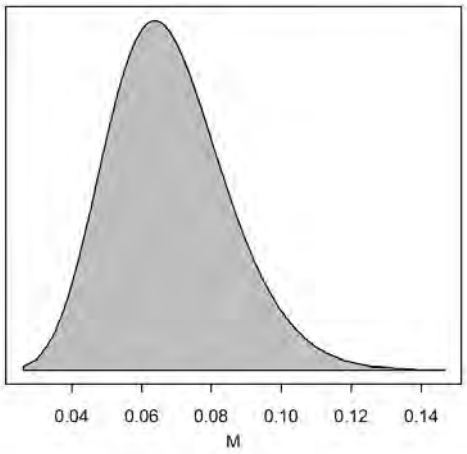

Figure 110. Prior distribution of natural mortality used in the *low M* sensitivity configuration for the JABBA-Select sensitivity analysis.

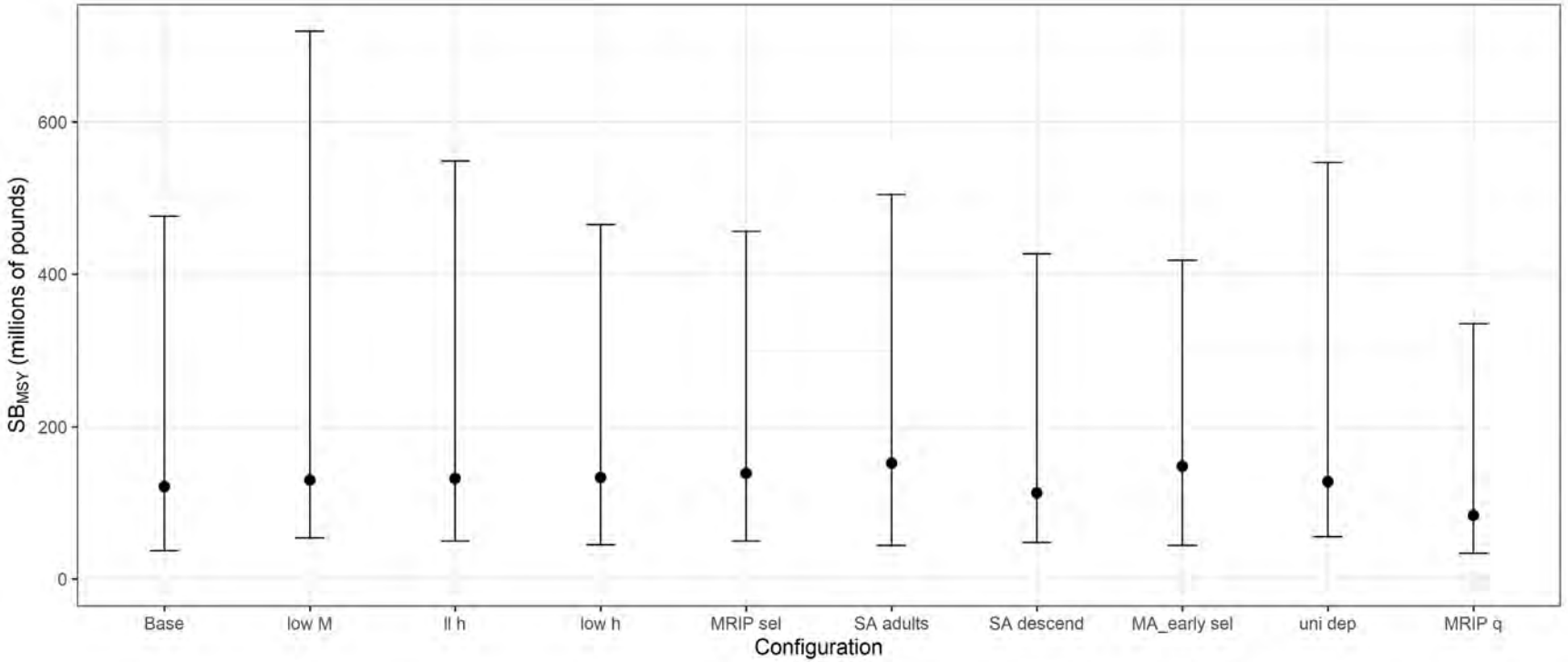

Figure 111. *SB$_{MSY}$* estimates from the JABBA-Select sensitivity analysis. Circles are median estimates and the error bars are 95% credible intervals.

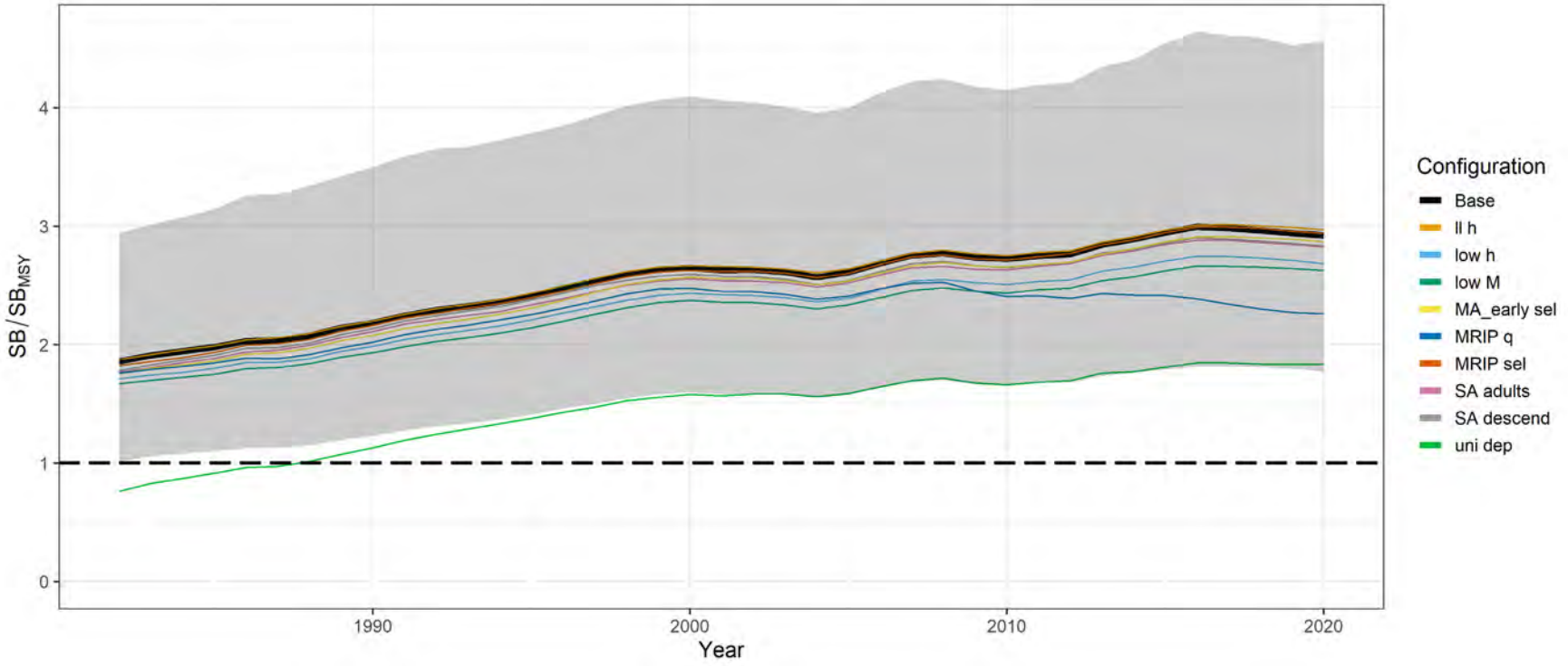

Figure 112. Relative biomass estimates from the JABBA-Select sensitivity analysis. The shaded region is the 95% credible interval of the base model. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

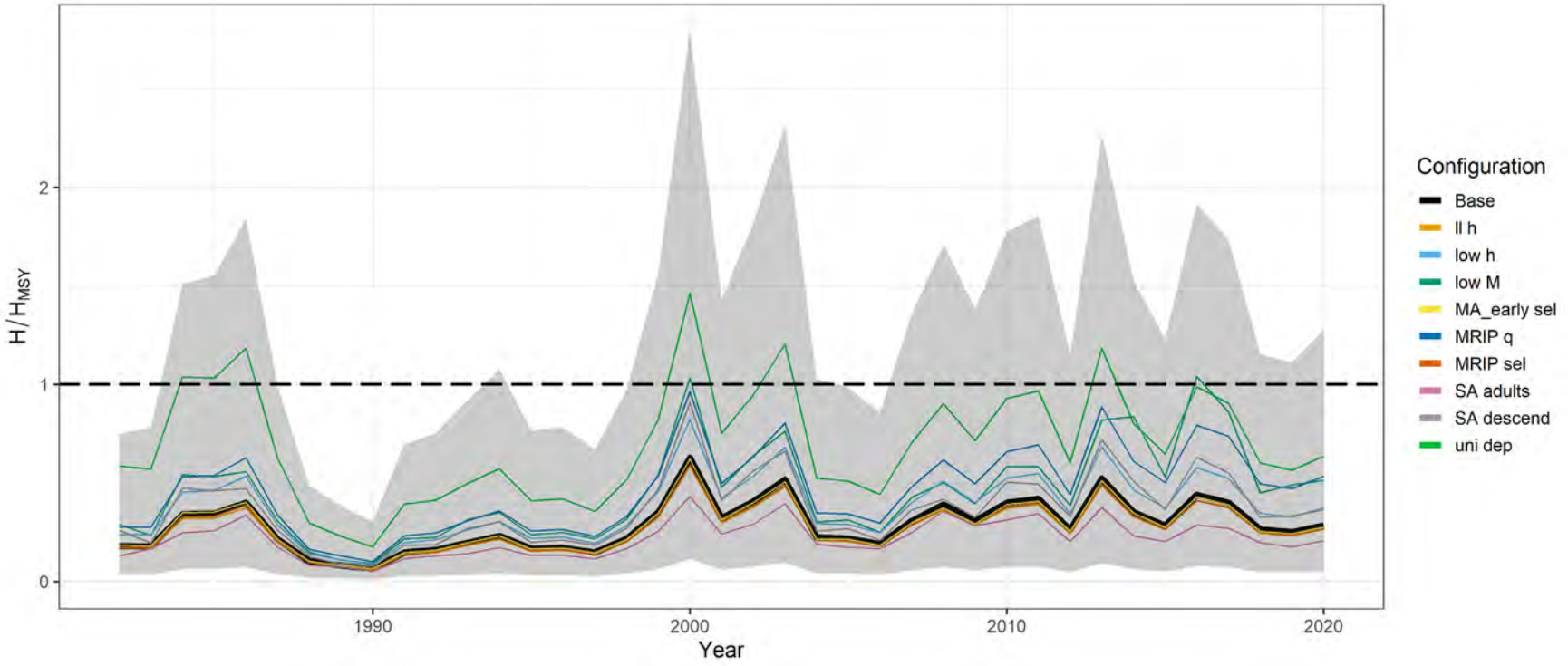

Figure 113. Relative exploitation estimates from the JABBA-Select sensitivity analysis. The shaded region is the 95% credible interval of the base model. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

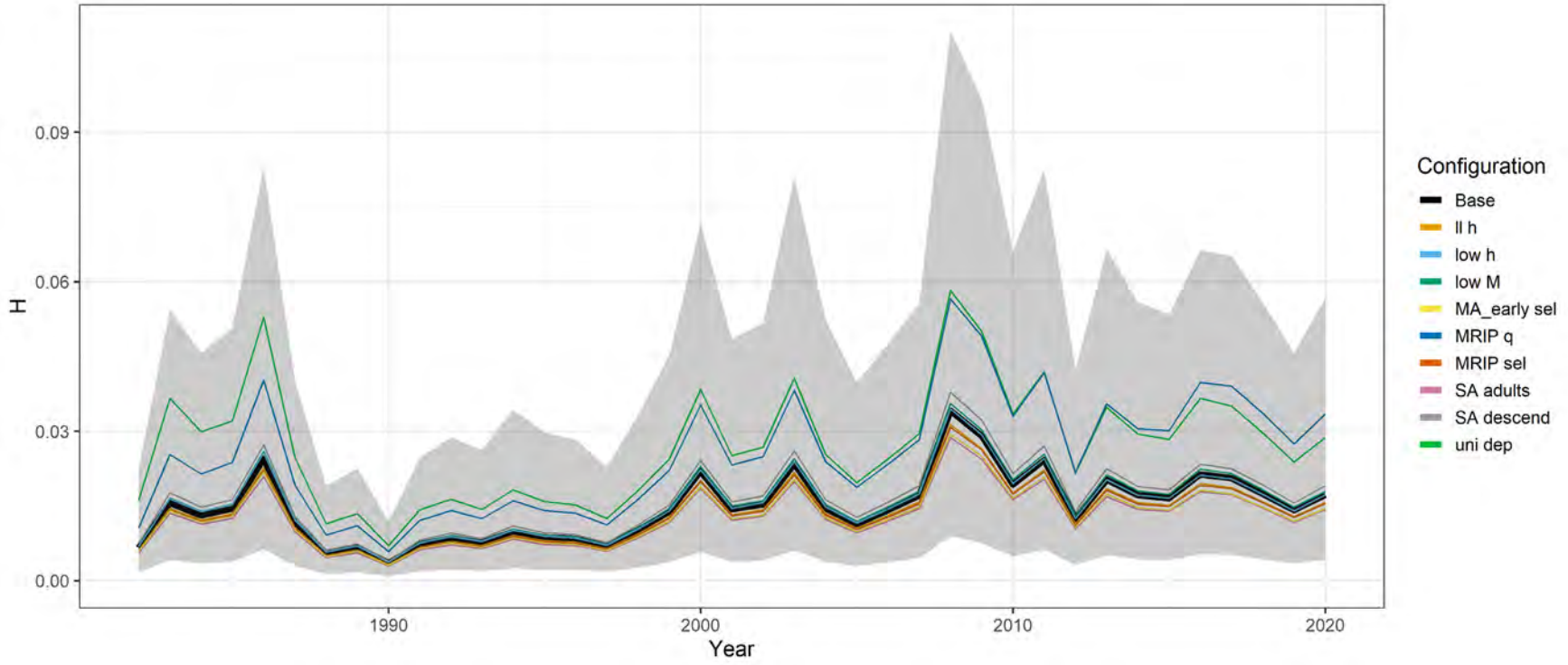

Figure 114. Exploitation estimates from the JABBA-Select sensitivity analysis. The shaded region is the 95% credible interval of the base model.

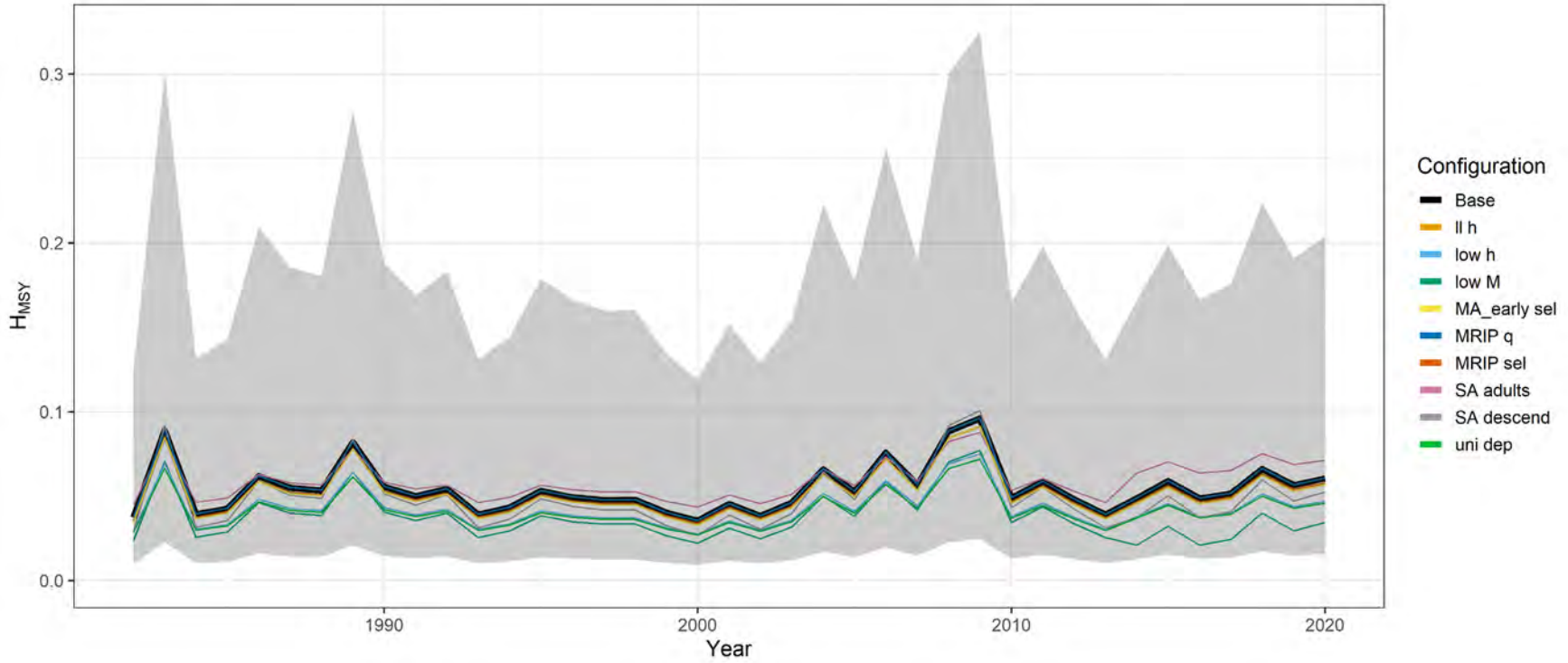

Figure 115. Exploitation associated with *MSY* estimates from the JABBA-Select sensitivity analysis. The shaded region is the 95% credible interval of the base model.

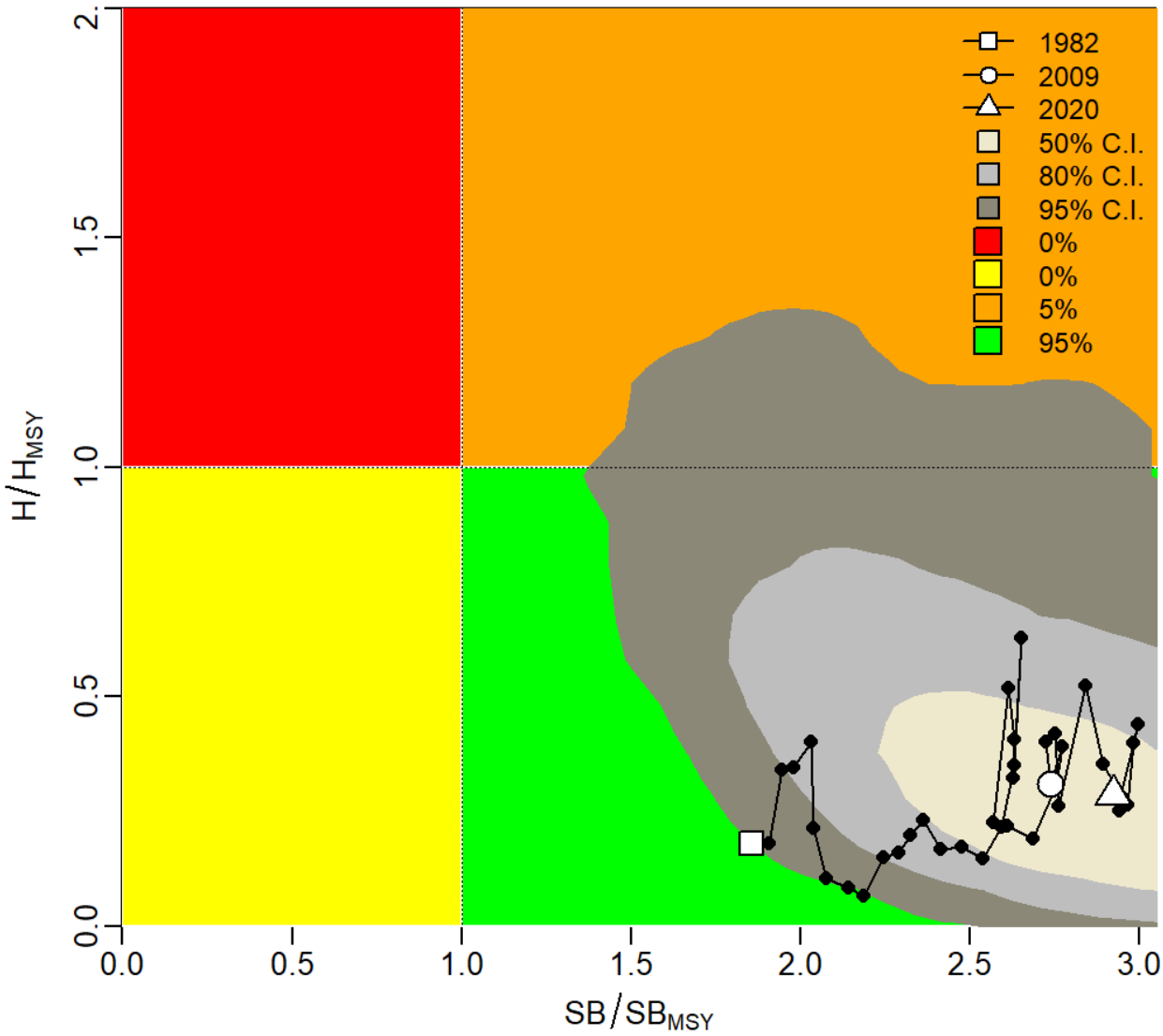

Figure 116. Kobe phase plot for the JABBA-Select model showing the estimated stock status trajectories. Different grey shaded areas denote the 50%, 80%, and 95% credibility interval for the terminal year of 2020. The probability of terminal year points falling within each quadrant is indicated in the figure legend. *Note: Figure has been updated in Section 13.5 based on changes that were made to the base model configuration in response to the recommendations of the Peer Review Panel.*

13 ADDENDUM TO THE 2023 BLACK DRUM STOCK ASSESSMENT REPORT

13.1 Background

During the Peer Review workshop in January 2023, the Peer Review Panel (Panel) and Black Drum Stock Assessment Subcommittee (SAS) discussed the need for seasonal fleets in the Mid-Atlantic region (MA_early and MA_late fleets, Section 7.3.2). The SAS noted that all available information indicates a vastly different size structure from the stock is available to the fisheries in the region during the earlier and latter parts of the calendar year. The Panel questioned whether this model complexity, including several assumptions about selectivity, was necessary given the small magnitude of removals accounted for by the MA_late fleet (Table 16, Figure 40).

The Panel requested an additional model run with the Mid-Atlantic removals throughout the calendar year collapsed into one fleet (MA fleet). The selectivity for this fleet was assumed to follow the logistic selectivity pattern of the MA_early fleet in the original base model configuration (Table 41, Figure 94) given this fleet accounts for the majority of removals in the Mid-Atlantic. All other model configuration details and inputs remained consistent with the original base model (Section 7.3.2).

Preliminary results of this simplified model configuration during the workshop indicated the model was not particularly sensitive to this change, presumably due to small magnitude of removals accounted for by the MA_late fleet. Through deliberations about this configuration change, the Panel and SAS agreed that the simplified model configuration with one Mid-Atlantic fleet provides an improvement over the original base model reviewed during the workshop and recommended that this simplified configuration be used as the base model to provide management advice.

The following sections provide full results of the new base model developed following he Peer Review workshop, including updated sensitivity analysis, retrospective analysis, and stock status determinations. These results replace the original base model results and stock status determinations in Sections 7.3 and 8, respectively, and are used for final management advice from this stock assessment.

13.2 Results

13.2.1 Base Model Estimates

The model converged to posterior distributions for each parameter according to stable behavior of the chains in trace plots (Figure 117) and the results of the Geweke and Heidelberger and Welch tests (Table 48, all p-values>0.05).

The model fit the general trend of the MRIP CPUE, but there were two periods of positive residuals around 2000 and at the end of the time series (Figure 118). Despite these residuals, the runs test p-value (0.145) indicated random residuals and the SDNR was 0.51. Annual process error deviates did not follow any systematic trending that would clearly indicate model misspecification (Figure 119).

Parameter posterior distributions are compared to prior distribution in Figure 120. The posterior to prior variance ratio (PPVR) is provided to assess the degree of influence the data have on the posterior distribution. The smaller the PPVR, the more the posterior is influenced by the data and the less it is influenced by the prior distribution. The posterior to prior mean ratio (PPMR) is provided to assess the direction in which the posteriors are influenced by the data relative to the prior, with values <1 indicating shifts of the posterior to the left, values >1 indicating shifts of the posterior to the right, and a value of 1 indicating no movement. The SB_0, H_{MSY1}, and *m* parameters were more strongly influenced by the data, while the depletion parameter (*psi*) was more strongly influenced by the prior. The influence the data did have on the depletion parameter indicated a more depleted stock (PPMR<1). The data indicated a larger stock that is slightly more productive (higher H_{MSY1} and lower *m*). The estimated process error parameter was small and typical of a long-lived stock with many ages contributing to the spawning stock biomass (Winker 2018). The additional observation error parameter was also small and resulted in a median total observation error corresponding to a CV of 0.182.

The spawning biomass was estimated to increase throughout the time series, though there were wide credible intervals indicating high uncertainty in absolute biomass estimates (Table 49, Figure 121). Relative biomass was estimated with more certainty (Table 49, Figure 122).

Exploitation generally follows the removal time series with higher exploitation estimated during the mid-1980s and since 2000 (Table 50, Figure 122). Credible intervals of relative exploitation are also quite wide. Most of the intervals through time indicate exploitation less than H_{MSYy}, but there is some low probability of exploitation exceeding H_{MSYy} during the higher exploitation years.

The base model is interpreting the increasing trend in both MRIP CPUE and fishery removals as indication that the stock was lightly exploited in earlier years allowing for surplus biomass to recruit to the less vulnerable spawning stock and build up over time (Figure 122). Some positive anomalies in biomass during the late 2000s and early 2010s (Figure 119), likely due to some strong year classes that were not fully exploited to the threshold level, appear to have offset the increased removals and a more drastic increase in exploitation to allow for the trend to continue increasing, albeit at a reduced rate that starts to flatten out from the increased exploitation since about 2000 (Figure 122).

13.2.2 Retrospective Analysis

A retrospective analysis was conducted with a five-year peel from the assessment terminal year. Mohn's rho values were calculated according to the methodology of Hurtado-Ferro et al. (2014).

Estimates from the retrospective with Mohn's rho values are provided in Figure 123. Mohn's rho values range from -0.05 for biomass estimates to 0.026 for relative exploitation estimates. These values indicate a more conservative pattern with a tendency to underestimate biomass and overestimate relative fishing mortality as years are peeled from the time series. The magnitude of the Mohn's rho values indicate no significant retrospective bias according to the rule of thumb proposed by Hurtado-Ferro et al. (2014) for long-lived species (-0.15 – 0.20).

13.2.3 Sensitivity Analysis

A sensitivity analysis was conducted by running alternative model configurations to assess impact of key assumptions and uncertainties identified by the TC. Nine alternative configurations were included in the analysis when done for the original base model that was peer reviewed during the Peer Review workshop (Table 47) and are described below. In addition to these alternative configurations, the original base model with seasonal Mid-Atlantic fleets (***Orig Base*** configuration) has been included in this updated sensitivity analysis for comparison to the final base model with one Mid-Atlantic fleet.

Three configurations included alternate assumptions on the key life history parameters influencing productivity, *h* and *M*. The ***low M*** configuration included a natural mortality prior distribution with a mean (0.068) lower than the base model (0.1041) and closer to the Hoenig (1983) estimate used in the previous assessment (0.063). Attempts were made to lower the mean to 0.063, but a small number (3%) of *M*-*h* draws with low *M* and high *h* caused errors in the per-recruit calculations that cascaded through the modeling software and 0.068 was the lowest mean that avoided these errors. The alternative prior distribution includes a significant portion of its density at or below the 0.063 mean value used in the previous assessment (Figure 110). The ***ll h*** configuration included a steepness prior distribution parameterized with the likelihood estimates from Shertzer and Conn (2012) as opposed to bootstrapped estimates. These parameters included a slightly larger mean (increased from 0.72 to 0.75) and greater precision (CV decreased from 0.25 to 0.20). The ***low h*** configurations included a steepness prior distribution with a mean decreased by 0.1 from 0.72 to 0.62.

Four configurations included alternate selectivity assumptions. The ***MRIP sel*** configuration decreased the selectivity for the largest sized fish from 0.25 in the base model to 0.1 due to uncertainty in vulnerability of spawning adults relative to sub-adults that account for the majority of recreational catch. The ***SA adults*** configuration increased the selectivity for the largest sized fish from 0 in the base model to 0.06 based on small reported catches of these sized fish and potential for small scale directed fishing at trophy sized fish such as tournaments and charter boat operations. The ***SA descend*** configuration shifts descending selectivity of the SA fleet to the left by 100 mm, reducing the size range available to this fishery. The ***MA_early sel*** configuration shifted selectivity of the MA_early fleet to the right of the selectivity pattern in the base model due to available length composition data peaking at larger sizes than full maturity.

The last two configurations dealt with the start year depletion assumption and uncertainty about a potential shift in catchability for the MRIP CPUE in recent years. The ***uni dep*** configuration included a beta prior distribution parameterized as a uniform distribution over the full range of values 0 to 1 (mean=0.5, CV=0.577). This configuration was included due to the use of a uniform prior distribution on the depletion assumption for DB-SRA in the previous assessment. One distinction due to the constraints of the JABBA-Select software is that the beta distribution can only be parameterized as a uniform distribution over the full range of values

(including overfished levels <0.4) whereas the DB-SRA uses a true uniform distribution with bounds that were set at levels representative of a stock that is not overfished (0.5 and 0.9). The ***MRIP q*** configuration included a second catchability coefficient parameter for the MRIP CPUE allowing for a unique catchability coefficient in years after 2015. This configuration was included due to the positive residuals since 2016 in the base model and the apparent shift in catchability identified and discussed in Section 4.2.1.3. This configuration acknowledges the possibility that the directed trips data set used to calculate the MRIP CPUE did not completely account for the apparent change in catchability. This configuration was also considered for the base model, but was not selected due to lower deviance information criterion (DIC) of the final base model presented here, indicating the additional *q* parameter was not justified by improved fit to the data, and a similar group of residuals around 2000 that changed after the same amount of time being observed at the end of the time series.

Relative biomass estimates with the final base model are almost identical to estimates from the ***Orig Base*** configuration, with the exception of some slight divergence in the last few years of the time series (Figure 124). All sensitivity configurations estimate similar trends with one exception (Figure 125). The ***MRIP q*** configuration estimates a similar trend as the other configurations for most of the time series, but then starts to diverge with a declining trend in the last decade. Notably, the ***uni dep*** configuration estimates relative biomass more similar to the base model than seen for the ***Orig Base*** model in the original sensitivity analysis (Figure 112) with median estimates that remain above one throughout the time series. The base model estimates also fall more in the center of estimates form sensitivity configurations compared to the ***Orig Base*** run in the original sensitivity analysis which estimated among the highest relative biomass.

Relative exploitation estimates with the final base model are essentially identical to estimates from the ***Orig Base*** configuration (Figure 126). Sensitivity configurations estimate similar trends in relative exploitation (Figure 127) as well as a narrower distribution of estimates than seen in the original sensitivity analysis (Figure 113). The ***uni dep*** configuration still estimates some of the highest exploitation during the time series, but, unlike the original sensitivity analysis, these estimates remain less than one.

13.3 Stock Status

Overfished is defined as spawning biomass falling below spawning biomass associated with *MSY* ($SB_y/SB_{MSY} < 1$). Overfishing is defined as exploitation exceeding exploitation associated with *MSY* ($H_y/H_{MSYy} > 1$).

The 2020 median relative spawning biomass estimated with the base model was 2.99, indicating the stock was not overfished in the terminal year of the stock assessment (Table 49). The 2020 median relative exploitation estimated with the base model was 0.28, indicating the stock was not experiencing overfishing in the terminal year of the stock assessment (Table 50).

Results indicate greater certainty that the stock has not been depleted to an overfished status in the terminal year of the assessment, while there is less certainty about the exploitation status. Figure 128 shows the time series of stock status estimates with uncertainty around

terminal year determinations. All of the 95% credible interval is above the overfished threshold, while exploitation shows some low probability of exceeding the threshold within the 95% credible interval. This low risk of overfishing according to the credible intervals extends back for much of the last twenty years of the time series. The sensitivity analysis included some configurations that estimated median relative exploitation that exceeds the threshold in recent years, while no sensitivity configuration estimated median relative biomass below the threshold since the 1980s.

There are several important points of context to consider with this stock status determination estimated from the JABBA-Select model:

- Empirical indicators show increased fishery removals in the last twenty years and less frequent large recruitment events in the Mid-Atlantic in the last ten years. There are no clear indications of a declining trend in recruitment or exploitable abundance from abundance indicators, with the exception of the anomalous GA trammel index, but there is a declining trend in the final two years of the recreational discard time series that may be reflective of abundance in addition to other factors. There is some indication of northern range expansion. Overall, stock indicators do not appear negative at this time, but should be monitored closely for any sign of change.

- The one-way trip increasing trend in both removals and the MRIP CPUE for the assessment time period may indicate that the stock either had been lightly exploited in the 1980s, which has allowed for the recent increase in exploitation of the predicted high biomass, or was overfished and rebuilding throughout the assessment time series. The latter scenario is contrary to the TC's expert opinion that the stock was not overfished at the beginning of the time period, and there were minimal regulation changes aimed specifically at black drum in the 1980s to induce a rebuilding period. However, it is also possible that recruitment overfishing is occurring or could begin to occur prior to detection with currently available data, due to sub-adult black drum accounting for the majority of removals and the lack of an index that solely tracks mature biomass. With over 30 cohorts contributing to *SSB*, recruitment overfishing may not be evident within current data streams for an extended number of years, leading to an overfished state being reached prior to removals and the MRIP CPUE index indicating a sustained downward trend. The TC concurs with the model-derived stock status but acknowledges the lack of contrast in both removals and the MRIP CPUE coupled with model uncertainty will require close monitoring of stock indicators and a more conservative approach to managing the fishery.

13.4 Addendum Tables

Table 48. JABBA-Select final base model estimated and derived (NA p-values) parameters with p-values for posterior distribution convergence tests.

Parameter	*LCI*	*Median*	*UCI*	*Geweke p-value*	*Heidelberger and Welch p-value*
SB_0	155	439	1,893	0.11	0.12
SB_{1982}/SB_0	0.298	0.549	0.815	0.09	0.26
m	0.332	0.627	1.165	0.45	0.31
$H_{MSY,1}$	0.008	0.031	0.107	0.81	0.23
$H_{MSY,2}$	0.010	0.041	0.143	0.76	0.25
$H_{MSY,3}$	0.036	0.150	0.533	0.40	0.24
q	0.000	0.000	0.000	0.13	0.06
σ^2_{est}	0.000	0.002	0.008	0.41	0.29
σ^2_{η}	0.000	0.003	0.021	0.57	0.48
SB_{MSY}	38	126	546	NA	NA
MSY_1	1	4	18	NA	NA
MSY_2	1	5	24	NA	NA
MSY_3	5	19	87	NA	NA

Table 49. Spawning biomass estimates from the JABBA-Select final base model.

Year	SB (millions of pounds)			SB/SB_{MSY}			SB/SB_0		
	LCI	Median	UCI	LCI	Median	UCI	LCI	Median	UCI
1982	69	234	1,200	0.973	1.862	3.300	0.294	0.533	0.805
1983	71	238	1,231	1.000	1.900	3.382	0.305	0.543	0.813
1984	73	242	1,253	1.017	1.932	3.449	0.316	0.552	0.821
1985	74	245	1,282	1.025	1.958	3.504	0.322	0.561	0.830
1986	77	253	1,313	1.056	2.016	3.615	0.333	0.577	0.849
1987	75	255	1,335	1.043	2.023	3.623	0.331	0.581	0.854
1988	75	260	1,361	1.054	2.064	3.695	0.340	0.593	0.867
1989	81	268	1,389	1.102	2.125	3.783	0.353	0.609	0.888
1990	81	275	1,415	1.130	2.170	3.842	0.364	0.624	0.896
1991	85	283	1,449	1.171	2.228	3.945	0.377	0.641	0.916
1992	87	288	1,453	1.196	2.276	3.997	0.388	0.654	0.928
1993	89	293	1,480	1.227	2.311	4.076	0.396	0.665	0.937
1994	91	299	1,489	1.258	2.355	4.135	0.405	0.677	0.952
1995	95	306	1,519	1.309	2.422	4.211	0.421	0.695	0.976
1996	98	312	1,553	1.351	2.484	4.316	0.434	0.713	1.001
1997	103	320	1,580	1.386	2.546	4.419	0.450	0.732	1.027
1998	106	328	1,615	1.426	2.604	4.495	0.461	0.750	1.051
1999	108	332	1,635	1.452	2.649	4.550	0.473	0.763	1.063
2000	108	334	1,651	1.468	2.674	4.553	0.474	0.768	1.076
2001	105	334	1,678	1.459	2.662	4.531	0.469	0.763	1.074
2002	105	335	1,692	1.461	2.661	4.545	0.471	0.763	1.066
2003	103	333	1,690	1.454	2.650	4.497	0.463	0.759	1.054
2004	98	330	1,697	1.413	2.613	4.439	0.451	0.748	1.034
2005	100	334	1,703	1.442	2.646	4.479	0.464	0.759	1.047
2006	106	342	1,716	1.503	2.723	4.606	0.484	0.784	1.074
2007	112	349	1,749	1.576	2.794	4.687	0.505	0.805	1.100
2008	114	353	1,750	1.589	2.819	4.728	0.507	0.812	1.108
2009	109	349	1,757	1.557	2.779	4.664	0.499	0.802	1.095
2010	106	348	1,770	1.543	2.768	4.636	0.496	0.798	1.093
2011	108	351	1,768	1.577	2.786	4.686	0.504	0.804	1.100
2012	109	353	1,768	1.585	2.812	4.717	0.509	0.812	1.117
2013	116	362	1,790	1.650	2.891	4.887	0.526	0.835	1.145
2014	117	366	1,811	1.672	2.934	4.958	0.533	0.848	1.166
2015	122	373	1,836	1.715	2.995	5.118	0.550	0.865	1.212
2016	125	379	1,853	1.750	3.045	5.201	0.555	0.877	1.236
2017	124	378	1,866	1.742	3.050	5.212	0.552	0.876	1.244
2018	120	378	1,866	1.726	3.036	5.160	0.548	0.874	1.231
2019	118	376	1,868	1.706	3.015	5.093	0.538	0.867	1.225
2020	113	373	1,858	1.661	2.989	5.114	0.527	0.860	1.220

Table 50. Exploitation estimates from the JABBA-Select final base model.

Year	H			H/H_{MSY}		
	LCI	*Median*	*UCI*	*LCI*	*Median*	*UCI*
1982	0.001	0.006	0.022	0.029	0.188	0.818
1983	0.003	0.015	0.051	0.028	0.188	0.863
1984	0.002	0.013	0.043	0.054	0.356	1.679
1985	0.003	0.014	0.048	0.054	0.362	1.743
1986	0.005	0.024	0.079	0.061	0.418	2.045
1987	0.002	0.011	0.038	0.032	0.224	1.129
1988	0.001	0.005	0.018	0.016	0.108	0.553
1989	0.001	0.006	0.021	0.012	0.086	0.441
1990	0.001	0.003	0.012	0.010	0.066	0.338
1991	0.001	0.007	0.024	0.023	0.152	0.766
1992	0.002	0.008	0.028	0.021	0.138	0.698
1993	0.001	0.007	0.024	0.031	0.198	0.993
1994	0.002	0.010	0.031	0.036	0.233	1.157
1995	0.002	0.008	0.027	0.026	0.170	0.841
1996	0.002	0.008	0.026	0.027	0.174	0.865
1997	0.001	0.007	0.021	0.023	0.146	0.723
1998	0.002	0.010	0.030	0.035	0.219	1.062
1999	0.003	0.013	0.041	0.054	0.339	1.635
2000	0.004	0.021	0.066	0.100	0.629	3.042
2001	0.003	0.014	0.044	0.051	0.324	1.571
2002	0.003	0.015	0.047	0.062	0.389	1.908
2003	0.004	0.023	0.073	0.081	0.510	2.553
2004	0.003	0.014	0.047	0.035	0.225	1.149
2005	0.002	0.011	0.037	0.035	0.220	1.107
2006	0.003	0.014	0.044	0.030	0.191	0.943
2007	0.003	0.016	0.052	0.048	0.298	1.429
2008	0.007	0.033	0.101	0.063	0.392	1.880
2009	0.006	0.028	0.090	0.049	0.310	1.510
2010	0.004	0.019	0.061	0.064	0.403	1.931
2011	0.005	0.023	0.075	0.065	0.411	1.981
2012	0.002	0.012	0.039	0.042	0.264	1.256
2013	0.004	0.019	0.061	0.083	0.522	2.431
2014	0.003	0.016	0.052	0.057	0.353	1.663
2015	0.003	0.016	0.049	0.046	0.282	1.302
2016	0.004	0.020	0.062	0.070	0.436	2.043
2017	0.004	0.020	0.060	0.062	0.386	1.813
2018	0.003	0.017	0.052	0.042	0.265	1.265
2019	0.003	0.013	0.043	0.040	0.250	1.230
2020	0.003	0.016	0.054	0.044	0.275	1.368

13.5 Addendum Figures

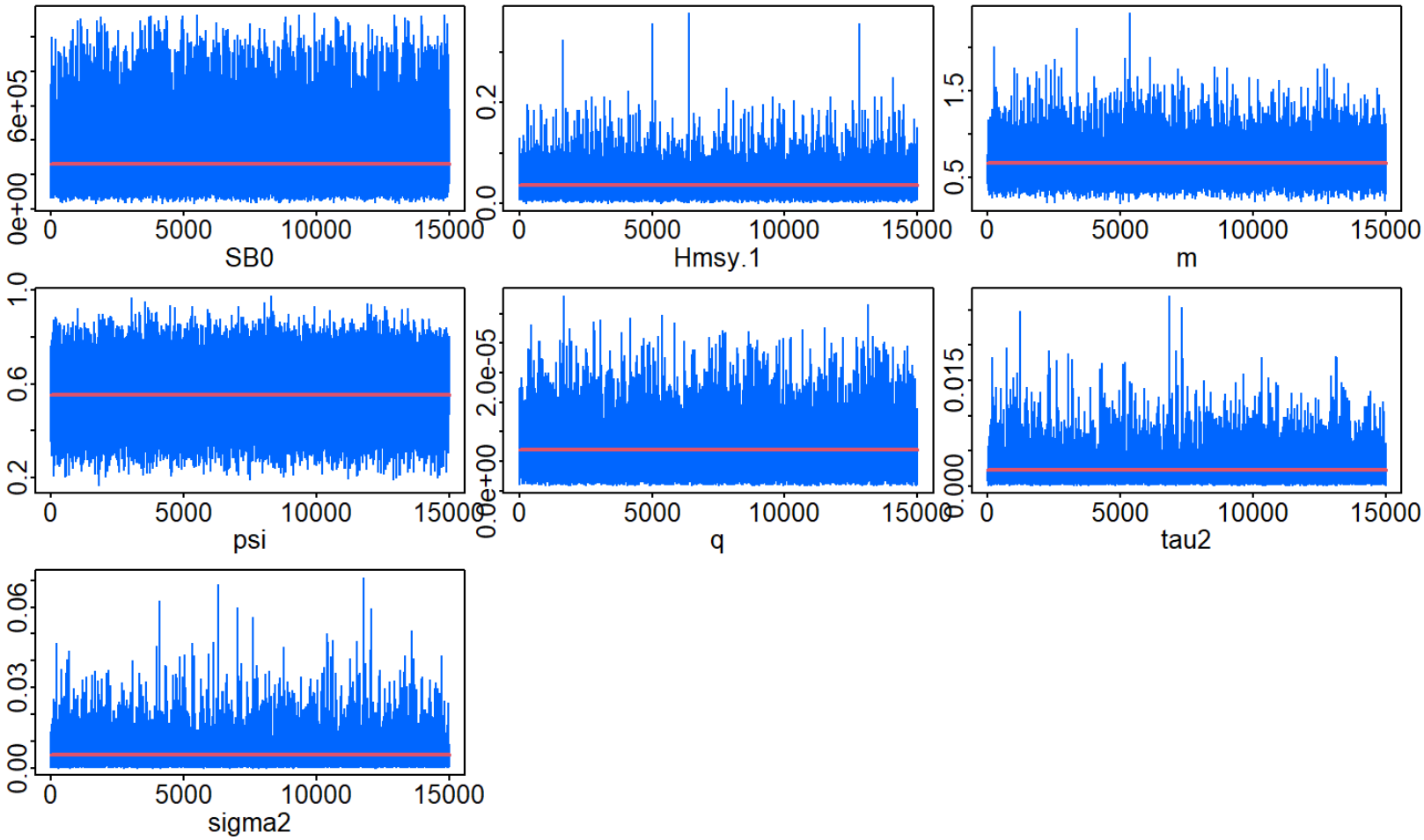

Figure 117. Trace plots of the Markov chains from the JABBA-Select final base model. SB_0 is in metric tons.

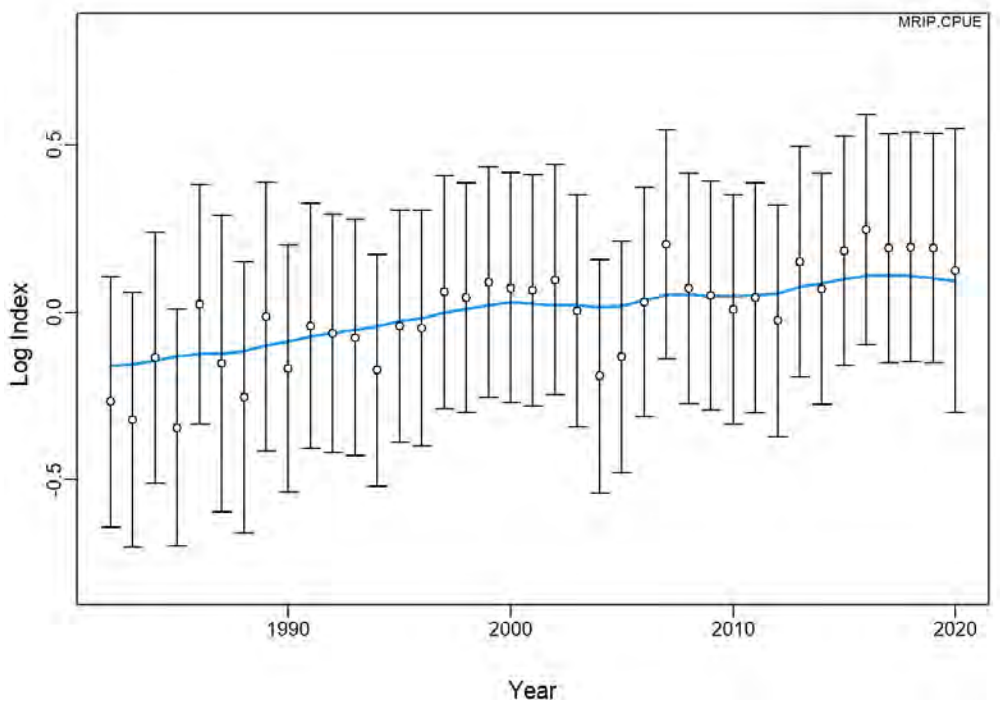

Figure 118. JABBA-Select final base model fit to the MRIP CPUE. The blue line is the model predictions of the observed CPUE (circles). Error bars are 95% confidence intervals of observed CPUE based on total observation error.

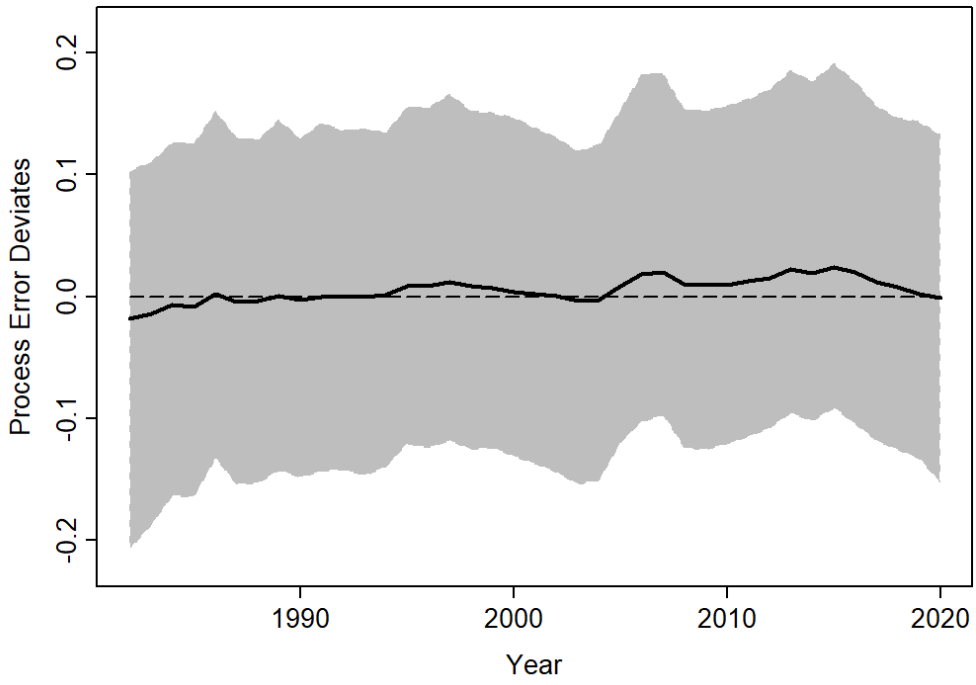

Figure 119. Annual process error deviates (i.e., difference between deterministic expectation of log(*SBy*) and stochastic realization of log(*SBy*)) estimated in the JABBA-Select final base model. The solid line is the median and the shaded region is the 95% credible interval.

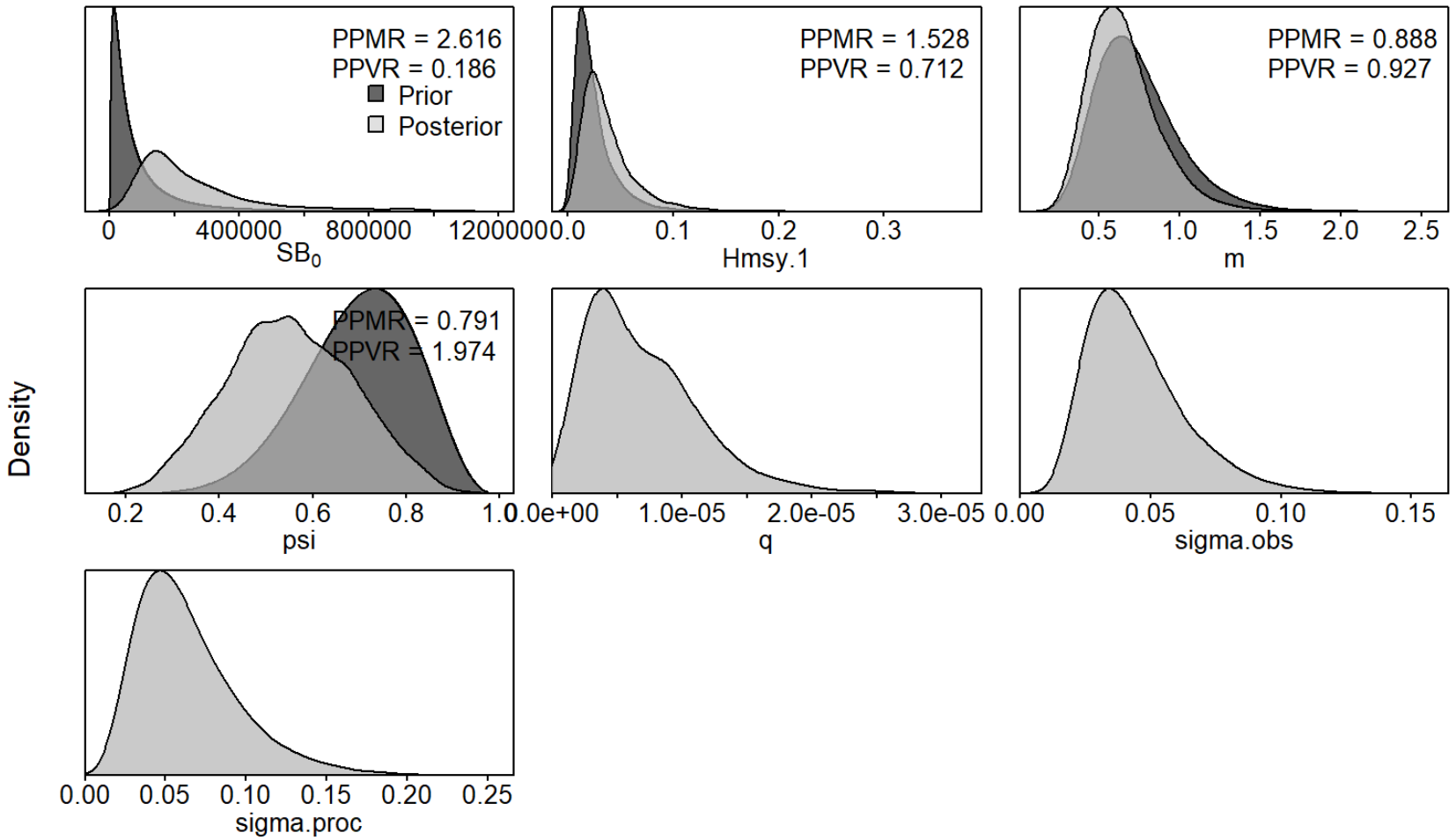

Figure 120. Prior and posterior distributions of parameters estimated in JABBA-Select final base model. *SB_0* is in metric tons. PPVR is the posterior to prior variance ratio and PPMR is posterior to prior mean ratio.

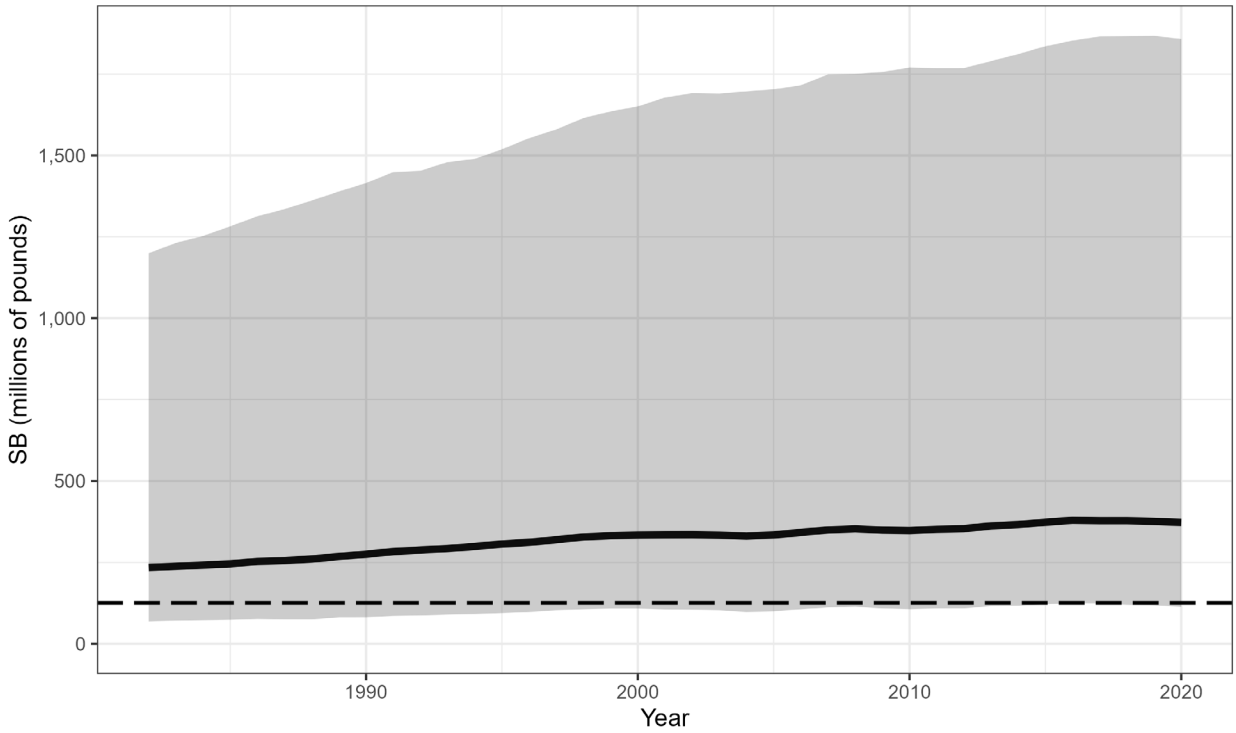

Figure 121. Spawning biomass estimated in the JABBA-Select final base model. The solid line is the median and the shaded region is the 95% credible interval. The dashed line is the median SB_{MSY} estimate.

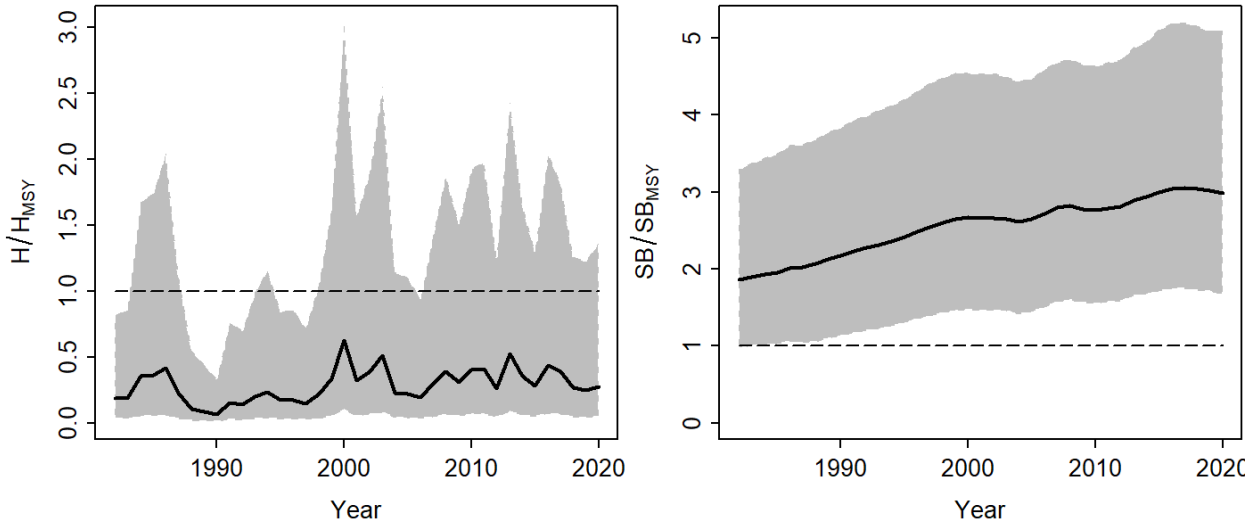

Figure 122. Exploitation (left) and spawning biomass (right) relative to threshold reference points estimated in the JABBA-Select final base model. The solid line is the median and the shaded region is the 95% credible interval. The dashed line indicates the estimate at its respective threshold level.

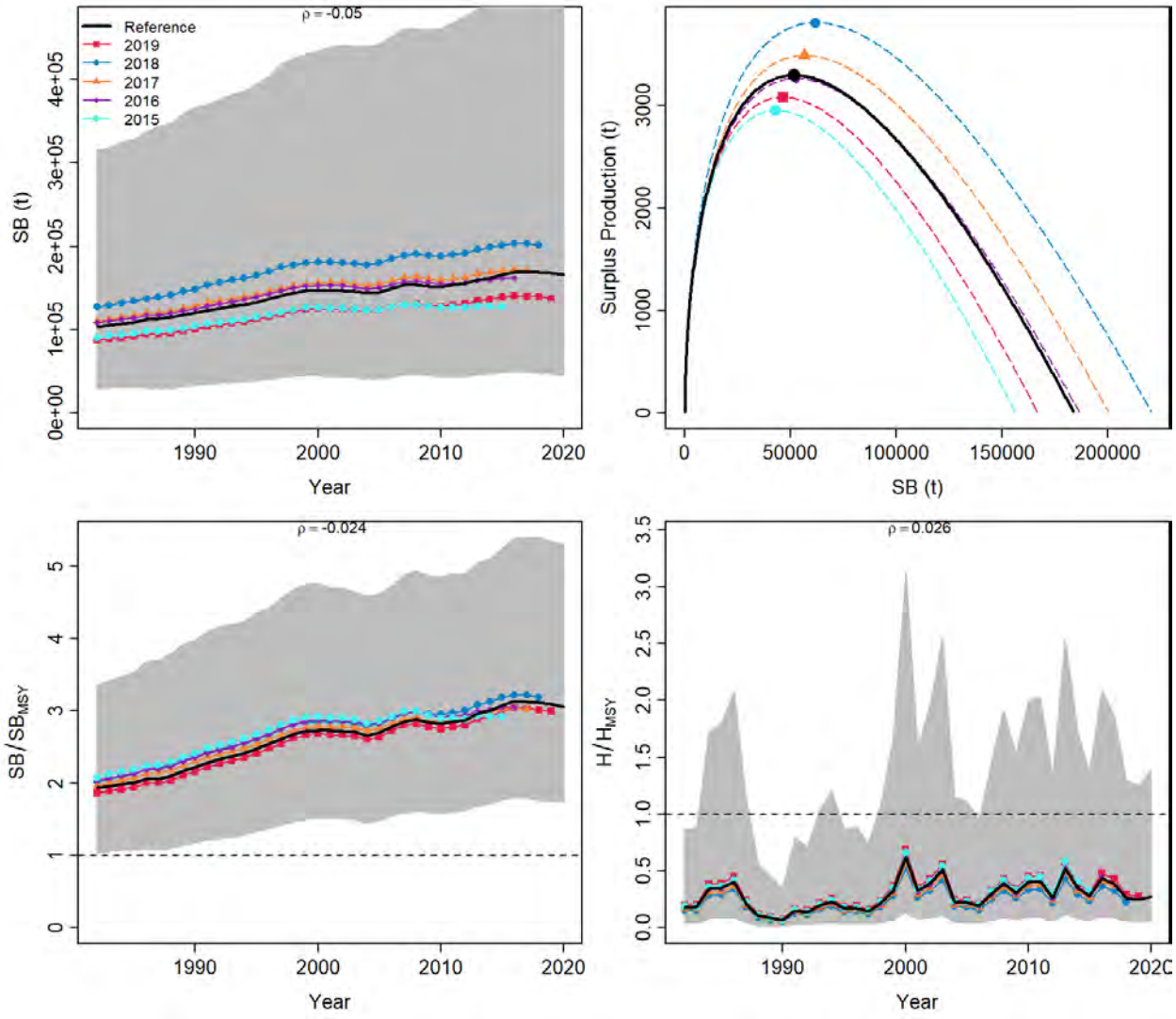

Figure 123. Estimates from JABBA-Select retrospective analysis for the final base model. Mohn's rho values are printed at the top of each panel for the respective parameter.

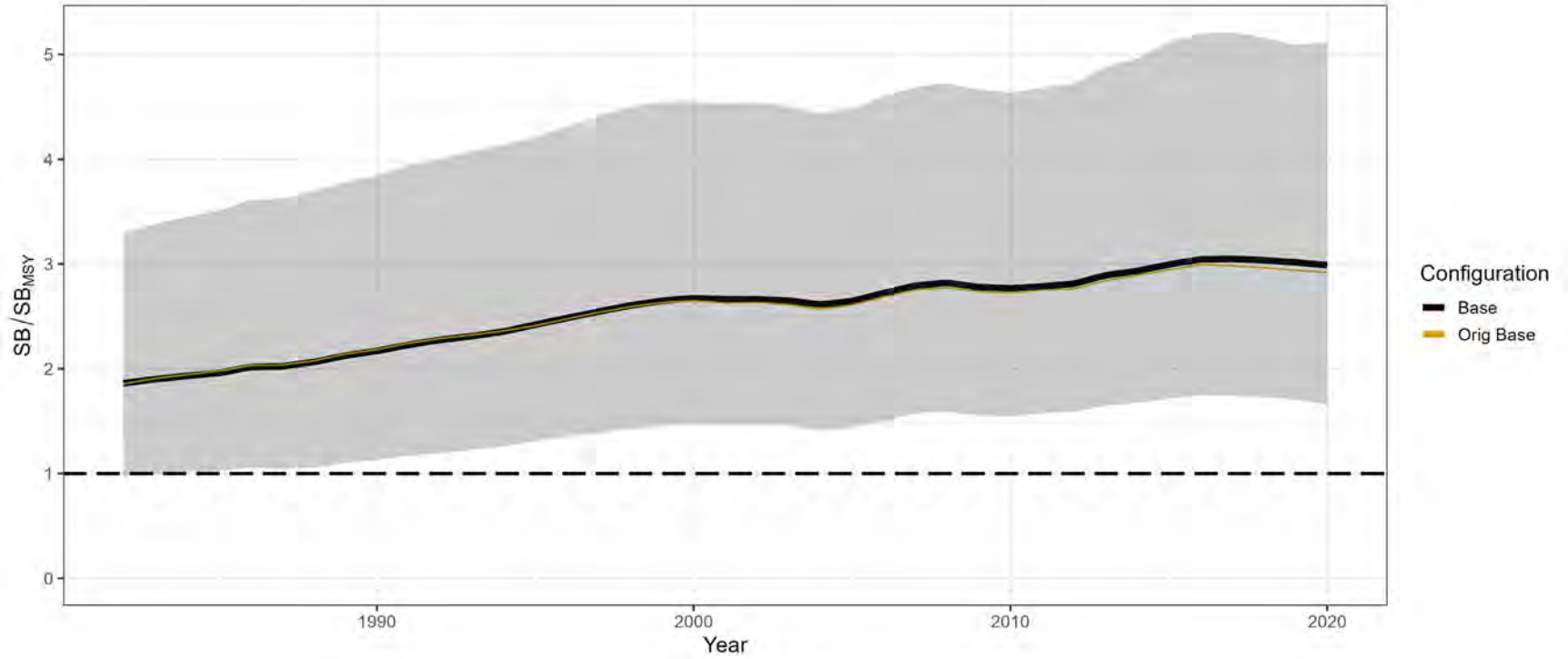

Figure 124. Relative biomass estimates from the JABBA-Select final base model and *Orig Base* configuration reviewed during the Peer Review workshop. The shaded region is the 95% credible interval of the final base model.

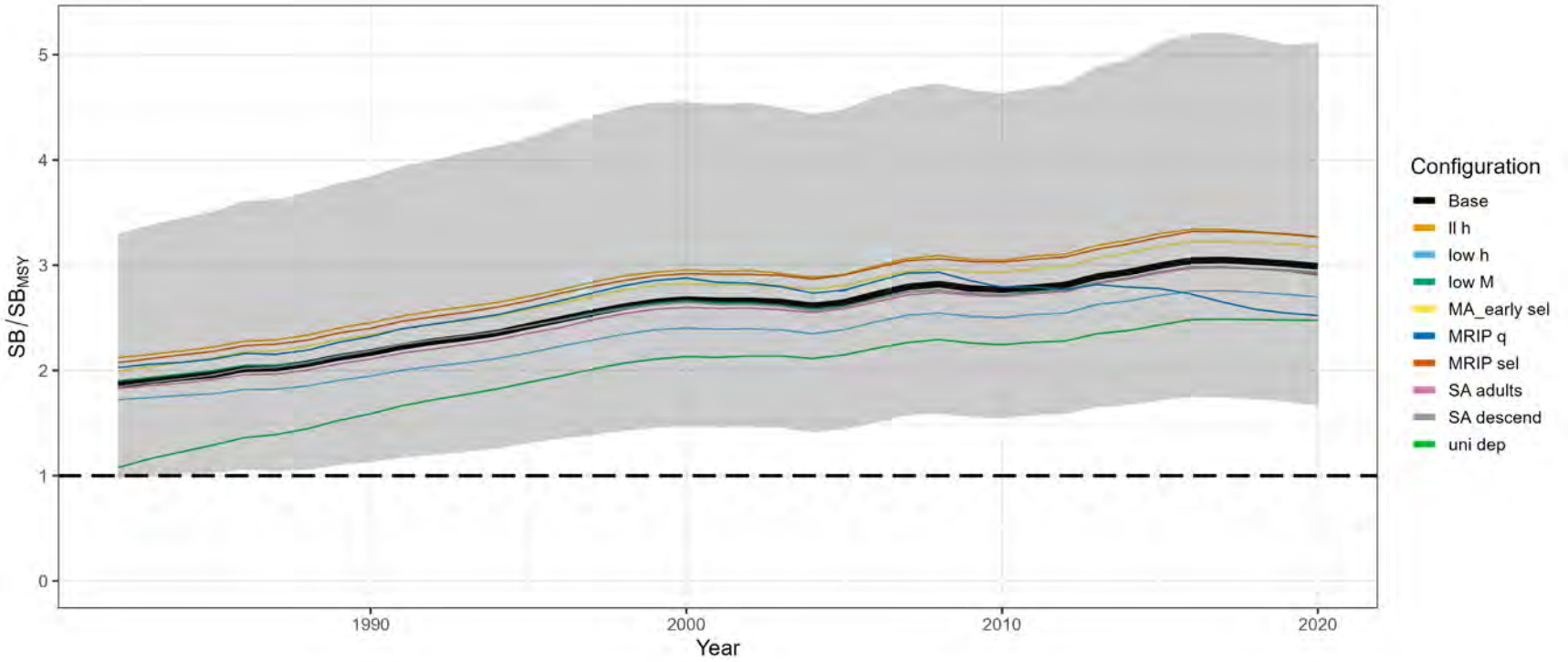

Figure 125. Relative biomass estimates from the JABBA-Select sensitivity analysis for the final base model. The shaded region is the 95% credible interval of the final base model.

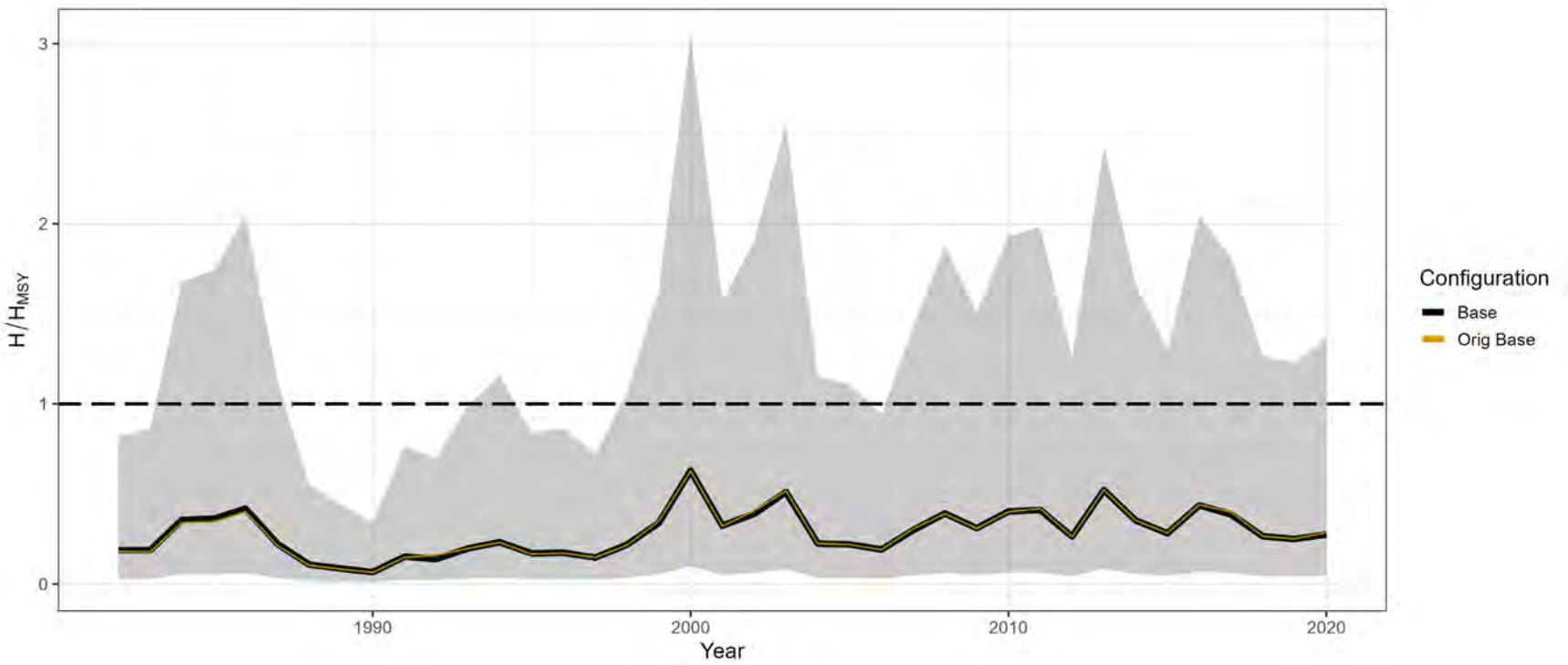

Figure 126. Relative exploitation estimates from the JABBA-Select final base model and *Orig Base* configuration reviewed during the Peer Review workshop. The shaded region is the 95% credible interval of the final base model.

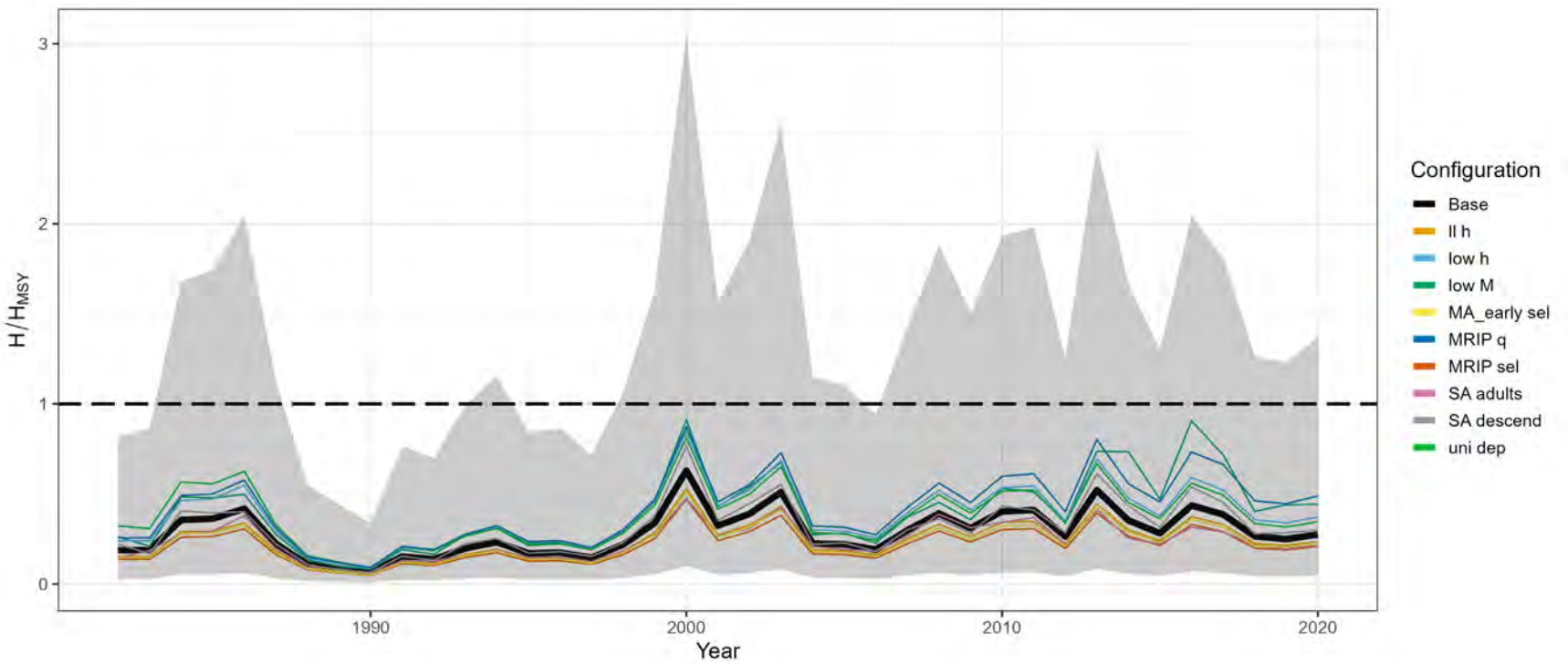

Figure 127. Relative exploitation estimates from the JABBA-Select sensitivity analysis for the final base model. The shaded region is the 95% credible interval of the final base model.

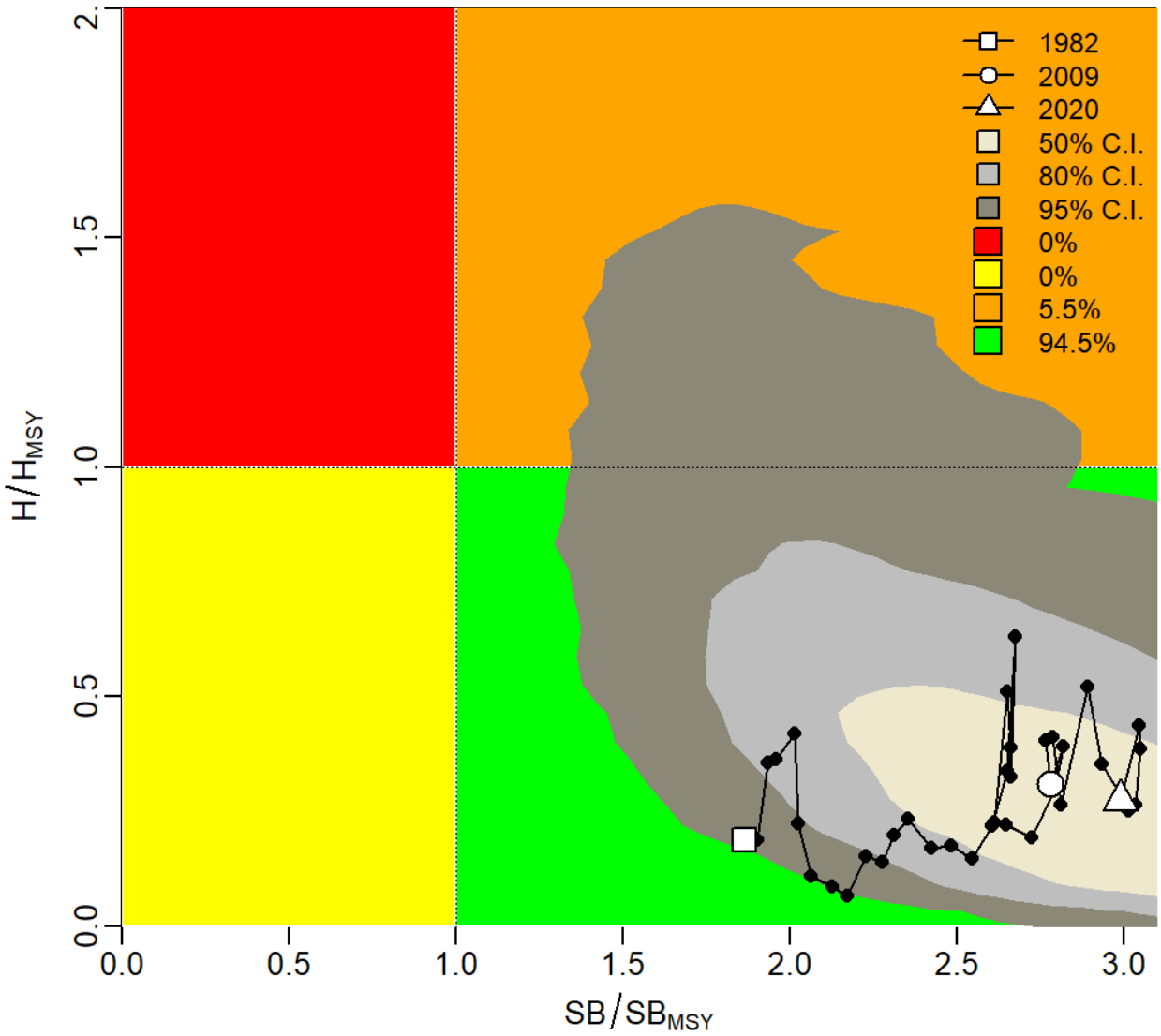

Figure 128. **Kobe phase plot for the JABBA-Select final base model showing the estimated stock status trajectories. Different grey shaded areas denote the 50%, 80%, and 95% credibility interval for the terminal year of 2020. The probability of terminal year points falling within each quadrant is indicated in the figure legend.**

14 APPENDICIES

Appendix 1

Analyses and Applications of Black Drum Age and Length Data Collected by Atlantic States between 2008 and 2019

Hank Liao, Jeff Kipp, Chris Stewart,
Ethan Simpson, and Chris McDonough

(Working paper)

August 3, 2022

Age Data Working Group
ASMFC Black Drum TC and SASC

INTRODUCTION

Black Drum (*Pogonias cromis*) 2015 benchmark stock assessment used three catch-based methods to evaluate Black Drum stock status and estimate biological reference points. One of the reasons for using the data-poor methods is the lack of age-length data and length distribution data, the former represents the relationship between age and length, and the latter represents length distribution of a catch. After the last stock assessment, the state agencies along the east coast have continued to collect age-length and length data from both commercial and recreational fisheries, fishery-independent surveys for multiple years. The primary goal of this study is to find out if the age-length and length data are sufficient enough to provide information for tracking cohort progressions through years, and to update von Bertalanffy growth parameters for age-specific natural mortality estimate. The specific objectives are: 1) evaluate the length data collected by Atlantic states to see if the data from different units (gear, state, region) can be collapsed to increase sample sizes; 2) evaluate the age-length data collected by Atlantic states to see if the data can be used to convert length distribution to age distribution; 3) examine if converted age distributions can track cohort progressions through years; 4) explore the implication of such information in Black Drum stock assessment; 5) fit von Bertalanffy growth model to the age-length data to estimate the growth parameters; 6) discuss the implication of these parameters in estimation of age-specific natural mortality.

METHODS

Data collection

Atlantic state agencies collected all the data used in this study. There are three sets of data as follows:

1. Length data: total length and fork length in mm, cm, or inch;
2. Age-length data: otolith age, total and fork length in mm, cm, or inch;
3. Abundance index: Age-0 and Age-1.

Length data

DE, MD, VA, NC, SC, and FL collected either total, folk length or both. Some states collected the data as early as 1980, all the states collected the data to 2020. The data were collected mainly from commercial fisheries and some from recreational fisheries using a variety of gears.

Age-length data

DE, VA, NC, SC, and FL collected the age-length data. FL collected the data as early as 1983 whereas most of states collected the data to present. The fish and carcasses were collected

from recreational and commercial fisheries, and fishery-independent surveys, however, mainly from the recreational fisheries. The otoliths were used to estimate ages.

Abundance index

NC provided an abundance index showing year-class strength ranging from 2001 to 2019. SC provided trammel net CPUE for Age-1 ranging from 1991 to 2021.

Data analysis

Length data

All the lengths in cm or inch were converted to mm. We used the fish with both total and folk length to develop a linear model and then used the model to convert folk length to total length for the fish who have only folk length as follows:

1. Assuming that the difference between total and folk length is normally distributed, we used boxplot function boxplot() in R (R Core Team 2021) to identify outliers of the differences, and removed any fish with those outliers;
2. We used the rest fish to develop a linear model, TOTAL = a + b x FOLK, where, FORK, TOTAL, a, and b stand for fork length, total length, intercept, and slope, respectively.

We used boxplot and Tukey test (TukeyHSD() in Package "stats" in R) to examine the differences in mean total length between gears with each state and between states within each gear to explore if we could collapse those units to increase sample sizes of length due to small sample size within some units. Based on the test results we collapse two or more gears and/or states to a fleet. We used the selected length data to make annual 1-inch length interval distributions for further age conversions.

Age-length data

We also standardized the length in the age-length data to total length in mm as described above. We used Kimura likelihood ratio test (Kimura 1980, growthlrt() function in Package "fishmethods" in R) to test differences in von Bertalanffy growth rate between sexes, states, and regions, to explore if we were able to collapse those units to increase the sample sizes of age-length data because it is difficult to collect Black Drum age-length data in general. Because there is no sex information in the age-length data collected from the fishery-independent surveys, we excluded all the fishery-independent surveys from Kimura test. More specific:

1. Assuming no significant difference in Black Drum growth rate between years, or at least no increasing or decreasing trend in their growth through years, we collapse all year data to test;
2. We used boxplot function to remove outliears by sex, state, and region, respectively, before testing the growth rates;

3. We used Kimura likelihood ratio test (fishmethods package in R) to test between sexes, any two states, and two regions (Mid-Atlantic region (DE, MD, and VA) versus South Atlantic region (NC, SC, GA, and FL)).

ALK and Conversion of length to age

Based on the Kimura test results we collapsed certain units to make annual ALKs. Here we included the age-length data from the fishery-independent surveys in the ALKs unlike in the Kimura tests described previously. This is because the fishery-independent data mainly consists of younger fish whereas the fishery-dependent data lacks of younger fish, and the combination of both will make the ALKs more representative of the relationship between age and length in the Black Drum population. Because there were few samples of age-length data before 2008, we removed any years before 2008 for further analysis. As a result, we converted the length distributions to age distributions from 2008 to present. In addition, for demonstration purpose of cohort progressions, we presented the conversions only from 2008 to 2019, making a 12-panel page (or 12 years in one page). We did the conversions as follows:

1. We used boxplot function on the age-length data to remove outliers by year;
2. We used the age-length data without outliers to make annual ALKs from 2008 to 2019;
3. We used each annual ALK to convert its corresponding length distribution to age distribution;
4. There were three sets of converted age distributions as follows:
   1) Age distribution from the length distribution with the fleet with the largest sample sizes;
   2) Age distribution from the coast-wide length data from all sources, commercial, recreational, and all gears;
   3) The 2) age distribution but with the most younger ages removed.

   The purpose to examine the three age distributions is to see which one would provide the most information on cohort progressions through years.

Comparison between the age distributions and abundance indices

We compared the strong cohorts identified by age distributions and abundance indices, expecting that the age distributions may verify the stock abundance through years identified by the abundance indices.

von Bertalanffy growth parameters

We assumed the age-specific natural mortality was constant through years, was the same between sexes, and between regions, therefore, we used the region-, year- and sex-pooled age-

length data collected between 1983 and 2020 (the terminal year for 2023 stock assessment). We fitted von Bertalanffy growth model $L_t = L_\infty[1 - e^{-K(t-t_0)}]$ using nonlinear least square function (assuming additive error structure) to the data to estimate the growth parameters, L_∞, K, and t_0. Before fitting the model to the data, we used boxplot function to remove outliers from the data by assuming that the length is normally distributed at each age. We fitted the model to both the mean length- and individual length-at-age data, respectively, in order to find which model is more appropriate to describe the black drum growth. The estimates of L_∞, K, and t_0 together with the Black Drum age range will be used to estimate age-specific natural mortality in the stock assessment (Lorenzen 1996; Then et al. 2015).

RESULTS

Length data

Examination of length data

There were 2375 fish used to develop the linear model (Figure 1). This model was used to convert the folk length to total length for fish with folk length only. There are significant differences in mean length between gears within each state (Figure 2 and 3), and between states within each gear (Figure 4 and 5) except between FL gill net and FL hook and line (Top panel in Figure 3). Even though the lengths are significantly different between the majority of gears and all the states, in order to increase sample sizes we made several fleets (Table 1) for further analysis (Please see detailed analysis in Jeff's working paper).

Length distributions to be converted

From Table 1 we picked NC commercial length data from 2008 to 2019 as the first length distribution (Figure 6) to convert it to its age distribution. Then, we used all the length data collected by both commercial and recreational using a variety of gears to make the second length distribution (Figure 7) for age conversion.

Age-length data and ALKs

In general, the sample sizes of age-length data from each state are very small and even the coast-wide sample sizes are very small before 2008 (Table 2), therefore, we didn't use any age-length data collected before 2008. Black Drum growth rates are significantly different between all the paired states (Not showing figures here), and we believe that such differences are mainly resulted from small sample sizes. However, there is no significant difference in growth between male and female Black Drum when all years and states data are pooled (Figure 8 and 9). There is no significant difference in growth between Mid- and South Atlantic region (Figure 10 and 11). Based on the results, we collapsed sexes and states within each year to make an annual ALK. Figure 12 shows the age-length data we used to make the annual ALKs and Figure 13 shows the age distribution in each ALK.

Converted age distributions

NC age distribution

Since NC gill nets collected mainly small fish (the majority $<$ 24 inch) (Figure 6), its age distributions are mainly young fish (the majority younger than Age 4) (Figure 14). As a result, NC age distribution is not able to provide any information on cohort progressions through years.

Coastal wide age distribution

The coast-wide length data did include more large fish, however, no cohort progression can be tracked through years in the age distributions from 2008 to 2019 mainly because the abundances of Age 3 and younger are significantly higher than the fish older than Age 3 (Figure 15).

Coastal wide partial age distribution

After removing fish Age 3 and younger, we are able to track four strong cohort progressions (2001, 2005, 2007, 20011) through years (Figure 16). Some strong cohorts are tracked more easily than others, for example, Year-class 2001 can be tracked through 11 of 12 years (lost tracking in 2016). Year-class 2015 is identified as a strong cohort, we may be able to track its progression through years after collecting more age-length and length data in the coming years.

Comparison between the age distributions and abundance indices

The strong cohorts identified by the age distributions do match those identified by abundance indices provided by NC (Figure 17) and SC (Figure 18).

von Bertalanffy growth parameters

There were 9378 samples of black drum collected between 1983 and 2020 with both age and length, of which 221 samples were identified as outliers, and 9157 samples were kept for further analysis (Figure 19). Figure 20 and 21 show the von Bertalanffy growth curves estimated using the mean length- and individual length-at-age, respectively. The predicted length at Age 0 is 328 and 242 mm from the mean length- and individual length-at-age model, respectively. Based on the observed length data for Age 0 Black Drum, we believe that the model developed from the individual length-at-age data is more appropriate to describe the Black Drum growth rate. As a result, we will use L_∞ of 1156, K of 0.133, and t_0 of -1.77 (Figure 21) in the development of age-specific natural mortality.

DISCUSSION

This study used the observed length distribution (or raw length distribution) instead of the converted length distribution (or expanded length distribution) to track cohort progressions through years, providing three advantages as follows:

1. Catch in number is not required, as a result, no need to figure out how many catch is from which gear and how many fish should be converted from a catch in weight;
2. Since we are only interested in if the raw length can provide any information on cohort progression, we may collapse all the gears together because the gear selectivity will not influence our analysis as long as we have as a large sample size as possible and cover as a wide length range as possible;
3. When converting a length distribution to its age distribution, very often the length intervals in an ALK may not completely match those in the corresponding length distribution due to small sample sizes of and a wide range of Black Drum length. For example, an ALK lacks 10" interval whereas a length distribution lacks 11" interval. In this study we can delete the 10" interval from the ALK and the 11" interval from the length distribution, making the rest intervals completely match between the two. when an expanded length distribution is used, removal of any length intervals from the length distribution will underestimate the total catch in the CAA because the fish in the removed length intervals will not contribute to the CAA. To overcome such a loss of fish, people may pool two or more intervals together, which could result in pooling different cohorts together, reducing the CAA's ability to track cohort progression.

The results from this study are limited to tracking cohort progression through years, and may help identify which abundance index may be used in stock assessment. The method in this study may not be used to generate any CAAs since gear selectivity influences size of fish in catch and different states harvest different length ranges, as a result, pooling different gears and states may mistakenly distribute fish in catch into wrong length intervals.

We fitted the von Bertalanffy growth model to both mean length- and individual length-at-age. The mean-length method estimated a higher L_∞ and a lower K whereas the individual-length method estimated a lower L_∞ and a higher K, demonstrating an intrinsic inverse relationship between L_∞ and K (Quinn and Deriso 1999). Based on the values of L_∞ and K alone, we were unable to decide which method was more appropriate. However, there are two reasons for which we believe the individual-length method is more appropriate as follows:

1. The t_0 of -1.77 from the individual-length method is much closer to 0 than the t_0 of -3.28 from the mean-length method;
2. The predicted length at Age-0 from the individual-length method (242 mm) is much closer to the observed mean length at Age-0 than the one from mean-length method (328 mm).

Therefore, we believe that the individual-length method had a better fit, and its estimates of growth parameters are more representative of the Black Drum population growth.

The t_0 value closer to 0 in the individual-length method is most likely due to the significant large sample size of Age-0, in other words, it is a sample size effect. A simple way to get rid of a sample size effect is to fit the model to mean length-at-age data. However, in this case the mean-length method doesn't have a better fit and doesn't provide a more realistic estimate of length for Age-0 fish. As a result, we will use the parameters from the individual-length method for natural mortality estimation.

Goodyear (2019) discussed the influence of biased estimates of L_∞ and K on natural mortality estimate (M). The L_∞ and K of the individual-length method may not be free of biases even though the method seems having a better fit and providing a more realistic estimate of length at Age-0. A better fitting and a closer estimate of length to the observed mean length at Age-0 could simply describe the data better, and may not necessarily describe the population growth better when the age-length data are not representative of the population (Goodyear 2019). Therefore, we suggest that more effort should focus on improvement of age-length collection along Atlantic coast.

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Table 1: Sample sizes of the length data collected from commercial fisheries by fleet and year.

Year	DE North Gill Nets	MDVA Gill Nets	MDVA Fixed	MDVA Hook&Line	NC Ocean Gill Nets	NC Estuarine Gill Nets	NC Long Haul/ Trawls/Fixed	South All Gears
1989	0	25	12	0			0	11
1990	0	4	35	0			0	9
1991	0	87	22	0			0	50
1992	0	39	0	0			0	39
1993	0	11	84	0			0	57
1994	0	129	5	0	0	26	19	86
1995	0	1	5	0	17	2	145	31
1996	0	28	35	0	1	18	182	49
1997	0	203	7	0	1	24	65	40
1998	0	77	18	1	0	27	44	93
1999	0	201	10		2	114	472	177
2000	0	110	12	0	7	240	516	138
2001	0	104	46	5	4	166	243	176
2002	0	39	35	17	0	579	1254	77
2003	0	4	25	0	35	349	193	96
2004	0	0	73	0	2	269	94	79
2005	0	11	14	0	17	377	84	68
2006	0	3	14	0	18	1052	783	70
2007	0	3	15	0	17	1540	346	112
2008	0	0	14	0	57	1915	1016	174
2009	63	1	39	0	28	984	126	141
2010	84	23	14	1	2	469	190	136
2011	59	0	5	0	233	932	216	83
2012	23	20	16	0	14	1185	254	63
2013	45	26	48	0	50	989	174	97
2014	58	7	39	0	1	692	60	103
2015	90	0	20	0	4	469	99	71
2016	0	392	59	0	3	791	297	61
2017	63	0	48	28	10	1087	80	63
2018	86	74	49	57	3	469	196	61
2019	6	2	46	16	0	287	248	61
2020	45	3	28	0			19	100

Table 2: Sample sizes of the age-length data collected from coast-wide, by region, state, and year.

Year	Coastwide	Mid-Atlantic	South Atlantic	NJ	DE	MD	VA	NC	SC	GA	FL
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0
1983	22	0	22	0	0	0	0	0	0	0	22
1984	101	0	101	0	0	0	0	0	0	0	101
1985	27	0	27	0	0	0	0	0	1	0	26
1986	46	0	46	0	0	0	0	0	46	0	0
1987	73	0	73	0	0	0	0	0	73	0	0
1988	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0
1991	26	0	26	0	0	0	0	0	26	0	0
1992	38	0	38	0	0	0	0	0	38	0	0
1993	87	0	87	0	0	0	0	0	87	0	0
1994	29	0	29	0	0	0	0	0	29	0	0
1995	16	0	16	0	0	0	0	0	16	0	0
1996	52	0	52	0	0	0	0	0	52	0	0
1997	66	0	66	0	0	0	0	0	66	0	0
1998	83	6	77	0	0	0	6	0	46	31	0
1999	141	80	61	0	0	0	80	0	42	19	0
2000	182	42	140	0	0	0	42	0	113	27	0
2001	148	86	62	0	0	0	86	0	35	27	0
2002	242	70	172	0	0	0	59	0	135	37	0
2003	180	36	144	0	0	0	11	0	76	67	1
2004	68	18	50	0	0	0	14	0	29	21	0
2005	62	28	34	0	0	0	8	0	26	8	0
2006	51	15	36	0	0	0	7	0	27	9	0
2007	139	57	49	0	0	0	35	0	24	23	2
2008	409	206	176	0	26	0	171	0	10	166	0
2009	317	171	83	0	97	0	61	0	25	58	0
2010	394	211	172	0	129	0	71	0	19	153	0
2011	368	115	205	0	90	0	19	175	13	13	4
2012	458	55	387	0	33	0	19	307	11	45	24
2013	422	108	294	0	58	0	42	178	24	51	41
2014	670	178	468	0	62	0	102	393	7	47	21
2015	576	144	397	0	78	0	55	358	2	16	21
2016	1108	400	702	0	11	0	372	571	20	106	5
2017	812	153	618	0	59	0	63	562	31	20	5
2018	735	320	373	0	105	0	215	350	11	0	12
2019	558	139	419	0	47	0	92	375	19	0	25
2020	208	73	74	0	67	0	6	64	1	0	9

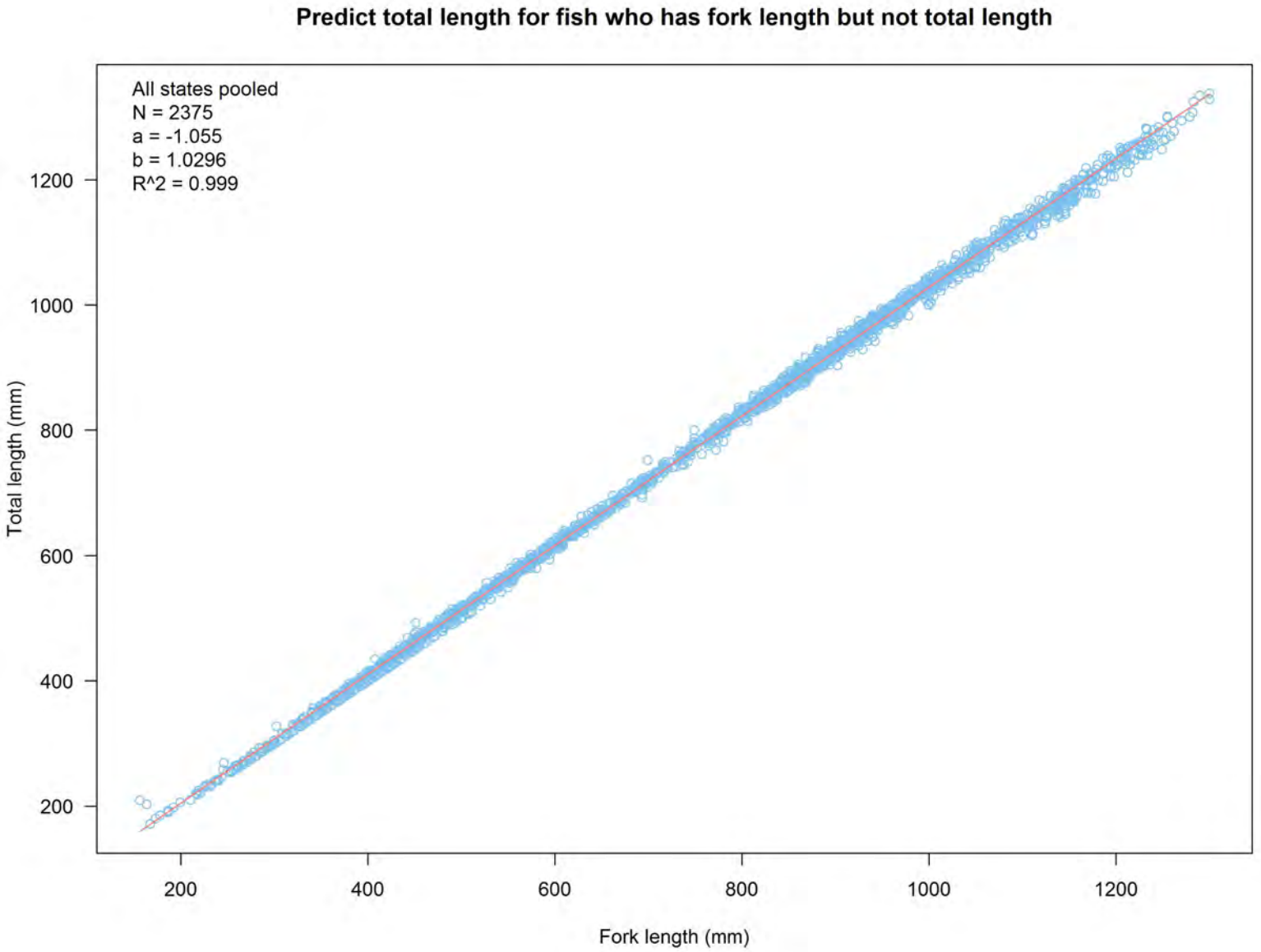

Figure 1: The relationship between fork and total length (mm) of Black Drum.

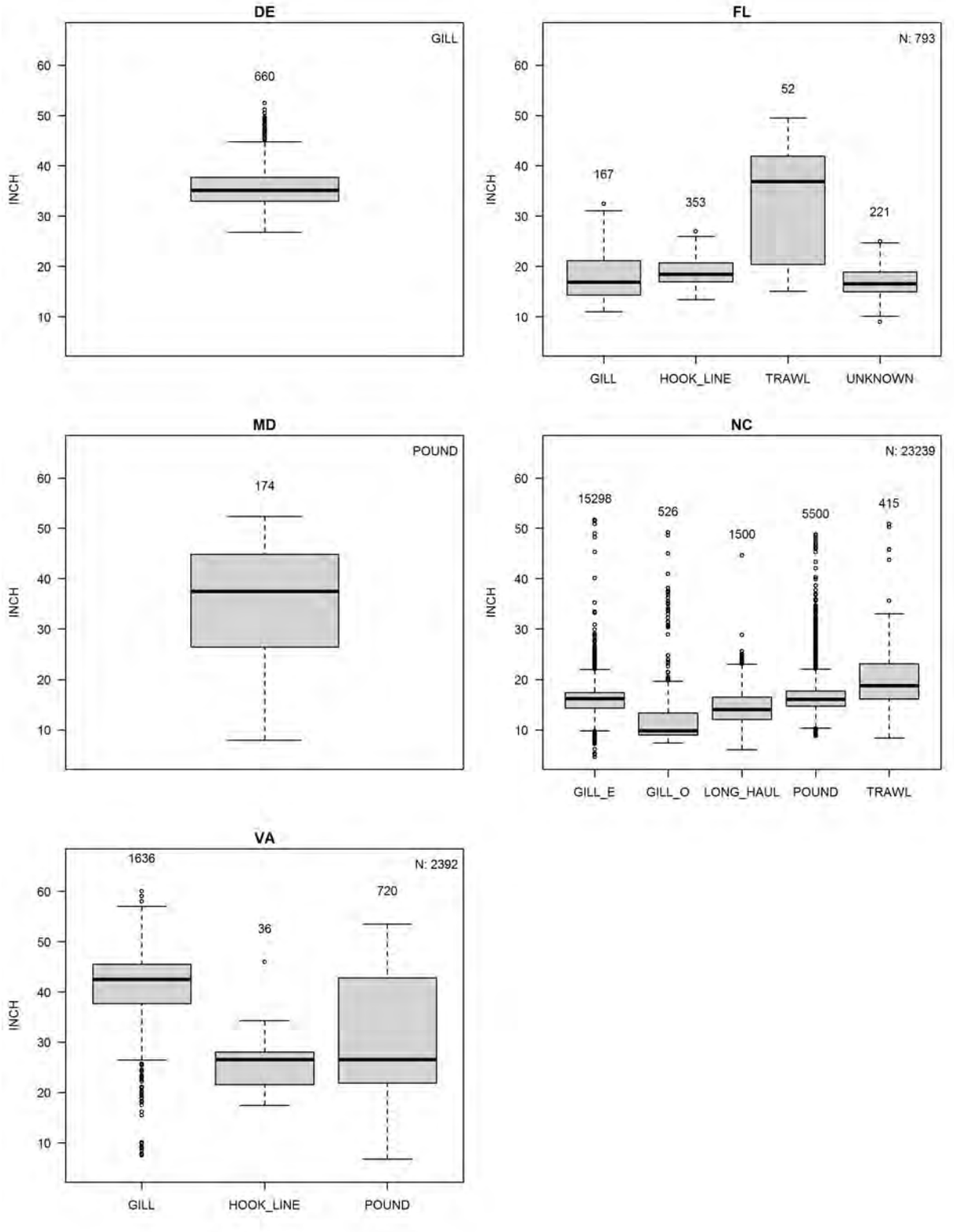

Figure 2: Comparison in the total length of Black Drum between gears within each state.

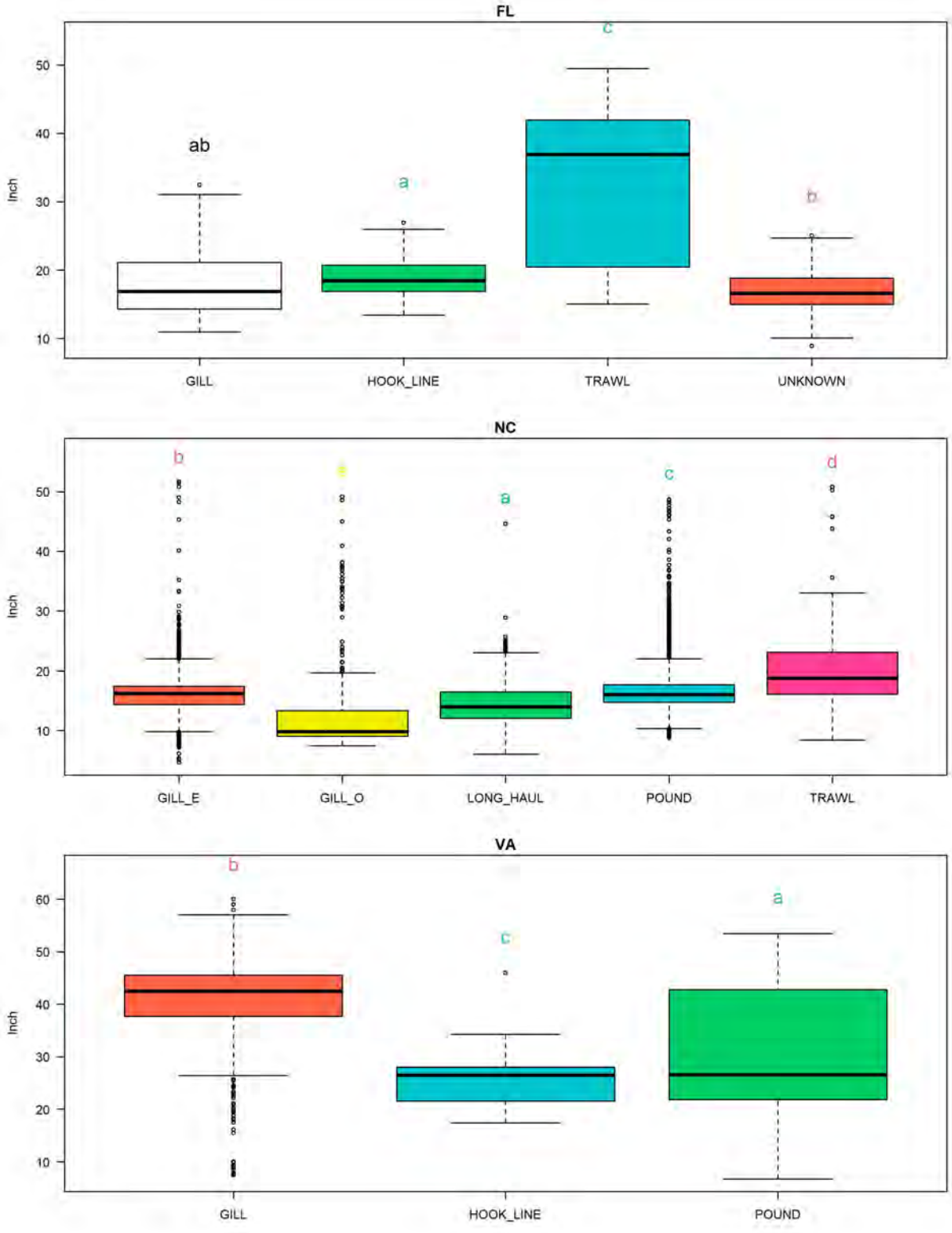

Figure 3: Tukey tests on the total length of Black Drum between gears within each state which has more than two gears. Two or more gears share the same letter are not significantly different.

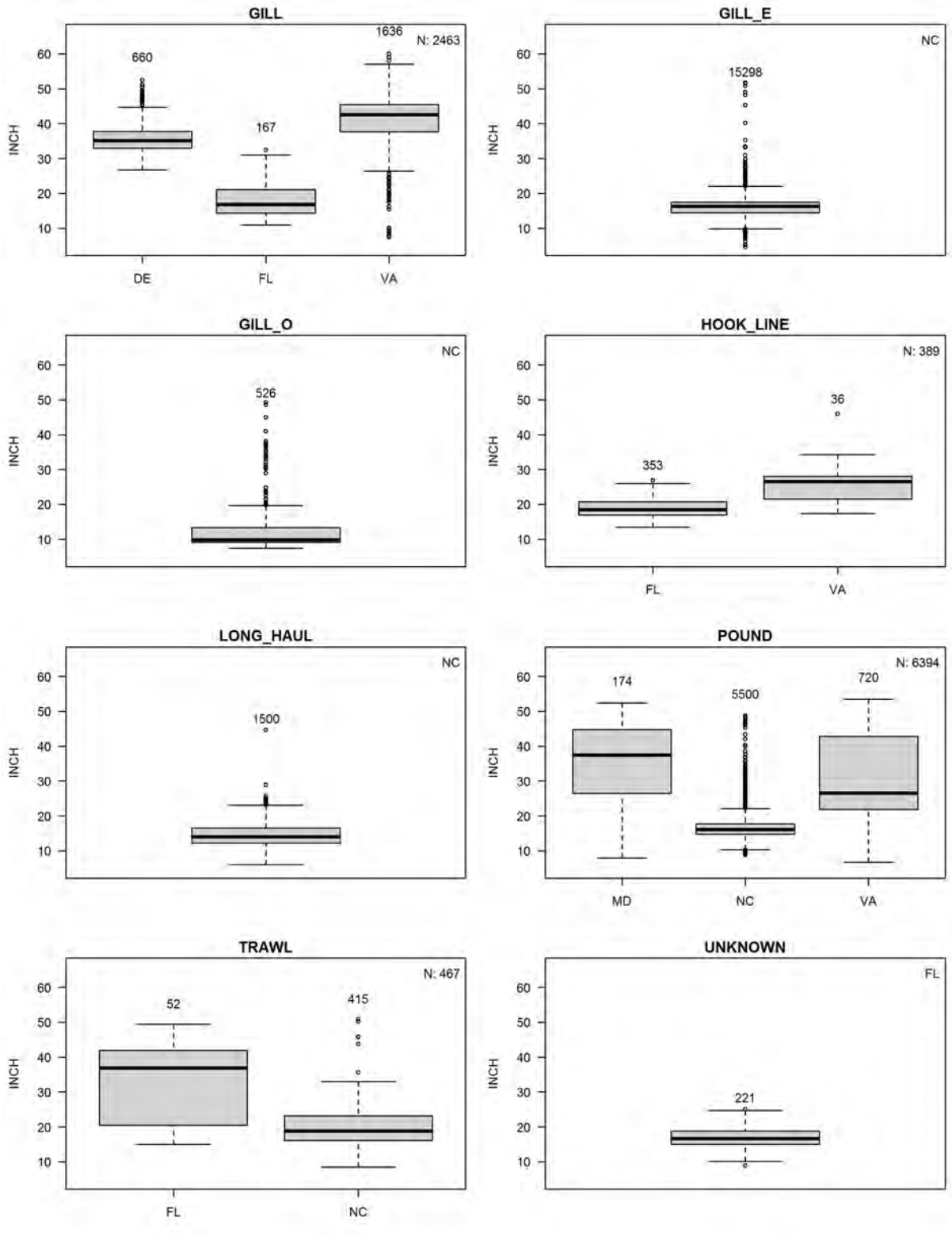

Figure 4: Comparison in the total length of Black Drum between states within each gear.

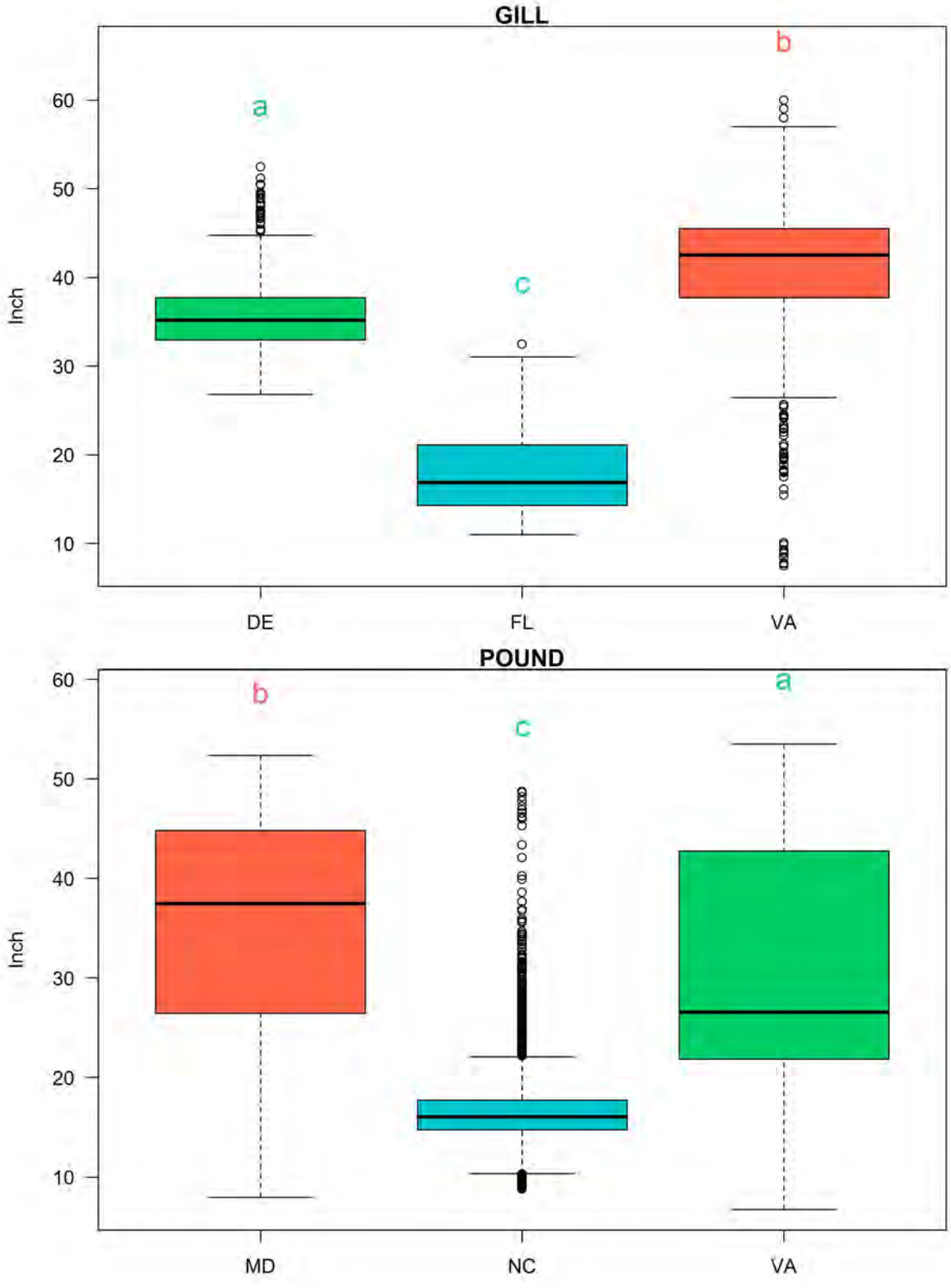

Figure 5: Tukey tests on the total length of Black Drum between states within each gear which has more than two states. Two or more states share the same letter are not significantly different.

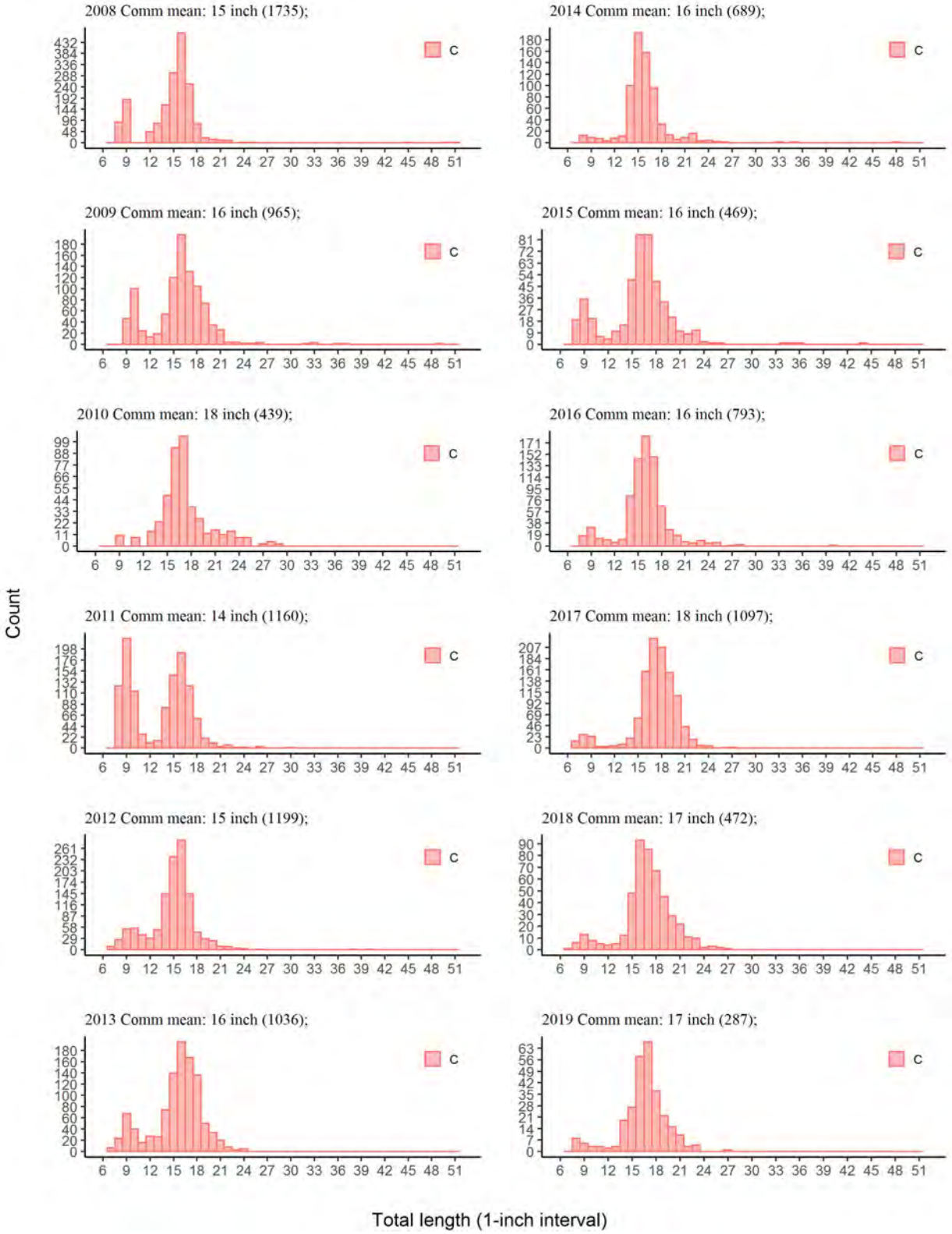

Figure 6: NC Black Drum length distribution (1-inch interval) collected from NC commercial fisheries from 2008 to 2019.

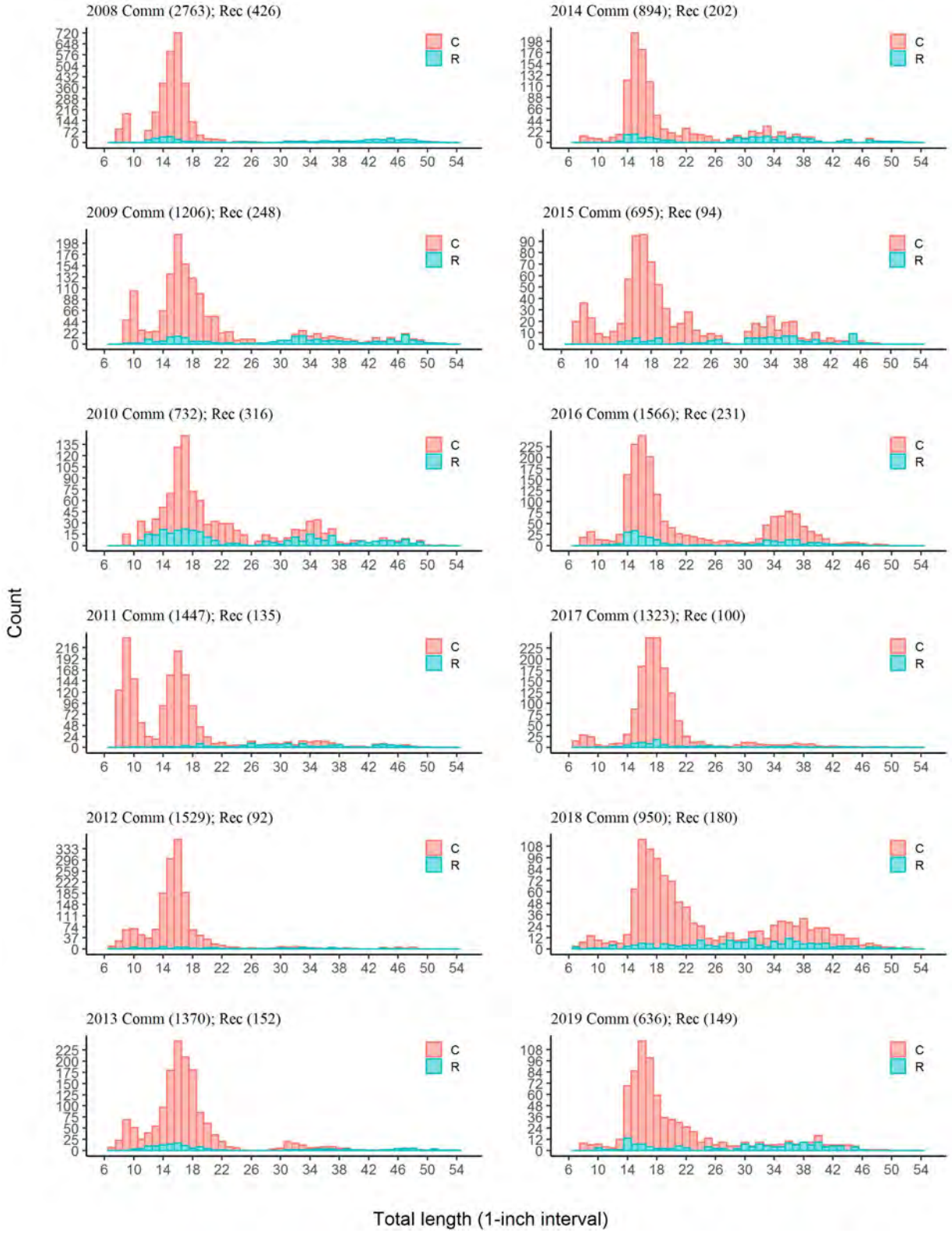

Figure 7: Coastal wide Black Drum length distribution (1-inch interval) collected from both commercial and recreational fisheries from 2008 and 2019.

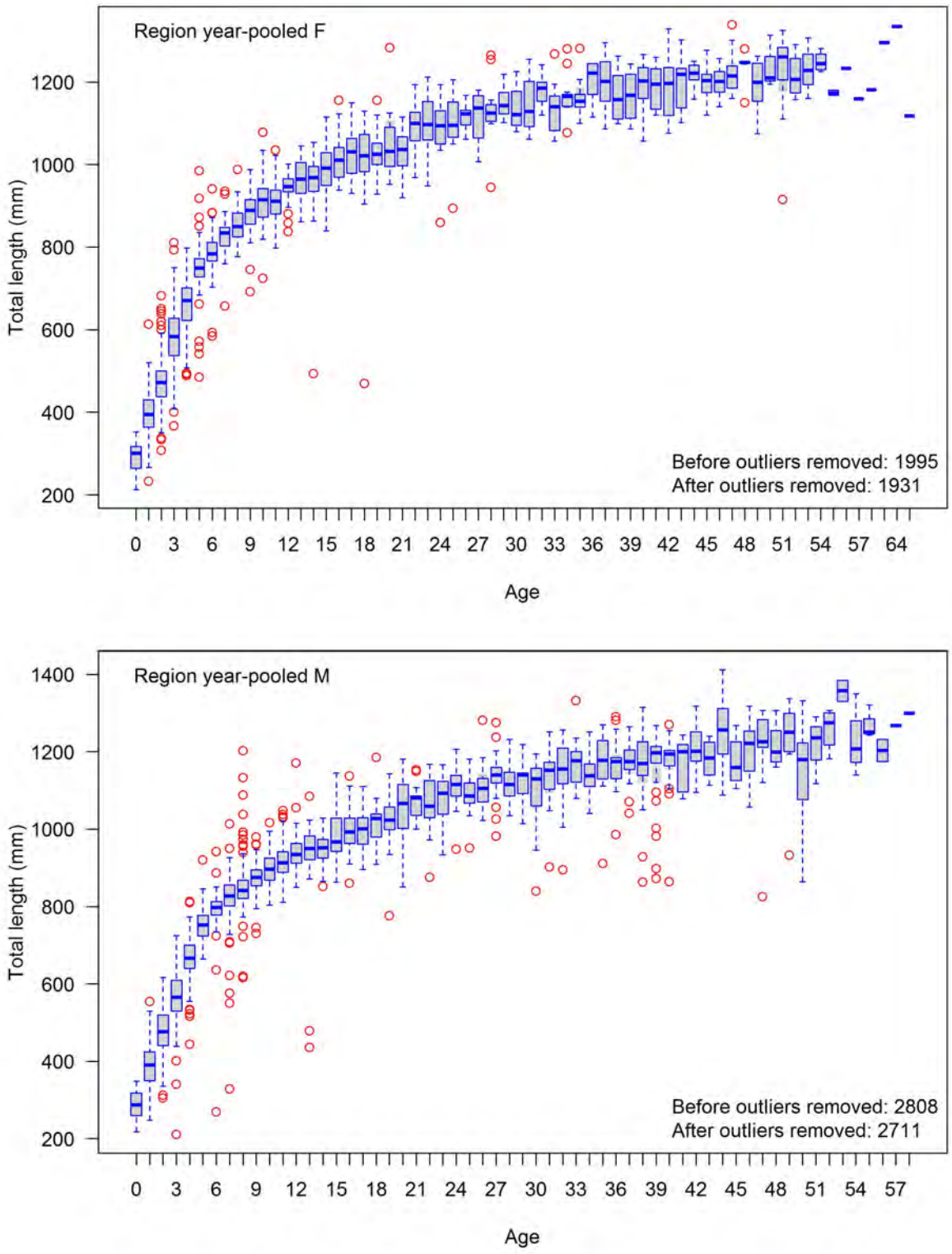

Figure 8: Age-length data before and after outlier removal by sex using boxplot function. "F" and "M" stand for female and male, respectively. One red circle represents one fish identified as an outlier.

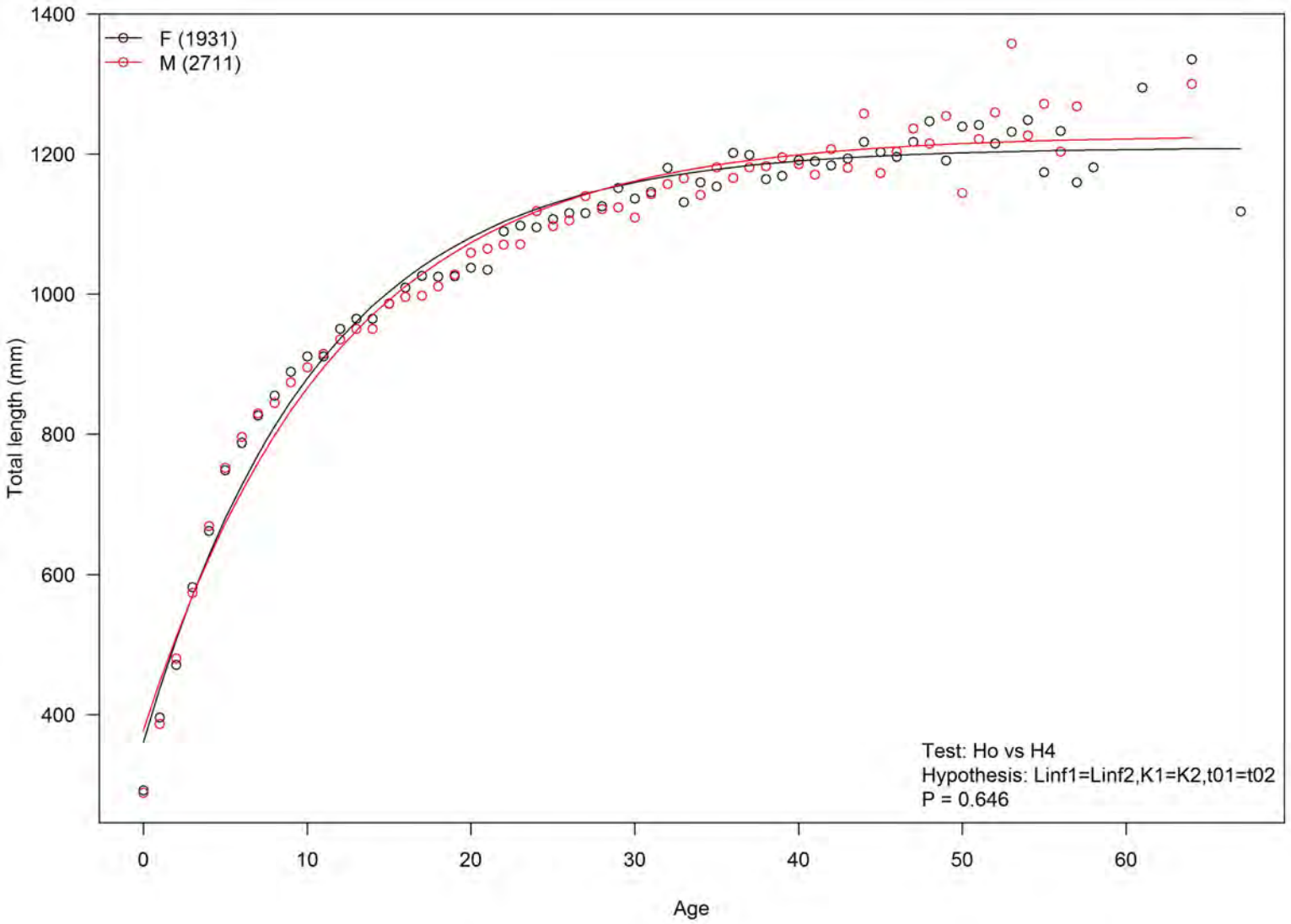

Figure 9: Kimura test on von Bertalanffy growth rates between coast wide and year-pooled female and male Black Drum. "F" and "M" stand for female and male, respectively. A data point is a mean length at age.

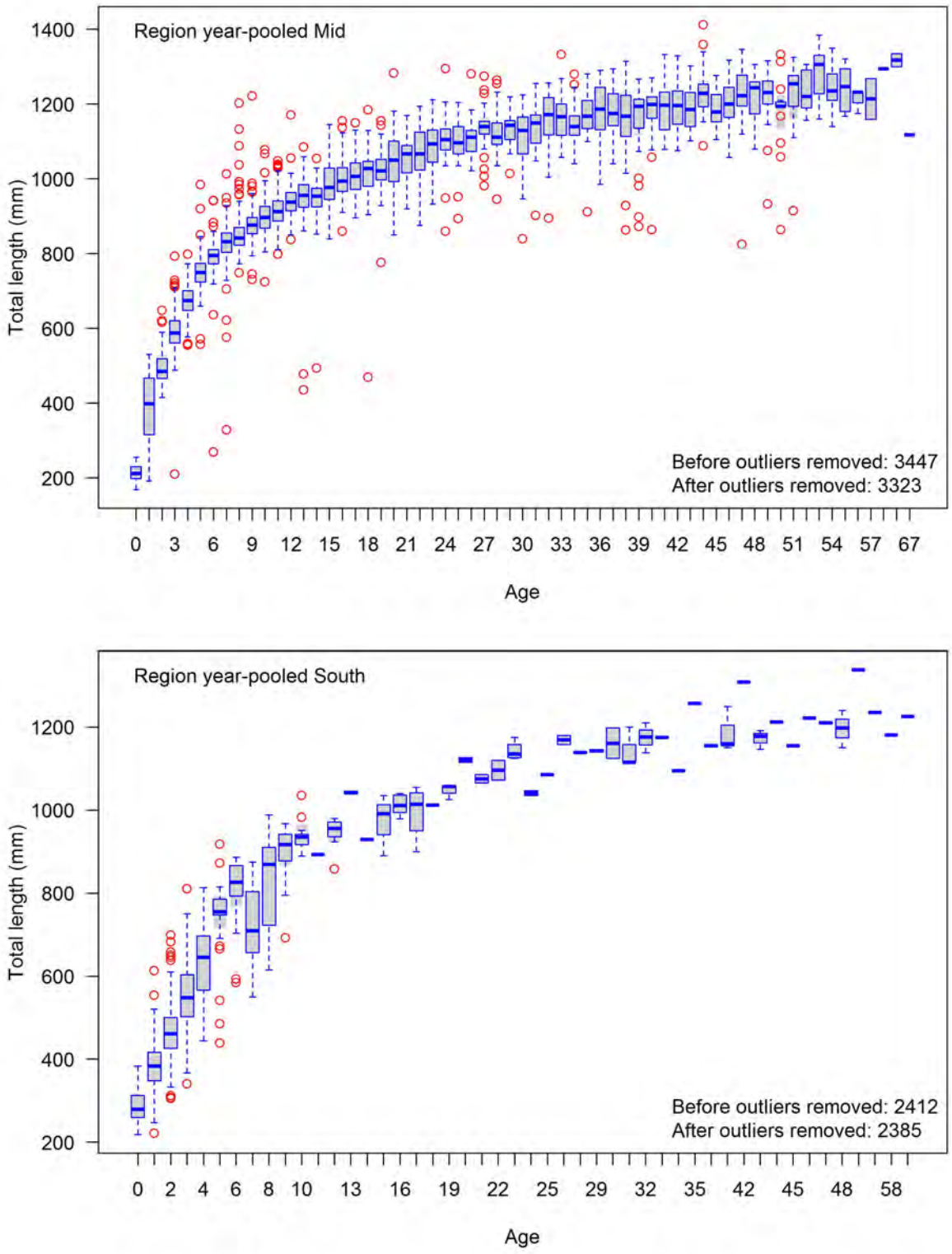

Figure 10: Age-length data before and after outlier removal by region using boxplot function. Mid-Atlantic includes NE, MD, and VA whereas South Atlantic includes NC, SC, GA, and FL. One red circle represents one fish identified as an outlier.

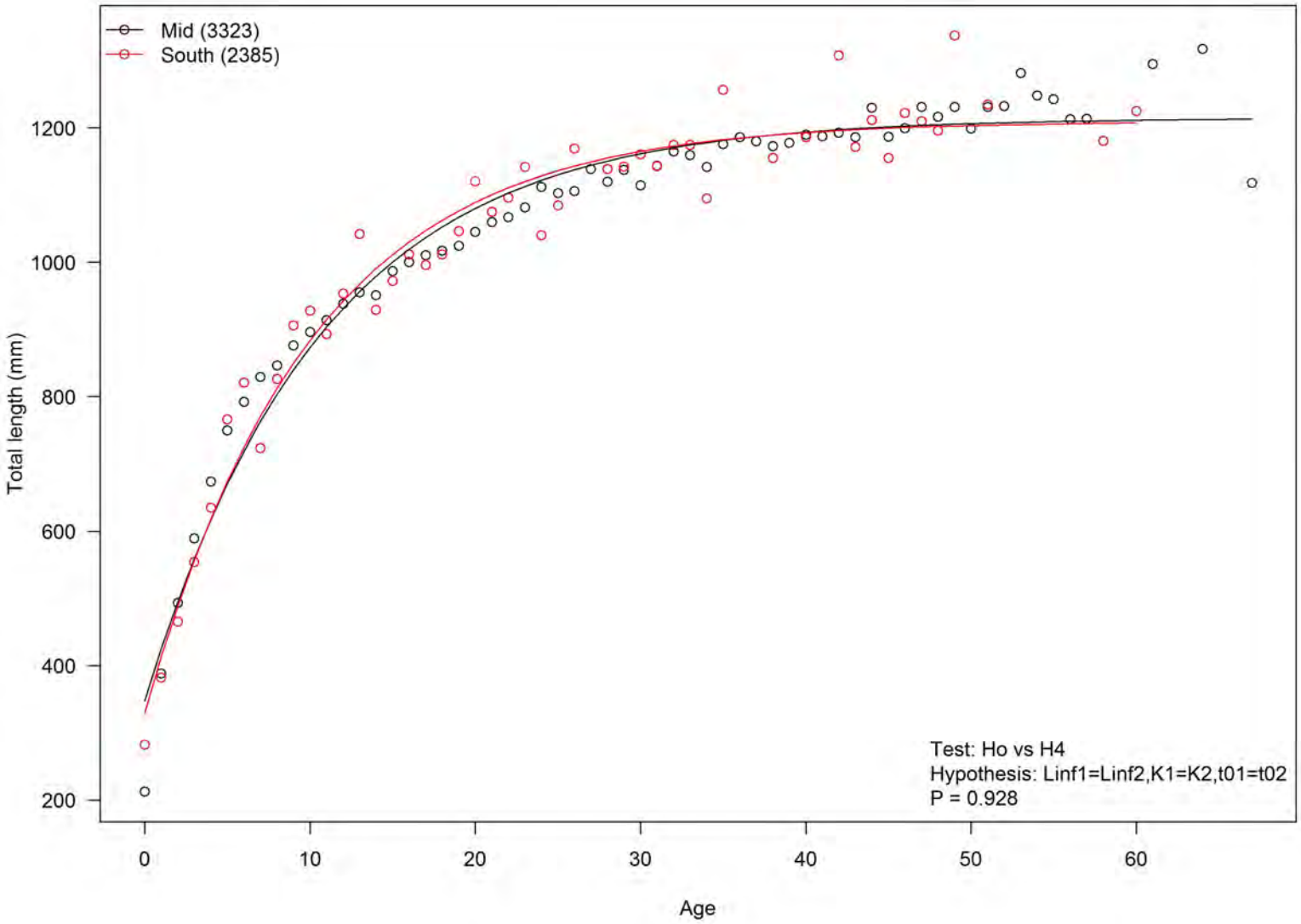

Figure 11: Kimura test on von Bertalanffy growth rates between coast wide and year-pooled Mid- and South Atlantic Black Drum. Mid-Atlantic includes NE, MD, and VA whereas South Atlantic includes NC, SC, GA, and FL. A data point is a mean length at age.

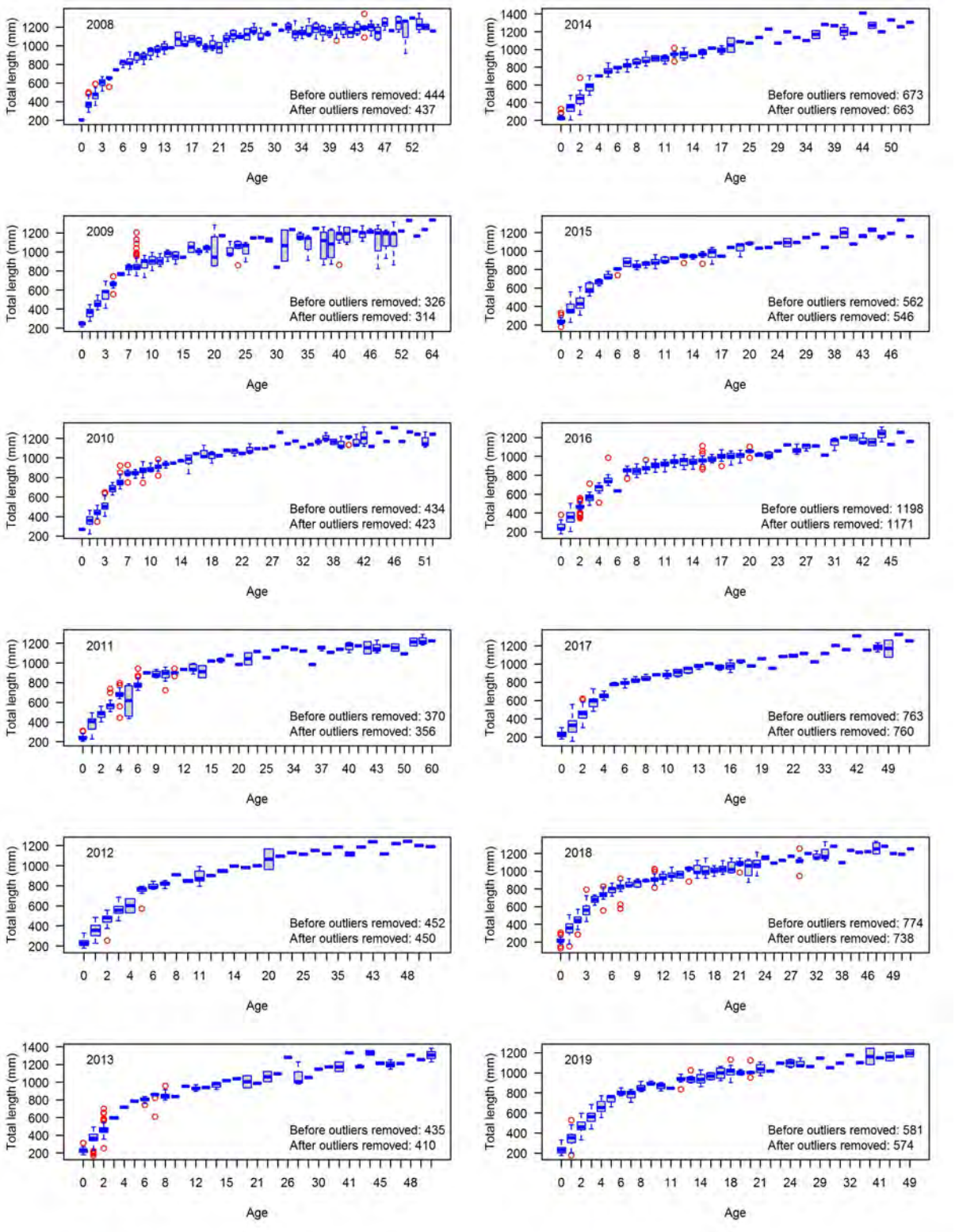

Figure 12: Coastal wide age-length data before and after outlier removal by year using boxplot function. One red circle represents one fish identified as an outlier.

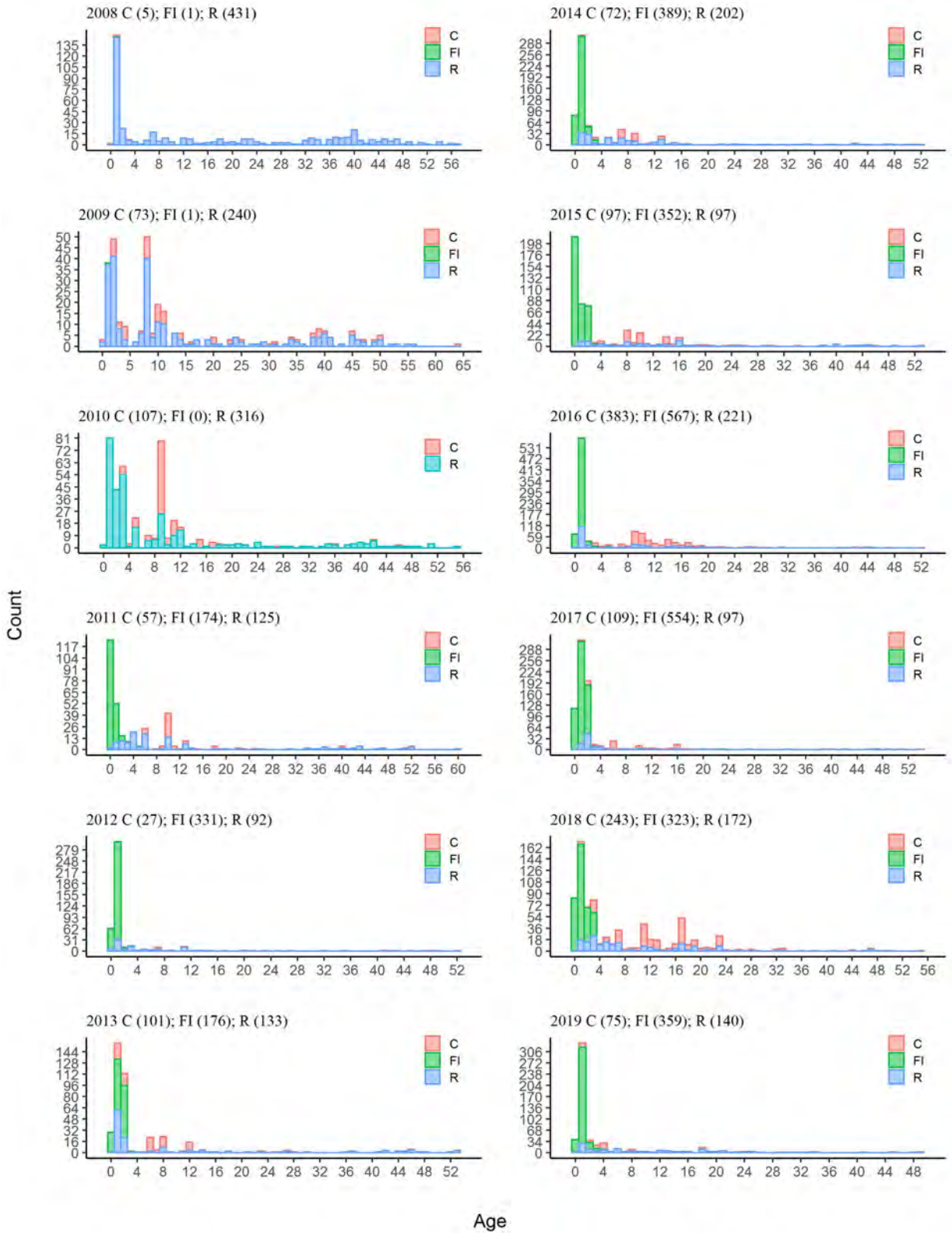

Figure 13: Coast-wide annual age distributions after outliers removed. "C", "FI", and "R" stand for the data collected from commercial fisheries, fishery independent survey, and recreational fisheries, respectively.

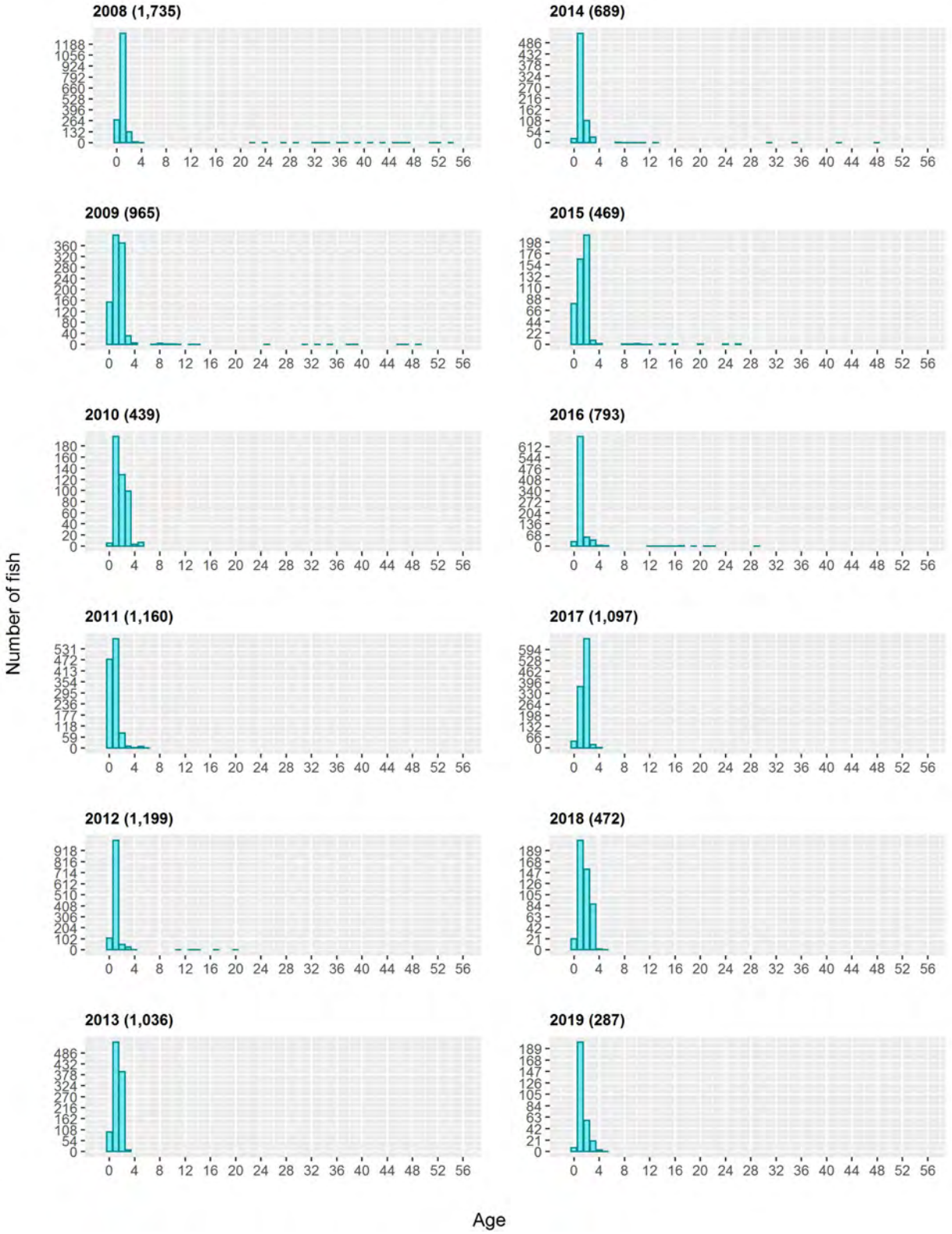

Figure 14: NC annual age distributions from 2008 to 2019 converted from NC annual length distributions using coast-wide annual ALKs.

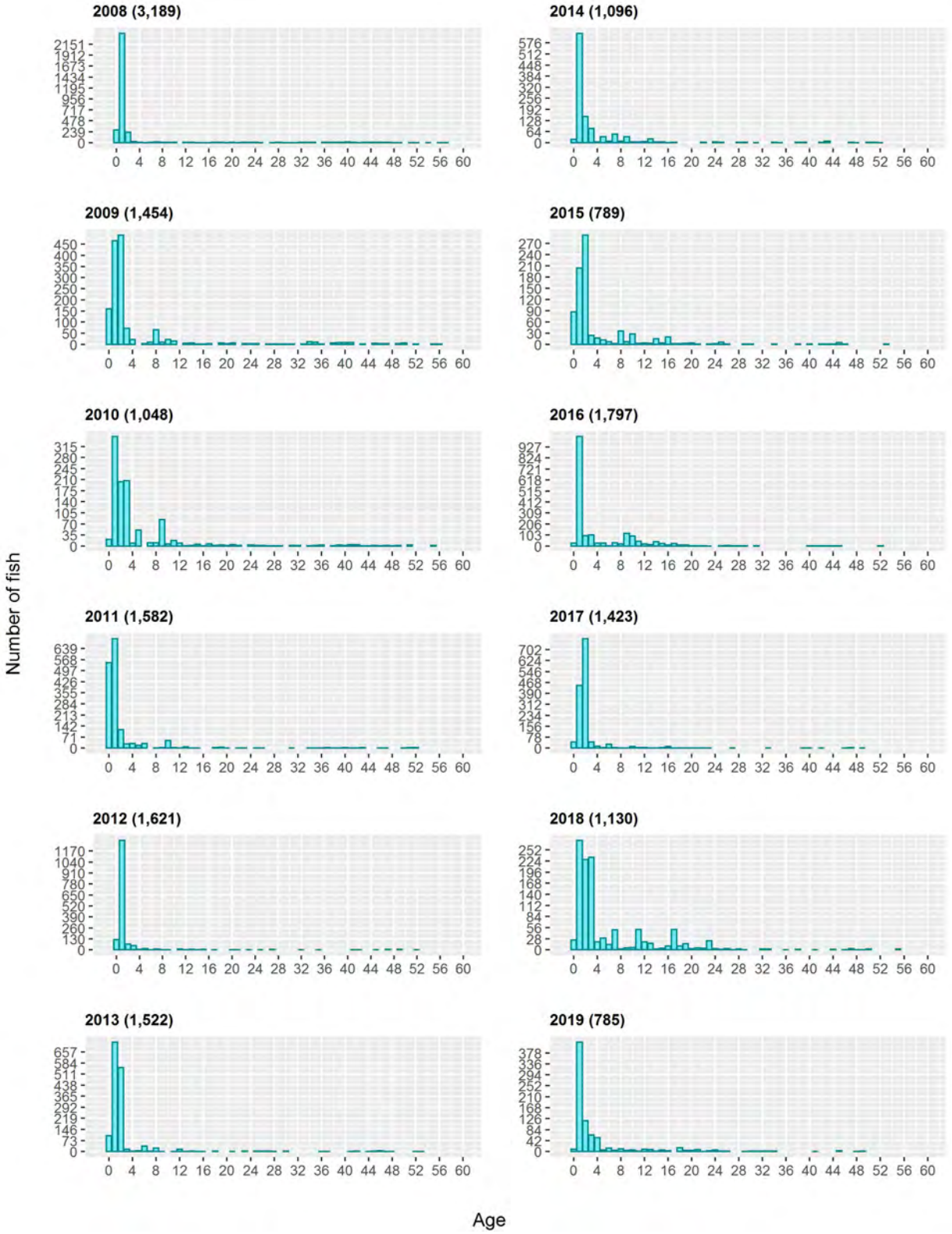

Figure 15: Coast-wide annual age distributions from 2008 to 2019 converted from coast-wide annual length distributions using coast-wide annual ALKs.

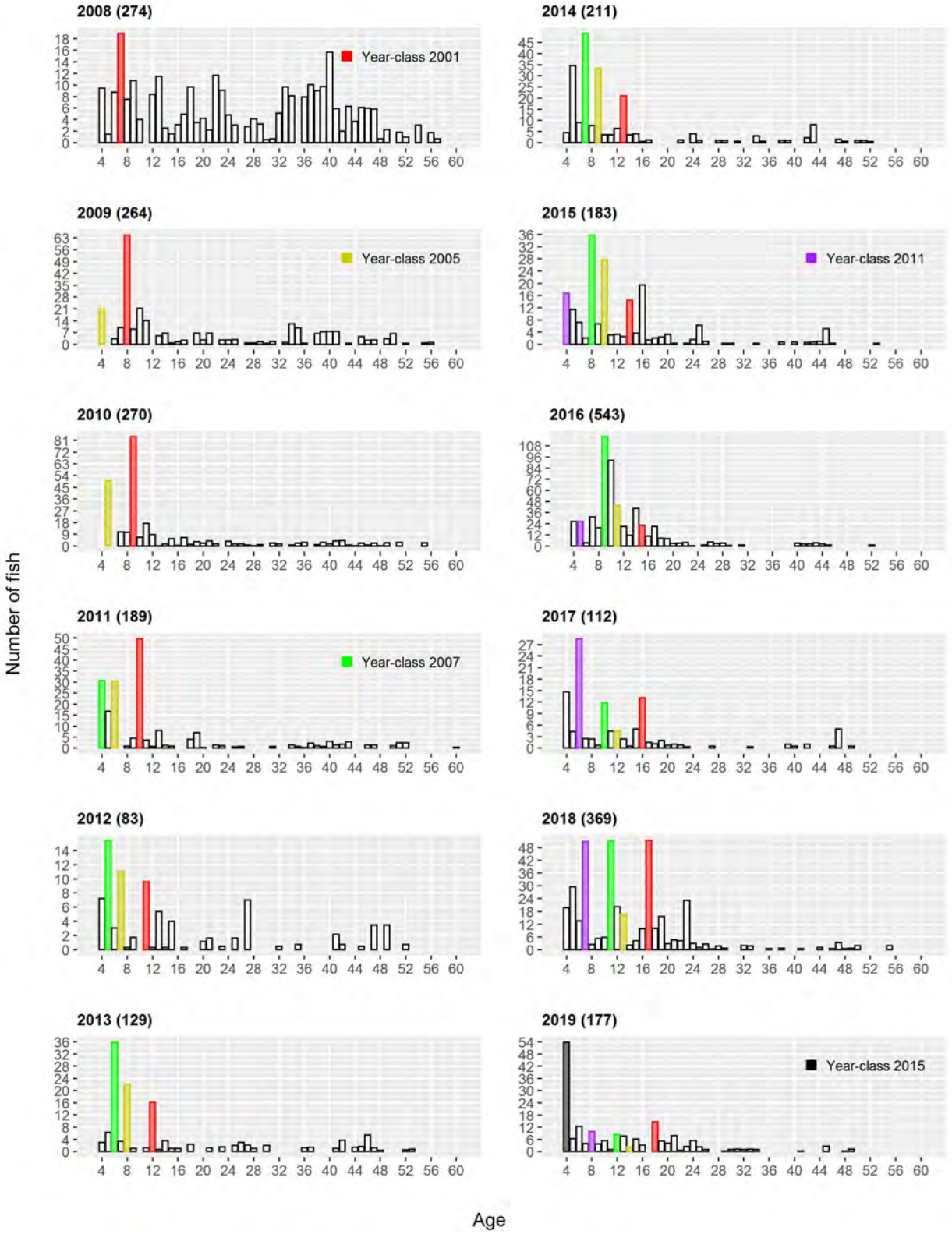

Figure 16: Coast-wide annual age distributions from 2008 to 2019 with removal of fish younger than Age 4.

Figure 17: NC abundance indices. X-axis is year-class.

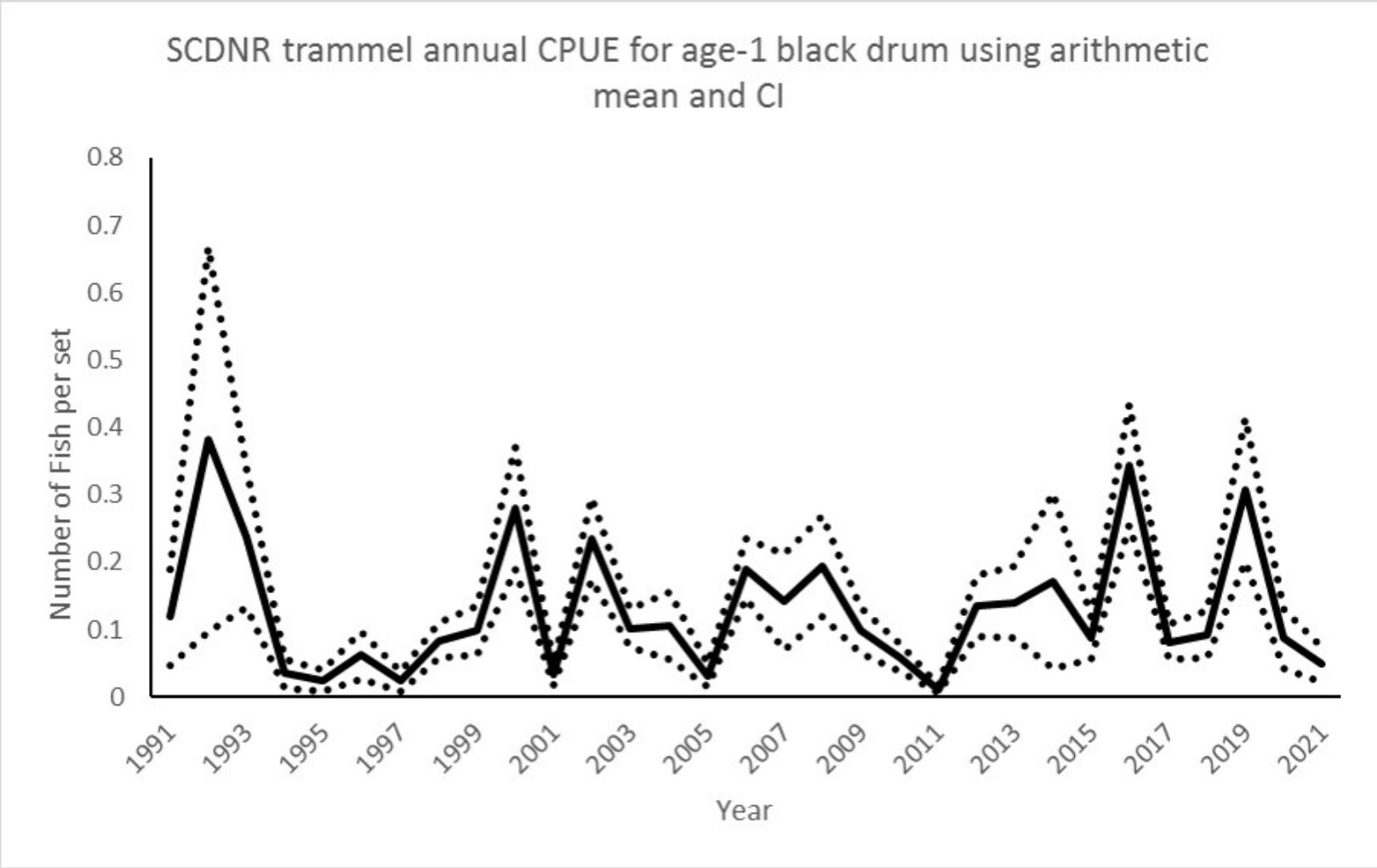

Figure 18: NC trammel net CPUE index for Age 1 of Black Drum.

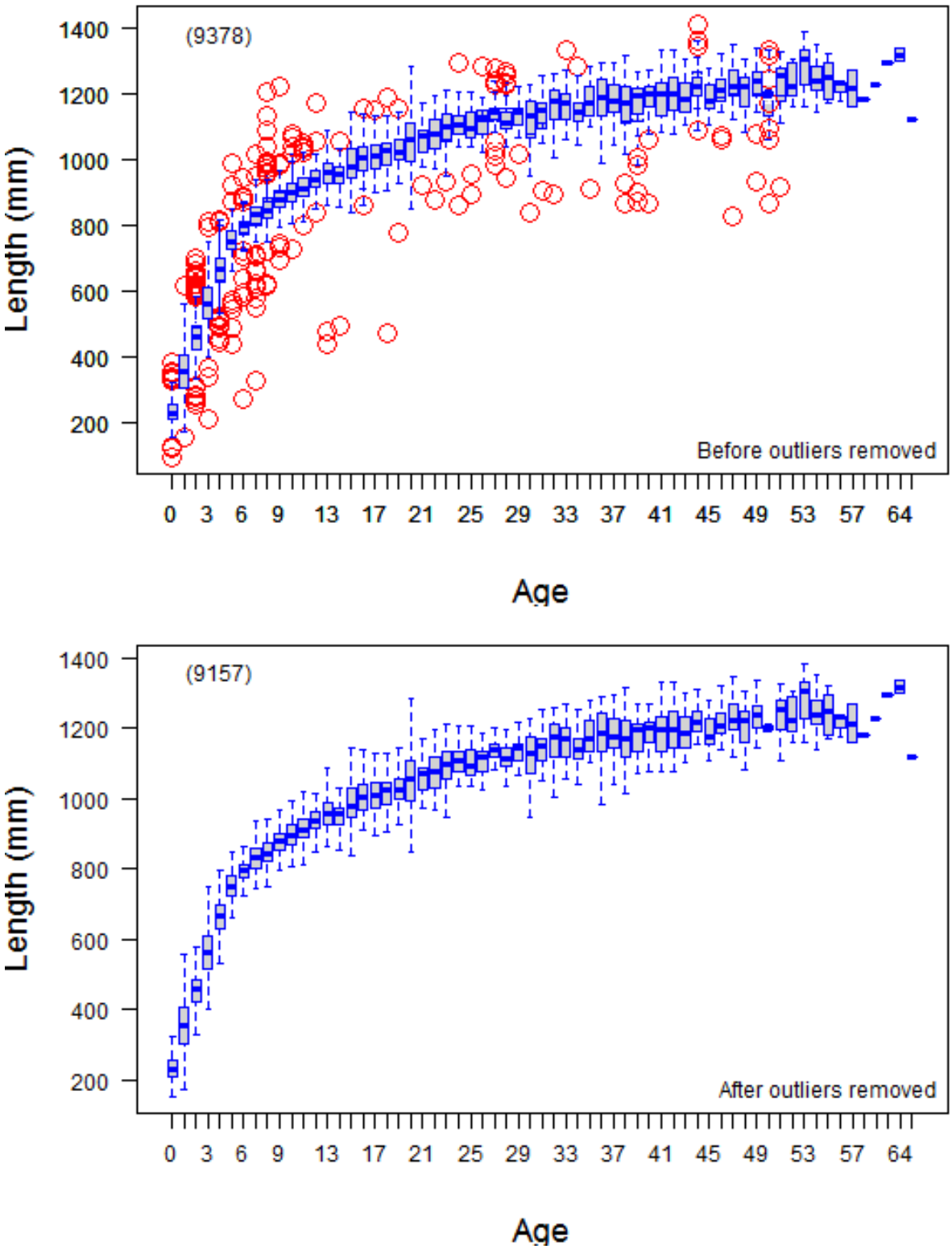

Figure 19: Outliers were moved from the coast-wide year- and sex-combined age-length data collected between 1983 and 2021 from recreational, commercial fisheries, and fishery-independent surveys. A red circle represents one fish identified as an outlier.

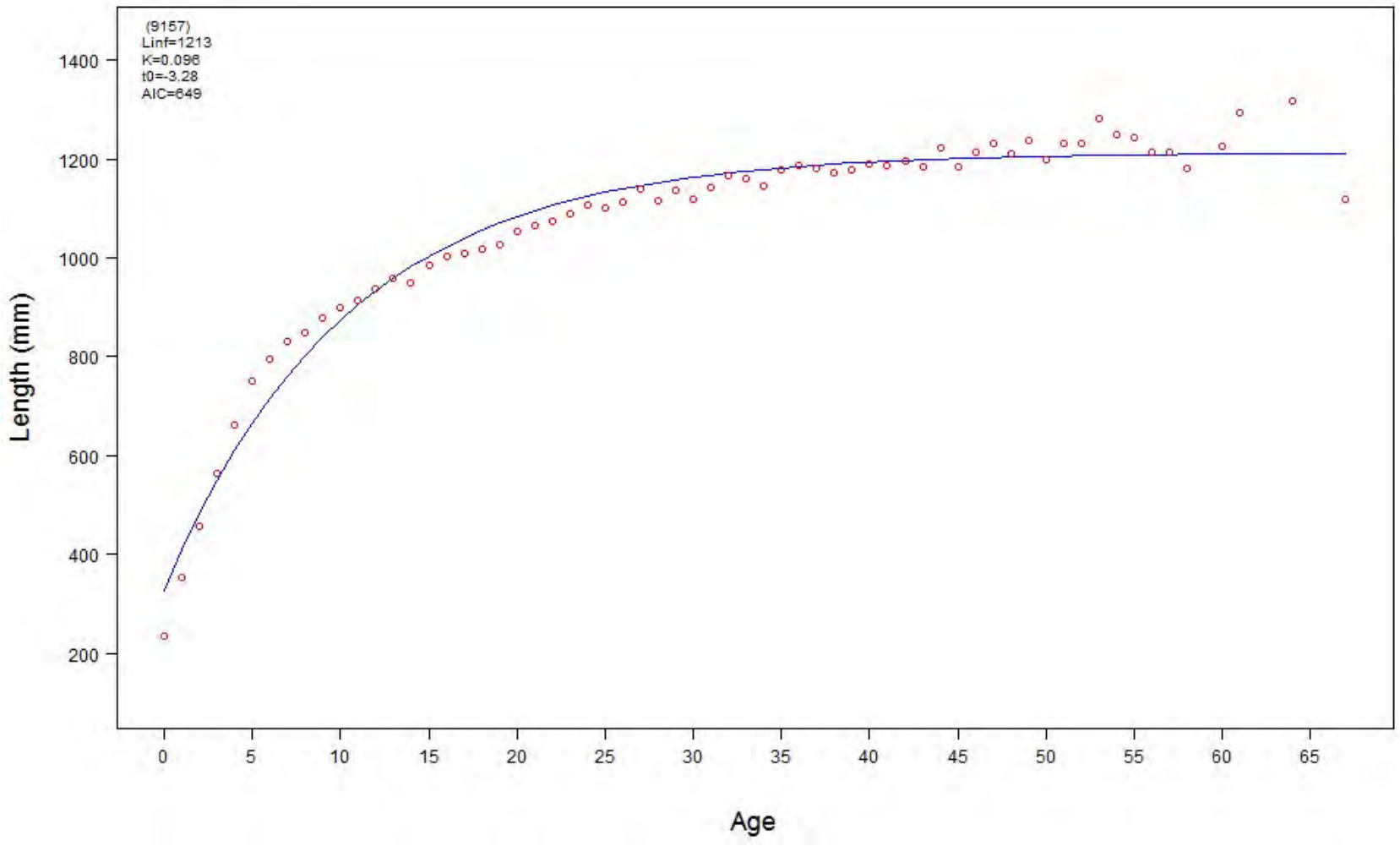

Figure 20: von Bertalanffy growth curve (blue line) with its parameters estimated using the region-, year-, and sex-pooled mean length-at-age data (red circles) collected between 1983 and 2020. The number in parenthesis is the sample size. The minimum age is 0 whereas the maximum age is 67.

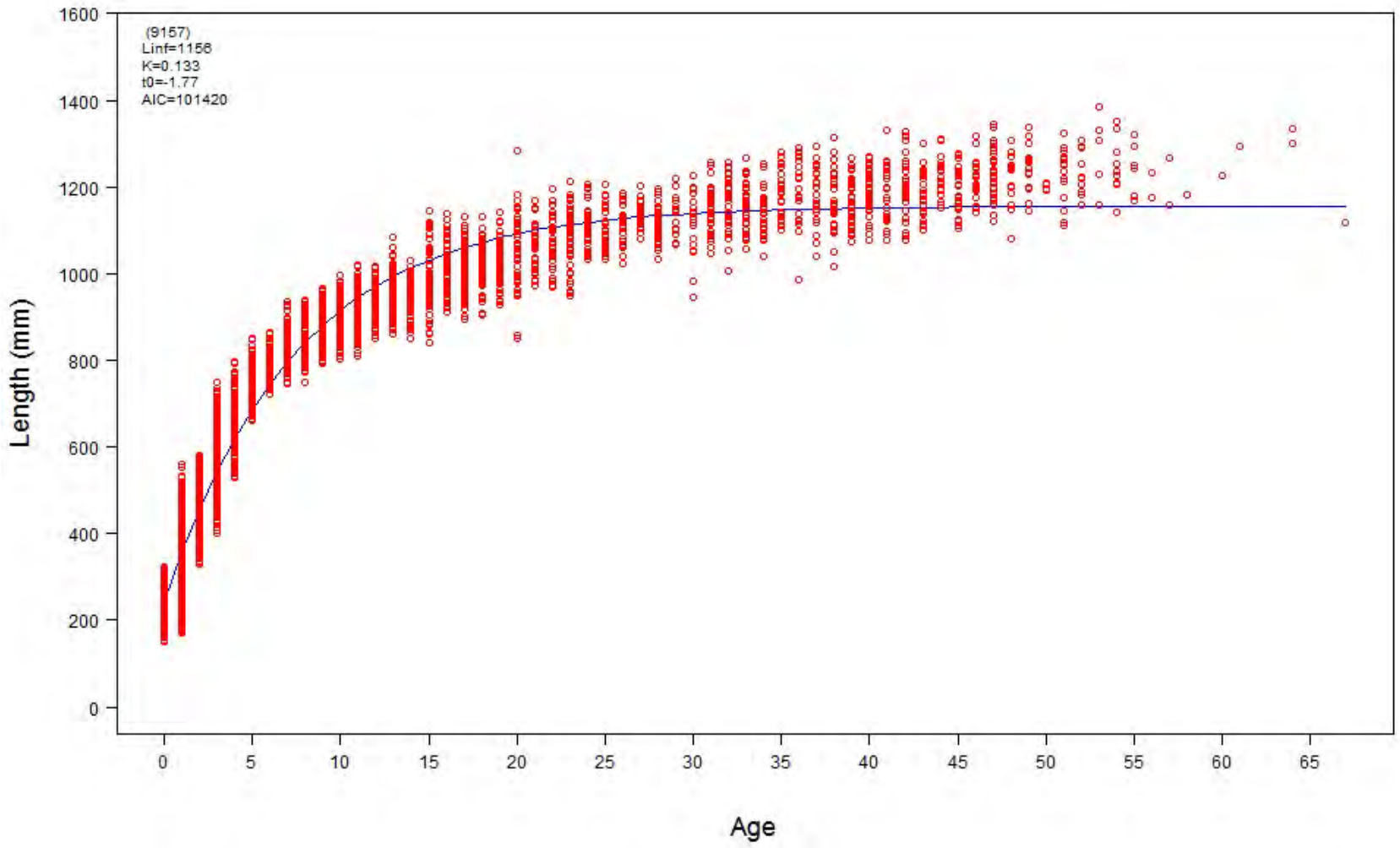

Figure 21: von Bertalanffy growth curve (blue line) with its parameters estimated using the region-, year-, and sex-pooled individual length-at-age data (red circles) collected between 1983 and 2020. The number in parenthesis is the sample size. The minimum age is 0 whereas the maximum age is 67.

Appendix 2: Development of Stock Synthesis models for the 2023 Black Drum Benchmark Stock Assessment

1 Introduction

Stock Synthesis is a flexible age-structured modeling framework that has been widely used in fish stock assessments around the world (Methot and Wetzel 2013). Stock synthesis can incorporate many different types of information, such as age, length, and tagging data, to inform estimates for a population. There have also been Stock Synthesis models developed for use in assessments that lack some or all of the above type of information. The Simple Stock Synthesis model is one type of Stock Synthesis model that was developed for use in situations where there is only historical catch and life history information (Cope 2013). The goal of the present study was to develop two different Stock Synthesis models for potential use in the 2023 Black Drum Benchmark Stock Assessment. The two different models are: (1) a Simple Stock Synthesis model and (2) a Stock Synthesis model fit to the length frequency distributions of total catches each year when length-frequency catch data is available.

2 Materials and Methods

2.1 Inputs common to both models

2.1.1 Biological

The growth model used was a von Bertanlanffy model with parameters $K = 0.133$, $L_\infty = 1115$ mm, $t_0 = -1.76$, and $CV = 0.1$ (Fig. 1). Natural mortality was assumed to vary by age and calculated using the Lorenzen curve. The weight W at length l was described by the function

$W(l) = al^b$, where the constants $a = 0.0000318$ and $b = 2.8977$ were estimated from paired observations of black drum length and weight.

2.1.2 Fishery removals

Both models utilized the time series of total removals along the entire Atlantic coast of the United States (Fig. 2).

2.2 Simple Stock Synthesis

Simple Stock Synthesis is based on the same idea as the Depletion-Based Stock Reduction Analysis (DB-SRA). DB-SRA uses a Monte Carlo approach to provide a distribution of catch that would be considered over fishing based on probability distributions for current depletion, natural mortality, the ratio of fishing mortality at MSY to natural mortality, and the ratio of biomass at MSY to initial biomass. Simple Stock Synthesis uses an age structured population dynamics model instead of a production model and therefore there are differences in some of the inputs needed for Simple Stock Synthesis compared to DB-SRA. A length-based selectivity curve was specified based on the length frequency distribution from coast wide MRIP data (Fig. 3). A change in the ascending portion of the selectivity curve was specified due to changes in regulations in 2014. Specific values used for the double-normal selectivity curve are in Table 1.

2.2.1 Base model

The base model used a beta distribution for the depletion and steepness parameters. For the depletion values, parameters of the beta distribution were $\alpha = 9.9$ and $\beta = 4.2$ and for steepness the parameters were $\alpha = 5.94$ and $\beta = 1.97$. The values for steepness were set to align with the JABBA-Select model and the values for steepness were taken from the meta-analysis in Shertzer and Conn (2012).

2.2.2 Other models

An attempt was made to incorporate the MRIP CPUE index (Fig. 4) into the Simple Stock Synthesis model based on comments from the previous black drum benchmark assessment, where reviewers suggested to try to include some of the available indices of abundance into the DB-SRA model. The MRIP CPUE index is the only index thought to provide some information on the coastwide exploitable portion of the black drum stock, and was therefore the only index selected for potential inclusion in the Simple Stock Synthesis model.

2.3 Stock Synthesis model fit to length data

This Stock Synthesis model was fit to length composition data from the MRIP during 1982-2020 (Fig. 5; Fig. 6) and the MRIP CPUE index of abundance during 1982-2020 (Fig. 4). An initial model was fit with selectivity specified as in the Simple Stock synthesis base model. Another model was run where some of the parameters of the double normal selectivity curve were estimated (Table 2). Finally, another model was run with a spline selectivity where some of the parameters were estimated (Table 3). Yearly recruitment deviations were estimated for all of these Stock Synthesis models fit to length data.

2.4 Code and data availability

All code and data for the Simple Stock Synthesis model and the Stock Synthesis model fit to length data are available at: https://github.com/mmace3/SSappendix.

3 Results

3.1 Simple Stock Synthesis

Base model

3.1.1 Parameter Estimates

All model runs had a maximum gradient component < 0.0001 and the difference between the observed and predicted survey value in the final year was < 0.01 for each run. The distribution of depletion values and steepness values used as input were similar to the specified distributions for these parameters. The distribution of depletion values used in model runs had a mean of 0.7 and a standard deviation of 0.12 and the distribution of steepness values had a mean of 0.75 and standard deviation of 0.14 (Fig. 7). As expected, depletion decreased over time from mean value of 1 in 1900 to 0.7 in 2020 (Fig. 8). The maximum value of depletion in 2020 was 0.29 and the minimum value was 0.98.

3.1.2 Reference Points

3.1.2.1 MSY

The median of the MSY distribution was 3,280 mt with a minimum of 827 mt and maximum of 47,055 mt (Fig. 9).

3.1.2.2 OFL

The median of the MSY distribution was 4,743 mt with a minimum of 872 mt and maximum of 90,391 mt (Fig. 9).

3.1.2.3 B_{MSY}

The median of the B_{MSY} distribution was 73,302 mt with a minimum of 27,314 mt and maximum of 1,020,680 mt (Fig. 9).

3.1.2.4 F_{MSY}

The median of the F_{MSY} distribution was 0.043, with a minimum of 0.0036 and maximum of 0.059 (Fig. 9).

Other models

When the MRIP CPUE index was included in the Simple Stock Synthesis model, the model did not converge unless extra variation (i.e., Q_extraSD parameter) was added to the standard deviation of the catchability coefficient for the MRIP CPUE index, and the observation error for the final depletion value was increased from 0.0001 to 0.1. After these modifications, the model converged, but there was a strong trend in the residuals for the MRIP CPUE index (Fig. 10). Additionally, the final depletion value in 2020 was above the specified value (Fig. 11). The trend in abundance implied by the MRIP CPUE index was different from the trend in abundance implied by the depletion assumption (Fig. 12). Therefore, the CPUE index was excluded from the base model.

3.2 Stock Synthesis fit to length data

Both models (double normal selectivity and spline selectivity) did not fit the length composition data well (Fig. 13-Fig. 16). Since neither model fit the length composition data well and both models produced unrealistically large estimates of abundance, no other results from either model are shown.

4 Conclusions

4.1 Simple Stock Synthesis

This type of model, along with DB-SRA, was developed to provide advice about catch limits in the short term (i.e., next year) and not stock status. Given that our goal is to try and determine stock status of black drum, these types of models are not well suited to our goals. Although these models could potentially be useful along with other lines of evidence to make some conclusions about stock status.

4.2 Stock Synthesis fit to length data

This model was not fitting the length composition data very well and could benefit from more development. Specifically, more work could be done on the selectivity portion of the model. Splitting the fishery removals into different fleets with at least one flat-topped selectivity fleet could help provide the model with more information about the older adult portion of the stock and result in a more reasonable estimate of abundance.

References

Cope, Jason M. 2013. "Implementing a Statistical Catch-at-Age Model (Stock Synthesis) as a Tool for Deriving Overfishing Limits in Data-Limited Situations." *Fisheries Research* 142: 3–14.

Methot, Jr., Richard D., and Chantell R. Wetzel. 2013. "Stock Synthesis: A Biological and Statistical Framework for Fish Stock Assessment and Fishery Management." *Fisheries Research* 142: 86–99.

Shertzer, Kyle W., and Paul B. Conn. 2012. "Spawner-Recruit Relationships of Demersal Marine Fishes: Prior Distribution of Steepness." *Bulletin of Marine Science* 88: 39–50.

Table 1. Parameter values used for double-normal length-based selectivity in the Simple Stock Synthesis model.

Label	Value
Size_DblN_peak_Fishery(1)	9.00
Size_DblN_top_logit_Fishery(1)	-5.75
Size_DblN_ascend_se_Fishery(1)	2.00
Size_DblN_descend_se_Fishery(1)	3.80
Size_DblN_start_logit_Fishery(1)	-5.00
Size_DblN_end_logit_Fishery(1)	-1.10
Size_DblN_peak_Fishery(1)_BLK1repl_2014	15.00

Table 2. Parameters used for double-normal length-based selectivity in the Stock Synthesis model fit to length data. For parameters that are not estimated, the specificed value is shown.

Parameter	Estimated	Value
Size_DblN_peak_Fishery(1)	Yes	-
Size_DblN_top_logit_Fishery(1)	Yes	-
Size_DblN_ascend_se_Fishery(1)	Yes	-
Size_DblN_descend_se_Fishery(1)	Yes	-
Size_DblN_start_logit_Fishery(1)	No	-5
Size_DblN_end_logit_Fishery(1)	Yes	-
Size_DblN_peak_MRIP(2)	Yes	-
Size_DblN_top_logit_MRIP(2)	Yes	-
Size_DblN_ascend_se_MRIP(2)	Yes	-
Size_DblN_descend_se_MRIP(2)	Yes	-
Size_DblN_start_logit_MRIP(2)	No	-5
Size_DblN_end_logit_MRIP(2)	Yes	-
Size_DblN_peak_Fishery(1)_BLK1repl_2014	Yes	-

Table 3. Parameters used for spline length-based selectivity in the Stock Synthesis model fit to length data. For parameters that are not estimated, the specificed value is shown.

Label	Estimated	Value
SizeSpline_Code_Fishery(1)	No	0
SizeSpline_GradLo_Fishery(1)	Yes	-
SizeSpline_GradHi_Fishery(1)	No	0
SizeSpline_Knot_1_Fishery(1)	No	10
SizeSpline_Knot_2_Fishery(1)	No	20
SizeSpline_Knot_3_Fishery(1)	No	25
SizeSpline_Knot_4_Fishery(1)	No	30
SizeSpline_Knot_5_Fishery(1)	No	40
SizeSpline_Knot_6_Fishery(1)	No	50
SizeSpline_Val_1_Fishery(1)	Yes	-
SizeSpline_Val_2_Fishery(1)	Yes	-
SizeSpline_Val_3_Fishery(1)	Yes	-
SizeSpline_Val_4_Fishery(1)	Yes	-
SizeSpline_Val_5_Fishery(1)	Yes	-
SizeSpline_Val_6_Fishery(1)	Yes	-
SizeSpline_Code_MRIP(2)	No	0
SizeSpline_GradLo_MRIP(2)	Yes	-
SizeSpline_GradHi_MRIP(2)	No	0
SizeSpline_Knot_1_MRIP(2)	No	10
SizeSpline_Knot_2_MRIP(2)	No	20
SizeSpline_Knot_3_MRIP(2)	No	30
SizeSpline_Knot_4_MRIP(2)	No	40
SizeSpline_Val_1_MRIP(2)	Yes	-
SizeSpline_Val_2_MRIP(2)	Yes	-

Table 3. Parameters used for spline length-based selectivity in the Stock Synthesis model fit to length data. For parameters that are not estimated, the specificed value is shown.

Label	Estimated	Value
SizeSpline_Val_3_MRIP(2)	Yes	-
SizeSpline_Val_4_MRIP(2)	Yes	-

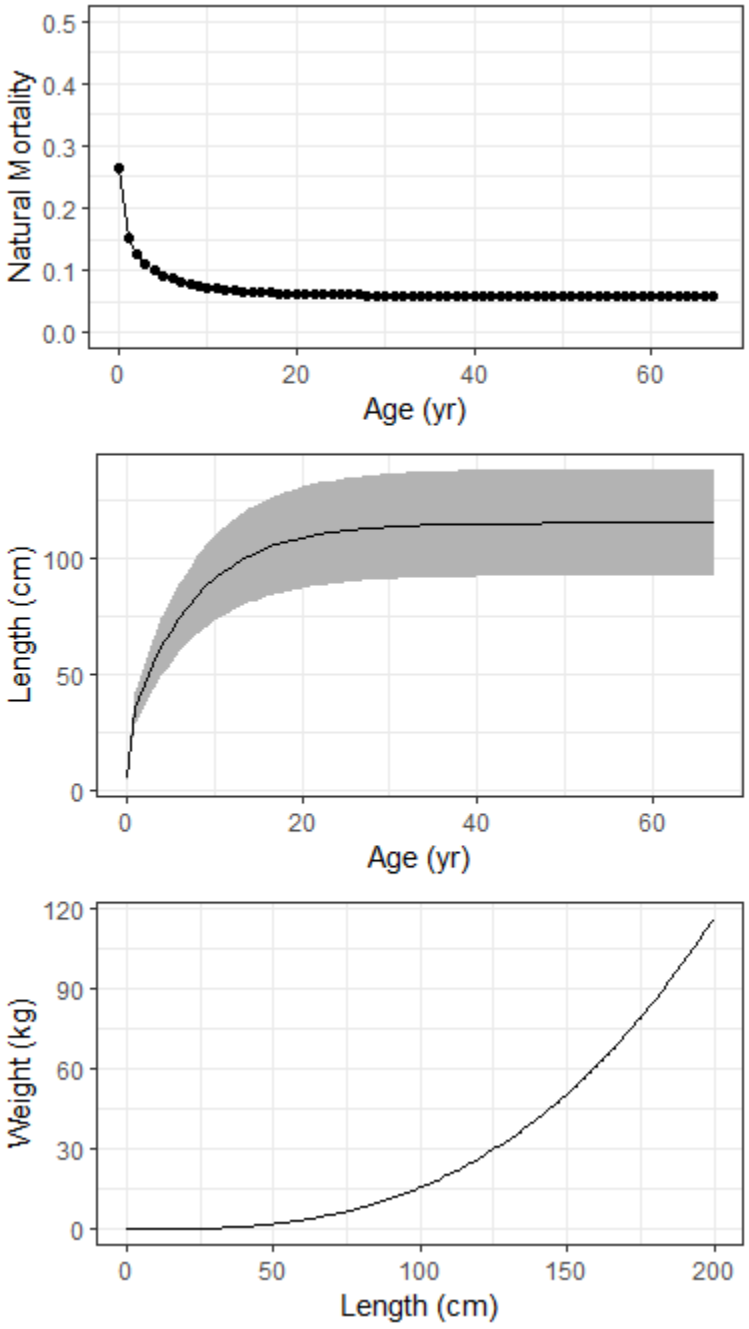

Fig. 1. Age-specific natural mortality, von Bertalanffy growth model, and length-weight relationship used in both Stock Synthesis models that were developed as part of the 2023 black drum benchmark stock assessment.

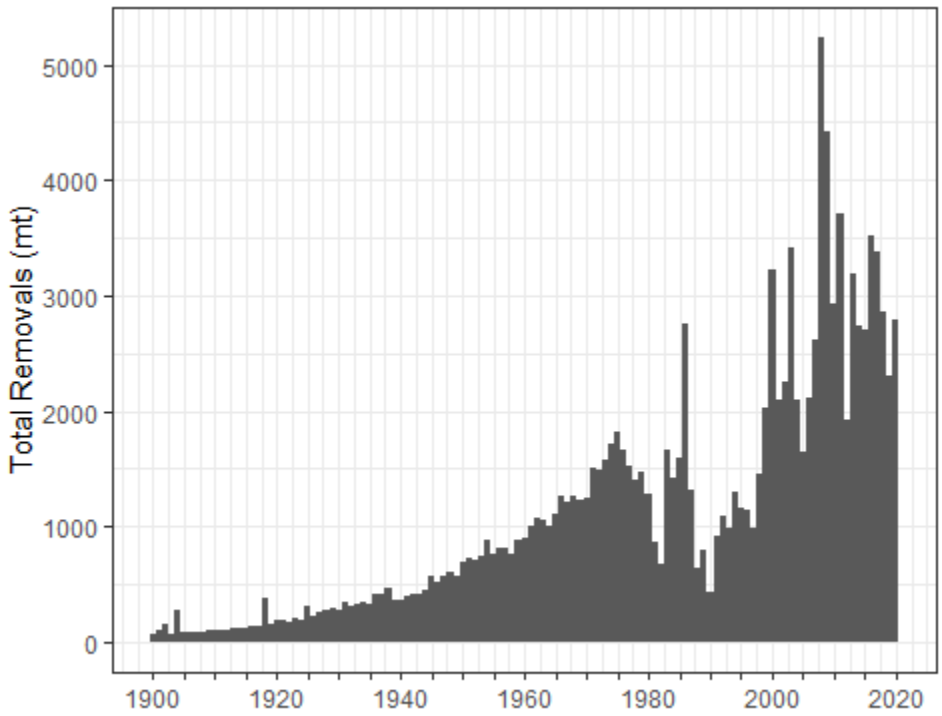

Fig. 2. Total coastwide removals of black drum during 1900-2020.

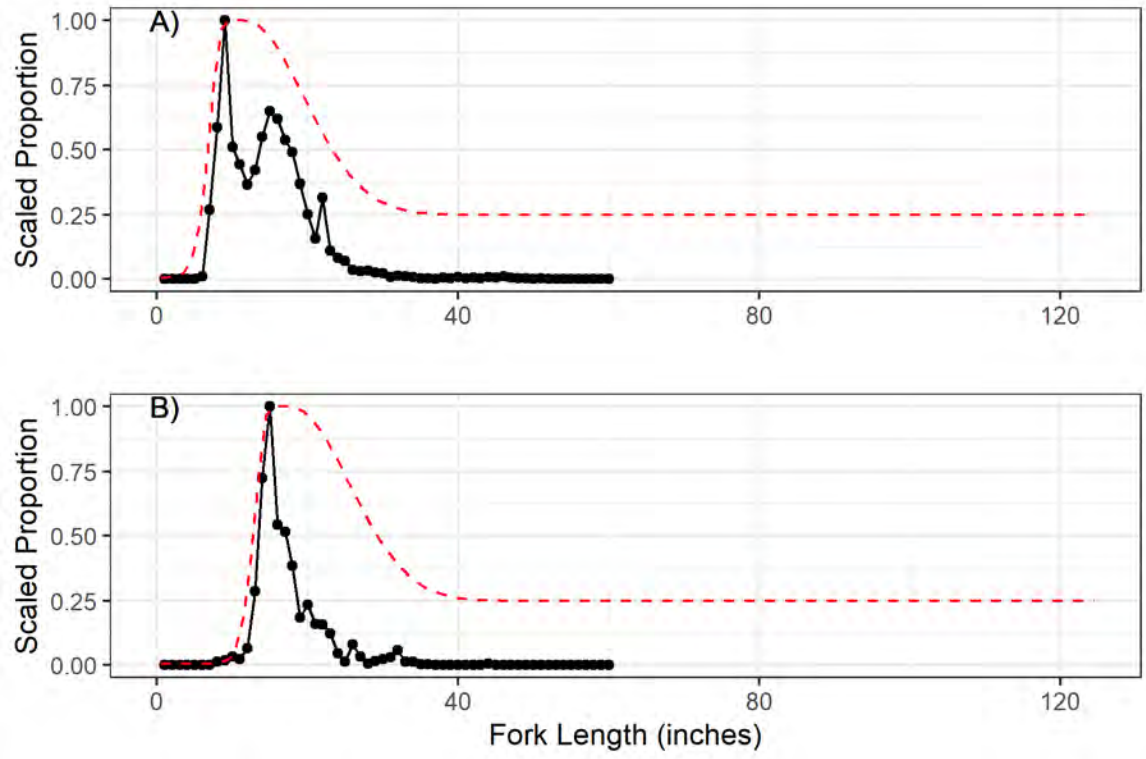

Fig. 3. Length specific selectivity curves for two different time periods (A-prior to 2014, B-2014-2020) that were used in the Simple Stock Synthesis model that was developed as part of the 2023 black drum benchmark stock assessment.

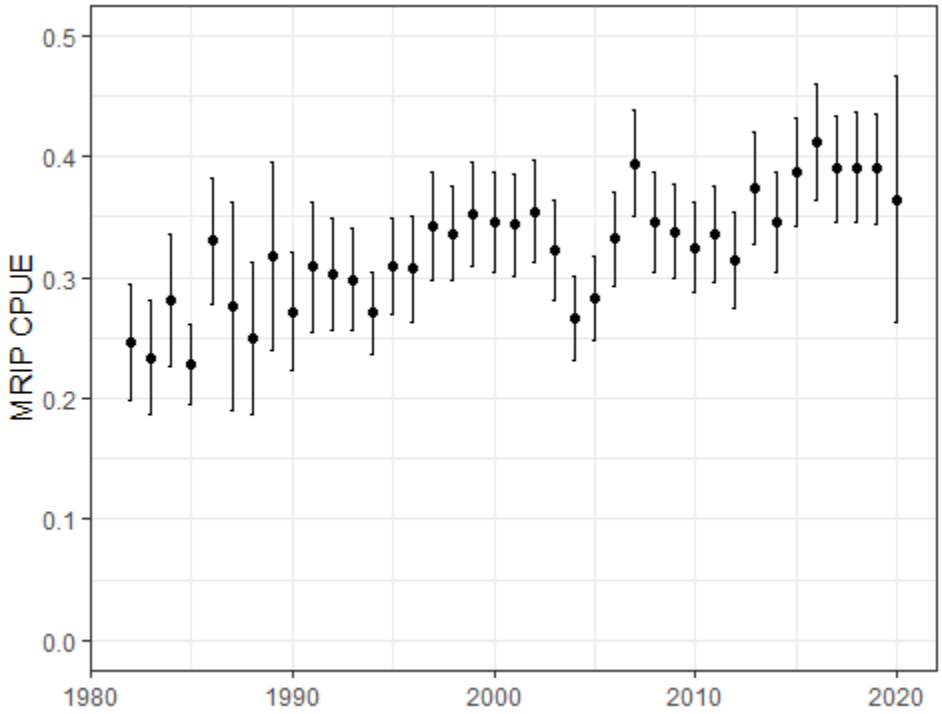

Fig. 4. MRIP CPUE index of abundance. Error bars are proportional standard errors.

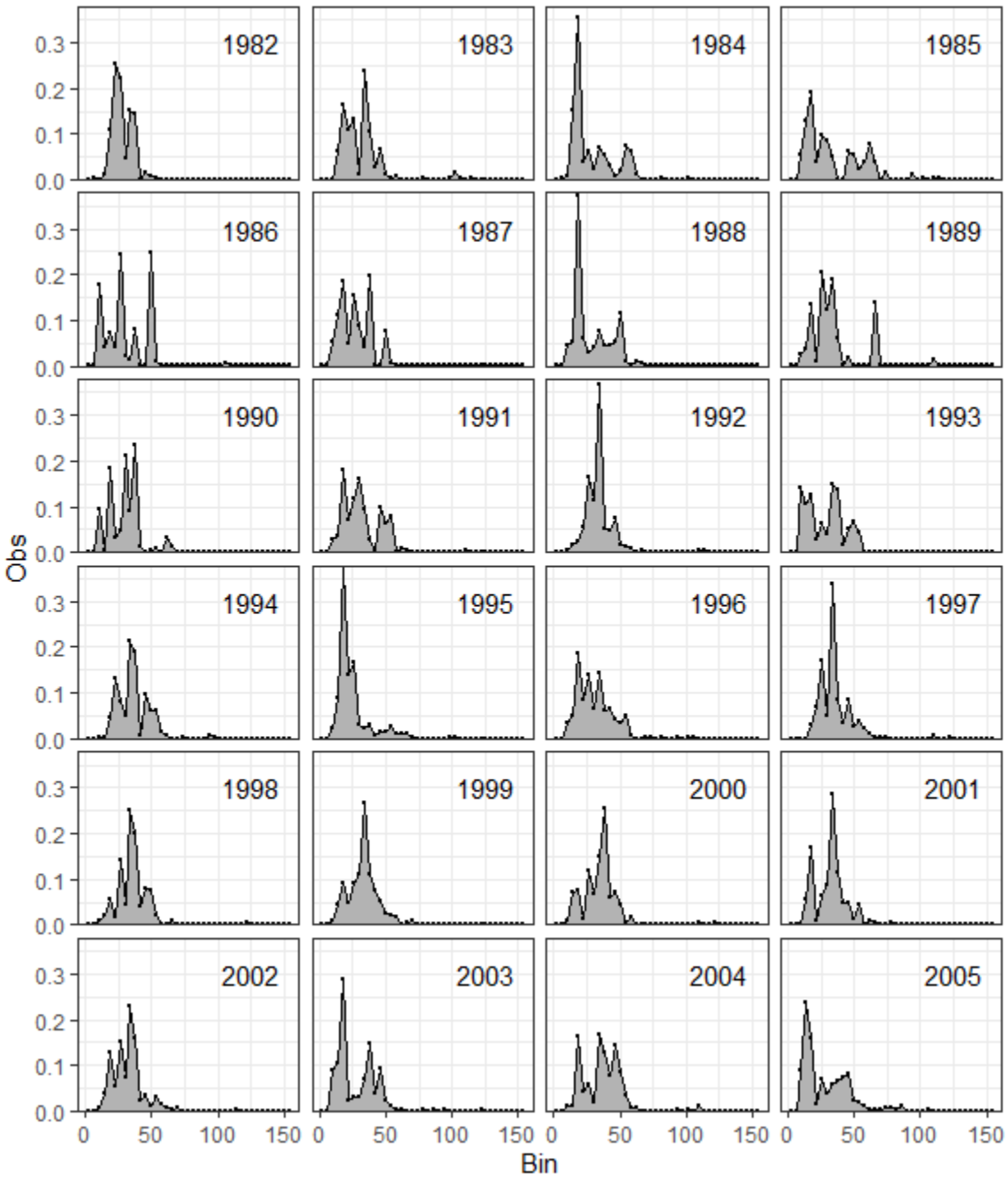

Fig. 5. Length composition data (cm) from MRIP data for 1982-2005.

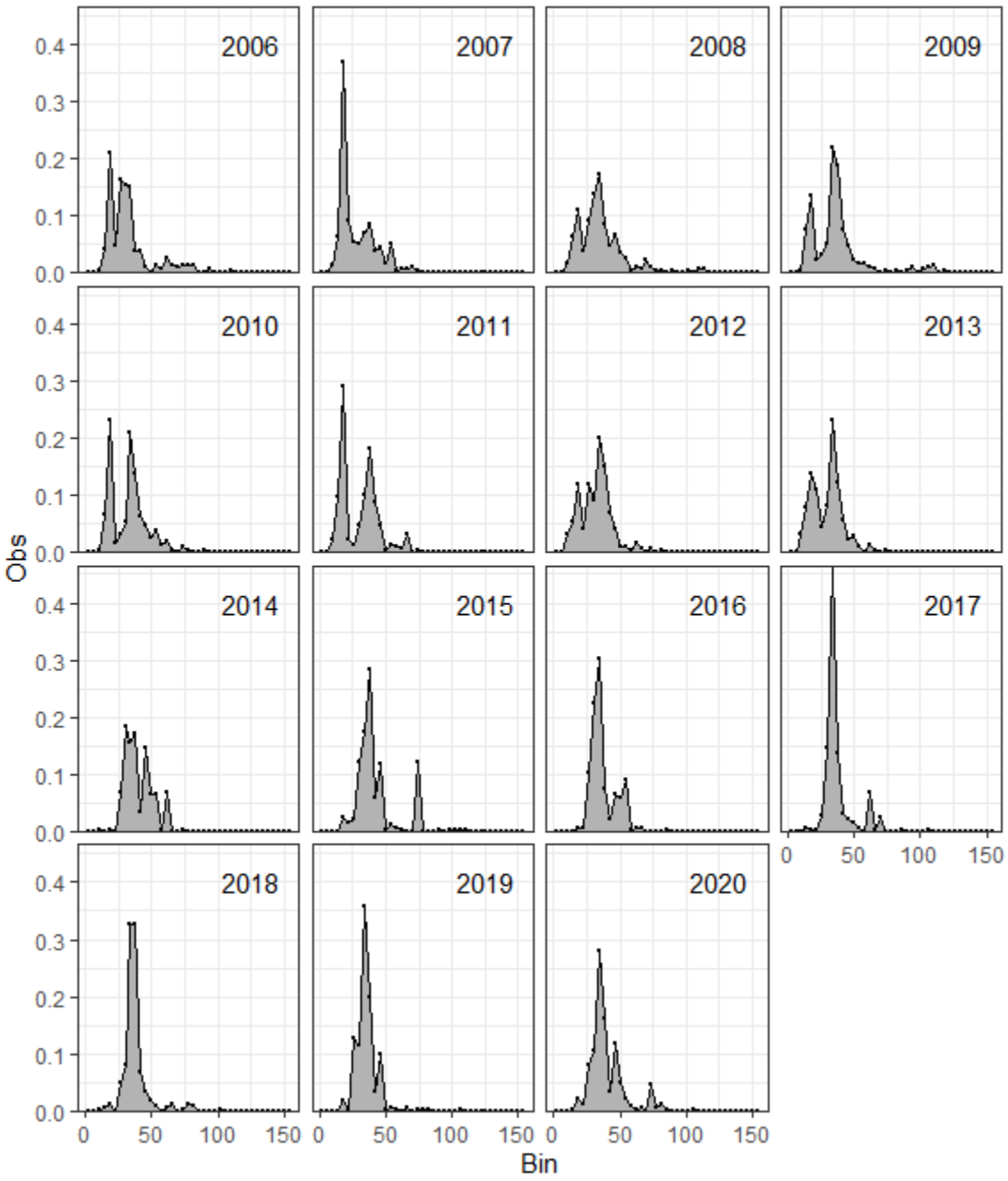

Fig. 6. Length composition data (cm) from MRIP data for 2006-2020.

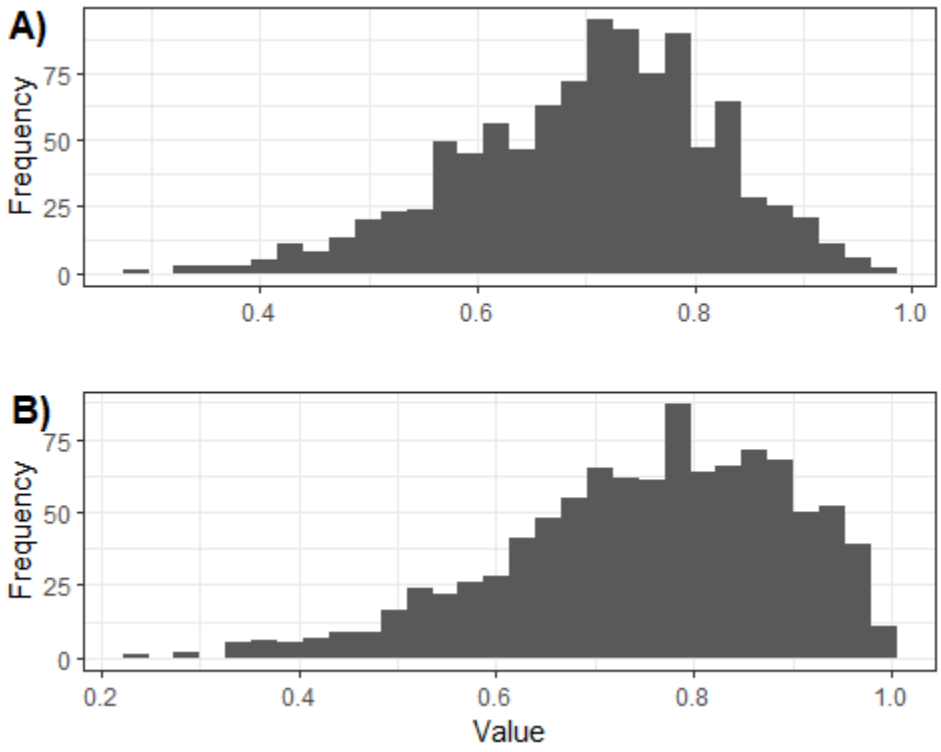

Fig. 7. Distribution of depletion (A) and steepness (B) values used in model runs (n = 1000) for the Simple Stock Synthesis model.

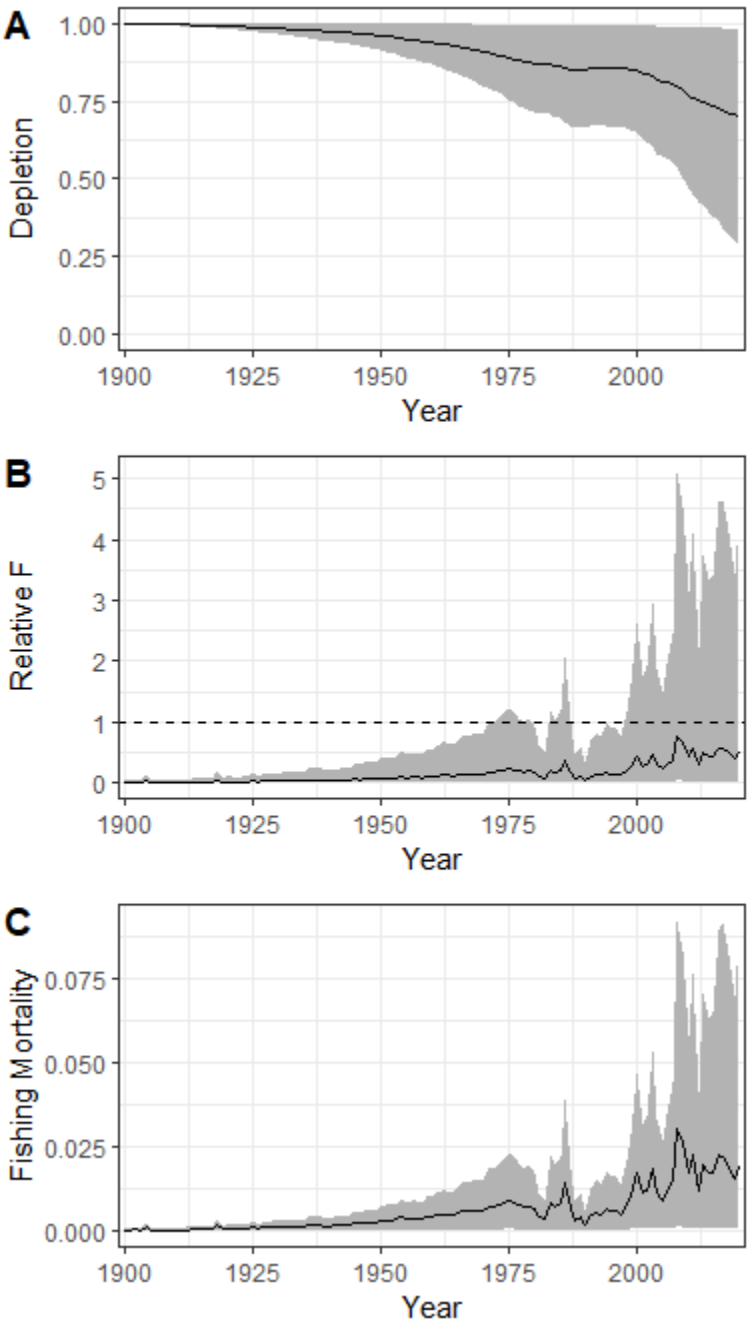

Fig. 8. Estimated depletion (A), relative *F* (B), and *F* (C) of the coastwide black drum stock during 1900-2020. Estimates are from the Simple Stock Synthesis base model. The black line is the mean value and the grey shaded area includes the minimum and maximum values from 1000 model runs.

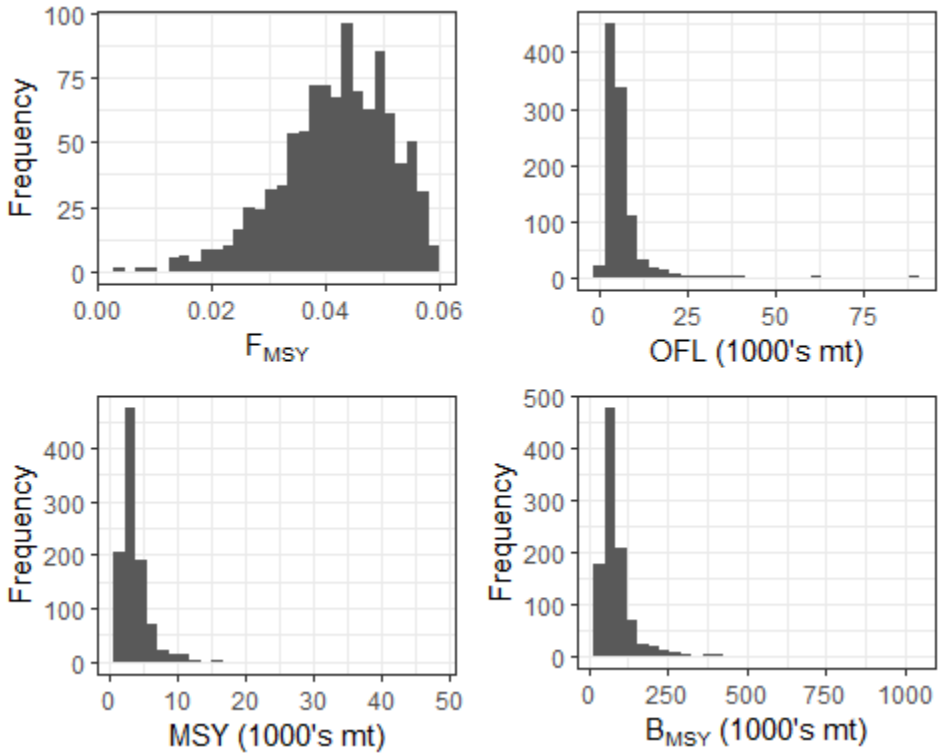

Fig. 9. Distribution of the estimated fishing mortality rate at maximum sustainable yield (F_{MSY}), overfishing limit in 2021 (OFL), maximum sustainable yield (MSY), and spawning stock biomass at maximum sustainable yield (B_{MSY}). Estimates are from the Simple Stock Synthesis base model with 1000 model runs.

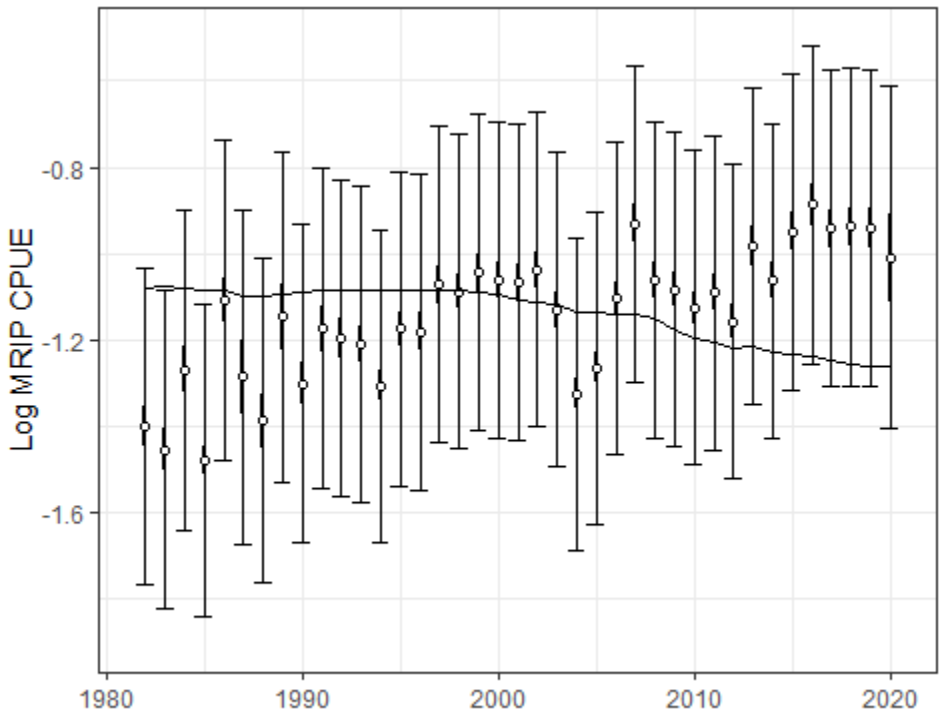

Fig. 10. Fit to log index data on log scale for MRIP CPUE. Lines indicate 95% uncertainty interval around index values based on the model assumption of lognormal error. Thicker lines indicate input uncertainty before addition of estimated additional uncertainty parameter.

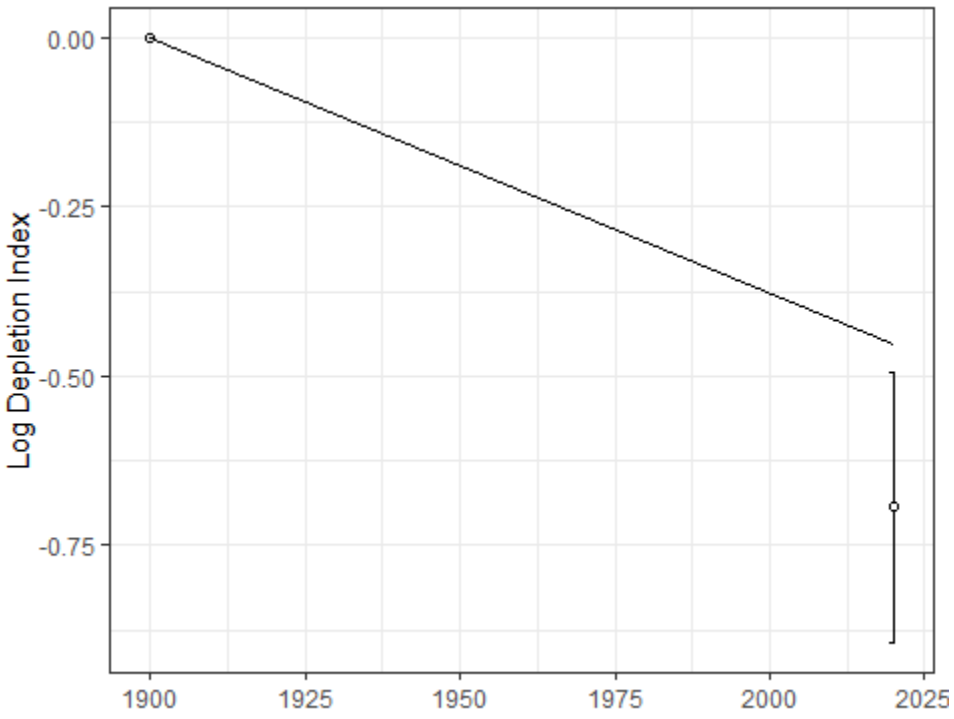

Fig. 11. Fit to log index data on log scale for Depletion index. Lines indicate 95% uncertainty interval around index values based on the model assumption of lognormal error.

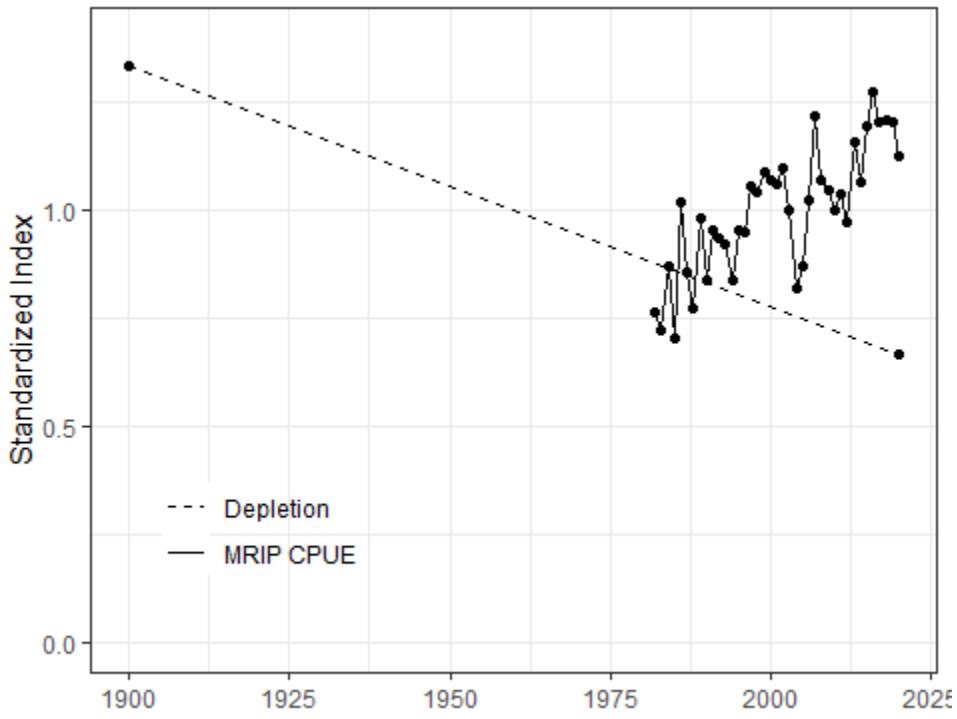

Fig. 12. Standardized indices overlaid. Each index is rescaled to have mean observation = 1.0.

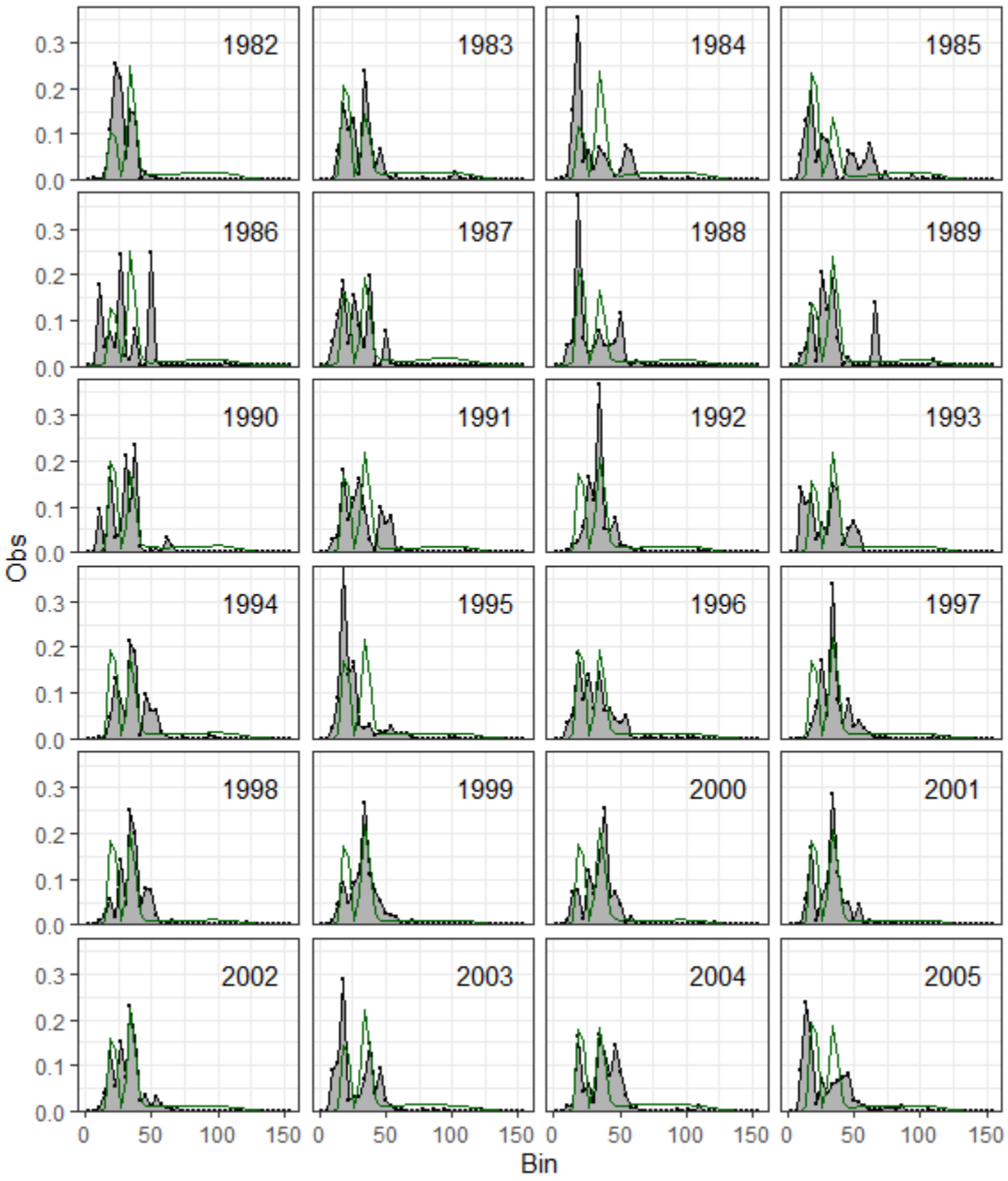

Fig. 13. Fit to length composition data (cm; 1982-2005) from Stock Synthesis Model using a double normal selectivity curve.

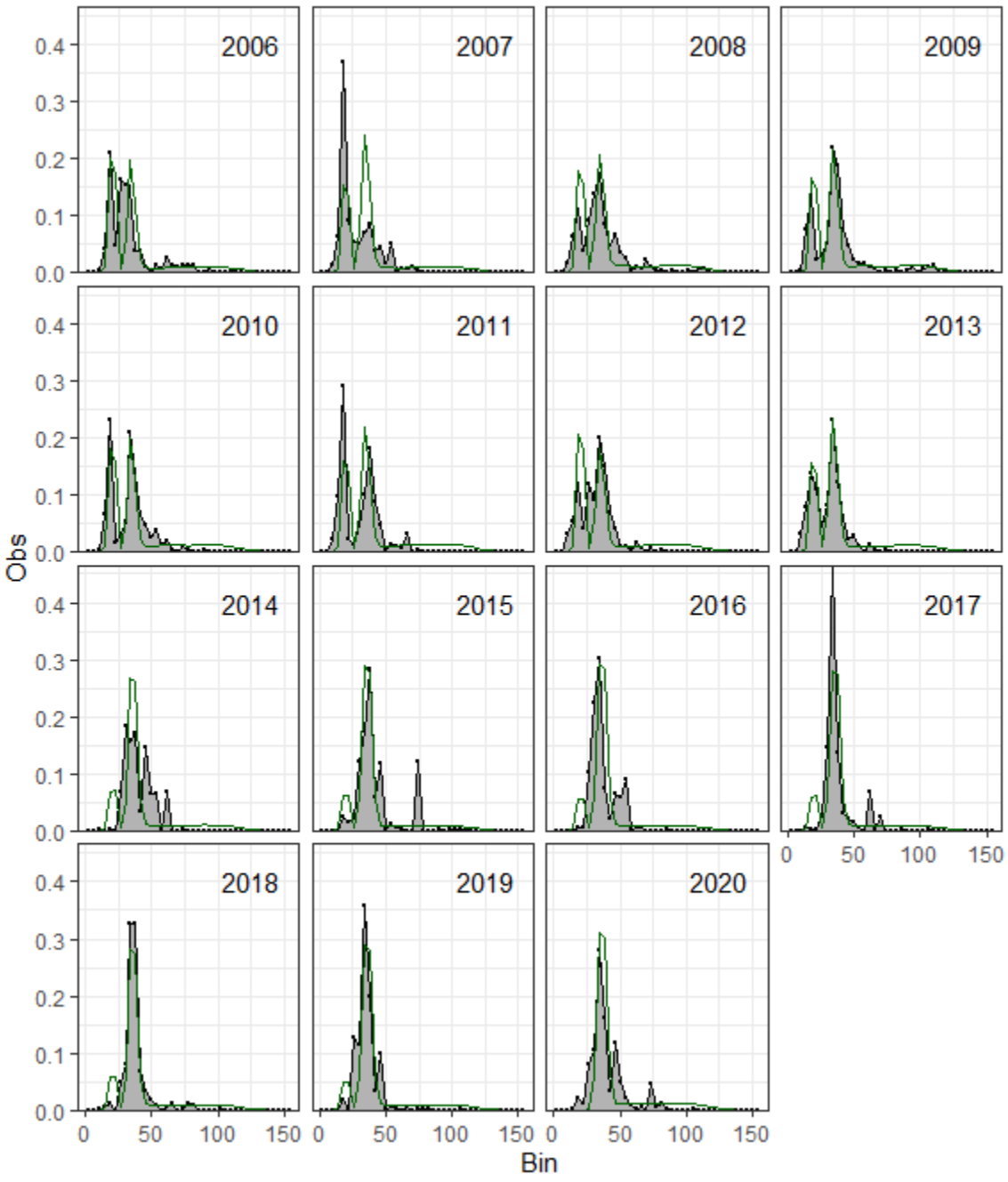

Fig. 14. Fit to length composition data (cm; 2006-2020) from Stock Synthesis Model using a double normal selectivity curve.

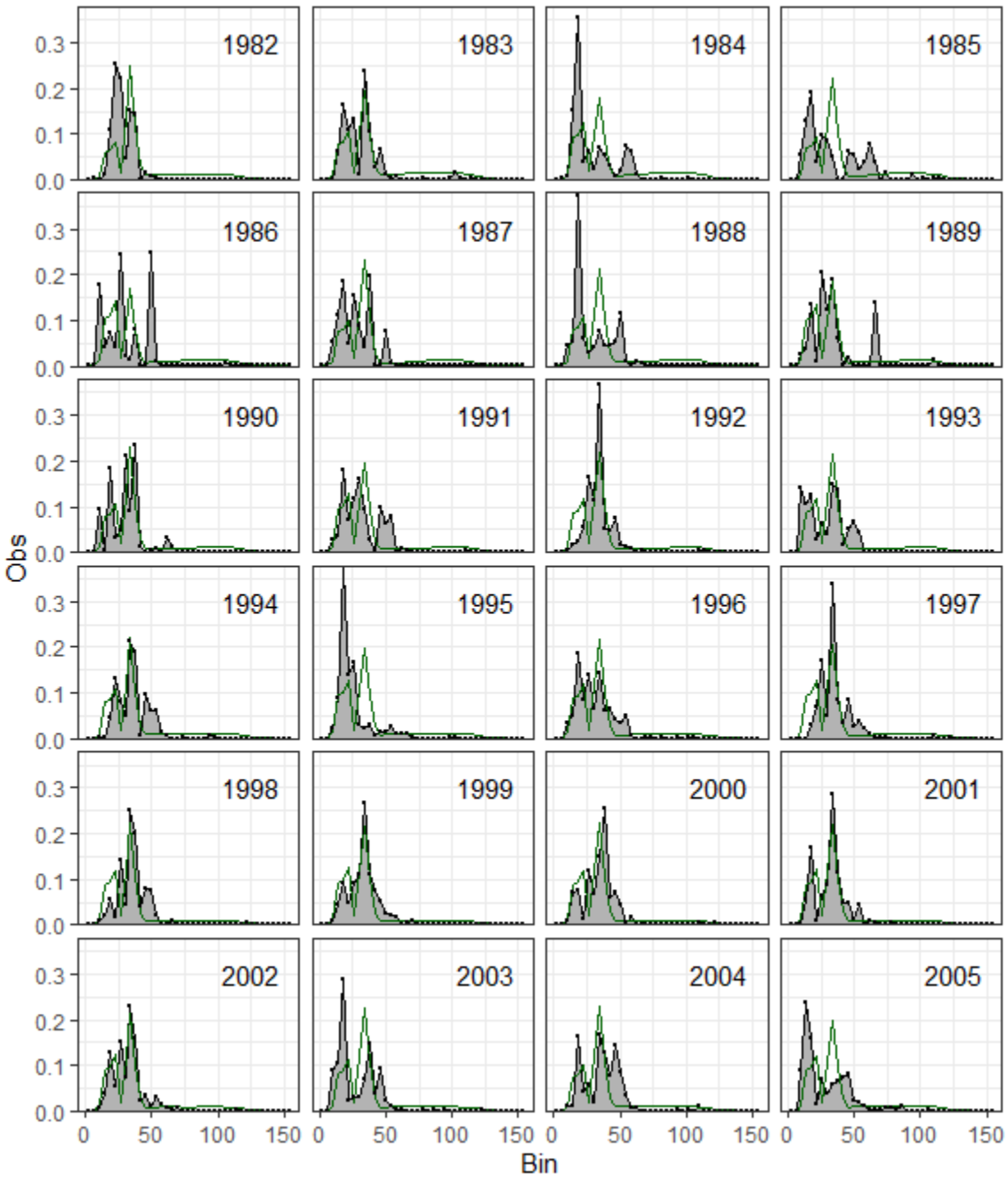

Fig. 15. Fit to length composition data (cm; 1982-2005) from Stock Synthesis Model using a spline selectivity curve.

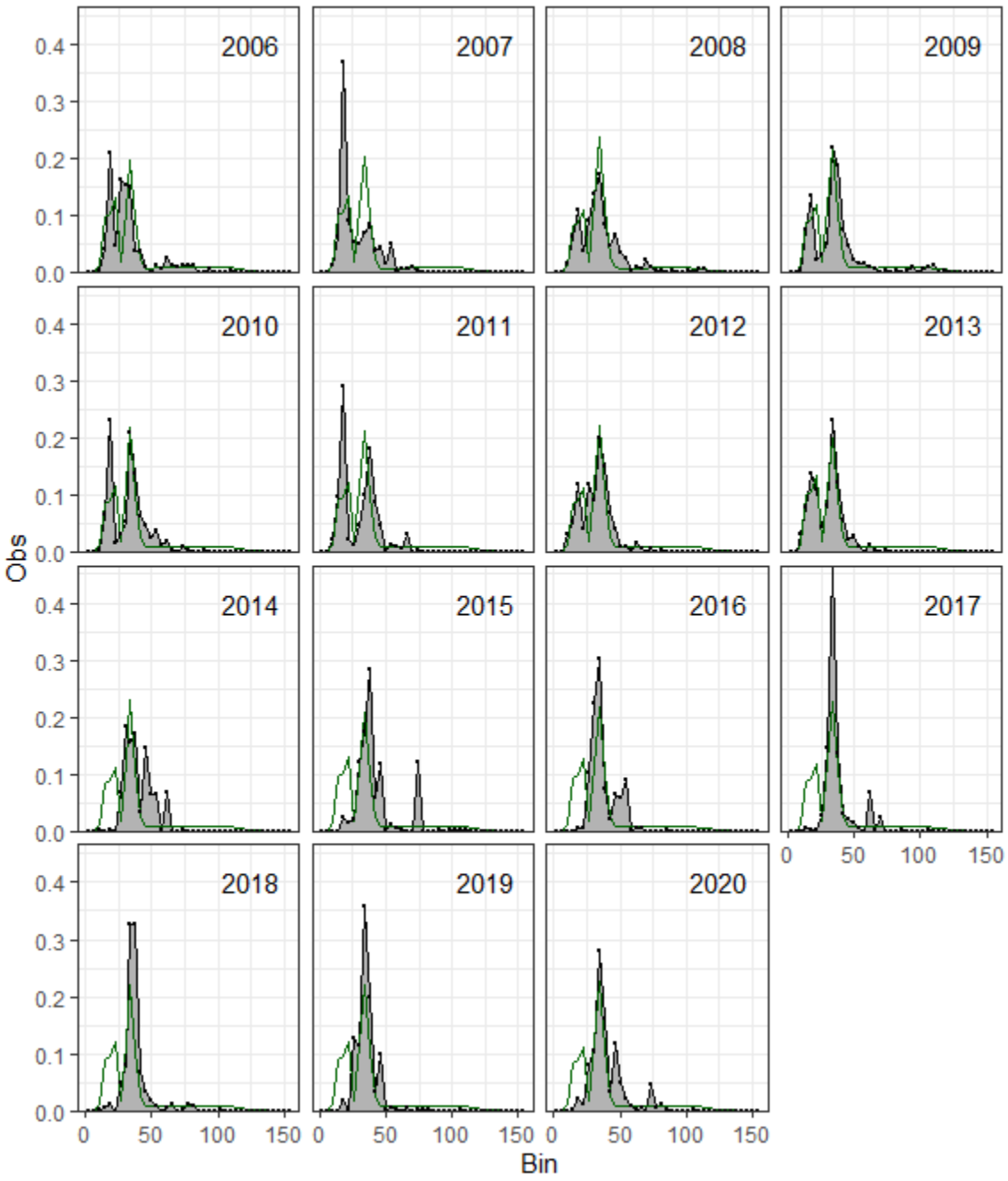

Fig. 16. Fit to length composition data (2006-2020) from Stock Synthesis Model using a spline selectivity curve.

Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

May 2, 2023
8:30 a.m. – 12:00 p.m.
Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.
This meeting will include a 10-minute break.

1.	Welcome/Call to Order *(M. Gary)*	8:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from January 2023	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Update on Striped Bass Cooperative Tagging Program *(J. Newhard)*	8:45 a.m.
5.	Technical Committee Report *(M. Celestino)* **Possible Action** • Projections Using 2022 Preliminary Data and Quota Utilization Scenarios • Consider Management Response to the Technical Committee Projections	9:00 a.m.
6.	Consider Approval of Addendum I on Ocean Commercial Quota Transfers **Final Action** • Review Options and Public Comment Summary *(E. Franke)* • Review Advisory Panel Report *(E. Franke)* • Consider Final Approval of Addendum I	10:30 a.m.
7.	Other Business/Adjourn	12:00 p.m.

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

MEETING OVERVIEW

Atlantic Striped Bass Management Board
May 2, 2023
8:30 a.m. – 12:00 p.m.
Hybrid

Chair: Marty Gary (PRFC) Assumed Chairmanship: 01/22	Technical Committee Chair: Nicole Lengyel Costa (RI)	Law Enforcement Committee Rep: Sgt. Jeff Mercer (RI)
Vice Chair: Megan Ware (ME)	Advisory Panel Chair: Louis Bassano (NJ)	Previous Board Meeting: January 31, 2023
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 January 2023

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

4. Update on Striped Bass Cooperative Tagging Program (8:45-9:00 a.m.)

Background

- The U.S. Fish and Wildlife Service coordinates the Atlantic Striped Bass Cooperative Tagging Program, including winter tagging of striped bass each year.

Presentations

- Update on 2023 and future winter tagging by J. Newhard

5. Technical Committee and Stock Assessment Subcommittee Report on Projections using 2022 Preliminary Data and Quota Utilization Scenarios (9:00-10:30 a.m.) Possible Action

Background

- In November 2022, the Board tasked the Technical Committee (TC) with evaluating whether 2022 removals remained at a level associated with the 2021 fishing mortality rate.
- In January 2023, the Board tasked the TC with conducting projections to determine how ocean commercial quota utilization scenarios would impact the stock rebuilding timeline. The Board requested projections in time for the May 2023 Board meeting, and requested the projections include 2022 preliminary removals data.

- The TC and Stock Assessment Subcommittee (SAS) met in March 2023 to develop projections addressing both Board tasks, and to review a correction to the rebuilding probabilities in the 2022 Stock Assessment Update Report **(Briefing Materials)**.

Presentations

- Technical Committee-Stock Assessment Subcommittee Report by M. Celestino

Board actions for consideration at this meeting

- Consider potential management response, if needed.

6. Draft Addendum I on Ocean Commercial Quota Transfers (10:30 a.m.-12:00 p.m.) Final Action

Background

- Draft Addendum I proposes options to allow for the voluntary transfer of striped bass commercial quota in the ocean region between states that have ocean commercial quota. It was approved for public comment in November 2022.
- Public comment was gathered from November 2022 through January 13, 2023 **(Briefing Materials)**.
- The Advisory Panel reviewed the draft addendum on January 17, 2023 **(Briefing Materials)**.
- In January 2023, the Board postponed final action until May 2023 and tasked the Technical Committee with developing stock projections for specific quota utilization scenarios **(Briefing Materials)**.

Presentations

- Overview of options and public comment summary by E. Franke
- Advisory Panel report by E. Franke

Board actions for consideration at this meeting

- Select management option and implementation date.
- Approve final document.

7. Other Business/Adjourn (12:00 p.m.)

Atlantic Striped Bass

Activity level: High

Committee Overlap Score: Medium (TC/SAS/TSC overlaps with BERP, Atlantic menhaden, American eel, horseshoe crab, shad/river herring)

Committee Task List

- TC – June 15th: Annual compliance reports due
- TC-SAS – Review 2022 landings
- TC-SAS – Conduct projections for quota utilization scenarios

TC Members: Michael Brown (ME), Kevin Sullivan (NH), Gary Nelson (MA), Nicole Lengyel Costa (RI), Kurt Gottschall (CT), Caitlin Craig (NY), Brendan Harrison (NJ), Tyler Grabowski (PA), Margaret Conroy (DE), Alexei Sharov (MD), Luke Lyon (DC), Ingrid Braun (PRFC), Joshua McGilly (VA), Charlton Godwin (NC), Jeremy McCargo (NC), Peter Schuhmann (UNCW), Tony Wood (NMFS), Steve Minkkinen (USFWS), John Ellis (USFWS), Katie Drew (ASMFC)

SAS Members: Michael Celestino (NJ, Chair), Gary Nelson (MA), Alexei Sharov (MD), Brooke Lowman (VMRC), John Sweka (USFWS), Margaret Conroy (DE), Katie Drew (ASMFC)

Tagging Subcommittee (TSC) Members: Angela Giuliano (MD), Beth Versak (MD), Brendan Harrison (NJ), Chris Bonzek (VIMS), Gary Nelson (MA), Ian Park (DE), Jessica Best (NY), Josh Newhard (USFWS), Julien Martin (USGS), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STRIPED BASS MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

January 31, 2023

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)
Steve Train, ME (GA)
Rep. Allison Hepler, ME (LA)
Cheri Patterson, NH (AA)
Doug Grout, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Mike Armstrong , MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Rep. Sarah Peake, MA (LA)
Jason McNamee, RI (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Jesse Hornstein, NY, proxy for B. Seggos (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Mike Luisi, MD, proxy for L. Fegley (AA Acting)
Russell Dize, MD (GA)
David Sikorski, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for J. Green (AA)
Bryan Plumlee, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Marty Gary, PRFC
Dan Ryan, DC, proxy for R. Cloyd
Max Appelman, NMFS
Rick Jacobson, US FWS

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

Ex-Officio Members

Nicole Lengyel Costa, Technical Committee Chair
Jeffrey Mercer, Law Enforcement Representative
Mike Celestino, Stk. Assmnt. Subcommittee Chair

Staff

Bob Beal
Toni Kerns
Madeline Musante
Tina Berger
Tracey Bauer
Kurt Blanchard
Pat Campfield
Emily Franke

Guests

Jerry Audet
Pat Augustine, Coram, NY
Roland Beatty
John Bello
Jessica Best, NYS DEC
Sean Betham
Alan Bianchi, NC DENR
Jason Boucher, NOAA
Colleen Bouffard, CT DEEP
Ingrid Braun, PRFC
Jeff Brust, NJ DEP
Craig Cantelmo
Patrick Cassidy
Nicole Caudell, MD DNR
Mike Celestino, NJ DEP
Matt Cieri, ME DMR
Peter Clarke, NJ DEP
Germain Cloutier
Allison Colden, CBF
Margaret Conroy, DE DFW
Heather Corbett, NJ DEP
Michael Cool
Caitlin Craig NYS DEC
Jessica Daher, NJ DEP
Evan Dintaman
Phil Edwards, RI DEM
Paul Eidman

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

Guests (continued)

Peter Fallon, Maine Stripers
Tony Friedrich, SGA
Tom Fuda
Jerry Gaff
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Willy Goldsmith, SGA
Kurt Gottschall, CT DEEP
Tyler Grabowski, PA F&B
Brendan Harrison, NJ DEP
Brian Hayes
Jay Hermsen, NOAA
Peter Himchak, Cooke Aqua
Carol Hoffman
Sean Hogan
Harry Hornick, MD DNR
Jesse Howe
Bob Humphrey
Ayden Jewell
Kekoa Kiana, Ofc. Sen. Reed
Richard Kuhlman
Jared Lamy, NH F&G
Toby Lapinski
Ed Liccione
Shanna Madsen, VMRC
Joshua McGilly, VMRC
Dan McKiernan, MA (AA)
Conor McManus, RI DEM
Steve Meyers
Drew Minkiewicz, Kelley Drye
Steve Minkkinen, US FWS
Chris Moore, CBF
Chris Piatek
Michael Pierdinock
Nicole Pitts, NOAA
Marisa Ponte, NC DENR
Will Poston, SGA
Jill Ramsey, VMRC
Cody Rubner
Erin Schnettler, NOAA
Zachary Schuller, NYS DEC
Tata Scott, NOAA
Alan Siegel
Jason Seman
Phillip Sheffield
Greg Shute
Amanda Small, MD DNR
Ethan Simpson, VMRC
Andrew Sinchuk
Skip Smith
Ross Squire
Michael Stangl, DE DFW
Jack Stoddard
David Stormer, DE DFW
ElizaBeth Streifeneder, NYS DEC
Kevin Sullivan, NH F&G
Colin Temple
Michael Toole
Andrew Valmassoi, NC DENR
Taylor Vavra
Beth Versak, MD DNR
Walt Vieser
Mike Waine, ASA
Michael Watkins
Craig Weedon, MD DNR
Ben Whalley
Ritchie White
Brian Williams
Charles Witek
Steven Witthuhn
Greg Wojcik, CT DEEP
Paul Wolfe
Anthony Wood, NOAA
Michael Woods
Chris Wright, NOAA
Dennis Zambrotta
Erik Zlokovitz, MD DNR

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, January 31, 2023, and was called to order at 3:15 p.m. by Chair Martin Gary.

CALL TO ORDER

CHAIR MARTIN GARY: Welcome everyone to the Atlantic States Marine Fisheries Commission winter meeting of the Atlantic Striped Bass Management Board. My name is Marty Gary from the Potomac River Fisheries Commission; I'm the Board Chair. Our Vice-Chair is Megan Ware from Maine, and Emilie Franke is our ASMFC FMP Coordinator.

I'm also joined at the front by ASMFC Science Lead, Dr. Katie Drew. For today's meeting before we get going, I would like to recognize some new faces around the table for the Board. First, virtually attending, we have from Maine Representative Allison Hepler from Maine, so Allison, online, welcome to the Striped Bass Board. Also at the table, not necessarily new, he's been at the Board before, but not in a while is Jesse Hornstein from New York.

Jesse, welcome to the Board. Also, we have Chad Thomas with the state of North Carolina. Chad, on the far right there, welcome, Chad. We also have several commissioners who are participating virtually today, including Cheri Patterson from New Hampshire, David Borden from Rhode Island, Tom Fote from New Jersey, Craig Pugh from Delaware, Mike Luisi from Maryland, Jerry Manning from North Carolina. I may be missing a couple, but I'll be looking to Emilie to help me out, to allow those folks to participate in our meeting today.

APPROVAL OF AGENDA

CHAIR GARY: We'll go ahead and start off with approval of the agenda. I would ask if there are any modifications or additions to the agenda. I'll look to the Board for those. None here in person, anybody online, Emilie? No. Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR GARY Let's go to approval of the proceedings from the November annual meeting in November, 2022.

Are there any edits to the proceedings of the meetings from November, 2022? Not seeing any here in the room, none online, then by consent we'll approve the proceedings from November, 2022.

PUBLIC COMMENT

CHAIR GARY: Next up on the agenda, Public Comment for items that are not on the agenda today. I'll look to the room to see if there is any public comment. Raise your hand, please, and I would also ask if there is anybody online for any comment for items that are not on the agenda.

I am not seeing any hands raised in the room. Emilie, are there any hands up online? Seeing none; we're going to go ahead and continue to move on.

ADDENDUM I ON OCEAN COMMERCIAL QUOTA TRANSFERS FOR FINAL APPROVAL

CHAIR GARY: We will move on to Item Number 4, which is Addendum I on Ocean Commercial Quota Transfers for Final Approval, a three-step process. We're going to Review the Options and Public Comment Summary. Emilie is going to provide that to us. Then we're going to Review the Advisory Panel Report; Emilie will give that to us. Then we'll move into action. Emilie, I'll turn to you for the Review of the Options and the Public Comment Summary.

OVERVIEW

MS. EMILIE FRANKE: Today I will provide an overview of the Draft Addendum, the proposed management options, as well as the public comment summary and the Advisory Panel report. The Board action for consideration today is to select a management option and consider final approval of Addendum I. Starting with the statement of the problem for this Draft Addendum. There have been several questions and concerns raised about the

striped bass commercial quota system over the years.

For example, particular concern about the use of 1970s as the reference period for the quotas. These questions and concerns were included as part of the scoping document for Draft Amendment 7 back in 2021, but the issue of commercial quota was not selected for further development at that time, and some Board members did express support for addressing commercial quota issues separately from Amendment 7.

In August, 2021, the Board initiated this Draft Addendum I to consider allowing for the voluntary transfer of commercial quota in the ocean region specifically. This action was initiated to consider a management option that could provide some more immediate relief to states that are currently seeking a change to the commercial quota.

Other commission-managed species do allow for quota transfers between states, and these transfers can address issues like shifting stocks, quota overages, et cetera. Here is the timeline for this management action. After the Board initiated the Draft Addendum in August, 2021, the Board then postponed the Addendum until August, 2022, at which point the Board provided additional guidance to revise the draft.

Then the Board approved the revised Draft Addendum in November 2022 for public comment. Then we had public hearings and public comments accepted throughout December 2022 and January 2023. Then today the Board is considering final action on this Addendum. Just a brief background for this Addendum.

First being, the status of the striped bass stock. As a reminder, we just had the 2022 stock assessment update for striped bass, which indicates that the stock is still overfished but no longer experiencing overfishing, relative to the reference points. The assessment also indicated that under the current fishing mortality rate there is about 78 percent chance the stock will rebuild to the spawning stock biomass target by 2029, which is the rebuilding deadline.

Moving on to commercial management specifically within the striped bass fishery for the ocean fishery, the FMP establishes state-by-state commercial quotas. Then for the Chesapeake Bay the FMP establishes one total Bay-wide quota, which is then allocated per the mutual agreement of the Chesapeake Bay states amongst themselves. Then for all the quotas, any overages are paid back the following year. The rollover of unused quota from one year to the next is not permitted, and then currently quota transfers between states are not permitted. The focus here of this Draft Addendum is considering quota transfers in the ocean region specifically. You can see here this is the table of the current state-by-state commercial quotas for the ocean. This does incorporate any approved conservation equivalency programs.

You can see the total ocean quota across all states is about 2.4 million pounds. As a reminder, Maine, New Hampshire, Connecticut and New Jersey prohibit the commercial harvest of striped bass, and then also note that New Jersey does reallocate their commercial quota to the recreational bonus program.

For the most recent fishing year we have data for, which is 2021, saw about 5.1 million removals of striped bass across both the commercial and recreational sectors. About 12 percent of that total in 2021 was commercial harvest. About 2 percent was commercial dead discards. About 36 percent was recreational harvest, and about 50 percent was recreational release mortality.

For commercial landings, specifically in 2021, the ocean commercial fisheries landed about 1.8 million pounds out of their 2.4-million-pound quota. Then Chesapeake Bay landed about 2.4 million pounds out of their 3-million-pound quota. The ocean commercial fishery does consistently underutilize its total quota.

Some of that quota is not used because striped bass are not always available in state waters. This is

particularly true for North Carolina, which holds about 13 percent of the ocean quota, but has had 0 ocean commercial harvest since 2012. Then second, as I mentioned, some quota is not used because some states prohibit commercial harvest.

Those states that prohibit commercial harvest collectively hold about 10 percent of the ocean quota. Then for states that do have active commercial fisheries, there are several factors that impact how much of the quota is harvested each year, including year class availability, overall abundance, nearshore availability, overall effort, and also state management programs.

This table shows what percent of each state's quota was landed for the past three years. Again, you can see the states that prohibit commercial fishing obviously landed 0 percent of their quota in the commercial fishery. The other states with active commercial fisheries, most of them landed over 90 percent of their quota in 2021.

Again, the exception is North Carolina, which has used 0 percent of the quota, again, because the fish just haven't been there off the coast of North Carolina. Looking across all state quotas, the bottom row you can see about 76 percent of the total ocean quota was landed in the commercial fishery in 2021.

This is just a longer look at that quota utilization for the past ten years. You can see the landings have been below the quota up there in red, every year somewhere between 50 and 76 percent of the quota has been landed in the commercial fishery. There is some concern that allowing commercial quota transfers could increase how much of that ocean quota is utilized. This could potentially undermine the goals of the Addendum VI reductions that were implemented back in 2020. Since the fishery has consistently underutilized its quota, due to the fish availability and also to some states prohibiting harvest, Addendum VI assumed that the commercial fishery will continue to underutilize its quota to the same degree. This assumption might be violated if commercial quota transfers are allowed, and that unused quota starts to be used.

I'll go now to the five proposed management options in the Draft Addendum. The options consider allowing for the voluntary transfer of commercial quota in the ocean region, between states that have quota. These options do not address the Chesapeake Bay quota at all, and they do not consider transfers between the ocean and the Chesapeake Bay or vice versa.

Also, note that commercial quota that has been reallocated to a state's recreational fishery, so for example New Jersey's quota that has been reallocated to their recreational fishery is not eligible to be used for quota transfers. If transfers are permitted, quota would be transferred pound for pound between states, and there would be some uncertainty associated with transfers between states that harvest different sized fish.

We know state fisheries catch different size striped bass due to a variety of reasons, including the variability in size distribution of striped bass along the coast. Also, states have different commercial size limits, different gears, seasons, et cetera. Then also through conservation equivalency over time states have adjusted their commercial size limits from the historical standard size limit.

This has resulted to changes in some state quotas over time. Overall, a pound of striped bass quota is not equal across all states, and some of the proposed options do incorporate a provision to try and address this discrepancy. Looking at the specific options. First, we have Option A. This is the status quo in which commercial quota transfers are not permitted.

All of the alternative options B through E would allow voluntary quota transfers, and they range from sort of the least restrictive option, Option B, all the way through the most restrictive option, Option E. I'll get into each of those in more detail. Option B is the general transfer provision. Voluntary transfers would be permitted with no restrictions, but there would be a conservation tax if the stock is overfished.

There would be no limit on how much quota could be transferred, but if transfers occur when the stock is overfished, there would be a 5 percent

conservation tax to address the issue that a pound of quota is not equal across all states. For example, if State A transfers 10,000 pounds to State B while the stock is overfished.

State B would receive 9,500 pounds of that transfer, and the remaining 500 pounds would be that conservation tax, which would be no longer available for harvest that year. Option C would limit transfers based on stock status. Transfers would be permitted, except transfers would not be permitted at all when the stock is overfished.

There is no limit on how much could be transferred, but when the stock is overfished transfers could not happen at all. It is important to note that because the stock is currently overfished, this type of option would not provide near-term relief to states that are currently seeking additional quota. Option D is the Board discretion option. For this type of option, the Board would decide whether voluntary transfers are permitted every one to two years, based on information available on stock status and the performance of the fisheries. If the Board does decide to allow transfers when the stock is overfished, there would be a 5 percent conservation tax to address that issue that a pound of quota is not equal across states.

The other aspect of this Option D is that the Board can, in addition to deciding whether or not transfers are allowed, the Board can specify certain criteria for these transfers. The Board could, for example first, set a limit on the transferrable amount of quota, so how much quota could be transferred in a given year.

The Board could also set a seasonal limitation on that limit. For example, the Board could say no more than 50 percent of how much can be transferred, can be transferred in the first half of the year. Then finally, the Board could also determine a state's eligibility for a transfer, based on how much a state has landed.

For example, the Board could say, a state cannot ask for a transfer until they've landed X percent of their quota. If the Board does select this option today, the Board could also decide whether or not to allow 2023 transfers for this year at this meeting. Then the Board would start this regular process of deciding about transfers in advance.

For 2024 the Board would need to make that decision by the fall of this year. Then finally, we have Option E. This would be the most restrictive option. Just like the previous option D, the Board would have discretion and decide whether transfers are permitted every one to two years, except for this option no transfers could occur at all when the stock is overfished.

The Board could still set certain criteria, but transfers couldn't happen at all when the stock is overfished. Again, important to note that because the stock is currently overfished, this type of option would not provide near-term relief to states. If transfers are permitted with any of those alternative options, there is a general process for how voluntary transfers occur.

Transfers require a donor and a receiving state and transfer between states may occur upon agreement of those two states at any time during the year, and up to 45 days after the calendar year ends. The Board today when approving the Addendum, could specify any number from 0 to 45 days if the Board wanted to limit when transfers can occur after the year ends.

The Administrative Commissioners from each state must submit a signed letter to the Commission regarding the transfer. The transfer becomes final when states receive written confirmation letters back from Commission staff, and then once quota has been transferred, the state receiving quota becomes responsible for any overages to that quota, and also any transfers don't permanently impact state quota shares, so every state resets to their original quota amount each year.

The final section of the Addendum is the compliance section. Any measures approved by the Board through this Addendum would be effective immediately, and if transfers are permitted, states would need to account for any potential additional quota through transfers, when they are determining how many commercial tags they need for the next

season. Also, just a note here that if the Board does select status quo Option A today, that would mean that there is no change to current management. In that case, there would be no final addendum document, because management is not changing. We would add a note to the FMP Review to acknowledge that the Draft Addendum I process took place, what was discussed. But if Option A is selected that is no change to current management.

PUBLIC COMMENT SUMMARY

MS. FRANKE: I'll now provide a summary of all the public comments that we received on this Draft Addendum.

Public comments were accepted through January 13, 2023. We received a total of 1,979 written comments. Those included 759 individual written comments, 1,190 comments through 6 different form letters, and also written comments from 30 organizations. Eight public hearings were held that covered 12 jurisdictions in December and January.

Five of those hearings were webinar only, two of them were hybrid format, and then one of them was in person only. We had 193 public individuals attend the hearings. That is not including state staff, commissioners, commission staff. Live polls or a show of hands were used at most hearings for the proposed options.

Also note that some people did attend multiple hearings and provide comments at multiple hearings. Here is the comment count. You can see that the vast majority of comments favored the status quo, Option A, no transfers permitted, with 1,950 written comments, and 155 public hearing comments in favor of the status quo, Option A.

Of those who did favor the alternatives, Option B through E, Option B, which is transfers allowed with the overfished conservation tax, had the most support of those alternatives. For those favoring Option A, the status quo, the majority of comments. The most common rationale was concern about expanding harvest and increasing fishing mortality when the stock is rebuilding when the stock is overfished, and also when the stock is experiencing poor recruitment.

Commenters noted that management should focus on rebuilding the stock and not maximizing harvest. Comments noted that allowing quota transfers would jeopardize rebuilding, and also noted that the Board has rejected quota transfers in the past. Some comments noted that allowing transfers would be in conflict with the stakeholder input received during the Amendment 7 process, in support of conservation.

Then some comments noted that if states aren't able to harvest their full quotas that indicates the stock may not be doing well, and so extra quota shouldn't be transferred or harvested by another state. For those in support of Option B, which is that transfer is permitted with overfished tax. Many commenters in support of Option B noted that they were commercial fishermen, and they noted that quota transfers would allow for the efficient use of commercial quota.

They also noted that the small impact of striped bass quota transfers on the overall fishery, because the commercial fishery is relatively small compared to the recreational fishery. Comments also noted that the commercial fishery already has accountability measures in place with payback for any quota overages. Also noted that transfers could help avoid regulatory discards after states filled their quota, and also noted the benefits of transfers seen for other species as well. There was no specific rationale provided for Option C, so moving on to Option D.

Those that supported this Board discretion option noted that some discretion on transfers would be beneficial, but also cautioned against too much oversight in setting overly restrictive criteria. Those in favor of Option E, which is Board discretion but no transfers at all when the stock is overfished, noted that this option would provide maximum oversight by the Board, and would support caution during rebuilding, while still benefiting states that are seeking additional quota.

Commenters also raised additional topics, including concern that commercial fisheries are removing large breeding females from the population, concern also about ongoing CE programs and support for ending current CE programs. Comments noted that the commercial sector should have the same size limits as the recreational sector.

There is also concern about the potential for a future moratorium if the stock doesn't recover. Some support for ending commercial harvest, and making striped bass a game fish, and then concern also about menhaden harvest in the Chesapeake Bay, and concern about impacts from commercial gillnets.

ADVISORY PANEL REPORT

MS. FRANKE: I'm going to also provide the Advisory Panel Report. The Advisory Panel Chair, Lou Bassano, asked that I provide the report today in his stead. The Advisory Panel met via webinar on January 17, to discuss this Draft Addendum. The AP members discussed their recommended options, and also provided some additional recommendations on the transfer process, and also on the quota system in general.

A majority of AP members on the call, 14, supported status quo, Option A, transfers not permitted. There were a few reasons. Those included transfers are not appropriate while the stock is overfished and rebuilding, and there shouldn't be any increase in either sectors harvest while the stock is overfished. The AP noted the public comments are overwhelmingly in support of Option A. Transfers will not benefit the stock, especially when the stock is overfished.

There is concern that quota transfers could set off the potential for nontransparent horse trading of quota. It was also noted that as long as the stock is overfished, the stock needs that buffer as not harvesting the North Carolina quota, and also concern that if quota is transferred north along the coast that there is concern that large breeding females will be taken out of the fishery, and there would be more loss of spawning potential there.

In general concern about moving quota around and the potential for that impacting the rebuilding analysis and our assumed size of commercial catch, since different size striped bass are caught in different states. Then it was also noted that the stock is experiencing recruitment failure in the Chesapeake Bay, so this would be a time for caution. A few AP members, 4 of them on the call did support Option B, transfers permitted with an overfished conservation tax. Those AP members noted that the quotas were developed scientifically, and the science would not set total quotas that would jeopardize the stock. Again, they noted that the commercial fishery is already constrained, and has payback and accountability provisions in place. Also noted that the fishery is primarily recreational, and with the commercial fishery only at 10 percent of total removals with relatively stable landings, that allowing transfers would not have a significant impact.

Some AP members also noted some additional recommendations about the quota transfer process itself. If the Board does allow transfers, a few AP members recommend the Board eliminate the 45-day provision allowing transfers up to 45 days after the year ends. There was concern that having this provision might lead to states being less careful about going over their quotas, since they could potentially cover a quota overage after the year ends.

A few AP members also recommended that transfers be permitted only for states that allow commercial fishing. The states that prohibit commercial fishing, Maine, New Hampshire, Connecticut and New Jersey, should not be able to transfer their quota. Then 1 AP member recommends revising the quota utilization calculation.

There is concern that calculating that percent utilization incorporating those states that don't have a commercial harvest is misleading, and so those states that harvest 0 percent should not be included in the calculation. Then the AP discussed, you know if the Board does not allow transfers at this time, should transfers be considered in the future? The AP was split on that.

Some AP members would support revisiting transfers after the stock is rebuilt. That would be a more appropriate timing from their perspective. Some AP members don't support revisiting the transfer issue in the future at all. From their perspective transfers should not be allowed in any case, and that transfers are not an appropriate tool for the striped bass fishery.

Then some AP members were uncertain about whether transfers should be considered in the future. They noted that when the stock is rebuilt quota transfers could be a tool to respond to climate change and shifting stocks, but only if that tool was controlled properly. Then finally, there were a couple recommendations on the general commercial quota system.

A few AP members recommend the Board reexamine the quota system overall, because it's based on date from the 1970s, and the data should be reevaluated, and science has advanced since that time. Then one AP member recommends the Board take a broader perspective and reexamine the contribution of each sector to the fishery overall. That concludes the AP report, as well as the public comment summary. I'm happy to take questions on anything that I have presented.

CHAIR GARY: Thank you, Emilie. Before we entertain questions for Emilie from the AP report and from the public comments, we will be pivoting to the final action on the board. Please hold your motions until that time. I do want to start that part of it off with a motion, but for now we'll strictly do questions for Emilie. We do have some folks online participating virtually, so I'm going to be looking to Emilie to toggle back and forth periodically. We'll open this up for questions for Emilie. Justin Davis.

DR. JUSTIN DAVIS: Emilie, one of the comments in there in the AP summary caught my eye on that slide about whether or not, you know if the Board decides not to approve transfers at this time, should they revisit the question? The comment that transfers are not an appropriate tool for the striped bass fishery. Can you elaborate on that at all, like some of the discussion or comments around that idea?

MS. FRANKE: Yes, so there wasn't too much in that discussion there. The discussion that we always had I think was concern about, because striped bass those different sized stripe bass harvested among the states, and each states fishery is a little bit unique, that transfers are just not the most appropriate tool.

Given the uncertainty there of transferring different size striped bass among states. I think that was the primary reason in that discussion. AP members noted although transfers are used for other fisheries and other species that with that uncertainty that it just wouldn't be appropriate for the striped bass fishery.

CHAIR GARY: Additional questions for Emilie? Steve Train.

MR. STEPHEN TRAIN: Emilie, that was a great presentation. If you can follow what I've written down here and scribbling along as you talked, maybe you can explain it to me. We're currently under Addendum VI, and under that we have a 78 percent likelihood of success rate in the current management plan. That is assuming that we aren't going to use all the quota that we're going to have a likelihood of unused quota. I don't want to misquote you, but that seems to be what you said.

MS. FRANKE: The current projections for the assessment assume that we maintain the same fishing mortality rate. The Addendum VI reductions from 2020 did indeed assume that the commercial quota would have the same utilization rate, that there would still be some unused quota.

The specific assessment projections are specific to the fishing mortality rate, and not necessarily that assumption. I'll turn to Katie if I'm missing anything. You know Addendum VI specifically had that commercial quota assumption, but the assessment projections are just looking at F, which is a combination of recreational and commercial.

CHAIR GARY: Yes, Steve.

MR. TRAIN: I'm trying to figure this out. At a 78 percent likelihood of success under the current management plan, based on the current real mortality rate with effort, or based on what we projected? If it's real, then what was the likelihood of success not knowing what the actual fishing mortality would be, not the allotted?

MS. FRANKE: I think I followed most of that. The projections are based on the fishing mortality rate from 2021. We're based on if we maintain that same fishing mortality rate every year, the same as we had in 2021, then we'll have that 78 percent chance of rebuilding the stock. The assessment doesn't differentiate between whether, like how much of that fishing mortality rate is from the recreational or from the commercial side, it's just taking that overall fishing mortality rate. You know if commercial harvest increased but recreational removals decreased, and fishing mortality stayed the same. The assessment would just take that as fishing mortality staying the same. If that is helpful at all. I'll see if Katie has anything to add.

CHAIR GARY: Did that answer your question, Steve?

MR. TRAIN: Close. When we did most of these projections, we have a projected harvest rate and a projected success rate. You're saying we have a quota, but we know we're not going to harvest all of it. We went from what we think we're going to harvest at, which is below what we've allowed them to harvest at, to come up with this success rate. My question is more, what would the likelihood of success in this plan been if we caught the full quota?

DR. KATIE DREW: We didn't run those projections. We ran the projection assuming that we would stay at the fishing mortality rate in 2021 would give you another set of projections where we assumed that the fishing mortality rate would increase up to the F target, as well as to the F threshold, and that does bring your chance of success down. But we did not specifically look at a scenario where we did it in terms of removals of fully utilizing that commercial quota, or of increasing recreational harvest by X or Y percent. We did not do those sets of projections for the assessment update.

MS. FRANKE: If I may, Mr. Chair. We had put together this backup slide, because this was a frequently asked question during the public hearings. This question asks, 'if previously unused quota is used, how would that impact the rebuilding timeline from the stock assessment?' You know the answer is, commercial harvest could increase.

But without new projections we can't say how much that would increase F or if it would decrease that probability of rebuilding, or how much it would decrease that 78 percent chance of rebuilding. We can't say that without new projections. Again, that depends on how much of the previously unused quota is harvested or transferred, and also again, the total fishing mortality rate depends on both commercial and recreational.

We can look that up, I put a table up here, we can estimate how much removals might change. For example, these are rough estimates. You know we took a look at removals, assuming the same size fish would have been harvested as they were in 2021. If the North Carolina quota was transferred and harvested on top of what was harvested in 2021, you will see somewhere around less than a 1 percent increase in total removals.

If we're talking about the scenario that you brought up. If all the ocean quotas, every state's quota was fully utilized, including those states without commercial fisheries, you might see around a 1 percent increase in total removals. Again, this is how much removals might increase, but we can't say without new projections how much that might increase F overall.

MR. TRAIN: Thank you, that answered my question.

CHAIR GARY: Thank you, Steve, thanks Emilie and Katie. This time I would turn to Emilie. Are there any hands raised from Board members that are online that want to ask a question? Okay, back to the room. Any additional questions for Emilie? Dennis Abbott.

MR. DENNIS ABBOTT: The Advisory Committee expressed a concern about whether if we maintain status quo, whether we could revisit transfers in the

future. I think in my opinion it would be clear that we always could do, a Board can do what it chooses in the future, regardless of the outcome of this, so choosing status quo would not preclude the fact of revisiting quota transfers at any time in the future, not correct.

MS. FRANKE: It's correct. The Board can absolutely revisit this in the future. From the Advisory Panel's perspective, the conversation was whether or not the Board should, from their perspective revisit it in the future. But absolutely the Board could revisit this if they would like.

CHAIR GARY: Thank you, Dennis, Emerson Hasbrouck.

MR. EMERSON C. HASBROUCK: Thank you, Emilie, for your presentation. I'm just looking at the slide that you have up there now, where it's an estimate that 0.2 to 0.5 percent increase from 2021 total removals if the North Carolina quota is harvested on top of the 2021 removals. Like the first line in that table. I'm just wondering, at that 0.2 to 0.5 percent, that is probably, I'm guessing, so I'll ask the question. Is that within the error bounds of that estimate of rebuilding by 2029, right that 0.5 percent?

MS. FRANKE: We haven't taken a look at those to see if that is within the error bars there. I think the important sort of caveat here is we're assuming, you know if all states decide the fish harvesting doesn't change, and for this range, is because we don't know if the North Carolina quota is transferred elsewhere, what size those fish will be. We have this range and I'm not sure if they're within the confidence intervals.

CONSIDER FINAL APPROVAL OF ADDENDUM I

CHAIR GARY: Did that answer your question, Emerson? All right. Any additional questions for Emilie? Any online? All right, so we will move to Consideration for Final Approval of Addendum I. I would look to start the conversation, if anyone has a motion. John Clark from the first state with the first hand up.

MR. JOHN CLARK: Thank you, Mr. Chair. Yes, indeed, I do have a motion. I sent it to Emilie, but not a big surprise, shall I just wait until it's up there, Emilie.

MS. FRANKE: It should be up momentarily, yes, thank you.

MR. JOHN CLARK: Short and sweet. **Move to approve Option D, Board discretion for a commercial quota transfer provision, with the overfished conservation tax.** If I can get a second, I would like to speak to it.

CHAIR GARY: Is there a second to the motion? Steve Train. We have a motion to approve Option D, Board discretion, commercial quota transfer provision with overfished conservation tax set. Motion by Mr. Clark, seconded by Mr. Train. All right, we'll open this up to discussion. John, I look to you as the maker of the motion to expand upon your motion.

MR. CLARK: I wish I had better powers of persuasion, but let me go ahead and start here. As Emilie pointed out in the presentation, Option B is one of the more restrictive transfer provisions. It gives the Board discretion every year to decide whether the population can support transfers. You know I think that should calm some of the concerns that people have about allowing transfers, because we would be looking at it as a Board.

Why D, instead of E, which would have taken the overfished status into account, and wouldn't have allowed transfers unless the stock was not overfished? I may be alone, or in Delaware we may be alone, but these spawning stock biomass reference points are extremely conservative. It takes a while for the assessments to catch up with the population, and my thinking is that we all see striped bass in our states.

We know when the population is recovering. I thought this would help the commercial fishery in that as the Board sees recoveries occurring out there, that they may be able to approve transfers before the stock is officially considered no longer overfished. As Emilie's slide just pointed out there,

we're not picking on North Carolina, of course, but North Carolina is where the unused quota is.

It is not even 1 percent of the total recreational and commercial removals. It doesn't seem too apt to be likely to have much of an effect on either the assessment results or the regulatory restrictions states must take based on the assessment. That's if the entire quota was transferred. With option D the Board has the power to approve whether the transfers will be allowed, and how much transfer will be allowed.

Because of that, of course, if the Board felt comfortable with 20 percent of the North Carolina quota being transferred, obviously that's probably a rounding in terms of our removals every year. But to a state like Delaware that would be a huge help. Why are we pursuing this approach in Delaware instead of a full reallocation, which we know people have suggested, you should just reallocate the commercial quota.

We know what a cluster fudge that reallocations turn into, and we'd be here for, I mean maybe by the time I retire, but maybe not even until after I'm dead that would probably happen. In any event, we think in Delaware that this is the fastest, easiest and hopefully a method that people could have oversight over and can agree to, to allow some states that get more quota.

Now, Delaware has been advocating for more quota for years. Obviously, the timing isn't great to be asking for quota transfer when the population status is overfished. We pursued this approach, as I said, because of the difficulty of getting reallocation done. We greatly respect the concern that recreational anglers show about this issue, but once again we want to keep it in perspective.

This is a very small amount of striped bass. The Board can defer allowing transfers until the population is recovering robustly under this option, and it brings us closer to fixing inequities in the original quota allocation. For all those reasons I'm hoping the Board can support this option. Thank you.

CHAIR GARY: Steve, as seconder, would you like to expand on John's comments?

MR. TRAIN: I have different comments, but yes. As a member of a state that has received quota transfers in a different species, I understand the importance of this type of tool, to allow a state to harvest a resource that maybe misappropriately quoted off, based on the change of the location of the resource.

I think that this option doesn't require it to be transferred. Even a full transfer from one state would still have us around a half a percent difference. I think it's something that should possibly be available. But this option is at Board discretion, which means it doesn't have to be done.

CHAIR GARY: Before we open this up to full Board discussion, I had a question for John. You may have mentioned this before, but I was curious about the scope, the sizes of the commercial fishery in Delaware that has the need for the transfers, if it's something you could comment to.

MR. CLARK: If you look at the table you'll see that Delaware, we have a very well-managed commercial fishery every spring. Our commercial fishermen get the gear in, get the gear out, because they want to move on to crabbing. We can easily accommodate more. Initially we would like to at least get back to where we were under Amendment 6, which would be probably about 50 to 60,000 pounds of quota. Once again, if the entire North Carolina quota is much less than 1 percent, we're talking really a fraction of a percent here.

CHAIR GARY: Roy Miller.

MR. ROY W. MILLER: I was wondering if you would indulge me for just a moment or two to add a little context to this request in John's motion. There are really two reasons Delaware feels that it would be important to pass Option D. One is, the '72 to '79 landings are not verifiable for a variety of reasons, at least in our state and some other states.

There was no mandatory catch reporting in our state back in ’72 to ’79. The landings statistics were compiled by National Marine Fisheries Service employee coming to Delaware for an annual visit, maybe a couple times a year. The records were voluntary that the gill netters submitted for purposes of compilation of this ’72 to ’79 landings.

They are unverifiable. They may be overestimates, they may be underestimates, we don’t know. The second reason why we feel, the first reason being we don’t feel that the ’72 to ’79 landings, looking at it from today’s point of view, are an appropriate resource to use to allocate the stock. The second reason has to do with the dissipation of the Delaware River pollution block.

In the sixties and seventies there was a 30-mile-long pollution block in the Delaware River that virtually precluded striped bass spawning from the Delaware River. You could reasonably ask, where did the landings that Delaware produced, where did they come from? Well, primarily through the C&D Canal, from transfers from Chesapeake Bay. There was relatively little reproduction in the Delaware River during that period of time, with the construction of five major sewage treatment plans in the Philadelphia area in the 1970s, and into the middle of 1980s. Gradually striped bass reproduction came back in the Delaware River, and the species was declared restored in ’98.

What I’m saying is, Delaware fishermen never had the opportunity to fish on Delaware produced striped bass during the period of record, because there simply was very little production in the Delaware River during that period of record. Could their landings have been higher? I know that requires speculation, but my guess is yes, they could have been considerably higher during that period of record, had there been successful spawning.

CHAIR GARY: Thank you, Roy, I appreciate your personal history of exposure, and that’s really very insightful, so I appreciate that. Let’s go to Jason McNamee and then to Dennis Abbott. Dr. McNamee.

DR. JASON McNAMEE: Mr. Chair, what I would like to do here is offer a substitute motion if the time is appropriate to do that.

CHAIR GARY: Let me do this. I’ll move that substitute. If you don’t have any further comment I want to go to Dennis, and let him make his comment and then double back if that’s okay. Would that work?

DR. McNAMEE: Perfectly fine, Mr. Chair, thank you.

CHAIR GARY: Thank you, Jason. Dennis.

MR. ABBOTT: Jason beat me to the punch, because I was going to do the same thing.

CHAIR GARY: You made it easy, Jason, go ahead.

DR. McNAMEE: Thank you, Dennis. I would like to offer a substitute motion here. What I would like to substitute is to move to postpone action on Addendum I, and task the Technical Committee with running two population projections. The first one would be one which assumes harvest of the entire ocean commercial quota from all states, and the second one would be one which assumes harvest of the ocean commercial quota from all states except New Jersey, and then parenthetical, since their quota is reallocated out of the commercial fishery.

The Technical Committee may use their expert judgment on the other needed assumptions for the projections, i.e., selectivity, to produce the most realistic output for consideration by the Board. If I get a second to that motion, I would be happy to provide my rationale behind that. Thank you, Mr. Chair.

CHAIR GARY: Do I have a second to the motion? Justin Davis. We have a motion by Dr. McNamee, second by Dr. Davis. Jason, do you want to go ahead and expand on this?

DR. McNAMEE: A couple of reasons for doing this. There was a lot of discussion about this in both the public comment and the Advisory Panel also made

mention of it, and then Steve Train also brought up a similar point. What this would do, is it would provide an answer to some of those comments, these comments about well, what would happen if the commercial quota was harvested?

Does it impact rebuilding? Does it have a meaningful impact on the stock? You know when I was reading those comments, we can answer that question with the model that we have in the projections that we run. You know they were really observant comments that were made, and I thought it would be helpful to the Board to actually have an answer, to kind of at least get some clarity on one of those things that people were bringing up.

In another manner, it seems people are uncomfortable with harvesting the commercial quota. I find that a little bit odd. I think if we are setting a commercial quota, we should be comfortable with harvesting that commercial quota. I'm not saying we should harvest the commercial quota. What I'm getting at is, this will give us an opportunity to kind of understand the commercial quota a little better in the context of the population.

If it's not an appropriate quota level we can have information and adjust it, if that's appropriate. We'll get a sense of whether or not this commercial quota is set at a reasonable level. Just a logistical one. It's my understanding that the Technical Committee is already working on some projections.

I am asking them for additional work, but at least I'm not pulling anyone off the bench, they're already out in the field playing ball. It's additional work, but hopefully not a huge burden on the Technical Committee, as they're already kind of working on some of this type of thing. Then finally, it will allow the Board to make a more informed decision when we take this back up, so I'll park it there, Mr. Chair, thank you for the time.

CHAIR GARY: Justin, would you like to add to that?

DR. DAVIS: I appreciate this motion from Dr. McNamee and support it. To me what's really clear is that the public here with this action, as with Addendum VI as was Amendment 7, is just very concerned about the stock being rebuilt by 2029. You know in my view the public's voicing very reasonable concerns that increases in removals could affect the recovery timeline that we're on.

I think this work can inform that question, as to whether additional removals on the commercial side will materially impact the rebuilding plan. Thinking back to the November meeting, I wouldn't have been willing to consider additional removals on the recreational side, adjusting measures there without some information on what those changes would do to our rebuilding timeline.

I think here we're just asking for the same thing, given that we're considering additional removals on the commercial sideline to better understand how that might impact rebuilding. I think this is a really reasonable ask, and will hopefully allow us to make a more informed decision when we come back for final action at a later date.

CHAIR GARY: Chris Batsavage has his hand up, but I'm going to pivot to online, and do we have any hands raised there, Emilie? All right, I think we have Dave Sikorski online. Go ahead, Dave.

MR. DAVE SIKORSKI: I was originally raising my hand to be in the queue, to possibly substitute the original motion, and I'll park it for now, and just ask that you keep me on the list as things progress here. In looking at this motion, I'm against really the first sentence, or at least the first half of the first sentence in postponing action on this Addendum.

I'm in the reallocation camp. I think Roy made some really important comments about the history there. Ultimately, I think that is the right thing to do to properly provide access to this fishery. I'm in that camp once we're rebuilt. Obviously, that does push us down the timeline quite a bit, but I think that's the right thing to do, given everything we've been through, what the public is looking for.

Let me just clearly say that when I say rebuilt, I say rebuilt on the timeline and the goal we have in place, not moving that goal, something else the public has

long said. You know ultimately, I think this additional analysis would be helpful, so I'm supportive of that component. I would also hope that we could get a better picture of what F looked like through 2022.

Something I think is being viewed, possibly after the May meeting, based on November conversations, because I think that will give us a good picture of what's happening at the recreational fisheries that we know is difficult to constrain, and obviously (interference) are rebuilding the most. Generally speaking, I think we're in the margins here, as far as the potential value of this information, so that's just some comments at this point, and if I have an opportunity, I might just like possibly substitute down the road, so thank you.

CHAIR GARY: Thank you, Dave, I've noted you're interested in seeing how this plays out and a possible substitution. Chris Batsavage.

MR. CHRIS BATSAVAGE: Actually, Dave Sikorski's comment, actually the questions that I have about this motion is, would these population projections be based on 2022 catch, and if so, I guess a question to Emilie. This is I guess a reminder for us, it's through Wave 5, what does the 2022 recreational harvest look like compared to 2020 and 2021?

MS. FRANKE: Thanks for the question. To the first part about, would these projections proposed on the screen here use 2022 catch data. The plan as discussed in November; you know the Board expressed interest in evaluating 2022 removals as soon as possible. The initial plan is for the Technical Committee to meet in March, to take a look at the preliminary MRIP data, because at that time we'll still only have preliminary data.

We also in March will not have final 2022 commercial data. The TC for the May Striped Bass Board meeting can provide a preliminary analysis and potentially preliminary projections with 2022 catch data, perhaps incorporating these scenarios on the screen if this is something the Board wants. Then the TC could provide additional analysis at the August meeting once they have all the final 2022 data. Then as far as the preliminary 2022 MRIP data, as you mentioned, we only have Waves 1 through 5. You know taking a quick look at those, but they are incomplete without Wave 6.

If we're comparing 2022, Waves 1 through 5 with 2021 Waves 1 through 5, recreational harvest increased, recreational live releases decreased. Overall, you did see, because of that increase on the harvest side, proportionately there is an increase in removals in 2022 relative to 2021, only for Waves 1 through 5. This is a preliminary comparison. We don't have Wave 6 yet. I'll again see if Dr. Drew has anything to add.

DR. DREW: Yes, that covers it, thanks, Emilie.

CHAIR GARY: Go ahead, Chris.

MR. BATSAVAGE: Thank you for that, Emilie. I guess the concern I have is, the catch that occurred in 2022 may kind of swamp out these projections, what we're looking at as far as the impacts to the commercial harvest, and put us in a different management situation when we look at the final numbers later this year. I guess with that, I don't know if I could support this motion right now.

CHAIR GARY: Dennis Abbott.

MR. ABBOTT: I came here today to vote for status quo, not entirely based on the public comments that we received in New Hampshire, but because I felt that the imposition of quota transfers would have some effect on the population. We just passed Amendment 7, where we made a commitment to rebuild the stock by 2029.

I can recall myself making a remark, probably 15 years ago that striped bass management was suffering from a thousand cuts, by making these little small changes. I agree with Jason's thoughts on going forward and looking at the commercial quota issue in its entirety, but I see that as a separate issue based on what the Addendum was asking us to do, which was to either approve status quo or four options.

I think that we should really go back to status quo, and then as an entirely new measure, and I think it's entirely justified in looking at the commercial allocations and everything surrounding it in the future. I appreciate Delaware's positions, but again, I think that based on what we sent out to the public, we should be voting on one of those five options that is in the document, and then further on, if we stick with status quo, then consider whether we want to move this forward at some point in time.

CHAIR GARY: Additional questions on the motion? Bob, we'll go to you, but John does have a question after that.

MR. CLARK: I didn't have a question; I had a comment.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Just a comment, I think, not a question, and not in favor or in opposition of this motion. But I think based on Emilie's comment where some analysis could be done on a preliminary data for the May meeting, but a more robust analysis could be done by August.

I think the Board should decide when they expect this report back from the TC if they go this route. Will there be adequate analysis by the May meeting to take action in May or is it in August? I think somehow, we need to clarify that before we vote, I would think, just so that there is common expectation of if and when this comes back up, how it would be in. It just seems like there are a couple options moving forward timing wise.

CHAIR GARY: That's right, John, you had a comment, correct?

MR. CLARK: Yes, are you taking comments now? I thank Jason for the thoughtful motion there, because to me it gets to one of the big questions here, which is for the Board just in general is how do we decide who gets the striped bass? I mean in our deliberations we're always trying to accommodate recreational.

To me it seems much more recreational than commercial right now, and I appreciate the effort of the anglers who took the time to express their concerns about the quota transfers. But we've got to look at the big picture. As managers we want our fisheries to serve as many of our constituents as possible.

I mean, within the recreational sector we acknowledge we have a strictly recreational side of fishing, and we have a commercial side, and that is the for-hire side of recreational fishing. We hear from them, which is great. I mean they should be out here talking to us. But we don't really acknowledge it on the commercial side in addition to the commercial fisherman we have a market side of commercial fishing.

I'm not just talking about seafood market and restaurants, but to the huge numbers of the public that would like local seafood. I know in the Mid-Atlantic as we've brought up at every one of these meetings, when we've been requesting more quota, is that we have people that don't fish. But it's traditional seafood throughout the Mid-Atlantic to have striped bass. You know as I said, I just want this Board, what we were asking here, you know again less than 1 percent, if all of North Carolina's quota was transferred.

But we wouldn't be asking anywhere near that much. I mean I just want us to look at the big picture when we are considering this. If it's the Board's will to turn this into a strictly recreational species, that is a whole different conversation. But this idea that any change to the commercial quota is off limits.

I just think that is something that should be looked at by the Board over time here. I think what Jay's motion here makes clear is that we can take a look at this, and again, assess the impact of what we're actually asking. Again, Option D. The Board would have full discretion over transfers. It's a rather conservative motion, and we're not asking for a lot here. Just this idea that any change to the commercial fishery is going to be the end of striped bass, I think it's just not productive. I think we really do have to look at this from the big picture, as to who are we managing this for? Are we managing it for our entire public, or just for one sector of our public?

CHAIR GARY: In deference to some commissioners that haven't spoken yet, I would like to shift to them. We have Cheri Patterson online, and then we're going to go to Bill Hyatt and then Tom Fote, and then back to Dennis. We hopefully get close to wrapping up, so Cheri.

MS. CHERI PATTERSON: I just have a question with this substitute. What is the intent behind it, and is the intent to change? If we get answers to this, and we might want to consider a change to the Addendum? I guess I'm not quite sure why the substitute, when this can happen with the first motion, in the sense that it would be up to the Board to determine whether to move quota. We can have these answers associated to whether the Board would make that decision. I guess I'm wondering why, in reality, this motion is going to change any decision from the first motion.

CHAIR GARY: Jason, do you have a response?

DR. McNAMEE: Yes, thank you, Mr. Chair, and thank you, Cheri. I think it's a really good question. To clarify, my intent was not to change the Addendum at all. What I noticed in kind of reviewing the materials was this piece of it, it was a question, this question kept coming up. Our job as managers is to look at this, kind of weigh the evidence and make a decision.

But questions aren't evidence, and so I thought there was an opportunity, and so often we don't have an opportunity like questions are kind of rhetorical and we can't answer them. But here is one we can. I saw value in answering the questions about what happens if we run the projections with the commercial quota being harvested, and what is the impact? That was my intent, it just generates additional information with which we can make our final decision, not to change the Addendum.

CHAIR GARY: Thanks, Jason. Cheri, does that help?

MS. PATTERSON: Yes, it does. Thank you very much.

CHAIR GARY: All right we'll go to Bill Hyatt and then Tom Fote and Dennis Abbott, and hoping to wrap up at that point.

MR. WILLIAM HYATT: I just wanted to make a comment in response to what Bob Beal said, and in response to what Emilie said regarding the 2022 harvest data that we have so far. Bob was talking about the need regards to this substitute motion to put a timeframe on it. Is this something we're shooting for to decide in May, or is it something that we're shooting for in August?

In reaction to what Emilie was saying relative to the appearance of a higher recreational harvest in 2022, I would suggest that the answer to the question Bob was asking is that the timeframe for this should be at such time as the full confidence that the 2022 data can be worked in in its entirety. I don't know exactly the best way to go about doing that to a motion that was made to postpone indefinitely, which technically can't be amended. But I'll just throw that out there as a suggestion.

CHAIR GARY: We're now going to go to Tom Fote. Tom, the floor is yours.

MR. THOMAS P. FOTE: I was listening to discussion, and I will agree with Cheri. We don't really need this motion at all. This could be done after we basically deal with the Addendum. I don't think that's going to change the opinion of other people as we go down the line. It's going to be a decision whether we allow transfers or not have transfers. I can't support this motion. (Muffled) I think to deal with the question, now if we approved any of these, someone would, unless this is a motion to basically react upon what we're going to do. We really shouldn't try because we're just dragging this along.

CHAIR GARY: Tom, I'm really sorry. But I'm not sure what the technical difficulty was. We really couldn't hear you very clearly, it was garbled. I don't know if you need to separate, provide some distance from your microphone. Maybe we could try one more time, just maybe back away from the microphone a little bit. We just didn't quite hear you.

MR. FOTE: I'm away from home, so I didn't bring my extra microphones with me, so I'm using the microphone on the computer. Can you hear me now?

CHAIR GARY: It's really difficult, Tom, I guess we have to move on. I'm sorry, Tom, we just can't hear you. We're trying.

MS. TONI KERNS: Tom, if you can dial in, that might be better if you use your telephone instead of your computer.

CHAIR GARY: Tom, if you can do that, we're going to go ahead with two other speakers and we'll reserve your spot if you can dial in. Okay, Dennis Abbot, and Craig Pugh has indicated he would like to talk, because he is a Delaware Commercial fisherman, I'm going to honor that. We'll go Dennis, Craig, and then we'll save Tom's spot if he can get on through the telephone.

MR. ABBOTT: A question for you, Marty. Assuming we go ahead and do what Jason is suggesting, which is not a bad idea on all hands. Then after we get whatever information is derived from that action, do we propose that we're going to have to go back out to public hearings, so the public can weigh in on whatever new information has been provided, or are we going to com back as a Board and make a vote? It just seems unclear to me. Are we going to be voting on the same five options based on some additional information? Is that what we're going to do, and is that where we should be going?

CHAIR GARY: Emilie, is that something we can address?

MS. FRANKE: I'll start and then I'll perhaps turn it over to Bob. Yes, if this motion to substitute were to pass and the main motion as substituted, if this motion were to pass, the Board would postpone any vote on which option to choose. The TC would conduct these projections, and would come back to the Board with that report on the projections. We would not need to take this out for public comment. The Board would be going back and looking at the same set of five options, having this new TC report in hand. I'll turn it over to Bob.

EXECUTIVE DIRECTOR BEAL: Generally, we don't, if there is a technical clarification, which this is to some degree, we usually don't go back out to public hearings. The same five options will be available to the Board if this sort of pass and they get back together and vote again. I would think not.

But the Board always has the prerogative to go back out for another round of hearings if they feel there is significant new information. I mean I think this is really clarifying a number of questions that the public brought up during the public hearings, so it's providing that information to the Board that the public didn't have.

I don't think the public's perspective really would change that much; I think it just provides the additional background for the Board to better understand where the public's concerns came in. I would suggest you probably don't need to go back out for public hearings.

CHAIR GARY: Thank you, Dennis, thank you Bob and Emilie. Dennis, did you have a follow up to that? Okay, thank you. Did we get Tom back online by any chance? We're close. I'm going to give Craig Pugh the last opportunity. Eric Reid hasn't said a word in this meeting and he asked to talk, so I'm going to power up to take the microphone next. You always have a good chance to break log jams, Eric, so maybe you can move us forward here.

MR. CRAIG PUGH: Thank you, Mr. Chair, I appreciate the opportunity to speak. Yes, I happen to be one of the commercial fishermen involved in the state of Delaware, and I've represented a lot of those people, not only the people that are fishermen, but the people that live here in our state.

For some it seems as though postponing or status quo is okay. Now don't get me wrong, I'm kind of interested in seeing what Dr. McNamee has provided here. I think it does answer a lot of questions. I do support that. But to think that this is something that just came up two days ago is way wrong.

This has been a disparaging quota that we've received in the state of Delaware for nearly 35 years. We have tried to work with this year after year after year, multiple years of waiting, and trying to deal with things and other excuses, more excuses, more excuses about waiting to move forward with this, so that maybe hopefully we could acquire a regional quota that would be acceptable and marketable for a state.

As it is now, we are a miniscule part of the coastal quota, and we represent a miniscule part of the marketability for our people, and our fishery is alive with the fish. I often hear dire things about striped bass, which we do not recognize. It's not necessarily what that would be an untruth told to us here in this state.

We would like to move forward in some fashion, I am also, as Mr. Sikorski said, I am also in the reallocation camp. But why we must wait to get a fair shake here, I don't understand. We've waited and waited; we've argued and argued. We've been through excuse after excuse. I need some help. Our people here need some help. We have the fish. I hear a lot of talk about climate change and fisheries moving northward, and I think you know black sea bass kind of goes along with that, maybe menhaden too.

This is a tool in the tool box just like the other fisheries. It will help us to a small amount, but the true thing is that it must be done as a reallocation, but not something that we're going to wait for another 20 years. We've watched two generations, now our children are moving into this type of fishery. They're kind of wondering, what can the ASMFC really do for us? If you've been this long with this disparaging quota, how much longer will this last? From what I hear today, it sounds like another 20 years.

We're listening to Mr. Abbott; he wants to postpone or stay status quo. We don't' want to do that. We came here to work with the other states, and this is a true issue. It's been an issue for a long period, and we would like to move through that if we could, and then hopefully move through the other states bigger issues. Understanding is what we need here, not cancellation.

CHAIR GARY: Thank you, Craig for your patience and your words. Appreciate it. We're down to two comments, we'll go to Eric Reid and we'll try Tom Fote one more time.

MR. ERIC REID: Thank you, Mr. Chairman, I'll try to be brief. I support Mr. Clark's original motion, but I would prefer Mr. McNamee's motion, because I think if Mr. McNamee's would fail then we would be faced with status quo, generally speaking, and I don't think that's the way to go, I'll support Mr. McNamee's motion, because I think that's the smart way to go.

But my question really is, you know it was said earlier that a pound of transfer from one state of commercial quota to another state is not necessarily equal, right? My real concern is, in my mind, a pound of commercial quota to the recreational fishery is not equal either. We've got 215,000 pounds of quota from New Jersey that is transferred to the recreational fishery.

The commercial quota is well controlled and it has a low discard rate. The recreational fishery is an open access fishery, and that has a very high discard rate, so I would like to understand what that is, because the commercial fishery is really negligible in this whole equation, and it's just to me, if I could better understand that it would be a slam dunk to me to not worry about it and do the transfers. Thank you, Mr. Chairman.

CHAIR GARY: Thank you, Eric, did Tom get through on the phone? We don't have him. Okay, we'll go ahead and call the question. Justin.

DR. DAVIS: I'm just wondering, returning back to Bill's comment, whether it would be good before we vote on this to have some clarification on when we're going to come back and reconsider this, and then how we go about doing that, whether we need to modify the motion or just sort of have an understanding of when the Technical Committee is going to provide the report.

MS. FRANKE: I would turn to Bob and Toni. Would it just be the maker of the motion could modify their motion to include timing at this point, or we need to modify the motion?

MS. KERNS: There is an agreement at the table. We know when we're coming back, that's fine.

MS. FRANKE: To clarify, Justin did you have?

DR. DAVIS: If there has been an agreement as to when we're coming back, when is that?

MS. FRANKE: We don't have an agreement yet, so I would, Jason if you had a recommendation on timing, when you would like the Board to reconsider this action, either at the May meeting with preliminary analysis or at the August meeting with final data analysis?

DR. McNAMEE: Yes, thanks. It's funny, I totally thought about this, and what I was trying to avoid at the time was kind of boxing the Technical Committee in. I didn't know how long it would take them. I'm getting the sense that they're sort of working on this. It could be in front of us in May, and that would be my preference. If we could set it to have that information back in front of us in May, I think that would be great.

CHAIR GARY: Thanks, Jason, do we need to modify?

MS. KERNS: As long as the Board agrees that Jay, are you asking that we include the preliminary 2022 recreational data in this projection or not? That we need to know. We will not have 2022 commercial data in May, well in time to bring you something for the May meeting, and we would only have the Wave 1 through 5 as preliminary for MRIP, we would not have final numbers in time.

MS. FRANKE: We would have Wave 6 preliminary as well.

MS. KERNS: Sorry.

DR. McNAMEE: Just making sure that was where we're at. You know preliminary is totally fine with me. I think even the idea here, even in the complete absence of the actual commercial harvest. We know what the quotas are, and so we can run the projections with that. That part is dispensed with, with regard to the recreational information, yes.

If we have the first five waves, we need to make some sort of projection. In the end the interest, I mean there is interest in the recreational data, but seeing the effect of the commercial data is the real intent of this. I'm fine with May and having it be preliminary, at least elements of it.

CHAIR GARY: Dr. Davis. Just as seconder of the motion, are you okay with the decision with preliminary data for May?

DR. DAVIS: To come back in May, yes.

CHAIR GARY: All right, we'll go ahead and call the question. I might ask the Board, is a two-minute caucus sufficient? I see nods, we'll have a two-minute caucus**. All right, we'll go ahead and call the question on the substitute motion. Motion to substitute, all those in favor please raise your hand. Hold your hands, lower your hands. All those opposed raise your hands. The motion passes 13 to 3. Is that all? Is everyone accounted for? It was 13-3. Motion passes 13-3, it now becomes the Main Motion.**

MS. FRANKE: There was a question of who voted against the motion, Massachusetts, Potomac River Fisheries Commission and North Carolina.

CHAIR GARY: All right so the substitute becomes the Main Motion, is there a need for a caucus. I don't see any heads nodding, so we're going to go ahead and call the question. **All in favor please raise your hands. Lower your hands. All those opposed raise your hands. The motion passes 15-1. All right so we've gotten through that.**

The motion has passed, so we've got our options, so this has been postponement, correct, to the May meeting. Then, I guess at this point staff will present information ahead of time, so we can be prepared for that discussion at the May meeting. Are there

any questions following the vote with procedure, any process going forward? It seems to be straightforward. Dave Sikorski.

MR. SIKORSKI: I would just like to say that that happened rather quickly, and while I missed the opportunity to substitute, that is what I came here to do today. I'll call it a difficulty of being here on the webinar instead of being in the room, but such is life. I look forward to the next meeting, thank you.

ADJOURNMENT

CHAIR GARY: Thanks, Dave. The next step is going to be any other New Business to bring before this Board. Is there any? Seeing none let's take a motion to adjourn. Justin Davis, second by Ray Kane. Striped Bass Board is adjourned, thank you.

(Whereupon the meeting adjourned at 4:45 p.m. on Tuesday, January 31, 2023)

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Atlantic Striped Bass Management Board**

FROM: **Atlantic Striped Bass Technical Committee and Stock Assessment Subcommittee**

DATE: **April 17, 2023**

SUBJECT: **Rebuilding Projections with 2022 Preliminary Data and Ocean Commercial Quota Utilization Scenarios**

The Striped Bass Technical Committee (TC) and Stock Assessment Subcommittee (SAS) met via webinar on March 14 and March 30, 2023 to develop updated stock rebuilding projections as tasked by the Striped Bass Management Board. Before developing the projections, the TC-SAS reviewed a correction to the rebuilding probabilities in the 2022 Stock Assessment Update Report.

Correction to Short-Term Projections and Probabilities in 2022 Stock Assessment Update

The 2022 Atlantic Striped Bass Stock Assessment Update (terminal year 2021) was reviewed by the Board in November 2022. The assessment includes short-term projections estimating the probability of female spawning stock biomass (SSB) reaching the SSB threshold and SSB target (rebuilt) under three constant fishing mortality (*F*) scenarios. The projections and probabilities are summarized in Table 10 and Figure 18 of the assessment report.

After the assessment report was completed, the assessment team identified an issue with the calculated error around those projections. When the assessment report was developed, the projections inadvertently used standard error, instead of coefficient of variation (CV), in the error calculations. This resulted in larger error than should have been shown around the SSB projections. The projections were later corrected using CV in the error calculations. The corrected projections have a smaller error around the projected SSB, which results in updated probabilities. This update did not affect the median SSB projection, only the error around the projection and associated probabilities.

The TC-SAS reviewed this correction on March 14, 2023, and the 2022 Stock Assessment Update Report will be updated to reflect the correction. The updated Table 10 from the Assessment Report is enclosed as an Appendix to this memo showing the change.

New Rebuilding Projections

In November 2022 and January 2023, the Board tasked the TC-SAS with two items:

- Task 1: Evaluate whether 2022 removals remained at a level associated with the 2021 fishing mortality rate.

- Task 2: Conduct stock projections to determine how specific ocean commercial quota utilization scenarios would impact the stock rebuilding timeline.

The Board requested projections in time for the May 2023 Board meeting, and requested the projections include 2022 preliminary removals data. The TC-SAS developed the following suite of projections to address both Board tasks.

Data Inputs for New Projections

Projections were conducted using the 2022 stock assessment model configuration, including using the low recruitment assumption. Age-1 recruitment was estimated using the 2021 Maryland YOY index to predict 2022 recruitment, and using the 2022 Maryland YOY index to predict 2023 recruitment for the quota utilization scenarios. The low-recruitment assumption was used for all other years.

Preliminary 2022 removals were compiled in number of fish. Preliminary 2022 commercial landings were provided by each state. It is important to note that commercial landing estimates will likely be updated as states complete final harvest accounting in the coming months. Commercial discards for 2022 were estimated by applying the 2021 discard-to-landings ratios for each region to the preliminary 2022 commercial landings. For recreational removals, preliminary 2022 MRIP data were used for recreational harvest and release mortality (9% of recreational live releases). Final MRIP data are expected to be published in late April 2023.

Preliminary MRIP data for 2022 indicate a 91% increase in recreational harvest and 3% increase in recreational live releases, relative to 2021. This results in an overall 40% increase in recreational removals, with a preliminary estimate of 6.2 million fish in 2022 relative to 4.4 million fish in 2021.

Total preliminary removals from both sectors was estimated to be about 6.9 million fish in 2022, a 33% increase from 5.2 million fish in 2021. These removal estimates will be updated in August 2023 as part of the FMP Review Report for the 2022 Fishing Year based on state compliance reports, but the TC does not expect significant changes from these preliminary numbers.

For the ocean quota utilization scenarios, the projections assume there would be additional commercial harvest starting in 2023 to reflect using all, or most of, the ocean commercial quota. To estimate commercial harvest for 2023 under Scenario 2 (full ocean quota used), any unused 2022 ocean quota was converted from pounds to number of fish and added to the total removals. For states with active commercial fisheries, unused 2022 quota was converted to number of fish using state-specific average commercial fish weight. For states with inactive commercial fisheries (ME, NH, CT, NJ, and NC), unused quota was converted to number of fish using the coastwide ocean average commercial fish weight (15.3 pounds). For Scenario 3 (full ocean quota used except NJ), New Jersey's quota in number of fish was subtracted from that additional harvest. Scenario 3 reflects the fact that New Jersey's commercial quota is currently unavailable for quota transfers because it has been re-allocated to the recreational fishery.

Projection Scenarios and Assumptions

The TC-SAS focused on three scenarios with constant *F* projections through 2029. Scenario 1 is based on preliminary 2022 removals only. Scenarios 2 and 3 have different assumptions for 2023-2029 by accounting for the ocean commercial quota utilization scenarios requested by the Board and by using a constant removals assumption between years 2022 and 2023 instead of a constant *F* assumption as in scenario 1. The TC-SAS decided to apply these quota utilization scenarios starting in projection year 2023 because 2023 is the first year that quota transfers could potentially be permitted.

For 2023-2029 projection years, all three scenarios assume a constant three-year average *F.* The TC-SAS emphasized that striped bass catch and *F* rates vary from year-to-year, even under the same regulations. Using a three-year average acknowledges that variability. The estimated *F* rate for 2022 (scenario 1) or the estimated *F* rate for 2023 + additional quota utilization (scenarios 2 and 3) were averaged with *F* rates from 2019 and 2021. 2020 was not included due to COVID-19 uncertainty. The 3-year average *F* was very close to the $F_{prelim2022}$, and projections with constant $F_{prelim2022}$ were explored as a sensitivity run.

Scenario 1 uses preliminary 2022 removals (6.9 million fish) to estimate *F* in 2022. For 2023-2029 projections, $F_{prelim2022}$ is averaged with F_{2019} and F_{2021}.

Scenario 2 uses preliminary 2022 removals data to estimate *F* in 2022. Starting in 2023, *F* is adjusted to account for harvesting the full ocean quota each year; active fisheries use all their quota and inactive fisheries transfer all their quota via commercial quota transfers. $F_{2023+fullquota}$ is calculated assuming preliminary 2022 removals plus an additional commercial harvest (~41,500 fish) are removed from the 2023 population. For 2023-2029 projections, $F_{2023+fullquota}$ is averaged with F_{2019} and F_{2021}. Because the landed NJ commercial quota is counted both in the "full commercial quota" and in the re-allocation of the commercial quota to the recreational fishery, those fish are double-counted for this scenario.

Scenario 3 uses preliminary 2022 removals data to estimate *F* in 2022. Starting in 2023, *F* is adjusted to account for harvesting the full ocean quota each year except for New Jersey's quota; active fisheries use all their quota and inactive commercial fisheries, except NJ, transfer all their quota via commercial quota transfers. $F_{2023+fullquotaminusNJ}$ is calculated assuming preliminary 2022 removals plus additional commercial harvest (~27,400 fish) are removed from the 2023 population. For 2023-2029 projections, $F_{2023+fullquotaminusNJ}$ is averaged with F_{2019} and F_{2021}.

Projection Results

For all scenarios, projected *F* rates were between the current *F* target of 0.17 and *F* threshold of 0.20. These projected *F* rates are higher than F_{2021} of 0.14. If *F* stays between the target and the threshold from 2023-2029, the probability of rebuilding the stock to SSB target by 2029 decreases substantially compared to the rebuilding probability associated with F_{2021}. The 3-year average *F* was very close to the $F_{prelim2022}$ and the projection results using $F_{prelim2022}$ as a sensitivity run were not substantially different from the results presented here.

Table 1 summarizes the projected *F* rates for each scenario and the associated rebuilding probability of reaching the SSB target by 2029. The table also includes the 2022 Stock Assessment Update projection based on F_{2021} for comparison.

Table 1.

Description	Scenario	Year	Projected *F*	Pr SSB > target in 2029	Pr SSB > thresh-old in 2029
2021 Fishing Mortality from 2022 Stock Assessment Update	-	2022-2029	*F* in 2021	97.5 %	99.9 %
2022 Preliminary Removals	1	2022	*F* in 2022	15 %	94 %
		2023-2029	Average *F* (2019,2021, 2022)		
2022 Preliminary Removals + Full Ocean Quota in 2023	2	2022	*F* in 2022	11 %	91 %
		2023-2029	Average *F* (2019,2021, 2023+fullquota)		
2022 Preliminary Removals + Full Ocean Quota minus NJ in 2023	3	2022	*F* in 2022	11 %	91 %
		2023-2029	Average *F* (2019,2021, 2023+fullquota minusNJ)		

Figure 1 shows the SSB projection and the probability curves for reaching the SSB threshold and SSB target for each scenario. For comparison, Figure 1 also shows the SSB projection and probability curves associated with constant F_{2021} from the 2022 Stock Assessment Update.

Discussion of 2022 Removals

Increased recreational removals in 2022 are driving the increased *F* rates and lower rebuilding probabilities in all scenarios. The projections indicate SSB will increase over time before stalling between the target and threshold. Since the estimated $F_{prelim2022}$ (and all other projected fishing mortalities) is between the *F* target and threshold, it is expected that SSB will also remain between the SSB target and threshold, without fully rebuilding to the SSB target level. Because the *F* reference points are calculated to achieve the SSB reference points in the long-term, SSB will reach its target over the long-term only if *F* is at (or below) its target. In order to meet the SSB target by 2029 (i.e., a short-term timeline), *F* would need to be below its target, as demonstrated by the high rebuilding probabilities associated with F_{2021}, which was below *F* target.

While the projections indicate a low probability of rebuilding to the *target* by 2029 under these higher *F* rates, the probability of reaching the SSB threshold in 2029 (no longer overfished) is above 90% for all scenarios. The TC-SAS noted that angler effort and behavior continue to be an

important factor and source of uncertainty. As the stock recovers and strong year classes become available to the recreational fishery, effort may increase, contributing to both increased harvest and live releases.

The outcome of projections is dependent on which constant *F* or catch level is assumed (as well as assumptions about recruitment and selectivity). The TC-SAS emphasized that projections assuming a constant *F* or constant catch are not necessarily representative of future years since striped bass catch and *F* vary from year-to-year. These new projections based on 2022 removals represent a higher catch outlook, while the projections based on 2021 removals represent a lower catch outlook (Figure 2). If future catch and *F* are somewhere in the middle, the rebuilding probability may also fall between the low 15% associated with 2022 removals and the high 97% associated with 2021 removals. The ocean quota utilization scenarios overlap almost completely with the 2022 removals scenario, indicating the additional quota utilization has a minimal impact on the projections compared to the increase in total removals from 2021 to 2022 (Figure 2). For the first years of the projections, the three new scenarios overlap significantly with the 2021-based projection, but diverge further in later years, where we have less confidence in our assumptions about *F* and recruitment (Figure 2).

Discussion of Quota Utilization Scenarios

The 2023-2029 projected *F* for the ocean quota utilization scenarios 2-3 is based on a worst-case scenario and is only about 2% higher than the projected *F* for the 2022 removals scenario 1. This slight increase in *F* results in a slightly lower (-4%) probability of rebuilding by 2029. However, this slight difference results from the assumptions used to generate the projected fishing mortality rates more than the addition of the ocean quota utilization. In scenario 1, an average *F* (2019,2021,2022) was applied to all remaining projection years (2023-2029), while in scenarios 2-3, an average *F* (2019,2021,2023) was applied to all remaining years (2023-2029). Consequently, both population dynamics between 2022 and 2023 and increased quota utilization are responsible for the differences between scenario 1 and 2-3.

The projections indicate that the impact of additional quota utilization on *F* and rebuilding probability is negligible. The maximum quota utilization scenario 2 only adds 41,500 extra fish to removals, which is less than 1% of total removals. The addition or subtraction at a scale of tens of thousands of fish relative to the total removals scale of several million has negligible impacts on overall *F*, as also demonstrated by the negligible difference between scenarios 2 and 3 (difference of 14,000 fish).

Discussion on Interim Projections

The TC-SAS discussed the benefits and challenges of conducting stock projections between stock assessments. In this case, the benefit of these interim projections is a timely update to the Board considering the significant increase in recreational catch in 2022 following two low catch years, which also included COVID-19 uncertainty. In addition, 2022 aligned with the emergence of the strong 2015-year class in the ocean fishery, which likely contributed to the large change between 2021 and 2022. The TC noted these projections are not the same as a full

stock assessment update where the model would be re-run to include the 2022 catch-at-age and index data to produce estimates of *F* and SSB in 2022 to determine stock status.

The TC-SAS noted that conducting annual stock projections would not be particularly useful given interannual variability in removals under constant regulations, and the life history of striped bass (long-lived, slow to mature, etc.). Instead, the TC-SAS talked about the potential benefits of aligning projections and assessments with planned management changes.

If the Board is considering management changes, the TC-SAS recommends the Board be as specific as possible with the types of measures they would consider and their intent (e.g., reduce removals to a particular *F* rate or rebuilding probability, protect year classes, etc.).

TC-SAS Members in Attendance on March 14 and 30
Nicole Lengyel Costa (TC Chair, RI), Mike Celestino (SAS Chair, NJ), Michael Brown (ME), Kevin Sullivan (NH), Gary Nelson (MA), Kurt Gottschall (CT), Caitlin Craig (NY), Brendan Harrison (NJ), Tyler Grabowski (PA), Margaret Conroy (DE), Alexei Sharov (MD), Luke Lyon (DC), Ingrid Braun (PRFC), Brooke Lowman (VA), Joshua McGilly (VA), Charlton Godwin (NC), Steve Minkkinen (USFWS), John Sweka (USFWS), Tony Wood (NOAA)

Board Members and Public in Attendance on March 14 and 30
Chris Batsavage, David Borden, Emerson Hasbrouck, Max Appelman, David Sikorski, Mike Wilberg, Rob Latour, Adena Schonfeld, Samara Nehemiah, Alan Bianchi, Jessica Best, Evan Dintman, Glen Fernandes, Tony Friedrich, Peter Himchak, Jesse Hornstein, Nichola Meserve, Chris Moore, Marisa Ponte, Will Poston, Cody Rubner, Patrick Rudman, Antonia Santegata, Ross Squire, David Stormer, Taylor Vavra, Mike Waine, Esther Wang, Charles Witek, Steve Witthuhn, Michael Woods

ASMFC Staff: Katie Drew, Emilie Franke

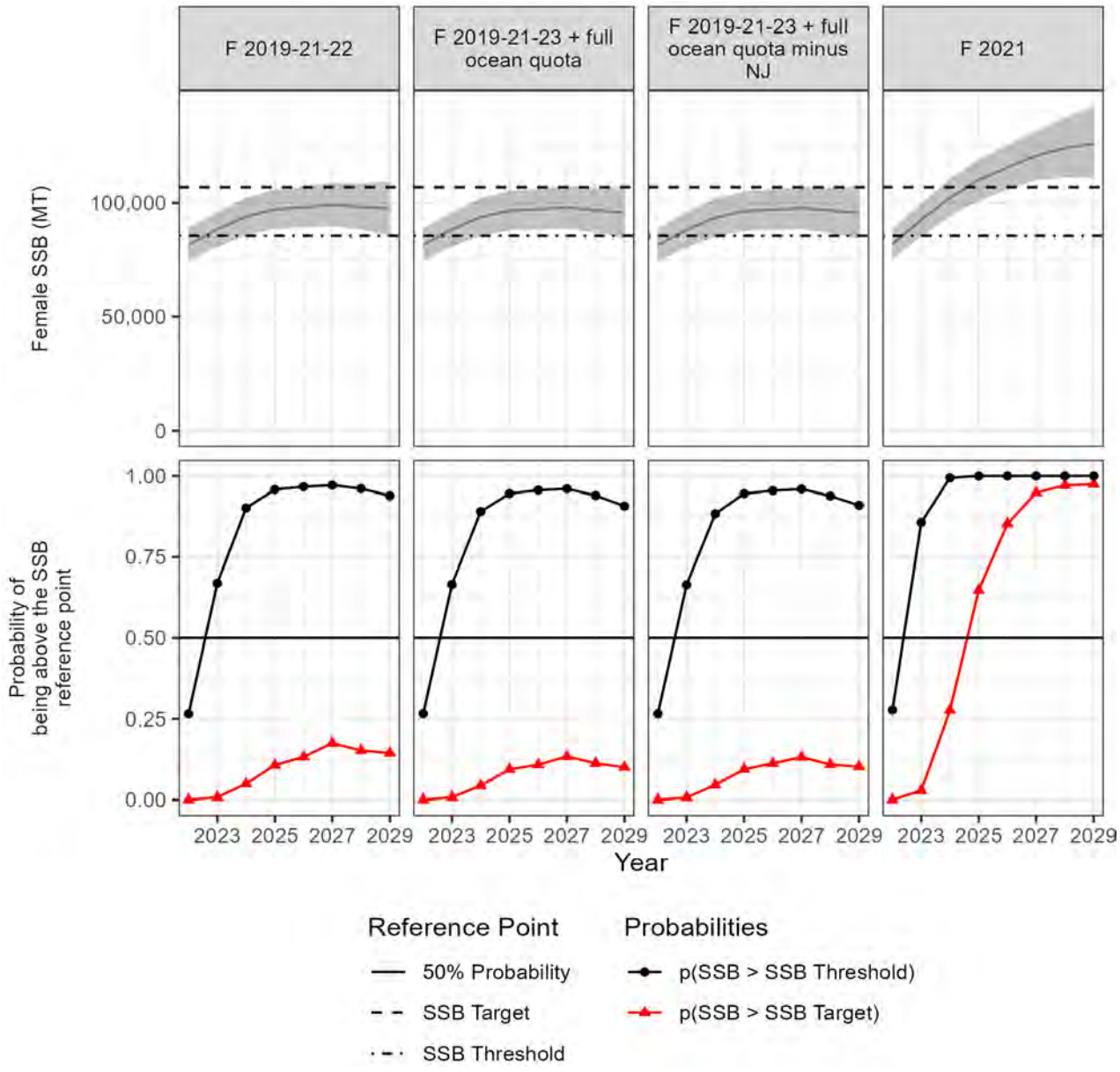


Figure 1. Projected female SSB with 95% confidence intervals (top row) and the probability of SSB being above the SSB reference point (bottom row) for the three new projection scenarios and for the original F_{2021} projection scenario from the 2022 assessment update.

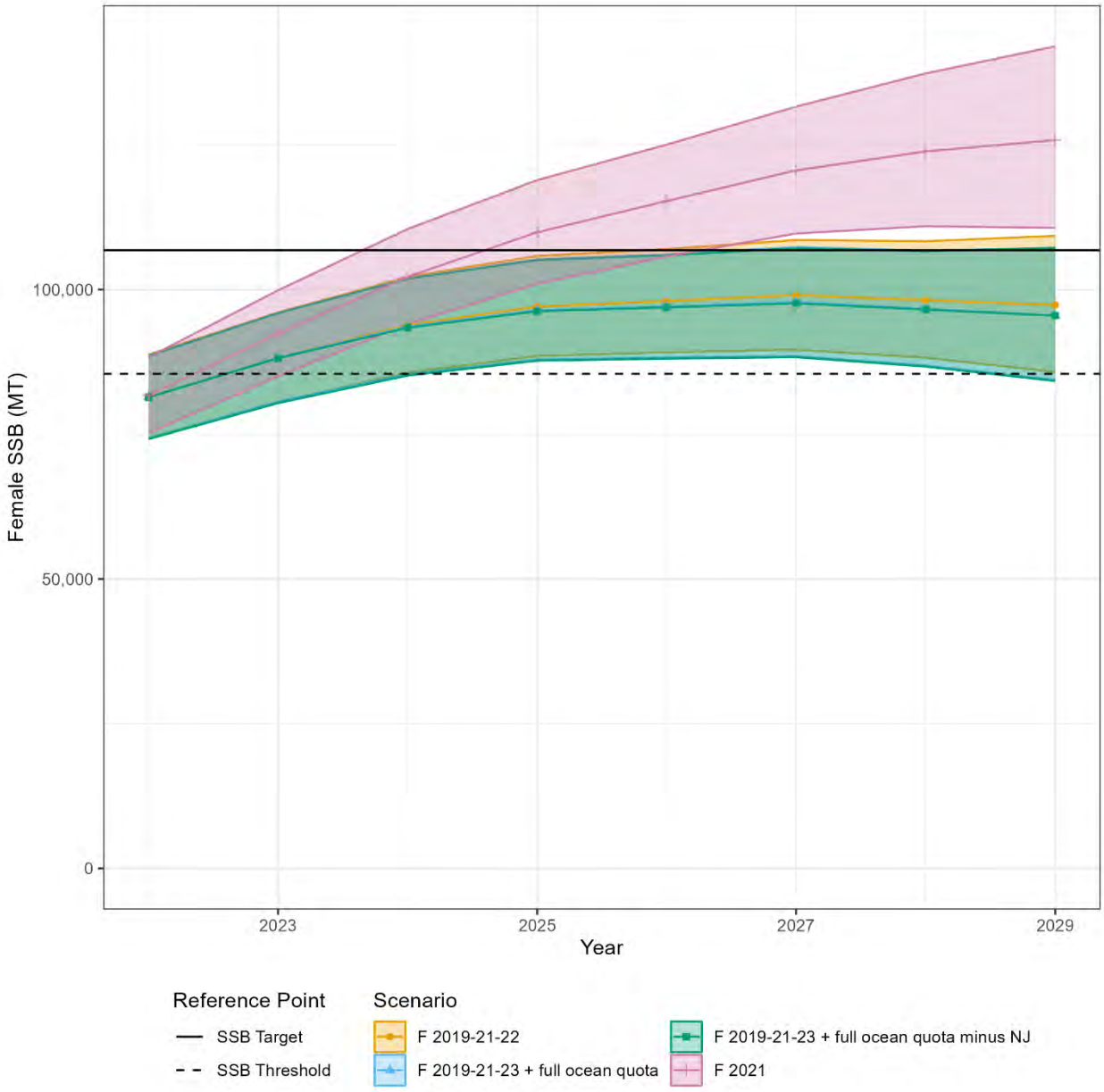


Figure 2. Projected female SSB with 95% confidence intervals for the three new scenarios (yellow, blue, green) and the original F_{2021} projection scenario from the 2022 assessment update (pink).

Appendix. Correction to 2022 Stock Assessment Update Report

Table 10, Figure 18, and associated text in the 2022 Stock Assessment Update Report will be updated to reflect the correction.

Table 10 Corrected. Probability of SSB being at or above the SSB threshold or target under different constant F scenarios. Bolded final row indicates 2029, the rebuilding deadline. Shaded green columns are the corrected probabilities compared to the originally reported values in grey text.

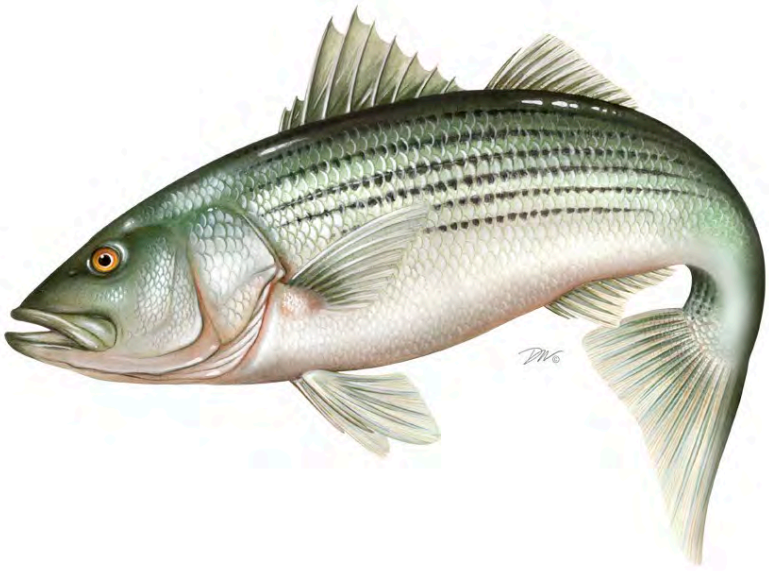
Year	Probability SSB ≥ SSB threshold under current *F*		Probability SSB ≥ SSB target under current *F*		Probability SSB ≥ SSB threshold under *F* target		Probability SSB ≥ SSB target under *F* target		Probability SSB ≥ SSB threshold under *F* threshold		Probability SSB ≥ SSB target under *F* threshold	
2021	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2022	34.4%	27.9%	0.4%	0.0%	34.5%	27.4%	0.4%	0.0%	34.5%	27.4%	0.4%	0.0%
2023	70.2%	86.1%	14.9%	2.8%	61.9%	76.5%	13.1%	1.3%	53.2%	61.2%	11.6%	0.5%
2024	86.0%	99.3%	39.0%	27.6%	74.1%	95.3%	29.2%	10.0%	61.8%	80.7%	23.2%	2.2%
2025	91.8%	99.9%	56.1%	64.7%	79.3%	99.1%	40.3%	25.1%	64.3%	87.7%	28.6%	4.7%
2026	94.1%	99.9%	65.7%	85.1%	81.4%	99.6%	45.5%	36.7%	63.4%	88.3%	30.3%	5.3%
2027	95.7%	99.9%	72.7%	94.8%	82.8%	99.8%	49.9%	49.0%	63.4%	87.3%	31.9%	5.9%
2028	96.4%	99.9%	76.6%	97.2%	82.8%	99.8%	52.0%	53.4%	61.7%	83.5%	31.6%	5.7%
2029	**96.7%**	**99.9%**	**78.6%**	**97.5%**	**82.4%**	**99.6%**	**52.5%**	**53.9%**	**59.4%**	**76.9%**	**30.5%**	**5.4%**

Corrected values in green

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM I TO AMENDMENT 7 TO THE ATLANTIC STRIPED BASS INTERSTATE FISHERY MANAGEMENT PLAN

Commercial Quota Transfers in the Ocean Region



November 2022

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In August 2021, the Atlantic Striped Bass Management Board initiated the development of Draft Addendum VII to Amendment 6 to the Interstate Fishery Management Plan for Atlantic Striped Bass to consider allowing voluntary transfers of ocean commercial quota. Since then, Amendment 7 to the FMP was approved, so this draft addendum is now Draft Addendum I to Amendment 7. This Draft Addendum presents background on the Atlantic States Marine Fisheries Commission's management of striped bass commercial fisheries; the addendum process and timeline; and a statement of the problem. This document also provides management options for public consideration and comment.

The public is encouraged to submit comments regarding the proposed management options in this document at any time during the public comment period. The final date comments will be accepted is **January 13, 2023 at 11:59 p.m. (EST).** Comments may be submitted at state public hearings or by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below. Organizations planning to release an action alert in response to this Draft Addendum should contact Emilie Franke, Fishery Management Plan Coordinator, at efranke@asmfc.org or 703.842.0740.

Mail: Emilie Franke
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington VA. 22201
Fax: (703) 842-0741

Email: comments@asmfc.org
(Subject: Striped Bass Draft Addendum I)

Date	Action
August 2021	Board initiated the Draft Addendum
August - October 2021	Plan Development Team (PDT) developed initial Draft Addendum document
October 2021	Board deferred consideration until May 2022, and later postponed until August 2022
August 2022	Board provided guidance to PDT for further development of the Draft Addendum
November 2022	**Board reviewed and approved Draft Addendum I for public comment**
November 2022 - January 2023	Public comment period, including public hearings; written comments accepted through January 13, 2023
February 2023	Board reviews public comment, selects management measures, final approval of Addendum I

1.0 Introduction

Atlantic striped bass (*Morone saxatilis*) are managed through the Atlantic States Marine Fisheries Commission (Commission) in state waters (0-3 miles) and through the National Marine Fisheries Service (NMFS) in federal waters (3-200 miles). The management unit includes the coastal migratory stock from Maine through North Carolina. Atlantic striped bass are currently managed in state waters under Amendment 7 (2022) to the Interstate Fishery Management Plan (FMP).

In August 2021, the Atlantic Striped Bass Management Board (Board) initiated Draft Addendum VII to Amendment 6 to consider allowing for the voluntary transfer of commercial striped bass quota in the ocean region, after deciding that changes to the commercial quota system would not be considered in the then ongoing development of Draft Amendment 7. Subsequently, this draft addendum was postponed to enable the Plan Development Team (PDT) and Board to focus on the development and completion of Amendment 7, which was approved in May 2022. In August 2022, the Board considered next steps for this draft addendum and provided additional guidance to the PDT on management options to be added. Due to Amendment 7's approval during its development, this addendum is now Draft Addendum I to Amendment 7.

2.0 Overview

2.1 Statement of the Problem

Members of the Board and public have raised questions about the striped bass commercial quota system, with particular concern regarding the 1972-1979 reference period and basis for state commercial quotas. Those concerns include, but are not limited to: changes in fishing effort and resource distribution since the 1972-1979 reference period; likely inaccuracies in the commercial landings data for the 1970s reference period due to the lack of mandatory reporting across all states and/or evidence of harvesters selling fish in states other than where it was landed; and inconsistent application of the reference period landings in one management action which increased all but one of the states' quotas (i.e., Delaware in Amendment 6). These concerns, along with other questions about the quota system (e.g., fixed quotas vs. setting quotas annually), were included in the scoping document for Draft Amendment 7 in 2021, but the issue of addressing commercial quotas was not selected for further development in Draft Amendment 7. Some Board members expressed support for addressing the commercial quota issue at a different time separate from Amendment 7, noting a desire to not slow Amendment 7's progress and focus on stock rebuilding.

In order to consider a management option that could provide some, more immediate relief to states seeking a change to their commercial quota, the Board initiated this addendum to consider allowing for the voluntary transfer of striped bass commercial quota in the ocean region. Many quota-managed fisheries allow for the voluntary transfer of commercial quota between states (e.g., black sea bass, bluefish, horseshoe crab). This is a useful technique that can be utilized to address a variety of problems in the management of a commercial fishery (e.g., quota overages, safe harbor landings, shifting stock distributions). The Atlantic Striped Bass FMP is the only Commission FMP with state-by-state commercial quotas that does not

allow for the voluntary transfer of commercial quota or quota reconciliation (using end-of-year quota underages to address any overages).

2.2 Background

2.2.1 Commercial Quota Management for Atlantic Striped Bass

The Atlantic Striped Bass FMP uses a quota system to manage the commercial fishery in the Chesapeake Bay and the ocean region. The FMP establishes a separate Chesapeake Bay-wide quota, which is then allocated to Bay jurisdictions per the mutual agreement of Maryland, the Potomac River Fisheries Commission (PRFC), and Virginia. The FMP establishes state-by-state quotas for the ocean region, which includes all coastal bay, inland rivers, and estuaries outside the Chesapeake Bay system. The ocean region commercial quotas are based on a proportion of the states' average landings during 1972–1979, with one exception for Delaware, and as modified by approved conservation equivalency (CE) proposals, as described in the following section.

Quota overages are paid back the following year on a pound-for-pound basis, while the transfer of quota between states and rollover of unused quota from one year to the next is not permitted.

In addition to commercial quotas, the FMP specifies commercial size limits, and requires states to implement a commercial tagging program whereby all commercially-harvested striped bass must be tagged at the point of harvest and/or the point of sale.

2.2.1.1 History of Commercial Quota Management

In general, the ocean commercial quotas are based on average landings during 1972-1979 and assuming a 28" minimum size limit. This historical base period was first used for management in 1989 under Amendment 4, which allowed for a modest relaxation of the stringent Amendment 3 requirements that had led to harvest moratoria in many states in the mid-to-late 1980s. Amendment 4 required closed seasons in order to restrict commercial harvest to 20% of the 1972–1979 base period, or an equivalent commercial quota as was elected by many of the states. The amendment allowed for separate "producer area" management (including a smaller size limit) for the Hudson River estuary, Chesapeake Bay, and inshore North Carolina. Due to New York's ban on commercial striped bass harvest in the Hudson River since 1976, this resulted in only an ocean quota for New York. In Maryland, separate Chesapeake Bay and ocean quotas were established, whereas Virginia was approved to adopt one state-wide quota for ease of management. Maryland was also authorized to employ a harvest control model to establish a flexible Chesapeake Bay quota based on projected exploitable biomass. The commercial fisheries never reopened in Maine, New Hampshire, Connecticut, and New Jersey following their voluntary moratoria. In 1991, New Jersey started a Striped Bass Bonus Program (i.e., permit program), which reallocates their commercial quota to the recreational fishery, allowing participating recreational anglers to take a "bonus fish"; the New Jersey bonus program is still in place and currently operates through an approved CE program. Connecticut implemented a similar bonus program from 2011-2019.

State-specific quotas were first implemented under Amendment 5 (1995) when the Commission declared the stock fully rebuilt; states were allocated 70% of their average landings during the 1972–1979 base period. Amendment 5 specified separate quotas for producer areas and the ocean, and extended producer-area status to the Delaware River and Bay, which allowed its producer-area commercial quota to be managed under a harvest control model (i.e., maintain a target *F* rate) similar to that used in the Chesapeake Bay. Like Virginia, Delaware was approved to combine its producer area and ocean quotas into one overall state quota beginning in 1996. The three Chesapeake Bay jurisdictions with commercial fisheries (Maryland, PRFC, and Virginia) adopted a Bay-wide commercial quota in 1997 (allocated per their own agreement) that was set using the harvest control model. Maryland maintained a separate ocean quota, while Virginia continued with a combined state-wide quota until 2002, when Virginia switched to managing the ocean and Bay quotas separately due to shifting effort into the coastal area.

Under Amendment 6 (2003), the state-by-state ocean commercial quotas were increased to 100% of the base period, except for Delaware's commercial quota which remained at the level allocated in 2002 for its statewide quota (Table 1). The decision to hold Delaware's commercial quota at the 2002 level was based on tagging information that indicated fishing mortality on the Delaware River/Bay stock was too high, and uncertainty regarding the status of the spawning stock for the Delaware River/Bay.

Producer areas were also no longer used as a management tool under Amendment 6, but the Chesapeake Bay and the Albemarle Sound/Roanoke River in North Carolina were defined as their own management areas, for different reasons. The Albemarle/Roanoke stock contributes minimally to the coastal migratory stock, and is therefore managed separately by the state of North Carolina under the auspices of ASMFC. On the other hand, the Chesapeake Bay stock, which is unquestionably part of the coastal migratory stock, was established as a management area in Amendment 6 in order to have a separate management program due to the size availability of striped bass in the area. This resulted in the ongoing use of a Chesapeake Bay-wide commercial quota distinct from the ocean commercial quotas.

Amendment 6 required all states to maintain a 28-inch minimum size limit for the commercial fishery, with three exceptions. The Delaware Bay shad gillnet fishery and the Albemarle Sound commercial fishery were subject to a 20-inch minimum size limit, and the Chesapeake Bay commercial fishery was subject to an 18-inch minimum size limit.

The ocean quotas were subsequently reduced by 25% in 2015 (Addendum IV) and by an additional 18% in 2020 (Addendum VI) in response to declining stock status (Table 1). Addendum IV required all states to maintain their 2013 commercial size limits and Addendum VI required all states to maintain their 2017 commercial size limits. Throughout quota management, states have used conservation equivalency (CE) to implement different commercial size limits resulting in changes to their quota amounts. Approved CE programs have used yield-per-recruit (YPR) and spawning stock biomass-per-recruit (SPR) analyses to determine how to adjust the quota to maintain the same spawning potential under a new

commercial size limit. The Addendum IV quota reductions were applied to the Amendment 6 base quotas, whereas the Addendum VI reductions were applied to the Addendum IV quotas as modified by conservation equivalency. The Addendum VI quotas were further modified by some states through approved CE plans (Table 1). Massachusetts increased its Addendum VI base quota to account for increasing its commercial minimum size limit, and New York reduced its base quota to account for lowering the minimum size of its commercial slot limit. Additionally, New Jersey, Delaware, Maryland, PRFC, and Virginia increased their Addendum VI base quotas by taking a greater than 18% reduction in the recreational sector to offset the commercial sector taking a smaller reduction. Amendment 7 (2022) maintains the same commercial measures specified in Addendum VI to Amendment 6; all approved Addendum VI CE programs and state implementation plans are maintained until commercial measures are changed in the future.

Table 1. Commercial striped bass quotas for the ocean region from 2003-2022.

Year	**2003-2014**	**2015-2019**	**2020-2022**	
State	**Am6 Quota (lbs)**	**Add IV Base Quotas: 25% reduction from Am6 Quota (lbs)**	**Add VI Base Quotas: 18% Reduction from Add IV Quotas (lbs)** *[accounting for Add IV CE adjustments]*	**Add VI CE-Adjusted Quotas**
Maine*	250	188	154	154
New Hampshire*	5,750	4,313	3,537	3,537
Massachusetts	1,159,750	869,813	713,247	735,240
Rhode Island	243,625[a]	182,719[b]	148,889	148,889
Connecticut**	23,750	17,813	14,607	14,607
New York	1,061,060[a]	795,795	652,552	640,718
New Jersey**	321,750	241,313[b]	197,877	215,912
Delaware	193,447	145,085	118,970	142,474
Maryland Ocean	131,560[a]	98,670[b]	74,396	89,094
Virginia Ocean	184,853	138,640	113,685	125,034
North Carolina	480,480	360,360	295,495	295,495
Ocean Total	**3,806,275**	**2,854,706**	**2,333,409**	**2,411,154**

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

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

a. Amendment 6 quota reduced through conservation equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

b. Addendum IV quota reduced through conservation equivalency for RI (181,572 lbs), NJ (215,912), and MD (90,727 lbs).

2.2.1.2. Past Consideration of Quota Transfers

Throughout its history, the Striped Bass FMP has not permitted the transfer of commercial quota between jurisdictions. The Board previously considered commercial quota transfers in the FMP through Draft Amendment 5 and Draft Addendum IV to Amendment 6. The Board did not approve the use of transfers in Amendment 5 (1995) in order to focus efforts on rebuilding the stock. During consideration of Draft Addendum IV to Amendment 6, the Technical Committee raised concerns that transfers had the potential to increase harvest at a time when harvest reductions were needed, which contributed to the Board not approving transfers under Addendum IV (2014).

2.2.2 Status of the Stock

Female spawning stock biomass (SSB) and fishing mortality rate (*F*) are estimated on a regular basis, and compared to target and threshold levels (i.e., biological reference points) in order to assess the status of the striped bass stock. The 1995 estimate of female SSB is currently used as the SSB threshold because many stock characteristics, such as an expanded age structure, were reached by this year, and this is also the year the stock was declared recovered. The female SSB target is equal to 125% of the female SSB threshold. The associated *F* threshold and *F* target are calculated to achieve the respective SSB reference points in the long term.

In November 2022, the Board reviewed the results of the 2022 Stock Assessment Update, which uses the same forward projecting statistical catch-at-age model from the peer-reviewed 2018 Benchmark Stock Assessment. The model uses fishery-dependent data and fishery-independent survey indices to develop catch-at-age matrices and estimate annual population size, fishing mortality, and recruitment. Data through 2021 were added to the model, and the model structure was adjusted for 2020-2021 to account for the regulation changes implemented through Addendum VI to Amendment 6.

The 2022 Stock Assessment Update found that the stock remains overfished but is no longer experiencing overfishing in the terminal year (2021). Female SSB in 2021 was estimated at 143 million pounds, which is below the SSB threshold of 188 million pounds and below the SSB target of 235 million pounds. *F* in 2021 was estimated at 0.14, which is below the *F* threshold of 0.20 and below the *F* target of 0.17. The reference points were updated using the low recruitment assumption, which resulted in a lower *F* target and *F* threshold compared to the 2018 Benchmark Assessment.

The assessment also indicated a period of strong recruitment (numbers of age-1 fish entering the population) from 1994-2004, followed by a period of low recruitment from 2005-2011 (although not as low as the early 1980s, when the stock was considered collapsed). This period of low recruitment contributed to the decline in SSB that the stock has experienced since 2010. Recruitment of age-1 fish was high in 2012, 2015, 2016, and 2019 (corresponding to strong 2011, 2014, 2015, and 2018 year classes), but estimates of age-1 striped bass were below the long-term average in 2018, 2020, and 2021. Recruitment in 2021 was estimated at 116 million age-1 fish, below the time series average of 135.7 million fish.

The 2022 Assessment Update also included short-term projections (using the low recruitment assumption) to determine the probability of SSB being at or above the SSB target by 2029, which is the stock rebuilding deadline following the initial overfished determination in the 2018 Benchmark Assessment. The 2022 Stock Assessment Update indicates that under the current fishing mortality rate, there is a 78.6% chance the stock will be rebuilt by 2029, indicating a reduction in catch is not necessary at this time.

The next stock assessment update is scheduled for 2024 with a terminal year of 2023.

2.2.3 Status of the Fishery

Note: Since this draft addendum applies only to commercial quota in the ocean region, this section focuses primarily on the ocean commercial fishery. For information on the Chesapeake Bay commercial fishery or striped bass recreational fisheries, see the Review of the FMP for Atlantic Striped Bass: 2021 Fishing Year (August 2022).

In 2021, total Atlantic striped bass removals (commercial and recreational, including harvest, commercial dead discards and recreational release mortality) were estimated at 5.1 million fish, which is about the same as removals in 2020. In 2021, the commercial sector accounted for 14% of total removals in numbers of fish (12% harvest and 2% dead discards), and the recreational sector accounted for 86% of removals in numbers of fish (36% harvest and 50% release mortality) (Figure 1). Removals for each sector by year are listed in the Appendix.

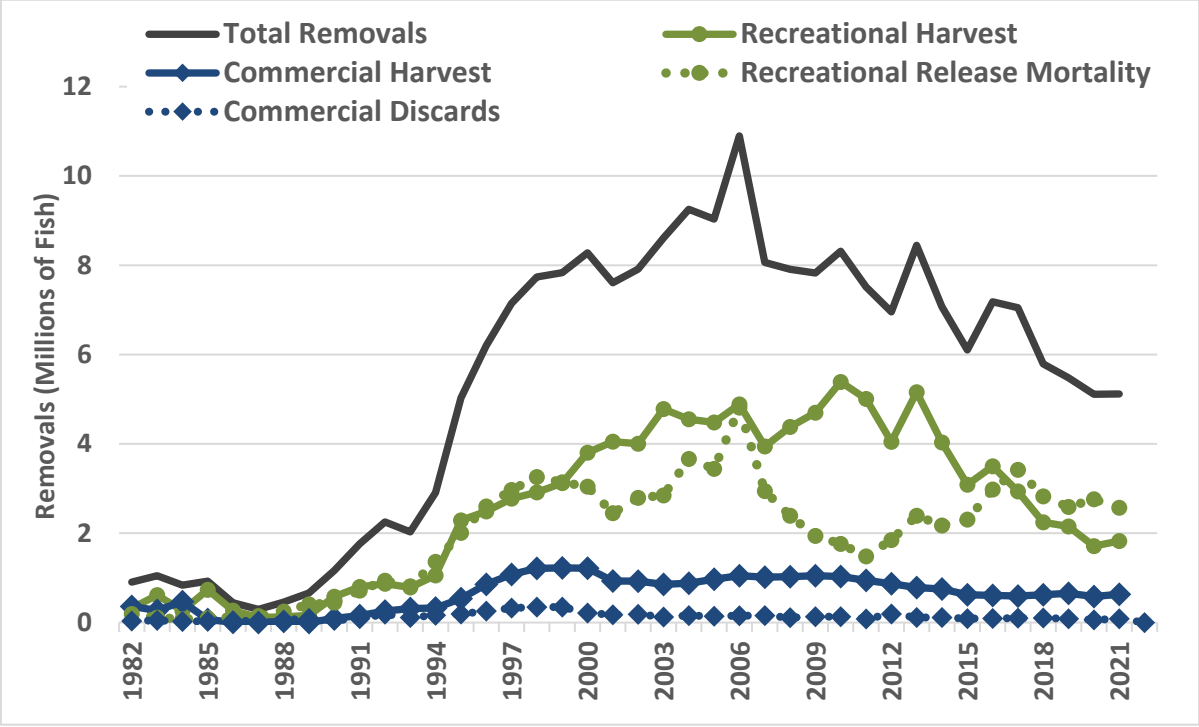


Figure 1. Total Atlantic striped bass removals by sector in numbers of fish, 1982-2021. Source: State compliance reports, MRIP, ASMFC.

Commercial Fishery Landings

In 2021, the ocean commercial striped bass quota was 2,411,154 pounds, and 1,840,693 pounds were harvested in the ocean region. In the Chesapeake Bay region, the 2021 commercial striped bass quota was 3,001,648 pounds, and 2,435,126 pounds were harvested. Neither quota was exceeded in 2021. Refer to the Appendix for 2021 quotas and landings by state, as well as 2021 commercial fishery regulations by state, including size limits, trip limits, and seasons, where applicable.

Since 1990, commercial landings from the ocean fishery have accounted for approximately 40% of total coastwide commercial landings by weight, with the other 60% coming from the Chesapeake Bay (Figure 2). The proportion of commercial harvest coming from Chesapeake Bay is much higher in numbers of fish (roughly 80%) because fish harvested in Chesapeake Bay have a lower average weight than fish harvested in ocean fisheries.

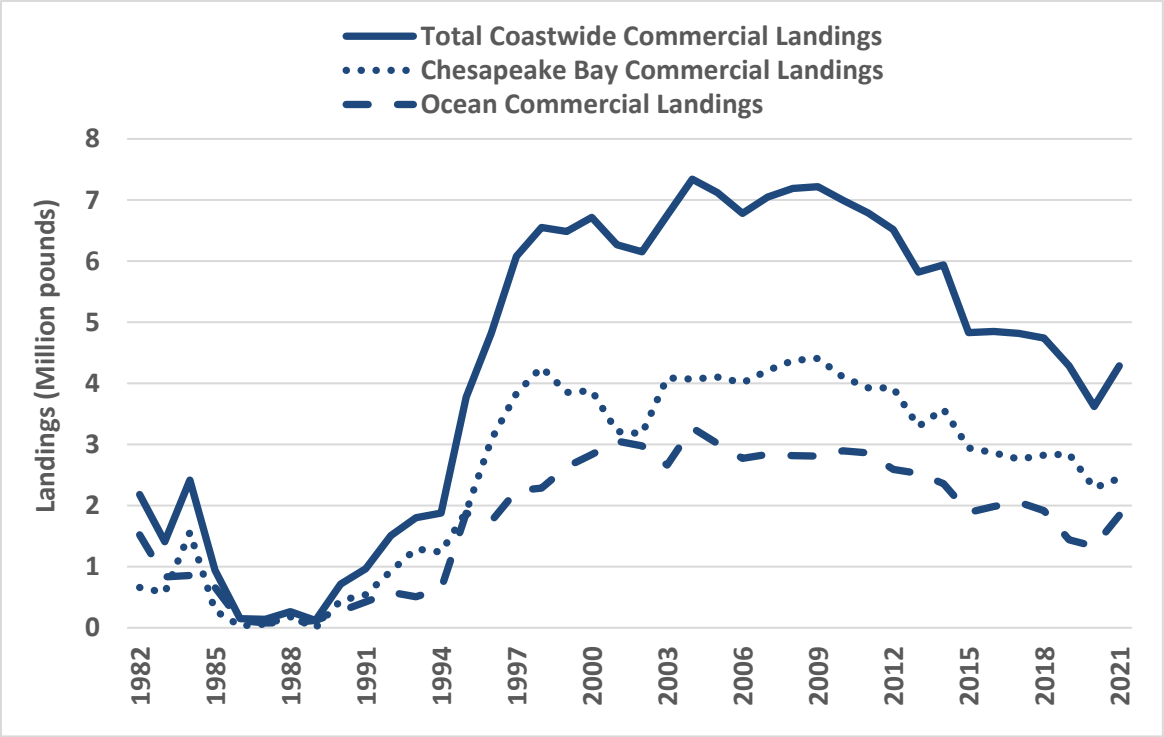


Figure 2. Commercial landings coastwide total, and by region, in pounds, 1982-2021. Source: State compliance reports.

From 2004 to 2014, ocean commercial landings averaged 2.8 million pounds annually. From 2015-2019, ocean commercial landings decreased to an average of 1.9 million pounds annually due to implementation of Addendum IV and a reduction in the commercial quota. In the last two years under Addendum VI, ocean commercial landings were 1.3 million pounds in 2020, and 1.8 million pounds in 2021.

In 2021, Massachusetts landed 40% of the ocean commercial harvest by weight, New York landed 34%, Delaware landed 8%, Rhode Island landed 7%, Virginia landed 7%, and Maryland landed 5% (Figure 3). North Carolina has had zero commercial harvest in their ocean waters since 2012.

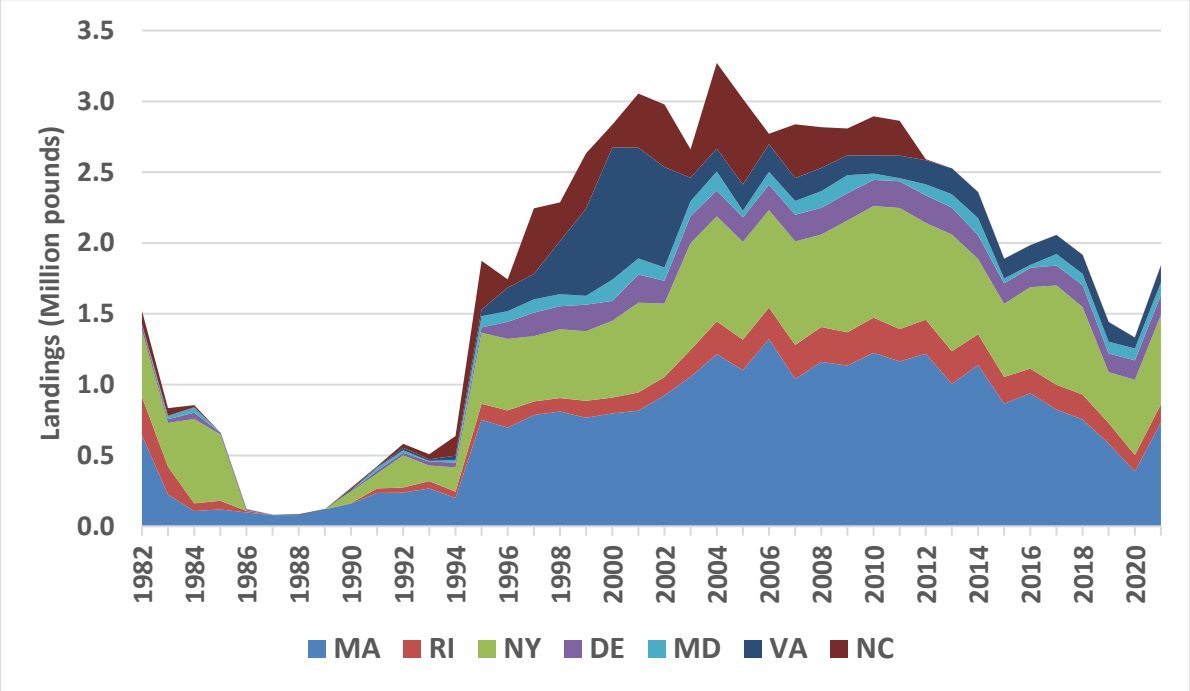


Figure 3. Commercial Atlantic striped bass landings from the ocean region by state in pounds, 1982-2021. Source: State compliance reports. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

Commercial Quota Utilization in the Ocean Region

The ocean region regularly underutilizes its cumulative quota due to lack of striped bass availability in some state waters (particularly North Carolina, which holds 13% of the ocean quota, yet has had zero ocean harvest since 2012) coupled with prohibitions on commercial striped bass fishing in Maine, New Hampshire, Connecticut, and New Jersey (which collectively share about 10% of the ocean commercial quota).

In 2021, the commercial quota utilization in the ocean region increased from 55% in 2020 to 76% in 2021 (Figure 4). This is the highest ocean quota utilization in the past five years and is similar to the ocean quota utilization in 2017 (74%). Each state that allows commercial harvest utilized 87-99% of their ocean quota in 2021, with the exception of North Carolina which had zero ocean harvest (Table 2).

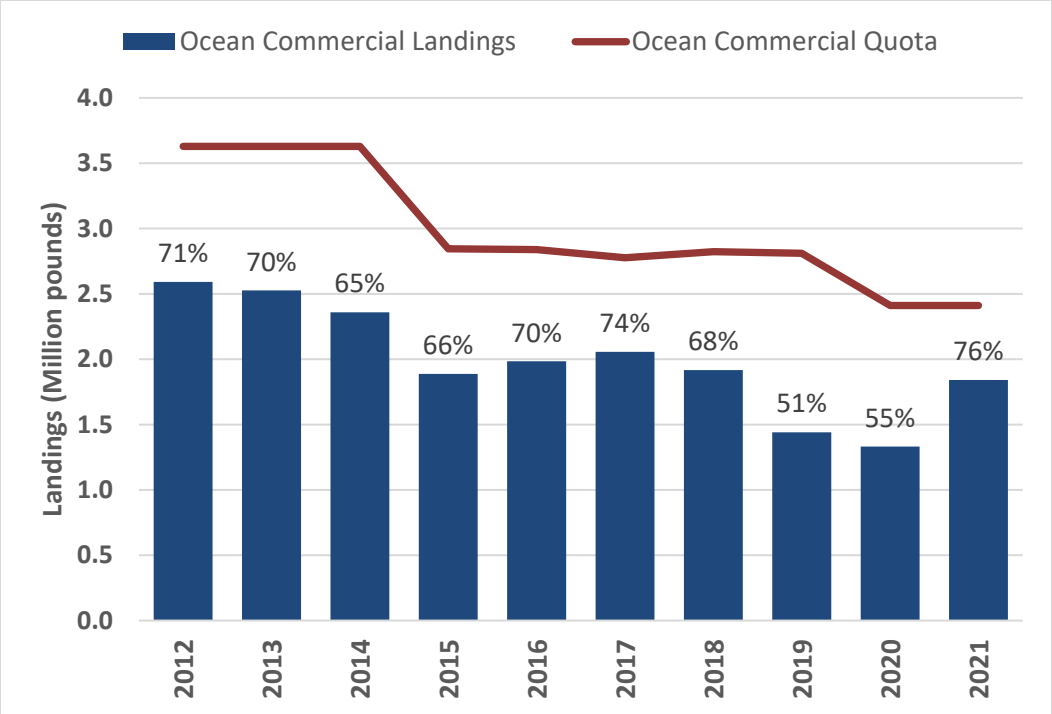


Figure 4. Ocean commercial landings and ocean commercial quota, and percent utilization, 2012-2021.

Table 2. Percent of ocean commercial quota utilized by state, 2017-2021.

State	2017	2018	2019	2020	2021
Maine*	0%	0%	0%	0%	0%
New Hampshire*	0%	0%	0%	0%	0%
Massachusetts	103%	89%	67%	53%	100%
Rhode Island	97%	97%	79%	78%	88%
Connecticut*	0%	0%	0%	0%	0%
New York	88%	78%	45%	83%	98%
New Jersey**	0%	0%	0%	0%	0%
Delaware	98%	107%	98%	97%	98%
Maryland (ocean only)	89%	88%	91%	94%	100%
Virginia (ocean only)	97%	97%	100%	62%	96%
North Carolina (ocean only)	0%	0%	0%	0%	0%
Ocean Total	**74%**	**68%**	**51%**	**55%**	**76%**

* Commercial harvest/sale prohibited.

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

There are several factors that could contribute to how much quota is landed each year, including year class availability, overall stock abundance, nearshore availability, fishing effort, and state management programs. These factors and their impact on striped bass commercial fisheries likely vary among states and within the seasons.

Allowing quota transfers could increase utilization of the total ocean quota, which could undermine the goals and objectives of the reductions taken under Addendum VI in 2020. The commercial ocean fishery has consistently underutilized its total quota, due to a combination of fish availability and state-specific regulations (e.g., commercial fishing prohibitions). Addendum VI was designed to achieve a specific reduction in total removals through more restrictive recreational measures and reduced commercial quotas in order to achieve the fishing mortality target. During the Addendum VI process, the Technical Committee noted the reduction in commercial quota would achieve the necessary reduction in commercial removals only if the commercial fishery performs as it has in the past (i.e., if the total quota continues to be underutilized to the same degree). This assumption may be violated if the transfer of commercial quota in the ocean region is permitted. If Addendum VI commercial quotas were fully utilized through the transfer of latent quota, commercial harvest would be higher than estimated in the Addendum VI projections and states may not maintain the desired commercial reduction.

3.0 Proposed Management Program

Draft Addendum I presents options that would allow for the voluntary transfer of commercial quota in the ocean region between states that have ocean quota. However, commercial quota that has been reallocated to a state's recreational fishery (i.e., for a recreational bonus program) is not eligible to be used for commercial quota transfers. When developing CE proposals to reallocate commercial quota to a recreational fishery, states can specify reallocation of all or part of their commercial quota; any portion of the state's commercial quota that is not reallocated to the recreational fishery may be used for commercial quota transfers.

This draft addendum does not address potential transfers of the Chesapeake Bay quota among the Bay jurisdictions because the FMP does not establish state-specific shares of the Chesapeake Bay quota; Maryland, Virginia, and PRFC do so per the jurisdictions' mutual agreement. Additionally, this draft addendum does not consider allowing transfer of Chesapeake Bay quota to an ocean fishery (or vice versa) due to the distinct management programs between the regions (e.g., size and availability of fish).

If quota transfers are permitted, quota would be transferred pound-for-pound from the donor state to the receiving state. There would be some inherent uncertainty associated with transfers occurring between states that harvest different size striped bass. State commercial fisheries catch different size fish due to multiple factors, including variability in striped bass size distribution along the coast and state management programs (different size limits, gears, seasons). Further, through CE, states have been able to adjust their commercial size limits from the historical standard, which results in changes to their respective commercial quotas. Several

adjustments have been made to commercial size limits over time resulting in changes commercial quotas. Stated more simply, a pound of striped bass commercial quota is not equal across all states.

3.1 Options for Allowing the Voluntary Transfer of Ocean Commercial Quota

Option A (status quo): Commercial quota transfers are not permitted.

Option B: General commercial quota transfer provision (with overfished conservation tax). The voluntary transfer of commercial quota in the ocean region between states that have ocean quota would be permitted. Transfers between states may occur upon agreement of two states at any time during the fishing year and up to 45 days[1] after the last day of the calendar year. All transfers require a donor state (state giving quota) and a receiving state (state accepting additional quota). There is no limit on the amount of quota that can be transferred by this mechanism, however, if transfers occur when the stock is overfished, a 5% conservation tax would be applied to address the discrepancy that a pound of striped bass quota is not equal across all states.

Example: If State A transfers 1,000 pounds to State B when the stock is overfished, State B would receive 950 pounds and the other 50 pounds would be the conservation tax that is no longer available for harvest.

All other terms and conditions of the transfer are to be identified solely by the parties involved in the transfer.

The Administrative Commissioner of the agencies involved (donor and receiving state) must submit a signed letter to the Commission identifying the involved states, species, and pounds of quota to be transferred between the parties. A transfer becomes effective upon receipt of a letter from Commission staff to the donor and receiving states, and does not require approval by the Board. All transfers are final upon receipt of the signed letters by the Commission. In the event that the donor or receiving state of a transaction subsequently wishes to change the amount or details of the transaction, both parties have to agree to the change, and submit to the Commission signed letters from the Administrative Commissioner of the agencies involved. These transfers do not permanently affect the state-specific shares of the quota (i.e., the state-specific quotas remain fixed).

Once quota has been transferred to a state, the state receiving quota becomes responsible for any overages of transferred quota. That is, the amount over the final quota (that state's quota plus any quota transferred to that state) for a state will be deducted from the corresponding state's quota the following fishing season.

[1] The Board can specify any number from 0 days up to 45 days to limit when transfers could occur after the calendar year ends.

<u>Option C</u>: Limited commercial quota transfer provision based on stock status.
Same as Option B except transfers would not be permitted when the stock is overfished (i.e., below the SSB threshold).

Note: Given the current overfished status of the stock, this option would not provide near-term relief to states seeking additional quota.

<u>Option D</u>: Board discretion commercial quota transfer provision (with overfished conservation tax).
The Board has discretion to decide whether the voluntary transfer of commercial quota in the ocean region between states that have ocean quota would be permitted in the next one or two years. Quota transfers are not permitted unless the Board decides to allow them. The Board would decide by their final meeting of the year, based on information the Board has available on the status of the striped bass stock and performance of the fisheries, whether to allow commercial quota transfers in the next one or two years.

Note: If the Board selects this option and the Addendum is approved during 2023, the Board could decide at the time of the Addendum's approval whether to allow transfers for the 2023 fishing year.

If the Board allows the voluntary transfer of commercial quota, the Board may choose to specify one or more of the following criteria:

- A limit on the transferable amount of quota (e.g., a set poundage or a set percentage of the total commercial quota), and further, a seasonal limitation on its transferability (e.g., no more than 50% of the transferable quota amount may be transferred before July 1).
- The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota).

If the above criteria are implemented, the Board should be as specific as possible when developing criteria (e.g., specify whether eligibility is based on total statewide quota utilization, or gear- or season-specific quota utilization within a state).

If the Board approves commercial quota transfers for a given year, transfers between states may occur upon agreement of two states at any time during the fishing year and up to 45 days[2] after the last day of the calendar year. All transfers require a donor state (state giving quota) and a receiving state (state accepting additional quota). All transfers must adhere to the quota transfer limitations/criteria established by the Board for that year. Additionally, if transfers occur when the stock is overfished, a 5% conservation tax would be applied to address the discrepancy that a pound of striped bass quota is not equal across all states.

[2] The Board can specify any number from 0 days up to 45 days to limit when transfers could occur after the calendar year ends.

Example: If State A transfers 1,000 pounds to State B when the stock is overfished, State B would receive 950 pounds and the other 50 pounds would be the conservation tax that is no longer available for harvest.

The Administrative Commissioner of the agencies involved (donor and receiving state) must submit a signed letter to the Commission identifying the involved states, species, and pounds of quota to be transferred between the parties. A transfer becomes effective upon receipt of a letter from Commission staff to the donor and receiving states, and does not require the approval by the Board. All transfers are final upon receipt of the signed letters by the Commission. In the event that the donor or receiving state of a transaction subsequently wishes to change the amount or details of the transaction, both parties have to agree to the change, and submit to the Commission signed letters from the Administrative Commissioner of the agencies involved. These transfers do not permanently affect the state-specific shares of the quota (i.e., the state-specific quotas remain fixed).

Once quota has been transferred to a state, the state receiving quota becomes responsible for any overages of transferred quota. That is, the amount over the final quota (that state's quota plus any quota transferred to that state) for a state will be deducted from the corresponding state's quota the following fishing season.

<u>Option E</u>: Limited Board discretion commercial quota transfer provision based on stock status.
Same as Option D except transfers would not be permitted when the stock is overfished (i.e., below the SSB threshold).

> *Note: Given the current overfished status of the stock, this option would not provide near-term relief to states seeking additional quota.*

4.0 Compliance Schedule
Measures approved by the Board through this Addendum would be effective immediately on the date of approval.

If commercial quota transfers are permitted, states must account for any additional quota potentially received via transfers when determining the number of commercial tags required for the upcoming season.

Appendix. State-by-State Commercial Fishery Regulations, Commercial Landings, 2021 Quota Accounting, and Coastwide Removals by Sector

Table A1. 2021 Striped Bass commercial regulations.
Source: 2022 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

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.	6.16-11.15 (or when quota reached); open fishing days of Monday, Tuesday and Wednesday, with Thursday and Friday added on October 1 (if quota remains). 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 throughout.
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.	5.15 – 12.15, or until quota reached. Limited entry permit only.
NJ*	Commercial fishing prohibited; *quota reallocated to recreational bonus program: 1 fish/permit at 24" to <28"	215,912 lbs.	5.15 – 12.31 (permit required)
PA	Commercial fishing prohibited		

Table A1, continued

STATE	SIZE LIMITS (TL) and TRIP LIMITS	SEASONAL QUOTA	OPEN SEASON
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
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)	Bay Pound Net: 6.1-12.31 Bay Haul Seine: 1.1-2.28; 6.1-12.31 Bay Hook & Line: 6.1-12.31 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. (split between gear types; 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: 11.9.2020-3.25.2021 Misc. Gear: 2.15-3.25, 6.1-12.15
VA	Chesapeake 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 A2. 2021 Commercial quota accounting in pounds.
Source: 2022 state compliance reports. 2021 quota was based on Addendum VI and approved conservation equivalency programs.

State	Add VI (base)	2021 Quota^	2021 Harvest	Overage
Ocean				
Maine*	154	154	-	-
New Hampshire*	3,537	3,537	-	-
Massachusetts	713,247	735,240	732,071	0
Rhode Island	148,889	148,889	130,308	0
Connecticut*	14,607	14,607	-	-
New York	652,552	640,718	629,491	0
New Jersey**	197,877	215,912	-	-
Delaware	118,970	142,474	140,250	0
Maryland	74,396	89,094	88,652+	0
Virginia	113,685	125,034	119,921	0
North Carolina	295,495	295,495	0	0
Ocean Total	2,333,409	2,411,154	1,840,693	0
Chesapeake Bay				
Maryland	2,588,603	1,445,394	1,305,276+	0
Virginia		983,393	729,736	0
PRFC		572,861	400,414	0
Bay Total		3,001,648	2,435,126	0

Note: North Carolina's fishing year is December-November; PRFC's fishing year for gill nets is Nov-March
* 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).
+ Maryland commercial landings for 2021 are considered preliminary.

Table A3. Commercial harvest by state and region in pounds (x1000), 1997-2021 calendar years.

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	
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	163.2	84.6	375.0	273.0	2,286.6	2,426.7	726.2	1,112.2	4,265.1	6,551.6
1999	766.2	119.7	491.8	187.1	62.6	614.8	391.5	2,633.7	2,274.8	653.3	923.4	3,851.4	6,485.1
2000	796.2	111.8	542.7	140.6	149.7	932.7	162.4	2,836.0	2,261.8	666.0	951.2	3,879.0	6,715.0
2001	815.4	129.7	633.1	198.8	113.9	782.4	381.1	3,054.3	1,660.9	658.7	893.1	3,212.6	6,267.0
2002	924.9	129.2	518.6	160.6	93.2	710.2	441.0	2,977.6	1,759.4	521.0	894.4	3,174.9	6,152.6
2003	1,055.5	190.2	753.3	191.5	103.9	166.4	201.2	2,662.1	1,721.8	676.6	1,690.4	4,088.7	6,750.8
2004	1,214.2	232.3	741.7	182.2	134.2	161.3	605.4	3,271.2	1,790.3	772.3	1,507.0	4,069.6	7,340.8
2005	1,102.2	215.6	689.8	173.1	46.9	185.2	604.5	3,017.4	2,008.7	533.6	1,561.0	4,103.3	7,120.6
2006	1,322.3	221.4	688.4	179.5	91.1	195.0	74.2	2,771.8	2,116.3	673.5	1,219.0	4,008.7	6,780.5
2007	1,039.3	240.6	731.5	188.7	96.3	162.3	379.5	2,838.1	2,240.6	599.3	1,369.2	4,209.1	7,047.2
2008	1,160.3	245.9	653.1	188.8	118.0	163.1	288.4	2,817.7	2,208.0	613.8	1,551.3	4,373.1	7,190.8
2009	1,134.3	234.8	789.9	192.4	127.3	140.4	190.0	2,809.1	2,267.3	727.8	1,413.3	4,408.4	7,217.5
2010	1,224.5	248.9	786.8	185.4	44.8	127.8	276.4	2,894.7	2,105.8	683.2	1,313.0	4,102.0	6,996.7
2011	1,163.9	228.2	855.3	188.6	21.4	158.8	246.4	2,862.5	1,955.1	694.2	1,278.1	3,927.3	6,789.8
2012	1,218.5	239.9	683.8	194.3	77.6	170.8	7.3	2,592.0	1,851.4	733.7	1,339.6	3,924.7	6,516.8
2013	1,004.5	231.3	823.8	191.4	93.5	182.4	0.0	2,526.9	1,662.2	623.8	1,006.8	3,292.8	5,819.7
2014	1,138.5	216.9	531.5	167.9	120.9	183.7	0.0	2,359.4	1,805.7	603.4	1,169.4	3,578.5	5,937.9
2015	866.0	188.3	516.3	144.1	34.6	138.1	0.0	1,887.5	1,436.9	538.0	967.6	2,942.5	4,830.0
2016	938.7	174.7	575.0	136.5	19.7	139.2	0.0	1,983.9	1,425.5	537.1	902.3	2,864.9	4,848.8
2017	823.4	175.3	701.2	141.8	80.5	133.9	0.0	2,056.1	1,439.8	492.7	827.8	2,760.3	4,816.4
2018	753.7	176.6	617.2	155.0	79.8	134.2	0.0	1,916.6	1,424.3	449.4	951.0	2,824.7	4,741.3
2019	584.7	144.2	358.9	132.6	82.8	138.0	0.0	1,441.2	1,475.2	417.3	951.1	2,843.6	4,284.8
2020	386.9	115.9	530.5	138.0	83.6	77.2	0.0	1,332.2	1,273.8	400.3	613.8	2,287.9	3,620.0
2021+	732.1	130.3	629.5	140.3	88.7	119.9	0.0	1,840.7	1,305.3	411.3	729.7	2,446.4	4,287.0

+ Maryland commercial landings for 2021 are considered preliminary.

Table A4. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1992-2021 calendar years. Note: Harvest is from state compliance reports/MRIP (June 2022), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from NC.

Year	Commercial		Recreational		Total Removals
	Harvest	Dead Discards*	Harvest	Release Mortality	
1992	256,476	189,814	869,779	937,611	2,253,681
1993	314,526	114,317	789,037	812,404	2,030,284
1994	325,401	165,700	1,055,523	1,360,872	2,907,496
1995	537,412	192,368	2,287,578	2,010,689	5,028,047
1996	854,102	257,506	2,487,422	2,600,526	6,199,556
1997	1,076,561	324,445	2,774,981	2,969,781	7,145,769
1998	1,215,219	346,537	2,915,390	3,259,133	7,736,278
1999	1,223,572	347,186	3,123,496	3,140,905	7,835,158
2000	1,216,812	213,863	3,802,477	3,044,203	8,277,354
2001	931,412	175,815	4,052,474	2,449,599	7,609,300
2002	928,085	187,084	4,005,084	2,792,200	7,912,453
2003	854,326	126,274	4,781,402	2,848,445	8,610,447
2004	879,768	156,026	4,553,027	3,665,234	9,254,055
2005	970,403	142,385	4,480,802	3,441,928	9,035,518
2006	1,047,648	152,308	4,883,961	4,812,332	10,896,250
2007	1,015,114	158,078	3,944,679	2,944,253	8,062,124
2008	1,027,824	108,830	4,381,186	2,391,200	7,909,039
2009	1,050,055	133,317	4,700,222	1,942,061	7,825,654
2010	1,031,448	132,373	5,388,440	1,760,759	8,313,020
2011	944,777	82,015	5,006,358	1,482,029	7,515,180
2012	870,684	192,190	4,046,299	1,847,880	6,957,053
2013	784,379	112,620	5,157,760	2,393,425	8,448,184
2014	750,263	114,065	4,033,746	2,172,342	7,070,415
2015	621,952	88,614	3,085,725	2,307,133	6,103,425
2016	609,028	91,186	3,500,434	2,981,430	7,182,077
2017	592,670	98,801	2,937,911	3,421,110	7,050,492
2018	621,123	101,264	2,244,765	2,826,667	5,793,819
2019	653,807	85,262	2,150,936	2,589,045	5,479,050
2020	583,070	58,641	1,709,973	2,760,231	5,111,915
2021	634,552	85,676	1,824,484	2,572,931	5,117,643

* 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 A5. Proportion of total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1992-2021. Note: Harvest is from state compliance reports/MRIP (June 2022), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from NC.

Year	Commercial		Recreational	
	Harvest	Dead Discards*	Harvest	Release Mortality
1992	11%	8%	39%	42%
1993	15%	6%	39%	40%
1994	11%	6%	36%	47%
1995	11%	4%	45%	40%
1996	14%	4%	40%	42%
1997	15%	5%	39%	42%
1998	16%	4%	38%	42%
1999	16%	4%	40%	40%
2000	15%	3%	46%	37%
2001	12%	2%	53%	32%
2002	12%	2%	51%	35%
2003	10%	1%	56%	33%
2004	10%	2%	49%	40%
2005	11%	2%	50%	38%
2006	10%	1%	45%	44%
2007	13%	2%	49%	37%
2008	13%	1%	55%	30%
2009	13%	2%	60%	25%
2010	12%	2%	65%	21%
2011	13%	1%	67%	20%
2012	13%	3%	58%	27%
2013	9%	1%	61%	28%
2014	11%	2%	57%	31%
2015	10%	1%	51%	38%
2016	8%	1%	49%	42%
2017	8%	1%	42%	49%
2018	11%	2%	39%	49%
2019	12%	2%	39%	47%
2020	11%	1%	33%	54%
2021	12%	2%	36%	50%

* Commercial dead discard estimates are re-estimated for the entire time series when a new year of data is added. Note: Percent may not sum to 100 due to rounding.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Atlantic Striped Bass Management Board**

FROM: **Atlantic Striped Bass Advisory Panel**

DATE: **January 24, 2023**

SUBJECT: **Advisory Panel Recommendations on Draft Addendum I Options**

The Atlantic Striped Bass Advisory Panel (AP) met via webinar on January 17, 2023 to discuss AP recommendations on the proposed options in Striped Bass Draft Addendum I to Amendment 7 regarding ocean commercial quota transfers. ASMFC staff provided the AP with an overview of the draft addendum background, proposed options, and public comment summary.

AP Members in Attendance

Louis Bassano (Chair, NJ recreational)
Dave Pecci (ME for-hire/recreational)
Peter Whelan (NH recreational)
Patrick Paquette (MA recreational)
Craig Poosikian (MA commercial)
Andy Dangelo (RI for-hire)
Michael Plaia (RI comm/rec/for-hire)
Bob Danielson (NY recreational)
Eleanor Bochenek (NJ fisheries scientist)
Leonard Voss (DE commercial)
Chris Dollar (MD recreational)
Charles (Eddie) Green (MD for-hire/rec)
Dennis Fleming (PRFC rec/processer/dealer)
Bill Hall (VA recreational)
Kelly Place (VA commercial)
Jamie Lane (NC commercial)
Jon Worthington (NC recreational)

Bob Humphrey (ME comm./for-hire) and Jamie Lane (NC commercial) provided comments via email, which are incorporated into this summary.

ASMFC Staff: Emilie Franke

Public Attendees: Marty Gary (Striped Bass Management Board Chair), Will Poston, Jaclyn Higgins, Erik Zlokovitz

A majority of AP members support status quo Option A (no transfers permitted), while some AP members support Option B (transfers permitted with overfished conservation tax). The following is a summary of AP members' recommended options, discussion, and additional recommendations.

Proposed Management Options

14 AP members support the status quo **Option A**: no transfers permitted for the following reasons:

- Considering transfers is not appropriate while the stock is overfished and rebuilding.
- The public comments are overwhelmingly in support of Option A.
- Transfers will not benefit the stock in any way, especially when the stock is overfished or overfishing is occurring.
- There shouldn't be any increase in either sector's harvest while the stock is overfished.
- Concern that quota transfers set up the potential for behind-the-scenes or non-transparent 'horse-trading'.
- The only quota likely available for transfer is the North Carolina quota since fish have not been available there inshore; as long as the stock is overfished, we need the buffer of not harvesting that quota.
- If quota is transferred north, large breeding females would be taken out of the fishery.
- A striped bass caught in southern state commercial fisheries is not the same size as striped bass caught in northern state commercial fisheries. There is concern around moving quota from an area that harvests smaller fish to an area that harvests larger fish (i.e., losing more spawning potential). Moving quota along the coast will disrupt the current rebuilding analysis and assumed size of commercial catch.
- The stock is experiencing recruitment failure in the Chesapeake Bay, so this is a time for caution and conservation.

4 AP members support **Option B**: transfers permitted with overfished conservation tax for the following reasons:

- Quotas were developed by science, and the science would not set total quotas that would jeopardize the stock.
- The commercial fishery already is already constrained and closely monitored with payback and accountability provisions in place.
- The striped bass fishery is primarily recreational, and the commercial fishery has been diminished to 10% of total removals with low, relatively stable landings; allowing transfers would not have a significant, if any, impact on the status of the stock since the commercial fishery is at such low levels.

There was no support stated for Options C, D, or E.

Additional Recommendations

Some AP members noted additional recommendations regarding the quota transfer process:

- If the Board does allow transfers, 3 AP members recommend the Board eliminate the 45-day provision that would allow transfers to occur up to 45 days after the calendar year ends. This type of provision could lead to states being less careful about exceeding their quota since they could cover a quota overage after the year ends through a transfer.

- 3 AP members recommend that if transfers are permitted, transfers should be permitted only for states that allow commercial fishing; states that prohibit commercial fishing (ME,NH,CT,NJ) should not be able to transfer their quota.
- 1 AP member recommends revising the quota utilization calculation to exclude states that do not have commercial fisheries. Currently, the percent quota utilization is calculated incorporating those states (e.g., Maine landed 0% of their quota), which seems wrong since those states have chosen not to allow commercial fishing.

If the Board maintains status quo and doesn't allow transfers through this addendum, AP members were split on whether transfers should/shouldn't be considered in the future:

- Some AP members support revisiting the issue of quota transfers in the future after the stock is rebuilt, as that would be more appropriate timing.
- Some AP members don't support revisiting the transfer issue in the future (i.e., transfers should not be allowed in any case) because transfers are not an appropriate tool for the striped bass fishery.
- Some AP members noted uncertainty about whether transfers should be considered in the future. When the stock is rebuilt, quota transfers could be a tool to respond to climate change and shifting stocks along the coast, but only if controlled and regulated properly.

Some AP members noted recommendations regarding the commercial quota system in general:

- 3 AP members recommends the Board re-examine the overall commercial quota system since it is based on outdated data from the 1970s; science has advanced since then and the quota system should be re-evaluated.
- 1 AP member recommends the Board take a broader perspective and re-examine the contribution/value of each sector (commercial and recreational) and their contribution to the striped bass fishery overall.

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MEMORANDUM

TO: **Atlantic Striped Bass Management Board**

FROM: **Emilie Franke, FMP Coordinator**

DATE: **January 17, 2023**

SUBJECT: **Draft Addendum I Public Hearing Summaries**

Eight public hearings were held for twelve jurisdictions from December 7, 2022 through January 9, 2023. Five hearings were conducted via webinar only: Massachusetts, Rhode Island, New Jersey, Maryland-Virginia-Potomac River Fisheries Commission-District of Columbia, North Carolina. Two hearings were conducted in a hybrid format with attendees participating via webinar and in-person: Delaware, Maine-New Hampshire. One public hearing was conducted in-person only: New York.

193 individuals (not including state staff, ASMFC staff, or Commissioners/Proxies) attended the hearings, and some of these individuals attended/participated in polls at multiple hearings. Each public hearing is summarized in the following pages and the summaries are ordered from north to south. Live polls or a show-of-hands vote were used at most hearings for the proposed options. Each hearing summary lists the number of public participants who attended the hearing as well as the number of people who provided comments and/or participated in polls during the hearing. Full attendance lists are provided following each hearing summary.

Note: A summary of all public comment (written and hearing comments) received by ASMFC on Striped Bass Draft Addendum I is provided in a separate memorandum in the 2023 Winter Atlantic Striped Bass Board main meeting materials.

Maine-New Hampshire Public Hearing
Striped Bass Draft Addendum I
January 9, 2023 – Hybrid: Webinar and Portsmouth, NH

Public Attendees: 61
Hearing Officers: Megan Ware (MEDMR), Cheri Patterson (NHFG)
ASMFC Staff: Toni Kerns, Tracey Bauer

49 attendees participated in live polling and/or provided comments, including comments on behalf of the Maine Association of Charterboat Captains (MACC), Plum Island Surfcasters (PIS), Native Fish Coalition (NFC), American Saltwater Guides Association (ASGA), Stripers Forever (SF)

Poll

Option A	48
Option B	
Option C	1
Option D	
Option E	

Polls/Commenters from

ME	22
NH	21
Other	6 (MA, NY, NJ, MD, FL)

48 people (including MACC, PIS, NFC, ASGA, SF) support status quo Option A: no transfers permitted for the following reasons:

- The stock is still overfished and any increase in fishing mortality should not be considered; management should focus on rebuilding.
- Any increase in harvest would undermine rebuilding progress.
- There is only a 78% chance of rebuilding the stock by 2029, and anything that removes more fish will lower that percent chance of rebuilding and negatively impact the stock.
- Commercial fisheries target large breeding females; if additional quota is transferred to states like Massachusetts, there would be significant impact on large spawners.
- Recruitment has been very poor for the last four years, and management needs to be as conservative as possible to rebuild the stock; the Technical Committee has noted the potential future negative impact of the low recruitment.
- This is not the time to maximize quotas when the stock is vulnerable to future decline.
- Although transfers are in place for other species, the striped bass fishery is unique and the Board has decided in the past that transfers don't fit this fishery.
- Quota transfers are contrary to what the public wants.

1 person supports Option C: transfers permitted except no transfers if overfished.

- No verbal comment provided.

Other comments included:

- Striped bass should be managed for abundance.
- Management should focus on the population as a whole and environmental balance; abundance helps insulate against forces like climate change.
- Conservation equivalency should not be part of management.
- Need to protect spawning locations.
- Live fish are more valuable than dead fish.
- Concern about the data used in the stock assessment related to COVID data quality issues.
- Commercial harvest should end and striped bass should be a gamefish.

Maine-New Hampshire Public Hearing
Striped Bass Draft Addendum I
January 9, 2023
Hybrid: Webinar and Portsmouth, NH

In-Person Attendees: enclosed sign-in sheet

Webinar Attendees:

Last Name	First Name	State
Agnelli	Larry	Massachusetts
Batter	Victoria	Maine
Bauer	Tracey	Virginia
Bryand	Michael	Maine
Calagione	Sam	Maine
Cloutier	Germain	Maine
Cronin	James	New York
Dart	Evan	Maine
Dutremble	Jason	Maine
Evanilla	Johnathan	Maine
Fallon	Peter	Maine
Ferdinand	William	Maine
Fitzgerald	Betsy	Maine
Fleming	Richard	New Hampshire
Friedrich	Tony	Maryland
Gallahue	Benjamin	New Hampshire
Hildreth	Carle	Maine
Hillier	Bryce	Maine
Hunter	Zandri	Maine
Johnson	Tom	Maine
Kingston	Jack	Massachusetts
Kleiner	Don	Maine
Lamy	Jared	New Hampshire
Landry	Aaron	Maine
Mohlin	Pete	Maine
Newman	Thomas	North Carolina
Opsatnic	Levi	Maine
Pappas	Thomas	Maine
Patterson	Cheri	New Hampshire
Phillips	Chris	New Hampshire
Poston	Will	Maryland
Roach	Eric	New Hampshire
Rubner	Cody	Florida

Last Name	First Name	State
Rudman	Patrick	Maine
Sarcona	Tony	Maine
Sawyer	Ian	Maine
Schaefer	Kyle	Maine
Spendley	Paul	New Hampshire
Sullivan	Kevin	New Hampshire
Temple	Colin	Massachusetts
Tirado	Lou	Maine
Vavra	Taylor	Maine
Wallace	Capt. Eric	Maine
Ware	Megan	Maine
Whalley	Ben	Maine
Williams	Brian	New Jersey
Willsea	Flynn	Maine
Young	robert	New Hampshire
Zobel	Renee	New Hampshire

ASMFC Staff: Toni Kerns, Tracey Bauer

Atlantic Striped Bass Draft Addendum I for Public Comment

Atlantic States Marine Fisheries Commission
January 9, 2023
Portsmouth, NH

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Name	Company/Organization	City, State
Ritchie White	CCANH	Rye NH
Scott Klose	Bye Polar Fishing	Bedford NH
Scot Calitri	ORCA	Durham, NH
Dylan Carney	13 Mile Fly Co	Dover, NH
Michael Toole	Plum Island Surfcasters	Strafford, NH
Nicu Martin	NFC	Litchfield NH
Joe Forrestall	NFC	Alstead NH
Derek Cummings		Portsmouth NH
Joshua Dionne		S. Berwick ME
Matt Larkin		Newmarket, NH
Tom Brightman		Dover, NH
Doug Grout		Sunapee NH
DJ Lovett		Nottingham NH
Peter Whelan		Portsmouth NH
James Shanley	NFC	Portsmouth, NH
Jared Kane	NFC	Milton Mills, NH
JENNIS ATTSOH	ASMFC	NEWMARKET NH
~~Stanley~~		
Stephen Collins		Portsmouth, NH.
Rob Wofchuck		Brentwood, NH
JORDAN CHICHESTER		SOUTH BERWICK, ME

Atlantic Striped Bass Draft Addendum I for Public Comment

Atlantic States Marine Fisheries Commission
January 9, 2023
Portsmouth, NH

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Name	Company/Organization	City, State
Ben Chlenowski		RYE NH

Massachusetts Public Hearing
Striped Bass Draft Addendum I
December 19, 2022 – Webinar

Public Attendees: 48
Hearing Officers: Mike Armstrong (MADMF)
ASMFC Staff: Emilie Franke, James Boyle

37 attendees participated in live polling and/or provided comments, including comments on behalf of the Cape Cod Salties Fishing Club (CCS), Rhode Island Saltwater Anglers Association for the MA sector (RISAA-MA), Stellwagen Bank Charter Board Association (SWBCA)

Poll

Option A	29
Option B	2
Option C	2
Option D	1
Option E	3

Polls/Commenters from

MA	28
Other	9 (ME, NY, CT, FL)

29 people (including CCS, RISAA-MA) support status quo Option A: no transfers permitted for the following reasons:

- The stock is still overfished.
- The stock is starting to improve and allowing transfers would increase mortality, which is contrary to the rebuilding plan that is an important part of Amendment 7.
- Allowing transfers would have unintended consequences as quota changes each year; allocations should be fair and equitable in the first place.
- There is a risk of concentrating harvest in certain areas if transfers are allowed; there could be unintended consequences for different breeding stocks.
- There is only a 79% chance of rebuilding and there are many scenarios where we won't achieve that goal.
- Allowing transfers would put more pressure on the commercial sector.
- The striped bass stock is fragile and we are approaching the rebuilding deadline.

2 people support Option B: transfers permitted with overfished conservation tax.

- No verbal comment provided.

2 people support Option C: transfers permitted except no transfers if overfished.

- No verbal comment provided.

1 person supports Option D: Board discretion on transfers with overfished conservation tax.

- No verbal comment provided.

3 people support Option E: Board discretion on transfers except no transfers if overfished.

- No verbal comment provided.

Other comments included:

- A SWBCA Board member noted that most comments opposing transfers are coming from recreational anglers.
- The surfcasting community has spent a lot of time working on improving catch and release mortality in the fishing community.

Massachusetts Public Hearing
Striped Bass Draft Addendum I
December 19, 2022
Webinar

Last Name	First Name	State
Adams	Mike	Massachusetts
Armstrong	Mike	Massachusetts
Audet	Jerry	Massachusetts
Avila	Jason	Massachusetts
Ayer	Matt	Massachusetts
Bannon	Mark	Massachusetts
Batsavage	Chris	North Carolina
Boghdan	Kalil	Massachusetts
Boland	Collins	Massachusetts
Bravo	Peter	Connecticut
Castano	Raymond	Massachusetts
Clark	Dean	Massachusetts
Cloutier	Germain	Maine
Creighton	Jack	Massachusetts
Cullen	James	Massachusetts
Cummings	Derek	New Hampshire
Dello Russo	Joe	Massachusetts
Delzingo	Capt. Mike	Massachusetts
Dresser	Winslow	Massachusetts
Fallon	Peter	Maine
Fetterman	Jacob	New York
Frenje	Johan	Massachusetts
Friedrich	Tony	Maryland
Gordon	Jesse	New York
Henrich	Georgette	Massachusetts
Hoffman	William	Massachusetts
Holden	Brendan	Massachusetts
Hughes	Ian	Massachusetts
Jewkes	James	Massachusetts
Johns	Caroline	Massachusetts
Jones	Kevin	Massachusetts
Kane	Raymond	Massachusetts
Mauck	Capt. Parker	Massachusetts
McKiernan	Daniel	Massachusetts
Meserve	Nichola	Massachusetts
Petracca	Timothy	Utah

Last Name	First Name	State
Pinkus	Will	Massachusetts
Poirier	Anthony	Massachusetts
Poosikian	Craig	Massachusetts
Prodouz	William	Massachusetts
Rubner	Cody	Massachusetts
Savino	Robert	Massachusetts
Schofield	Austin	Massachusetts
Schwond	Peter	Massachusetts
Shukis	Alex	Massachusetts
Sikorski	David	Maryland
Sullivan	Tamer	Massachusetts
Sylvestre	Capt. George	Massachusetts
Temple	Colin	Massachusetts
Thiebault	Kristen	Massachusetts
Tighe	John	Massachusetts
Ungerland	Jon	Massachusetts
Vespe	Greg	Massachusetts
Webb	Anna	Massachusetts
Whalley	Ben	Maine
White	Kyle	Massachusetts
Williams	Al	Massachusetts
Woods	Michael	Rhode Island
Zlokovitz	Erik	Maryland

ASMFC Staff: Emilie Franke, James Boyle

Rhode Island Public Hearing
Striped Bass Draft Addendum I
December 14, 2022 – Webinar

Public Attendees: 16
Hearing Officers: Jason McNamee (RIDEM)
ASMFC Staff: Emilie Franke, Tracey Bauer

11 attendees participated in live polling and/or provided comments, including comments on behalf of the Rhode Island Saltwater Anglers Association (RISAA), Backcountry Hunters and Anglers (BHA), and American Saltwater Guides Association (ASGA)

Poll

Option A	11
Option B	
Option C	
Option D	
Option E	

Polls/Commenters from

RI	9
Other	2 (ME)

11 people (including RISAA, BHA, ASGA) support status quo Option A: no transfers permitted for the following reasons:

- Increasing fishing mortality is contradictory to rebuilding striped bass, and we don't want to derail the rebuilding effort.
- If fishing mortality increases, the probability of rebuilding by 2029 will decrease and the rebuilding timeline will extend.
- The rebuilding plan is already on a razor's edge with a thin margin of error, and any increase in mortality is risky.
- The stock is still overfished, so now is not the time to maximize harvest.
- Recovering striped bass and protecting the fishery long-term is most important.
- The options that intend to provide guardrails would still increase fishing mortality.
- The Addendum VI assumption of underutilization must remail valid, and transfers would violate that assumption.
- If, through transfers, one state can harvest way more striped bass than other states, that might impact the striped bass in that area; for example, if quota ends up in a state where striped bass have not been heavily harvested in the past, there could be bigger consequences that intended.

- If the Board wants to address broader issues with the commercial quotas, the Board should reassess the allocations first.

Other comments included:

- The figure showing the percent quota utilization is misleading since it does not show the percent of quota that was re-allocated to the recreational sector (NJ quota), which is about 9% of the quota. The figure should more clearly show how much quota is re-allocated to the recreational sector and how much quota is in states that don't have commercial fisheries.

Rhode Island Public Hearing
Striped Bass Draft Addendum I
December 14, 2022
Webinar

Last Name	First Name	State
Bertoline	Sue	New York
Blanchard	Kurt	Rhode Island
Calagione	Sam	Rhode Island
Cloutier	Germain	Maine
Finnegan	Owen	Connecticut
Friedrich	Tony	Maryland
Halavik	Byron	Rhode Island
Hittinger	Rich	Rhode Island
Jenkins	Peter	Rhode Island
Kalil	Chris	Rhode Island
Lengyel Costa	Nicole	Rhode Island
McManus	Conor	Rhode Island
McNamee	Jason	Rhode Island
Newman	Thomas	North Carolina
Poston	Will	Maryland
Spicer	Ken	Rhode Island
Tiska	Carl	Rhode Island
Vespe	Greg	Rhode Island
Whalley	Ben	Maine
Woods	Michael	Rhode Island

ASMFC Staff: Emilie Franke, Tracey Bauer, Toni Kerns, Madeline Musante

New York Public Hearing
Striped Bass Draft Addendum I
December 7, 2022 – Kings Park, NY

Public Attendees: 21
Hearing Officers: Jim Gilmore (NYDEC)
ASMFC Staff: Emilie Franke

21 attendees participated in a show of hands/or provided comments, including comments on behalf of the New York Coalition on Recreational Fishing (NYCRF) and American Saltwater Guides Association (ASGA)

Show of Hands

Option A	21
Option B	
Option C	
Option D	
Option E	

Attendees from

NY	21

21 people (including NYCRF and ASGA) support status quo Option A: no transfers permitted for the following reasons:

- Allowing transfers would increase removals and jeopardize the 2029 rebuilding plan.
- Increasing harvest is not acceptable while in a rebuilding period; harvest should not be maximized at this time.
- Rebuilding success hinges on maintaining a low fishing mortality rate, and intentionally increasing commercial harvest goes against that.
- The rebuilding plan already has a small margin of error.
- Allowing transfers would add risk and uncertainty to the rebuilding plan, especially considering recent low recruitment.
- The stock is still overfished and this action is being considered at the wrong time; it is contrary to any progress being made following Amendment 7.
- Amendment 7 public comments were overwhelmingly in support of conservative management.
- Commercial reductions for Addendum IV and Addendum VI were taken off the commercial quota, not off harvest levels, and Addendum VI assumed the same level of quota underutilization.
- The Board has rejected quota transfers twice in the past.

- The original issue was quota for just one state (Delaware); now this addendum is much broader and could lead to harvesting all unused quota and unintended consequences.
- The safeguards presented in the alternative options are not adequate. For example, the conservation tax should apply to every transfer to address the size discrepancy, not just those that happen when the stock is overfished. And in addition to no transfers when the stock is overfished, no transfers should be permitted when overfishing is occurring.
- Two commenters noted that if Option A is off the table, Option E (Board discretion with no transfers when overfished) would be the 'least bad' second choice.

Other comments included:

- The use of conservation equivalency should be stopped.

Atlantic Striped Bass Draft Addendum I for Public Comment

Atlantic States Marine Fisheries Commission
December 7, 2022
Kings Park, NY

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Name	Company/Organization	City, State
ROSS SQUIRE	NYCRF	Centerport, NY
Paul Dixon	ASGA	East Hampton NY
CHARLOS WITTEK		W. Babylon, NY
Craig Cantelmo	VANSTAAL	Cutchogue, NY
MARK SEDOTTI		SAG HARBOR NY
Matt Broderick	The Fisherman Mag	Medford, NY
Jim Levison	ASGA	SAG Harbor NY
Dominic DeFlumeri	DBS Surfcasting	Massapequa Park, NY
Joseph Aiello		Huntington NY
Dylan Jewell	All Island Surfcasters	Shirley N.Y.
ART Boyd	ALL ISLAND SURFCASTERS	SAYVILLE NY
Steve Withum	For-Hire/Comm.	Elwood NY
Luyen Chou	Rec angler	East Hampton, NY
Susan Bertolin	ASGA	Floral Park, NY
Tom McKelvey		Floral Park, NY
Kerry Heffernan	Chef/Rec Angler	New York NY
Mike Dean	Manhattan to Montauk	East Quogue, NY
Adam Cooperstock	Rec angler	Merrick, NY
John Seifert	Rec. Fish Hatchery	Smithtown NY
DAVE FLANAGAN	FORMER	ST JAMES, NY
Vinny Catalano	for hire	Greenport, NY

New Jersey Public Hearing
Striped Bass Draft Addendum I
December 20, 2022 – Webinar

Public Attendees: 34
Hearing Officers: Joe Cimino (NJDEP)
ASMFC Staff: Emilie Franke, Tina Berger

25 attendees participated in live polling and/or provided comments, including comments on behalf of the Jersey Coast Anglers Association (JCAA).

Poll

Option A	23
Option B	1
Option C	
Option D	
Option E	1

Polls/Commenters from

NJ	16
Other	9 (ME, NH, MA, NY)

23 people (including JCAA) support status quo Option A: no transfers permitted for the following reasons:

- The stock is still overfished and transfers would go against rebuilding the stock.
- Rebuilding depends on maintaining a low fishing mortality rate, and transfers would increase commercial landings while trying to rebuild the stock.
- Transfers have not been supported by the Board in the past.
- The focus should be rebuilding the stock as quickly as possible.
- Management should strive for a higher than 78% probability of rebuilding the stock, and transfers would decrease that probability.

1 person supports Option B: transfers permitted with overfished conservation tax.

- No verbal comment provided.

1 person supports Option E: Board discretion on transfers except no transfers if overfished.

- No verbal comment provided.

Other comments included:

- Conservation equivalency should be eliminated; continuing CE seems like an intentional loophole in Amendment 7 despite overwhelming public opposition to CE.
- Fishery has been sporadic and is not doing well coastwide.
- Make striped bass a gamefish.
- The New Jersey bonus program collects important striped bass data that should be used.

New Jersey Public Hearing
Striped Bass Draft Addendum I
December 20, 2022
Webinar

Last Name	First Name	State
Araujo	Jovaun	Massachusetts
Archer	Colin	New Jersey
Barbato	Carmine	New Jersey
Bertoline	Sue	New York
Bogan	Raymond	New Jersey
Brust	Jeffrey	New Jersey
Camarata	Joe J.	New Jersey
Cantelmo	Craig	New York
Carr	Michael	New Jersey
Catalano	Vincent	New York
Celestino	Michael	New Jersey
Cimino	Joe	New Jersey
Cloutier	Germain	Maine
Corbett	Heather	New Jersey
Cudnik	Greg	New Jersey
Cummings	Derek	New Hampshire
DePersenaire	John	New Jersey
Emerson	Clay	New Jersey
Friedman	Justin	New York
Friedrich	Tony	Maryland
Gary	Martin	Virginia
Haasz	Steve	New Jersey
Haertel	Paul	New Jersey
Harrison	Brendan	New Jersey
Harrison	Brendan	New Jersey
Kameen	Paul	Pennsylvania
Koch	Greg	New Jersey
Kosinski	Thomas	New Jersey
Lynch	David	Massachusetts
ONeill	Tyler	Delaware
Papciak	John	New York
Petersen	Daniel	Massachusetts
Poston	Will	Maryland
Rubner	Cody	Massachusetts
Taylor	Doug	New Jersey
Walsifer	Peter	New Jersey

Last Name	First Name	State
Whalley	Ben	Maine
Williams	Capt Brian	New Jersey
Woods	Michael	Rhode Island
Zorzi	Ken	New Jersey

ASMFC Staff: Emilie Franke, Tina Berger

Delaware Public Hearing
Striped Bass Draft Addendum I
December 15, 2022 – Hybrid: Webinar and Dover, DE

Public Attendees: 18
Hearing Officers: John Clark (DENREC)
ASMFC Staff: Emilie Franke, Madeline Musante, Toni Kerns

16 attendees provided comments, including comments on behalf of the American Saltwater Guides Association (ASGA)

Comments

Option A	2
Option B	12
Option C	
Option D	2
Option E	

Commenters from

DE	16

2 people (including ASGA) support status quo Option A: no transfers permitted for the following reasons:

- The stock is in a rebuilding period and allowing transfers would increase harvest at the wrong time.
- The recreational slot has saved fish from the recreational sector and is contributing to the increase in spawning stock biomass; these fish were saved in order to rebuild by 2029, not to be killed before they can spawn.
- There should be no additional take as the stock rebuilds, especially take of larger striped bass.

12 people support Option B: transfers permitted with overfished conservation tax.

- All those in support of Option B are commercial fishermen.
- Support for allowing transfers as Delaware has been seeking more quota for some time.
- Option B is the only option that benefits Delaware in the near-term.

2 people support Option D: Board discretion on transfers with overfished conservation tax.

- Some oversight would be a good thing.
- However, oversight should not be excessive; for example, would not be supportive of the criteria that would not allow a state request a transfer until 90% of its quota is harvested.

Delaware Public Hearing
Striped Bass Draft Addendum I
December 15, 2022
Hybrid: Webinar and Dover, DE

In-Person Attendees: enclosed sign-in sheet

Webinar Attendees:

Last Name	First Name	State
Friedrich	Tony	Maryland
Logan	Kenneth	Delaware
Pangman	Kelsey	Delaware
Parrott	Eric	Delaware
Poston	Will	Maryland
Satterfield	Paul	Delaware
Stangl	Michael	Delaware
Townsend	Wes	Delaware

ASMFC Staff: Emilie Franke, Toni Kerns, Madeline Musante

Atlantic Striped Bass Draft Addendum I for Public Comment

Atlantic States Marine Fisheries Commission
December 15, 2022
Dover, DE

-- PLEASE PRINT CLEARLY –

Name	Company/Organization	City, State
Shirley Donovan	Waterman Commercial	Dover, De.
Leonard Voss	Commercial Waterman	Smyrna DE.
Zach Voss	Commercial	Smyrna DE
Robert Pinsonski	Commercial fisherman	Dover De
Tyler O'Neill	ASGA	Hockessin, DE
Brian Heffelfinger	Commercial	Smyrna, DE
Lee Thomas	Commercial	Port Penn
Ron Virdin	//	Smyrna
Jeremy Virdin	Commercial	Leipsic
Jordan Gillam	Commercial	Bowers
Vernon Gillam	Commercial	Bowers
Tom Hendricks	Commercial	Bowers
Margaret Conroy	DNREC	

Maryland-Virginia-Potomac River Fisheries Commission-District of Columbia
Public Hearing
Striped Bass Draft Addendum I
January 5, 2023 – Webinar

Public Attendees: 29
Hearing Officers: Mike Luisi (MDDNR), Pat Geer (VMRC), Marty Gary (PRFC), Danny Ryan (DCDOE)
ASMFC Staff: Toni Kerns, Caitlin Starks, Madeline Musante

20 attendees participated in live polling and/or provided comments, including comments on behalf of the Annapolis Anglers Club (AAC) and Chesapeake Bay Foundation (CBF)

Poll

Option A	15
Option B	
Option C	1
Option D	
Option E	4

Polls/Commenters from

MD	6
VA	4
Other	10 (ME, MA, NY, NJ, FL)

15 people (including AAC, CBF) support status quo Option A: no transfers permitted for the following reasons:

- The stock is still overfished and recruitment has been low for the past few years.
- Any transfer would likely be large fish that are important to the spawning stock biomass.
- There is only a 78% chance of meeting the rebuilding deadline, so it seems inappropriate to change limits and still be able to meet the rebuilding deadline.
- Prefer changing allocations instead of allowing transfers.
- Stock productivity is already uncertain due to climate change, low recruitment, etc.

1 person supports Option C: transfers permitted except no transfers if overfished.

- No verbal comment provided.

4 people support Option E: Board discretion on transfers except no transfers if overfished.

- No verbal comment provided.

Maryland-Virginia-Potomac River Fisheries Commission-District of Columbia
Public Hearing
Striped Bass Draft Addendum I
January 5, 2023
Webinar

Last Name	First Name	State
Batsavage	Chris	North Carolina
Catalano	Vincent	New York
Cloutier	Germain	Maine
Deem	Jeff	Virginia
Friedrich	Tony	Maryland
Gary	Martin	Virginia
Geer	Pat	Virginia
Gillingham	Lewis	Virginia
Haile	Kayla	Maryland
Hogan	Sean	New York
Holtz	Jacob	Maryland
Hornick	Harry	Maryland
Humphrey	Bob	Maine
Kelly	Brian	Massachusetts
Koller	Stan	Virginia
LeMense	Julia	New York
Luisi	Michael	Maryland
Lynch	David	Massachusetts
Madsen	Shanna	Virginia
McCrickard	Alex	Virginia
McGilly	Joshua	Virginia
McMenamin	Kevin	Maryland
Miller	Roy	Delaware
Moore	Chris	Virginia
Musick	Susanna	Virginia
Newberry	Capt. Robert	Maryland
Nolan	Dave	Virginia
Owens	Ronald	Virginia
Poston	Will	Maryland
Pride	Bob	Virginia
Roach	Matthew	Maryland
Rubner	Cody	Florida
Ryan	Daniel	Maryland
Shoultz	Matthew	Maryland
Sikorski	David	Maryland

Last Name	First Name	State
Stoehr	Joel	New York
Whalley	Ben	Maine
Williams	Brian	New Jersey
Williams	Al	Massachusetts
Woodruff	Frederick	Maine
Woods	Michael	Rhode Island
Yarworth	Rudolph	Maryland
Zlokovitz	Erik	Maryland

ASMFC Staff: Toni Kerns, Caitlin Starks, Madeline Musante

North Carolina Public Hearing
Striped Bass Draft Addendum I
December 8, 2022 – Webinar

Public Attendees: 11
Hearing Officers: Chris Batsavage (NCDENR)
ASMFC Staff: Emilie Franke, James Boyle

7 attendees participated in live polling and/or provided comments including the American Saltwater Guides Association (ASGA)

Poll

Option A	6
Option B	1
Option C	
Option D	
Option E	

Polls/Commenters from

NC	2
Other	5 (ME, CT, MD)

6 people (including ASGA) support status quo Option A: no transfers permitted for the following reasons:

- Allowing transfers would increase mortality at a time when the stock is rebuilding.
- We should be doing everything possible to rebuild the stock to hopefully support striped bass eventually returning to NC at the southern end of the stock.
- The rebuilding plan is on a razor's edge and there are concerns about 2020 data.
- Increasing quota utilization would decrease the buffer between commercial landings and the full quota, which would reduce the margin for error in rebuilding the stock.
- Striped bass are managed differently along the coast so there are risks with transfers.
- This issue has grown from just focusing on Delaware to the entire coast.
- The fishery is mostly catch and release and should be managed as such.

1 person supports Option B: transfers permitted with overfished conservation tax for the following reasons:

- The commercial sector has relatively low harvest and discards.
- Striped bass is a profitable fish but North Carolina has not had them for ten years, so other states should be able to use the quota.
- The commercial fishery is accountable with a payback mechanism in place so it will not cause overfishing.
- The reason overfishing is occurring is recreational discards.

North Carolina Public Hearing
Striped Bass Draft Addendum I
December 8, 2022
Webinar

Last Name	First Name	State
Batsavage	Chris	North Carolina
Bryand	Michael	Maine
Cloutier	Germain	Maine
Friedrich	Tony	Maryland
Fuda	Tom	Connecticut
Lowman	Brooke	North Carolina
McGilly	Joshua	Virginia
Meyers	S	Virginia
Mulvey-McFerron	Owen	North Carolina
Newman	Thomas	North Carolina
Poston	Will	Maryland
Roller	Tom	North Carolina
Whalley	Ben	Maine
Williams	Scott	North Carolina

ASMFC Staff: Emilie Franke, James Boyle, Madeline Musante

Emilie Franke

From: Dave Flood <dflood621@gmail.com>
Sent: Monday, February 13, 2023 10:12 AM
To: Comments
Subject: [External] Commercial quota transfers

It so frustrating that every time input from public recreational fishermen is requested for consideration that this organization seemingly disregards it every time.
Quotas for commercial harvest should not be considered.
I guess when the Striped Bass biomass equals that of the cod biomass and ZERO fishing or harvesting can occur because there won't be any fish, then the rules y'all set forth will be scrutinized.
Recreational fishermen spend BILLIONS of DOLLARS in travel, gear and the hiring of boats.
Someday the TOURISM affect off recreational fishermen will be valued.
David Flood
13 Mirador Ct.
Toms River, NJ 08757
201-232-1982

Emilie Franke

From: mzuralow@comcast.net
Sent: Sunday, February 26, 2023 4:01 PM
To: Comments
Subject: [External] Striped Bass PID

I am a Maryland resident, 70 years old. I have been fishing on the Chesapeake Bay since the late 1970's. I own a home located on the point of Rockhold Creek and Herring Bay in Tracys Landing. I watch the charter boats out of Deale pass by each morning in season. I fish on my 25 Parker at least once a week, often more frequently, from May through November. My fishing grounds are from the Bay Bridge, Eastern Bay, and down to the south end of the Choptank. My short trips are "out front": West River to Ches Beach, or across to Poplar Island. 10 yrs ago it was quite common to limit out with 3 on board in 3-4 hrs of trolling with 4 lines in the water. Last year I was lucky to get 1 or 2 keepers every other time out running 7 lines.

Look at the charters in Deale and Ches Beach: most are running planers with 35+ rods or running 40+ miles to get north of the Bay Bridge to live line.

I think everyone agrees that the Striper stock has been depleted. My concern is that the recreational fishing community always gets the short end of the deal when it comes to solutions. I don't see me and my friends catching many rockfish. Charter boats with their 40 rods seem to do OK. What toll do the commercial fishermen bring to the rockfish population? My empirical evidence is that the "Recs" don't amount to a large percentage of the take. The managers grossly overestimate the recreational take. I'd like to see the pain evenly distributed. Charter boats – 1 fish per customer. They are professional captains that should be able to fish for a different species after the 1 fish striper limit is reached. How many fish are the commercial fishermen allowed? I never see a lack of stripers at the fish counters.

I see MD DNR is requesting fishing results for stripers from the Recs – that's a move in the right direction for identifying where the real depletion is coming from.

Bottom line: apply the conservation measures in an equitable way. There's no sanctity of watermen jobs. As in any other industry, when you use up your resource, some businesses close and some folks have to find other jobs.

Michael Zuralow
483 Leitch Rd.
Tracys Landing, MD
571-217-3974

Emilie Franke

From: katie <shugaah1130@aol.com>
Sent: Tuesday, March 7, 2023 2:17 PM
To: MICHAEL LUISI; Toni Kerns; Emilie Franke; Tina Berger; adrian.baker@maryland.gov; josh.kurtz@maryland.gov
Subject: [External] Susquehanna Striper Fishing

Hello,
I wanted to express my concern about the striper fishing in the susquehanna last month. There was a lot of unnecessary pressure put on the fish, especially by a lot of people not releasing or handling them correctly. Seeing this for at least a few weeks changed my opinion about closures. One of my fellow anglers suggested I reach out to you all to encourage February and January be closed to catch and release next year.
Thank you.
-Kat

From: Emilie Franke
To: "Adam.Aguiar@stockton.edu"
Cc: Toni Kerns; Tina Berger
Subject: RE: Please close the Susky in January and February for Catch and Release Striped Bass
Date: Thursday, March 2, 2023 10:13:26 AM

Hello Dr. Aguiar,

Thank you for reaching out about striped bass in the Susquehanna River in Maryland. Your comments will be shared with the Striped Bass Management Board ahead of their Spring Board meeting.

Thanks,
Emilie

Emilie Franke | Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
Phone: 703.842.0716 | Fax: 703.842.0741
efranke@asmfc.org | www.asmfc.org

From: Aguiar, Adam <Adam.Aguiar@stockton.edu>
Sent: Wednesday, March 1, 2023 6:20 PM
To: Robert Beal <Rbeal@asmfc.org>; Mike Rinaldi <Mike.Rinaldi@accsp.org>; Geoffrey White <geoff.white@accsp.org>; Tina Berger <tberger@asmfc.org>; Patrick A. Campfield <pcampfield@asmfc.org>; Kristen Anstead <kanstead@asmfc.org>; Toni Kerns <Tkerns@asmfc.org>
Subject: [External] Please close the Susky in January and February for Catch and Release Striped Bass

Hello,

This past month has been a chaotic mess for the spawning class striped bass in the susky.

I strongly encourage January/February be closed to catch-n-release striped bass above the Lapidum line. With the years warmer earlier, there's been tons of spawning class fish earlier. With this, there's tons of anglers, 90% of which are inexperienced with proper catch and release practices. They purposely mishandle the fish roughly, and though I understand the incentive for taking pictures (I do myself on occasion), they do extensive photo ops with the fish out of the water, carelessly bang them against rocks, and walk the fish all the way into the shoreline from far out in the river. My friends and I have witnessed mishandled fish die and float down the river, and others washed up on the river banks. I informed DNR about this, and they should be giving tickets for fish harassment at the very least, but there's not much they can do given the current January/February regulations.

If these masses of new anglers were all experienced and conservation-oriented it wouldn't be so worrisome (After all, I myself have a staunch perspective on the need for nuance in even the March/April regulations). However, their inexperience and mishandling of the fish in wrong ways and for excessive time periods exacerbates the catch-and-release mortality. Here it's exceptionally critical because these are spawning class fish, and in these warmer winters with eggs already developed.

The DNR and policy-makers are ostensibly concerned about the March/April season, but everything is moving earlier with these warmer years. 2020-2023 (last 4 years) have been warmer and thus the large striped bass arrival has occurred much sooner. This year was extreme, with us catching spawning-size stripers in mid-January!

I understand that such changes in policies would hinder my attempts to catch these fish too, but I rather have the bass population healthy just as the DNR and state supposedly do. So I am writing this not just as a marine and molecular biologist, but more importantly as an avid striped bass angler. Please encourage your superiors to make the restrictions for the Susky earlier for future years. I understand you need before and after survey data for January-Februarys to demonstrate the effectiveness of such potential policies, and that you currently do not undertake such surveys there at that time. I emplore you to, at the very least, effectuate such surveying methods from the Conawingo dam to lapidum boat ramp, for shore-caught fish, during the months of January and February. I think our minds will be blown at the negative impact to the striper population that these crowds of shore-based anglers cause.

I, along with many others anglers that have shifted perspectives on this topic, agree that the area below the Conawingo dam to lapidum should be closed January-February for even catch-and-release. Its not only logical and consistent with your other policies, but it is best for the bass population! I have 2016 emails from fisheries biologists and DNR officers (Eric Durell and Sarah Widman) explaining why this area should be closed. Having the currently inconsistent regulations (February to March shift) continue as they are is embarrassing to the organization and will undoubtedly upset voters, especially as all the fish pics of mishandled/killed bass hit social media these upcoming months. I am mass emailing the DNR officers, state legislators and assemblymen too; and plan to write extensive news articles on the topic to bolster public awareness of this issue.

Again, please consider shutting down that area of the river to even catch-and-release next January-February. It would be better for our natural resource and environment, and after this last season you will have much less resistance in doing so from the recreational community who have largely switched perspectives on the matter.

Dr. Adam A. Aguiar, Ph. D.
Associate Professor,
Biology Department,
School of Natural Sciences and Mathematics (NAMS),
Stockton University
(adam.aguiar@stockton.edu)
732-939-5257

From:	Aguiar, Adam
To:	Emilie Franke
Cc:	Toni Kerns; Tina Berger
Subject:	[External] Re: Please close the Susky in January and February for Catch and Release Striped Bass
Date:	Monday, March 27, 2023 9:27:15 PM

Hello again,

This one of many instances that is the direct result of the susky (above the normal closure line) being put on blast in February because it was open:

8:38 LTE

facebook

Fishing Maryland
Lou Walden · 17m ·

What is going on

Greg Thorpe
5h ·

If I told y'all about my spot it ain't even rockfish season yet 😂😂😂

14 25 comments

Like Comment Send

Home Friends Watch Marketplace Notifications Menu

5:36 LTE

Greg's post

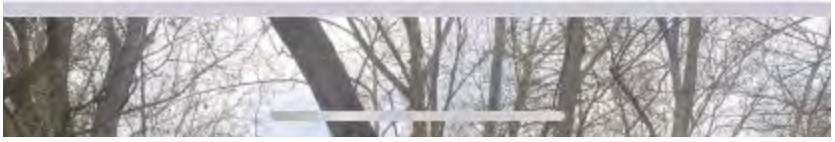
Greg Thorpe · 6m ·

IYkyk 😂😂😂🤷‍♀️🤫🤫

6 3 comments

Like Comment

Like Comment



There was even a clip sent to the March 16th edition of the Fisherman Magazine's video forecast, which had details and pics with background to fish it before closure. I have been in contact with many other anglers and DNR officers who all say many many more anglers are risking ticketing now as a result of the chaos that was broadcast in February. And many of those anglers are keeping the fish. Again, it needs to be shut down for catch and release from January through April! This would be for the health of the bass population, the reputation of policymakers and DNR, and for upholding the standard of trophy striped bass. I hope this is all mentioned in the next ASMFC meeting.

Dr. Adam A. Aguiar, Ph. D.
Associate Professor,
Biology Department,
School of Natural Sciences and Mathematics (NAMS),
Stockton University
(adam.aguiar@stockton.edu)
732-939-5257

From: Emilie Franke <EFranke@asmfc.org>
Sent: Thursday, March 2, 2023 10:13 AM
To: Aguiar, Adam <Adam.Aguiar@stockton.edu>
Cc: Toni Kerns <Tkerns@asmfc.org>; Tina Berger <tberger@asmfc.org>
Subject: RE: Please close the Susky in January and February for Catch and Release Striped Bass

Hello Dr. Aguiar,

Thank you for reaching out about striped bass in the Susquehanna River in Maryland. Your comments will be shared with the Striped Bass Management Board ahead of their Spring Board meeting.

Thanks,
Emilie

Emilie Franke | Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
Phone: 703.842.0716 | Fax: 703.842.0741
efranke@asmfc.org | www.asmfc.org

From: Capt Steve Witthuhn, F/V Top Hook

March 28, 2023

Subject: Suggestions to **reduce release discard mortality** of striped bass.

It has become painfully obvious since the implementation of the slot (28" – 35"), discard mortality of large bass has sky rocketed! This coupled with marine biologist understanding that larger/older fish produce higher quality eggs, compounds the stock recovery problems.

Regulations changes to consider and include:

All RECREATIONAL FISHERS:

1. All lures/plugs are restricted to single hooks. Treble hooks illegal for striped bass fishing.
2. All barbs on circle hooks crimped/removed. (makes hook easy to remove)
3. Large (pole type) nets required to remove fish from water and return.
4. fish should not be suspended by the jaw and/or cradled for pictures.
5. Release limit of ten fish (per angler)

COMMERCIAL INDUSTRY:

1. Gill net and gill seining should be banned.
2. All commercial harvest restricted to rod and reel/hand gear. (down riggers)
3. Coastwide striped bass harvest should be limited to same min/max length fish.

ENFORCEMENT:

1. Larger penalties for poaching & pirating: Loss of permits/licenses and vessels.

CONSISTENCY:

States with striped bass gamefish status do not have commercial quotas, Only a recreational quota. Therefore, all striped bass must comply with recreational guidelines.

GEOGRAPHIC SPAWNING CLOSURES:

1. Striped bass spawning areas should be identified, and brief seasonal closures implemented to protect the breeders.
   The rebuilding future of striped bass should NOT require a moratorium and can happen with full coastwide cooperation and commitment with implementation of HONEST and common regulations!

From:	Tom Fuda
To:	Justin Davis; Comments; WILLIAM HYATT
Subject:	[External] Comments for the Spring Meeting of the Striped Bass Management Board
Date:	Tuesday, April 18, 2023 8:07:58 AM

Dear Commissioners,

I am writing to provide comments for the upcoming Spring meeting of the Striped Bass Management Board next month. I am a recreational angler from the state of Connecticut. I am not affiliated with any particular groups and speak for myself.

Last month's meeting in which the Technical Committee provided a summary of the preliminary recreational fishing data for the 2022 season made it very clear that recreational harvest saw a significant spike in 2022, vs the prior two years (a 90% increase over 2021 and a 106% increase over 2020, in terms of numbers of fish harvested by recreational anglers). The TC made it very clear this dramatic increase in harvest has put the rebuilding plan established by Amendment VII in jeopardy, to the point where it is far more likely to fail than succeed. This increased harvest is likely due to the availability of the abundant 2015 year class, which is now firmly "in the slot" in terms of size. Therefore, I feel it is imperative that action be taken at the upcoming May meeting to address this alarming trend and get the rebuilding plan back on track. It is time to initiate the addendum process to come up with a set of management options **for the 2024 season** that will reduce recreational harvest and get fishing mortality, and the rebuilding plan back on target. IMO this should take priority over finalizing Addendum I. We need to protect the 2015 (and eventually the 2017 and 2018 year classes) by adjusting the slot limit to take some of the harvest pressure off of them. These are the fish that we are relying on to rebuild the stock, given the very poor year classes we have had over the last four year. I feel this is one of those inflection points where the ASMFC has a chance to act in the best interests of the fishery. There will be pressure from some board members to wait until the 2024 benchmark stock assessment to get further clarification of the status of the stock. IMO, there's no time to wait until the stock assessment, since that will likely delay any management action until the 2026 season. Thank you for your consideration.

Sincerely,
Thomas Fuda
Shelton, CT

Atlantic States Marine Fisheries Commission

Atlantic Coastal Cooperative Statistics Program Coordinating Council

May 2, 2023
1:45 p.m. – 3:45 p.m.
Hybrid Meeting

Draft Agenda

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

1. Welcome/Call to Order *(G. White / J. McNamee)*
2. Council Consent
   - Approval of Agenda
   - Approval of Minutes from November 2022
3. Public Comment
4. Consider Funding Decision Document and FY2024 Request for Proposals *(J. Simpson)* **Action**
5. Update on Program and Committee Activities (*G. White, J. Simpson*)
6. Other Business
7. Adjourn

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

DRAFT PROCEEDINGS OF THE

ATLANTIC COASTAL COOPERATIVE STATISTICS PROGRAM

COORDINATING COUNCIL

The Ocean Place Resort
Long Branch, New Jersey
Hybrid Meeting

November 7, 2022

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

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Council Members

Bob Beal, ASMFC
Megan Ware, ME, proxy for P. Keliher
Renee Zobel, NH
Dan McKiernan, MA
Jason McNamee, RI
Greg Wojcik, CT, proxy for J. Davis
Jim Gilmore NY
Heather Corbett, NY, proxy for J. Cimino
John Clark, DE
Lynn Fegley, MD
Pat Geer, VA
Mel Bell, SC
Kathy Knowlton, GA
Erika Burgess, FL
Brandon Muffley, MAFMC
John Carmichael, SAFMC, Chair
Marty Gary, PRFC
Rick Jacobson, USFWS
Richard Cody, NOAA

Staff

Toni Kerns
Tina Berger
Madeline Musante
Emilie Franke
Adam Lee
Joe Myers
Jennifer Ni
Mike Rinaldi
Julie Defilippi Simpson
Anna-Mai Christmas-Svajdlenka
Geoff White

Guests

Jason Avila
Alan Bianchi, NC DENR
Jason Bochat, NYS DEC
David Borden, RI (GA)
Michael Brown, ME DMF
Pete Burns, NOAA
Julia Byrd, SAMFC
Patrick Cassidy
Nicole Caudell, MD DNR
Phil Coates
Nicole Lengyel Costa, RI DEM
Jessica Daher, NJ DEP
Maureen Davidson, NYS DEC
Wes Eakin, NYS DEC
Warren Elliott, PA (LA)
Mark Eustis
Dawn Franco, GA DNR
Erica Fuller, CKF
Angela Giuliano, MD DNR
Daniel Hadler, NYS DEC
Melissa Albino Hegeman, NYS DEC
Jaclyn Higgins, TRCP
Harry Hornick, MD DNR
Jesse Hornstein, NYS DEC
Helen Takade-Heumacher, US FWS
Thomas Kosinski
Jared Lamy, NH F&G
Brooke Lowman, VMRC
Mike Luisi, MD DNR
Dee Lupton, NC DENR
Nicole MacDonald, NOAA
Jerry Mannen, NC (GA)
Genine McClair, MD DNR
Lorraine Morris, ME DMR
Brian Neilan, NJ DEP
Thomas Newman
Jeffrey Nichols, ME DMR
Will Poston, SGA
Craig Pugh, DE
Michael Pierdinock
Jason Rock, NC DENR
Daniel Ryan, DC
Ross Self, SC DNR
McLean Seward, NC DENR
Nathan Shivers, CFARM
Ethan Simpson, VMRC
Andrey Sinchuk, NYS DEC
Somers Smott, VMRC
Rene St. Amand, CT DEEP
David Stormer, DE DFW
ElizaBeth Streifeneder, NYS DEC
Kevin Sullivan, NH F&G
Scott Curatolo-Wagemann, Cornell
Craig Weedon, MD DNR
Peter Whelan
Holly White, NC DENR
John Page Williams
Steven Witthuhn
Chris Wright, NOAA
Erik Zlokovitz, MD DNR

The Atlantic Coastal Cooperative Statistics Program Coordinating Council of the Atlantic States Marine Fisheries Commission convened in the Monmouth I Room in The Ocean Place Resort via hybrid meeting, in-person and webinar; Monday, November 7, 2022 and was called to order at 1:15 p.m. by Chair John Carmichael.

CALL TO ORDER

CHAIR JOHN CARMICHAEL: We'll call the Coordinating Council to order.

APPROVAL OF AGENDA

First bit of business is Approval of the Agenda. Any comments or additions on the agenda? I don't see any, so the agenda is approved.

APPROVAL OF PROCEEDINGS

Second bit of business would be Approval of the Previous Meeting Minutes. Are there any comments on the prior meeting minutes? Seeing none; minutes are approved.

CONSIDER FY2023 ACCSP PROJECT AND ADMINISTRATIVE PROPOSALS FOR FUNDING

MR. GEOFF WHITE: Thank you, John, our next agenda item is Consideration of the Project and Administrative Proposals. Julie Simpson, our Deputy Director is going to cover this.

MS. JULIE DEFILIPPI SIMPSON: I'll start with the average ranking of the maintenance proposal. There are three projects on Maintenance Proposals. We have the Rhode Island Black Sea Bass, the North Carolina Biological Database and PRFC Electronic Trip Reporting. Then in the average ranking of new proposals we have again, these are the values that this is for both of these slides this is the ranking of both the Advisors and the Operations combined.

That is weighted as one vote per person, if not the average of Operations and Advisors averages. For the new projects we had six new projects here. I won't read them all. These are in your meeting materials. The total of all proposals does not exceed the expected value of funding. The recommendations from the Operations and Advisory Committee.

They met in September. The recommendation is to fully fund all proposals, both maintenance and new. But there were some discussions that they wanted to pass on. There was extensive discussion on the project for the collection of recreational fishing data from citizen science sources. While they do recommend fully funding this project, there were some questions about setting the precedent on the paying for a private entity for data.

Where they don't have any oversight or input into how those data are collected, how this approach might fit into the approach of citizen science as it moves forward with ACCSP and SciFish. There was a note that this is a pilot, and so they need to recommend the funding for it, because it was a pilot and was being requested for development and programming. For that particular pilot, FishBrain is waiving their data licensing fees for this year. Again, the question is, how does this fit in with SciFish? Then the final item here was the request that the PIs incorporate into their outreach effort continued understanding and participation in MRIP surveys, with the idea that explaining, this is what citizen science is, this is what it does.

To manage expectations, the purpose of this is not to replace the existing MRIP survey. Additional recommendations, were from that the Coordinating Council determined an appropriate avenue, such as the existing funding subcommittee, or perhaps a new working group, to review the potential to create guidance for the RFP on funding for application development.

What data are to be collected, how those data would be used, methods of collection, duplication of effort, and to whom those data would be transmitted. Then the last recommendation was that there was significant appreciation for the fact

that the Accountability Workgroup did put in an independent proposal.

However, they recommend that this type of proposal actually be incorporated into the Administrative Branch as an option moving forward, because while they appreciated the transparency, because of the nature of the Accountability Workgroup being a workshop, it doesn't actually make it easy to rank.

It was one of those things where they said, you should absolutely do it, but it doesn't rank well. It's easier to just say, we approve the Admin Grant with this option in it. Appreciation of the transparency, but maybe not quite so transparent in future was their recommendation there. We do have a few funding notes for this year.

We did want to note that the Admin Grant is slightly less than last year by about $18,000.00. We are funding Helpdesk and FISMA through other sources. We also wanted to mention the managing 100 percent lobster harvester reporting in Maine. As many of you may have noted, that project did not appear in your maintenance proposals.

They did send a letter, and that was part of the original materials that went to the Operations and Advisors. They have moved that implementation, the date back, because they do have some of the funds available that have already been distributed, and they wanted to have the opportunity to spend those funds.

They want to push back their maintenance timeline by a year, and so they basically put a pause on their maintenance fund request for a year. They're sort of taking a break, so that they can spend the funds that they have. But they did want to note that they would be returning next year as a maintenance proposal.

Also, we wanted to point out that the initial RFP was extended through August 18. Five new proposals were submitted in that period. There was a significant amount of proposals that didn't get submitted in the first round. The Leadership Team met and decided to extend that. I think this is good awareness. We wanted to share with you all that there are funds available, but we do feel like this is an interim period, where the stepdown that has been in place for some years is kicking in, and now is a good time for new maintenance proposals to come online. The staff has been working with the Committees on new proposals, and we encourage everyone to work with their staffs as well on proposals for next year. Then finally, the Leadership Team does recommend that any unallocated funds for this year roll forward, so that they can best support coastal needs next year.

CHAIR CARMICHAEL: Thank you, Julie, for that overview. I think we probably need to go back at least a slide, maybe two and have some discussion on the recommendations, for sure. Any questions for Julie on the presentation to start out? Yes, Renee.

MS. RENEE ZOBEL: Julie, could you give us a little bit more info on the citizen science proposal that was discussed? I know when I read it, I shared some of the similar concerns. I talked to my Ops member about it. Maybe a little bit, sounds like it was fairly heavily discussed and controversial. I kind of shared similar concerns, and I would love to know a little bit more about the discussion, and how everybody came to it being a pilot program, therefore we think it should be funded. A little more context I think would be really helpful.

MS. SIMPSON: The quick summary of the proposal is the idea; it was a little bit complicated. There was sort of a graphic in there. There is actually two sort of flows of data. One was coming from the application angler catch that Harbor Light created for Rhode Island, and that pathway didn't really have any concern.

The other was data that would come from FishBrain, and FishBrain is not interested in sending data to ACCSP, and so those data would be sent to

Harbor Light, who would then appropriately, adjust them, so that they could go through the SciFish data flow that's being created right now. Their intent is to charge money for those data.

There were a lot of questions asked about should we be paying for citizen science data? What is our approach to citizen science? Is it something that we want to have monetized? It was that idea of also, where would that funding come from in coming years? They put out a number that they waived this year, and they said they would be willing to negotiate in the future.

But it is a substantial sum of money. They said, we could try it this year and see how the pilot goes, because it's not costing us anything. But we really have to think about whether or not we do this moving forward, and how that would go. That is what I can remember. Did you have anything else to add to that?

MR. WHITE: Thanks, Julie, agree with that. One of the additional questions was, for volunteer anglers that are using FishBrain, they are answering questions that haven't been vetted through what the SciFish EPI was intended for. There was a question about, are the data translations meeting the intent of the actual data storage?

Then beyond that, it's an unknown, so this goes on both sides of the pilot issue. How will we make sure that a single trip wasn't represented in more than one dataset? In one sense it's a pilot, you have to do the work to learn that. In another sense is that enough of an issue for everyone at the Coordinating Council to have a decision point or a concern.

CHAIR CARMICHAEL: We have Kathy Knowlton online.

MS. KATHY KNOWLTON: I really appreciate that some time was spent with this proposal recommendation from the Operations Committee and Advisors on this particular proposal. I think this is a really critical issue that came up the appropriate way through our process. It means our process is working.

Our ranking process has done really well for many, many years, and it's pretty well equipped to deal with new ideas, innovative ideas as they arrive. This is certainly one of them. I appreciate the detail that is drawn into the various components of why there was great discussion on this, and why it deserves more conversation.

However, and you all knew I was going to put a however in there. I have great reservations about this path, and those reservations are comforted, I guess you could say, by the fact that it is a pilot project. I understand what's being said, because clearly in that path if you don't know what you don't know, until you look into it, and you try to go down the path.

Then in future years there might be levels of funding that are required that would push this to a different place in the ranking. But conversation, I agree with Operations and Advisors, has to extend beyond their level. They're clearly reaching out and saying they would like some policy level discussion, on how to handle these things moving into the future.

When we develop primarily the commercial data collection methods and paid for that through ACCSP for the various partners, we generally were not coming up against for profit companies that were wanting to do the same thing. That is one of the ways in which citizen science is very different. Getting anglers to want to choose anything that rolls out through ACCSPs program, with the development of SciFish.

It basically puts us in the position of competing in some ways for the attention to those Apps. We're going to have to be cognizant of that and aware of that. But paying for data is something that makes, I think us all, understandably a little bit nervous. Also, paying for data through a point in time. My understanding quickly, reading this proposal is it

would only be up through FY23 when this project was done, and not forward into the future.

I've got some concerns. I really appreciate them being raised in this detailed and thorough format, and I hope that this moves forward by Coordinating Council members, maybe in a workgroup with some input from other Operations Committee members and others that may be interested, and then really sitting down and having a long conversation about how we deal with citizen science, and using our precious, very precious funds to go down that path.

CHAIR CARMICHAEL: Yes, thank you, Kathy, we were waiting for your however, so we appreciate that. Next up is Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, just to echo what Renee and the Ops Committee and Kathy and everybody is saying. It is kind of a strange dynamic that gives me a little bit of heartburn. You know you've got general public anglers using these Apps, FishBrain, FishRules and other things, and they're reporting their catch. I think some of them are doing that with the idea or the hope that it would improve management. You know it gives some information about discards or locations or whatever it might be. Then, so this data exists. Now, in order to access that data, management, ACCSP or whoever it is, is having to pay.

They are giving $27,500.00 of that access this year in kind. But next year is it close to a $30,000.00 bill to access the data that general anglers, you know citizen science, citizen anglers are providing. It's just I'm not sure that all the folks putting data into these Apps, necessarily thought on the back end, the company that they are providing this data to is going to absolutely sell it to someone.

Yes, that gives me quite a bit of heartburn, but you know I agree with the idea. Let's try it, see how it goes for a year. Is there value here? Maybe have a bigger conversation, as Kathy was suggesting of a subgroup for this group or Ops Committee, or something to figure out, how are we going to deal with this?

As more and more data will likely end up in multiple Apps up and down the coast, and what do we do to gain access to that data? Do we pay for it, or do we set up some different agreements? Do we let folks know which ones are free and which are not free, as far as managers getting access to that data, and let them decide where they want to report? I think it's a tough precedent for me to wrap my brain around and be happy about.

CHAIR CARMICHAEL: Yes, I think a lot of people feel that way. I know I certainly share that as well, and I think it's CitSci here, but a lot of those Apps also do sell the idea of kind of angler diaries, and just basic catch information. This model could quickly expand to lots of other catch. I have Lynn and then Mel on the list.

MS. LYNN FEGLEY: I also share a bit of a concern, although I think to some degree I can relate. You know the state of Maryland, and I think it's been over ten years. You know we use a private entity to collect commercial data over SAFIS, because at that time over a decade ago, SAFIS wasn't giving us what we needed.

We needed a hail component that added significant accountability to a harvest. I think fast forwarding to now, the ACCSPs platforms have caught up. One of my questions is, I think it's worth asking the question, what are these private entities collecting that is needed that can help management? If it is helping management, is it even possible that ACCSP would catch up?

You know start incorporating those things into its own platform, so that people can be directed there. Because part of the problem is if there is something being offered over here that is not offered through, and SciFish is one of the most brilliant things I've heard about in a long time, and it has some

flexibility. But I think we need to be cognizant of that gap, and standing ready to fill it if need be.

CHAIR CARMICHAEL: Mel.

MR. MEL BELL: Yes, I think Bob had a really good point. There is an expectation, I believe, on the part of the folks that are utilizing these that somehow their efforts to do this are going to go towards being applied somehow in management. We've seen that with other applications used in other fisheries and other places, where they were useful in making decisions about things, perhaps like red snapper and other fisheries earlier on.

That is just something to be cautious of with this is that as you pointed out, there may be sort of secondary benefits, if you will. If there is something that the individual anglers can benefit from directly from it that's great. But I think there really is an expectation that somehow these data will be used by managers. Again, unfortunately it's not free to collect this data.

You're dealing with a private entity; they are a company. That's why they are there, to make a living. Just as we kind of look into this area, we have to kind of be cautious about what we could get ourselves into, because like we said, this could get really expensive, if you all of a sudden decided you really wanted a particular data, and the price was what it is. Then I guess there are no price controls on this sort of thing, so it could get rather expensive.

CHAIR CARMICHAEL: Yes, thank you, Mel, and I think Geoff, maybe if you want to comment some on what they offer. I know whoever, talking to different Apps, one of their thoughts is they offer convenience. You know they try to package the rules and the weather and your fishing log, and all of this stuff together. I know they certainly try to offer convenience. But Geoff, as far as Lynn's question about, are there other things, and ACCSP catching up. Maybe you could comment some on that.

MR. WHITE: Thanks, Lynn, for the question. There are a couple of questions that I'm going to tease out of this. Right now, when it comes to not just angler catch, but volunteer angler Apps in general. There has been a proliferation of them over the last ten years. There have been several different AFS workshops about what those applications are good for, or not.

MRIP is struggling as well, with how to use these voluntary reports, and what they're best used for. That is one of the great things about SciFish, because it lends in that idea that oh, these voluntary angler things are great for, and I'll use the examples I remember, not all of them. They are great for presence/absence.

They are great for discards and depths and species IDs, things that are supplemental to the catch estimates that are from a probability-based sample, i.e., MRIP. Not confusing what is a probability-based sample, what can you expand for total effort, total catch, total discards, with how do you characterize those total estimates with more information about presence/absence, geographical location, discard, species IDs et cetera.

The voluntary Apps can do a lot of those other things. Getting back around to Lynn's question, how far behind is SAFIS, is ACCSP and SciFish. SciFish is probably another year, maybe two from being open to more systems to use it. Right now, it has two Apps in it, later in the presentation. But there needs to be some more work to get there, so it's not a right now item. While I have a microphone. One of the questions is really, is it worth funding the pilot now, because there are available funds? Everybody want to bring that to the Coordinating Council to really discuss and decide upon? Then on the next slide, the top recommendation is, whether or not it's funded, should there be a group to delve into some of these questions about future funding, application development, what is the right fit for the strategy of

ACCSP funds. Maybe if we have those conversations separately, or if you want to ask me that might be helpful, because in my mind there is really two separate things.

CHAIR CARMICHAEL: Yes, Dee.

MS. DEE LUPTON: I'll take your second question. I do think there needs to be a group. citizen science I think it can be useful, but I think we certainly need to set expectations and put some parameters of what we need, instead of other people telling us what we need. We need to identify what we need.

I worry about us collecting data that is never used, and anglers have been told, oh this data will be useful for management and we've never used it, because it wasn't useful, because it was not generated from the managers as what we need, and we needed the parameters. These competing Apps, I reckon, you know maybe what type of feeds do they need to provide. I reckon some structure around it. I see that as a need.

The first question, there is part of me coming in here I had a lot of reservations of this proposal, like others. It's a pilot, and if we set expectations. But you know it's kind of like, well maybe we could fund it for one year. Once we dive into that and people like it, and we get pressure from the public to keep funding it or something like that.

That's going to be an issue, because they're going to have to step down off funding too. Then they'll start charging anglers or really sending us a bill. I don't know how that's going to look in the future. I see the dangers are in the future, more than just this one-year proposal. I haven't really wrapped my own mind how that's going to work, but the parameters do need to be set.

CHAIR CARMICHAEL: Is there support for, let's look at the second question. Maybe we knocked that out, for that request there in the first bullet. Does everyone support that? I think Kathy gave a pretty good description of what went down at the Ops as we've heard, and I feel like they did their part properly and didn't have a reason to say, don't fund it.

They just recognized there is kind of a new wrinkle in the system here, and they are asking for the higher-level policy guidance, which to me seems completely appropriate for their perspective. Is there consensus to create a group of this type, and then we can work out who is on that, et cetera?

MR. WHITE: Yes.

CHAIR CARMICHAEL: Kathy, do you want to jump in here? Go ahead, Kathy.

MS. KNOWLTON: Yes, I absolutely support a workgroup being pulled together to have these discussions. I think it should involve some representation from the Operations Committee, because they've already had the detailed conversation. I think having folks involved that have been working on a ACCSPs SciFish would be helpful as well. I think we virtually almost have to fund this project, because it did rank in our system, and our system is working. If the Operations and Advisory Committees had lengthy discussions about this, and they recommend to us funding this.

Then it would behoove us, I think to go with that recommendation, because they obviously struggled before we knew there was even a struggle with this one. I am supporting it being funded with 18 caveats and asterisks following it. But yes, they did a really good job, and again kudos to them.

CHAIR CARMICHAEL: Geoff.

MR. WHITE: Dee, I'm going to extend on the thought. This first bullet that is on the screen to request this group. This bullet was brought up by the citizen science proposal. But the discussion at Ops was really beyond that as a more strategic thing within ACCSP, and that is when ACCSP has an

API that is kind of on water application agnostic, and ACCSP has a default option that is already paid for and available to all partners.

When should ACCSP be funding alternate on-water applications? I think it's a good point for this group to handle. I think there is a history where ACCSP wasn't ready, and we funded another App to get up to speed, to help a partner that would be applicable across multiple partners and ranges that includes Maryland, that includes you know South Carolina with their charter boat systems.

That includes a couple of different perspectives and projects over time. I think that is within the realm of what ACCSP was intended to do, get something started, make it applicable, make it flow through a centralized data collection and availability system. Certainly not saying as staff, or speaking for anyone else that ACCSPs software should be the only thing available.

But I think we've been thinking internally, as the Coordinating Council has been asking us to do for several years, about what is the best strategic use of ACCSP funds in the long term, and this question of which Apps are funded, which default applications do we create, should be adopted. There is also good opportunities and examples.

I know I'm kind of going a little long here. Where partners have seen SAFIS eTRIPS and decided to use that software as a cost-efficient method to implement trip reporting in their jurisdiction. It's not the only option. It is an option that was intended for that expansion purpose. That kind of option was available for ACCSP funding.

This bullet, this workgroup, I completely support where I'm hearing the group go. Create this workgroup, include this iFish people, include Ops, include hopefully a couple of folks from Coordinating Council. But I wanted to just kind of extend that thought that it isn't just citizen science, it's kind of all applications and RFP process.

CHAIR CARMICHAEL: All right, yes, thanks, Geoff. I have Richard Cody online.

MR. RICHARD CODY: Yes, John, thanks. I hope you can hear me. I'm doing dual monitor versus phone here. Can you hear me, okay?

CHAIR CARMICHAEL: Yes, Richard, we hear you.

MR. CODY: In the two bullets that are on the screen, I mean absent from those is an actual research question. It's one thing to create an RFP that looks at App development. But really, when you're talking about an App, you're talking about a logbook, basically. There needs to be some focus on what you want in that logbook, what you want in that App, in terms of the data that are being collected.

That's why I'm a little bit concerned here that this is a little bit of a solution in search of a problem. We don't have a research question that specifically identifies, and that bothers me a little bit. I think there are types of things that we can look at that Apps obviously would be more suited to than others.

But I think that we need to have some emphasis on the types of data that we are collecting and the reasons why we're collecting it. Because the whole question that was brough up by Kathy and Dee and others, about the expectation that anglers have that their data will be used. We can't go looking for a use for the data after we get the data from the angler, we have to have something, I think in mind ahead of that.

Anyway, I just wanted to put my concerns out there. Then the other point I wanted to make was related to a point that Geoff brought up earlier about MRIP, you know a probability-based sampling program struggling to incorporate App-based data. That is any probability-based survey that is struggling to use nonprobability-based information.

Obviously, there are assumptions that you can make to make the data a little bit more accessible or more useful. I think that that is a more general problem, it's not just an MRIP problem. It relates to a lot of different surveys. Anyway, I just wanted to make those two points, and also that I would be in favor of a workgroup to look at this.

There have been some efforts on the NOAA side, and I think at some of the state level as well, to look at appropriate uses for Apps and things like that. The MAFAC Committee under NOAA produced a report, I think earlier on this year that looked at data gaps and the potential for using App based reporting to fill those data gaps. There are some sources of information that are out there also, I think that we could latch onto with a working group.

CHAIR CARMICHAEL: Kathy, are you back?

MS. KNOWLTON: Of course, I am, you know I never ever even go away. Richard's comments dovetail perfectly into what I was going to mention about one of the tasks that the SciFish Workgroup, within ACCSP has brought up to leadership, as you will recall. I think it was last June. Julia made a presentation on where we are with the development of SciFish in ACCSP, and that we will be working on developing some policy and guidance for partners, as to who gets to use this tool within ACCSP. What are the general recommendations, and what makes good project, what should be included? Are those just recommendations or are they requirements? This fits perfectly with what Richard just said, in terms of getting at the issues, at least as far as ACCSP is concerned, in terms of the minimums that are needed and the ability of projects to manage expectations. We always talk about with citizen science projects and also, what are the data going to be used for? Confidentiality, all those things.

This group with the SciFish is supposed to be working on developing those in the next year. I would recommend that we find a way to combine forces, and have a larger conversation that includes things that Richard just mentioned, about other conversations have already been taking place through NOAA with the MAFAC, and other groups.

Can we please try to pull everybody into one place, and maybe have a conversation, because the effort through ACCSP with SciFish is representing the entire Atlantic Coast, in terms of a new coordinated effort to wrap our heads around citizen science data in the marine fisheries world. We're not going to be the end all for everybody's needs.

We certainly can't force other groups and entities from creating your own App, especially when they are for profit. But we can at least be coordinated through the Atlantic Coast. I think it would behoove us to try to dovetail both this question generally, as it arose from this specific presentation, as well as what the SciFish Workgroup has already been tasked to do.

CHAIR CARMICHAEL: Yes, so I guess I just want to try to wrap up the discussion on the first bullet. I haven't heard anybody raising any concern, so since there is support for keeping this group, creating this group with representatives from Ops, a few Coordinating Council folks, the SciFish group, and then as Kathy said, trying to loop in some of the broader NMFS perspective on these things.

You know NMFS has a citizen science program, which I'm sure SciFish people are well aware of, because Julia has been pretty engaged with them, as a result of her working on the Council's citizen science program. It would probably be good to loop them in as well. It sounds like we have support for that, and then we can talk about the second bullet, and then we can talk about the funding, perhaps.

Richard, I understand you had your hand raised again. Do you have something to that, or are we ready to move on? Support for the first bullet, and then the second bullet addressed the difficulty they had in dealing with the Accountability Workshop,

and really recommending that this type of thing be handled through the Administrative Grant.

Is there any objection to handling such workshops through the Administrative Grant? Okay, seeing none; I think we can support that as well, Geoff. That brings us up to the funding action, and the Ops recommendation was to fund all of the proposals, and then we also had a little bit of money left over we recommended for carrying over, because we do anticipate significant future needs in the coming years. Open that up for some discussion. All right, well I'm not seeing any, you've got to draft a motion, okay. Kathy, go ahead.

MS. KNOWLTON: I can hold on if you want. I'll definitely approve the motion, but I kind of wanted to go back to the other issue with, I think it was the Accountability Workgroup.

CHAIR CARMICHAEL: Go ahead.

MS. KNOWLTON: Can you go back up to that slide where it shows the comment? I'm curious as to, so the Accountability Workgroup submitted an entire proposal that everyone said, appreciate it so much, but you know we don't need to go to this length for it, although we are really grateful that you all put in the time. Was there something that made that group think that it needed to be at the level of a proposal that was outside of just being completely transparent?

Then my second part of that would be, I support the recommendation that workshops and similar activities be included as optional in an administrative grant, but I would like to see some level of detail in the Administrative Grant. Perhaps not as long as what was given in this proposal, but it would be written up as a fairly detailed item that's an optional item in the Administrative Grant, so that people can really dig into it and see what it's about would be my recommendation.

CHAIR CARMICHAEL: I see Julie, or was it Geoff, I forget which one of you. Geoff was, sorry. Geoff can go ahead. You guys do whoever needs to do it, don't listen to me.

MR. WHITE: We make it work, it's all good. Kathy, thank you. We were called out for being a little over transparent by Ops, in this case. What really happened was when the Coordinating Council tasked the Accountability Workgroup last May, to kind of follow through and take the next steps. That process and the extended RFP allowed for an opportunity to put in a proposal to fund the workshop and make people aware.

That is why we submitted it as a proposal, and I certainly appreciate your comments about not making it a short paragraph in the Admin Grant as an option. I think having the proposal there as an appendix that can be fully evaluated is an excellent suggestion, and really kind of where my mind would be on that already.

Having it clear, having it there, but the type of work for that we as staff did not want to kind of hide in and burry into and Admin Grant proposal that wouldn't be clear about a choice. We also didn't want to over emphasize kind of the funding choices that were happening. When it turns out we created that, put it in front of Operations Committee, there was a process problem where it didn't fit the ranking criteria, and that was a whole lot of the discussion. As Julie pointed out, it wasn't a bad idea, it just wasn't easy to be ranked.

MS. KNOWLTON: I think that having it like you said, as embedded as an appendix, also gives the Operations and Advisors the option for commenting on the extra or the optional task, and still you can relay at the bottom of the recommended funding for future years from Operations and Advisors, that they recommended this be included. That still would be part of the discussion of the Coordinating Council, and it helped a lot. I kind of wish we had an award that was named being overly transparent, because this was awesome.

CHAIR CARMICHAEL: Thank you, Kathy, yes, I think that was some good guidance to staff there for sure. I think we can go back to the funding motion and ask that someone may perhaps read that out. Give us a second to switch screens. Does anybody wish to make this as a motion?

MR. JAMES J. GILMORE, JR.: You guys are way too shy around here, you've got to wake up. **Yes, move to approve the ACCSP FY2023 projects as presented to the ACCSP Coordinating Council, with unallocated funds to be held in the ACCSP Administrative Grant for future determination.**

CHAIR CARMICHAEL: A second by Mr. Reid, thank you. Megan.

MS. MEGAN WARE: More of a question, and Geoff or Julie, this is not to put you guys on the spot, but for the workgroup on the funding for application development. I'm curious if you have a sense of the timeframe of how that workgroup may operate, because I think I can support the motion today, knowing it's a pilot project that citizen science project.

But I think it would be really great to have a better footing or framework of how we want to move forward, should we see this next year. That workgroup though seems like it has, even just in the 30 minutes we've been here, evolved into something that is pretty large. I'm just curious what your thoughts on how quickly that group can actually accomplish the growing task.

MR. WHITE: It would probably need a couple of meetings to begin with, and then fold into the Funding Workgroup, because that would be part of the RFP. We would have to talk internally and figure out if that could happen before the RFP that normally goes out in May of 2023. That does seem like a tight timeline. Julie, do you want to add anything? Thank you, Julie.

MS. SIMPSON: We're side barring.

MR. WHITE: The point was that the SciFish small group that is working on policy would probably make some progress before then. However, it wouldn't be formalized in the RFP by May. I think there is opportunity to make progress on some of that committee. Again, I took those recommendations as kind of separate actions, so there is an actual motion for the funding of the proposals that you have in front of you today. Then if there is a desire for a separate motion, or just an understanding to move forward on creating that workgroup, we'll get started.

MS. WARE: Yes, that's helpful. Yes, I think as much as we can keep those on somewhat parallel tracks, so we're just in a better position for that conversation next year, I think would behoove us. But acknowledge that there are only so many hours in the day.

CHAIR CARMICHAEL: Bob.

EXECUTIVE DIRECTOR BEAL: Just a quick comment on the unallocated funds. You know some of the conversations we had earlier in this meeting were to hold those funds until, it almost sounded like next year's RFP process. But I actually kind of prefer the way the motion is worded, kind of open ended where there are parts for a while. Maybe a high priority need comes up later this year, you get the Leadership Committee together and decide we could use those funds later this year, if that were to happen. I think I like the way the motion is worded now. It seems to be a little bit more flexible than necessarily holding onto these and waiting a full year before we work on it. I just want to make that point. We may, if something really were to pop up, I don't know what that would be, we might be able to tap into those funds if we had to.

CHAIR CARMICHAEL: Yes, that's a good point. We don't know what will pop up. All right, anyone else? Okay, is there any objection to the motion? Anybody online raising their hand or anything?

Okay, no objection then the motion carries. Next, Geoff.

CONSIDERATION OF THE ATLANTIC RECREATIONAL IMPLEMENTATION PLAN FOR 2023 TO 2027

MR. WHITE: Thank you everybody for your conversation, discussion on that and action. Our next item is for Consideration of the Atlantic Recreational Implementation Plan for 2023 to 2027. This is an action item, so just as a quick reminder, and it's in the summary. You've got the Regional Recreational Implementation Plans were originally requested and developed for MRIP, and they used the five or six regional implementation plans to set national priorities.

They are supposed to be updated when regional priorities shift, or every five years. This would be the second Atlantic plan, and after that five-year timeline. As part of the MRIP Regional Implementation Council, ACCSP represents the Atlantic partners, gathers input, and puts all that together to represent the activities and major priorities.

While this document is for delivery to MRIP, the ACCSP approach is really to collate this not just for tasks for funding for MRIP, but also part of the ACCSP request for proposals and/or supplemental data to MRIP that could be used in assessments and management. It's kind of trying to double dip the effort, and make sure that we get everyone's regional priorities here.

That said, as you all discussed in May, you asked for kind of a reranking of these things and removal of Citizen Science as an actual priority, which we agreed with, so it's been moved down as a tool that could be used to address any of these priorities. Improve the in-season monitoring remained at Priority Number 6 in this numerical ranking.

I will say that because of the reranking activity, a lot of these got very close in their scores, and almost rotated in their order between Items 3 through 6. There was kind of a 3, 4, and 5 and 6. It almost swapped. They were very close, it was a good approach to go through, and I appreciate everything that the Council and Rec Tech did to get us here.

Just as a reminder, the reason that Items 1 and 2 are still on the list is because, even though MRIP has, through modern fish act, provided funds to increase the dockside APAIS sampling, that's really only been completed for almost two years now, 2021 and 2022. That needs to kind of continue on, to see if it has the affects in the data that are expected by doing all those additional sampling assignments.

While I'll touch on progress in the comprehensive for-hire data collection, again that's a work in progress and still is a priority to continue there. We had advice to keep those in place. With that, I'm not going to walk you through more of the document. I would ask for discussion and a motion.

CHAIR CARMICHAEL: Yes, any discussion on this? I appreciate you guys updating that and taking the guidance and making those changes. Do you have a draft motion already drafted, perhaps?

MR. WHITE: We do, and we're working on showing it.

CHAIR CARMICHAEL: Cool, well I had a feeling you might. Is Kathy online?

MS. KNOWLTON: Yes, I was just going to congratulate you all. I think you all did a really good job on a highly detailed and informative document that can be picked up by a lot of people that were just delving into the challenges for collecting marine recreational fisheries data. They can read this and really get a good idea of what is going on with the various surveys and programs are, and where we still have needs on the Atlantic Coast.

You all did an excellent job of getting this information ready, and hopefully it will be of high utility to NOAA for conversations about future

developments within MRIP. I would be happy to make the motion and read it as given, if that is okay with you all. I'm going to take that as a yes.

CHAIR CARMICHAEL: Oh yes, please do.

MS. KNOWLTON: Okay, I move to approve the Atlantic Recreational Implementation Plan (2023-2027), as presented to the ACCSP Coordinating Council.

CHAIR CARMICHAEL: Second by Mr. Bell. Any more discussion on the motion? Any objection to the motion? All clear online, okay thank you, motion stands approved.

MR. WHITE: Thank you very much, we will finish that up, and again the next step is to submit that to MRIP, now that it has been finally approved, and that dovetails well into the larger MRIP process, where they're getting updated implementation plans from all the regions, while they finish their next five-year strategic plan. That's great news, thank you. With that, Mr. Chair, I see you nodding. I can head right into the Program Updates.

CHAIR CARMICHAEL: I think that will be fine, keep us moving along. There is probably an important Board to come along here soon.

PROGRAM AND COMMITTEE UPDATES

MR. WHITE: We'll run through some topics that we have been working on that are kind of exciting to us, and I think to all of you. The first one here is really an update on the confidentiality process. This is based on PRFC now sending us direct eco data. The confidentiality for, and so congratulations to PRFC and exciting for us.

The confidential use to be through Virginia, so if you had access in Virginia, you would get access to the PRFC data. The new process, we've got a new partner on the confidentiality form that will get signed off, and people would request it. We can be much more granular in that approach and the timelines. We're kind of excited to have this take the next step. For those who have confidential access today, how will this affect you? The first thing is, those that have access today through Virginia, will have that access until it expires. All access through Virginia has a one-year timeline. Instead of expiring everybody all in the same day, and making them go into the website and request another one, and putting a burden on PRFC, we said let's let them expire on the dates that they naturally would, and when they do, if those people want access back to PRFC data, they will specifically request it, and therefore that will be handled by PRFC staff to review and approve or take action on those next steps.

Congratulations to PRFC, thanks for letting us move a step further in the granularity of this. Pilot on data dissemination activity. We finished the fall release of the calendar year 2021 landings, so there is a spring data load and then the fall, which is more complete. This has a smaller change to the landings, where either different items were collected, or latent reports were entered.

But that was completed on time. I think it was released September 19, which is right on our normal schedule. We've been hitting those spring and fall data releases pretty consistently for the past four years. The Data Team and the rest of us are pretty proud of getting that done. That relies on all of your staff getting that data cleaned up, squared away and sent to us on time. A roundabout thank-you to all of you.

They've also provided data to eight stock assessments listed there, five FMP reviews, and one of our action items this year was to develop a searchable online inventory for the biological and bycatch programs. This isn't the raw data, it is the references to what type of biological programs are out there, who are the contact points, and what kind of information is collected by them.

Along the same vein, another action item was to add information to the biological data module, and

staff have been working really hard with both the TIP data and the South Atlantic states. This is a process improvement, where in the past the South Atlantic states, the TIP data would be collected. They would send it to ACCSP, and to TIP, and then would have to get filtered back around another way. It was kind of double effort.

What we're working on now is to have the states send that TIP information to ACCSP, we'll compile it, and then send it back down to, I think it's Miami, so Southeast Fisheries Science Center, so process improvement there. Continuing to support the SEFHIER data flows for the for-hire in the South Atlantic and Gulf of Mexico.

That is both through adjustments and changes to the SAFIS eTRIPS Application, the API itself that collects the data, and at least the other primary App that collects this on the water is bluefin vessel software, which submits again, through the ACCSP API, and then it goes down to the Southeast Fisheries Science Center and SERO.

Moving on, another big item on partnerships. Back to MRIP. We have hit another milestone of sharing data systems that were developed for MRIP and through ACCSP across regions, it is both fiscally efficient, and it standardizes the survey implementation, and it speeds the data delivery. On the APAIS tablets, we've talked about these for a few years. ACCSP has had them in the field since 2019. The Gulf states, three states implemented that in 2022, and NOAA is now asked for our help. We've provided them the software so they can deploy that for Hawaii in 2023. We're in the aspects of sharing that. Each region has their own database for it, and supports their own users, but it uses essentially the same tablets, essentially the same program. While there is a little bit of flexibility within the regions, it really standardizes things, and it has been great, because so many more users will give feedback on what are the priority items to make changes to.

What makes the survey work better for staff? What makes it work better for data processing? What makes it work better for those of us in the middle, handling that data and passing that on to MRIP. It gives MRIP a little bit more time to do their work, to create the estimates and review the data before the regular release of the information. The other aspect is the for-hire telephone survey, and the state conduct.

Again, ACCSP developed the computer assisted interview, or a computer guided survey. That has been in play for several years with the states doing those telephone calls. GulfFIN implemented this for their three states, Florida, Alabama, and Mississippi in September of this year, and that's saving them a lot of time, and they are excited about that. Again, joint application and development proving some benefits.

The other piece of that that has been a good collaboration has been the MRIP Socioeconomic Add-On Survey. This is part of the APAIS Dockside Interviews. It's done about every five years. Last one was on paper in 2017. This year was on the tablets. That screen there is just what the tablet looks like.

On the far-right side you can kind of toggle between anglers, and get those answers a lot faster. It does a lot of skip logic, so you don't ask questions you don't have to, depending on the response to the previous question. It's been a while since we' showed you a graph today, so we have to have a data graph.

This one shows the light bars of that Sea Survey in 2017 by state. The darker bars are 2022, the main point here is 75 percent completion rate of seas for all the Access Interviews that are occurring, and that is 10 percent higher than it was five years ago. Kudos again to the states, as well as those helping to develop an application that was a lot more streamlined in getting it done.

I promise talking about the comprehensive for-hire data collection program again. The focus items here are on the development of methodology that does not exist in a current program today. But it is the blending of an electronic logbook reporting with Did Not Fish reports using the APAIS as the dockside catch validation survey, using an estimation for boats that are under an approved logbook, based on a South Carolina pilot, and hail-outs are listed as an optional component.

For those vessels that do not have a logbook requirement, based on their permit. Those would continue to be surveyed under the FHS Effort Survey with a Dockside Catch Survey. The progress point here. Between your last meeting we first submitted the actual documentation to MRIP on June 14. They did an excellent job getting us a response back and comments on August 3rd. A lot of that had to do with delineation between core and optional. What is the specific math of the four options in the South Carolina project that we wanted to recommend? In clear language an overall reformatting. We've made those changes, and we'll probably submit that back to MRIP in the next week or two. Moving down to software development. The major priorities in those blue chevrons have been presented before, but I did want to highlight, we're looking forward into next year.

Our major item in 2022 development has been adjusting the species list by reporting platform. That is important so that the species on a dealer report can be a different list of what species, market grades, units of measure are visible on a commercial trip report or a for-hire trip report, and separating out which options are available to the software, and presented through the APR.

It's going to really tighten down those lists and end up with higher quality data in the end. You wouldn't want to choose goose fish livers landed whole on a fishing trip. Those things don't, I just made that one up. Any kind of oddity like that, right now having a single list, every once in a while, we get some strange choices that sneak in there.

The other one is working on lobster tracking. Anyone who was in the Lobster Board meeting today or earlier, it's adding in the ability for ACCSP API to accept the ping locations for lobster vessels, as well as present some of the lobster tracks to the state administrators through the SAFIS Management System Application.

Those things are slated for 2023 rollout. During next year we're looking at updating the registration tracking that has been evaluated a few years ago, and we're now ready to address it. That has to do with how participants, fishermen, dealers, corporations, vessel owners, vessel operators, all interact with which permits and what records can be shown.

Of course, when you log into a data entry application, what questions are then asked of you. This Registration Tracking is kind of a critical component before moving forward to 2024, and doing the electronic dealer reporting redesign. Yes, that does feel like it's a long way out. But if we didn't do the species list now, if we didn't do the registration tracking first, it would require double effort of the same task.

Do it once for trip reporting, and then having to revisit it again. This is kind of the most streamlined approach that the software team and database folks have worked out to do this. On the right-hand side of the screen you'll see, these are just the new big items. Sorry, the left-hand side of the screen are the new big items, on the right side those are all the continuing things that are happening on a regular basis that takes a lot of staff time, and a lot of effort to keep up with changing partner needs.

Who is doing this work? Well, we have a whole new software team. In March we hired Jamal Quididen and Daniel Mestawat. They are fantastic. They're learning really fast, they are picking up on

different aspects of SAFIS, things like message of the day, what's going on with some of these biological inventories.

They are really moving pretty quickly and that's great. Karen Holmes has decided to kind of recalibrate. She started her change from a full-time staff to a contractor on August 1st, we have her through the end of this year on limited hours, but thank you to Karen for her 18 years. She started literally in May, I think it was 2004, just before the first SAFIS electronic dealer reporting was ready to go online. She has brought us a long way, and we thank Karen for her efforts. To backfill her spot, we have selected an individual who starts December 1st, and we'll put that out in our Committee Newsletter once he actually comes onboard.

We're excited to be kind of fully staffed again. We're getting there. We might, depending on conversations, we might be close for a 2:45 timeline. There is a prediction for you. We have been working on spatial data tools. This is something that with new versions of application express from staff that have the lobster project, and some staff that have experience with some spatial data.

We've got several new things that are happening. The graphic there on that new feature on Trip Plotting is out on our outreach table. But we've been working both with the lobster location tracking to accept those locations, partner agency visibility that I mentioned before. There are SAFIS interactive area code map locations pickers in some of the applications and on the website now, to help identify multiple fields.

That would be not that the data elements are no longer required, but make it easier for users to select them. If you punch your finger on a point you can say oh, here is the area, here is the sub-area, here is the local area. This might be the lobster management area; this might be the ten-minute grid square.

But you might be able to get five questions answered with just a single finger push, and that makes things a lot easier on the end user, and ultimately ends up in data that aligns better and is of higher quality. The last one is really this SAFIS Mobile On-Device Trip Plotting. This is the ability to, at the user's discretion, and on their own device, create that kind of plot line for what their fishing trip was.

These things are interesting and kind of set the stage for capabilities that we may be able to expand upon in the future. Two more items under the updates, oh actually sorry, three. On one stop reporting, this has really been a crux of where SASFIS eTRIPS is going. It's enabling our fishermen with permits in multiple jurisdictions to support a single electronic vessel trip report, and have that pass from ACCSP out to the proper agencies. This was part of, and at the moment SAFIS was the first and remains the only reporting option that fits this need.

I will note that while the SAFIS application and data storage are in place, and the partners are really helping out. The implementation will also require kind of some joint Council actions, and a little more to that on the next slide. About a year ago GARFO implemented the electronic reporting for commercial and for-hire. That has gone really well, and integrated fantastically for those with HMS permits, and even for those that are dual permitted in the South Atlantic.

However, Southeast Fisheries Science Center, South Atlantic Council, Gulf Council and HMS are still collaborating with ACCSP on how to use SAFIS eTRIPS for the coastal logbooks and for the pelagic longline. Those are some choices about regulatory changes aligning which questions get asked, and what would be accepted. Right now, there are issues with the Southeast permit system, which delays implementation of that and one stop electronic reporting beyond these GARFO dual permitted vessels. Right now, there is a very limited number of vessels that are able to use this OSR function between GARFO and South Atlantic. We're

looking to get that moving forward, but until some of these permit data base issues are squared away, we're kind of waiting for, again the joint action of the Councils, as well as some data work outside of ACCSP to get done.

Rolling right through here. Our next slide is back to SciFish. We alluded to a few of these things before. Of course, citizen science is potentially very powerful to understand marine fish populations, what things are happening. There is a ton of growing interest here, and the long-term goal of SciFish.

I'll read it off the bottom, is to develop a citizen science mobile application, and menu driven project builder interface that ACCSP partners could use to easily create a customizable application, by selecting specific data fields, without the need to develop standalone applications for each new project or data need.

This won't answer everything, but it will align some ability to create a customized application, centralized data storage, availability to the assessment and management after the fact, and knowledge of how those questions are being developed. SciFish has been a developing platform and activity, three major phases.

The first was to combine two existing Apps, the South Atlantic Council's Release and the North Carolina Catch U Later Apps into the SciFish App. That has been completed. Under Phase 2, launch SciFish with these two projects, expand the species to meet some other data needs, and develop the SciFish project builder. That is also underway and laying the groundwork for policy.

Phase 3 is to continue the data collection, develop that policy guidance, and finish the SciFish Project Builder, and then move it on from prototype into production. In the next slide we did meet, the SciFish group met with the ACCSP Leadership Team back in June. They suggested that draft policies of how to handle things like what questions should be asked, how would a program apply to be part of this.

Does that get written and drafted by the current SciFish group? Then with membership and input from the Technical Committees, Operations and Advisors. This is the same group we talked about earlier today. Develop that Advisory Group and then once the policies are drafted, that final approval will lie with Operation Committee or Coordinating Council as appropriate, so that we don't spend too much time in the weeds at Coordinating Council.

Next slide is about outreach. You see Julie and I are wearing new ACCSP outfits, yay! We have our staff shirts on. Also, there were new handouts and stickers out there. There are different outreach items that are available. There are phone cases, and some dry bags and some hats. You all have a hat in front of you, for those of you who are here.

Enjoy that and if you're out, maybe doing the Laura Leach Fishing Tournament tomorrow night when it gets cold, you've got a hat, so there you go. But anyway, we are excited to have those things, but more consistently at a wider audience, we've been keeping up with the Committee Newsletters, those were in your packets. Julie and Marissa have been generating weekly tweets. Those have been getting really good feedback as well, and contributing to the ASMFC communications plan, both through Fisheries Focus and the Atlantic Coast Fisheries News. That is the end of the program updates, and if you want to entertain questions.

CHAIR CARMICHAEL: Yes, there is a lot that goes on behind the scenes at ACCSP, Geoff, so I appreciate you taking the time to hit on that many things. But as we know there are a lot of people back there working to keep this thing moving smoothly, and to make the many advances that you went over, so I appreciate that. Does anybody have any questions for Geoff on all of those items? Yes, Lynn.

MS. FEGLEY: I continue to love the Committee Updates and just to thank the staff for all of their

hard work. Oh, and you may have to verify your identity on Twitter going forward, FYI.

MR. WHITE: Is that another comment about ACCSP keeping up? No problem.

ELECTION OF COUNCIL CHAIR

CHAIR CARMICHAEL: Okay for online? We are good to move ahead. Okay, thank you. We have some more business. My illustrious term as Chair has gone by in a rapid two years. Jason, I think, well he's here, so he's ready to take over as Chair, perhaps and we'll hand it over to Geoff to handle this bit of administrative business.

MR. WHITE: Before we actually do a nomination for Vice-Chair, congratulations, Jason, you're the new Chair. Before we do nominations for Vice-Chair, I did want to take this moment. I'm being corrected, we need a motion for Jason to Chair.

CHAIR CARMICHAEL: Somebody like to make a motion, yes, Dan, thank you. Do you want to read that out?

MR. DANIEL McKIERNAN: Yes, motion to elect Dr. Jason McNamee as the Coordinating Council Chair.

CHAIR CARMICHAEL: And a second. Jim. Any discussion on the motion? We got a second, Jim. All right, it looks like we're caught up on the screen. Any objections? All right, seeing none, congratulations, Jason.

ELECTION OF COUNCIL VICE-CHAIR

MR. WHITE: Okay, let's stick with this. We need to nominate a new Vice-Chair. I see a hand, Lynn.

MS. FEGLEY: I would like to nominate my good friend from the state of Georgia, Kathy Knowlton as Vice-Chair. If I would move to do so, thank you.

CHAIR CARMICHAEL: There are a lot of second hands down at the end. We'll go with Dee for the second, since she is retiring and leaving us. Awesome, thank you. Any discussion on the motion? Yes, please, Jim.

MR. GILMORE: Just Kathy may want to know, many years ago when I was elected Vice-Chair, and Eric Smith was the Chair. He said don't worry, you'll have two years to learn this stuff, and then he retired the next meeting. Just so you know, Kathy, there are always surprises with this Committee.

CHAIR CARMICHAEL: Yes, you never know, poor Lynn had to do Chair for three years. Kathy, do you accept the nomination?

MS. KNOWLTON: I do. I would just like to say, Lynn and Dee, nicely done, nicely done to both of my esteemed colleagues indeed. It's sort of a requirement to give them my level of comments. But I still have a very large interest in ACCSP, even though I've been involved over 20 years, so thanks, you all, I appreciate your confidence.

CHAIR CARMICHAEL: All right, is there any objection to the motion? No, Kathy, you can't object either. Seeing none; the motion stands approved. We now have new leadership, excellent, thank you.

MR. WHITE: I would like to take a moment before we get off this item, to extend a heartfelt thank you to John for his leadership and centering guidance over the last two years as Chair, as well as informally since we first connected on the ASMFC Tautaug Management Plan in the late '90s. But yes, John, we have added you to the plaque of Coordinating Council Chairs, which we do hang outside in the Commission Office. But anyway, we've got you on the list.

CHAIR CARMICHAEL: Thank you, Geoff, that's quite a cast of characters for sure. (Applause) It seems like only yesterday you were a graduate student working on tog, that's for sure.

OTHER BUSINESS

MR. WHITE: I think we do have one more item under Other Business, and this, Dee, would you mind coming up to visit us. Dee, this is her last meeting. We wanted to get you a gift, and a very large card. But anyway, Dee has been with ACCSP for 27 years, if I have that correct.

MS. LUPTON: Yes.

MR. WHITE: I consider Dee one of our founding members from the original MOU Creation Crowd in 1995, roles on literally I think every committee that's ever been part of ACCSP. Thank you for your guidance and continuation of thoughtful processes and moving us forward, and kind of keeping us accountable to ourselves, and to each other, and moving things forward. A lot of the funding decision and step-down processes were things that you and Kathy and others weighed in a lot on, and anyway, thank you and good luck.

MS. LUPTON: I appreciate this. I really do. I am retiring, I have retired kind of. Retired for the past month. The ACCSP I consider just as much a part of my career as the Division of Marine Fisheries, and we've achieved a lot of items in North Carolina. We kind of come from the Gulf end, and I was trying to explain that earlier this morning where we came from. But it's been a lot of evolution. We didn't even have staff; I think we borrowed staff from U.S. Fish and Wildlife Service to start off. But we've come a long way, and I'm very proud to see what's been achieved on the entire Atlantic Coast. I'm very proud being part of it, and part of the people I've met throughout time and everything, so thank you very much.

MR. WHITE: Mr. Chairman, are you ready to adjourn?

ADJOURNMENT

CHAIR CARMICHAEL: Is there any other business? I don't have any other items, so it's 2:50. We came pretty darn close to 2:45. I think the Coordinating Council is adjourned.

(Whereupon the meeting convened at 2:50 p.m. on Monday November 7, 2022.)

ACCSP FY24 RFP Summary of Changes

1. RFP

1.1. General Changes

1.1.1. Updated dates appropriately

2. Funding Decision Document

2.1. General changes

2.1.1. All dates have been updated

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

2.2.1. Added Year 6 (final year) value ($43,635) for RI black sea bass project

3. Biological Priority Matrix

3.1 Updated based on the matrix review held at the Biological Review Panel meeting held in February of 2023.

4. Bycatch Priority Matrix

3.1 Updated based on the matrix review held at the Bycatch Prioritization Committee meeting held in February of 2023.

5. Recreational Technical Committee Priorities

5.1 Updated to reflect the priorities outline in the MRIP Regional Implementation Plan for the Atlantic Coast (2023-2027) as developed by the Recreational Technical Committee and Coordinating Council.

6. Socioeconomic Priority Data Elements – No Changes

7. Timeline for Proposal Review

7.1. Dates are updated

7.2. Overall timeline remains relatively the same

8. Ranking Criteria Document – No Changes

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
703.842.0780 | 703.842.0779 (fax) | www.accsp.org

TO: ACCSP Coordinating Council and All ACCSP Committees

FROM: Geoff White, ACCSP Director

SUBJECT: ACCSP Request for 2024 Proposals

The Atlantic Coastal Cooperative Statistics Program (Program or ACCSP) is issuing a Request for Proposals (RFP) to Program Partners and Committees for FY24 funding.

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

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

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

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

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

Proposals to continue Program-funded partner projects ("maintenance proposals") may not contain significant changes in scope (for example the addition of bycatch data collection to a dealer reporting project), and must include in the cover letter whether there are any changes in the current proposal from prior years' and, if so, provide a brief summary of those changes.

Additionally, in FY16 a long-term funding strategy policy was instituted to limit the duration of maintenance projects. Maintenance projects are now subject to a funding reduction following their

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

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

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

Attachment VI provides a timeline for the FY24 funding process. The final decision on proposals to be funded for FY24 will be made in October 2023. Project awards will be subject to funding availability and, if there is a funding shortfall, awards may be adjusted in accordance with the FDD. Successful applicants will be notified when funding becomes available.

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

Please submit initial proposals as Microsoft Word and Excel files no later than **June 16, 2023** by email to Julie DeFilippi Simpson, ACCSP Deputy Director julie.simpson@accsp.org. If you have any questions about the funding decision process, please contact your agency's Operations Committee member (http://www.accsp.org/committees) or ACCSP staff (703-842-0780).

RELEVANT ATTACHMENTS

ATTACHMENT I	FY2024 Funding Decision Document
ATTACHMENT II	FY2024 Biological Priority Matrix
ATTACHMENT III	FY2024 Bycatch Priority Matrix
ATTACHMENT IV	FY2024 Recreational Technical Committee Priorities
ATTACHMENT V	FY2024 Socioeconomic Priority Data Elements
ATTACHMENT VI	FY2024 Timeline for Proposal Review
ATTACHMENT VII	FY2024 Ranking Criteria Document

SOCIOLOGICAL AND ECONOMIC DATA

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

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

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

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

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

A. COMMERCIAL FISHERIES

Table 1:
TRIP LEVEL INFORMATION

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

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

Table 2:
DATA ELEMENTS FOR OWNER/OPERATOR SURVEY

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

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

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

Funding Decision Process
Atlantic Coastal Cooperative Statistics Program
May 2023

The Atlantic Coastal Cooperative Statistics Program (the Program) is a state-federal cooperative initiative to improve recreational and commercial fisheries data collection and data management activities on the Atlantic coast. The program supports further innovation in fisheries-dependent data collection and management technology through its annual funding process.

Each year, ACCSP issues a Request for Proposals (RFP) to its Program Partners. The ACCSP Operations and Advisory Committees review submitted project proposals and make funding recommendations to the Deputy Director and the Coordinating Council.

This document provides an overview of the funding decision process, guidance for preparing and submitting proposals, and information on funding recipients' post-award responsibilities, including providing reports on project progress.

Overview of the Funding Decision Process

Funding Decision Process Timeline

April- Operations and Advisory Committees develop annual funding priorities, criteria and allocation targets (maintenance vs. new projects)

May- Coordinating Council issues Request for Proposals (RFP)

June- Partners submit proposals

July- Operations and Advisory Committees review initial proposals, PIs are invited (not mandatory) to this meeting to answer questions and hear feedback; ACCSP staff provide initial review results to submitting Partner

August- Final proposals are submitted. Final proposals must be submitted electronically to the Deputy Director, and/or designee by close of business on the day of the specified deadline. Final proposals received after the RFP deadline will not be considered for funding.

September- Operations and Advisory Committees review and rank final proposals

October- Funding recommendations presented to Coordinating Council; Coordinating Council makes final funding decision

ACCSP Staff submits notification to submitting Partner of funded projects and notification of approved projects to appropriate grant funding agency (e.g. NOAA Fisheries Regional Grants Program Office, "NOAA Grants") by Partner

As Needed- Operation and/or Leadership Team and Coordinating Council review and make final decision with contingencies (e.g. scope of work, rescissions, no-cost extensions, returned unused funds, etc.)

Detailed Steps of Funding Decision Process

1. Develop Annual Funding Priorities, Criteria and Allocation Targets (maintenance vs. new projects).

Prior to issuing the Request for Proposals, the Coordinating Council will approve the annual funding criteria and allocation targets. These will be used to rank projects and allocate funding between maintenance and new projects respectively.

In FY16, a long-term funding strategy policy was instituted to limit the duration of maintenance projects. Maintenance projects are now subject to a funding reduction following their fourth year of maintenance funding.

- For maintenance projects entering year 5 of ACCSP funding in FY20, a 33 percent funding cut was applied to whichever sum was larger: the project's prior two-year-average base funding set in FY16, or the average annual sum received during the project's four years of full *maintenance* funding. In year 6, a further 33 percent cut will be applied and funding will cease in year 7. Please see Appendix A for a list of maintenance projects entering year 6 in FY20 and the maximum funds available for these projects.
- For more recent maintenance projects (i.e., those entering year 5 of maintenance funding after FY20), the base funding will be calculated as the average of funding received during the project's four years as a *maintenance* project. These projects will receive a 33 percent cut in year 5, a further 33 percent cut in year 6, and funding will cease in year 7. Please see Appendix A for a list of maintenance projects entering year 5 or 6 in FY24 and the maximum funds available for these projects.

2. Issue Request for Proposals

An RFP will be sent to all Program Partners and Committees no later than the week after the spring Coordinating Council meeting. The RFP will include the ranking criteria, allocation targets approved by the Coordinating Council, and general Program priorities taken from Goal 3 of the current ASMFC Five-Year Strategic Plan. The RFP and related documents will also be posted on the Program's website here.

All proposals MUST be submitted either by a Program Partner, jointly by several Program Partners, or through a Program Committee. The public has the ability to work with a Program Partner to develop and submit a proposal. Principle investigators are strongly encouraged to work with their Operations Committee member in the development of any proposal. All proposals must be submitted electronically to the Deputy Director, and/or designee, in the standard format.

3. Review initial proposals

Proposals will be reviewed by staff and the Operations and Advisory Committees. Committee members are encouraged to coordinate with their offices and/or constituents to provide input to the review process. Operations Committee members are also encouraged to work with staff in their offices who have submitted a proposal in order to represent the proposal during the review. Project PIs will be invited to attend the initial proposal review, held in July. The review and evaluation of all written proposals will take into consideration the ranking criteria, funding allocation targets and the overall Program Priorities as specified in the RFP. Proposals may be forwarded to relevant Program technical committees for further review of the technical feasibility and statistical validity. Proposals that fail to meet the ACCSP standards may be recommended for changes or rejected.

4. Provide initial review results to submitting Partner

Program staff will notify the submitting Partner of suggested changes, requested responses, or questions arising from the review. The submitting Partner will be given an opportunity to submit a final proposal incorporating suggested changes in the same format previously described in Step 2(b) by the final RFP deadline.

5. Review and rank final proposals

The review and ranking of all proposals will take into consideration the ranking criteria, funding allocation targets, and overall Program Priorities as specified in the RFP**.** The Deputy Director and the Advisory and Operations Committees will develop a list of prioritized recommended proposals and forward them for discussion, review, and approval by the Coordinating Council.

6. Proposal approval by the Coordinating Council

The Coordinating Council will review a summary of all submitted proposals and prioritized recommended proposals from the Operations and Advisory Committees. Each representative on the Coordinating Council will have one vote during final prioritization of project proposals. Projects to be funded by the Program will be approved by the Coordinating Council by the end of November each year. The Deputy Director will submit a pre-notification to the appropriate NOAA Grants office of the prioritized proposals to expedite processing when those offices receive Partner grant submissions.

7. Confirmation of final funding amounts

The Director and Deputy Director will be notified by NOAA Fisheries of any federal grant adjustments (e.g. additions or rescissions). Additional funds will generally go to the next available ranked project. Reductions may include, but are not limited to:

- Lower than anticipated amounts from any source of funding
- Rescission of funding after initial allocations have been made
- Partial or complete withdrawal of funds from any source

If these or other situations arise, the Operations Committee will notify Partners with approved proposals to reduce their requested budgets or to withdraw a proposal entirely. If this does not reduce the overall requested amount sufficiently, the Director, Deputy Director, the Operations Committee Chair and Vice-Chair, and the Advisory Committee Chair will develop a final recommendation and forward to the ACCSP Leadership Team of the Coordinating Council. These options to address funding contingencies may include:

- Eliminating the lowest-ranked proposal(s)
- A fixed percentage cut to all proposals' budgets
- A directed reduction in a specific proposal(s)

8. Notification to submitting Partner of funded projects and submittal of project documents to appropriate grants agency (e.g. NOAA Grants) by Partner.

Notification detailing the Coordinating Council's actions relevant to a Partner's proposal will be sent to each Partner by Program staff.

- Approved projects from Non-federal Partners must be submitted as full applications (federal forms, project and budget narratives, and other attachments) to NOAA Grants via www.grants.gov. These documents must reflect changes or conditions approved by the Coordinating Council.
- Non-federal Partners must provide the Deputy Director with an electronic copy of the narrative and either an electronic or hard copy of the budget of the grant application as submitted to the grants agency (e.g. NOAA Grants).
- Federal Partners do not submit applications to NOAA Grants.

9. Operation and/or Leadership Team and Coordinating Council review and final decision with contingencies or emergencies.

Committee(s) review and decide project changes (e.g. scope of work, rescissions, no-cost extensions, returned unused funds, etc.) during the award period.

Proposal Guidance

General Proposal Guidelines

- The Program is predicated upon the most efficient use of available funds. Many jurisdictions have data collection and data management programs which are administered by other fishery management agencies. Detail coordination efforts your agency/Committee has undertaken to demonstrate cost-efficiency and non-duplication of effort.

- All Program Partners conducting projects for implementation of the program standards in their jurisdictions are required to submit data to the Program in prescribed standards, where the module is developed and formats are available. Detail coordination efforts with Program data management staff with projects of a research and/or pilot study nature to submit project information and data for distribution to all Program Partners and archives.

- If appropriate to your project, please detail your agency's data management capability. Include the level of staff support (if any) required to accomplish the proposed work. If contractor services are required, detail the level and costs.

- Before funding will be considered beyond year one of a project, the Partner agency shall detail in writing how the Partner agency plans to assume partial or complete funding or, if not feasible, explain why.

- If appropriate to your project, detail any planned or ongoing outreach initiatives. Provide scope and level of outreach coordinated with either the Program Assistant and/or Deputy Director.

- Proposals including a collection of aging or other biological samples must clarify Partner processing capabilities (i.e., how processed and by whom).

- Provide details on how the proposal will benefit the Program as a whole, outside of benefits to the Partner or Committee.

- Proposals that request funds for law enforcement should confirm that all funds will be allocated towards reporting compliance.

- Proposals must detail any in-kind effort/resources, and if no in-kind resources are included, state why.

- Proposals must meet the same quality as would be appropriate for a grant proposal for ACFCMA or other federal grant.

- Assistance is available from Program staff, or an Operations Committee member for proposal preparation and to insure that Program standards are addressed in the body of a given proposal.

- Even though a large portion of available resources may be allocated to one or more jurisdictions, new systems (including prototypes) will be selected to serve all Partners' needs.

- Partners submitting pilot or other short-term programs are encouraged to lease large capital budget items (vehicles, etc.) and where possible, hire consultants or contractors rather than hire new permanent personnel.

- The Program will not fund proposals that do not meet Program standards. However, in the absence of approved standards, pilot studies may be funded.

- Proposals will be considered for modules that may be fully developed but have not been through the formal approval process. Pilot proposals will be considered in those cases.

- The Operations Committee may contact Partners concerning discrepancies or inconsistencies in any proposal and may recommend modifications to proposals subject to acceptance by the submitting Partner and approval by the Coordinating Council. The Operations Committee may recommend changes or conditions to proposals. The Coordinating Council may conditionally approve proposals. These contingencies will be documented and forwarded to the submitting Partner in writing by Program staff.

- Any proposal submitted after the initial RFP deadline will not be considered, in addition to any proposal submitted by a Partner which is not current with all reporting obligations.

Proposal Format

Applicant Name: Identify the name of the applicant organization(s).

Project Title: A brief statement to identify the project.

Project Type: Identify whether new or maintenance project.

> *New Project – Partner project never funded by the Program. New projects may not exceed a duration of one year.*
>
> *Maintenance Project – Project funded by the Program that conducts the same scope of work as a previously funded new or maintenance project. These proposals may not contain significant changes in scope (e.g., the addition of bycatch data collection to a catch/effort dealer reporting project). PIs must include in the cover letter whether there are any changes in the current proposal from prior years' and, if so, provide a brief summary of those changes. At year 5 of maintenance funding, a project's base funding will be calculated as the average of funding received during the project's four years as a* maintenance *project.*

Requested Award Amount: Provide the total requested amount of proposal. Do not include an estimate of the NOAA grant administration fee.

Requested Award Period: Provide the total time period of the proposed project. The award period typically will be limited to one-year projects.

Objective: Specify succinctly the "why", "what", and "when" of the project.

Need: Specify the need for the project and the association to the Program.

Results and Benefits: Identify and document the results or benefits to be expected from the proposed project. Clearly indicate how the proposed work meets various elements outlined in the ACCSP Proposal Ranking Criteria Document (Appendix B). Some potential benefits may include: fundamental in nature to all fisheries; region-wide in scope; answering or addressing region-wide questions or policy issues; required by MSFCMA, ACFCMA, MMPA, ESA, or other acts; transferability; and/or demonstrate a practical application to the Program.

Data Delivery Plan: Include coordinated method of the data delivery plan to the Program in addition to module data elements gathered. The data delivery plan should include the frequency of data delivery (i.e. monthly, semi-annual, annual) and any coordinate delivery to other relevant partners.

Approach: List all procedures necessary to attain each project objective. If a project includes work in more than one module, identify approximately what proportion of effort is comprised within each module (e.g., catch and effort 45%, biological 30% and bycatch 25%). Please note that only one primary module and one secondary module are considered for ranking.

Geographic Location: The location where the project will be administered and where the scope of the project will be conducted.

Milestone Schedule: An activity schedule in table format for the duration of the project, starting with Month 1 and ending with a three-month report writing period.

Project Accomplishments Measurement: A table showing the project goals and how progress towards those goals will be measured. In some situations the metrics will be numerical such as numbers of anglers contacted, fish measured, and/or otoliths collected, etc.; while in other cases the metrics will be binary such as software tested and software completed. Additional details such as intermediate metrics to achieve overall proposed goals should be included especially if the project seeks additional years of funding.

Cost Summary (Budget): Detail all costs to be incurred in this project in the format outlined in the budget guidance and template at the end of this document. A budget narrative should be included which explains and justifies the expenditures in each category. Provide cost projections for federal and total costs. Provide details on Partner/in-kind contribution (e.g., staff time, facilities, IT support, overhead, etc.). Details should be provided on start-up versus long-term operational costs.

> **In-kind** - [1]Defined as activities that could exist (or could happen) without the grant. [2]In-kind contributions are from the grantee organization. In-kind is typically in the form of the value of personnel, equipment and services, including direct and indirect costs.
>
> [1] The following are generally accepted as in-kind contributions:
>
> i. Personnel time given to the project including state and federal employees
>
> ii. Use of existing state and federal equipment (e.g. data collection and server platforms, Aging equipment, microscopes, boats, vehicles)

Overhead rates may not exceed 25% of total costs unless mandated by law or policy. Program Partners may not be able to control overhead/indirect amounts charged. However, where there is flexibility, the lowest amount of overhead should be charged. When this is accomplished indicate on the 'cost summary' sheet the difference between the overhead that could have been charged and the actual amount charged, if different. If overhead is charged to the Program, it cannot also be listed as in-kind.

Maintenance Projects: Maintenance proposals must provide project history table, description of completed data delivery to the ACCSP and other relevant partners, table of total project cost by year, a summary table of metrics and achieved goals, and the budget narrative from the most recent year's funded proposal.

Principal Investigator: List the principal investigator(s) and attach curriculum vitae (CV) for each. Limit each CV to two pages. Additional information may be requested.

Budget Guidelines & Template

All applications must have a detailed budget narrative explaining and justifying the expenditures by object class. Include in the discussion the requested dollar amounts and how they were derived. A spreadsheet or table detailing expenditures is useful to clarify the costs (see template below). The following are highlights from the NOAA Budget Guidelines document to help Partners formulate their budget narrative. The full Budget Guidelines document is available here.

Object Classes:

Personnel: include salary, wage, and hours committed to project for each person by job title. Identify each individual by name and position, if possible.

Fringe Benefits: should be identified for each individual. Describe in detail if the rate is greater than 35 % of the associated salary.

Travel: all travel costs must be listed here. Provide a detailed breakdown of travel costs for trips over $5,000 or 5 % of the award. Include destination, duration, type of transportation, estimated cost, number of travelers, lodging, mileage rate and estimated number of miles, and per diem.

Equipment: equipment is any single piece of non-expendable, tangible personal property that costs $5,000 or more per unit and has a useful life of more than one year. List each piece of equipment, the unit cost, number of units, and its purpose. Include a lease vs. purchase cost analysis. If there are no lease options available, then state that.

Supplies: purchases less than $5,000 per item are considered by the federal government as supplies. Include a detailed, itemized explanation for total supplies costs over $5,000 or 5% of the award.

Contractual: list each contract or subgrant as a separate item. Provide a detailed cost breakdown and describe products/services to be provided by the contractor. Include a sole source justification, if applicable.

Other: list items, cost, and justification for each expense.

Total direct charges

Indirect charges: If claiming indirect costs, please submit a copy of the current approved negotiated indirect cost agreement. If expired and/or under review, a copy of the transmittal letter that accompanied the indirect cost agreement application is requested.

Totals of direct and indirect charges

Example. Budget narrative should provide further detail on these costs.

Description	Calculation	Cost
Personnel (a)		
Supervisor	Ex: 500 hrs x $20/hr	$10,000
Biologist		
Technician		
Fringe (b)		
Supervisor	Ex: 15% of salary	$1500
Biologist		
Technician		
Travel (c)		
Mileage for sampling trips	Ex: Estimate 2000 miles x $0.33/mile	$660
Travel for meeting		
Equipment (d)		
Boat	Ex: $7000, based on current market research	$7000
Supplies (e)		
Safety supplies		$1200
Sampling supplies		$1000
Laptop computers	2 laptops @$1500 each	$3000
Software		$500
Contractual (f)		
Data Entry Contract	Ex: 1000 hrs x $20/hr	$20,000
Other (h)		
Printing and binding		
Postage		
Telecommunications charges		
Internet Access charges		
Totals		
Total Direct Charges (i)		
Indirect Charges (j)		
Total (sum of Direct and Indirect) (k)		

Post-award Responsibilities

Changing the Scope of Work

Partners shall submit requests for amendments to approved projects in writing to the Deputy Director. The Coordinating Council member for that Partner must sign the request.

When Partners request an amendment to an approved project, the Deputy Director will contact the Chair and Vice Chair of the Operations Committee. The Deputy Director and Operations Committee Chairs will determine if the requested change is minor or substantial. The Chairs and Deputy Director may approve minor changes.

For substantial proposed changes, a decision document including the opinions of the Chairs and the Deputy Director will be sent to the Operations Committee and the ACCSP Leadership Team of the Coordinating Council for review.

The ACCSP Leadership Team will decide to approve or reject the request for change and notify the Deputy Director, who will send a written notification to the Partner's principal investigator with a copy to the Operations Committee.

When a requested major amendment is submitted shortly before a Coordinating Council meeting, the approval of the amendment will be placed on the Council Agenda.

The Deputy Director will notify NOAA Grants of any change in scope of work for final approval for non-federal proposals, and the Partner will need to request a Change in Scope through Grants Online. Necessary communications will be maintained between the concerned Partner, the Program and NOAA Grants. Any changes must be approved through the normal NOAA Grants process.

Requesting a No-cost Extension

If additional time is needed to complete the project, Program Partners can request a no-cost extension to their award period. Partners should let the Program know of the need for additional time and then request the extension as an Award Action Request through NOAA Grants Online at least 30 days before the end date of the award.

Necessary communications will be maintained between the concerned Partner, the Program, and NOAA Grants office. Any changes must be approved through the normal NOAA Grants process.

Declaring Unused/Returned Funds

In an effort to limit the instances in which funds are not completely used during the award period, draw down reports from the NOAA Grants offices indicating remaining grant balances will be periodically reviewed during each fiscal year.

While effort should be made to complete the project as proposed, if Program Partners find that they will not be able to make use of their entire award, they should notify the Program and their NOAA Federal Program Officer as soon as possible. Depending on the timing of the action, the funds may be able to be reused within the Program, or they may have to be returned to the U.S. Treasury.

Program Partners must submit a written document to the Deputy Director outlining unused project funds potentially being returned. The Partner must also notify their Coordinating Council member (if applicable) for approval to return the unused funds. If the funding is available for re-use within the Program, the Director and Deputy Director will confer with the Operations Committee Chair and Vice-Chair and the Advisory Committee Chair, and then submit a written recommendation to the ACCSP Leadership Team of the Coordinating Council for final approval on the plan to distribute the returned money.

Necessary communications will be maintained between the concerned Partner, the Program, and NOAA Grants office. Any changes must be approved through the normal NOAA Grants process.

Reporting Requirements

Program staff will assess project performance.

The Partner project recipients must abide by the NOAA Regional Grant Programs reporting requirements and as listed below. All semi-annual and final reports are to include a table showing progress toward each of the progress goals as defined in Step 2b and additional metrics as appropriate. Also, all Partner project recipients will submit the following reports based on the project start date to the Deputy Director:

- Semi-annual reports (due 30 days after the semi-annual period) throughout the project period including time periods during no-cost extensions,
- One final report (due 90 days after project completion).
- Federal Partners must submit reports to the Deputy Director, and State Partners must submit reports to both the Deputy Director and the appropriate NOAA Grants office.

Program staff will conduct an initial assessment of the final report to ensure the report is complete in terms of reporting requirements. Program staff will serve as technical monitors to review submitted reports. NOAA staff also reviews the reports submitted via Grants Online.

A project approved on behalf of a Program Committee will be required to follow the reporting requirements specified above. The principle investigator (if not the Chair of the Committee) will submit the report(s) to the Chair and Vice Chair of the Committee for review and approval. The Committee Chair is responsible for submitting the required report(s) to the Program.

Joint projects will assign one principle investigator responsible for submitting the required reports. The principle investigator will be identified within the project proposal. The submitted reports should be a collaborative effort between all Partners involved in the joint project.

Project recipients will provide all reports to the Program in electronic format.

Partners who receive no-cost extensions must notify the Deputy Director within 30 days of receiving approval of the extension. Semi-annual and final reports will continue to be required through the extended grant period as previously stated.

Partners that have not met reporting requirements for past/current projects may not submit a new proposal.

A verbal presentation of project results may be requested. Partners will be required to submit copies of project specifications and procedures, software development, etc. to assist other Program Partners with the implementation of similar programs.

Report Format

Semi-Annual(s) – Progress Reports: (3-4 pages)

- Title page - Project name, project dates (semi-annual period covered and complete project period), submitting Partner, and date.
- Objective
- Activities Completed – bulleted list by objective.
- Progress or lack of progress of incomplete activities during the period of semi-annual progress – bulleted list by objective.
- Activities planned during the next reporting period.
- Metrics table
- Milestone Chart – original and revised if changes occurred during the project period.

Final Report:

- Title page – Project name, project dates, submitting Partner, and date.
- Abstract/Executive Summary (including key results)
- Introduction
- Procedures

- Results:
    - Description of data collected.
    - The quality of the data pertaining to the objective of the project (e.g. representative to the scope of the project, quantity collected, etc.).
    - Compiled data results.
    - Summary of statistics.
- Discussion:
    - Discuss the interpretation of results of the project by addressing questions such as, but not limited to:
    - What occurred?
    - What did not occur that was expected to occur?
    - Why did expected results not occur?
    - Applicability of study results to Program goals.
    - Recommendations/Summary/Metrics
- Summarized budget expenditures and deviations (if any).

Programmatic review

Project reports will inform Partners of project outcomes. This will allow the Program as a whole to take advantage of lessons learned and difficulties encountered. Staff will provide final reports to the appropriate Committee(s). The Committees then can discuss the report(s) and make recommendations to modify the Data Collection Standards as appropriate. The recommendations will be submitted through the Program committee(s) review process.

Appendix A: Maximum Funding for Maintenance Projects Entering Year 5 or 6 of Funding in FY24

Projects in Year 5 or 6 of Maintenance Funding	**Calculated Base** (4-year avg)	Maximum Funding Year 5	**Maximum Funding Year 6 (Final Year)**
Advancing Fishery Dependent Data Collection for Black Sea Bass (Cetropristis striata) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Vessel Research Fleet Approach	**$132,229**	$88,153	**$43,635**

Appendix B: Ranking Criteria Spreadsheet for Maintenance and New Projects

Ranking Guide – Maintenance Projects:

Primary Program Priority	**Point Range**	**Description of Ranking Consideration**
Catch and Effort Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 – 10 0 – 6 0 – 4	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	**Point Range**	**Description of Ranking Consideration**
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. geographic range of the stock).
> yr 2 contains funding transition plan and/or justification for continuance	0 – 4	Rank based on defined funding transition plan away from Program funding or viable justification for continued Program funding.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections ↓ 4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	Point Range	Description of Ranking Consideration
Properly Prepared	-1 – 1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – Maintenance Projects: (*to be used only if funding available exceeds total Maintenance funding requested*)

Ranking Factors	Point Range	Description of Ranking Consideration
Achieved Goals	0 – 3	Proposal indicates project has consistently met previous set goals. Current proposal provides project goals and if applicable, intermediate metrics to achieve overall achieved goals.
Data Delivery Plan	0 – 2	Ranked based if a data delivery plan to Program is supplied and defined within the proposal.
Level of Funding	-1 – 1	-1 = Increased funding from previous year 0 = Maintained funding from previous year 1 = Decreased funding from previous year
Properly Prepared	-1 – 1	-1 = Not properly prepared 1 = Properly prepared
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – New Projects:

Primary Program Priority	Point Range	Description of Ranking Consideration
Catch and Effort Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 – 10 0 – 6 0 – 4	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	Point Range	Description of Ranking Consideration
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. fisheries sampled).
Contains funding transition plan / Defined end-point	0 – 4	Rank based on quality of funding transition plan or defined end point.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections ↓ 4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	Point Range	Description of Ranking Consideration
Innovative	0 – 3	Rank based on new technology, methodology, financial savings, etc.
Properly Prepared	-1 – 1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

Biological Sampling Priority Matrix

Created in February 2023

For FY2024

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

Biological Review Panel Recommends:

- Species in the upper 25% of the priority matrix should be considered for funding.

- Sampling projects which cover multiple species within the upper 25% are highly recommended.

* UPPER 25% OF MATRIX

Biological Review Panel Recommendations Based on Matrix:

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

Biological Sampling Priority Matrix

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

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

Bycatch Sampling Priority Matrix

Created in February 2023

For FY 2024

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

Top Quartile of Bycatch Matrix Suggestions

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

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
703.842.0780 | 703.842.0779 (fax) | www.accsp.org

ACCSP Funding Priorities For Recreational Fisheries

April 2023

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

1. **Improved precision (PSE) and presentation of MRIP estimates**
2. **Comprehensive for-hire data collection and monitoring**
3. **Improved recreational fishery discard and release data**
4. **Improved timeliness of MRIP recreational catch and harvest estimates**
5. **Expanded Biological sampling for recreational fisheries**
6. **Improved in-season monitoring**

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
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This list includes dates for fiscal year 2023, including ACCSP committee meetings, relevant dates of the funding cycle, as well as meetings or conferences ACCSP typically attends or which may be of interest to our partners. If you have any questions or comments on this calendar, please do not hesitate to contact the ACCSP staff at info@accsp.org.

Jan 24-26:	NEFMC Meeting – Portsmouth, NH
Jan 24-Feb 2:	ASMFC Meeting – Arlington, VA
Feb 1:	2023 FHTS Training– Webinar
Feb 7:	Bycatch Prioritization Committee Annual Meeting –Webinar
Feb 7-8:	APAIS North Atlantic Training- Providence, RI
Feb 7-9:	MAFMC Council Meeting- Washington, D.C
Feb 8:	Biological Review Panel Annual Meeting – Webinar
Feb 23-24:	APAIS South Atlantic Training- Raleigh, NC
Mar 1:	Start of ACCSP FY23
Mar 8:	Recreational Technical Committee Meeting- Webinar
Mar 6-10:	SAFMC Meeting – Jekyll Island, GA
Apr 4-6:	MAFMC Meeting – Durham, NC
Apr 5:	Commercial Technical Committee Annual Meeting – Webinar
Apr 6:	Information Systems Committee Annual Meeting – Webinar
Apr 13:	Operations and Advisory Committees Spring Meeting – Webinar
Apr 18-20:	NEFMC Meeting – Mystic, CT
May 2-4:	ASMFC/Coordinating Council Meeting – Arlington, VA
May 8:	ACCSP issues request for proposals
May 31:	Recreational Technical Committee – Webinar
Jun 6-8:	MAFMC Meeting – Virginia Beach, VA
Jun 12-16:	SAFMC Meeting – St. Augustine, FL
Jun 16:	Initial proposals are due
Jun 23:	Initial proposals are distributed to Operations and Advisory Committees
Jun 27-29:	NEFMC Meeting – Freeport, ME
July 5:	Any initial written comments on proposals due
Week of Jul 10:	Review of initial proposals by Operations and Advisory Committees – Webinar
July 19:	If applicable, any revised written comments due
Week of Jul 24:	Feedback submitted to principal investigators
July 31-Aug 3:	ASMFC Meeting – Arlington, VA

Aug 8-11:	MAFMC Meeting – Annapolis, MD
Aug 18:	Revised proposals due
Aug 25:	Revised proposals distributed to Operations and Advisory Committees
Week of Sep 4:	Ranking exercise for Advisors and Operations Members – Webinar
Sep 11-15:	SAFMC Meeting – Charleston, SC
Sep 19-20:	Annual Advisors/Operations Committee Joint Meeting (in-person; location TBD)
Sep 26-28:	NEFMC Meeting – Plymouth, MA
Oct 3-5:	MAFMC Meeting – New York, NY
Oct 14-20:	ASMFC Annual Meeting/Coordinating Council Meeting – Webinar
Dec 4-8:	SAFMC Meeting – Beaufort NC
Dec 5-7:	NEFMC Meeting – Newport, RI
Dec 11-14:	MAFMC Meeting – Philadelphia, PA

Ranking Guide – Maintenance Projects:

Primary Program Priority	**Point Range**	**Description of Ranking Consideration**
Catch and Effort Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 – 10 0 – 6 0 – 4	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	**Point Range**	**Description of Ranking Consideration**
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. geographic range of the stock).
> yr 2 contains funding transition plan and/or justification for continuance	0 – 4	Rank based on defined funding transition plan away from Program funding or viable justification for continued Program funding.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections ↓ 4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	**Point Range**	**Description of Ranking Consideration**
Properly Prepared	-1–1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

<u>Ranking Guide – Maintenance Projects:</u> (*to be used only if funding available exceeds total Maintenance funding requested*)

Ranking Factors	Point Range	Description of Ranking Consideration
Achieved Goals	0 – 3	Proposal indicates project has consistently met previous set goals. Current proposal provides project goals and if applicable, intermediate metrics to achieve overall achieved goals.
Data Delivery Plan	0 – 2	Ranked based if a data delivery plan to Program is supplied and defined within the proposal.
Level of Funding	-1 – 1	-1 = Increased funding from previous year 0 = Maintained funding from previous year 1 = Decreased funding from previous year
Properly Prepared	-1 – 1	-1 = Not properly prepared 1 = Properly prepared
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – New Projects:

Primary Program Priority	**Point Range**	**Description of Ranking Consideration**
Catch and Effort Biological Sampling Bycatch/Species Interactions Social and Economic	0 – 10 0 –10 0 – 6 0 – 4	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	**Point Range**	**Description of Ranking Consideration**
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. fisheries sampled).
Contains funding transition plan / Defined end-point	0 – 4	Rank based on quality of funding transition plan or defined end point.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections ↓ 4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	**Point Range**	**Description of Ranking Consideration**
Innovative	0 – 3	Rank based on new technology, methodology, financial savings, etc.
Properly Prepared	-1–1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

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March 2023 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.

- **April 5:** Commerical Technical Committee Meeting
- **April 6:** Information System Committee Meeting
- **April 13:** Joint Operations and Advisory Committees Meeting
- **See** ACCSP Calendar Link **for more information**

Standard Codes Committee

- The Southeast Fisheries Science Center (SEFSC) has requested that the Standard Codes committee review the definition for “Fishing Time” for the pots and traps gear-category. To reduce confusion for captains, they have asked that the helper-text change from “average total soak time” to simply “average soak time”.

Commercial Technical and Information Systems Committees

- On April 5, the Commerical Technical Committee will meet via webinar. Meeting documents and information can be found here.
- On April 6, the Information Systems Committee will meet via webinar. Meeting documents and information can be found here.

Recreational Technical Committee

- A Recreational Technical Committee (RTC) subcommittee was created to draft a proposal for a project to develop methods for improving discard data collection. This proposal is intended to help address the third priority of the 2023-2027 Atlantic recreational implementation plan to improve recreational fishery discard and release data. Currently, the subcommittee is working towards a pilot project to use pre-trip catch-cards, tied to a certified random sampling design (e.g., the APAIS). The next step is to involve MRIP for awareness and consideration of overall design.
  The subcommittee met on January 19, February 16, and March 13 of 2023 to agree on high-level methodology direction and to begin drafting the proposal. The RTC discards subcommittee will meet again on April 19 and in May/June of 2023 to finish the discards project proposal.

The full RTC held a call on March 8 of 2023 to:

- Provide visibility of the proposed methodology for the creation of for-hire logbook estimates of both catch and effort. This methodology represents a step towards the idea of comprehensive for-hire data collection to address a critical need along the Atlantic Coast to provide for data collection that is inclusive of charter and headboats operating in both state and federal waters, while minimizing overlapping for-hire fishery reporting programs.

- Provide visibility of the Atlantic Recreational Implementation Plan (2023-2027) which will help guide MRIP allocation of resources to best address data needs of recreational fisheries. The implementation plan was approved by the MRIP Executive Steering Committee and ASMFC/ACCSP and NOAA Fisheries staff working in tandem to release standardized outreach communications about the plan.
- Summarize and discuss major updates to the MRIP in 2023:
    - Fishing Effort Survey (FES) seminar
    - For-hire Survey (FHS) certification
    - Large Pelagics Survey (LPS) redesign
- Discuss the work being done by the RTC discards subcommittee in order to find major points of agreement for the subcommittee to continue with their progress.
- The full RTC will meet again in May/June of 2023 to further discuss the subcommittee's progress on the discards proposal and potentially to discuss feedback from MRIP to the for-hire estimate methodology.

Highlight

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

ACCSP

Good Data, Good Decisions

February 2023 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.

Upcoming Events

- **March 8:** Recreational Technical Committee Meeting
- **April 5:** Commerical Technical Committee Meeting
- **April 6:** Information System Committee Meeting
- **See** ACCSP Calendar Link **for more information**

Operations and Advisory Committees

- NOAA's Fisheries Information System program (FIS) has issued its 2024 Request for Proposals. The competitive RFP awards up to $5.5 million (subject to appropriations) of FY24 funding to support projects in Regional Offices, Science Centers, Headquarters Offices, FIN programs, and State partners through the Commissions.
- All completed pre-proposals are due by end of day on April 7, 2023, and all completed full proposals must be submitted by end of day on June 23, 2023. The funds are intended to be distributed in Spring 2024 depending on appropriations.
- You can learn more about the process and requirements in the RFP Guidance Document.

2023 Regional Recreational Trainings

- ACCSP staff run two-day trainings that review required APAIS procedures, including interview conduct, fish identification, fish measurements, and data entry and review.
- Over 100 state staff attended two regional in-person trainings on February 7-8 in Providence, RI and February 23-24 in Raleigh, NC.
- Check out the upcoming ACCSP article in the ASMFC Fisheries Focus newsletter to learn more.

- After reviewing the attendance poll results, it became apparent that neither committee had an in-person attendance of at or above 2/3 of the membership. As such, both meetings will be held by webinar. Please contact Julie Simpson with any questions or concerns.
- On April 5, the Commerical Technical Committee will meet via webinar. Meeting documents and information can be found here.
- On April 6, the Information Systems Committee will meet via webinar. Meeting documents and information can be found here.

Biological Review Panel

- The in-person meeting of the Biological Review Panel was held on February 8th, 2023. The biological matrix was reviewed and discussed on a species-by-species basis. In total 261 suggested changes across 96 species were reviewed.
- M. Rinaldi demonstrated the Biological and Bycatch Inventory application. This is a repository for programmatic level metadata which allows for a centralized catalog of partner biological sampling programs along the Atlantic coast.
- Elections were held for the position of vice chair. A. Willey (MD DNR) was nominated and elected as vice chair by the committee while L. Beerkircher (NOAA SEFSC) moved into the role of committee chair.
- ACCSP would like to thank B. Linton (NOAA NEFSC) for their tenure as chair.

Bycatch Prioritization Committee

- The Bycatch Prioritization Committee in-person annual meeting was held on February 7th, 2023. The Bycatch Priority sampling matrix for FY24 was reviewed and discussed.
- M. Rinaldi demonstrated the Biological and Bycatch Inventory application. This is a repository for programmatic level metadata which allows for a centralized catalog of partner bycatch sampling programs along the Atlantic coast.
- Elections were held for the position of vice chair. C. Davis (VA MRC) was nominated and elected as vice chair by the committee while C. Uraneck (ME DMR) moved into the role of committee chair.
- ACCSP would like to thank C. Bradshaw (FWC) for their tenure as chair.

Highlight

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

ACCSP

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January 2023 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.

- **February 7:** Bycatch Prioritization Committee Meeting
- **February 8:** Biological Review Panel Committee Meeting
- **March 8:** Recreational Technical Committee Meeting
- **See** ACCSP Calendar Link **for more information**

Biological Review Panel

- The Biological Review Panel in-person annual meeting is currently scheduled for **February 8, 2023**, during which the Biological Matrix for FY2024 and FY2025 will be discussed and finalized. Preliminary meeting materials to be distributed shortly.

Bycatch Prioritization Committee

- The Bycatch Prioritization Committee in-person annual meeting is currently scheduled for **February 7, 2023**. Preliminary meeting materials to be distributed shortly.

Spring Data Load Deadlines

- Participant Deadline: February 13
- Data Deadline: March 13
- Please reach out to Heather Power with any questions or issues.

Commercial Technical and Information Systems Committees

We are looking to hold the Commercial Technical and Information Systems annual meetings during the weeks of March 27 and April 3. This year we would like to have the meeting in person. It is imperative that we have an accurate head count of those that will be attending in person vs virtually so that we ensure a minimum of attendance and appropriately plan the room block.

Please provide your availability on the poll below by **COB Friday, February 3**. We will work on creating/distributing the TA beginning on February 6.

https://www.surveymonkey.com/r/accspscheduler

Highlight

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

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Good Data, Good Decisions

November/ December 2022 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.

Upcoming Events

- **February 7:** Bycatch Prioritization Committee Meeting
- **February 8:** Biological Review Panel Committee Meeting
- **March 8:** Recreational Technical Committee Meeting
- **See** ACCSP Calendar Link **for more information**

Coordinating Council

- Met November 7, 2022 during the ASMFC Annual Meeting in Long Branch, New Jersey.
- Approved FY2023 Partner proposals and administrative grant.
- Approved the 2023-2027 Atlantic Recreational Implementation Plan, submitted to MRIP in December 2022.
- Elected Jason McNamee (RI) as incoming chair and Kathy Knowlton (GA) as vice-chair

Biological Review Panel

- The Biological Review Panel in-person annual meeting is currently scheduled for February 8, 2023, during which the Biological Matrix for FY2024 and FY2025 will be discussed and finalized. Preliminary meeting materials to be distributed shortly.
- The call for suggested changes to the Biological Matrix closed on November 21, 2022. Thank you to everyone who provided feedback in the appropriate timeline. This tool is designed to prioritize species based on a number of criteria; state and federal priorities, changes in management and landings, sampling adequacy, and characterizations of the fishery and species.

Bycatch Prioritization Committee

- The Bycatch Prioritization Committee in-person annual meeting is currently scheduled for February 7, 2023. Preliminary meeting materials to be distributed

Thank you to everyone who provided feedback in the appropriate format and timeline. We will be reviewing and finalizing the bycatch matrix as a primary agenda item during the annual meeting.

Recreational Technical Committee

The Recreational Technical Committee (RTC) held a call on November 1 during which they:

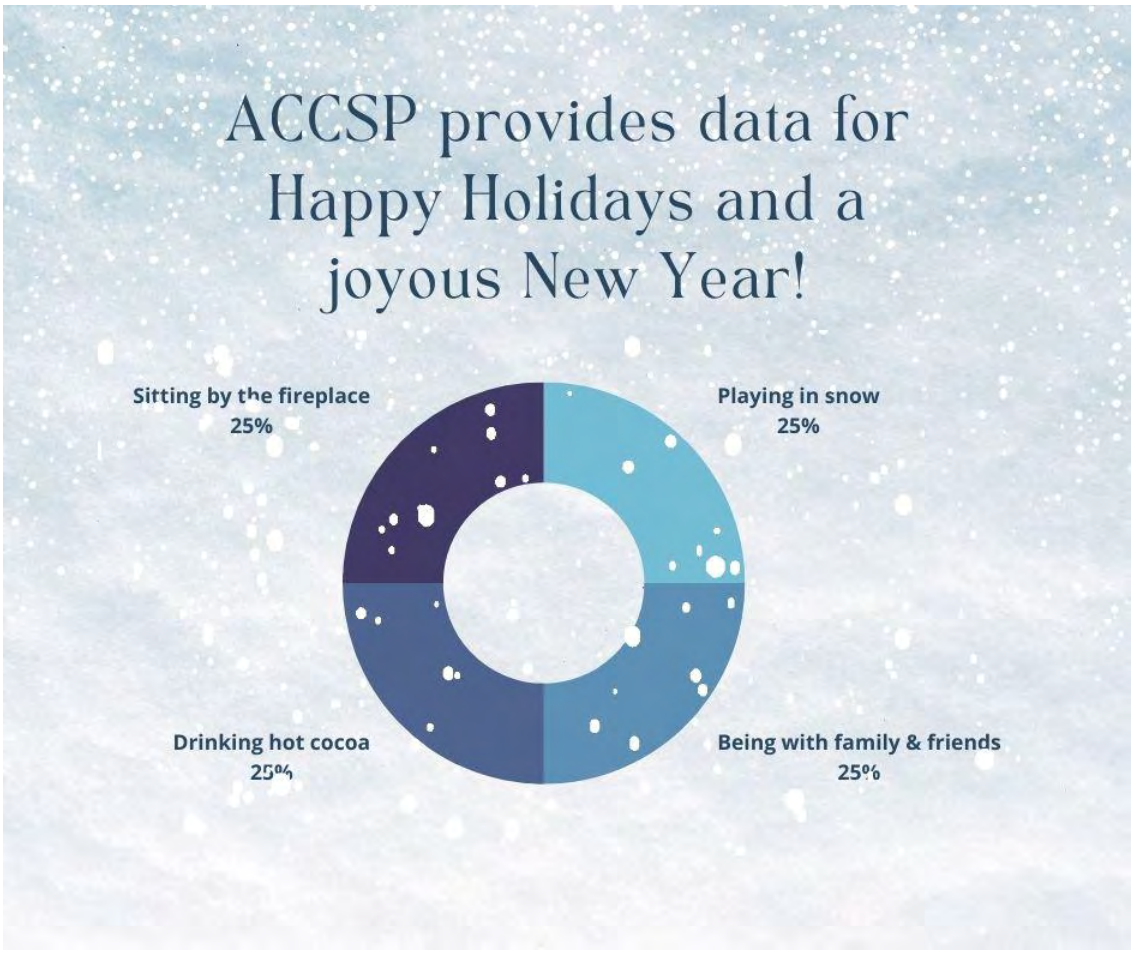
- Reviewed conduct of the Socioeconomic Add-on Survey (SEAS) to the Access Point Angler Intercept Survey (APAIS) in 2022. The SEAS, which occurs every five years, is a component of NOAA Fisheries' Expenditures Survey. The SEAS is being conducted electronically for the first time, via the APAIS tablet-based application, and a review of performance metrics shows that completion rates are higher than in previous years which could help improve the statistical estimates of recreational fishing expenditures on the Atlantic Coast.
- Discussed and provided final feedback to three major documents:

1. ACCSP Recreational and For-hire Data Standards
    - Define ACCSP policies for fisheries data collection and management and set direction on future improvements for recreational and for-hire fisheries on the Atlantic Coast
2. 2023-2027 Atlantic Recreational Implementation Plan
    - Guide MRIP allocation of resources to best address data needs of recreational fisheries
3. Second draft of a proposed methodology for the creation of for-hire logbook estimates of catch and effort for eventual submission to NOAA Fisheries for certification review
    - Comprehensive for-hire data collection could help address a critical need along the Atlantic Coast to provide for data collection that is inclusive of charter and headboats operating in both state and federal waters, while minimizing overlapping for-hire fishery reporting programs
    - Comments were incorporated and the document was resubmitted to NOAA Fisheries in December, 2022.

- Julia Byrd (SAFMC) updated the Recreational Technical Committee on recent progress to SciFish, a citizen science mobile application and project builder intended to better support the capturing and sharing of marine fish information on the Atlantic Coast.
- Established a Recreational Technical Discards Subcommittee to draft a proposal for the 2023 ACCSP Request for Proposal (RFP), that plans to propose methods of improving data collection efforts for recreational discard data, likely focused on the private/rental boat fishing mode, which encompasses the majority of fishing effort on the Atlantic Coast.

meet again on March 8, 2023.

Highlight



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


mailchimp

Atlantic States Marine Fisheries Commission

Coastal Sharks Management Board

May 2, 2023
4:00 – 5:15 p.m.
Hybrid Meeting

Draft Agenda

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

1.	Welcome/Call to Order (*M. Bell*)	4:00 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from November 2022	4:00 p.m.
3.	Public Comment	4:05 p.m.
4.	Review NOAA Fisheries' Final Actions and Consider Comment on Proposed Actions for Coastal Sharks *(K. Brewster-Geisz)* • Proposed Rule to Prohibit the Harvest of Oceanic Whitetip Sharks • Final Amendment 14 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) • Final Atlantic Shark Fishery Review (SHARE) • Scoping for Amendment 16 to the 2006 Consolidated Atlantic HMS FMP • Scoping for Electronic Reporting • Proposed Rule for Amendment 15 to the 2006 Consolidated Atlantic HMS FMP	4:15 p.m.
5.	Consider Approval of Fishery Management Plan Review and State Compliance for the 2021 Fishing Year *(C. Starks)* **Action**	5:00 p.m.
6.	Other Business/Adjourn	5:15 p.m.

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

MEETING OVERVIEW

Coastal Sharks Management Board
May 2, 2023
4:00 – 5:15 p.m.
Hybrid Meeting

Chair: Mel Bell (NC) Assumed Chairmanship: 05/21	Technical Committee Chair: Angel Willey (MD)	Law Enforcement Committee Representative: Greg Garner (SC)
Vice Chair: Erika Burgess (FL)	Advisory Panel Chair: Vacant	Previous Board Meeting: November 9, 2022
Voting Members: MA, RI, CT, NY, NJ, DE, MD, VA, NC, SC, GA, FL, NMFS (13 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from November 2022

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

4. Review NOAA Fisheries' Final Actions and Consider Comment on Proposed Actions for Coastal Sharks (4:15-5:00 p.m.)

Background

- There are a number of recent or ongoing actions related to NOAA Fisheries' management of coastal sharks:
  - A Proposed Rule to prohibit the retention and possession of oceanic whitetip sharks (*Carcharhinus longimanus*) in U.S. waters of the Atlantic Ocean, including the Gulf of Mexico and Caribbean Sea. More information can be found on the NOAA Fisheries webpage.
  - Final Amendment 14 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP)
  - Final Atlantic Shark Fishery Review (SHARE)
  - Scoping for Amendment 16 to the 2006 Consolidated Atlantic HMS FMP
  - Scoping for Electronic Reporting
  - Proposed Rule for Amendment 15 to the 2006 Consolidated Atlantic HMS FMP

Presentations

- NOAA Fisheries Actions by K. Brewster-Geisz

Board actions for consideration at this meeting

- Consider providing public comment on proposed actions

5. Fishery Management Plan Review of the 2021 Fishing Year (5:00-5:15 p.m.) Final Action

Background

- State Compliance Reports are due annually on August 1st.
- The Plan Review Team reviewed state reports and compiled the annual FMP Review for the 2021 fishing year.
- Massachusetts has requested *de minimis* status.

Presentations

- Overview of the FMP Review Report by C. Starks

Board actions for consideration at this meeting

- Accept 2021 FMP Review and State Compliance Report.
- Approve *de minimis* requests from Massachusetts.

6. Other Business/Adjourn

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

COASTAL SHARKS MANAGEMENT BOARD

The Ocean Place Resort
Long Branch, New Jersey
Hybrid Meeting

November 9, 2022

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

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INDEX OF MOTIONS

Draft Proceedings of the Coastal Sharks Management Board Hybrid Meeting
November 2022

ATTENDANCE

Board Members

Dan McKiernan, MA (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Jason McNamee, RI (AA)
Dave Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Jim Gilmore, NY (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD (AA) (Acting)
Russell Dize, MD (GA)
Lewis Gillingham, VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Mel Bell, SC (AA)
Malcolm Rhodes, SC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Karyl Brewster-Geisz, NMFS

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

Ex-Officio Members

Michael Thomas, Law Enforcement Representative

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Emilie Franke
Chris Jacobs
Jeff Kipp
Dustin Colson Leaning
Adam Lee

Guests

Alan Bianchi, NC DENR
Jesse Bissette
Phil Coates
Allison Colden, CBF
Heather Corbett, NJ DFW
Jessica Daher, NJ DEP
Guy DuBeck, NOAA
William Dunn
Matt Gates, CT DEEP
Pat Geer, VMRC
Carrie Kennedy, MD DNR
Adam Kenyon, VMRC
John Kravchak
Meghan Lapp, SeaFreeze
Mike Luisi, MD DNR
Joshua McGilly, VMRC
Kelli Mosca, CT DEEP
Nichola Meserve, MA DMF
Brandon Muffley, MAFMC
Daniel Namur, NOAA
Brian Neilan, NJ DEP
Derek Orner, NOAA
Lucas Pensinger, NC DENR
Nicole Peyrafitte
Jill Ramsey, VMRC
Jeff Renchen, FL FWC
Jason Rock, NC DENR
Brandi Salmon, NC DMF
Chris Scott, NYS DEC
McLean Seward, NC DENR
Ethan Simpson, VMRC
Somers Smott, VMRC
Renee St. Amand, CT DEEP
Beth Versak, MD DNR
Craig Weedon, MD DNR
Meredith Whitten, NC DENR
Greg Wojcik, CT DEEP
Phil Zalesak
Erik Zlockovitz, MD DNR
Renee Zobel, NH FGD

The Coastal Sharks Management Board of the Atlantic States Marine Fisheries Commission convened in The Monmouth I Room in The Ocean Place Resort, a hybrid meeting, in-person and via webinar; Wednesday, November 9, 2022, and was called to order at 11:20 a.m. by Chair Mel Bell.

CALL TO ORDER

CHAIR MEL BELL: All right, this looks like a quorum to us, so we're going to go ahead and get started here. Welcome to the Coastal Sharks Management Board. I'm Mel Bell; the Chair. We have a fairly brief agenda; we've got a couple of action items we're going to have to deal with. We'll go ahead and get started. The only thing standing between your lunch right now.

APPROVAL OF AGENDA

CHAIR BELL: The first thing would be approval of the agenda. Are there any modifications to the agenda? John Clark, did you? Okay, got you down for something, okay, one item there. Any other modifications to the agenda? All right, seeing no other modifications we'll adopt the agenda as modified with one item under Other Business.

APPROVAL OF PROCEEDINGS

CHAIR BELL: Okay, approval of the proceedings of the May 2022 meeting. Any edits to the minutes from May, 2022? I don't see any hands, so the minute will stand approved then.

PUBLIC COMMENT

CHAIR BELL: Okay, it takes us to Public Comment. This would be public comment or anything not on the agenda. Do we have any public comment?

I see no hands. Do you guys have any hands virtually? No, okay. No public comment.

SET SPECIFICATIONS FOR THE 2023 FISHERY

CHAIR BELL: All right that takes us to our first actual item, which would be to set the 2023 specifications for the fishery, and I will turn it over to Dustin, and he's going to run us through that.

MR. DUSTIN COLSON LEANING: We've got just a short amount of time and just a few things to get through, so I'll get right into it. We're going to be covering the 2023 Commercial Specifications for Coastal Sharks. This is the same process that we've used in previous years. The proposed rule from the NOAA Fisheries Highly Migratory Species Division was published on September 9, and that was included in the briefing materials.

The Final Rules will be published after this meeting, sometime later this fall. The proposed rule demonstrated that we have pretty much everything status quo. The quotas remain status quo from 2022, and they've been the same for a number of years now. The rule also proposes to open all shark management groups on January 1 of 2023.

The aggregated large coastal sharks, other than sandbar sharks' retention limit also remains status quo at 55 sharks per vessel per trip. Blacknose sharks' retention limit is also status quo at 8 sharks per vessel per trip. Here we have the 2023 quotas themselves. I'll quickly just run through them. For the aggregated large coastal sharks, we have a proposed quota of 372,552 pounds dressed weight. For hammerhead sharks we had 59,736 pounds. For non blacknose small coastal sharks we have 582,333 pounds.

For blacknose sharks we have 37,921 pounds. For smoothhound sharks we have 3,973,902 pounds dressed weight. For the non-sandbar large coastal sharks research group, we have a proposed quota of 110,230 pounds. For sandbar shark research group, we have a quota of 199,943 pounds.

For blue sharks it would be 601,856 pounds. For porbeagle sharks it would be 3,748 pounds, and then lastly pelagic sharks other than porbeagle or blue sharks would be 1,075,856 pounds. It's really

simple here today, we're just considering whether to approve the 2023 coastal shark specifications via an e-mail vote.

After NOAA Fisheries publishes their Final Rule for the 2023 Atlantic Shark Commercial Fishing Season, Caitlin Starks and Toni Kerns will help with that e-mail vote process. If we approve this here today, it runs as we have done so in previous years. I do have a motion prepared for the Board's consideration, if they would like to move forward with that route.

CHAIR BELL: All right, does everybody understand where we are? We just need a simple, if someone would care to make a motion. John Clark.

MR. JOHN CLARK: Do you want me to read it into the record? Move to approve the 2023 Coastal Shark Specifications via an e-mail vote after NOAA Fisheries Highly Migratory Species Division publishes the Final Rule for the 2023 Atlantic Shark Commercial Fishing Season.

CHAIR BELL: All right, and Chris Batsavage seconds. Any discussion of the motion? Any objection to the motion? I don't see any, so motion carries. That leads us to our next item, which once again will be Dustin.

CONSIDER FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE OF THE 2020 FISHING YEAR

MR. COLSON LEANING: After we complete the motion, if we could pull up the Power Point for the FMP Review. All right, another agenda item that will likely go through fairly easily. But we do have the coastal sharks FMP Review of the 2020 fishing year. Now this is a little bit more delayed than we usually do this review.

Typically, this occurs at the spring meeting, however, there was a little bit of a delay not getting it on that agenda, and so we decided to bring it up here the next time the Coastal Sharks Board meets. Just so you are aware though, due to the data that is used in the FMP Review report that is published through NOAA Fisheries.

They have quite a significant delay, in terms of when that data becomes available. Already, within our standard process, we're typically a year later than most FMP reviews. Here I have listed the sections of the FMP Review Report. But like I said, in the interest of time, and getting you all to lunch, I'm going to only briefly touch on these topics. The Coastal Sharks FMP was implemented in 2009. Here on the screen, I have the five subsequent addenda that modified the fishery management plan. There are no coastal shark monitoring or research requirements, and the Commission also follows the lead of NOAA Fisheries Highly Migratory Species Division on setting quotas and closures, as we just went over. In regard to status of the stocks. There haven't been any changes to status of any of the sharks for the managed shark species.

However, there was one new stock assessment since this issue was taken up last, the Atlantic Blacktip shark stock assessment revealed that the stock is not overfished and not subject to overfishing. Now to cover status of the fishery. The commercial landings of aggregated large coastal shark species in 2020 were 227,783 pounds, roughly a 30 percent increase from 2019 landings.

The commercial landings of small coastal shark species in 2020 were 234,557 pounds, a 28 percent decrease from 2019 landings. The commercial landings of Atlantic pelagic sharks in 2020 were 98,514 pounds, which represents an approximate 6 percent decrease from 2019 landings. Then here on the graphic up on the screen, you can just see trends over time grouped by species management group.

This graphic, displays recreational harvest of sharks in numbers, and as was the case for commercial harvest, generally, recreational harvest decreased for large coastal sharks, small coastal sharks and pelagic sharks in 2020, relative to 2019. Now I'll cover de minimis requests. This fishery management plan actually does not establish specific de minimis guidelines that would exempt a

state from regulatory requirements contained in this plan.

De minimis is determined more on a case-by-case basis. Massachusetts is requesting a continuation of de minimis status for the aggregated large coastal and hammerhead species groups, with regard to the possession limit and closure requirement. Massachusetts is also requesting that blacknose sharks be included within the exemption, given the species range and based on the fact that no blacknose sharks are landed in Massachusetts.

The Plan Review Team reviewed the de minimis request and recent data, and recommends de minimis status be granted to Massachusetts for the aggregated large coastal, hammerhead and blacknose species groups. The PRT also noted that the non-offset circle hook requirements for the recreational fishery have not been implemented yet in New Jersey.

In the compliance report, New Jersey has indicated that their rulemaking process has faced some delays, but implementation is expected by January of 2023. The PRT will just continue to monitor this in their next year of review. Lastly, the Plan Review Team noted that Georgia's recreational regulations allows for the landing of one hammerhead, one shortfin mako, and one other shark, and keep in mind this is for 2020, before the shortfin mako 0 retention limit was implemented.

But that three-shark regulation for recreational retention is in excess of what is allowed under the FMP, which if you remember is one shark per person per vessel, plus one Atlantic Sharpnose and one bonnethead. This issue has been raised with the Georgia Department of Natural Resources, and staff there have indicated that the regulations will be updated accordingly. With that, just a very quick review of the FMP and compliance, and most importantly the PRT comments and recommendations. Aside from the issues that the PRT raised, there were no other major concerns. I turn it back to you, Mr. Chair, for any questions. Then again, we do have a motion prepared if the Board would like to move ahead with approving state compliance, FMP review and de minimis requests.

CHAIR BELL: Thank you for the presentation, Dustin. Any questions regarding anything in there or anything not in there? You all must be hungry. I don't see any hands, so we could cue up the motion. All right, this would be a motion to approve. Nichola.

MS. NICHOLA MESERVE: I would move to approve the Coastal Sharks FMP Review for the 2020 fishing year, state compliance reports and the de minimis request from Massachusetts.

CHAIR BELL: Thanks, and Eric Reid seconds. Any discussion of the motion? Any objection to the motion? Seeing none; motion carries. Thank you.

Those were the two items that we had to cover, and remember, we will get a follow-on e-mail regarding with dealing with the 2022 fishery, so look for that after NOAA does the Final Rule.

OTHER BUSINESS

CHAIR BELL: John Clark, you had an item you wanted to bring up?

MR. CLARK: I'll make it brief. Far be it for me to stand between anybody and lunch. Many of the Commissioner's know that I sent out an e-mail a couple months ago about bow fishing and rays, and I greatly appreciate the responses I received about that. Part of the bow, it's three parts of course, there is the bow fishing in the lights, which is a state issue.

But the problem that I have right now in Delaware is that we can't manage a species that doesn't have a management plan, at least a two-state management plan. The harvest of rays, as I looked into this, is actually pretty significant in our state, which as you know is a very small state. As I looked

into it and got information from up and down the coast.

I mean it seems mostly from about Delaware south, and I know from the information I got from New Jersey, it's not legal to do this in New Jersey. But it seems like it's going on in every other state. The technology has gotten to the point with the generators and lights that this is now a growing activity.

I was just curious if, rays of course are not sharks, but they are elasmobranchs. I didn't know whether this is where it would fit. One of the comments that keeps coming up from public in Delaware about this issue is that I'll say, we can do something about regulating the lights, but we can't stop them from harvesting as many rays as they want to. I give credit to the guides in Delaware that are doing this.

They are very sure to point out that they are cleaning these fish, they are giving them to their clients that are killing these rays. But they are killing a lot of rays, and I just didn't know whether there was any interest in the Board to start looking into that. I know Maryland has been working on a ray management plan, right, Lynn? I don't know if any other states have given any consideration to that. But I just wanted to put it out there. Thanks.

CHAIR BELL: Thanks, John, appreciate you asking about that. I know we don't manage them either in South Carolina. I can see where some of the gear things, lights and all. Yes, that is something you can deal with. Yours is recreational primarily?

MR. CLARK: Right now, it is recreational, but given that it is a legal gear to be using commercially too, not that anybody is. Given the amount of harvest that can be done. If there really was a market out there, I think there might be something that could develop. Of course, rays are like sharks, the ones that are most common in the inshore waters where we are, like the cownose and the bullnose rays, and they are slow to reproduce.

You know they typically have one or two pups a year. They are something that can be overharvested, I think, and also some of the concerns about them, in terms of their eating clams and things like that are pretty much overblown, based on diet studies. They are not really a menace to shellfish populations.

CHAIR BELL: Okay, any questions, comments, any thoughts on that from other states at this point? Yes, Jason.

DR. JASON McNAMEE: Just a question for John, Mr. Chair, if you don't mind. John, is it your sense that because of the way the fishery is prosecuted, it's not like it's happening at night. Are the fish not being intercepted, like is it being captured by MRIP, or is it your sense that it's not?

MR. CLARK: I don't believe it really is. Well, there is nighttime. I mean they're actually doing it during the day also, but especially because of the huge elimination you can get from LEDs now with just a small generator on a boat. They can really light a place up, and you know the rays are easy to find at night. But yes, I don't believe it is being picked up.

CHIAR BELL: Yes, I know in our case if it's a charter boat, we would pick that up as a state. But other states might not. Any other questions or thoughts on that? I know they are not sharks, but they are indeed elasmobranchs. Yes, Jason.

DR. McNAMEE: Yes, just wondering what the next step is. I'll offer a suggestion. Perhaps we could let NOAA know about this. You know, I can't remember the name of the branch. I don't know if it would be protected species or a large pelagics branch, but we could let them know that they can investigate it, to see if they have a concern with the number being removed, you know relative to life history characteristics that you mentioned. I don't know what else to do. It's not something that we think is happening in Rhode Island.

CHAIR BELL: Yes, Toni, you want to say something first? Then I'll go to Roy.

MS. TONI KERNS: I could ask Karyl, she's online. NOAA does do assessments of some ray species, so they are managed in some way. I don't know which ones exactly. But in terms of the Commission, if it is the pleasure of this Board to investigate whether or not we want to add X species of rays, then I would think we would need to specify which ones we're looking to do. Then that would be a recommendation to the Policy Board. Typically, we do sort of an investigation of that species, and try to get as much information as we can to present to the Policy Board and determine if it's a species that we want to add to the Commission. We've done this in the past with species like whelk. Most recently Jonah crab and then Jonah crab was added, but we did not whelk. But Karyl does have her hand up, so I can let her speak to which species are or are not managed by NOAA.

CHAIR BELL: Yes, that would be great.

MS. KARYL BREWSTER-GEISZ: Hi, thanks. Skates and rays are not managed by my division, the Highly Migratory Species Management Division. I know there are some skate species managed through the New England and Mid-Atlantic Councils. Some of the skate, like thorny skate and clearnose skate, I will do some research to see if anyone is doing ray management. But I am not aware of that.

CHAIR BELL: Yes, the concern might be a growing fishery or potential for a rapidly growing fishery with not management, and then you're having to come back maybe at some point and deal with it. Roy, I know you had your hand up, and then Bill.

MR. ROY W. MILLER: I was just going to quickly add. A few years ago, there were concerns over expansion of cownose rays' populations, due to excessive removal of some of the large coastal sharks that would otherwise prey on cownose rays. Really, if NOAA Fisheries has any data, they could share with us on the dynamics of the cownose ray, bullnose ray population, I think that would be very helpful in this, so we know whether these populations are indeed increasing or decreasing, and are they vulnerable to overharvest.

CHAIR BELL: Good point. Bill Hyatt, and then I'll come back.

MR. WILLIAM HYATT: Just a quick question. You know I thought I heard you say before that Delaware doesn't have the authority to manage it as an in-state fisheries issue. I was just wondering why that's the case. I might have missed something.

MR. CLARK: That's the law, Bill. I'm not exactly sure. I think they didn't really trust us. I think it's partly, we're just such a small state that I think the thinking if for tidal fish that they are never just going to be in Delaware. You know therefore, if there is a plan out there, we can manage based on that, but otherwise we're not allowed to set up regulations to limit the harvest.

You know, I just was hoping eventually something simple that could be done. But I know it is adding a species is a big lift, and then get it into compliance and all that. But just thinking of some way that perhaps, you know to put this on the radar of everybody that, you know this is something that we could be seeing more of up and down the coast.

CHAIR BELL: Okay, thanks. Russell then Lynn.

MR. RUSSELL DIZE: Mr. Chairman, in Maryland cownose rays are a menace to the crab industry. They follow the shedding of the crabs in the Chesapeake Bay. They come up the Bay and you can see where they are by where the crabs are shedding and which part. The Maryland part it would start in Crisfield and come right on up the Bay. But we have so many now that they have crabbers use clams and little bags on a trotline, and they go in and they just mash those clams and your bait is gone. Not only that, they cut the grass off in our creeks and our rivers, as they're going through the grass to catch the soft crabs they cut the grass

off, and we don't want that. We want the grass to stay there.

As you can notice, I'm not a big fan of the cownose ray. Now there are so many different rays, this cownose ray, this specific ray that we can find, has any value for food. About 25 years ago when Larry Sims was President of Maryland Waterman's Association, we had a bunch of them caught and their wings cut off and packed, and shipped them overseas to Korea.

We were trying to find a market so that we could catch these. They sent back and tried to send us a bill for dumping them. They couldn't get rid of them. You know different areas different things, but in Maryland, in our part of the Bay in the summer, they come up somewhere around the first of June until September, they are a menace to the crab industry. Thank you, Mr. Chairman.

CHAIR BELL: Thanks for that perspective too. Lynn.

MS. FEGLEY: Just quickly I wanted to say that back in 2015, I think Emilie was the one who spearheaded this. Cownose rays were highly controversial. We did a workshop in Maryland that really assembled pretty much all of the data we could find on this species. There is a report, I would be happy to forward that to you, Toni, for distribution, just to sort of get at this, what do we know? You know what is fact? What is the life cycle what are the vital rates, all those sorts of things we looked at and that is on file with us. I can send that around.

CHAIR BELL: Okay, thanks, Lynn. Roy, do you have another?

MR. MILLER: Very quickly. I was just going to elaborate for Bill Hyatt and others who might be wondering. Back in the middle of 1980s legislation passed giving the Division of Fish and Wildlife regulatory authority over finfish, to the extent they are covered in an interstate fishery management plan.

Prior to that all governance over marine finfish in Delaware was through the legislature. That has not changed since the middle 1980s, and that's why the Division of Fish and Wildlife needs to act in concert with either a neighboring state or an approved fishery management plan, in order to pass regulations on marine finfish.

CHAIR BELL: Thanks, Roy, anything else on rays? Well, you all didn't talk about sharks much, but you talked about rays. John.

MR. CLARK: I just wanted to make clear. I'm not looking that we would eliminate harvest of rays, and Russel, I understand that there is concern about them. But I'm just saying there is concern in Delaware, just because there are guys coming back with 20 rays, and people see that and they're like, what are you doing with all those rays. The guys are very good about saying they clean them and they give them to the customers to eat. But just as you said, I don't know that all that is getting eaten. Let's just put it that way. Thanks.

CHAIR BELL: No that's fine to bring that up too. I mean that's the benefit of having a group like this where we can point out things that are going on and discuss them. Any other discussion of rays? All right that's it for the agenda. Toni.

MS. KERNS: Today is Dustin's last day at the meeting, and I just wanted to, I was going to do this at Policy Board, but he won't be here so I have to embarrass him a little bit now instead. For those of you that didn't see Bob's e-mail, Dustin is taking a new position with the Environmental Defense Fund, and a job that he declared to me once just the perfect next step path for him.

It's always bittersweet when members of the staff leave, but I'm always super excited for the new challenges that they have waiting for them at their next step. I just want to thank Dustin for all of the work that he has done with the Commission. He walked in day one with so much energy, and such an inquisitive mind on how the Commission works and our process, and really stepped in to get into

the details, which was particularly helpful in summer flounder and bluefish and exploring analyses, and working with the Technical Committees.

Then on the other hand just really trying to make sure that the products that we put out are accessible to our stakeholders and working back and forth with them, to make sure that what we were presenting for the Harvest Control Rule was something that folks could understand, which was not an easy task. I just want to say thank you and good luck in your new role.

CHAIR BELL: Thank you, Dustin. (Applause) You've been great for support and I love, yes young energy. That's what we need, so congratulations and good luck. If you have anything you would like to say, go right ahead.

MR. COLSON LEANING: Yes, thank you, and thanks for going easy on me today. We got such a free coasting last meeting, not always reminiscent of summer flounder. I do appreciate just being able to meet with you all at one point or another over the course of the last three days. It's been great to say goodbye in person.

Because it really has been such a pleasure working with you all. I hope this isn't goodbye and farewell, I hope this is just me moving into a new position, where I get to continue to work with you all on just making sure that we have sustainable fisheries, not only in the U.S. but abroad as well, so I am excited for the new chapter. Thanks everyone.

ADJOURNMENT

CHAIR BELL: Thank you. All right, having no other business to come before the Coastal Shark Board, we will adjourn. Lunch and then back here for some fun with menhaden, right? Eat a good lunch.

(Whereupon the meeting adjourned at 11:50 a.m. on Wednesday, November 9, 2022)

Atlantic States Marine Fisheries Commission

Horseshoe Crab Management Board

May 3, 2023
1:00 – 3:00 p.m.
Hybrid Meeting

Draft Agenda

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

1.	Welcome/Call to Order *(J. Clark)*	1:00 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from November 2022	1:00 p.m.
3.	Public Comment	1:05 p.m.
4.	Consider Work Group Report on Biomedical Best Management Practices *(C. Starks)* **Action**	1:15 p.m.
5.	Review Potential Processes and Resources Required for Evaluating Management Objectives for the Delaware Bay Bait Fishery *(C. Starks)* **Possible Action**	2:15 p.m.
6.	Other Business/Adjourn	3:00 p.m.

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

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEETING OVERVIEW

Horseshoe Crab Management Board Meeting
May 3, 2023
1:00 – 3:00 p.m.
Hybrid Meeting

Chair: John Clark (DE) Assumed Chairmanship: 1/22	Horseshoe Crab Technical Committee Chair: Vacant	
Vice Chair: Justin Davis (CT)	Horseshoe Crab Advisory Panel Chair: Brett Hoffmeister (MA)	Law Enforcement Committee Representative: Nick Couch (DE)
Delaware Bay Ecosystem Technical Committee Chair: Wendy Walsh (FWS)	Adaptive Resource Management Subcommittee Chair: Dr. John Sweka (FWS)	Previous Board Meeting: November 10, 2022
Voting Members: MA, RI, CT, NY, NJ, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from November 2022

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

4. Work Group Report on Biomedical Best Management Practices (1:15-2:15 p.m.) Action

Background

- In November 2022, the Board formed a work group to review the best management practices (BMPs) for handling biomedical collections. The work group includes technical committee and advisory panel members with expertise in horseshoe crab biology, ecology, and biomedical processing.
- The work group met multiple times to recommended updates to the BMPs originally developed in 2011 (**Briefing Materials**).
- The work group provided additional recommendations for Board consideration related to the biomedical fishery and industry (**Supplemental Materials**).

Presentations

- Work Group Report on Biomedical Best Management Practices by C. Starks

Board actions for consideration at this meeting

- Approve updated Best Management Practices

5. Review Potential Processes and Resources Required for Evaluating Management Objectives for the Delaware Bay Bait Fishery (2:15-3:00 p.m.) Possible Action

Background

- At its November 2022 meeting, after adopting changes to the Adaptive Resource Management (ARM) Framework, the Board discussed the possibility of forming a work group to evaluate the current goals and objectives for the management of Delaware Bay horseshoe crab.
- Staff has provided a list of potential approaches for evaluating management objectives, and the resources required for each option (**Briefing Materials**).

Presentations

- Potential Processes for Evaluating Management Objectives for the Delaware Bay Bait Fishery by C. Starks

Board actions for consideration at this meeting

- Consider forming a work group to address management objectives for the Delaware Bay bait fishery

6. Other Business/Adjourn

Horseshoe Crab

Activity level: Low

Committee Overlap Score: Low

Committee Task List

- TC – July 1st: Annual compliance reports due
- ARM & DBETC – Fall: Annual ARM model to set Delaware Bay specifications, review red knot and VT trawl survey results

TC Members: Katie Rodrigue (RI), Jeff Brunson (SC), Derek Perry (MA), Deb Pacileo (CT), Catherine Ziegler (NY), Samantha Macquesten (NJ), Jordan Zimmerman (DE), Steve Doctor (MD), Ingrid Braun (PRFC), Adam Kenyon (VA), Jeffrey Dobbs (NC), Eddie Leonard (GA), Claire Crowley (FL), Chris Wright (NMFS), Joanna Burger (Rutgers), Mike Millard (USFWS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

Delaware Bay Ecosystem TC Members: Wendy Walsh (USFWS, Chair), Samantha MacQuesten (NJ), Henrietta Bellman (DE, Vice Chair), Jordan Zimmerman (DE), Steve Doctor (MD), Adam Kenyon (VA), Jim Fraser (VA Tech), Eric Hallerman (VA Tech), Mike Millard (USFWS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

ARM Subcommittee Members: John Sweka (USFWS, Chair), Linda Barry (NJ), Henrietta Bellman (DE), Jason Boucher (DE), Steve Doctor (MD), Wendy Walsh (USFWS), Conor McGowan (USGS/Auburn), David Smith (USGS), Jim Lyons (USGS, ARM Vice Chair), Jim Nichols (USGS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

HORSESHOE CRAB MANAGEMENT BOARD

The Ocean Place Resort
Long Branch, New Jersey
Hybrid Meeting

November 10, 2022

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

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ATTENDANCE

Board Members

Dan McKiernan, MA (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Conor McManus, RI, proxy for J. McNamee (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Sen. Craig Miner, CT (LA)
Jim Gilmore, NY (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Mike Luisi, MD, proxy for L. Fegley AA (Acting)
Robert Brown, MD, proxy for R. Dize (GA)
Dave Sikorski, MD, proxy for Del. Stein (LA)
Shanna Madsen, VA, proxy for J. Green (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Marty Gary, PRFC
Chris Wright, NMFS
Rick Jacobson, US FWS

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

Ex-Officio Members

Brett Hoffmeister, Advisory Panel Chair

Staff

Robert Beal
Toni Kerns
Madeline Musante
Tina Berger
Kristen Anstead
Tracey Bauer
Emilie Franke
Chris Jacobs
Jeff Kipp
Adam Lee
Heather Power
Caitlin Starks
Geoff White

Guests

Fred Akers, Gr. Egg Harbor
Max Appelman, NMFS
Linda Barry, NJ DEP
Meredith Bartron, US FWS
Alan Bianchi, NC DENR
Nora Blair, Charles River Labs
Sarah Blick, ACCI USA
Jason Boucher, NOAA
Colleen Bouffard, CT DEEP
Jeff Brunson, SC DNR
Jeff Brust, NJ DEP
Nicole Caudell, MD DNR
Zach Cockrum, NWF
Margaret Conroy, DE DFW
James Cooper
Heather Corbett, NJ DEP
Abigail Costigan, Stonybrook
Stephen Cottrell
Deborah Cramer
Jolie Crunelle, RIT
Jessica Daher, NJ DEP
Steve Doctor, MD DNR
Tim Dillingham, Littoral Society
Jeffrey Dobbs, NC DENR
Roman Dudus
Chiara Eisner, NPR
Jacob Espittia, FL FWC
Catherine Fede, NYS DEC
Cynthia Ferrio, NOAA
Brad Floyd, SC DNR
Tony Friedrich, SGA
Matt Gates, CT DEEP
Pat Geer, VMRC
Lewis Gillingham, VMRC
Shirley Goffigon
Jamie Green, VA, (AA)
Zoe Grueskin
Brooke Handley, Gr. Egg Harbor
Harry Hornick, MD DNR

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

Guests (continued)

Margaret Keane
Michael Kendrick, SC DNR
Carrie Kennedy, MD DNR
Adam Kenyon, VMRC
John Kravchak
Rob LaFrance, Quinnipiac Univ
Christina Lecker, Fuji Film
Benjamin Levitan, EarthJustice
Susan Linder, HSC Recovery
Danni Logue
Samantha MacQuesten, NJ DEP
John Maniscalco, NYS DEC
Tobias Matts, ACCI USA
Patrick McGrath, VIMS
Dayna Mercadante, NJ Leg.
Lindsey McNamara, Littoral Soc.
David Meservey, Chatham, MA
Mike Millard
Kyle Miller, FL FWC
Steve Minkkinen, US FWS
Tina Moore, NC DENR
Kelli Mosca, CT DEEP
Brandon Muffley, MAFMC
Kirby Rootes-Murdy, USGS
Brian Neilan, NJ DEP
Josh Newhard, US FWS
Derek Perry, MA DMF
Zoe Read, WHYY
Allen Reneau, Fuji Film)
Samantha Robinson, DE DFW
Jason Rock, NC DENR
Brandi Salmon, NC DMF
Daniel Sasson, SC DNR
Chris Scott, NYS DEC
Anna Schields, DE DFW
McLean Seward, NC DENR
Ethan Simpson, VMRC
Dave Smith, USGS
Somers Smott, VMRC
Brian Sparrow, Fuji Film
Renee St. Amand, CT DEP
David Stormer, DE DFW
Alex Su
Toni Tablante, Littoral Soc
Beth Versak, MD DNR
Wendy Walsh, US FWS
Kristoffer Whitney, RIT
Angel Willey, MD DNR
Faith Zerbe, DE Riverkeeper
Jordan Zimmerman, DE DFW
Erik Zlokovitz, MD DNR

The Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission convened in The Monmouth I Room in The Ocean Place Resort via hybrid meeting, in-person and webinar; Thursday, November 10, 2022, and was called to order at 9:00 a.m. by Chair John Clark.

CALL TO ORDER

CHAIR JOHN CLARK: Good morning, everybody, and welcome to the Horseshoe Crab Board. The Board is now in session. I am your Chair, John Clark, I'm the Administrative Commissioner from the first state, Delaware, and I'm joined up here at the front by our Advisory Panel Chair, Brett Hoffmeister, and ASMFCs dynamic duo of Horseshoe Crabs.

The Plan Coordinator, Caitlin Starks, and Assessment Scientist, Kristen Anstead, and between them they'll be able to cover so many of the things that we're going to be talking about today.

APPROVAL OF AGENDA

CHAIR CLARK: Let's move on to Item 2, which is Board Consent. First on the agenda there is going to be a slight rearrangement. It will just make things work better in the flow.

We're going to go to Agenda Item 5, which is to Review the Results of the ARM Model. That way we'll have all the description of what's going on with the ARM, before we consider Addendum VIII. But we will not be taking action on Item 5. The action will be taken in order, so we'll be taking action on Addendum VIII, and then we will be going to Item 5, which is to set the specifications and taking action on that. Just a slight rearrangement.

Having said all that, are there any further revisions to the agenda? Seeing none, the revised agenda is accepted by consent.

APPROVAL OF PROCEEDINGS

CHAIR CLARK: Proceedings from the August 2022 meeting, Are there any revisions or comments about the proceedings? Seeing none; those are also approved by consent.

PUBLIC COMMENT

CHAIR CLARK: We move on to Item Number 3, Public Comment.

Is there any public comment for items not on the agenda? I've been told, no there is not.

ADAPTIVE RESOURCE MANAGEMENT MODEL RESULTS

CHAIR CLARK: I just want to make clear that we are not going to be allowing further comment on Draft Addendum VIII or on the ARM Model. We had plentiful opportunity to comment on the Draft beginning with the August board meeting, and through the many hearings, and during the open comment period.

The number of comments received, as everybody saw, was huge. The Board appreciates the effort, thought and passion shown in those comments, and will fully consider those comments. They will all be getting summarized by Caitlin during the addendum process here. We will be carefully considering those when we make our decisions. I just wanted to make that clear.

CHAIR CLARK: Okay, having said all that now, we move on to our next item, which will then be Item 5, the presentation for Item 5, and I'll turn it over to Kristen for that. Thanks.

REVIEW HORSESHOE CRAB AND RED KNOT ABUNDANCE ESTIMATES AND ARM MODEL RESULTS

DR. KRISTEN ANSTEAD: Thank you, good morning. I'm Kristen Anstead. I'm the Commission's Stock Assessment Scientist on Horseshoe Crab. Today I'll be presenting the Delaware Bay harvest recommendations from the ARM Subcommittee, and the Delaware Bay Ecosystem TC.

Since the implementation of the ARM Framework, the Delaware Bay Ecosystem Technical Committee, the TC, and the Adaptive Resource Management Subcommittee, the ARM, have met annually to

review the data on horseshoe crab and red knots, and make a harvest recommendation to the Board.

As a reminder, both of these committees are made up of Horseshoe Crab biologists, shorebird biologists, state and federal representatives, and stock assessment scientists. Both committees have approximately a 50/50 split of shorebird and horseshoe crab representation, although there has been some turnover in the last couple months, and we will be repopulating those committees.

This year is a little different, because we're currently operating under Addendum VII, which is the old ARM. That is how I'm going to refer to it throughout this presentation is the old ARM as the 2012 ARM. But we're also considering Addendum VIII, which is the revised ARM or the new ARM.

At our annual meeting of the Delaware Bay Ecosystem TC and ARM Subcommittee, we considered both of these methods, and discussed the recommendation for the Board. Also, I'm going to spend a little bit more time on the details today than I normally do, because of the immense public interest in the science and the process around the ARM revision. First, let's talk about the old ARM.

Up here in the italics are the objective statement for the ARM. This was developed through lengthy discussions with the Technical Committees, mangers and stakeholders during the development of the original ARM Framework. To achieve this objective, which is to manage horseshoe crabs in the Delaware Bay Region, to maximize harvest, but also maintain ecosystem integrity, and provide adequate stopover habitat for migrating shorebirds.

To achieve this the ARM Model was developed, where the harvest of female horseshoe crab is decreased or prohibited when the red knots and female horseshoe crab abundances are low, and the male harvest would be decreased or prohibited when horseshoe crab population sex ratio limits the population growth.

The original ARM had a couple population thresholds for both species, which I'll go over in the following slides, and the horseshoe crab population was estimated from the Virginia Tech Trawl Survey, and the red knot population was estimated from mark/resight model using tagging data. There were five harvest packages that could be recommended for the Board's consideration on an annual basis. Here are the original five harvest packages. The need for these five to three packages is due to modeling limitations at the time. We couldn't have continued packages where they were all available options for both sexes up to the maximum allowable harvest by sex. We had Harvest Package 1, which is full moratorium for both sexes for all states in the region. Harvest Package 2 and 3 with low and high, male only harvest for when the populations were below their thresholds, and Package 4 and 5 were low and high harvest packages for both sexes when the threshold was met.

Again, female harvest was always an option in the original ARM and the two of the five possible harvest packages included female harvest. The maximum harvest allowed, so for example of 210,000 for females, was agreed upon by the Committee deliberations during the development of the original ARM.

Let's talk a little bit about the thresholds in the old ARM Framework. The ARM Model recommends female harvest only when the abundance of red knots reaches 81,900 birds, and that was the value related to historic abundance of red knots in the region, and/or when the abundance of female horseshoe crab reaches 80 percent of a carrying capacity.

That was 11.2 million female horseshoe crabs, assuming a carrying capacity of 14 million. Stakeholders at the time of the original ARM Framework agreed that if the female population grew to 80 percent of that carrying capacity, that harvest would not be considered a limiting factor for the red knot population growth.

The carrying capacity was based on a paper by Sweka et al. in 2007. It was an age structured model based on life history parameters, and at the

time it was the best science available. On an annual basis the ARM Model is used to select the harvest packages out of those five packages, to implement for the next year, given the current state of how many horseshoe crabs are in the system, and how many red knots are in the system.

For red knots, the red line is that 81,900 threshold, the population threshold for red knots. The blue line are the mark/resight estimates. Those are the ones we use in the ARM Framework, and you can see their error bars. There is a little bit more error in the last two years, and that is due to sampling around COVID. There were some reduced teams, but the survey was still fully in operation, you can just see a little bit more error.

The green line are the aerial and ground count. We don't use that as an input to the ARM Framework, but the committees annually look at several data streams in their deliberations, and so that is just included on the graph. Red knot abundance estimates from the mark/resight estimates in the spring of 2022 was 39,800 red knots.

The data and the methods around the estimation can be found in the meeting materials. They are provided by Jim Lyons from the USGS. For red knots, the population estimate in 2022 was slightly lower than 2021, as was the amount of time that the birds spent on average in the region. Okay, for horseshoe crab the old ARM used the Virginia Tech Trawl Survey to estimate population abundance.

The top graph is females. You can see the population threshold was 11.2 on that graph, and the bottom graph is males. The survey was not funded for a few years there in the middle, and those years are indicated by the dash line. Index was developed from other surveys in the region to make up data for those years, so you have a continuous time series. You can also see that in the terminal year 2021, that the females have exceeded their population threshold. I just for one minute want to talk about the different stages, and how we use that in ARM Framework.

The Virginia Tech Trawl Survey collects data on three stages, so immature or juveniles. For females that would be about ages 0-8. We have newly mature horseshoe crabs, which are around 9, and those are horseshoe crabs that are newly mature in the fall, and will participate in peak spawning the following spring, and provide eggs for the birds.

Then we have the mature stage, which is 10 plus for females, so everything else. Each year on the annual time step that newly mature becomes mature horseshoe crabs. When we're doing the ARM Framework, we're adding the newly mature and mature together from the fall, because that is what is going to provide a stopover for the birds in the following year.

Because that survey operates in the fall, we take away half a year of natural mortality before we use that population estimate in the ARM Framework. There were 15.5 million females and 44.9 million males in the Virginia Tech Trawl Survey in 2021. We subtracted a half a year of natural mortality, and so going into the ARM Framework for the old ARM this year, there was 13.5 million females and 39.1 million males.

As you probably know, this is the first year that the population estimates in the Virginia Tech Trawl have exceeded the threshold. Since its implementation, the ARM has recommended Harvest Package 3, which is that 500,000 male-only harvest, because both female horseshoe crabs and red knots were below their threshold.

Using the old ARM Framework and agreed upon objectives, thresholds and harvest packages, the harvest recommendation for 2023 would be Harvest Package 5, maximum female harvest, because that threshold was exceeded. Even though the red knots have not reached the population threshold, the female harvest is recommended, because the population is above their threshold, and unlikely to be the limiting factor at that point.

This is an example of the harvest allocation between the states using that Harvest Package 5. Not all the states in the Delaware Bay are felt to be

100 percent Delaware Bay origin, so I won't belabor this slide, but you have your Delaware Bay origin that is coming from the maximum harvest, Harvest Package 5, how it's divvied up between the states, and then Maryland and Virginia's crabs are not 100 percent Delaware Bay origin, so their quotas are slightly adjusted.

Plus, that has more to do with Caitlin's presentation, so we can save some of the questions on allocation for later. Let's talk about the new ARM. Who asked for this? Why was the ARM revised? The ARM Subcommittee was tasked with revising the ARM Framework to incorporate new data. We have ten years of data since the previous ARM was developed, as well as move the model to a different software platform.

The old ARM is run in an obsolete platform and we can't update it anymore, so it had to be moved to a different place, if we wanted to continue to use the ARM Framework. Additionally, this is a routine part of stock assessments, to update a model and data on a 3, 5, 10-year time series, depending on the species life history. It is fairly normal and part of our process to redo stock assessments on this time scale. During the ARM revision the committees added to the previous objective statement so that the same objective statement.

But we have added the additional part in red, to ensure that the abundance of horseshoe crab is not limiting the red knot stopover population or slowing recovery. This was implicit in the original ARM, but we made it explicit in our objective statement as we continue to revise this model. The red knots are estimated the same way in the new ARM, so from the mark/resight estimates.

The horseshoe crab is now estimated from a catch survey model. The Catch Survey Model uses and heavily relies on the Virginia Tech Trawl Survey, as well as two other surveys in the region that provide additional information on abundance at natural mortality, and it accounts for all sources of quantifiable removals, so biomedical mortality of commercial dead discards from other fisheries.

This is considered an improvement over the previous methods, since we are now using a population model instead of a swept area population estimate. Because we can do more modeling now, we have continuous harvest packages, so anywhere between, for example for females 0 and 210,000 females can be selected, depending on their abundance.

Additionally, the males in the female harvest are no longer linked to each other, so each sex of horseshoe crab, the quota can be recommended based fully on their own population. Also, we have incorporated biomedical data, which was a specific task from the Board when we went to do this revision, which should account for that mortality in the model. We have done that.

But the Delaware Bay specific biomedical data is confidential, so we have developed a model, both using coastwide data, no biomedical data, but we make our harvest recommendation based on that confidential run. You'll see ranges here in my following slides. These are the horseshoe crab population estimates coming out of the Catch Survey Model.

The females are on the top and the male horseshoe crabs are on the bottom, and you see the two runs here. One with the coastwide biomedical and one with no biomedical data. The Delaware Bay specific is confidential, but the harvest recommendations are made on that run. What I'm showing you is the upper and lower bounds of what that population is, based on that confidential data.

You can see they overlap for the most part, because the biomedical, the coastwide harvest as well as no harvest is on a much smaller scale than the millions of the population estimates. Between the two runs, females are between 6 and 6.1 million mature crabs in 2021, and the males are between 15.9 and 16 million. That real value using the confidential data is somewhere between there.

Why is this so different from Virginia Tech Trawl? As I'm sure you recall, the Virginia Tech Trawl we had our highest value in the entire time series in

2021. Well, they are different for a couple of reasons. I'll go through those. But what I'm showing here on the top graph is the newly mature and the mature females on the bottom, this is just females. We're going to talk about females for a minute, and I split them out by sex. First of all, the two methods are just different.

The Virginia Tech Trawl, the total abundance that they are coming up with their estimate annually is from extrapolating that mean catch per tow to the entire Delaware Bay Region, versus the Catch Survey Model, which is a population model. They're different methods. Additionally, Virginia Tech Trawl is conducted in the fall, so the Catch Survey Model lags that forward to match the timing of the other surveys and the removals.

The 2020 Virginia Tech datapoint is being used to inform the 2021. The Catch Survey Model is about a year behind the Virginia Tech Trawl. That very high datapoint actually isn't even in the Catch Survey Model yet. The terminal year of 2021 is using the 2020 Virginia Tech Trawl data. Thirdly, the Catch Survey Population Estimate is highly influenced by that stage abundance data that I talked about in the Virginia Tech Trawl.

The model is having a hard time reconciling those low values that started in 2019 of the newly mature, which is the top graph. You can see a dramatic drop in 2019, with the very high values of the mature. That is a one-year timestep, so where are those crabs coming from? That is one reason the model is estimating that population to be lower.

It's sitting so closely to the newly mature it can't make sense out of the very high values of where those crabs are coming from. It's probably underestimating the population. The committees have discussed this. We talked about this at our meeting. What is going on with this newly mature stage? We have three hypotheses about what could be happening.

One, maybe we have a catchability issue that for some reason newly mature, mature are not happening in the same place as they used to. We have assumed thus far that we're catching them at the same rate during the same time and space. Maybe something has changed and the newly mature is hanging out somewhere else during the time of the survey.

Also, could there be a recruitment failure. That is another possibility. If in 2019, when they suddenly disappeared, that would mean in 2010, so nine years previous, there was a recruitment failure. I think that is probably an appealing hypothesis for some, because that was time of higher harvest before the ARM was implemented.

That is still kind of hard to reconcile with these really high mature values. They still have to come from somewhere. How do we believe these really high values, which are really low, which is the stage before? It's still hard to make that make sense, but it's still a possibility. Thirdly, it could be an identification issue.

There is a lot of nuances in staging the crabs. While the survey had trained technicians onboard, you know there are staffing changes. Could there suddenly be an issue identifying these, and they are being misclassified, either as mature and contributing to those large numbers, but they're actually newly mature, or maybe they're being classified as juveniles. We haven't decided which we think is the best explanation yet for what is happening for these newly mature. It does matter, because you can see its influence on the Catch Survey Model. We have a couple lines of evidence we can look at going forward. NEAMAP stages the crabs. We can look to them. They don't catch them at as high a rate as Virginia Tech, so it would be informative, but probably not a data input into the model. But we can look at it.

What is the ratio of newly mature to mature? Are they also finding that these crabs are disappearing, or is there just something happening in the Virginia Tech Trawl specifically? Delaware Adult Trawl has also started staging crabs. I have about four, five years of data from that. That is another place we can look.

We have ways going forward to try to figure this out, and try to resolve this in the model. Just as a reminder, using the new ARM this is how many red knots we have going in this year, how many female horseshoe crabs and how many males. These are the harvest policy functions for the revised ARM.

First, we have the males in blue. This is showing the optimal harvest for 10,000 simulation runs. On the X axis for the males, you have a male abundance, and then you can see that curved line that goes from 0 harvest up to the 500,000, and it asymptotes there at the top. If you follow the 15,000, which is approximately how many males we had in 2021. You can see that it's pretty much intersecting with about 500,000.

You would expect most likely your male harvest recommendation is going to be around that 500,000, maximum, maybe slightly lower, if you haven't quite reached the total flattening out point. For females it's a little different. We have our light yellow, which is zero recommended female harvest, up to the 210, maximum in the dark red. That gradient moves across the graph. You can see that harvest gradually ramps up.

On the X axis you have the red knot population, and on the Y, you have the female horseshoe crab population. The blob in the middle is where most of our simulated runs end up. You can see there aren't a lot of cases in our simulations where we end up at maximum harvest, or at 0 harvest, because the female population has been so high for a few years that we're not seeing female populations in our entire time series in around like 2 million or anything like that.

Most of the runs end up in this blob. If you follow our birds in 2021, which was about 42,000 to the million females. You can anticipate that the harvest is probably going to be somewhere around that 100,000 range. Why is this different from how female harvest is handled in the old ARM? Specifically, the 11.2 million, where you saw before it was no harvest, and now in the revised ARM there is a little bit of female harvest.

This was a criticism from the original Peer Review, as well as structure decision making experts, that the threshold was not properly handled in the old ARM Framework. For one, there was concern among the Peer Review, as well as the ARM Committee that the recommendations would go from Harvest Package 3, a female moratorium, to maximum female harvest, if that threshold was exceeded, and that is exactly what we saw this year. We were concerned about that, because basically the ARM was functioning like a Harvest Control Rule. Below this level no harvest, above this level maximum harvest. That's because from a modeling perspective 210,000 horseshoe crabs is not a significant number, compared to 11.2 million. It's almost always going to go to maximum harvest once you exceed the threshold, and that was concerning. Additionally, the modeling perspective that threshold was considered too prescriptive.

You're telling the model the answer already. You don't need to do adaptive management, or have a complicated model. Say zero females below this level, 210 above this level. You don't need all that to do that, so it's too prescriptive to have that constraint in the model that says you can only harvest females above or below this.

The way that we handled it from a modeling perspective was to gradually give females as the population increases. As you saw in this graph, there is a gradient, so a little bit of females at a lower population level and you slowly ramp up. But there is almost no scenario where we now hit that 210. You would have to have about 30 million females to get up to that, versus 11.2 that we see in the old ARM Framework.

That was considered to be more in line with structured decision making, and that was advice we got from structured decision-making modelers that are not specific to this field. It was just that that was not the proper way to handle it in the old ARM. Okay, so the harvest recommendation coming out of the new ARM.

There were two options and a designate, B1 and B2, and they were both rounding conventions to

protect the biomedical data. If you use B1 you would have 475,000 male-harvest recommended for 2023, and 125,000 females. If the males were recommended from the new ARM to be 500,000, we don't round down.

You know by looking at this that the male population using confidential data is somewhere between 476 and 499. If it hits that 500,000, we don't round down. If you round down to the nearest 50,000, you can see that the optimal harvest is there. It is likely that this rounding in the final harvest recommendation overwhelms the effect of additional uncertainty incorporated in the horseshoe crab model.

When we got that 6 million estimate coming out of the Catch Survey Model when compared to the 15.5 million coming out of Virginia Tech. We were less concerned about it, one because it will be more conservative. Our estimate is likely an underestimate, and will result in lower harvest. But also, because that blob that you saw on that colorful graph, most of the harvest falls around a similar level from many levels of female horseshoe crabs.

You are not moving the needle as much. If we put in 15.5 million, that harvest recommendation still will not jump to 210, it's going to be lower than it was in the old model. The difference between 6 million and 15.5 million, while it sounds like a lot, the way that we have gradually tuned that harvest makes it a less dramatic harvest recommendation.

Finally, my last slide, is after the ARM Committee has reviewed all of that, and talked about what's going on between the two models, as well as the newly mature horseshoe crab. We had consensus among the committees that the harvest recommendations from the new ARM were preferred over the old ARM for those reasons. I'll do my best to answer any questions.

CHAIR CLARK: Thank you, Kristen, for that brilliant and thorough summary of the two different models. That really is great for informing discussion about the Addendum. But before we do that, that is a lot to digest there. Does anybody have questions? I see Bill Hyatt.

MR. WILLIAM HYATT: This is a question for Kristen. Earlier in your presentation you mentioned 11.2 million crabs as not only where you are trying to get, but you mentioned it as a level that is not limiting. That was determined to be not limiting for the red knot performance. You also talked throughout your presentation on the estimates from the Virginia Tech Trawl, the Catch Survey Method, how they differed.

How the Catch Survey Method was an improvement, and that the numbers of female estimate are around 6 million now, based upon the 2021 analysis. Is it safe to say that regards to number of females, we're in the ballpark of halfway to the number that need to be out there, in order to be nonlimiting to the red knot? Is that sort of a safe way to look at the gestalt of all this?

DR. ANSTEAD: We no longer have that 11.2 threshold. My short answer is no, actually. That 11.2 threshold was based on that Sweka paper from 2007. It was the best, but it borrowed information from New Hampshire for some of the life history parameters from the literature.

We have data in the region now, so we no longer have a threshold in our revised ARM. But we have a projected equilibrium point of the model, and it is lower than the 11.2. But 11.2 isn't in the model anymore, so we're not comparing that 6 million against anything. Does that answer your question?

MR. HYATT: Not entirely. The 11.2 million, I was looking at it not so much as a threshold, but as something that had been sort of determined through the process as, here is the number to achieve, in order to not be limiting to the red knot population. I guess my follow up question would be, what number would you describe of female horseshoe crabs would be not limiting? If that number hasn't been determined yet, I wonder if there is an effort underway to determine that number, or if it's practical to actually determine that number.

DR. ANSTEAD: It's a great question, and it has come up. We have our projection now that goes out to kind of an equilibrium point. It was lower. I believe it was closer to an 8 million, but we're not measuring necessarily against that anymore. The 11.2 wasn't a magical number, it was just the best number we had at the time. We have not updated that analysis to have a revised carrying capacity.

CHAIR CLARK: Does that answer it for you, Bill?

MR. HYATT: Yes, it answers the question, although conceptually I think that given whatever you're dealing with, trying to recover threatened or endangered species, the objective one way or another is to try to get to a point where you are no longer limiting. That is just a conceptual approach to that aspect of conservation biology that, you know I feel probably should be part of this process.

CHAIR CLARK: Next question is from Mike Luisi.

MR. MICHAEL LUISI: This may come later with Caitlin's presentation, but I'm just wondering. The ARM recommendation is from both male and female harvest. But if states that prosecute this fishery choose to not, they don't want to harvest females. What options do we have from there?

This may be coming later, so maybe I could hold back, I can ask the question again after Caitlin's presentation. But I'm just wondering what options we have, if our industry, they don't want to prosecute the female crab. I'll leave it there and see what you think is best, Mr. Chairman.

CHAIR CLARK: Okay thanks, Mike. That will definitely be coming up, but Kristen does have some response to that.

DR. ANSTEAD: I just want to say, from a modeling perspective. You all don't harvest females. That doesn't matter to us as an ARM Committee. This is the optimal harvest of what you could harvest up to these limits to feel confident that you're not impacting the red knot population. If you don't harvest it, anywhere from 0 to that is within the bounds of the science, the best science we have available.

CHAIR CLARK: I see Rick Jacobson.

MR. RICK JACOBSON: I don't want to go too far down a rabbit hole, but having read Addendum VIII several times, and trying to understand one of the caveats within it. I saw that there is an exception for Maryland and Virginia, and that exception is there is, there is an action by the Board when there could be a harvest of female horseshoe crabs, to not allow the harvest of female horseshoe crabs.

There is a two-to-one offset for Maryland and Virginia, where they may take two male horseshoe crabs for each female horseshoe crab they would have been allowed as a quota. What was unclear from that, but what I think I understood, was that the quotas assigned to Virginia and Maryland included harvest of female horseshoe crabs, both in the Bay and outside of the Bay, and that the additional compensatory male harvest would be attributed to the quota outside of the Bay, not inside the Bay. Is that correct, or am I misinterpreting?

MS. CAITLIN STARKS: I believe there was no spatial restriction on where that additional male quota could come from. But this is definitely more related to the Addendum VIII conversation, I think.

CHAIR CLARK: Thanks, do we have any other questions? I see Shanna.

MS. SHANNA MADSEN: Thank you, Dr. Anstead, for your presentation. I had a question regarding the Catch Survey Model. I think you noted that it might be underestimating the populations, since we're not really capturing those newly matured crabs, and the model is kind of struggling with the fact that we are capturing a high number of mature crabs.

Is there any scenario, and you kind of went through the different scenarios of why that might be happening, catchability, et. cetera. Is there any scenario where the committee might believe that we're overestimating the population with the

Capture/Remodel, or are we really just underestimating right now?

DR. ANSTEAD: In the graph where I plotted the two, you can see that sometimes the Catch Survey Model estimates more than the Virginia Tech Trawl Survey, and sometimes it does less. That's because it's taking more things into consideration. If we have a high primiparous, it will show up in a higher newly mature and mature the next year. It's not going to always match the Virginia Tech Trawl.

That is one reason why we think the method is better, is because it's using the Virginia Tech Trawl, specifically for scaling. But these additional bursts of data are helping to better inform an estimate. I suspect that we're underestimating it in the last couple years, because of this issue with the newly mature. But it's the best data we have, so maybe it's nailing it. I suspect that it's underestimating it, because we have a catchability issue or maybe a misidentification issue. But let's not rule out the third, and look at more data to find out.

CHAIR ANSTEAD: Thank you, Kristen. Does that answer your question, Shanna?

MS. MADSEN: It does, thank you.

CHAIR CLARK: Okay, are there any further questions? I see Joe Cimino, and then Jim Gilmore.

MR. JOE CIMINO: No, just a comment. It made me think about what was presented, and thank you, Kristen for that. Just we went through our Climate Scenario Planning Workshop, and this is one of the big concerns right, is like if things are changing, then we need to be ready for that for our surveys.

You know I hope that this group is looking ahead, and thinking of what this might mean. You know, is the timing changing and are we missing things? How do we move forward there? It's going to be an important question for all of our surveys. The Virginia Tech Trawl Survey in particular has always been a priority of ASMFC and New Jersey DEP, and we will continue to be, so thank you.

CHAIR CLARK: Thanks, Joe. Jim.

MR. JAMES J. GILMORE: Yes, and just to comment also, just following what Joe said. After going through the material, I had several questions, Kristen. But your presentation was outstanding, and you answered every one of them. Good job, thank you.

CONSIDER ADDENDUM VIII ON IMPLEMENTATION OF RECOMMENDED CHANGES FROM 2021 ARM REVISION AND PEER REVIEW REPORT FOR FINAL APPROVAL

CHAIR CLARK: Indeed, that was a wonderful summary there, Kristen. Okay, if we don't have any further questions for Kristen. Now we move back to Agenda Item 4, which is to Consider Draft Addendum VIII for Approval. For that I'll kick it over to Caitlin to bring us up to speed.

MS. STARKS: Thank you, Mr. Chair. I'll be going through the Addendum VIII Options, Public Comments and Advisory Panel input on the Addendum. I'll start off with some background leading up to this meeting, the timeline for the action's development. Proposed management options, and then again cover public comments and AP report will be given by Brett Hoffmeister, our AP Chair, and then I'll wrap up with Actions for Board to Consider today and Next Steps.

To provide some context for today's discussion. Again, our current management program for horseshoe crab bait harvest of Delaware Bay origin was established by Addendum VII to the horseshoe crab FMP in 2012. Addendum VII implemented the use of the Adaptive Resource Management or ARM Framework, for recommending the bait harvest quotas for the Delaware Bay Region space, based on abundance of both horseshoe crabs and red knots.

As we've discussed, ARM underwent a revision, which was endorsed by the Peer Review Panel, and in January of this year the Board accepted the ARM revision and Peer Review for management use. At that same meeting the Board also initiated this

Addendum, Draft Addendum VIII, which considers using that revised ARM in setting the annual specifications for horseshoe crab of Delaware Bay origin, and that is what we're discussing today.

PUBLIC COMMENT SUMMARY

MS. STARKS: After the January meeting, the PDT has worked on this Addendum document. The Board approved it for public comment in August. Then we held state public hearings and received written comments in August and September. That leads us to today to have the Board consider final approval of the draft Addendum. Now, I'll just review the proposed options. Draft Addendum VIII includes two main management options.

Option A is no action, and Option B would be to use the revised ARM for management to set the bait harvest specifications for the Delaware Bay. Option A is no action, because true status quo will not be possible in future years, and this is because the software that was used to run and update the original ARM model is obsolete.

Since that model can no longer be updated, that means we cannot continue doing adaptive resource management with it, as it was established in Addendum VII. As a result, the no action option would result in the management program reverting back to the provisions of Addendum VI, and I'll go over those shortly. Alternatively, Option B would adopt the changes that were recommended in the 2021 ARM Revision and Peer Review.

This means that the updated data and model would be used to produce annual harvest recommendations for the Delaware Bay origin horseshoe crab. The general structure of how the ARM optimal harvest recommendation is allocated among the four Delaware Bay states would effectually remain the same. I'll also go into detail on that shortly. Under Option A, if no action is taken, management would revert back to the provisions of Addendum VI, and that means the quotas for the four states of New Jersey through Virginia would go back to those shown on the table. Additionally, beyond the quotas, these are the other provisions of Addendum VI that would go back into effect if no action is taken. First, the directed harvest and landing of all horseshoe crabs in New Jersey and Delaware would be prohibited from January 1st through June 7th, and harvest of female horseshoe crabs in New Jersey and Delaware would be prohibited year-round.

Additionally, from January 1st through June 7th, directed harvest and landing of horseshoe crabs in Maryland, and landing of horseshoe crabs in Virginia from federal waters would also be prohibited. No more than 40% of Virginia's annual quota would be allowed to be harvested east of the COLREGS line, and horseshoe crabs that are harvested east of the COLREGS line and landed in Virginia, must be comprised of a minimum male to female ratio of two-to-one.

To highlight the important points here. Under Option A, New Jersey and Delaware would not be allowed any female harvest. But this action would not affect New Jersey's voluntary moratorium on all horseshoe crab harvest. For Maryland, the quota of 170,653 crabs is not restrictive by sex, and there are no spatial restrictions on where that quota can come from.

In the Addendum VI provisions however, all harvest would be prohibited from January 1st through June 7th. Then for Virginia, again only 40 percent of that total quota can come from east of the COLREGS Line, and there is no harvest from federal waters allowed from January 1st through June 7th.

Action B in the Addendum would again, adopt the changes to the ARM recommended in the 2021 Revision and Peer Review, and going forward we would use that revised ARM to annually recommend and set the specifications for bait harvest of Delaware Bay origin horseshoe crab. Option B addresses each of these aspects that were established in Addendum VII, related to how the harvest specifications are set or recommended, which include the harvest recommendations that come out of the ARM, the adaptive management cycle.

The percent of each state's harvest that is considered to be of Delaware Bay origin. The state allocation of the overall Delaware Bay quota, and then fallback options for setting specifications. I'm going to walk through each of these one by one, and review what's in the Addendum. For the annual harvest recommendations, Addendum VIII proposes that the revised ARM Framework would be used to annually recommend optimal harvest levels for males and females.

The maximum number of males and females that can be recommended by the ARM would not change, and they remain at 500,000 males and 210.000 females. However, where the original ARM recommended one of those five harvest packages, the revised ARM recommends sex-specific harvest levels on a continuous scale.

There are two sub-options here which would result in the optimal harvest output for each sex being rounded down to either the nearest 25,000 or 50,000 horseshoe crabs. Again, rounding that harvest recommendation to some degree is necessary to protect confidential data that are input into the model. Rounding the output from the ARM would prevent anyone from being able to back calculate those confidential data. Sub-Option B1 would round down to the nearest 25,000 crab, and would generally result in a harvest recommendation that is closer to what the optimal harvest is that comes out of the ARM, before rounding for confidentiality. Then Option B2 would round down to the nearest 50,000. That would result in a more conservative harvest recommendation. One clarification is that if the ARM were to recommend the maximum amount of either males or females, rounding would not be necessary to protect those confidential data, because it's already being limited by that maximum.

This is an example of the harvest recommendations produced by the revised ARM for 2019 through 2021. These are relevant to the future years, but I just want to show you what they look like. The table shows that female and male horseshoe crab population estimates, the red knot stopover population estimate, and then the resulting harvest recommendation for each of those years if we use the revised ARM.

As a note, these are using coastwide biomedical mortality data, rather than Delaware Bay specific confidential data. These are not confidential numbers, but they are likely a slight overestimate of what we would get if we used confidential biomedical from Delaware Bay specific.

In each of these years the revised ARM would have recommended the maximum, or just short of the maximum amount of male harvest, and a varying amount of female harvest, ranking from around 150,000 to 127,000 pounds. On this next slide is an example of how rounding those options, so rounding options in the addendum would be applied to the recommended harvest that comes out of the ARM using the 2020 number as an example.

In the uppermost table is the 2020 ARM recommendation for optimal male and female harvest, and then the next table shows the harvest that Sub-Option B1 would result in, so 125,000 females and 500,000 males. In the last table the female harvest would be rounded down to 100,000 crabs rather than 125,000.

I'll just throw these out shortly, these are for comparison the harvest packages that were used in Addendum VII. The second item under Option B in Addendum VIII is the management process for the ARM Framework. Option B would establish the three-level process, which includes an annual management process, an interim update process and a revision process.

The annual management process is essentially exactly the same as what we're currently doing under Addendum VII, and that is that annually the ARM Framework would be used to produce a harvest recommendation for the upcoming fishing year. The interim update process would be that every three years the model parameters, including things like the red knot survival and recruitment rates and horseshoe crab population parameters

would be updated based on the most recent years of data from the Delaware Bay Region.

Then the third level would be a more intensive revision process occurring every 9-10 years, in which the ARM Framework would undergo a revision similar to what we did in 2021. This timeline was chosen because it allows for two interim updates to occur, and it also encompasses an entire generation for horseshoe crabs. The third issue under Option B is the proportion of harvest in each state that is of Delaware Bay origin, and this value is called Lambda. Option B would update these Lambda values for each of the states, based on the most recent genetic data, which was recommended in the ARM Revision and Peer Review. This would result in decrease a set of proportions of Maryland and Virginia's harvest that is assumed to be of Delaware Bay origin, whereas Delaware, New Jersey remain unchanged. I'll go over the details here, but these Lambda values do affect the state-by-state allocations of the overall Delaware Bay quota.

For comparison here, the current Lambda values used in the original ARM and Addendum VII on the left, compared to the proposed updated Lambda values on the right. The fourth issue under Option B is the methodology for calculating the state allocations of the total Delaware Bay harvest. In Option B the allocation methodology from Addendum VII is basically the same, with the exception of those updated Lambda values.

Changing those Lambda values does result in new allocation weights for each state, specifically the new state allocations of the Delaware Bay harvest limit would be those shown in the table on the top right, compared to the allocations in Addendum VII, the new allocations for New Jersey and Delaware slightly increase, and the allocations for Maryland and Virginia slightly decrease.

I'll show a comparison of those in a second. I do want to note here that with all of these numbers we're only talking about Virginia's quota for crabs harvested east of the COLREGS Line, and that's what is considered to include Delaware Bay origin crabs. The other two aspects of state allocations that were in Addendum VII and carried forward in Addendum VIII under Option B are the Harvest Cap Provision and the two to one male/female offset provision.

These are remaining status quo from Addendum VII. The Harvest Cap for Maryland and Virginia limits the total level of allowed harvest by those two states, in order to provide protection to crabs that are not of Delaware Bay origin. The caps are shown in the bottom table, and those were based on the Addendum VI quota levels for Maryland and Virginia.

These caps do not apply when the ARM Framework recommends zero female harvest of horseshoe crabs. As a result, these caps have never been applied to Virginia and Maryland to date. The two-to-one offset is only relevant when the ARM recommends zero female horseshoe crab harvest.

When the recommended harvest is zero, then this provision allowed a two-to-one offset of males to females for Maryland and Virginia male harvest allocation to increase, making up for those females that were not allowed. These are the current state allocations resulting from the old Lambda values, and then on the right the new Lambda values and the resulting state allocations.

On this slide I am going to walk through an example of how the total Delaware Bay quota is allocated if the harvest quota recommendation, after it's rounded down, gets split up amongst the states. In this example, I'm showing a breakdown among the four states if we're using 500,000 males and 100,000 females.

Once again, this is just the Delaware Bay portion of these state quotas. Then on this slide you can see both the Delaware Bay origin quotas on the left in the blue, and the total of quotas that include the non-Delaware Bay origin crabs on the right in the orange, for each state using the revised allocation. Delaware and New Jersey are the same on both sides, blue and orange, because 100 percent of their harvest is considered to be of Delaware Bay

origin, whereas Maryland and Virginia's overall quotas, which are shown in the red plots are greater than their Delaware Bay only quotas, and that's counting for those additional crabs and their harvest that are not of Delaware Bay origin.

In this example, the harvest caps for Maryland and Virginia are being applied, because there is female harvest recommended from the ARM. Because of that, the total quota for Maryland is 170,653 crabs, and the total for Virginia east of the COLREGS Line is 60,998. These are equal to the quotas again that were in Addendum VI for Virginia and Maryland.

The last item under Option B is the fallback option for how harvest specifications would be set if the ARM cannot provide a harvest recommendation in a given year. This is basically the same as what's in Addendum VII, which is that if in a given year the model and ARM there is not enough data, or some other issue that causes it to not be able to produce a harvest recommendation.

The next year's harvest could be set either based on the Addendum VI quotas, and management measures for the four Delaware Bay states, or based on the previous year's ARM Framework harvest level and allocation to the four states. Beyond that language the Addendum VIII does update this section to reflect new datasets that are required for running the revised ARM Model.

Now I'm going to transition into the summary of public comments that we received on Draft Addendum VIII. The public comment period started in mid-August and ended on September 30th, 2022. During that period, we had four public hearings that we held, one in person and three on webinars. Across those four hearings there were 59 public attendees, and in total during the comment period we received 34,613 written public comments.

Of those 34,000 comments, these included 24 letters from organizations, 245 comments from individual industry stakeholders and members of the public, as well as 8 form letters that were submitted by a total of 33,932 individuals. For our purposes, 3 or more comments that have the same language or state support for a single organization's comments are considered a form letter.

However, if a comment includes additional comments or rationale related to a potential management action beyond what is in the original letter, then it is considered to be an individual comment. That is just how we count those. During the four public hearings we had 18 comments that were provided in person. I want to spend a moment here explaining how these comments were categorized, because there is some nuance to this. Many of the comments we got did not say explicitly which management option they supported.

In some cases, there was a need to interpret some comments. For example, comments that made statements to the effect of, I strongly oppose the use of the 2021 ARM for setting horseshoe crab harvest regulations, or ASMFC should reject or abandon Addendum VIII, or I oppose the proposal to increase the harvest of horseshoe crab or oppose Addendum VIII.

These comments were interpreted as being in support of Option A, because the opposition to the revised ARM Framework was made clear. Support of Option B was usually stated fairly clearly in the comments, but in some cases, interpretation had to be made. For example, in comments that stated their support for the revised ARM Framework, but also stated they did not want to see any female harvest allowed, we put that under support for Option B, given the caveat that the Board could still restrict female harvest through specifications if the ARM is adopted.

Lastly, we had to mark some comments as not stating sport for a particular option at all. This was done when a comment advocated for something that was outside the scope of possibilities in the draft addendum option. For example, if a comment said something to the effect of wanting the Board to retain the current ARM Framework, or comments that advocated for a complete horseshoe crab moratorium, for example.

That was categorized as no option selected. This is a breakdown of the comments, and which options were preferred. As you can see in the table here, support for Option A was expressed in the majority of the comments, both were in and delivered at hearings. Three comments, one written and two at hearings, were in support of Option B to adopt the ARM revision for setting specifications.

Of those two comments included a preferred sub-option. One favored each of those sub-options, B1 and B2. Then there was a chunk of comments that could not be classified as being clearly in support of either option. Within the comments that supported Option A, the most common reason that they supported it was that they opposed any female horseshoe crab harvesting allowed for the Delaware Bay.

A few of the comments that supported Option A did acknowledge the fact that Option A would allow for female harvest for Maryland and Virginia, but the large majority of them did not. The other comments did not agree with the fact that the ARM revision does not have the same population threshold for horseshoe crab and red knots that were in the original ARM Framework, which had to be exceeded to allow female harvest.

Many comments expressed their concern about the red knot population and recovery as their reason for supporting Option A, and some also expressed concern about the horseshoe crab population, and concern that allowing female horseshoe crab harvest could have cascading impacts on the ecosystem.

There were also a number of comments that criticized the revised ARM for various reasons, including statements that the model's relationship in the ARM between horseshoe crabs and red knots was weak. That the horseshoe crab population model does not properly account for uncertainty. Some comments took issues with the data that were used in the ARM revision, stating that the ARM did not use the egg density data in the models, and some disagreeing with the equal weighting of the three horseshoe crab surveys that go into the population model.

Other comments stated that they did not feel there was sufficient stakeholder input in the revision process, and many comments were critical of the fact that the models were not available for the public to review during the comment period. Comments from organizations in support of Option B generally expressed a desire from individuals and organizations to use science-based management, and some supported the new ARM Framework's ability to make updates and improvements to the modeling approach in the data. One of the organization comment letters did state support for the ARM as the best management approach, but they did caveat their support with a request to not allow female harvest for a period of ten years, in order to allow another generation of horseshoe crabs to mature, and to allow the population to stabilize at the projected equilibrium in the ARM Model.

There was also support for prioritizing the research that was recommended in the ARM Framework Revision and Peer Review, including additional data collection to support the inclusion of egg density information in the model, and research to better understand the effects of climate change on spawning and breeding habitat for horseshoe crabs and red knots.

As I mentioned earlier, some of the comments submitted did not support either of the proposed management options. Instead, some asked for a complete moratorium on female harvest, or in some comments a full moratorium on all horseshoe crab harvest. There were some comments that expressed concerns with the sublethal impacts of mortality associated with biomedical collections.

Some others said that the eel and whelk fisheries, which use horseshoe crab as bait are not in good condition, and those fisheries should be limited. A number of comments expressed a desire for more holistic ecosystem-based management approach for the Delaware Bay resources.

ADVISORY PANEL REPORT

MS. STARKS: Now I'm going to hand the microphone over to Brett Hoffmeister, our AP Chair for the AP report.

MR. BRETT HOFFMEISTER: Thank you, Caitlin. The AP met virtually on October 13. Seven advisors attended the meeting. The ASMFC staff provided a summary of Addendum VIII, and of course the option to revert to Addendum VI. A summary of metrics concerning the public comments was also reviewed, and we had general discussion, basically agreeing that management should adapt to use the best available science.

The horseshoe crab populations have improved under ARM management. The data that was presented is out of Virginia Tech. That said, the AP also wants to acknowledge the public comment in opposition of Addendum VIII. I think the general comments and general feeling from the AP was that the ARM process is obviously much more complex than it's often described, and that the oversimplification in some of these form letters may not be an accurate description of the model, or the good work that has been done.

But clearly, the spirit of public comment reflects a desire to protect female horseshoe crabs for the benefit of the crabs and ecosystem and the red knot. We wanted to point out that the ARM, the original ARM and the revised ARM have that purpose in mind. This is consistent with that desire.

Reverting back to Addendum VI would decrease bait quotas in some areas, and allow female harvest in others. Also reverting back to Addendum VI, set quotas based on historical landings independent of other data, and exclusive of the most recent data. Reducing the bait harvest in the Delaware Bay area could mean additional pressure in the northeast, so there were some comments regarding the balloon effect, something that we have seen in Massachusetts on a small scale, and even in a larger scale, as females from Massachusetts find their way south. There was a genuine concern there. Just a reminder to the AP that the states do have the ability to implement stricter controls, if they desire to do so. The AP was amenable to a modest harvest of females supported by the data, but also not averse to the Board conservatively limiting female harvest. We are sensitive to the public comment, but I think we really want to see science drive the decision making here.

The AP recognizes the importance of horseshoe crabs in the ecosystem, the economy and the fishing community. There are multiple stakeholders here. That said, the AP members present unanimously supported Addendum VIII, Option B with no sub-option as a preference. This being the best science-based management option available.

There was a little bit of discussion after the meeting had broken, maybe days later, and a couple of points that needed to be made by the AP, or wanted to be made by the Ap that coastal development is really a major factor affecting beach habitat for both red knots and the horseshoe crabs. There was comment that perhaps the Virginia Tech Survey should run tows earlier in the year, to capture some of the large number of juveniles that, as some of the fishing leaders are seeing, they may not be reflected in the assessments.

I wanted to point out that there is a lot of additional key aspects of red knot decline, as a disturbance of birds and habitat from relentless coastal development. These things must be kept in mind when discussing horseshoe crab harvest impacts, and supporting the management recommendations. There are a lot of things at play here. That's all.

CHAIR CLARK: Thank you, Brett, thank you, Caitlin, for those excellent summaries of public comment, and the explanation of the Addendum. Caitlin, you have a couple more slides, right?

MS. STARKS: Just one, Mr. Chair. This slide is just to set the Board up for their discussion today. First the Board will need to select a management program from the proposed options, and finally consider approval of Draft Addendum VIII to the

horseshoe crab FMP. With that I can take any questions.

CHAIR CLARK: As Caitlin did such an excellent summary of the public comment. There has been a heck of a lot of public comment, and there is a lot of questions raised. Before we get into discussion of the Addendum let's take some questions. Bill Hyatt.

MR. HYATT: This is a follow up a little bit to the question that Rick asked earlier. I'm still struggling with understanding fully the two to one tradeoff that is in the Addendum. I'm going to ask kind of a hypothetical, and maybe that will help me understand. As I understand it, if the ARM Model calls for female harvest, there is a two-to-one tradeoff that comes into play. My question is, if the ARM calls for female harvest, but the Board then decides on a male only quota. Does that two-to-one come into play at all? I hope I've asked that clearly.

CHAIR CLARK: Okay, Bill. Toni will address that.

MS. TONI KERNS: Thank you, Mr. Chair, I was hoping this would not come up. Caitlin and I did a little homework, and went back and looked at the minutes from all of the board meetings leading up to the approval of the ARM, when the two-to-one offset was originally discussed, because as you saw in Caitlin's presentation earlier, it does say that two to-one-offset is for when the ARM sets the female harvest at zero. That is pretty specific language. When you go back and read the minutes, it was very clear that that offset was to provide to make up for the lack of those larger females, and to give additional males to make up for it. It did not talk about the ARM setting at zero. It was just about providing that offset there.

To us, the intention was there to allow for that, but the language in the document is very specific to the ARM. It would be the Board's decision of whether or not you think the intention was there, or do you want to stick with the language that is in the Addendum? We will leave it to you all.

CHAIR CLARK: Thank you, Toni, Bill, did you have a follow up?

MR. HYATT: Yes, just a follow up. The cleanest way would be to accommodate for that within the actual, if we were to set a male-only quota could be to just incorporate that into the decision over what number to pick.

CHAIR CLARK: You got the answer you needed, Toni, to respond?

MS. KERNS: Just needed to check one thing before I responded. Yes, you could just add additional male quota to the harvest allowance that you're giving.

MR. HYATT: Thank you, that definitely helps.

CHAIR CLARK: Joe, you had a question? Joe Cimino.

MR. CIMINO: I will get to a question for Caitlin. Thank you to both Caitlin and Brett for those great presentations. I think this gets to this conflated issue, what Bill was just talking about. There is a challenge in that. I know Mike, it certainly is for you. This erroneous assumption that what a model suggests is safe harvest and then actual management action, right.

I mean this is now in the New York Times erroneously is, and is an ASMFC proposal when its just a model suggestion. I'm very troubled by that wording that we got in there, and I hope that we can remedy that, because what we actually set as harvest is what impacts the resource, and what should impact the two-to-one ratio.

I just wanted to put that on the record. Then second, you know this is something that has always bothered me with weakfish as well. We have genetic work that distributes the catch of Florida's weakfish catch between sand seatrout and weakfish, and we have the catch composition here in the Lambda.

But we don't have a timeframe for how often that should be updated. Luckily genetic work is getting cheaper, easier and much more accurate. I really

think we should also consider a timeframe for how often we update that work for the Lambda. I guess it wasn't a question. Thank you.

CHAIR CLARK: Further questions? Looking around the Board. Shanna Madsen.

MS. MADSEN: Thank you for both of your presentations. My question is for Caitlin. Caitlin, I think it was pretty clear, but I just kind of want you to correct me if I'm wrong. Essentially, if this Board selects Option A, we would revert back to Addendum VI, which would allow female harvest in Maryland with no spatial regulations. However, in Virginia it would allow female harvest, but with those spatial regulations outside of the COLREGS Line. Essentially before us today are two decisions, either Option A or Option B, and both of those options allow female harvest.

MS. STARKS: That's correct, Shanna. As you stated, Maryland quota would go back to 170,653 horseshoe crabs, and that could be male or female. It is not restricted by sex, and it's not restricted by area. For Virginia female harvest would be allowed. The way that works is the total quota for Virginia would be 152,495 horseshoe crabs, and then 60,998 can come from east of the COLREGS Line, and the crabs that come from east of the COLREGS Line have to have a sex ratio of two to one.

CHAIR CLARK: Okay, and the next question we have is from Mike Luisi.

MR. LUISI: Yes, this might be a little more than a question, but just a comment as well. You know I guess the thing, and I asked this before, but I'm going to bring it up again. I feel like we're challenged by this new information, in the fact that there is going to be a pretty dramatic industry impact, because the model is telling us we can harvest females, but if we choose to not harvest females, there is going to be a pretty large reduction in our bait harvest.

I'm looking to staff, looking to you, Mr. Chairman, other members around the table. I mean we've been successful in what we've done, given the quotas that we've had. I just find it challenging that if we decide not to harvest the females, but the model is telling us we're allowed to, then we don't get that two-to-one ratio, and we have to cut back on our bait harvest, which is going to be impactful to the industry.

It's going to be hard for me to go home and say, guys you have the opportunity to harvest females, based on the pressure that we're under to not harvest females. If you choose not to, you're going to lose 80,000 crabs. I just wish there was some way out of the box that we could just kind of maintain what we have. I feel like we've been pretty successful, and I'll just offer that as a comment, and see if there are any thoughts around the table as to how we can just kind of keep doing what we're doing. I don't know.

CHAIR CLARK: I think that was an issue kind of brought up by Bill's question. Toni, do you want to respond to that?

MS. KERNS: I was just going to say, I think what I believe Bill is alluding to, and what I was trying to point to, is that the ARM is giving you a recommendation for quota. It doesn't mean the Board has to set it at exactly what the ARM is recommending. Therefore, you could provide a value that gives you that offset. Originally, in the underlying intention of what the Board was trying to do when they originally put together the offset, it was just provided for that. When the Board is not harvesting any females at all, then you're giving that extra male to make up for it. The Board could set a higher quota, that is possible. Then there is also always the possibility of transfers as well.

CHAIR CLARK: That is a much simpler solution. Mike, you want to follow on this?

MR. LUISI: I just wanted to say, I apologize, I had to step away from the table for a minute, and I might have missed Bill. Between walking from here up, it takes about ten minutes to get up to your room in this place. I had to step away for a second, so I apologize if I missed that. Toni, thank you for that summary.

CHAIR CLARK: Mike, and I think that is very helpful to Maryland's situation. Shanna, you had a follow up question?

MS. MADSEN: I think I'm good, Mr. Chair, I was just trying to help Mr. Luisi out.

CHAIR CLARK: Thank you. Rick Jacobson.

MR. JACOBSON: I actually wanted to follow up on Shanna's earlier question. I just want to be clear. If we were to vote for Option A, we would revert to Addendum VI. The total quota of females that could be harvested from Delaware Bay approaches 200,000.

MS. STARKS: I'm going to pull up the slide so that you can see it more clearly.

MR. JACOBSON: If it's the same slide I'm thinking of, I'm not sure it's clearer to me.

MS. STARKS: Under Option A, these are the quotas that would go back into effect for each state. For New Jersey and Delaware there is 100,000 crabs allocated each. Maryland gets 170,000. But not all of those would necessarily come from the Delaware Bay, as their Lambda value is about half. Then for Virginia, the 60,998 are east of the COLREGS Line, so some of those could be from Delaware Bay.

MR. JACOBSON: Am I interpreting that as, if the Lambda is 50 for Maryland, 85,326 could come from Delaware Bay, and there is no restriction on sex, they could all be females, so 85,000 potential females, and from Virginia 40 percent of 71,000, so another 28,000. Something in the neighborhood of 100,000 females could come from Delaware Bay.

MS. STARKS: Yes, something like that.

MR. JACOBSON: Yes, it was rough math, but thank you.

CHAIR CLARK: Do we have any further questions? Kristen, if I could just bring up, based on the huge amount of comments we received. But some of them were very detailed, and in particular the two scientists that sent detailed critiques of the ARM, and then just more recently another paper about egg density. Could you just let us know what the ARM Subcommittee, their considerations about those type of detailed comments?

DR. ANSTEAD: Sure, thank you. The inclusion or exclusion of the egg density surveys has been debated by the ARM since its inception. During the old ARM, the ARM Subcommittee chose not to use that data, because the surveys that were operating were using different methods. We couldn't make it be one time series, and it was a challenge.

Also, the ARM manages for the horseshoe crabs, and that abundance is related to egg density. We manage the crabs, so it's easier to use the abundance indices as the direct measure of horseshoe crab. With that said, when we do a new stock assessment, we always ask for more data. What do you have? Give us everything and we'll look at it. No egg density data was submitted for our consideration.

I did have a conversation with the author of the egg density paper that recently came out, Smith, and we talked about the data. But we didn't have it in hand. It has since been published, and we did extract that time series out of the paper to compare it to what we have from Virginia Tech Trawl, from the Catch Survey Model, and our model goes from 2003 to 2021. The trend is quite similar, actually, in the egg density survey. They kind of all track each other.

During that time series they all start out kind of low, and they increase through the terminal year. We could put the egg density survey in the catch survey model, which I have done, and you get similar results. It's probably isn't sufficient to some, because it doesn't go farther back in time. But unfortunately, I can't go further back in time. I would love to go further back in time with the model, before the pressure was of horseshoe crab. But our data starts in 2003.

CHAIR CLARK: Thanks, Kristen, and once again the amazing amount of work and modeling done by the

ARM Subcommittee. You know there are all these other factors came up, and just one other comment that I saw coming up a bunch. I believe in one of the critiques showed the weak linkage between horseshoe crab population and the red knot population, and what is happening there, because the model seems to show that even if there were no horseshoe crabs, red knots could still increase.

DR. ANSTEAD: That is correct. Our model shows a very weak, but significant link between horseshoe crab abundance and red knot survival. That is using the data from the region. We can't make it be a stronger link. We believe that these two populations are linked, and we have modeled it that way. But if more years of data come out, and that relationship falls apart. We do have to rethink some of the ARM.

But this is the best data we have in hand. In the original ARM and this ARM there was always these different possibilities of these populations are not linked, that they are linked in a weak way or they are linked in a strong way. We're just using the data that we have, and that's how it came out. There are probably other factors that we're not able to model at this time. Hopefully, in a decade it will be better.

CHAIR CLARK: As we know, the strong correlation possibly seen earlier in the time series could have been done due to other factors, other than the fact of a direct linkage there. But thank you very much for those explanations. If there are no further questions about the public comment. Joe Cimino.

MR. CIMINO: I just have a comment on that. What we see between the relationship of these two species is kind of, and I think maybe even at one point in time described by Fish and Wildlife Service as a phenomenon. Previous to the '80s, we're not sure that this linkage was there. It's a molluscivore that is highly dependent on horseshoe crab eggs now in the Delaware Bay.

But we all acknowledge that things are changing, and so that relationship may be changing as well. Fortunately, we're able to start tagging these birds in a way we want. You know we have to understand their usage of the Delaware Bay. Now the importance of horseshoe crab eggs isn't going to change. But if the usage of the Delaware Bay by these birds' changes, then we might lose that relationship.

CHAIR CLARK: Thanks, Joe, and again, it was more just because that was such a theme that came up, just good to address it a bit here. I guess before we go on to deliberation of our management actions regarding Draft Addendum VIII, are there any further questions? Not seeing any. If it's the will of the Board, perhaps we would start. I'm sorry, we have a question coming from online from Chris McDonough. Go ahead, Chris.

MR. CHRIS McDONOUGH: This is more of a comment, just kind of learning from the model and the relative scale in looking at, you know what the models are and the estimated harvest levels, and what population levels that the model is outputting. You know the estimated natural mortality, 0.3, 30 percent.

Those harvest levels represent a fraction of what even natural mortality is. You know at the level, I understand the linkages, what may or may not be there between red knot populations and horseshoe crab abundance. But the processes that are going on in that, I always have problems with the connection between the red knot and the horseshoe crab population in these models.

Because those connections are very tenuous, and small things in the model could change that a lot. I guess that is my comment is that given the way the population estimates come out, just a natural mortality alone just swallows up what could possibly be harvested through bait, through biomedical, whatever, all that stuff.

CHAIR CLARK: Thanks, Chris. Kristen, do you want to add anything to that?

DR. ANSTEAD: No, just that he is correct that we're talking about very different scales here, and that's why the model has responded the way it has. You

would have been in this situation either way. The old ARM also recommends female harvest, that when you're talking about a population, whether it's 6 million or 15 million mature females, removing 100,000 isn't going to register the same way that natural mortality does. He's correct.

CHAIR CLARK: Okay, well let me just check again. Is there anybody else online that has a question? We don't have any further questions.

BOARD DISCUSSION AND CONSIDERATION OF APPROVAL OF DRAFT ADDENDUM VIII

CHAIR CLARK: In that case, as I was saying. Now we move into Board Discussion and Consideration of Approval of Draft Addendum VIII. Perhaps, are you ready for further discussion, Shanna, or do you want to make a motion? Okay, let's move right to a motion, and then we can get the discussion going. Go ahead, Shanna.

MS. MADSEN: I think it always helps for us to have a motion on the table for us to incite a bit of discussion. If I get a second, I'll go ahead and give you why I am making this motion. **My motion is, move to implement Option B, which is implementing the ARM revision for setting bait harvest specifications for Delaware Bay origin horseshoe crabs.**

With that Sub-option B1, which is rounding down the continuous optimal harvest specifications to the nearest 25,000 crabs. Additionally, I would like to add to the end of that motion, with the intent to allow the 2-1 offset allowance for Maryland and Virginia, if the Board sets female horseshoe crab harvest at zero.

CHAIR CLARK: Thanks Shanna, and we have a second from Mike Luisi. We'll just give it a second here to get the motion up there. That was a very comprehensive motion. I think you pretty much covered all the issues, didn't you there, Shanna? Is that your motion?

MS. MADSEN: That is my motion.

CHAIR CLARK: Okay, we have a motion, we have a second and let me throw it back to you, Shanna to talk about the motion.

MS. MADSEN: You know the intent of the original ARM was really born from a desire to protect female horseshoe crabs for the benefit of the species, as well as the benefit of the ecosystem and red knot. The point was really to be responsive to changes in that ecosystem, through evidence-based science. You know over the past decade, I think we've heard from our experts that we've collected more complete datasets on shorebirds and horseshoe crabs, and we've advanced our modeling techniques.

This updated ARM really does fulfill the original intent and goals of the ARM overall. I think, you know Dr. Anstead asked earlier, who asked for this? Well, we asked for this. We asked for this update, we asked for the science, and we asked for our technical experts to include both shorebirds and horseshoe crab experts, to give us the best available science.

I know that later motions are going to address the input that we've received from the public, and that can be done when we set our specifications. But what I want to say today is, if we reject the ARM itself, we are essentially rejecting one of our very first original ecosystem modeling approaches, and really the recommendations from our experts and the best available science.

CHAIR CLARK: Mike, as the seconder would you like to add anything?

MR. LUISI: Shanna got a lot better sleep than I did last night, so no, I'll say ditto to what Shanna said. But I think this motion allows for the minimal impact to the industry, based on decisions regarding female harvest. I appreciate the interest for that. I'll leave it there.

CHAIR CLARK: Shanna, Toni has a follow up, just to perfect the motion.

MS. MADSEN: Yes, Toni asked for a quick perfection. Essentially just to say, to allow the 2-1 offset allowance for Maryland, Virginia if the Board sets female horseshoe crabs harvest at 0 during specification setting.

CHAIR CLARK: Thanks, Shanna, and since the motion was already made and seconded, is there any objection from the Board to adding that wording? I see none. Okay, is there any further discussion of the motion? I see Joe Cimino and then Bill Hyatt.

MR. CIMINO: I had the honor of sitting in your seat as we got through this process, and like Shanna touted that this was, you know the ARM Framework was early adoption of multispecies management. But what we learned through the Peer Review was that we weren't actually doing anything. This is our first attempt at adaptive management, and so I'm fully supportive of this motion. We will hopefully have further discussions about what that means to all the stakeholders, but for right now on this particular motion, I'm in full support.

CHAIR CLARK: Bill.

MR. HYATT: Yes, and I will also speak in support of the motion, you know for all the reasons that Shanna and Mike mentioned, with a little caveat, and that is that I'm not convinced that the addition of the 2-1 offset makes things simpler or easier, or fair for anybody in this process. But I believe that we'll be able to play it out in the specifications part of the discussion. It could just be a function of me still not understanding that completely. I'm hoping to have opportunity to talk to my colleagues across the table at some point, as the meeting progresses.

CHAIR CLARK: Next we have Rick Jacobson.

MR. JACOBSON: I look to the Chair for point of order as I wade into this**. In order to just extend the conversation beyond Sub-option B1, I would like to offer a motion to amend for purposes of discussion. The motion as previously stated and adopted, replacing Sub-option B1 with Sub-option B2.**

CHAIR CLARK: Okay, we have a motion to amend from Rick Jacobson, do we have a second for the motion to amend? We have Justin Davis is seconding the amendment, and so Rick, would you like to further discuss?

MR. JACOBSON: Yes, thank you. We at the U.S. Fish and Wildlife Service are committed to the recovery of rufa red knot, and the sustainable management approach to crabs. We're similarly committed to managing the recovery of red knots, and sustainable use of horseshoe crabs using the best available science. We believe that the ARM model represents the best available science.

We're also committed to public transparency, including sharing and providing access to the ARM model. Ultimately, we will seek avenues to forestall the horseshoe crab harvest from Delaware Bay, until such time as the public has ample opportunity to explore the ARM model, the model code, and as indicated in our minority report from the fall of 2021. We continue to encourage ASMFC to engage stakeholders, to consider adjustments to the levels of risk tolerance that are embedded within the ARM framework. Ultimately, we are committed to the recovery of rufa red knot, and taken a precautionary approach, and we feel Sub-option B2 would better achieve those ends.

CHAIR CLARK: As the seconder, Justin, would you like to add anything? Okay. Nothing there. Just before we get further in discussion of the Amendment. You both, Caitlin and Kristen, the round down options, both of them achieve the confidentiality requirements we have for the data, correct.

MS. STARKS: Correct.

CHAIR CLARK: Now we have an amendment to the motion on the floor, is there any discussion of the amended motion? I'm not seeing any hands; do we have any online? Okay, no hands online, oh, we have Shanna Madsen.

MS. MADSEN: I won't be supporting this motion to amend, simply because the option is really just a

round down option in order to protect confidentiality. I believe that the intent of what we're doing here is to get the specification setting where the Bay states will likely be discussing not having female harvest. The conservation measures will come in during specification setting, and that is why I left the motion as is, with the 25,000 round down.

CHAIR CLARK: Any further discussion? Not seeing any, then I think we'll call the question. Okay, I was planning to have a caucus. I'm the only one here from Delaware, so I'll see what I can connect with here. Okay, so why don't we take, would three minutes, given the situation. Can we put a three-minute timer up there? Does anybody else need a caucus break. How about after. **Let's call the question now. We are voting on the amended motion. All in favor, please raise your hand. We have Fish and Wildlife Service, right?**

MS. KERNS: I'll say it, Fish and Wildlife Service and NOAA Fisheries.

CHAIR CLARK: All opposed, please raise your hand.

MS. KERNS: Rhode Island, Massachusetts, Connecticut, New York, Georgia, North Carolina, Virginia, Potomac River Fisheries Commission, Maryland, Delaware. May I clarify on the record? Chris, are you voting, McDonough? I don't see your hand up right now.

MR. McDONOUGH: Yes, I am. I have it clicked up, but it indicated yes voting up.

MS. KERNS: If you click it again, I think your hand will actually be up then. Now your hand is up, now it's down, just letting you know. South Carolina is also against.

MR. McDONOUGH: Yes.

CHAIR CLARK: What is our final tally? Oh, I'm sorry, do we have any extensions? New Jersey is abstaining. Do we have any null votes? No nulls. Okay, motion fails 2 in favor, 11 opposed, 1 abstention and 0 null. That means.

MS. ERIKA BURGESS: Mr. Chair.

CHAIR CLARK: Yes, Ma'am.

MS. BURGESS: Florida abstains on that vote as well on the webinar. Thank you.

CHAIR CLARK: **Okay, so it's 2 abstentions on the vote to amend.**

CHAIR CLARK: Okay, so we are now back to the Main Motion, and do we need any time to caucus on the main motion? I'm not seeing any need for that. Why don't we go right to the vote. All in favor, please raise your hands.

MS. KERNS: I have NOAA Fisheries, Delaware, Rhode Island, Massachusetts, Connecticut, New York, New Jersey, Fish and Wildlife Service, Georgia, North Carolina, Virginia, Potomac River Fisheries Commission, Maryland, South Carolina.

CHAIR CLARK: Okay, do we have any abstentions? I'm sorry, it's been a long day already. Do we have any votes in opposition? Seeing none. Do we have any abstentions?

MS. KERNS: Florida.

CHAIR CLARK: Okay, and do we have any null votes? Okay, seeing none of those. The motion passes, 14 in favor, 0 opposed, 1 abstention and 0 null. All right, so that is now our accepted motion. Now we'll need a motion to approve the addendum as modified this morning. I have Justin Davis as the maker of the motion to approve the Addendum, and Shanna Madsen as the seconder of the motion. Justin, would you please read the motion. Also, do we have a seconder? Oh, Shanna that's right, sorry about that. Go right ahead, Justin.

DR. JUSTIN DAVIS: I move to approve Addendum VIII as modified today with an implementation date effective today.

CHAIR CLARK: Okay, we have the motion to approve the Addendum, it's been seconded. Why don't we do this the easy way this time. Is there

any opposition to this motion? Okay, not hearing any or seeing any. We don't have any opposition online; nobody needs to abstain?

MS. KERNS: I have one hand raised. Tom Fote. Tom, is that in opposition?

MR. THOMAS P. FOTE: I just want to make a comment before we vote, because it's been such a controversial subject. I just wanted to state, I wish I could be there today, my back wouldn't basically allow me. But I think we always have to use the best science available, and this is much better science than we had before, and I truly support this motion.

CHAIR CLARK: Okay, thank you, Tom, and other than that we had no opposition to the motion. The motion is approved as written. We have now approved the Addendum. Before we move on to the specification setting process, would we like to take a short caucus break? Why don't we make it five minutes? Can everybody be back here at 10:55?

(Whereupon a recess was taken.)

SET SPECIFICATIONS FOR 2023

CHAIR CLARK: Okay, I think the Board is all here now, so why don't we move on and I'll turn it over to Caitlin to discuss the specifications for 2023**.**

MS. STARKS: I think we need to pull up a table from the last Power Point. It's Slide Number 39 in the last Power Point.

CHAIR CLARK: We're getting there. Okay, now we're there.

MS. STARKS: The Board today will be determining what the specifications will be for the 2023 fishing year, based on the ARM, which was adopted through Addendum VIII just now. The decision before the Board is simply to set the specifications for the Delaware Bay states of New Jersey through Virginia. As we've discussed, the Board can use the ARM recommendation or make some modifications to those state quotas.

CHAIR CLARK: Thanks, are there any questions, or do we want to go right to a motion here? Seeing no questions, I believe Shanna has a motion. Hold on one second, Shanna. Emerson, did you have a question?

MR. EMERSON C. HASBROUCK: Yes, Mr. Chairman, thank you. I'm not quite following those two tables, unless one is mislabeled, because they both say round down to the nearest 25,000.

CHAIR CLARK: Problem solved.

MS. STARKS: This is the only relevant table for your consideration. This is what is recommended from the ARM for the 2023 fishing year.

CHAIR CLARK: Okay, so now hopefully everything is clear now. This is the specifications for 2023, and I'm going to turn it to Shanna Madsen who has a motion for us.

MS. MADSEN: I know they've got a motion prepared, so I'm just going to wait and read it off. My motion is, move to accept the 2023 ARM harvest specification with 475,000 males and no female harvest on Delaware Bay-origin crabs. In addition, the 2:1 offset will be added to Maryland and Virginia's allocation due to the Board selecting no female harvest.

CHAIR CLARK: Do we have a second? Mike Luisi. Discussion of the motion, Adam Nowalsky.

MR. ADAM NOWALSKY: A question on the application of the offset and language that is in the Addendum that we approved. Some quick math I think I did on my end was, Maryland and Virginia are about 30 percent of the quota. We're talking about 30 percent of 125,000 female crabs, about 37,500.

We're doing a 2-1 offset, so we're looking at adding about 75,000 male crabs back, for a total harvest of around 550. That is my back of the envelope math.

But in the Addendum, there was language that said the maximum possible harvest for both females and males are maintained at 210,000 and 500,000 respectively. With the language that was in the Addendum, can we get to the 550,000 male crabs, if my math was correct, or are we constrained that we're actually still capping it at 500,000?

CHAIR CLARK: You and your quick math, Adam. Let me turn it over to Toni.

MS. KERNS: The short answer is yes, Adam. It's the same as we had been doing under the old ARM, where for several years we had 0 females and 500 males only crabs. But then you put the 2-1 offset in there and it puts you above that 500 male only crabs. We're working in the same method that we had before, and Caitlin will add one more piece.

MS. STARKS: For your consideration on the screen there is a table here that shows what the Delaware Bay origin quota is, as recommended by the ARM. If you are only looking at 475,000 males, and then on the other half of the table shows what the quotas for Maryland and Virginia would be with the offset applied.

CHAIR CLARK: Okay, are there further comments/questions on this? Bill Hyatt.

MR. HYATT: All I want to do is speak in support of the motion. Should I do that now, or are we still handling questions?

CHAIR CLARK: Go right ahead, Bill, you use big support.

MR. HYATT: Yes, I want to speak in support of this motion, particularly the elimination of the female harvest. I think that the Addendum and the ARM Framework that we approved before does a great job of representing the best available science. It provides us with valuable guidance to this group on what we can do.

But it's our job to decide what we should do. I think in light of a number of considerations, this motion represents exactly that, what this body should do. It takes into consideration the low to nonexistent numbers of newly mature female horseshoe crabs and the uncertainty that Kristen so well described around that.

It takes into consideration sort of a lack of any really convincing argument for a need to significantly improve the harvest of the crabs, and in particular any argument of a need to approve the harvest of female crabs. It's really responsive to the amount of input that we've gotten from the public. For all those reasons, I think this represents a good example of what this group can do, and is exactly what we should be doing at this point.

CHAIR CLARK: Are there other comments? Shanna.

MS. MADSEN: Just really quickly, and I actually think Bill did an excellent job. You know I didn't get to give my justification for making this motion, but what Bill summarized is my exact intent here. You know the Bay states got together and had a discussion about whether or not we felt comfortable harvesting female horseshoe crabs, in lieu of all of the comments that we received. You know we came to this decision together. I think this Board did an excellent job of really deliberating over that, and recognizing that these two parts of the process are separate in that way. We can accept the best available science for management, and make the decisions regarding what we are going to do with the harvest after that point. I really appreciate Bill's comments, and Joe Cimino's comments previously to that affect. I hope to see this motion go forward today.

CHAIR CLARK: We have Tom Fote has a comment.

MR. FOTE: I had a lot of meetings with legislators over the last couple of months, and other people concerned about it and I said, we have to use the best science. But again, the Board will make the decision on what they feel is right. This motion I think makes that decision the right one, just as I said to all those people out there that's what would happen. Thank you, and I really want to also say, I really appreciate all the science that went into this,

all the work by the Technical Committee, and it just really always amazes me. Thank you.

CHAIR CLARK: Thanks, Tom, Mike Luisi.

MR. LUISI: I'll just say I certainly support the motion, and in discussions with our industry over the last few months. You know years ago they made some considerable sacrifices to the way that they operated by moving to male only over a period of time. They've evolved, and understand and realize that the female horseshoe crab and the importance of it.

The controversy that surrounds it is not something to, you don't want to poke the bear. I guess that might be the way to put it out there bluntly. I appreciate the motion before us. I think this gets us back to status quo, if you want to call it that. I certainly support it, so thank you.

CHAIR CLARK: We have Justin Davis and then Joe Cimino.

DR. DAVIS: I'll also speak in support of the motion. Kind of what Shanna was alluding to; I think this decision point is really about risk tolerance. Certainly, with what we do at the Commission, the scientific process and decisions about risk are linked, but they are not one and the same. You know science can provide us advice, it can tell us where we're at, it can give us probabilities of different outcomes if we take different actions.

But ultimately, it's up to the Board to decide how risky or not we want to be with the decisions we make. I just think what we're doing here is in keeping with, you know other recent decisions this Commission has made to be risk averse. When I think about striped bass, the decisions we made in the rebuilding plan. We chose to use a low recruitment assumption, even though we didn't need to do that, which led to more conservative estimates of appropriate fishing mortality.

The debate we had about menhaden this week, we chose a TAC that was really conservative. We didn't have to do that, we could have chosen one with a 50 percent probability of exceeding F, but we chose one that was really conservative. I think this decision is in keeping with decisions this Commission has made in recent history to be conservative, to be precautionary when we're setting targets. For that reason, I support this motion.

CHAIR CLARK: Joe Cimino and then Rick Jacobson.

MR. CIMINO: To paraphrase Mike Luisi, I think everybody around this table got more sleep than I did, and ditto all the great comments. Two things, one, I hope we are seeing the fruits of our labor here, and an increasing trend for female horseshoe crab abundance in the Delaware Bay.

But we're, I think a long way if ever, in my opinion, considering female horseshoe crab harvest. I would be remiss not to give my thanks to the group, but I think you all know I had a chance to share and just appreciate all the hard work, and for Dr. John Sweka as well. Just thank you to all of you.

CHAIR CLARK: Thanks, Joe, Rick.

MR. JACOBSON: I want to speak in favor of the motion as well. I do believe that the ARM does represent the best available science, and we're committed to utilizing the best available science. I also applaud the members of this Board for supporting an Amendment that looks beyond simply the recommendations of the ARM, and recognizes the public interest in the issue. I'll also be continuing to press the Board to continue to explore the human dimension elements of the model, and the risk tolerance factors that are within it.

I also would like to acknowledge our colleagues of the U.S. Geological Survey for their collaboration in the construction of the model, and also their diligent efforts to make the model code available to the public. Taking this action will provide the additional time necessary for the public to gain the confidence in the model code in this period. Thank you very much, and I look forward to voting in favor of the motion.

CHAIR CLARK: Are there any further comments? Seeing none; it's time to call the question. Let me just see first if we can do this the easy way. Is there any opposition to the motion? I should have asked. Does anybody need time to caucus? I'm not seeing any hands on that, not seeing any hands in opposition.

In that case, are there any abstentions from the motion? We have one abstention, but otherwise the motion is passed by unanimous consent.

REVIEW AND POPULATE A WORKGROUP TO REVIEW THE BEST MANAGEMENT PRACTICES FOR HANDLING BIOMEDICAL COLLECTIONS

CHAIR CLARK: Fantastic, we've got the Addendum approved and the specifications for 2023 set, and you might think that was it, but wait, there's more. Now, I'm going to turn it back over to Caitlin to cover Agenda Item 6, which is Review and Populate a Workgroup to review the best management practices for handling Biomedical Collections. Take it away, Caitlin.

MS. STARKS: This should be brief and relatively straightforward. At the last meeting the Board decided to form this workgroup, and that is what I'm going to be discussing today. At that August meeting, the Board agreed to form a workgroup to review the best management practices for handling biomedical catch, and suggest options for updating and implementing the BMPs.

This was based on a recommendation from the Plan Development Team that no action was needed related to the biomedical mortality threshold that is currently in the FMP, but that the Board could continue to annually review estimated biomedical mortality levels, and form this workgroup to address the BMPs. The original Best Management Practices document was produced by a workgroup in 2011, and it contains recommendations for best management practices from each step of the biomedical process from capture to returning those crabs to the ocean. These BMPs are recommendations, but they are not implemented as requirements by ASMFC.

There are some states that do require some of those self-management practices as part of their permitting process. The nominations that I received to serve on the management workgroup include these names here. We have Katie Rodrigue from Rhode Island, Derek Perry from Massachusetts, Sam MacQuesten from New Jersey, Brett Hoffmeister from Associates of Cape Cod, Nora Blair from Charles River Labs, Benjie Swan from Limuli Labs, and Dr. Daniel Sasson from South Carolina DNR.

This group represents something similar to the original workgroup, with representation from both the biological and ecological technical side, as well as the understanding of the biomedical process side. With that today, the Board can consider approving the nominations to the Biomedical Workgroup.

CHAIR CLARK: Do we need a motion to do so, Caitlin? Yes. Just to make it clean, why don't we go ahead and get a motion to approve the workgroup. Does anybody want to offer that? We have Emerson Hasbrouck, and seconded by Conor McManus. Is there any discussion? Emerson.

MR. HASBROUCK: Do you need me to read that into the record?

CHAIR CLARK: Great point, yes, please do.

MR. HASBROUCK: Move to approve the nominations to the work group to review best management practices for handling biomedical collections.

CHAIR CLARK: **Thank you, and is there any discussion of the motion? Seeing none; is there any opposition to the motion? Are there any abstentions from the motion? Nothing, okay, good, so the motion is approved, passed by unanimous consent**. Mike Luisi.

MR. LUISI: Yes, just a quick question, Mr. Chairman. This jumped up on me faster than I thought it was going to. I didn't realize we were going to be approving this today. I believe one of my members

of my staff were interested in participating. What would the process be, once I confirm that, if somebody wanted to be added to the group? I just want to confirm it before I recommend a nomination, so I just sent out a quick note.

But it just kind of jumped up on me pretty fast here, and I just want to see what the process would be. I just got a confirmation that Steve Doctor from Maryland DNR would like to serve as part of this working group. I don't know if we can add him. Is it to late to do that, since we already approved it?

CHAIR CLARK: Well yes, why don't we just do it. Is there any objection to adding Steve Doctor of Maryland DNR to the Workgroup. Okay, we're being told we don't need a motion, so there is no objection to adding Steve, and the good Doctor will be added to the workgroup.

MR. LUISI: Excellent, and he'll be very happy. Thank you very much.

CONSIDER THE FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2021 FISHING YEAR

CHAIR CLARK: Excellent, now we move on to Item Number 7, which is Consider the Fishery Management Plan Review and State Compliance for the 2021 Fishing Year, and that is Caitlin again.

MS. STARKS: Quickly I just want to note that the document that went out in materials will be updated following the meeting, because I have received some additional data from the states. I just wanted to make that note. This is going to be short and sweet. This is the management history for horseshoe crab at the Commission.

We can add Addendum VIII to this list as of today. Then on this figure, I am just showing the annual values of the reported horseshoe crab bait harvest, biomedical questions and estimated biomedical mortality in millions of crabs. As you can see, bait harvest and biomedical collections are slightly higher in 2021 compared to 2020.

For bait harvest in 2021, the total number of crabs reported was 741,684 crabs, and this number is the most up-to-date, and does include the landings from Connecticut that came in recently. After this meeting I'll update the FMP Review Document to reflect this change. The 2021 landings represented 63 percent increase from the 2020 landings, but it is still well below the Commission's coastwide quota for horseshoe crabs, which is 1.59 million crabs.

The states of Massachusetts, Delaware, New York and Maryland made up for 84 percent of the total coastwide bait harvest, and each of those states represents 24 percent, 23 percent, 21 percent, and 15 percent respectively. This is a note. The increase in landings seen in 2021 was likely due to 2020 landings being very low, as a result of COVID.

The 2021 landings are more similar to 2019. In 2021 the number of crabs collected for the sole purpose of LAL production in the biomedical industry was 697,025 crabs. This represents a 3 percent increase from the 2020 value. The estimated mortality from biomedical was 112,104 crabs.

As a reminder, this includes the observed mortalities that are reported, plus 15 percent of the total crabs that are bled. In 2021 the biomedical mortality represents about 13 percent of the total directed mortality, which is bait harvest plus biomedical mortality. That's about 836,000 crabs.

That total mortality is an increase from 2020, considering that bait harvest was much higher in 2021 than 2020. This next graph shows the total coastwide mortality of horseshoe crabs by year, broken out by bait and biomedical mortality. The orange area on the graph is the bait harvest, and the blue area is the estimated biomedical mortality. This is just to give you a sense of the relative magnitude of each of those to sources of mortality. I did want to make a note that the COVID-19 pandemic still had some impacts on sampling in 2021, not as much though as in 2020. But in 2021 the Long Island Sound Trawl Survey and the New Jersey Benthic Trawl Survey were not completed because of COVID restrictions. For de minimis

status, states can qualify for this if their combined average bait landings for the last two years are less than 1 percent of the coastwide bait landings for the same two-year period.

In 2021 South Carolina, Georgia and Florida requested and meet the de minimis criteria. The PRTs recommendations, based on their review of the Annual Compliance Report are first, it's always recommended for the last several years, the PRT recommends that the Commission continue to prioritize finding long term funding for the Virginia Tech Trawl Survey, as that is a critical data source that we need throughout the management program.

The PRT also recommends working towards getting annual estimates of horseshoe crab discard removals for the coast. With regard to state compliance, the PRT found that with the exception of the surveys that were affected by COVID, as well as a late compliance report, all states and jurisdictions appear to be in compliance with the requirements of the FMP. The PRT recommended approval of the Compliance Reports, de minimis request, and the FMP review for the 2021 fishing year. That's all I have.

CHAIR CLARK: Before we go to a motion on the Plan Review, does anybody have any questions for Caitlin? Seeing none; can we get a motion? Mike Luisi.

MR. LUISI: Yes, I'll be happy to make that motion, Mr. Chairman. I've got something I can read.

CHAIR CLARK: Please, go right ahead, Mike.

MR. LUISI: Okay. Move to approve the FMP Review, state compliance reports, and de minimis requests for South Carolina, Georgia, and Florida for the 2021 fishing year.

CHAIR CLARK: Motion by Mike Luisi, we have a second from Jim Gilmore. Any comments? Okay, seeing no hands**. Is there any opposition to approving this motion? Okay, and nothing online, so motion is approved, and the Plan Review and State Compliance for 2021 fishing year is therefore approved by unanimous consent.**

OTHER BUSINESS

CHAIR CLARK: I believe that brings us up to our last item, which is Other Business. I don't believe there was any. Oh, we have Shanna would like to bring something up.

MS. MADSEN: I'll make this Other Business brief. I don't know if it helps to have my other business in motion form or not, but essentially, we've talked a lot today about the goals and objectives of the fishery and the ecosystem, and protecting red knots for Delaware Bay origin crabs.

I think it's time that we potentially sit down and start to have some facilitated workshops with stakeholders and managers and scientists, to try to help better inform future goals and objectives and modeling approaches. I will say that I envision this to be a lot like the Ecosystem Management Objectives Workshop that were held for Atlantic Menhaden. There were really great, a cooperative approach with our managers, stakeholders and scientists, to really start to talk about what our goals and objectives are for both the fishery and the ecosystem. I think that our discussions today have led me to believe that we should start to do that as soon as possible. I know that might mean an amendment to the Action Plan, or something like that. But I do believe that this is important enough that we should discuss it today.

CHAIR CLARK: Thanks, Shanna. Bob, you have a response to that?

EXECUTIVE DIRECTOR ROBERT E. BEAL: Well not a response, just maybe a little bit different course. You know some of the examples that Shanna mentioned, the menhaden work and others, were pretty expensive and very involved. As Shanna mentioned, we probably would need to do an addition to the Action Plan, which is fine to do this.

But it might be best if the staff does some work and kind of maps out some possible courses moving

forward, sort of a different levels of workload, and different options for workshops and cost associated with those options and that sort of thing. We can bring that back in February, and then the Board can sort of dig in to how involved do you want this to be?

You know I think it's a good idea to do it, but there is a workload component. You know, do we want to have the sort of Cadillac version or the cheap Ugo version, or whatever that old car was that the doors fell off. You know I think it's probably worth doing some staff exploration as the first step.

CHAIR CLARK: I like billing it as the Cadillac or the Ugo version, but Shanna, does that meet your expectations?

MS. MADSEN: Yes, I'm completely comfortable with that, Bob. I think it makes sense to go back, reevaluate workload, and look at what funds might be available. I just kind of wanted to point the Ecosystem Workshop as kind of maybe a framework, because I think it really did help us a lot in moving forward.

CHAIR CLARK: I saw Rick and then Joe.

MR. JACOBSON: I just wanted to echo Shanna's comments and her suggestion. I think that is the perfect path forward for us. I'm totally happy with Bob's approach to going and looking at various options to achieve those objectives. I'm very supportive, thank you.

CHAIR CLARK: Thanks, Rick, Joe.

MR. CIMINO: Yes, I agree that discussions need to happen. I'm just kind of curious, Bob, on the timing. You know if you thought this would be available at the first 2023 meeting, but the Horseshoe Crab Board had no reason to meet. Could we cover this at another Board?

EXECUTIVE DIRECTOR BEAL: I'll kind of turn it back on the Board. When do you want it? We can pull together a list of options and different scenarios, sort of different process options for the February meeting. But if that's the only thing the Board needs to tackle, we can postpone it for awhile if the Board is comfortable with that. It's really up to this group.

CHAIR CLARK: Any further discussion of that? I mean could this be something done, like the suggestions be sent out by e-mail also?

EXECUTIVE DIRECTOR BEAL: We can send them out. I think it might be worth Board discussion to select the option. There are different levels of work and cost and those sorts of things, and that may be hard to resolve over e-mail. But we can share the options over e-mail, and then have a future conversation at the Board.

CHAIR CLARK: Okay, thanks, Bob. Mike, before we get to you, we have Chris Wright on the webinar that would like to make a comment.

MR. CHRIS WRIGHT: I was just thinking if we don't want to wait, we could always have a conference call. You know we've had webinars like that before. In between boards, if needed.

EXECUTIVE DIRECTOR BEAL: Toni would like to respond, but I'm going to do it. One option is if the Best Management Practices Workgroup that was just formed, that their output will be available at the spring meeting, I think is the current plan. We could just do all of these at the spring meeting, if the Board is comfortable waiting that long.

CHAIR CLARK: Is that okay with the Board? I'm seeing thumbs up here, and Shanna has got a big thumb up there. Mike, did you have any further comments you wanted to make, Mike? Okay. I think in that case we've resolved that item, have we? All right, I'm not seeing any.

ADJOURNMENT

CHAIR CLARK: Before we adjourn, I would just like to take this opportunity again to thank the ASMFC staff.

Caitlin's phenomenal job of getting us through all the hearings, the massive amount of public comment. Thanks to the public for their just passion and interest in this issue. I also wanted to just make special notice. This new ARM is just such an advance in modeling. Special thanks to Kristen, and I know Joe mentioned John Sweka.

The two of them did phenomenal work on this. The entire ARM Subcommittee, the Technical Committee. This has really been an achievement, and ASMFC is rightly proud of this. I just wanted to say that. With that, if there is nothing else, this Board will stand adjourned. Thank you, everybody.

(Whereupon the meeting adjourned at 11:30 a.m. on Thursday, November 10, 2022)

April 9, 2023

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Horseshoe Crab Recovery Coalition Comments: Proposed Work Group Recommendations on Biomedical Best Management Practices

Executive Summary

In October 2011, the Atlantic States Marine Fisheries Commission's Horseshoe Crab Biomedical ad hoc working group met to codify best practices governing the bleeding of horseshoe crabs in the production of LAL. Despite more than a decade of scientific advances and a deepening understanding of the impacts of bleeding on horseshoe crabs, the BMPs have not been meaningfully revised since that time.

The goal of the Horseshoe Crab Recovery Coalition (HCRC) is a phaseout of the biomedical harvest replaced by widespread adoption of an already available synthetic alternative for endotoxin testing. Multiple laboratories have demonstrated recombinant test reagents to be equally effective and provide the reliability of a renewable resource rather than relying on the unsustainable practice of bleeding wild animals.

Until the phaseout becomes complete, the coalition is proposing revisions to the BMPs to address the following deficiencies:

- They are not mandatory or specific and there is little or no regulatory oversight.
- Key data are not available to NGOs and the public-at-large.
- The process is optimized for the blood product and not for the health of the crabs.
- There is no consequence to killing horseshoe crabs: in fact, the Atlantic States Marine Fisheries Commission and the U.S. Fish and Wildlife Service encourage bleeding of bait crabs as a "conservation measure." However, states like Massachusetts use this loophole to purchase bait crabs from other states that are bled and enter the bait market in that state through a so-called rent-a-crab program.
- Finally, there is no adaptive process to reduce the impacts of biomedical bleeding and no assessment of metrics to reduce crab mortality.

The HCRC's newly proposed BMPs are designed to address these deficiencies through a variety of measures including:

- Calling for reduction in the mortality of bled crabs to less than 5 percent and total mortality from the entire capture-to-release process of less than 7 percent.

- Reform the practice of storing crabs in ponds or pens prior to bleeding. Under normal conditions, holding time should be limited to less than 24 hours, and bled crabs should be released within 24 hours after the bleeding process.
- Selecting only healthy and undamaged crabs for bleeding.
- Improved reporting and Increased transparency in reporting the number and sex of the crabs selected for bleeding, as well as those that are rejected.
- Developing a coastwide system of marking bled crabs to avoid rebleeding in the same year.
- Discontinuing the bleeding of bait crabs, which is currently practiced in Massachusetts.
- Regular auditing by regulatory agencies to ensure compliance with the revised BMPs.
- Increasing the number of horseshoe crabs that actually spawn.

The coalition believes its best practice proposal is aligned with United Nations Sustainability Development Goals for Biodiversity and will help to ensure the health of U.S. horseshoe crab populations until the phaseout of the biomedical harvest is complete.

The following pages provide more detail on our proposal and how it should be implemented and monitored.

Signed by members of the Horseshoe Crab Recovery Coalition

American Littoral Society
Center for Biological Diversity
Connecticut Audubon
Delaware Audubon
The Delaware River Keeper
The Forest Keeper
Georgia Audubon
Maryland Ornithological Society
Mass Audubon
National Audubon Society
New Jersey Audubon
North Carolina Wildlife Federation
One Hundred Miles
Revive and Restore
The Safina Center
Shark River Cleanup Coalition
Southeast Massachusetts Pine Barrens Alliance
The Wetlands Institute
Wild Cumberland

Background/History

The Horseshoe Crab Biomedical *ad-hoc* Working Group (WG) met on October 3, 2011 to discuss the biomedical process and begin building a biomedical best management practices document, as tasked by the Horseshoe Crab Management Board at its August 4, 2011, meeting. The meeting opened with a brief background on the biomedical industry, its impacts, and the board's task, followed by a period of public comment. The WG received written public comment from the Horseshoe Crab Conservation Association of Massachusetts, and Amanda Dey of New Jersey. Discussion by the WG was conducted in a closed-door setting, in anticipation that potential confidential and proprietary information may be discussed. The WG produced a report presenting the biomedical process broken down by steps, with the best management practices (BMPs) that are associated with each step. Some areas for improvement, through training and other methods,

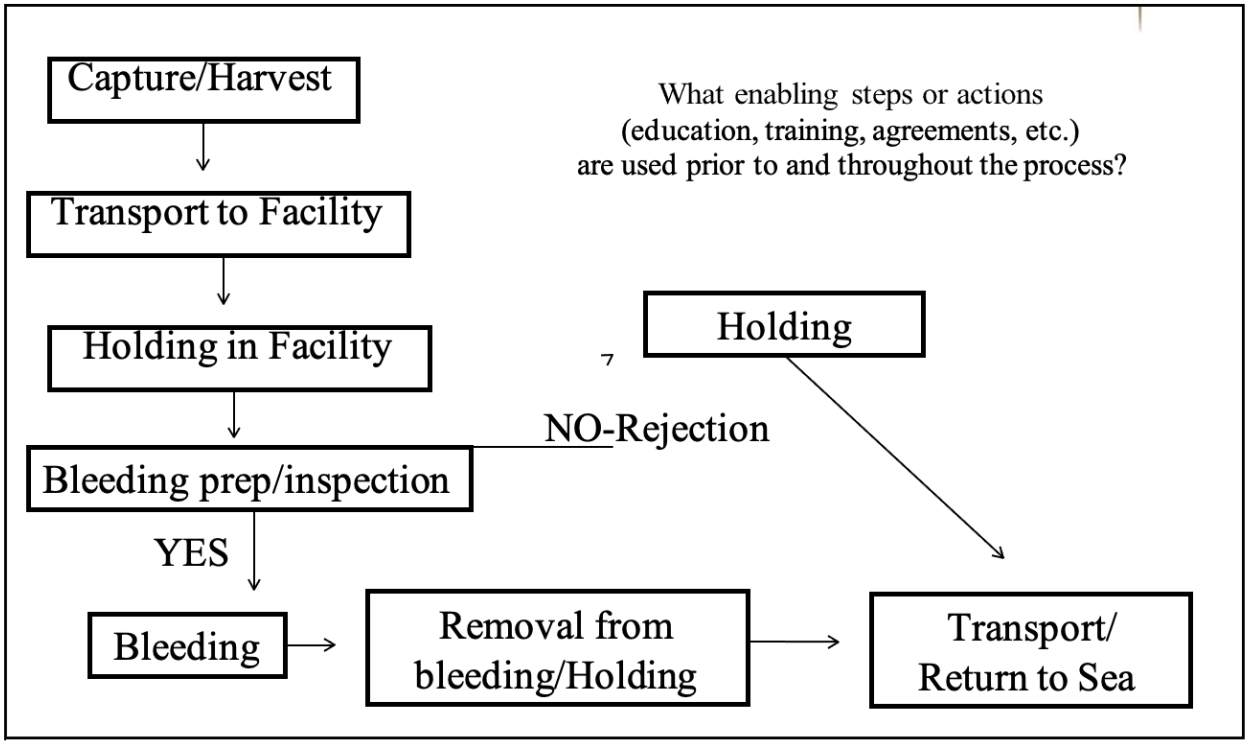
were identified. Additionally, the group felt that future discussions would likely be necessary as practices continue to evolve.

These recommendations were never formally adopted as required standards and have not been revised since 2011. The Horseshoe Crab Recovery Coalition recommends the following revised BMPs be adopted.

The following comments follow the format of the original BMP but are updated reflecting recommendations from scientists involved with the Horseshoe Crab Recovery Coalition.

Development of Biomedical Best Management Practices

In 2011, the WG based its discussion of BMPs on the following step chart. The scope of discussion for the BMPs was limited to the collection, bleeding, and release of crabs collected solely for biomedical purposes. However, the WG recognized that these same practices must also be used when collecting crabs that will ultimately go to the bait industry to ensure a quality product for the biomedical and bait industries.



HCRC Recommended Updated BMPs

By 2027, biomedical facilities will reduce the mortality of bled crabs to ≤ 5 percent, and total capture-to-release mortality of all biomedical crabs collected to ≤ 7 percent (including culled at sea, culled at dock, dead on arrival at lab, bled and unbled mortality in lab, dead on release). This more accurately captures the impact of biomedical industry collection and use of horseshoe crabs.

Registered fishers will play a key role in collecting data on number, sex, and status (condition) of crabs during collection and transport, after bleeding, and upon release at sea.

Capture/Collection:

- Biomedical collection in the Carl Shuster Reserve is discontinued.
- For targeted horseshoe crab trawl tows (biomedical-only and combined bait and biomedical collection), use reasonable tow times to reduce injury and stress, recommended at 15 minutes bottom time (winches locked).

For hand collection of horseshoe crabs, crabs should not be stacked in the bottom of a boat (stacked upside down and left uncovered in direct sun); holding containers must be used to reduce stress, direct sunlight (high temperatures) and desiccation. Proper care and handling of horseshoe crabs must be exercised while collecting, sorting, and placing crabs in holding containers.

Proper care, handling, holding:

- At all times, crabs should be picked up with two hands by the carapace.
- Crabs should never be held by the telson.
- Crabs should never be tossed or thrown.
- Crabs are always be placed right side up (legs down) in holding containers and stacked no more than 3 crabs deep.
- Crabs are to be inspected for standardized markings that indicate whether an individual was bled in the current collection year; release such crabs immediately.
- Holding containers must be well aerated and light in color to reduce heat inside the container.
- Crabs are to be kept cool, moist, and shielded from direct sunlight.
- Released crabs are placed right side up in shallow water (hand collection) or individually into deeper water (trawl/dredge collection); do not throw, toss, or dump crabs *en masse*.
- Healthy crabs are stacked in holding containers, no more than 3 crabs deep to reduce stress and injury during transport to biomedical facility.
- Data to be collected by registered fishers during collection:
    - Sort and record the number, sex, and status of crabs:
        - Healthy crabs: to be transported to biomedical facility.

        - Released crabs: juveniles, dead, injured, unsuitable for bleeding and reason (due to small size, too slow, too old/dull shell).
    - A record of crabs collected, culled at sea and culled at dock are required for annual capture-to-release biomedical harvest reports (ASFMC Addendum III).
    - Avoid exposure to direct sun, extreme temperatures as well as rapid temperature changes; containers with horseshoe crabs are to be kept covered with wet cloth to protect against direct sunlight.
- Night harvesting is recommended during periods of excessive heat (≥75 degrees Fahrenheit)
- Upon landing, if crabs are sorted and released at dock ("culled at dock") before transport to bleeding facility, collectors should follow the above handling and recording procedures.
- Biomedical staff will educate collectors in proper holding, handling, and careful sorting and transport techniques and release site requirements. Rigorous sorting, and release at capture site, of crabs unsuitable for bleeding will reduce the number and mortality of such crabs transported and unnecessarily held at bleeding facilities.
- All collectors and their employees are provided a written copy of procedures and sign a training document to indicate they understand the required procedures.
- Specify collection requirements, best management procedures, and expectations of collectors and their designees/employees in written contracts. Annually audit horseshoe crab collectors on implementation of best management procedures (collection, handling, holding, transport) of horseshoe crabs to biomedical facilities.

Transport to Biomedical Facility

- Transport crabs in enclosed box trucks to maintain a cool temperature and moisture, reduce desiccation (exposure to wind) and exposure to sun.
- Before and during transport, maintain temperature between approximately ambient water temperature at time of collection and 10ºF below the ambient water temperature.
- Maintain good ventilation while stacked in holding containers. Limit number of horseshoe crabs stacked in any container to no more than 3 crabs deep, with crabs placed right-side up, legs down to minimize stress and damage to other horseshoe crabs.
- Transport to bleeding facility immediately after landing; do not hold crabs overnight. Institute the ability of biomedical labs to accept delivery and secure crabs indoors (in environmentally controlled conditions) outside of normal business hours.
- Minimize travel time.
- Keep bins and horseshoe crabs covered (e.g., wet cloth) to protect against desiccation.
- Secure containers in the transport vehicle.

Holding at Facility/Preparation for bleeding/Bleeding

- Limit holding time, under normal circumstances, at the facility to less than 24 hours.
- Minimize exposure to fresh water.

- Follow above procedures for proper care and handling when sorting horseshoe crabs and moving them between bins and within the facility; at all times, crabs in containers are kept indoors, moist, and out of direct sun.
- Inspect crabs for health and damage, selecting only undamaged and healthy crabs for bleeding (do not bleed injured, juvenile, too small, too slow, too old/dull shell).
- Crabs to be bled are placed in containers right-side up, feet touching bottom and not stacked (only one crab deep) to reduce stress. Maintain this condition during sorting or in holding bins throughout the bleeding process, including post-bleeding holding period.
- Record the number, sex, and status (healthy, slow, dead) of bled crabs required for annual capture-to-release biomedical harvest reports (required by ASFMC Add. III).
- Maintain same level of care for rejected crabs (unbled) while being held until release at sea. Crabs rejected for bleeding should be placed in containers right-side up, stacked no more than 3 crabs deep, and released immediately to a waiting collector/delivery person for transport and release. Do not delay the release of unbled crabs until bled crabs are ready for transport and release.
- As with bled crabs, record the number and sex of crabs rejected for bleeding (unbled) and reason (injured, too slow, too small, too old/dull shell). Report the sex and number of unbled crabs and cause for rejection for annual capture-to-release biomedical harvest reports.
- If not medically necessary for a sterile bleed (by heart puncture), discontinue the use of sharp knives to hack epibionts from the carapace of crabs. This practice causes stress and injury that may be unnecessary.
- Maintain clean, sanitary conditions during bleeding.
- Avoid bleeding crabs more than once per year.
- Develop a coastwide system of marking crabs (not USFWS tags) such that all collectors can easily identify by sight, and immediately release, crabs already bled in the current collection year.
- If crabs are marked to avoid re-bleeding, ensure that the mark is residual and not harmful to the crab.
- Upon arrival at the facility, all crabs to be bled will be measured and weighed.
- Measurements will include inter-ocular distance (OID) and Prosomal width (PW), and total blood volume (ml) will be estimated for each crab using 25 percent of wet weight [(1)]; the blood volume extracted (ml) will not exceed 30 percent of an individual crab's total blood volume.

Bleeding

- Given a higher mortality from bleeding during the breeding period, the process for Horseshoe crabs collected and bled during the breeding period [(2)] (the period while not in the wintering area) must be restricted in the following ways.
    - Only males may be bled from April – July; females bled in this period have mortality rates as high as 29% [(2)]
    - Bleed females August to October, after main breeding period.

- An 18-gauge sterile needle will be used. This should be inserted through the membrane in the hinge to extract a predetermined amount of blood from each crab (not to exceed 30% of total blood volume of an individual). If less blood is collected from the crab, suction will not be used.
- The bleeding lab will report (for each crab)
    - Total estimated blood volume (ml) and hemolymph (ml) extracted (not to exceed 30 percent of total blood volume).
    - Type of needle used.
    - Discontinue practices of timed bleeding periods and discontinue allowing crabs to bleed until rate slows.
- Perform internal audits to maintain quality control over written procedures.
- Perform weekly audits of metrics: number and sex of bled crabs and mortality during pre-bleeding, bleeding, and post-bleeding processes.
    - Total mortalities of bled crabs (intake to discharge from biomedical facility) that exceeds 15 percent will be cause for temporary suspension of bleeding activities until deficient handling/holding/bleeding practices are identified and corrected.
    - If deficiencies are corrected but mortality/injury are not reduced to 15 percent or less, reduce amount of blood drawn per crab to 25 percent or less of total blood volume (ml).
    - If mortality cannot be brought to 15 percent or less within two (2) weeks following initial suspension of bleeding activity, the permit/license to bleed crabs may be suspended until the biomedical facility develops changes to procedures that reduce bled crab mortality to 15 percent or less and prove the efficacy of new procedures to an independent assessor (not related to biomedical industry or fisheries agencies).
- Biomedical facilities will account and report the number and sex of unbled crabs and their status (dead, injured, too slow, too small, too old) in annual capture-to-release biomedical harvest reports. To date, the number of unbled crabs have not been required to be reported in annual biomedical harvest figures; unbled crabs range in number from 12,331 to 63,324 per year (avg. 31,238/year); 2004 to 2019 [(3)].

<u>Post-Bleeding Holding</u>

- Recognizing that the horseshoe crabs are now stressed from the bleeding process, maintain the same level of care.
- Minimize holding time in biomedical facility to less than 24-hours post-bleeding.
- When returning crabs to the water, if not being returned to the area of capture, ensure that conditions (salinity, water temperature, etc.) are similar to those found at the harvest site.
- While in holding, keep horseshoe crabs in the dark to minimize movement and injury.
- Keep horseshoe crabs well-ventilated, moist, and allocate only a suitable number of crabs to holding containers – no stacking, allow crabs to rest on bottom of container to reduce post-bleeding stress and injury.

- Crabs placed into containers for transport and release at sea should be right side up and stacked no more than 3 crabs deep.
- Crabs should not be out of salt water for more than 24 hours.
- All crabs must be processed in less than 24 hours and placed back in saltwater holding tanks after processing.

Return to Sea

- Whenever feasible, crabs should be returned to capture location within 36 hours or less from time of capture.
- Use same care in handling and transport when crabs are returned to the water.
- Include return written instructions and requirements within contract with collectors, if applicable
- Periodically audit horseshoe crab collectors on implementation of BMPs for returning crabs to sea.

Summary of Data to be collected by registered fishers during collection, before transport to biomedical facility, and post-bleeding before release at sea:

Monitoring disposition of all crabs collected for biomedical use: To ensure thorough monitoring, all crabs collected for biomedical use must be tracked from the time of capture until release (bled or not bled).

1. This will be done by registered fishermen only, who will report the following:
    a) The location of the catch.
    b) The number of crabs caught.
    c) The number and sex of injured, killed, rejected for bleeding that are released at sea and released at dock, the number of healthy crabs transported to biomedical facility.
    d) After capture, all crabs judged suitable for bleeding will be marked, the fishermen will mark the crab and will report the health of crabs at marking and at release.
    e) The number and condition of crabs transported and delivered to bleeding labs
    f) The disposition of each crab after bleeding including:
        i. The number, sex, and relative health of the crab at the dock (healthy, injured, slow, dead)
        ii. The number, sex, and relative health of crabs at release to sea (same as above)
    g) The time from first capture to release.
2. An oversight (peer group) will monitor the data collected for each segment of the crab's movement from initial collection to release. The data will be reported to a mutually agreed upon group or agency who will release mortality and injuries data for each state within two weeks of the end of each quarter.

Thresholds for allowable mortality and injury at each stage will be determine by the oversight (peer review) group. The group shall be composed of experts who have demonstrated expertise in

the ecology of horseshoe crabs and shall not contain experts representing any commercial interests.

Overarching practices for all steps

- Generate written procedures for all handlers of horseshoe crabs, covering all steps in the process from collection to release.
- Keep horseshoe crabs cool, moist, and covered, avoiding direct sunlight.
- Establish a dialogue among collectors, the biomedical company, and the state regulatory agency to address concerns and challenges.
- Have a written contract between collectors and the biomedical company, outlining practices and expectations.
- Perform audits of the various steps in the biomedical use process and contractors/employees throughout the process
- Ensure proper monitoring and recording of mortality and injury at each step in the chain of custody.

Other concerns: bleeding of bait crabs

- Dual use of bait horseshoe crabs for biomedical practices should be prohibited.
- Eels and whelk fisheries are depleted, and HSC bait harvest should decline on its own, but not if bait fishermen can sell crabs to the biomedical industry.
- The bleeding of bait crabs will prop up an unnecessary bait harvest and institutionalize the death of hundreds of thousands of crabs/years rather than moving the biomedical industry toward a less lethal, more sustainable industry.
- Bait crabs from a given state or region are now sold to other states/regions for bleeding and entry into the purchaser's bait market (e.g., MA rent-a-crab, see Addendum III) or may be returned to the fisher – either way their fate is unknown. This practice undermines conservation efforts (*e.g.*, in Del. Bay Region) and rewards states/regions that continue to overfish their HSC populations (e.g., NY & New England Regions).
    - (Action: disallow sale of bait crabs outside the region of landing, e.g., bait crabs harvested in the Del. Bay region can only be sold to states within the Del. Bay Region – NJ, DE, MD, VA).
- Biomedical reps. claim that bait crabs receive the same level of care as biomedical-only crabs (i.e., only passively bled). This is doubtful. The biomedical industry is secretive, there is no oversight, facilities do not assess in-house mortality or allow independent assessment of mortality or best management practices. There is no reason to trust that the biomedical industry is not bleeding bait crabs to death.
- The biomedical industry has dismissed all biomedical mortality studies to date on the basis that the studies "did not follow industry best management practices." Industry BMPs were adopted in 2011 after most biomedical mortality studies were conducted. The 2011 BMPs are non-specific and non-measurable, and each biomedical facility is alleged to use additional unpublished practices. If industry BMPs are not measurable and

unknown, they cannot be reasonably replicated in biomedical mortality studies – this is an industry gambit.

- Starting in 2018, the number of bait crabs bled has not been reported in annual bait or biomedical harvest figures. This decreases public information and transparency of these two industries. The bleeding of bait crabs will prop up an unnecessary bait industry.

Review of Bleeding Mortality reports

Given recent findings and the wide variation in testing conditions and mortality results in bleeding studies, a formal peer review of the published studies needs to be undertaken. Publication of such a report could reduce some of the conflicting views currently expressed by various interests. Such a report could also frame future research avenues.

Summary

This report recommends revised BMPs for the various steps throughout the biomedical process, from harvest to release. The Horseshoe Crab Recovery Coalition continues to advocate for phaseout of the biomedical harvest replaced by widespread adoption of a equivalent synthetic alternatives for endotoxin testing. Until that time, we believe these BMP recommendations will help to reduce horseshoe crab mortality and protect this iconic species.

Literature Cited:

(1) Hurton, L, J. Berkson, and S. Smith. 2005. Estimation of total hemolymph volume in the horseshoe crab *Limulus polyphemus*. Mar. Fresh. Behav. Physiol. 79A:493-494.

(2) A.S. Leschen* and S.J. Correia. 2010. Mortality in female horseshoe crabs (Limulus polyphemus) from biomedical bleeding and handling: implications for fisheries management, Marine and Freshwater Behavior and Physiology Vol. 43, No. 2, 135–147

(3) ASMFC, Review of the Interstate Fishery Management Plan, Horseshoe Crab, Fishing years 2004 to 2017. http://www.asmfc.org/species/horseshoe-crab.

From: Mary Pickett
To: Comments
Subject: [External] Horseshoe crabs and Delaware Bay
Date: Saturday, January 21, 2023 10:19:13 AM

Horseshoe crabs are the foundation of so many species survival including the migratory birds. It is shameful that you are even considering allowing the harvest of female horseshoe crabs. Your purpose is to manage and help with species survival and that includes strict regulations on harvesting the female horseshoe crabs. Reread the research including paper published in the Environmental and Resource Economics which recommends that with a 12 year moratorium on crab bait harvests, this species could recover along with giving migratory birds including the red knot a fighting chance for recovery. So, please consider your actions carefully as so many species from the horseshoe crabs, fish, and birds depend on your decision.
Sincerely,
Mary Rose Pickett
Toledo, Ohio
419-297-3061

Sent from my iPhone

Best Management Practices for Handling Horseshoe Crabs for Biomedical Purposes

May 2023

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT FOR BOARD CONSIDERATION

Biomedical Best Management Practices Work Group
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Summary

The Atlantic States Marine Fisheries Commission (Commission) has maintained primary management authority for horseshoe crabs in state and federal waters since it adopted the Interstate Fishery Management Plan for Horseshoe Crabs (FMP) in 1998. The goal of the FMP includes management of horseshoe crab populations for continued use by current and future generations of the fishing industry and non-fishing public, including the biomedical industry, scientific and educational researchers, migratory shorebirds, and other dependent fish and wildlife. The Commission also assesses the horseshoe crab population through periodic stock assessments; the most recent assessment was the Horseshoe Crab Stock Assessment and Peer Review Report completed in 2019[1].

In 2022, the Horseshoe Crab Management Board (Board) appointed a work group to review and update the best management practices (BMPs) for handling biomedical catch, given over a decade has passed since the BMPs were originally developed. The work group included technical committee and advisory panel members with expertise in horseshoe crab biology, ecology, and biomedical processing. The purpose of the BMPs is to recommend broadly applicable industry standards that are expected to minimize mortality and injury of horseshoe crabs associated with the biomedical process. This document includes the modified BMPs, as recommended by the work group. It also provides background on the horseshoe crab biomedical fishery, information on current regulations in the Commission's Horseshoe Crab Fishery Management Plan (FMP) related to biomedical collections, descriptions of general processes used to collect and transport horseshoe crabs for biomedical purposes, and research

[1] Horseshoe crab stock assessment reports and information can be found on the Commission's webpage here: http://www.asmfc.org/species/horseshoe-crab#stock

recommendations that could further inform the BMPs and potentially further reduce mortality or injury of biomedical horseshoe crabs.

Background

Coastwide, horseshoe crabs are harvested for use as bait, and are an important resource for research and human health. In 1964, researchers discovered that horseshoe crab blood coagulates in the presence of very small quantities of bacterial endotoxin. By 1979, the U.S. Food and Drug Administration (FDA) issued draft guidelines for the use of *Limulus amebocyte lysate* (LAL), the product derived from horseshoe crab blood, as a test for detecting pathogens in patients, medical devices, and injectable drugs. The LAL test is the compendial standard[2] currently used domestically and internationally for screening injectable and indwelling medical products for endotoxin contamination. Vaccines, IV fluids, medications, artificial joints, and internal devices (e.g., stents, pacemakers, catheters) are just some examples of products tested. LAL is also used in medical research for human health and most recently, it has been approved for use as a clinical diagnosis of invasive fungal infections in patients.

To manufacture LAL, horseshoe crabs are collected by fishermen and provided to biomedical companies, which take a portion of their blood. The blood is then separated, and the proteins within the white blood cells are processed for more precise results. There are currently five FDA-licensed LAL manufacturers along the Atlantic Coast that process horseshoe crab blood for use in manufacturing LAL: Associates of Cape Cod Inc.; Lonza, Limuli Laboratories; FujiFilm Wako Chemicals; and Charles River Microbial Solutions. Horseshoe crabs are currently collected for biomedical purposes in Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and South Carolina.

As required for the reporting for biomedical horseshoe crabs, both the total number of horseshoe crabs collected and the number bled are reported. The number of bled horseshoe crabs has averaged 92.6% of the total number collected for the years since 2011 when the BMP document was developed. Some crabs are not bled due to damage, health (slow movements) and mortality. Horseshoe crabs collected solely for biomedical use are required to be released alive, however, there is a low level of mortality associated with biomedical processing. The overall biomedical mortality reported by the Commission includes any horseshoe crabs that are observed dead between the point of capture and release, plus the estimated number of horseshoe crabs that die from the biomedical bleeding process. Biomedical companies are required to record and report numbers of horseshoe crabs that are observed dead between the

[2] "Compendial standard" refers to a pharmaceutical standard of the United States Pharmacopeia, or other international pharmacopeia, meaning it is the official quality standard to be used for all pharmaceutical products sold in the U.S. or international marketplace. Testing and compliance to these standards is a basic requirement for global manufacturing, release, and distribution of pharmaceutical products.

point of capture and release, however, there are differences in how this information is collected by different biomedical collectors, companies, and facilities. Since this reporting began in 2004, the observed number of biomedical mortalities per year has averaged about 1.5% of the total number of horseshoe crabs collected for biomedical purposes coastwide (ASMFC 2022). The estimated mortality rate is 15% of all horseshoe crabs processed and released alive by the biomedical industry, which was determined through a review of all available literature on mortality, including studies that were not representative of standard biomedical handling practices, nor the practices described in the 2011 BMPs. This mortality rate has been reassessed and maintained in recent stock assessments (ASMFC 2019). Some states also have a dual use program where horseshoe crabs destined for the bait market can be loaned to a biomedical facility to be bled, before being returned to the bait market. These horseshoe crabs are not subject to the reporting described above; instead, they are counted against the state's bait quota as they have a 100% mortality rate.

The relative mortality of horseshoe crabs from the biomedical fishery is small when compared to the bait fishery. The number of horseshoe crabs harvested for bait on an annual basis typically accounts for over 85% of the total fishing mortality (bait fishery harvest plus estimated and observed biomedical mortality). Additionally, the Commission does not have regulatory authority over biomedical companies; they are subject to regulation by the FDA. Nevertheless, the Board strives to minimize the impact of biomedical collections on Atlantic horseshoe crab populations. In 2011, an *ad-hoc* work group drafted a BMP document including BMPs for the various steps throughout the biomedical process, from harvest to release. Many of the practices identified as BMPs had been historically used by the biomedical companies to sustain the horseshoe crab population and ensure a steady and reliable product supply to the pharmaceutical market. The work group recommended biomedical facilities follow the BMPs and monitor their suppliers. Recognizing the potential for future changes in the industry and the status of the resource, the WG also recommended meetings be held periodically to identify opportunities for improvements and minimize mortality.

In 2022, the Board formed a new work group to review and update the 2011 BMPs for handling biomedical catch. Over several meetings in early 2023, the work group evaluated each of the BMPs and identified areas that are out of date or could be improved with additional information. This document reflects the recommendations of the 2023 work group. Its purpose is to establish broadly applicable industry standards that are expected to minimize mortality and injury of horseshoe crabs associated with the biomedical process. This document also serves to educate the public about the biomedical industry, processes, and practices.

Horseshoe Crab Biomedical Regulations

Biomedical LAL manufacturers are regulated by the FDA and are permitted to obtain horseshoe crabs for blood collection by individual states. Collections of horseshoe crabs for biomedical use are subject to state regulations, separate from those placed on harvest and landing of horseshoe crabs for bait. The Commission's Horseshoe Crab FMP and subsequent Addenda include some regulations that states must comply with related to the biomedical collection of horseshoe crabs, which are summarized below.

FMP Requirements:

Interstate Fishery Management Plan for Horseshoe Crab (ASMFC 1998):

- States must issue a special permit, or other specific authorization, for harvests[3] for biomedical purposes.
- Horseshoe crabs taken for biomedical purposes shall be returned to the same state or federal waters from which they were collected.
- If horseshoe crabs are captured for biomedical use, all states must monitor and report monthly and annual harvest of horseshoe crabs by biomedical facilities (i.e., numbers), identify percent of mortality up to the point of release (including harvest, shipping[4], handling, and bleeding mortality), and certify that harvested horseshoe crabs are being used by biomedical facilities and not for other purposes.

Addendum III (ASMFC 2004):

- All states where horseshoe crabs are captured for biomedical use must monitor and report monthly and annual harvest of horseshoe crabs by biomedical facilities. All states must identify percent mortality up to the point of release (including harvest, shipping, handling and bleeding mortality), harvest method, number or percent of males and females, disposition of bled crabs, and condition of holding environment of bled crabs prior to release.

[3] The FMP refers to the collection of horseshoe crabs for biomedical purposes as "harvest." However, for the purposes of this document the term "collection" will be used because it more accurately represents the practices of the industry.

[4] The FMP refers to the transport of horseshoe crabs for biomedical purposes from where they are collected to a biomedical facility as "shipping." However, in this document the term "transport" is used because it more accurately represents the practices of the industry.

Best Management Practices for Handling Biomedical Collections

The following presents the biomedical process broken down into steps (Figure 1), with the best management practices associated with each step, as well as overarching practices applicable to all steps.

The general steps in the process are collection, transport to facility, holding at facility, inspection, blood collection, transport for return to sea, and release. “Collection” refers to removing horseshoe crabs from their natural environment, using methods such as trawl netting, or by hand from shore or shallow water. Some states use the practice of in-water holding, which involves keeping horseshoe crabs in coastal ponds or pens between capture and transport to the facility for blood collection. “Transport” refers to moving horseshoe crabs from the point of collection, landing, or holding to a biomedical facility, typically in containers by truck. “Holding at Facility” and “Blood Collection” refers to keeping the horseshoe crabs at the facility until they are inspected and then collecting blood from horseshoe crabs that pass inspection. Once blood is collected, the horseshoe crabs are held at the facility (along with those that were rejected) until they can be transported to the same state or federal waters from which they were collected and released.

The BMPs presented in this document represent standard practices used by the licensed manufacturers, and serve as recommendations for the best handling practices to minimize mortality and injury of horseshoe crabs. They are geared toward collections of horseshoe crabs for biomedical purposes, however these practices may be utilized by LAL manufacturers participating in a dual use program. The Work Group recommends that states review the BMP recommendations periodically to continue to minimize rates of mortality and injury of horseshoe crabs collected for biomedical purposes. The work group recognized the potential for changes in industry practices, increased knowledge related to the impacts associated with the various aspects of the biomedical process, and other factors that could affect the BMPs. Therefore, periodic review of the BMPs will be necessary to ensure their positive impact into the future.

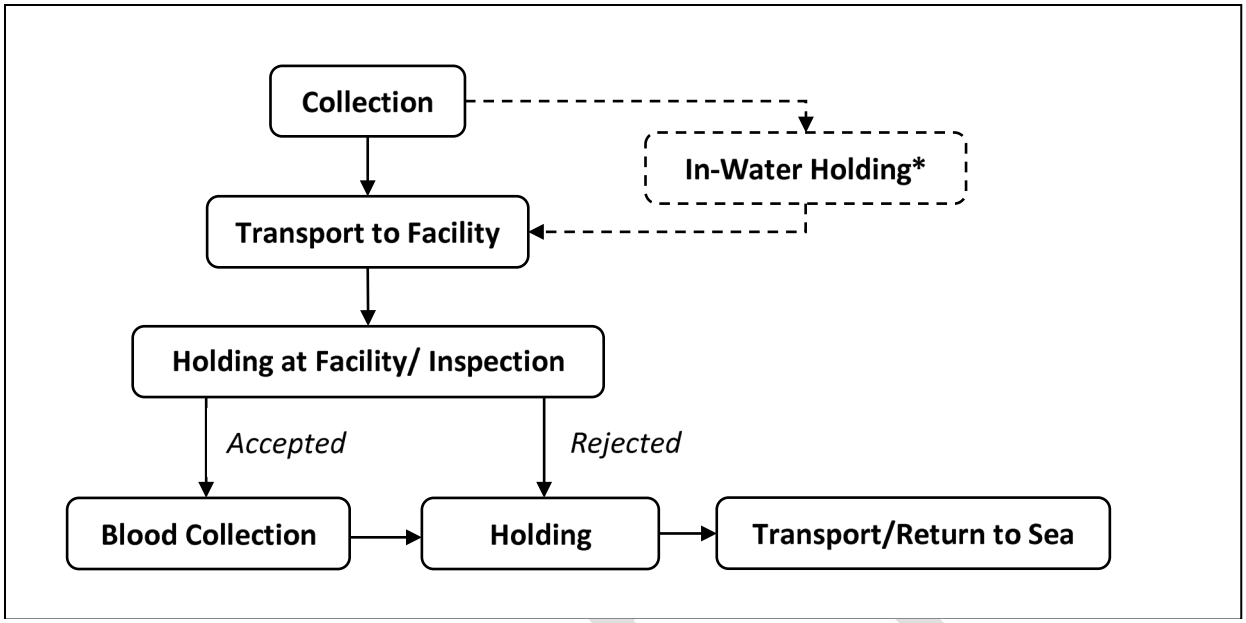

Figure 1. Diagram illustrating the general flow of horseshoe crabs through the biomedical process, from collection until return. *In-water holding is not utilized in all states.

Overarching practices for all steps

- Keep horseshoe crabs cool and moist, and minimize exposure to direct sunlight and anoxic conditions
- Avoid prolonged exposure of gills to fresh water
- Establish a dialogue among collectors, the biomedical company, and the state regulatory agency to address concerns and challenges
- Have a written agreement between collectors and the biomedical company, outlining practices and expectations
- Perform reviews of the various steps and contractors/employees throughout the process
- Ensure proper monitoring and recording of mortality at each step in the chain of custody
- Return horseshoe crabs taken for biomedical purposes to the same state or federal waters from which they were collected
- Avoid keeping horseshoe crabs out of the water for longer than 36 hours in total

Collection

- Minimize tow times for targeted horseshoe crab trawl tows,
- Handle horseshoe crabs carefully to minimize injury (e.g., avoid dropping/tossing horseshoe crabs, etc.)
- Minimize exposure to direct sun, avoid extreme temperatures and rapid temperature changes
- Night collection is recommended, especially during periods of excessive heat, when permitted by state regulation

- Sort out and return immediately to the water individuals that do not appear to be healthy (damaged, slow movement), soft shelled, or undersize horseshoe crabs (based on state regulations)
- Educate collectors in BMPs
- Specify expectations of collectors in written agreements
- Periodically observe horseshoe crab collectors' adherence to BMPs
- Horseshoe crabs marked as having been bled during the calendar year should be immediately released

In-Water Holding

- Minimize holding time
- Avoid overcrowding
- Monitor water conditions (e.g., temperature, dissolved oxygen, salinity) and minimize exposure to stressful conditions
- Follow state guidelines on holding conditions, where applicable

Transport to Facility

- Limit number of horseshoe crabs to a suitable number dependent on container size and shape to minimize damage to horseshoe crabs
- Minimize travel time
- Keep transport containers protected against direct sunlight and heat
- Secure containers in transport vehicle

Holding at Facility/ Blood Collection

- Minimize holding time at the facility, ideally to less than 24 hours
- Follow written procedures for proper care and handling when sorting horseshoe crabs and moving them between bins and within the facility
- Inspect horseshoe crabs for health and damage, selecting only undamaged and healthy individuals for blood collection
- Maintain clean, sanitary conditions during blood collection
- Maintain same level of care for rejected horseshoe crabs while they are being held until release back to state or federal waters
- Avoid collecting blood from individual horseshoe crabs more than once per year (e.g., by marking, tagging, etc.)
- If horseshoe crabs are marked, ensure that the mark is residual and not harmful
- Cease blood collection once blood flow rate slows
- Do not use suction to collect blood
- Perform internal audits to maintain quality control over written procedures

Post-Blood Collection Holding

- Maintain the same level of care that is used prior to blood collection
- Return to the state or federal waters from where they were collected as soon as possible, following state guidance when applicable

- Keep horseshoe crabs in low-light areas to minimize movement and injury

Return to Sea

- Use same care in handling and transporting horseshoe crabs being returned to the water
- Include written instructions and requirements for return within agreements with collectors, if applicable
- Periodically observe horseshoe crab collectors on implementation of BMPs and/or other criteria

Research Recommendations

The Work Group compiled the following list of research recommendations, which would enhance the understanding of impacts of the biomedical process on horseshoe crab populations. The work group recommends future experimental research related to biomedical practices using horseshoe crabs adhere to the applicable BMPs to more accurately reflect industry practices.

- *Study survival rates of horseshoe crabs collected for biomedical purposes over time when kept in in-water holding ponds or pens*
    - *Compare survival of horseshoe crabs at different holding durations to determine standard maximum holding times for different systems and water conditions*
- *Study the impacts of biomedical collection processes on spawning of horseshoe crabs, including the differential impacts of various collection and holding methods*
- *Compare mortality rates across different collection methods*
- *Estimate horseshoe crab discard mortality associated with trawling collection methods*
- *Review and summarize the findings of current literature on horseshoe crab mortality associated with blood collection, and compare across experiments that more closely reflect BMPs and do not reflect BMPs*
- *Quantify mortality rates of horseshoe crabs post-blood collection, applying the BMPs and other standard biomedical industry practices*
- *Study conditions that minimize movement and injury of horseshoe crabs during biomedical processes (e.g., light, density, etc.)*

References

Atlantic States Marine Fisheries Commission (ASMFC). 2022. Review of the Interstate Fishery Management Plan for Horseshoe Crab (Limulus polyphemus): 2021 Fishing Year. Arlington, VA. 31 pp.

ASMFC. 2019. 2019 Horseshoe Crab Benchmark Stock Assessment. Arlington, VA. 271 pp.

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Atlantic States Marine Fisheries Commission

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Horseshoe Crab Biomedical Best Management Practices Work Group Meeting Summary

Webinar
January 4, 2023

Work Group Members: Benjie Swan (Limuli Labs), Brett Hoffmeister (Associates of Cape Cod), Daniel Sasson (SC DNR), Derek Perry (MA DMF), Katie Rodrigue (RI DEM), Nora Blair (Charles River Labs), Samantha MacQuesten (NJ DEP), Steve Doctor (MD DNR)

ASMFC Staff: Caitlin Starks

Public: Robert LaFrance, Susan Linder, Ben Levitan (Earthjustice)

In November 2022, the Horseshoe Crab Management Board formed a work group to review and update the best management practices (BMPs) for handling biomedical catch, which were originally developed in 2011. The work group (WG) includes technical committee and advisory panel members with expertise in horseshoe crab biology, ecology, and biomedical processing.

The WG met on January 4, 2023, to begin working on the Board task. Staff reviewed the task, and the WG raised issues with the BMPs that should be discussed. Daniel Sasson raised the issue that across the states with biomedical collections, there are different practices that are used. For example, in SC they only allow collection by hand, and then use holding ponds for crabs between collection and transport to the bleeding facility. For that reason, it is worth considering where the BMPs could be made more general. Derek Perry also mentioned that MA rarely used trawling as a biomedical collection method until this year, so it would be worth thinking about methods that are not used now but may be in the future. The group suggested that the section of BMPs related to collection should include sub-headers with BMPs that are specific to certain collection methods.

The group also suggested adding a new section for "penning or holding" to come before the "holding at facility" section. While the group saw value in adding more detail to the BMPs, one member reminded the group that the BMPs were originally developed to document industry practices, not to regulate industry. Practices have evolved over time, and there are a wide variety of methods for harvest, transportation, etc., and therefore the BMPs should tend to be more general. The group agreed it would be helpful to document and describe what general methods are used in each state. The WG noted that when summarizing practiced by state there could be some issues with proprietary information, so summaries should be general.

Derek suggested that the product of the WG should include recommendations for some broad-based regulations that could serve as baselines for biomedical practices coastwide. This would

set limits to ensure that the minimum standards accepted by the industry continue to be followed. He also suggested the group develop a list of research recommendations that would help inform improvements to BMPs in the future. Daniel noted that there are some research papers available the group could refer to that could inform BMPs related to how long crabs can be held in ponds, density, and water quality.

The WG had a discussion about the marking of crabs after they are bled with the purpose of avoiding bleeding crabs more than once in a season. In most places crabs are marked. In MD they use a tool to make a dent (but not perforate) the shell. MA uses waterproof paint applied at the bleeding facility, and rotates through four different marks each year. It was noted that the bleeding season seems to be getting longer so there is some uncertainty about whether the paint mark will continue to last through the season. Associates of Cape Cod did a small study in conjunction with Massachusetts DMF by marking a small number of crabs and placing them in an aquarium tank; this study demonstrated the mark was visible after several months when applied correctly. In addition, observations in the LAL manufacturing plant have showed evidence of marks from previous years showing up the next year. For SC the group was not sure if all crabs are marked after bleeding, but Nora Blair indicated that Charles River Labs' current practice is to mark crabs after bleeding. In the past some facilities have used scarring of the membrane to try and assess if the crab was previously bled.

Not all members of the WG agreed that the language in the BMPs on marking crabs should state that crabs "should" be marked. One person preferred that the language to remain as is, and say "if crabs are marked." It was noted that marking crabs can add additional time before returning crabs to sea, and in some areas may be unnecessary due to the large population. In tagging studies done by Limuli Labs they found they were not re-catching crabs that had already been bled that year, presumably due to the large number of crabs in the Delaware Bay area. The group suggested adding examples of marking methods to the BMPs.

The WG also began to discuss whether the BMPs should address the seasonality of collection, or collecting crabs from spawning beaches. Some members were concerned about harvest and penning during spawning season because it could limit the reproduction potential of the population. Others thought that this issue might be outside the scope of the document, which they argued was to reduce mortality and keep crabs healthy from when they are collected for biomedical purposes to when they are returned to the sea.

On the BMP related to appropriate tow times for trawling, the WG agreed that specifying a tow time was not necessary because there are other variables, like the number of crabs, that would affect what tow times are best. The WG suggested changing the language to encourage "minimizing" tow times.

The WG discussed the BMP related to "proper handling" of crabs. Some members thought there should be a more specific description of what "proper handing" entails. Others were concerned that defining it too narrowly could create unnecessary problems for the industry when practices differ. The group agreed to continue this discussion at its next meeting.

The following tasks were assigned to WG members to prepare for the next meeting:

- WG members will provide descriptions from each state on general biomedical practices used (e.g., collection methods, holding practices, seasonality, time out of the water, transport methods, release practices, etc.)
- Daniel will provide literature on handling for group to review, and literature on holding crabs and water quality
- All WG members will bring specific suggestions for changes to BMPs for next meeting, as well as research recommendations
- WG members will identify BMPs that could apply coastwide as baseline regulations for the group to consider

The WG will meet next month to continue work on this Board task.

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Horseshoe Crab Biomedical Best Management Practices Work Group Meeting Summary

Webinar
March 13, 2023

Work Group Members: Benjie Swan (Limuli Labs), Brett Hoffmeister (Associates of Cape Cod), Daniel Sasson (SC DNR), Derek Perry (MA DMF), Katie Rodrigue (RI DEM), Nora Blair (Charles River Labs), Samantha MacQuesten (NJ DEP), Steve Doctor (MD DNR)

ASMFC Staff: Caitlin Starks

Public: Melissa Chaplin (USFWS), Kristoffer Whitney (), Glen Fernandes, John Martin, Susan Linder, Ben Levitan (Earthjustice)

The Biomedical Best Management Practices Work Group (BMP WG) met on March 13th via webinar to continue addressing the Board task to review and update the Biomedical BMPs. The WG reviewed a draft document including the recommended modifications to the BMPs. First, the WG discussed the background information that should be provided in the document. WG members suggested that there should be a brief description of the biomedical industry's history and average observed mortality rates to provide context. They also agreed that there should be an explanation of the document's purpose and audience.

The WG also reviewed a draft diagram to include in the document. The diagram illustrates the flow of horseshoe crabs from the point of collection, to the biomedical facilities, to their point of return to the ocean during the biomedical process. The goal is to clarify the steps in the process to which each of the BMPs are relevant. The WG suggested changes to make the diagram as accurate as possible, while also including processes used across different regions.

The WG discussed recommendations for research and management. They agreed to include a number of research recommendations in the document that could increase knowledge of the impacts of the biomedical industry on horseshoe crab populations. The WG considered adding a recommendation to the states about how to make use of the BMPs. They agreed that the goal of the BMPs is to minimize mortality and injury of horseshoe crabs, but considering the variation in practices across the states, some members do not think it is appropriate to suggest the BMPs be implemented as requirements. The WG agreed that it should recommend the states periodically review the BMPs to continue to reduce the impacts of biomedical collections.

Two public attendees made comments at the end of the meeting. Ben Levitan from EarthJustice commented that the work group should recommend that the states should make material publicly available on which states allow biomedical collections of horseshoe crabs, as well as

their permit requirements for the biomedical industry. He also stated that if the document produced by the WG includes observed mortality rates, it must be made clear what practices are being used that result in those rates. Regarding the research recommendations, he commented that if studies on biomedical mortality rates are reviewed to reevaluate the number used to estimate the mortality bled crabs, there would need to be full transparency and public input on the studies that are used.

Susan Linder commented that she appreciates that this WG is considering how to improve the BMPs to decrease mortality, and also appreciates that the public were able to listen in. She said it has been helpful to listen to these conversations to better understand the biomedical process and clear up misconceptions that some may have about it.

Staff will revise the document based on the WG's recommendations. The WG will meet again in several weeks to finalize the draft document for the Board's consideration at its May 2023 meeting.

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Horseshoe Crab Biomedical Best Management Practices Work Group Meeting Summary

Webinar
April 4, 2023

Work Group Members: Benjie Swan (Limuli Labs), Brett Hoffmeister (Associates of Cape Cod), Daniel Sasson (SC DNR), Derek Perry (MA DMF), Katie Rodrigue (RI DEM), Nora Blair (Charles River Labs), Samantha MacQuesten (NJ DEP), Steve Doctor (MD DNR)

ASMFC Staff: Caitlin Starks, Toni Kerns

Public: Melissa Chaplin (USFWS), Kristoffer Whitney , Susan Linder, Ben Levitan (Earthjustice), John Sweka (USFWS), Allen Burgenson (Lonza), Christina Lecker (Wako Chemicals USA Inc.), Jim Cooper, David Mizrahi (NJ Audubon)

The Biomedical Best Management Practices Work Group (BMP WG) met on April 4th via webinar to continue addressing the Board task to review and update the Biomedical BMPs. Staff began the meeting by reviewing the work group ground rules and process for allowing the public to make comments during the meeting. The WG reviewed suggested edits to the draft BMP document it has developed over the last several months. The draft document includes a summary, a background section to provide context for the biomedical industry BMPs and purpose of the document, a description of the general flow of horseshoe crabs through the biomedical blood collection process, research recommendations, and a recommendations section geared toward management.

The WG did not complete its review of the draft document at this meeting, but did review the summary and background sections. The WG discussed adding data on the horseshoe crab population, and the relative numbers of crabs collected for biomedical use. There was disagreement among group members on the level of detail to provide on this topic, but ultimately a compromise was reached by agreeing to add a reference to the most recent stock assessment to provide population information, and a direct link to the stock assessment publications on the Commission's website. The group also agreed it would be helpful to note that this review of the BMPs is occurring due to the amount of time that has passed since the BMPs were originally developed, and not as a result of an issue with the BMPs. The group also wanted the background section to clarify that fishing practices within each state have generally dictated the collections methods that can be used for biomedical crabs.

There was also a discussion on the dual use of horseshoe crabs originating from the bait fishery for biomedical blood collection. The group decided the BMP document should mention this practice only occurs in some states. Because dual-use crabs are counted against the bait fishery

quota and have a mortality rate of 100%, the document should clarify that the BMPs are not relevant to dual-use horseshoe crabs.

One member of the public commented that he disagreed with comments suggesting that the BMP document should address how shorebirds are impacted by the biomedical collection of horseshoe crabs. He noted that the purpose of the BMPs is to reduce the mortality and injury of horseshoe crabs during the biomedical process, and that comments about broader impacts to other species are outside the scope of the document and should be disregarded.

Staff will provide edits to the document to address the concerns raised by the WG. The WG will meet again in April to continue reviewing the document and finalize it for the Board's consideration at its May 2023 meeting.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Horseshoe Crab Management Board**

FROM: **Caitlin Starks, Senior FMP Coordinator**

DATE: **April 17, 2023**

SUBJECT: **Options for Evaluating Delaware Bay Horseshoe Crab Fishery Management Objectives**

Background

At its November 2022 meeting, after adopting changes to the Adaptive Resource Management (ARM) Framework, the Horseshoe Crab Management Board (Board) discussed the possibility of forming a work group to evaluate the current goals and objectives for the management of Delaware Bay horseshoe crab. The 2021 ARM Revision established the following objective statement:

> *"Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity, provide adequate stopover habitat for migrating shorebirds, and ensure that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery."*

The Board requested a list of potential approaches for evaluating management objectives, and the resources required for each option be presented in May. The three options listed below range from low to high resource requirements and include a general description, anticipated timeline and personnel needs, and major budget line items associated with each approach. Any of the options may require an amendment to the Commission's Action Plan.

Each of these processes would provide the Board more information on which to base the decision about whether to consider changes to the Delaware Bay horseshoe crab management program. For all of these approaches the Board would need to provide guidance on the scope of issues to be addressed. All of the options would inform possible revisions to the management goals and objectives and ARM Framework. If the Board were to pursue changes to the management program based on the information provided through their selected approach, an addendum or amendment to the fishery management plan would likely be necessary.

Options for Evaluating Goals and Objectives

1. Stakeholder Survey (Low Resource Requirements)

Description: A Board Work Group (WG) would be convened to develop a survey to evaluate the current goals and objectives for Delaware Bay horseshoe crab management. WG members would include a subset of Board members from the Delaware Bay region. Additionally,

individuals would be identified by the WG to provide information on the stock, the fishery, ecosystem services, and biomedical use to the WG during their deliberations. These individuals would represent the various stakeholder interests including horseshoe crab bait fishermen, conservation organizations, shorebird and horseshoe crab ecologists, biomedical industry representatives, etc. ASMFC staff would present the results of the survey to the Board.

Timeline: ~4-6 months

Personnel Needs: ASMFC Staff, 5-6 Board members

Major Budget Items: WG meeting(s)

2. Board Work Group (Medium Resource Requirements)

Description: A Board WG would be formed to identify possible goals and objectives for both the fishery and horseshoe crab's role in the ecosystem for the Horseshoe Crab Board to consider. WG members would include one Board member from each of the Delaware Bay states, one non-Delaware Bay state, and a federal representative. The product would be a WG report that outlines potential objectives (e.g., sustain a horseshoe crab fishery, maximize red knot forage) and a range of possible management strategies to address the objectives. The WG could seek information from stakeholder groups (e.g. horseshoe crab bait fishermen, conservation organizations, shorebird and horseshoe crab ecologists, biomedical industry representatives, etc) to address issues outlined in the statement of the problem.

Timeline: 6-9 months

Personnel Needs: ASMFC Staff, Board and Advisory Panel members, technical and stakeholder representatives

Major Budget Items: In-person WG meetings

3. Ecosystem Management Objectives Workshop, Similar to Atlantic Menhaden Process (High Resource Requirements)

Description: This approach would involve one or a series of facilitated workshops with stakeholders, managers, and scientists, to identify possible goals and objectives for both the fishery and horseshoe crab's role in the ecosystem for the Horseshoe Crab Board to consider. Participants in the workshop would include one Board member from each of the Delaware Bay states, one non-Delaware Bay state, and one federal representative, as well as one representative each from the following groups: biomedical industry, bait industry (harvester), non-governmental organizations, technical committee (horseshoe crab expertise), technical committee (shorebird expertise), bait dealer or fisherman that uses horseshoe crab for bait. The workshop report would outline potential objectives (e.g., sustain a horseshoe crab fishery, maximize red knot forage) and potential performance measures for those objectives (e.g., meeting or exceeding reference points, historic distribution maintained). The workshop could potentially discuss a system for prioritizing competing objectives, if applicable.

Timeline: 9-12 months

Personnel Needs: ASMFC Staff, Board and Advisory Panel members, technical and stakeholder representatives, workshop chair (e.g., a previous ARM peer review panel member) and/or a hired facilitator

Major Budget Items: In-person stakeholder workshop(s), workshop facilitator