# Atlantic States Marine Fisheries Commission

## Atlantic Striped Bass Management Board

*January 26, 2022*
*1:30 – 5:00 p.m.*
*Webinar*

## Draft Agenda

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

| | |
|---|---|
| 1. Welcome/Call to Order *(M. Gary)* | 1:30 p.m. |
| 2. Board Consent<br>• Approval of Agenda<br>• Approval of Proceedings from October 2021 | 1:30 p.m. |
| 3. Public Comment | 1:35 p.m. |
| 4. Consider Draft Amendment 7 for Public Comment *(E. Franke)* **Action**<br>(includes a 15 minute break at 3:30 p.m.) | 1:45 p.m. |
| 5. Elect Vice-Chair *(M. Gary)* **Action** | 4:55 p.m. |
| 6. Other Business/Adjourn | 5:00 p.m. |

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

# MEETING OVERVIEW

**Atlantic Striped Bass Management Board**
**January 26, 2022**
**1:30 p.m. – 5:00 p.m.**
**Arlington, VA**

| | | |
|---|---|---|
| Chair: Marty Gary (PRFC)<br>Assumed Chairmanship: 01/22 | Technical Committee Chair:<br>Kevin Sullivan (NH) | Law Enforcement Committee Rep: Kurt Blanchard (RI) |
| Vice Chair:<br>Vacant | Advisory Panel Chair:<br>Louis Bassano (NJ) | Previous Board Meeting:<br>October 20, 2021 |
| Voting Members:<br>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 October 2021

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

**4. Draft Amendment 7 (1:45 – 4:55 p.m.) Action**
**(includes a 15-min break at 3:30 p.m.)**

**Background**

- The status and understanding of the striped bass stock and fishery has changed considerably since implementation of Amendment 6 in 2003, which has raised concerns that the existing management program may no longer reflect current fishery needs and priorities.
- Accordingly, the Board initiated development of Draft Amendment 7 to consider addressing a number of important issues facing striped bass management and build upon the Addendum VI action to end overfishing and initiate rebuilding.
- In May 2021, the Board approved the following four issues for development in Draft Amendment 7: recreational release mortality, conservation equivalency, management triggers, and measures to protect the 2015 year class.
- In October 2021, the Board tasked the PDT with the developing additional options for Draft Amendment 7, including options for Chesapeake Bay recreational measures to protect year classes, options considering recruitment assumptions for stock rebuilding, and an additional option for the fishing mortality threshold trigger.
- The Plan Development Team and the Technical Committee met multiple times between May 2021 and January 2022 to develop Draft Amendment 7 **(Briefing Materials).**

- The Advisory Panel met in September 2021 and January 2022 to discuss the scope and clarity of options presented in Draft Amendment 7 **(Supplemental Materials)**.

**Presentations**

- Overview of Draft Amendment 7 for public comment by E. Franke

**Board Actions for Consideration**

- Approve Draft Amendment 7 for public comment.

**5. Elect Vice Chair (4:55 -5:00p.m.) Action**

**Background**

- The vice chair seat is empty since Marty Gary (PRFC) has become the new chair.

**Board actions for consideration at this meeting**

- Elect Vice Chair

**6. Other Business/Adjourn (5:00 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

- PDT – develop all documentation for the development of Draft Amendment 7
- SAS/TC – various tasks relating to development of Draft Amendment 7 and preparing for the 2022 stock assessment update
- TC – June 15th: Annual compliance reports due

**TC Members:** Kevin Sullivan (NH, Chair), Carol Hoffman (NY, Vice Chair), Nicole Lengyel Costa (RI), Alexei Sharov (MD), Charlton Godwin (NC), Ellen Cosby (PRFC), Brooke Lowman (VA), Gail Wippelhauser (ME), Gary Nelson (MA), Brendan Harrison (NJ), Jeremy McCargo (NC), Kurt Gottschall (CT), Margaret Conroy (DE), Luke Lyon (DC), Tyler Grabowski (PA), Peter Schuhmann (UNCW), Tony Wood (NMFS), Steve Minkkinen (USFWS), John Ellis (USFWS), Katie Drew (ASMFC), Emilie Franke (ASMFC)

**SAS Members:** Michael Celestino (NJ, Chair), Gary Nelson (MA), Alexei Sharov (MD), Hank Liao (ODU), John Sweka (USFWS), Tony Wood (NMFS), Katie Drew (ASMFC), Emilie Franke (ASMFC)

**PDT Members:** Nichola Meserve (MA), Nicole Lengyel Costa (RI), Brendan Harrison (NJ), Simon Brown (MD), Max Appelman (NMFS), Greg Wojcik (CT), Emilie Franke (ASMFC)

**Tagging Subcommittee (TSC) Members:** Stuart Welsh (WVU, Chair), Heather Corbett (NJ, Vice Chair), Angela Giuliano (MD), Beth Versak (MD), Chris Bonzek (VIMS), Gary Nelson (MA), Ian Park (DE), Jessica Best (NY), Carol Hoffman (NY), Tony Wood (NMFS), Josh Newhard (USFWS), Wilson Laney (USFWS), Katie Drew (ASMFC), Emilie Franke (ASMFC)

# DRAFT PROCEEDINGS OF THE

# ATLANTIC STATES MARINE FISHERIES COMMISSION

# ATLANTIC STRIPED BASS MANAGEMENT BOARD

**Webinar**
**October 20, 2021**

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.

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## INDEX OF MOTIONS

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

2. **Approval of Proceedings of August 3, 2021** by consent (Page 1).

3. **Move to consider a formal rebuilding plan for striped bass in Amendment 7 using methods described under"Management Response to Recruitment Trigger". Option 1 would be status quo *F* target. Option 2 would establish a *F* (rebuild) calculated as the *F* value projected to achieve SSB (rebuild) by 2029 under the assumption of the lower recruitment regime** (Page 17). Motion by Megan Ware; second by John McMurray. Motion tabled until the end of the Draft Amendment 7 agenda item.

   **Motion to Table #1**
   **Move to table until the end of the Draft Amendment 7 agenda item** (Page 23)**.** Motion by Justin Davis; second by Martin Gary. Motion adopted by consensus (Page 23).

4. **Move to add protection for the 2015, 2017, and 2018 year classes through adding a maximum size limit option/slot option in the Chesapeake Bay recreational fishery in section 4.2.1. Maximum size limit options developed by the PDT should aim to maximize protection for the 2015, 2017 and 2018 year classes consistent with the Technical Committee advice for the coastal analysis** (Page 34)**.** Motion by David Sikorski; second by Mike Armstrong. Motion tabled until the end of the Draft Amendment 7 agenda item.

   **Motion to Table #2**
   **Move to table until the end of the Amendment 7 agenda item** (Page 37)**.** Motion by Adam Nowalsky; second by John Clark. Motion carried (Page 37).

5. **Main Motion**
   **Move to defer consideration by the Striped Bass Board of Draft Addendum VII to Amendment 6 to the Atlantic Striped Bass Plan to allow further development and review of the transfer options** (Page 53)**.** Motion by Roy Miller; second by Marty Gary.

   **Motion to Substitute**
   **Move to substitute to postpone Draft Addendum VII to Amendment VI until such time as striped bass is notoverfished and overfishing is not occurring** (Page 54) Motion by Cheri Patterson; second by Tom Fote. Motion fails (2 in favor, 14 opposed) (Page 57).

   **Main Motion**
   **Move to defer until May 2022 consideration by the Striped Bass Board of Draft Addendum VII to Amendment 6 to the Atlantic Striped Bass Plan to allow further development and review of the transfer options.** Motion by Roy Miller; second by Martin Gary. Motion carried (Page 58).

6. **Move to remove Option F from the conservation equivalency options** (Page 63)**.** Motion by John Clark; second by Mike Luisi. Motion carried (Page 64).

**INDEX OF MOTIONS (continued)**

7. **Tabled Motion #1**
**Move to task the PDT to develop a formal rebuilding plan for striped bass in Amendment 7 using methods described under "Management Response to Recruitment Trigger". Options could include a status quo F- target and another option that would establish a F (rebuild) calculated as the F value projected to achieve SSB (rebuild) no later than 2029 under the assumption of the lower recruitment regime**. Motion by Megan Ware; second by John McMurray. Motion carried (Page 67).

8. **Tabled Motion #2**
**Move to add protection for the 2015, 2017, and 2018 year classes through adding a maximum size limit option/slot option in the Chesapeake Bay recreational fishery in section 4.2.1. Maximum size limit options developed by the PDT should aim to maximize protection for the 2015, 2017 and 2018 year classes consistent with the Technical Committee advice for the coastal analysis.** Motion by David Sikorski; second byMike Armstrong. Motion carried (Page 67).

9. **Move to adjourn** by consent (Page 67).

## ATTENDANCE

### Board Members

Megan Ware, ME, proxy for P. Keliher (AA)
Cheri Patterson, NH (AA)
Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
MikeArmstrong, MA, proxy for Dan McKiernan (AA)
Raymond Kane, MA (GA)
Rep. Sarah Peake, MA LA)
Jason McNamee (AA)
DavidBorden, RI (GA)
Nicole Lengyel Costa, RI
DEMJustin Davis, CT (AA)
Bill Hyatt, CT (GA)
Sen. Craig Miner, CT (LA)
John Maniscalco, NY, proxy for J. Gilmore (AA)
Emerson Hasbrouck, NY (GA)
John McMurray, NY, proxy for Sen. Kaminsky (LA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Adam Nowalsky, NJ, proxy for Asm. Houghtaling (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
G. Warren Elliott, PA (LA
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Mike Luisi, MD, proxy for B. Anderson (AA)
Russell Dize, MD (GA)
David Sikorski, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for S. Bowman (AA)
Shanna Madsen, VA, proxy for B. Plumlee (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Bill Gorham, NC proxy for Rep. Steinberg (LA)
Marty Gary, PRFC
Dan Ryan, DC, proxy for J. Seltzer
Max Appelman, NMFS
Mike Millard, USFWS

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

### Ex-Officio Members

Kevin Sullivan, Technical Committee Chair
Mike Celestino, Stock Assmnt Subcommittee Chair
Kurt Blanchard, Law Enforcement Representative

### Staff

Bob Beal
Toni Kerns
Laura Leach
Lisa Carty
Tina Berger
Pat Campfield
Katie Drew
Maya Drzewicki
Emilie Franke
Lisa Havel
Chris Jacobs
Dustin Colson Leaning
Savannah Lewis
Kirby Rootes-Murdy
Sarah Murray
Caitlin Starks
Deke Tompkins
Geoff White

### Guests

Karen Abrams, NOAA
Patrick Adamitis
Robert Andersen
Dave Anderson
Bill Anderson, MD (AA)
Josh Antunes
Jerry Audet
Pat Augustine, Coram, NY
Christopher Ballerini
Alan Battista
Peter Benoit, Ofc. Sen. King
Susan Bertoline
Alan Bianchi, NC DENR
Kevin Blinkoff
Frederick Bogue
Christopher Borgatti
Rob Bourdon, MD DNR
Michael Bryand
Simon Brown, MD DNR
Delayne Brown, NH FGD
Jeff Brust, NJ DEP

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)**

George Bucci
Allen Burgenson, Lonza Inc
Craig Cantelmo
Benson Chiles
Bryan Choquette
Drew Ciok
Adam Clark
Tyler Clark
Will Clark
Allison Colden, CBF
Margaret Conroy, DE DFW
Heather Corbett, NJ DEP
Nathan Cowen
Derek Cox, FL FWS
Caitlin Craig, NYS DEC
Derek Cummings
Jessica Daher, NJ DEP
John Dameron
Dean Danenhower
Lennie Day
Rachel Dean
Jeff Deem
Patrick Denno
Greg DiDomenico
Evan Dintaman
Joshua Dionne
Kurt Doherty
Eric Durell, MD DNR
Jason Dutremble
Michael Eveland
Fred Everett
Mike Faulkingham, Portland, ME
Lynn Fegley, MD DNR
Michael Feldman
Julien Frank
Anthony Friedrich, SGA
Tom Fuda
John Gans, TRCP
Dominic Genovese
Lacie Gaskins, Omega Protein
Daniel Gayer
Dominic Genovese
Lewis Gillingham, VMRC
Bob Giordano
Thomas Girdwood
Angela Giuliano, MD DNR
Willy Goldsmith
Frank Goncalves
Tyler Grabowski, PA F&B
Sam Greene
Charles Gregorski
Pam Lyons Gromen
Robert Groskin
Brandon Hamilton
Brenden Harrison, NJ DEP
Eric Harrison
Hannah Hart, FL FWC
Tom Hesford
Rebecca Heuss, NH FGD
Jaclyn Higgins, TRCP
Nicholas Hill
Peter Himchak, Cooke Aqua
Carol Hoffman, NYS DEC
Mac Hoggan
Jeffrey Horne, MD DNR
Jesse Hornstein, NYS DEC
Chris Horton
Asm. Eric Houghtaling, CT (LA)
Bob Humphrey
Noah Iaongo
Stephen Jackson, FL FWS
James Jewkes
Michael Kapareiko
Dimitri Karandrikas
Pat Keliher, ME (AA)
Carrie Kennedy, MD DNR
Adam Kenyon, VMRC
Josh Kiggans
Dale Kirkendall
Thomas Kosinski
Aaron Landry
Wilson Laney
Toby Lapinski
Josh Lashley
Peter Leary
Kevin Lesser
Carl Lobue, TNC
Michael Louie
Chip Lynch, NOAA
James Lynch
Ethan Magun
Eric Malone
Bob Mazzola
Genine McClair, MD DNR
Dan McKiernan, MA (AA)
Conor McManus, RI DEM
Kevin McMenamin
Nichola Meserve, MA DMF
Steve Meyers
Steve Minkkinen, FL FWS
Billy Mitchell
Chris Moore, CBF
Patrick Moran, MA DMF
Jerry Morgan
Brandon Muffley, MAFMC
Matthew Murphy
Allison Murphy, NOAA
Lindsey Nelson, NOAA
Robert Newberry
Travis O'Neal
Gerry O'Neill, Cape Seafoods
Tyler O'Neill
Tamara O'Connell, MD DNR
Zane Oliver
Derek Orner, NOAA
Patrick Paquette
Willow Patten, NC DENR
Derek Peters
Chad Pfeiffer
Michael Piper
Anthony Pizzella
Kelly Place
Michael Plaia
Anthony Poirier
Nick Popoff, FL FWS
Will Poston, SGA
Even Priovolos
Daniel Putnam
Michael Quinan
Jill Ramsey, VMRC
Stephanie Richards, MD DNR
Harry Rickabaugh, MD DNR
Courtney Roberts
Gaelin Rosenwaks
Cody Rubner

**Guests (continued)**

Patrick Rudman
Jacob Rushing
Randy Scheule
Austin Schofield
Tara Scott, NOAA
Chris Scott, NYS DEC
Alexei Sharov, MD DNR
Conor Sheridan
James Simmons
Zento Slinger
Richard Small
Somers Smott, VMRC
Joey Solomon
Mike Spinney
Ross Squire
Sam Stavis
David Stormer, DE DF
WJess Swaringen
Grant Thompson
Luis Tirado
Michael Toole
Marek Topolski, MD DNR
Jeremiah Treanor
Troy Tuckey VIMS
Edward Tully
Jim Uphoff, MD DNR
Taylor Vavra, Stripers Forever
Owen Ventura
Beth Versak, MD DNR
Ralph Vigmostad
Mike Waine, ASA
Peter Whelan
Kate Wilke, TNC
Angel Willey, MD DNR
Brian Williams
John Page Williams
Jim Williams
Nicholas Whitbeck
Kyle Wightman
Logan Williams
Phil Zalesak
Renee Zobel, NH FGD

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened via webinar; Wednesday, October 20, 2021, and was called to order at 1:00 p.m. by Chair David V. Borden.

**CALL TO ORDER**

CHAIR DAVID V. BORDEN: Before I start the formal meeting, I would like to recognize and applaud the professional conduct of Emilie during the last couple of weeks. She's done a fabulous job working on Amendment 7. The reason I'm doing this, most of you don't know, but she just got married within the last few days, and kept working and kept getting the job done.

I think that deserves some special recognition, so on behalf of the Board, Emilie, I wish you and your spouse well on your new adventure. I'm sure everybody applauds you.

**APPROVAL OF AGENDA**

CHAIR BORDEN: With that, we will move on to the agenda for the October 20th Board meeting. We've had an agenda that's been distributed. Are there any additions, deletions or changes to that agenda? Any hands up, Toni?

MS. TONI KERNS: I have no hands.

CHAIR BORDEN: Okay, so the agenda stands approved as submitted. The one thing I would note on the agenda, we have a really full afternoon of activity. It's my intent to take Amendment 7, which is the primary issue, and dedicate most of the agenda to that issue. But I also intend, if we have not gotten through Amendment 7 by five o'clock, I'm going to stop the discussion on Amendment 7, and move to Addendum VII, and see if we can at least finalize one issue today.

**APPROVAL OF PROCEEDINGS**

CHAIR BORDEN: The proceedings have been distributed, are there any comments, corrections, objections to those? Any hands up, Toni?

MS. KERNS: No hands.

CHAIR BORDEN: Okay, so the proceedings stand approved without objection.

**PUBLIC COMMENT**

CHAIR BORDEN: Public comments, this is for items that are not on the agenda. Did anyone request an opportunity to speak to the Board at this point?

MS. KERNS: Right now, I have one hand up, Phil Zalesak.

CHAIR BORDEN: Okay, so this is for items that are not on the agenda. We'll allow you a minute to address the Board.

MR. PHIL ZALESAK: One minutes, I thought we had three.

CHAIR BORDEN: One minute, please.

MR. ZALESAK: All right, Chairman Borden, quoting another documentation, 60 percent of the Atlantic coast ocean going striped bass began its spawn in the Chesapeake Bay. The Atlantic Menhaden Management Board has determined that striped bass are dependent on Atlantic menhaden for their survival.

Though Atlantic menhaden are neither overfished nor overfishing is occurring, the Atlantic Menhaden Board has concluded there are not enough Atlantic menhaden along the Atlantic coast to ensure the survivability of key predator fish, such as striped bass, bluefish, and weakfish. I see no signs which support removing 26 percent of the Atlantic coast total allowable catch of Atlantic menhaden from the Virginia portion of the Chesapeake Bay.

That is 51,000 metric tons out of a little over 192,000 metric tons. Clearly, overharvesting is occurring in the Chesapeake Bay. Just let me jump to the very end of this. I strongly recommend, Chairman Borden, that you advise Mr. Spud Woodward, the Atlantic Menhaden Board Chairman, to end the Atlantic menhaden reduction

fishery in the Virginia waters, as this is adversely impacting the striped bass fishery along the entire Atlantic coast.

Omega Protein, the last remaining Atlantic menhaden reduction fishery on the Atlantic coast, doesn't have to lose one fish from its quota of 160,800 metric tons. They just need to catch the Chesapeake Bay cap at 51,000 metric tons of Atlantic menhaden outside the Virginia waters, where the majority of their allocation is now anyway.

Implementing this solution will allow Atlantic menhaden to recover in the Chesapeake Bay, to the benefit of predator fish, the commercial and recreational fishing industries, osprey in the marine environment. Any reduction fishery in the Virginia waters, as other states have done, will be an enormous benefit to the Chesapeake Bay region. All this is documented with links to Commission data or Maryland, Virginia or Potomac River Fishery Commission data. That's it, thank you.

CHAIR BORDEN: Thank you for being brief. I'm sure that Spud will take that recommendation under advisement. In terms of public participation during this meeting, I may or may not take public comments when we get to motions. But in any event, if I do decide to take public comments on issues, I'm going to ask the public to really limit themselves.

We've had substantial opportunity for the public to provide input to the Board, and I'm sure the members of the public have been discussing issues directly with their commissioners, at least I hope so. I would also ask that members of the public not raise your hands when we're calling on Board members.

If we get to a point where I'm going to solicit public input, that will be the time for you to raise your hand, and then we'll call on you in order. In terms of Amendment 7, this is potentially an action item. We're going to start with a series of reports by staff on various issues, in order to provide the Board with comprehensive updates on our last steps of the subject. The path today is to approve the document for public hearing, and if we can't do that for some reason, then we need to provide sufficient guidance to the PDT to reefer out specific elements in the documents. In the case of the latter, we will approve any of those changes at a subsequent meeting. At this point, according to what Emilie has told me the likely implementation date is 2023, regardless if the action gets taken today or it gets taken at a subsequent meeting.

In terms of the process that I intend to follow today. Emilie is going to go, or at least she's going to start with an overview of the draft document and timeline. Since the draft amendment is separated into four parts or elements, as I call them, we will present those separately. We're going to take questions on those first, and then we will ask for comments and changes.

I would prefer doing as Spud Woodward did on menhaden, to try to operate by consensus, if that is possible. But if it's not possible, then I think motions are in order. I would also like to recognize, so that some of you don't have to point this out. There is a linkage between some of those elements and subsequent elements in the document.

Staff will be prepared to note changes that we make, and basically point those relationships out when we get to the specific item. I'm almost done. In terms of my own thoughts on this Amendment, I'm very concerned about the level of complexity in the document. I've spoken to a number of you and said the same thing to you.

I'm also very concerned about the ability of the public to digest this many issues and alternatives during the hearing process. During Emilie's report, she's going to note that a lot of those concerns are shared by some of the members of the AP. My takeaway is that I think we need to prioritize some of these issues, simplify others, and possibly defer some to allow further refinement.

There is nothing that would stop us, for instance, from selecting a few of these items, move forward with those as Amendment 7, and continue to refine issues over the next few months, and start another action. I guess my final point is, we're likely to have considerable discussion on some of these issues, and I urge each of you to be brief and to the point, non-repetitive.

If a large number of individuals want to comment, you are likely to only get one opportunity to speak, but that all depends on the number of speakers on different issues. I mean the issues that we're dealing with are very complex. There are a lot of people that it's an important subject, not only to our collective constituents, but to those of you that are on this call that represent your constituents.

Toni has been asked to select speakers in the order that they appear, and I've asked her to refrain from calling on Board members a second time until everyone has had an opportunity to speak. The last point I would like to make, in terms of just telegraphing where this is going. I intend to take a break at some point in the meeting. I would ask, are there any questions on the process that I intend to follow today? Any hands up, Toni?

MS. KERNS: David, I just wanted to note. You had two members of the public raise their hand just right after Phil did, so there were two additional people that wanted to make public comment again, and to let you know. I don't have any hands up, in terms of questions on the process.

CHAIR BORDEN: Okay, I'll take those two individuals, and then we're going to move on with the presentation. Toni, if you would call on each of those individuals. You have one minute each, please.

MS. KERNS: First is Tom Lilly, and then it will be Jeff Dean. Go ahead, Tom.

MR. TOM LILLY: Yes, I would like to speak to you about you all getting more linkage between the food supply of the striped bass and what you're doing. Fishermen, I would like you to look at the Rhode Island plan for menhaden, in effect for ten years. If you move their forage baseline over the Chesapeake Bay, you will see that we should have about 1,500 to 2,000 schools of adult menhaden in Maryland Bay at all times, for our striped bass and bluefish only.

How many are you seeing, folks? On the average fishing trip, you should see (faded out). If you spend hours on the Bay, you should see a lot of adult menhaden schools. You need to let Secretary Riccio know if they're not there, and the same with the Board members. The menhaden simply are not there in the Maryland Bay. Thank you.

CHAIR BORDEN: Thank you, next speaker, Toni.

MS. KERNS: Jeff Dean, go ahead, Jeff. Jeff, if you'll put your hand up, I'll make sure you are unmuted.

MR. JEFF DEAN: I didn't mean to have my hand up.

MS. KERNS: All right, then you're good to go.

CHAIR BORDEN: Emilie, you're on, and congratulations on getting married!

**CONSIDER DRAFT AMENDMENT 7 FOR PUBLIC COMMENT**

MS. EMILIE FRANKE: Thanks so much, Mr. Chair, I really appreciate it. I will be taking over the presenter role at this time. As the Chair mentioned, I will start today's presentation on Draft Amendment 7 with just a brief background, the timeline, and overview of what's in the draft amendment document, and then I will transition to reviewing the draft options issue by issue, for the four main elements, and we'll pause for Board questions and discussion after each issue.

Throughout my presentation today, I'll note comments from the Advisory Panel on the scope of the draft options. As a reminder, as Mr. Chair mentioned, the Board action for consideration today is to consider approving Draft Amendment 7

for public comment. First, I would like to thank the PDT for all their time developing this draft document.

We've had numerous meetings and e-mails over the past few months, so again, I just want to thank all the PDT Members. Starting with a recap of the background here. Since Amendment 6 was adopted in 2003, the status and understanding of the striped bass stock and fishery has changed considerably.

The results of the 2018 benchmark stock assessment in particular led the Board to discuss a number of issues facing management. That stock assessment indicated the striped bass stock has been overfished since 2013, and is experiencing overfishing. In August, 2020, the Board initiated the development of Amendment 7, to update the management program to better align with current fishery needs and priorities, and to build on the Addendum VI action to end overfishing, and initiate rebuilding.

In February of this year, the Board approved for public comment the Public Information Document or PID for Draft Amendment 7, and following public comment in February through April, the Board approved four issues for development in the Draft Amendment at the May, 2021 Board meeting.

Those four issues are management triggers, measures to protect the 2015-year class, recreational release mortality, and conservation equivalency. Here on the screen is the current timeline for Amendment 7. As I mentioned, the Board started this process back in August of last year. The PID would approve public comment in February, and after the Board approved the four issues for development in May, the PDT started developing the draft options.

At the last Board meeting in August, the Board provided some additional guidance to the PDT, and today we're here at this current step of reviewing the Draft Amendment to consider approving it for public comment. If the document is approved today, public comment would take place over the next few months, and the final Amendment could be approved as early as January, 2022, with an expected implementation date of 2023.

This timeline is subject to change per the direction of the Board. If the Board does not approve the Draft Amendment for public comment today, but instead waits until January, this timeline would shift back a few months. However, the expected implementation date of 2023 would likely stay the same.

As a reminder, also listed here, the next stock assessment update for striped bass is expected to be complete about a year from now in October, 2022. Listed here on the slides are the components of the draft amendment document. It's a pretty comprehensive document. Section 1 is the introduction and background section, and includes the statement of the problem, benefits of implementation, description of the resource and the fishery, as well as habitat considerations.

Section 2 includes the history of management, the goals and objectives of the Amendment, the management unit, a description of the reference points, and the stock rebuilding program. One note for the Board in Section 2 is that the state of North Carolina has requested some additional clarifying language be added to the draft, to further describe the Albemarle Sound Roanoke River stock. Staff will work with North Carolina to add that clarifying language. Moving on to Section 3.

Section 3 specifies the monitoring program information, including catch and landings information, socioeconomic information, biological data, and the overview of stock assessment. I just want to thank the Habitat Committee and the Committee on Economics and Social Sciences for their work to update those sections for the Draft Amendment. Section 4 of the Draft Amendment is the management program section, which includes the four-issue section, management triggers, recreational and commercial measures, habitat recommendations, as well as alternative state management regimes, which include conservation

equivalency, as well as adaptive management and a few other sections listed on the screen. Draft Amendment 7 maintains the same FMP standard from previous management documents, except for those FMP standards related to the four Amendment 7 issues. Again, those are management triggers, year class protection, recreational release mortality, and conservation equivalency, highlighted in red.

One clarification for the Board to discuss is a clarification on how the Chesapeake Bay trophy fishery is characterized in the Draft Amendment, which I will note later on in the presentation. Continuing on, Section 5 is the compliance section, and includes the mandatory compliance element, and outlines the compliance reports and procedures.

Section 6 describes the management and research needs, and Section 7 reviews potential interactions with protected species. As Mr. Chair mentioned, the next part of my presentation will be to review the draft options for each issue. After I review the options for each issue, I will pause, and have this question up on the screen for Board questions and discussion, or any proposed modifications to those draft options.

Again, I'll be going through the four issue sections listed here, as well as touching on the need for Board clarification on the Chesapeake Bay trophy fishery. In addition, I want to note that the Advisory Panel met on September 29th, to provide feedback on the scope of the draft options. I'll include the AP feedback throughout my presentation today.

The full AP meeting summary was included in supplemental materials. As far as general comments from the AP, the AP did note overall concern about the complexity of Draft Amendment 7, and the large number of options that are presented in the draft. The AP noted that this would be difficult to present at public hearings, and it would make the public comment process challenging.

With that I will move into the first issue today, which is management triggers, which is Section 4.1 of Draft Amendment 7. I'll start with the statement of the problem briefly for each issue. For management triggers, as stock status and fishery performance have changed over time, there are some shortfalls with how the triggers are designed that have emerged.

First, when female spawning stock biomass is below the target level, the variable nature of fishing mortality can result in a continued need for management actions. These shorter time tables for corrective actions are also in conflict with the Board's desire for management stability. The Board is sometimes criticized for considering management changes before the stock has had a chance to respond to the previous changes. Additionally, the use of point estimates for management triggers does not account for an inherent level of uncertainty.

Finally, the long periods of below average recruitment have raised questions about the current recruitment trigger. The Plan Development Team divided the trigger option into four tiers. The first tier outlined the fishing mortality trigger option, second tier outlines the female spawning stock biomass trigger options, the third tier outlines the recruitment trigger option, and the fourth-tier outlines options for deferred management action if certain criteria are met. Within each tier is a set of primary options and a set of sub-options to consider. This tiered framework is really designed to provide the Board with the option to consider each individual existing management trigger individually. Starting with Tier 1, which is fishing mortality triggers. The Board must choose one sub-option within each of these primary options. Starting with Option A, that is the timeline to reduce fishing mortality to the target.

Sub-option A1 is the status quo option being required to reduce fishing mortality to the target within one year. A2 would be requiring to reduce to the target within two years, and A3 would require a reduction to the target within three years.

Moving on to Option B, which covers the fishing mortality threshold trigger. Option B1 is the status quo option, where that trigger is tripped if F is above the threshold for one year. For the alternative sub-option B2, that trigger would instead be tripped if the three-year average of F is above the threshold.

Those are the two options for the F threshold trigger. Moving on to Option C, which is the fishing mortality target trigger. Option C1 is the status quo option, where the trigger trips if F is above the target for two years, and spawning stock biomass is below the target in either year. Option C2 would trip if F is above the target for two years, but spawning stock biomass is less than the target in both years.

Option C3 would trip if F is above the target for three years. Option C4 would trip if the five-year average of F is above the target, and C5 would eliminate the trigger related to F target. Moving on to Tier 2, which are the female spawning stock biomass triggers. Again, the Board must choose one sub-option within each of these three main option categories.

Starting with Option A, which considers the deadline to implement a rebuilding plan once a spawning stock biomass trigger is tripped. The status quo option A1, is that there is no deadline for when a rebuilding plan must be implemented. Again, the rebuilding timeline is the stock must be rebuilt within ten years.

But currently there is no deadline for when a rebuilding plan itself must be implemented. Option A2 would require that the Board implement a rebuilding plan within two years from when the trigger is tripped. Moving on to Option B, which is the spawning stock biomass threshold trigger. B1 is the status quo option where the trigger is tripped if spawning stock biomass is less than the threshold for one year.

Sub-option B2 would eliminate the trigger related to the spawning stock biomass threshold. This option to eliminate this trigger recognizes that there does not necessarily have to be a trigger for both the SSB target and the SSB threshold, since managing to the SSB target is already more conservative, and there is the same management response for both triggers, which is rebuilding within ten years.

Moving on to Option C. Option C considers the SSB target trigger. B1 is the status quo option, where the trigger trips if SSB is less than the target for two years, and F is above the target in either year. C2 would also trip if SSB is below the target for two years, but the three-year average of F would need to be above the target. C3 would trip if SSB is below the target for three years. C4 would trip if SSB is below the target, and there is at least a 50 percent probability that SSB will be below the threshold within three years. C5 would eliminate a trigger related to the SSB target. Just note that there must be at least one SSB trigger, so the Board could not eliminate both the SSB target and the SSB threshold trigger. There has to be at least one of those in place. Then finally, I just wanted to note some AP feedback here. The AP noted some concern about these options that would eliminate either one of the SSB triggers, given the importance of these triggers in the management program. I'll move on to Tier 3, which is the recruitment trigger.

The first component here for consideration is the definition of the recruitment trigger. The status quo Option A1 was designed to identify true recruitment failure, and would trip if any of the six juvenile abundance indices, so that would be for Maine, New York, New Jersey, Maryland, Virginia or North Carolina is below the 25th percentile of the reference period established by Addendum II for three consecutive years.

As requested by the Board, the recruitment trigger alternatives developed by the Technical Committee would be more sensitive in the status quo trigger, in order to alert the Board to periods of low recruitment. Those alternatives are designed to be an early warning sign of reduced productivity of the

stock, following multiple weak year classes entering the population.

Starting with Sub-option A2. A2 would have a moderate sensitivity and would trip if any of the four core JAIs is below the 25th percentile of values from a reference period of 1992 through 2006 for three consecutive years. The term core JAIs refers to the four JAIs used in the stock assessment model, so that is New York, New Jersey, Maryland and Virginia.

Sub-option A3 would have a high sensitivity, and that would trip if any of the four core JAIs is below the median of values from that reference period of 1992 to 2006, or three consecutive years. That reference period for these alternatives, 1992 to 2006 was identified as a period of high recruitment by the Technical Committee, and changing that reference period results in these more sensitive trigger options.

This is Table 2 from the Draft Amendment, which shows when the status quo option, A1 and the alternative trigger options would have tripped, those are the black shaded cells. The running green cells offer a comparison of whether the model estimate of recruitment was above or below the average each year.

You can see that the status quo option, in discussing columns here, tripped only once since 2003. Option A2, which is the moderate sensitivity option, would have tripped three times in that time period, and Option A3, which is the higher sensitivity option, would have tripped six times during this time period. The second component of the recruitment trigger is the management response. The status quo option B1 requires the Board to review the cause of recruitment, and determine appropriate action if the trigger is tripped.

Sub-option B2 would require the Board to manage the stock under a lower interim F target, calculated based on the low recruitment regime. This would include reducing fishing mortality to that new interim F target if F was above that interim target. That interim target would remain in place at least until the next stock assessment update, or a benchmark assessment is approved for management use. B3 would require the Board to adjust to an interim F target if SSB is below the target, and this interim F target would be calculated again using that low recruitment assumption, but it would be calculated specifically to rebuild the stock within ten years. These Sub-options B2 and B3 are intended to reduce fishing pressure as those weak year classes enter the population. Just to recap for the recruitment trigger. There are two components, and the Board would have to select one sub-option for Option A to actually define the trigger, as well as an option from Option B to define the management response.

Now I'm moving into the final tier for the management triggers, which is deferred management action. Option A in this tier is the status quo, which is no deferred management action. That is, if a management trigger is tripped at any time, the Board must take the corresponding action. The following alternative options would provide the Board the flexibility to defer action until the next stock assessment if certain criteria are met.

These options were developed in response to the Board's concern about the frequent need for management action. Option D here would allow management action to be deferred until the next assessment, if it's been less than three years since the last action was taken in response to a trigger. Option C would allow action to be deferred if the F target trigger is tripped, and SSB is above the target.

Option D would allow management action to be deferred if F target trigger is tripped, and SSB is projected to increase or remain stable over the next five years. Option E would allow action to be deferred if F target trigger is tripped and there is at least a 50 percent probability that SSB will be above the threshold.

Finally, Option F would allow action to be deferred if a management trigger trips after the Board has already initiated action in response to a different

trigger. For example, this scenario might occur if the Board selects a new recruitment trigger that might be tripping on a different timeframe than the other triggers.

Just a note here from the Advisory Panel. AP members noted general concern about this suite of options. The AP noted that there is already public concern about the Board not responding quickly enough to management triggers, and that these options might delay the timeline for a response even further.

That covers the draft management trigger options. Again, as the Chair mentioned, here on the screen is that question for the Board, as well as a couple other discussion questions related to the range and clarity of options, and the viability of implementation for the Board's discussion. Mr. Chair, I'm happy to take any questions on the management trigger options.

CHAIR BORDEN: Thanks, Emilie, any questions for Emilie? Toni?

MS. KERNS: Giving the hands a second. I just have John McMurray.

CHAIR BORDEN: John.

MR. JOHN G. McMURRAY: Emilie just mentioned that the public seemed to overwhelmingly support less delay not more. I'm trying to understand how Sub-option A2 and A3, as well as the deferred management options. I'm trying to understand the rationale. I understand that we're trying to avoid a continuing need for management action, and shorter time tables for correction and action are in conflict with stability.

But I'm not sure where all that concern is coming from, because in the last 15 years between 2003 when Amendment 6 was adopted and today, those management triggers were tripped only twice, and both of those times we were overfishing or the stock was overfished or both. I would like to hear the PDTs rationale. I'm not going to move to have them taken out. I think we should probably include them for public comment. But I'm not quite where that concern is coming from, and I would like some clarity on that.

MS. FRANKE: As you mentioned, these options for deferred management action were developed to address the Board's concern about the continuous need for management action and the criticism the Board has received in the past for taking management action before the stock had had a chance to respond to previous management action. That was really the motivation for these options to try to address that concern as outlined by the Board. Again, the PDT tried to be very specific with what criteria needed to be met, or these options to be implemented.

MS. KERNS: I have no additional hands. I'm sorry, Mike Luisi.

CHAIR BORDEN: Mike.

MR. MIKE LUISI: Just one question about Tier 1, which is the F trigger, and under Option A there are three sub-alternatives. The first one is one year, to reduce F to the target in one year, two years or three years. Did the PDT discuss, let's just say that two or three years were determined to be the timeline for F to be reduced to the target?

Was there an expectation by the PDT that a state would implement measures over those three years to achieve reducing F to the target, or would it be more so in just one? I look at that and I think, if we had three years to reduce F to the target, are we taking consecutive actions over three years to get our fishery there, or are we going to work on something and implement it within those three years as a means to getting the F down to the target?

Because in the first example, it almost would seem as if it goes against the goals and objectives for stability. But if the PDT was thinking more along the lines of allowing the Board and the states additional time to reduce F to the target, that would

make more sense to me. That is just a quick question. I've got a few comments along the way, Mr. Chairman, but I'll hold those for now. Thanks.

MS. FRANKE: Thanks, Mike. The PDT did not discuss how that action would be taken, whether it was one action in Year 3 or more of a gradual action over those three years. I think that would be a decision for the Board at the time the trigger is tripped.

MR. LUISI: Okay, thanks, Emilie.

MS. KERNS: Mr. Chair, you have one other hand, John Maniscalco.

CHAIR BORDEN: John.

MR. JOHN MANISCALCO: I guess I have a little bit of concern about how Option B and C, the F threshold and F target triggers work, when you kind of consider the timeline of assessments and management response. When you have to start considering longer periods, you know three-year averages of F, for example.

Could you please go over, for example, the timeline of receiving that assessment from 2019, the data that assessment included when the Board took management action, and how many years of fishing mortality we would be kind of basing our next decision on that reflects the current regime versus before the Board took action, and I hope my question is clear. Thank you.

MS. FRANKE: Thanks, John. If my response doesn't address your question, just let me know. But the triggers would trip when the Board accepts an assessment for management use, or in the case of an assessment update, the Board does not have to adopt that for management use, so when those results are presented to the Board.

In the case of the 2018 benchmark stock assessment, the triggers were tripped in spring of 2019, when the Board approved that assessment for management use. I'm assuming, Katie, please jump in here, that if for example we're looking at this three-year average of F, these two options. Then in that case the terminal year of the assessment was 2017, so the trigger would be looking at a three-year average of 2015, 2016, and 2017 to determine whether that fishing mortality trigger was tripped.

DR. KATIE DREW: Yes, that is correct.

CHAIR BORDEN: John, do you want to follow on that?

MR. MANISCALCO: Yes, please. I understand that okay, we're going to use the last two years of the assessment Fs to gauge whether or not we trip a three-year average at the threshold. I guess maybe I'm trying to think about the future. We're going to get an assessment in 2022, and I believe that's what was said.

I think we took management action, put the new slot limits for example, and those were implemented in 2020, so you would have 2020 and maybe 2021 under new management. But we might be taking action on the three-year F that doesn't reflect the fact that we had management like, you know scheme 1 for one year, and then we had management on scheme 2 for two years. Is that clear?

MS. FRANKE: Yes, and I think again, Katie, jump in here, but I think that's just without, we only have the most recent assessment, in terms of knowing what the fishing mortality was, so we're still going to be working off whatever the terminal year is for the stock assessment. Depending on you know how close we are to the next assessment, and that kind of thing, we're only working off of what we have in the assessment.

CHAIR BORDEN: Any other questions, Toni?

MS. KERNS: No other hands.

CHAIR BORDEN: Okay, so at this stage we're going to move on to the issue of comments. I would like

to hear a few comments from Board members. Are you happy with the way this is structured? Do you think it should be changed or not changed? If you want to change it, then propose a specific course of action. Those individuals who would like to speak to the point, please raise your hand. Toni.

MS. KERNS: Yes, just writing down names. Justin Davis followed by Mike Armstrong.

CHAIR BORDEN: Justin and then Mike.

DR. JUSTIN DAVIS: I was one of the proponents of keeping management triggers in this document, because I thought it was worth taking a look at developing some additional alternatives and evaluating them, and sending those out to the public. I'm concerned with what is currently in the document.

I agree with the general sentiment that this document as a whole is really complex, and has a lot of options. I'm concerned about effectively conveying all those options to the public in a hearing environment. I also just sort of worry about a general perception that by building all these options into this, it will create that perception that the Board is trying to find a way to sort of wiggle out of having to take conservative action for striped bass when necessary.

I feel like it would be in the Board's best interest to consider narrowing these lists of options down a bit. But I'm not prepared at this point to make a motion, because I would like to hear more of the discussion around the table. But that is sort of where I'm at this point, is I would favor taking some time at this point to try to narrow this list of options down a bit. Thanks.

CHAIR BORDEN: Justin, I don't want to put you on the spot, but it would be helpful without making a motion, as I indicated before. I would like to deal with this by consensus if it's possible. I think it would be illuminating if we could ask Emilie to put up the list, and then you could just suggest what you think would be appropriate to remove. I think that would be helpful. You don't need to talk on each one of them, but just identify the issues that you think should be removed.

DR. DAVIS: Okay, I could take a shot at that. Under the F trigger options. I would be in favor of removing Sub-option A3, the three-year timeline to reduce F to target. Sub-option C4, the five-year average F above target. C5, no trigger for F target, and under SSB triggers, I would be in favor of removing B2, no trigger for SSB threshold, the C4 Sub-option, SSB less than target and greater than 50 percent probability of SSB being less than threshold in three years, and C5, no trigger for SSB target.

CHAIR BORDEN: Thank you for doing that. Mike Armstrong.

DR. MIKE ARMSTRONG: I could segue from what Justin said. I think Option A, I think in the interest of provisioning this down, this Board just needs to make some hard decisions, and put it in the document, rather than bringing it to public hearing. I think there is too much to bring here. Under that, I would get rid of Option A.

I think you've shown it clear that what's in Amendment 6, I guess it's in is with one year. We've heard it from the public before. I think most people on this Board probably feel, especially given the light that we've all been informed that the stock status is looking different in the last week, another bad recruitment year. I would say get rid of Option A, keep it a one-year response.

Under B and C, the problem is, you know the threshold and the target are 0.04 apart, and someone correct me if I'm wrong on that. I think the target 0.2, the threshold 0.24. That is measurement error in a stock assessment, and so we're doing a lot to put out a bunch of options around the target.

I'm not going to suggest it now, but I'm going to throw it out there. Maybe we get rid of Option C, and we just go with the threshold, because it's really not much different than the target. That

would simplify things a great amount. That is about as far as I've gotten so far, so I'll leave it at that.

CHAIR BORDEN: All right, thanks, Mike. Toni, anyone else with their hands up? We can go back to these comments later. I would just like to get the ideas on the board, so that people understand where other members are coming from. What other hand?

MS. KERNS: Mike Luisi.

CHAIR BORDEN: Mike.

MR. LUISI: Yes, thanks, Mr. Chairman. In line with Justin and Mike Armstrong's comments. I thought I would provide a comment regarding Tier 1 and Tier 2. I do agree, maybe not entirely with Mr. Armstrong, but more with Dr. Davis that A3 under Option A is probably too long of a time period for the public to be supportive of, in the event that it takes three years to get F down to the target.

In my mind that shows too much delay. I can agree though with the two-year time period, just given the new information as it becomes available. There are times when it's difficult within a year to make changes, and it could actually be the follow up year or the future year, when changes would likely be made at the state level.

I'll leave that Option A comment there. I also have concerns in Tier 1 and in Tier 2, both Option Cs in those cases, where there is a combination of fishing mortality and spawning stock biomass as it relates to a trigger. You know we're calling Tier 1 an F trigger, yet C1 and C2 combine spawning stock biomass as it stands in comparison with the target, as an indicator along with fishing mortality, as to tripping the trigger, as well as in Option C under Tier 2 for spawning stock biomass. We discussed spawning stock biomass being below the target for a number of years. But then again, we're adding in fishing mortality as well. I didn't like it in the previous amendment, and I don't like it here. I think it just adds more complexity than necessary. In my opinion fishing mortality is what you have ultimate control over, and if fishing mortality and spawning stock biomass are continue to be linked, based on the modeling and the actions that we take.

By focusing on fishing mortality we will achieve spawning stock biomass if we can maintain that fishing mortality at the target. I think we should consider eliminating C1 and C2 from both Tier 1 and Tier 2, to simplify that and not confuse the public any more than they would be if they had to look at all these options at the same time.

CHAIR BORDEN: Toni, anyone else?

MS. KERNS: No other hands at this time.

CHAIR BORDEN: Okay, so there are some similarities between the comments that were made. Let's deal with the Tier 1A. The suggestion was, I mean there were a couple of suggestions, and they're different. But the suggestion was to remove A3, three years. Any objection to doing this?

MS. KERNS: No hands.

CHAIR BORDEN: Okay, so three years is out. Then on Option B, anyone proposing any additional changes on that?

MS. KERNS: I don't have any hands.

CHAIR BORDEN: That stays the same. Then we're down to Option C. If I understand the comments that both Mike and Justin made, I think one of them recommended, correct this, Emilie, if I have it wrong, eliminating C4 and C5, and then I think the other one made comments on C1 and C2. Is that correct?

MS. FRANKE: Mike suggested removing C1 and C2. However, C1 is the status quo, so in that case I think that would still have to go to public comment to look at alternatives to that status quo. But he did recommend removing C2. I think it was Justin recommended removing C4 and C5, and Mike, I was wondering if you could clarify if you meant to

eliminate the F target trigger altogether, or to just keep a status quo for the F target trigger.
MS. KERNS: I think she meant Armstrong there.

MS. FRANKE: Sorry, Mike Armstrong, yes.

DR. ARMSTRONG: I guess I was thinking of eliminating it, only because we have set a threshold and a target so close, I don't think it's meaningful.

MS. FRANKE: Thanks, Mike.

CHAIR BORDEN: Okay, so we have to keep Emilie, what you said, we have to keep C1, is that correct?

MS. FRANKE: Right, that's the status quo option.

CHAIR BORDEN: Does anybody object to removing C2?

MS. KERNS: I have no hands raised. I think John Maniscalco wants to make a comment though.

CHAIR BORDEN: John.

MR. MANISCALCO: Not to derail from the F target conversation. I do think the F threshold for the trigger is really crucial. Kind of going back to where I was going with my earlier questions, could we modify B2 so that it's a three-year average or two-year average if that reflects the most recent management action, something to that effect.

CHAIR BORDEN: I'm still on the issue of C2. The suggestion has been to take it out, does anyone object?

MS. KERNS: No hands in objection.

CHAIR BORDEN: Okay, so it's out of the document. On C3, John, you want that changed to two years, or do you want to add a statement that says you can use two years under certain conditions?

MR. MANISCALCO: I guess my comment could apply to both B and C, but my issue is that we take action on current management not take some kind of action on a split management that represents a prior management scenario. That could apply for any time we're using a three-year average if we took management action, and the assessment only incorporates two years of the fishery under that most recent management.

CHAIR BORDEN: Any objections to doing that?

MS. KERNS: I have no hands.

CHAIR BORDEN: Emilie, if you can perfect the language that would be very helpful.

MS. FRANKE: Sounds good. John, I think what you're saying here is for B2 for the F threshold trigger that it would be looking at a three-year average of F, or in some cases a two-year average if there has been less than three years of a management action.

MR. MANISCALCO: That is correct, thank you.

CHAIR BORDEN: Then John, your suggestion was to modify C3 in a similar manner?

MR. MANISCALCO: It could apply to C3, I'm not sure I feel strongly about the target trigger, given Armstrong's comment.

CHAIR BORDEN: Okay, any changes on C3? If not, no hands up, we'll move on to C4. The suggestion is to take C4 out.

MS. KERNS: One second, Adam Nowalsky has a suggestion.

CHAIR BORDEN: Adam.

MR. ADAM NOWALSKY: I think the fact that B2 is still in blue, Mr. Chairman, do you intend to come back to that discussion more, because I'm not fully resolved on that item?

CHAIR BORDEN: We can do that right now if you would like.

MR. NOWALSKY: Specifically, I think I would prefer to see these either as two separate options, or have it broken down as some type of sub-option associated with B2, as to whether or not we're going to apply that. Because in my mind, to have an either/or in here, I think those really are, or the ability to select both. Maybe if we have them as two separate options here.

But for this particular section we have the ability to select multiple ones. I think in the interest of clarity, I would rather see these as separate options, and then again either language added that we could select both of them. But I just think this "or" aspect is going to add more confusion for the public, as we seek to whittle down options to add clarity.

CHAIR BORDEN: Adam, does that do it?

MR. NOWALSKY: It's awfully hard right to just take the words. I think staff is doing a tremendous job, quite frankly. I love this idea of putting some sort of white board in front of us, and erasing and doing it. All we need are some post-it notes around the screen here, and we'll have a real live conference room. I think staff's doing a great job. I think there is just enough there, welcome to other comments, wouldn't oppose if there needs to be some other wordsmithing moving forward. But I think this helps address my concern.

CHAIR BORDEN: Okay, so I'm going to leave that the way it is, and then move back to C4. The suggestion is to take C4 out. Any hands up, Toni?

MS. KERNS: No hands.

CHAIR BORDEN: Okay, so C4 is out. Any other changes on this slide? If not, let's move on to the next comment.

MS. KERNS: Justin Davis has his hand up.

CHAIR BORDEN: Justin.

DR. DAVIS: I just wanted to reiterate that I was suggesting removing C5 as well, and I don't think we reached a decision point on that.

CHAIR BORDEN: Okay, to Justin's point. Any objections to taking C5 out?

MS. KERNS: I have one hand up, or I have a couple hands up, Jason McNamee.

CHAIR BORDEN: Jason.

DR. JASON McNAMEE: Not necessarily an objection, just wondering, you know there was this notion of not having hard triggers at all. Per Emilie, we need to have the status quo option in there, so I wonder if we didn't want an F target trigger, if we need C5 in there or if it just defaults to C1 or C3? I wonder about, I'm just curious as to whether it's wise to remove C5. I'm fine if we do, I'm just wondering if that kind of, sorry for the pun, triggers us into one of the other options just by default.

CHAIR BORDEN: Emilie, to that point, please.

MS. FRANKE: If the Board's intent is to eliminate the F target trigger, which is Option C5. C5 needs to be in there as something that the public and Board would consider, which is eliminating this trigger altogether.

CHAIR BORDEN: Jason, have you got a follow up?

DR. McNAMEE: No, I'm good, thank you for that.

CHAIR BORDEN: Okay, so Toni, you had one more hand.

MS. KERNS: I'm not sure if this is residual or not, John Maniscalco.

MR. MANISCALCO: Thank you, it is not residual. I guess this is a question for the stock assessment scientists. A comment was made about measurement error, in terms of our ability to distinguish between F threshold and F target. I was wondering if anyone can comment on that, as to

how much uncertainty there is in our F, and if there is overlap between F threshold and F target.

CHAIR BORDEN: Katie.

DR. DREW: Sure. I don't want to over promise, based on, you know we'll have to see what this next coming year of data says. But I would say they are distinguishable, depending on how much uncertainty or error you want to see in that last terminal year. I would say it's not that we can't, if you say okay, we're between the target and the threshold, we could be anywhere in there is not quite true.

I do think we have a fairly decent handle on the uncertainty, but it is true that there is some uncertainty about that stock status determination. But it depends on kind of where you are relative to those reference points, and how you're quantifying that uncertainty. I would not say it's that we can't tell them apart, but there definitely is uncertainty on that one.

CHAIR BORDEN: Toni, have you got any other hands up on this?

MS. KERNS: No other hands.

CHAIR BORDEN: Okay, so is there any objection to making the changes that are noted?

MS. KERNS: I have one hand up, Justin Davis.

CHAIR BORDEN: Justin.

DR. DAVIS: I just wanted to clarify. Did we make a decision about C5?

CHAIR BORDEN: I think you were recommending taking it out, and I did not hear a lot of objections to taking it out.

MS. KERNS: I had one hand up, Mike Luisi.

CHAIR BORDEN: Mike.

MR. LUISI: I was waiting for you to ask if there was any objection to taking out C5. I think in my opinion, based on the comments that we've heard so far, Mike Armstrong's comments and John Maniscalco's comments that I would prefer leaving in C5, which would then with further understanding about the statistical difference, and the ability of the assessment to really differentiate between threshold and target,

I would prefer to leave that in, so that there is an opportunity for us as a Board to select C5, if we agree down the road that a trigger on F target is not necessary. I would hate to be bound by either C1 or C3 if it's ultimately determined that no F target trigger is needed. That's just my comment on taking that in or out, leaving it in or taking it out.

CHAIR BORDEN: Do we want to have both options in the document? In other words, take it in or take it out, would that do it?

MS. FRANKE: Mr. Chair, so I think if we leave it in that provides the option to keep enough target trigger or eliminate it.

CHAIR BORDEN: Okay, that's fine. Justin, does that address your point?

DR. DAVIS: Yes, thanks, Mr. Chairman. After hearing what John and Mike and Jay had to say, at this point I would support leaving it in the document. We've already managed to eliminate some options here, reduce the complexity a bit. I think it's fair to leave this in and send it out to the public to get their thoughts on it.

CHAIR BORDEN: All right, so Emilie, could you go to, I think this was all of the comments that were made on changes to this document.

MS. FRANKE: Yes, that's all I have.

CHAIR BORDEN: Does anyone else want to suggest changes to what Emilie presented?

MS. FRANKE: Mr. Chair, I do have a few changes for Tier 2, sorry.

MS. KERNS: I have Megan Ware with her hand up, and Mike Luisi, is that residual?

CHAIR BORDEN: Megan, on Tier 2.

MS. MEGAN WARE: Yes, on Tier 2 I would remove B2, which I think someone else suggested, the no trigger for SSB. I would put that forward. I assume we'll get to the other tiers on subsequent slides. I'll hold on that.

CHAIR BORDEN: All right, any other suggestions before we discuss removing it or not removing it? Any other changes, C2, C4, C5?

MS. KERNS: I have no hands.

CHAIR BORDEN: Mike Luisi.

MR. LUISI: Yes, Mr. Chairman, my hand was up from before, but I'm happy to make a quick comment. I think my comment would be the same regarding C5 here. Leaving something in to allow the Board a decision on, well I guess it would be for B2 and C5. I think the Board would need to decide which triggers would be the most important.

I don't know, I would like to hear some other thoughts about having options in here for no triggers for threshold or target. I know we can't select both of them, but in my mind at least, it gives us an option, rather than being bound by the status quo, at least for B. For C, if we remove C5, we're going to be bound by either the status quo or C3. But thanks for calling on me again, I'll make sure to put my hand down this time.

CHAIR BORDEN: All right, so other comments on the suggested. The suggestions in red, it has been suggested to remove those. Comments on that.

MS. KERNS: I have no hands.

CHAIR BORDEN: Okay, any objections to removing those?

MS. KERNS: I have one hand, Adam Nowalsky.

CHAIR BORDEN: Adam.

MR. NOWALSKY: If I just understood Mr. Luisi's comment, I believe he was suggesting that B2 and C5 should stay in, if I understood him correctly. I would support leaving B2 and B5 in as well. If that was not his comment, then I think I need a little bit more clarification, and I might reconsider my position. But if again, his comment was that he supported keeping B2 and C5 in, then I would offer that as another voice of support for keeping those in.

CHAIR BORDEN: All right, let's see if we can make some progress on the points that I think we have common ground. Does anyone object to taking C2 and C4 out? Any hands, Toni?

MS. KERNS: I have no hands in objection.

CHAIR BORDEN: All right, those two items are taken out of the document. We have a difference of opinion on whether or not B2 and C5 should be removed. We've got recommendations on both sides. Does anyone want to comment on that who has not commented?

MS. KERNS: I have John Clark followed by Roy Miller.

CHAIR BORDEN: John and then Roy.

MR. JOHN CLARK: I just want to agree with Mike Luisi and Adam Nowalsky that I think it's a good idea to keep those in there. That way we could choose one or the other, as is noted down there. There has to be one SSB trigger, but we may not want both, so that would be helpful.

CHAIR BORDEN: All right, Roy.

MR. ROY W. MILLER: John expressed my concern, thank you.

CHAIR BORDEN: Okay, so we had four speakers that have basically recommended leaving those in, and two that have recommended taking them out. Now that you've heard the discussion, both pro and con, is there any objection to leaving them in? Does anyone want to object?

MS. KERNS: I have John McMurray.

CHAIR BORDEN: John McMurray.

MR. McMURRAY: I'm not sure I'm objecting to leaving them in, but I have a clarification question. I understand the rationale for wanting to leave these in, particularly Mr. Armstrong's rationale that target and threshold are very close to each other. That changes if we get new reference points, correct? I could be wrong, but we may have those with a new stock assessment. Is that a right way to think about this?

CHAIR BORDEN: Emilie or Katie to that point.

DR. DREW: I think the assessment update would provide new values for the SSB triggers and the F, but we don't expect those to change significantly, and probably the uncertainty around them would not change very much with the assessment update. If down the road the Board wanted to create a new definition for the reference points.

Maybe regional reference points or reference points that are more based on SPR or something like that through a benchmark assessment. That may also affect the precision or the confidence intervals around those reference points. But for the assessment updates in the near term, it's not likely to change kind of those confidence intervals or the level of uncertainty that we have around them.

MR. McMURRAY: That was helpful, thank you.

CHAIR BORDEN: John, not to put you on the spot, do you now have a position on that?

MR. McMURRAY: I see no reason to take it out at this point. But I will likely oppose it if it stays in.

CHAIR BORDEN: I think we've basically got a consensus to leave those two in.

MS. KERNS: I have Mike Armstrong with his hand up.

CHAIR BORDEN: Mike.

DR. ARMSTRONG: Yes. I'm okay with that, but I do think we need under C3. I think that language could be under B also. I think we should have an option to take a running need. I'm curious why that wasn't put in by the PDT.

CHAIR BORDEN: Emilie to that point.

MS. FRANKE: I think there you have the potential for overlap. For example, if we had that same trigger for both Option B and Option C, it's essentially the same trigger for both. I think the PDT was trying not to overlap, considering you might have both of these triggers.

DR. ARMSTRONG: Yes, to that point. I go back to the first one. Target is redundant to threshold. We should have triggered the threshold before the target, and if we get to the target triggers, we've done something wrong, because we should have done something at the threshold triggers. It's almost like we could throw out Option C. If we don't, we put in thresholds for these things and then we don't use them, by putting in a bunch of options that go for the target. I'm fine going to public hearing with this one, I'm just thinking it could be simpler.

CHAIR BORDEN: All right, are there any other changes to this? The items in red come out.

MS. KERNS: I have no hands.

CHAIR BORDEN: Okay, so we're going to move on to the next slide, Emilie, if you would please.

MS. FRANKE: Yes, Mr. Chair, here we have the summary of the recruitment trigger options.

CHAIR BORDEN: Thank you, are there any changes to this?

MS. KERNS: I don't have any hands. One hand, Megan Ware.

CHAIR BORDEN: Megan.

MS. WARE: Mr. Chair, I guess I'm looking for guidance here. I had sent a motion to staff that speaks in some ways to the management response, although it's a separate issue. If you feel it's appropriate to make that motion now, I can or I can wait until we get through the management trigger slides and then make it. But I do think it's most related to the management response options.

CHAIR BORDEN: Megan, let's take that up as a separate motion at the end of this, just keep going. I'll come back to you. Anything else on Tier 3 changes? If not, we're going to move on.

MS. KERNS: I have Mike Luisi.

CHAIR BORDEN: Mike.

MR. LUISI: I guess this is maybe for Emilie. Is there a way that we could quantify in some way this moderate sensitivity and high sensitivity under the recruitment trigger definition, rather than? In my mind, I mean correct me if I'm wrong, it establishes a new line based on periods of high recruitment and higher recruitment. It's going to draw the line that we currently use at the 25th percentile of the reference period.

It's going to draw it up. I just wondered if there is a way for the public, so that they can see how this relates to our current JAIs. I know you had that one table there, right. I guess maybe that is enough. Maybe I'm just speaking. I kind of had a question there about trying to quantify it, but maybe that table just speaks for itself.

I'll see if anybody else has any other thought. The whole concept of an interim or a new target, not a target. But the whole idea of adjusting that baseline for the JAI is just a little confusing, as to how high it really would go. Do you have any thoughts on that or not? I was confused by this a bit.

CHAIR BORDEN: All right, any other comments on this section? Any hands up, Toni?

MS. KERNS: No hands.

CHAIR BORDEN: Okay, we're going to move on, unless somebody wants to propose something different here. Okay, Emilie, if you could go to the next one, deferred management action, changes on this slide. We had general comments on this before, but are there specific recommendations to either add something or delete some of these?

MS. KERNS: No hands so far.

CHAIR BORDEN: Okay, let me ask one more time. Do we have any suggested changes? If not, they're going to stay like this.

MS. KERNS: No hands.

CHAIR BORDEN: Okay then we'll move on, Emilie.

MS. FRANKE: Thanks, Mr. Chair, that's all I have for management triggers.

CHAIR BORDEN: Okay, so I'm going to go back to Megan. Megan, would you like to make your motion?

MS. WARE: Thank you, Mr. Chair. I'll read it, and then if I get a second, I'll provide my rationale. **Move to consider a formal rebuilding plan for striped bass in Amendment 7 using methods described under "Management Response to Recruitment Trigger". Option 1 would be status quo F target. Option 2 would establish a F(rebuild) calculated at the F value projected to achieve SSB**

**(rebuild) by 2029 under the assumption of the lower recruitment regime.**

CHAIR BORDEN: That's a motion, is there a second to that motion?

MS. KERNS: I have John McMurray.

CHAIR BORDEN: John McMurray, so Megan, do you want to offer any thoughts on why you want to suggest this?

MS. WARE: Yes, I think that would be good. We have this ten-year timeframe to rebuild the striped bass stock. But as a Board we really haven't formally developed an approach about how we plan to get there. Seeing some of the information about the lower recruitment values is making me nervous, in our ability to maintain the current F target and also achieve a rebuilt stock in ten years.

The current F target is based on average recruitment, and if we're experiencing recruitment that is lower than that, then that F target is not going to get us where we need to be.
We've seen this challenge with other species like herring or mackerel, kind of the challenges that recruitment assumptions can have on a rebuilding plan.

I do think it's a fair question to ask, you know is this an issue that gets included in this Amendment, or do we wait to trip one of the JAI triggers, and then consider action? My concern is that the longer we wait to address the recruitment assumptions underlying our F target, the more drastic our reductions may need to be in the future to meet that ten-year timeline. I would rather wait, rather than waiting for a JAI trigger to trip, and then adjusting F. I think it's a prudent choice to establish this rebuilding structure now in the Amendment. I also think taking action now would align will with the upcoming assessment, as this would allow the TC to calculate that F rebuild in the 2022 assessment. I'll just close by saying, you know I completely understand that this is adding some complexity to the document, but in my opinion, I think this marginal increase in complexity is well worth it for the Board to signal to the public that we have a rebuilding plan for striped bass.

I also think that establishing a rebuilding structure could address some of the confusion that at least I had, regarding with how we deal with triggers under a poor stock status. I would envision our goal of maintaining F at F(rebuild) kind of taking precedence over triggers associated with an F target.

CHAIR BORDEN: Thanks, Megan. John, as the seconder do you want to offer any comments, and then I'll go to the Board.

MR. McMURRAY: Thank you, Mr. Chairman. I think Megan did a very, very good job of providing rationale on this motion. I would just add that the public has been very vocal on the need to initiate a rebuilding plan, and there has been some disappointment that thus far we haven't. I think it's time that we do.

CHAIR BORDEN: All right, so comments on the motion from the Board. Toni.

MS. KERNS: I have Mike Armstrong, Adam Nowalsky, Ritchie White, Jason McNamee.

CHAIR BORDEN: Mike Armstrong.

DR. ARMSTRONG: I think this is necessary and I support it, and I think a lot of it comes out what we learned in the last week that F at three years in a row now, I'm sorry, recruitment is low. We could have a scenario where we go through this process, and the moment we pass this Amendment we're going to have to start an addendum to start rebuilding, based on lower recruitment.

It's questionable whether we could get it all done and get it in by 2023. If we can't get it by 2023, we are way too late on getting it in. I support getting in it now. It does increase the complexity, and adds a whole other element to this Amendment, but I think we ought to do it. In fact, I think this is

probably a lot more important than some of the other things that are in this Amendment.

CHAIR BORDEN: Okay, thanks, Mike. Adam.

MR. NOWALSKY: Building on Mr. Armstrong's comment about this adding complexity and adds a whole new item here. Where would this leave us on voting this out today? I think I would want to have the PDT to take some time to digest it, to see if these are the only options that are appropriate here to develop some content for the document that would go around it. What would be the intentions if we were to add this here with regards to actually voting it out for public comment today. Does including this offer an inherent element of delay until we can develop this to the point that we want? I almost think we're better served if we have interest in this as a Board. I feel like the motion today would be to consider a formal rebuilding plan for inclusion in Amendment 7, stop there, give the PDT time to work on it, bring another revised document out. But I would be interested to hear other thoughts on if this motion were to stand exactly as it was introduced, and if it was passed where that would leave us on our planned schedule.

CHAIR BORDEN: Yes, I guess my response to that, Adam is that to some extent how we treat this will depend on where we end up today. If we end up in the position that there are going to be a number of issues that may get referred back to the PDT for work, we certainly could do what you are recommending. As an alternative, if the Board wants to vote it out, then I think we still could ask for comments from the PDT. But it's a question of how we handle it, in terms of the document. Let me move on to Ritchie White.

MR. G. RITCHIE WHITE: I strongly support this motion, and the herring example is a perfect example. We certainly do not want to do what has happened to herring, and it certainly is recruitment. We have to pay attention to the low recruitment, and we have to be prepared to take the necessary action to make sure this stock does not get in a very bad situation.

CHAIR BORDEN: I've got Jason McNamee next.

DR. McNAMEE: I also really like the idea behind this motion. I have a couple of questions though. The first is just to clarify whether the lower recruitment regime would be defined, you know per the way it's defined in the document. I just wanted to clarify that, because the notion of lower recruitment regimes is a topic of discussion across species, and can be a pretty hot topic. I think it's something we need to be very specific about what we're talking about.

Then if the answer to that is yes, the issue that I see with the way that this is worded is, you know we're thinking about, this is an amendment so something that will persist for a while. A low recruitment regime, I think it's identified with a change point analysis, and it's a specific set of years. That's my concern is that we sort of have locked in on a new set of years, and it's kind of a notion of low recruitment is dynamic, so it could change.

I guess I like the concept here a lot. I wonder though if it needs a little more work, to avoid any sort of unintended consequences by adopting it at this point. Maybe Megan has already thought about this, and so I would be interested in hearing a little more about those two questions, so thanks for the time, Mr. Chair.

CHAIR BORDEN: Megan, do you want to respond to Jason's point?

MS. WARE: Sure. I think at this point, Jason, I would use the regimes that are identified on Page 51, so it looks like it was, I think it's 2008 to 2007 was the regime for the low recruitment period. But I will note on Page 51, and Emilie can correct me if I'm reading this wrong.

But it sounds like during benchmark stock assessment, the TC would update that change point analysis to evaluate the definition of the

recruitment regime. I would assume that whatever our next benchmark assessment is, which I don't believe is 2022, I think that's just an update. But that that change point analysis would be evaluated at a subsequent benchmark.

CHAIR BORDEN: Jason, have you got a follow up?

DR. McNAMEE: Maybe just quickly to say, maybe it is safe or not, in the short term to adopt this in the way that it kind of stands. I do think there are additional questions that could come up. For instance, you may need to rebuild during the period of time when we don't have low recruitment potentially.

You know depending on if there is some other dynamic pathway. I think it's safe enough to adopt this in the short term, but probably would need to be revisited at some point, and maybe through an addendum process, to kind of perfect it a little bit. But in the short term I think it could work.

CHAIR BORDEN: Toni, do you have any other hands up from individuals that have not spoken?

MS. KERNS: I have on the list Dave Sikorski, Tom Fote, Max Appelman, Justin Davis, and Mike Luisi.

CHAIR BORDEN: Okay, the first one, I can't read my own handwriting. The first one was.

MS. KERNS: David Sikorski.

CHAIR BORDEN: David, excuse me.

MR. DAVID SIKORSKI: I will say, me too, to Mr. Armstrong's comments and Ms. Ware's comments, and just highlight from the Chesapeake Bay perspective that in 2018 we had an unprecedented freshet, and saw the spread of blue catfish throughout the watershed, especially to the upper Bay, where key spawning happens in breaches of the spawning rivers.

I'm very supportive of this motion, and I just want to raise the issue that these invasive species which were first noted by Maryland's team in the upper Bay this year, and is reproducing, is a key factor here. Whether it be competing for forage and places to live, or simply eating juvenile striped bass.

It's something that's been on my mind and on the mind of a lot of anglers here in Maryland, as we continue to interact with blue catfish in areas of even moderate salinity. This is of the upmost importance to me, and I look forward to seeing the results, and really just flag that if there is a way to also consider natural mortality changes, I think it's really important to consider.

CHAIR BORDEN: Thanks, David, Tom Fote and then Max.

MR. THOMAS P. FOTE: My concern is when we look at recruitment in spawning stock biomass. You know we had some high recruitment in a couple years, with a spawning stock biomass not much different than it is now. It might be a little low, but not dramatically low. What we're seeing is there are other factors. I mean I just look at species like winter flounder, weakfish, where we basically are down to one fish, and we've been down there for about 15 years, and it hasn't done anything on the stock. We are dealing with other problems such as recruitment. The same thing with summer flounder, because summer flounder comes in and striped bass, when they're smaller, yes spawn offshore.

But they come in and survive in the bays and estuaries when they're very juvenile. They don't seem to be surviving the way they used to. Even with the highest spawning stock biomass that we had when we had good recruitment with lowest spawning stock biomass. I don't know how you basically correct the problems, when there is no relationship or no proved relationship on the size of the spawning stock biomass based on the recruitment.

The environmental factors and the other factors like forage, becoming forage species for other species is affecting them. To try to say this, and we're

actually going to do something like basic with the options, because the recruitment is low. It might have no effect at all on what the population does, as far as recruitment goes, and I hate spinning my wheels.

CHAIR BORDEN: Thanks, Tom. Max.

MR. MAX APPELMAN: I'm hearing a lot of support for this concept, and I think I support it too. But I'm a little uncomfortable with putting this out for public comment without the PDT giving it a fair scrub. I think we've heard some concerns or possible challenges of how this F (rebuild) would be used in the future.

I think that's a place where the PDT could really help out and just flesh out sort of the process for when this sort of F(rebuild) with the lower recruitment assumptions, you know when that would be needed versus if we're not in a low recruitment regime, for example. Just thinking that this is something we would consider codifying in an amendment. I would be uncomfortable putting this in the document at this step, without letting the PDT give it a good look.

CHAIR BORDEN: Justin.

DR. DAVIS: I appreciate the intent here. I all along have felt like the Board in retrospect we missed the boat a bit by not addressing that management trigger and formalizing a rebuilding plan back during the Addendum VI process. I also really like the attention here to acknowledging the reality that we're in a low recruitment regime for this stock right now, and we need to acknowledge that. I have a couple of questions, which maybe might be clarifying, I don't know.

The first would be that Option 2 here talks about establishing an F(rebuild) that essentially acknowledges a low recruitment regime. My question is whether Option 1, the status quo F target. I don't know if the current F target we have could be considered as an F(rebuild) under an average recruitment regime, because I don't know if that F target was calculated such that it was determined to rebuild the stock by 2029. I don't know if that is the right timeline. That would be my first question is whether it's safe to assume that the status quo F target is synonymous with an F(rebuild) under an average recruitment regime. The other thing I'm trying to figure out is exactly how this would interface with the other section of this document, where we're considering potential changes to the ocean recreational fishery, to be implemented potentially in 2023.

We've got some regulation options in there that are intended to protect the 2015-year class. I think what I heard is the F values that come out of this assessment of a rebuilding plan, would be used following the 2022 stock assessment, to determine measures that we might need to implement under different recruitment regimes to rebuild the stock.

How would that work out if we approved the Amendment with some recreational measures to implement to 2023, but then we also go through this exercise with the assessment and these F(rebuilds) and determine some measures there. I guess I'm just trying to figure out how those two different processes would mate up.

CHAIR BORDEN: Megan, do you want to take any of those?

MS. WARE: Sure, I'll try to take both, and people can correct me if I misspeak. I think the first question is basically, does F target equal F(rebuild) under average recruitment. I guess I would say I don't know, we would need updated projections to know that. My understanding is that the F target it's set that if you held it there you should get to the SSB target.

I just don't know if you get there within ten years or a longer timeframe. I guess that would be a question for projections. The second question was, what happens if we take action in 2023? What does it do with this? I'll say, I have also struggled, Justin, with kind of how this Amendment and the assessment in 2022 align, because I think we're

scheduled to take final action on the Amendment before we're going to see results of the 2022 assessment, which is kind of a weird position to be in.

But I think what we want to see in that 2022 assessment is what our F rate is at present. Then compare that to where that F (rebuild) is, and see what the difference is, right. It's kind of hard to speak without knowing what those two values are. If there is a difference and we needed to take a reduction, maybe we get there with that action we've considered in the Amendment or not. But I hear you on the timing part of that.

CHAIR BORDEN: All right, next person on the list is Mike Luisi.

MR. LUISI: I'll be very brief. I agree with just about everything that I've heard. I really like the idea of adding a rebuilding plan into Amendment 7. However, I do agree that this is something that I believe. I think Max and Adam Nowalsky and others made the comment that this is something that we should direct the PDT to help develop.

Possibly with additional options for F(rebuild) calculated as using lower recruitment, in addition to possible timeframe differences for that rebuild. While I support the overall concept, I think that we're at the point here that yes, the PDT did an amazing job getting us to this point here in this draft document. But I do think that additional work needs to be done, especially based on some of the questions that have been asked. I think we need to have a more full understanding and appreciation for what this means, before we send it to the public. I was thinking about possibly an amended motion here. But I don't have anything drafted yet. Maybe there will be some others that are thinking along the same lines. I do want to see this develop, but I think the PDT needs to spend some time with it before we see it again.

CHAIR BORDEN: One option I think we have here is that almost all of the comments have been positive, with qualifiers, and the qualifiers revolve around the issue of having the PDT review it, and basically look at it and possibly work on it a little bit. That would not be problematic, if in fact we end up in the position where this Amendment doesn't move forward.

In other words, the issues are going to continue to get worked on for a few months until the next meeting. Then clearly, we have the time to have the PDT do that, which it sounds like there is a consensus that that would be desirable. We could temporarily table this, or table this to a time certain to the end of the meeting, when we know which avenue this is going to go, in terms of either moving forward for public hearing or basically continuing to work on it.

We will know that at the end of the meeting. I don't have any other suggestions, other than doing that, which would temporarily lay this issue on the side until the end of the meeting. Are there any objections to doing that at this point? Toni, do we have any objections?

MS. KERNS: I don't have any hands.

CHAIR BORDEN: Okay, without objections, we'll postpone the vote on this until the end of today's session.

MS. KERNS: If we could just get a motion on this on the screen, David, that would be helpful. We would need a maker and a seconder.

CHAIR BORDEN: Does someone care to make that as a motion?

MS. KERNS: I have Justin Davis with his hand up.

CHAIR BORDEN: All right, can the staff prepare the motion, please?

MS. KERNS: I think you need to clarify it's not the end of the meeting but until the end of the.

CHAIR BORDEN: Striped Bass Board meeting.

MS. KERNS: No, well David, because you would have to make it, it needs to be a part of the Amendment discussion. You don't want to end the meeting.

CHAIR BORDEN: It's Amendment 7.
MS. KERNS: Thank you, Emilie. Justin, are you making that motion?

DR. DAVIS: Sure, do you want me to read it into the record?

MS. KERNS: That would be great.

**DR. DAVIS: Motion to table until the end of the Draft Amendment 7 agenda item.**

MS. KERNS: I have a second from Marty Gary.

CHAIR BORDEN: Any comments on the motion? Any objections to the motion?

MS. KERNS: I see no hands.

**CHAIR BORDEN: Okay, so the motion is adopted by consensus.**

MS. KERNS: Roy Miller has his hand up.

CHAIR BORDEN: Roy.

MR. MILLER: Mr. Chair, one clarification for when we come back to this item. I may have missed this, but we're defining the recruitment regime as the Maryland JAI, am I correct in that assumption that we're ignoring the Hudson Index and the Delaware Index?

CHAIR BORDEN: Megan, do you want to comment on that?

MS. WARE: Sure, I may need to lean on others. But my understanding is the regime is more about the timeframe. I look to Emilie as to what defines that timeframe, but the low recruitment regime is 2008 to 2017, actually.

CHAIR BORDEN: Emilie, do you want to follow up on that?

MS. FRANKE: Thanks, Megan. Yes, the recruitment regimes, as noted in the Draft Amendment, are based on a change point analysis of the Maryland Juvenile Abundance Index, and that index is most closely correlated with the Age 1 recruitment estimate coming out of the stock assessment. I will also lean on Katie, if she has anything to add on this analysis.

CHAIR BORDEN: Katie.

DR. DREW: Yes, Emilie is correct, we based it on the Maryland JAI because of that strong correlation that is informing the models the best about overall coastwise recruitment. Then also, it had the longest time series out of any of our indices, so we're able to see more contrast in that series going back in time, prior to the 1980s, and get a better handle on what really is low versus high recruitment over the entire time series. That's why the index was used to develop that time period for this analysis.

CHAIR BORDEN: Roy, do you need a follow up?

MR. MILLER: Just a quick comment if I may, Mr. Chair.

CHAIR BORDEN: Certainly.

MR. MILLER: I understand that the Maryland Index best informs our analysis in this regard. However, I still think that it's possible during a period of low recruitment in the Maryland Index. It's possible that there may be some buffering offered by Delaware JAI and/or Hudson JAI. I wouldn't rule them out necessarily, and put all the reliance on the Maryland Index.

DR. DREW: Just to follow up on that real quick. I will say, so we're using the Maryland Index to develop that time period. But for this type of an analysis, we would be using the model estimate of recruitment, which would include information on year classes in this other producer areas. Even if

the Maryland Index is way below average from these years, the model may be able to buffer up some of that.

It may bring the average or the observed recruitment going into that SSB and that F(rebuild) calculation will have some of that information on those other recruitment indices when it calculates recruitment. The Maryland data is only informing the time period. Those other indices are informing the estimates of recruitment used to develop the F(rebuild).

MR. MILLER: Thank you for that clarification.

CHAIR BORDEN: All right, Emilie, do we have anything more on this portion of the discussion?

MS. FRANKE: I do not.

CHAIR BORDEN: Okay, so what I'm going to do is declare a five-minute break. It's almost three o'clock, so that you can get up and stretch your legs, and we will reconvene according to my watch at three o'clock.

(Whereupon a recess was taken.)

CHAIR BORDEN: All right, I would like to call the meeting to order again. Toni, are we all connected?

MS. KERNS: We are connected, David, ready to go.

CHAIR BORDEN: Okay, so Emilie, you're back on with the second element/issue to talk about.

MS. FRANKE: Sounds good, thank you, Mr. Chair. If okay with you before I get into that second element, I would like to briefly address this Board clarification for the Chesapeake Bay trophy fishery.

CHAIR BORDEN: Yes.

MS. FRANKE: As I indicated at the beginning of my presentation, the PDT noted an area requiring some Board clarification related to the Chesapeake Bay trophy fishery. Addendum VI specified that the Chesapeake Bay fishery is defined as all fisheries operating within Chesapeake Bay. However, Addendum IV specifies that the Chesapeake Bay spring trophy fishery specifically is considered part of the coastal fishery or ocean fishery, for management purposes.

Addendum IV, just as a reminder, implemented measures to reduce harvest by 25 percent for the ocean fisheries and 20.5 percent for the Chesapeake Bay fisheries. The Addendum IV implementation plan for the Chesapeake Bay states were developed to reduce the Chesapeake Bay trophy harvest by 25 percent, consistent with this characterization of the trophy fishery as part of the coastal fishery for management purposes, since the trophy fishery targets large migratory coastal fish.

The PDT noted that some clarification is needed from the Board on how to characterize the trophy fishery for Draft Amendment 7, just because that language in Addendum VI was not as specific as the language in Addendum IV, so there was a little bit of uncertainty in how to characterize the trophy fishery. That's all I have, Mr. Chair, if there are any questions.

CHAIR BORDEN: Comments on that issue. Toni, any hands?

MS. KERNS: Giving it a moment to see if I get any hands here. I have Mike Armstrong followed by Max Appelman.

CHAIR BORDEN: Mike and then Max.

DR. ARMSTRONG: Just a quick question. If we were to return to the Addendum IV definition, what would we have to do in this document?

MS. FRANKE: I think the Draft Amendment 7 would just include that language from Addendum IV, specifying that the trophy fishery is considered part of the coastal fishery for management purposes.

DR. ARMSTRONG: Okay, it wouldn't go out as an option, it would simply be in the verbiage, and I'm

going to throw that on the end as something we should probably do.

CHAIR BORDEN: All right, Max.

MR. APPELMAN: Maybe it will help me understand what makes the most sense if I knew where, if a fish was caught in the trophy fishery in the Chesapeake Bay, and was for example intercepted by an APAIS member. Would that fish be reported as being caught in Chesapeake Bay, or would it be part of the ocean, I think? Like, how is the catch of that fish used in assessment? I think that to me would sort of explain how we should be handling the trophy fishery, in terms of management.

CHAIR BORDEN: Any response?

DR. DREW: I guess I could take the first stab at it and say that yes, from the MRIP data alone. You know if we said a fish that was reported as being caught in inland Chesapeake Bay, i.e., inland Maryland or Virginia waters, would be recorded as part of the Chesapeake Bay catch, and a fish that was reported as being caught in state or federal waters would be reported as being from those two states, would be reported as being part of the ocean population.

I think previously the Chesapeake Bay states have gone through and sort of cleaned their data on the basis of timing and size of fish that are caught, in order to separate the sort of those spawning fish or those trophy fish out from the rest of the population, which could be an option if the Bay states wanted to continue that approach. But I don't think it's something we've done in recent years for the most recent assessment.

CHAIR BORDEN: We're back to the Board. Which language do you want in the document?

MS. KERNS: I have Tom Fote.

CHAIR BORDEN: Tom.

MR. FOTE: Yes, if I remember those right, it gave you a rattle when we did this. We basically awarded Maryland and Virginia in public river, 25 percent of the coastal migratory stock, so they figured that they spent that much time in Chesapeake Bay. That is where the trophy tag program came out of. It's in Amendment 4, we have done nothing to change that, and since that's historically what it was, unless we do an amendment to basically take it away, that should be where we are doing, if I got this right.

CHAIR BORDEN: Anyone else?

MS. KERNS: I have no other hands. Mike Luisi.

CHAIR BORDEN: Mike.

MR. LUISI: I'll just clarify what we've done. I am interested in what the Board thinks about how we use the trophy fishery as a follow up for any management action. But when Addendum VI came out and reductions were needed. We used modifications to the trophy fishery as part of our overall reduction in Chesapeake Bay.

We shortened the season and we closed other periods of the early pre-trophy fishery to targeting, which added to our total reduction necessary within our conservation equivalency plan that year. We did it because it was specified in Addendum VI that those fish were considered a Chesapeake Bay fish.

I do understand that we went from Addendum IV to Addendum VI, and there was a change in the definition of that trophy season. The trophy fishery is targeting the migratory stock, so I'm just interested in what others have to say about how we move forward in Amendment 7. But I just wanted to give you a little background as to how we applied the necessary reductions needed under Addendum VI for the Chesapeake Bay.

CHAIR BORDEN: We're back on the same question. Which language do you want to include in the Amendment?

MS. KERNS: Pat Geer.

CHAIR BORDEN: Pat.

MR. PAT GEER: I wasn't going to speak to the definition, but I just wanted to say in Virginia we did away with our spring trophy fishery in 2019, as a result of the Addendum that was coming up. It was a pretty small fishery. We only got about 0.25 percent savings out of that 18 percent that we had to come up with. But I'll concede to Mike and Marty about what they feel is the best definition to use.

CHAIR BORDEN: Does anyone else want to comment?

MS. KERNS: I'm waiting for hands. Mike Armstrong.

CHAIR BORDEN: Mike. I'm giving you a second bite of the apple.

DR. ARMSTRONG: Yes, very quickly. I mean it comes down to the trophy fishery, will it be subject to whatever rules they want to apply, or will it be subject to whatever we pick for the coastal slot limit or whatever it comes out to be? Because they are the same fish, coastal migratory, I think they should be treated as coastal migratory fish, have to follow the rules that we put in in this Amendment.

CHAIR BORDEN: You're recommending Addendum IV then.

DR. ARMSTRONG: Correct.

CHAIR BORDEN: Okay. Anyone object to that?

MS. KERNS: We have Mike Luisi with his hand up.

CHAIR BORDEN: Mike.

MR. LUISI: No so much in principal that I object, but the trophy fishery in our state is a two-week period of time, and we tried to do what Mike Armstrong suggested years ago, which is to have a slot limit for that trophy fishery, and it was a disaster. Right now, we have a minimum size, I think of 35 inches maybe, 36. I can't remember off the top of my head. But applying the coastal fishery regulations to that spring trophy season, without any flexibility, was a major problem for us in the Bay.

I would hope that there would be some tolerance for some flexibility, even if the definition is that those fish are considered part of the coastal fishery. I just can't imagine going back and putting a slot limit in. People see a trophy season as being something where, you know you're throwing back the largest fish during a trophy season, which a trophy is defined as a certain size limit. It makes it really difficult for us to maintain that season, maintain that fishery, if we had to go back to what we have on the coast with a slot limit. I'll leave it there. It's more of a management concern than the definition, which makes sense. They are coastal migratory stock, but it's a management issue on our end.

CHAIR BORDEN: Anyone else?

MS. KERNS: You have Tom Fote.

CHAIR BORDEN: Tom Fote.

MR. FOTE: Mike, I understand your point. But do you understand that a lot of fishermen up and down the coast, some of them stopped fishing for striped bass, because they really fished for a trophy fish, and since they did that, they moved on to other fisheries. That was important to a lot of the coastal migratory tournaments and everything else. We all had to bite the bullet, because these men move fast. If you're going to treat it as a coastal migratory, we need to consider that. They probably need to be under the same regulations that we're all suffering with.

CHAIR BORDEN: My suggestion is we use the Addendum IV language and, in the minutes, note the concern voiced by Michael Luisi. Any objections?

MS. KERNS: I see no hands.

CHAIR BORDEN: Okay, so next issue, Emilie.

MS. FRANKE: Moving on to this next set of draft options, and these options address protecting the 2015-year class. These options are listed in Section 4.2.2 of Draft Amendment 7, which is the ocean recreational fishery section. Starting with the statement of the problem here. It was raised by stakeholders and the Board that protecting emerging strong year classes is important for stock rebuilding.

There is some specific concern that the 2015-year class, which is the strongest year class observed since 2003, is entering the recreational ocean slot limit of 28 inches to less than 35 inches. That was implemented by the majority of states under Addendum VI in 2020. If that slot limit is maintained, the 2015-year class may be subject to high recreational harvest for the next several years while that year class is within the slot.

That potentially reduces its ability to help rebuild the stock. Then also, while outside the slot limit, the 2015-year class would still also be subject to recreational release mortality. The following options in this section consider whether to change the ocean recreational fishery measures to protect these strong year classes.

The status quo option of 28 inches to less than 35 inches with a one-fish bag limit, as I mentioned was adopted under Addendum VI, to achieve that 18 percent reduction. That is Option A, the status quo option. Option B and C were also actually considered as part of Draft Addendum VI. They were also projected to achieve at least an 18 percent reduction. They were considered here as part of Draft Amendment 7, in the context of providing some protection for the 2015-year class. Option B would implement a 35-inch minimum size limit with a one-fish bag limit. Option C would implement a 32-inch to less than 40-inch slot with a one-fish bag limit. Then the final two options here are Option B, which would implement a narrower slot limit of 28 to less than 32 inches, and Option E, which would implement a coastwide moratorium on recreational harvest.

This needs to be clarified in the document, but the PDTs intent is that this moratorium would apply both to the ocean region and to the Chesapeake Bay, so it would be a moratorium on all recreational harvest. I just wanted to note some feedback from the AP, just some general concerns about considering these size and slot limit options.

Some AP members noted some concern from the for-hire industry about these larger minimum size options, and these larger slot options. There was some support for the simplicity regarding compliance and enforcement, when considering a larger minimum size option, and some AP members also noted some concern about higher discards associated with slot limits.

Just a little bit more detail on Option E, which is the coastwide harvest moratorium option. There were a few different sub-options for how long the moratorium would be in place. When the moratorium ends, the status quo recreational measures would be re-implemented. For Sub-option E1, the moratorium would be implemented through 2024.

If Amendment 7 is implemented in 2023, that would be a two-year moratorium, continuing on with that 2023 implementation assumption, E2 would be a three-year moratorium, E3 would be a four-year moratorium, and E4 would be a five-year moratorium on all recreational harvest both in the ocean and the Chesapeake Bay. The longer the moratorium is in place, as noted in the draft options, a higher percentage of the 2015-year class would be protected from harvest once that status quo options are implemented at the end of the moratorium.

In their discussion for this issue, the PDT noted that both the 2017- and 2018-year classes were also above average in multiple JAIs, and so the TC recommended including those two-year classes in

this analysis as well. Each of the alternative size and slot limit options that I just reviewed were analyzed in terms of the protection from harvest provided each year class.

That is indicated by the percent of each year class that is estimated to be outside the size of a slot limit, so the percent of fish that could not be harvested. The TC noted that while changing the size of slot limit might protect a year class from harvest in the near term, it's important to develop soft reductions to look at the potential impact on total SSB and stock productivity over time.

This is Table 4 from the Draft Amendment, and this shows the estimated mean, striped bass size at age based on age data compiled from the last stock assessment. It's important to note here that this is just a mean size at age, and the size is highly variable along the coast, and there is a lot of overlap among the age classes. This is the table, Table 5 from the Draft Amendment that shows the percent of fish in each year class that would be protected from harvest for these various size and slot limit options. Again, this is the percent of fish that cannot be harvested for each option. It's important to note here that this level of protection from harvest will change over time, as the fish age. For example, looking at Option B, 35 is minimum size limit. This would provide the 2015-year class that column circled in red here. There is more protection from harvest in 2023, with about 83 percent of the surviving 2015 protected from harvest in the ocean, as compared to only 33 percent protected from harvest under the status quo option in 2023.

But again, this level of protection will change over time as those fish age. That level of protection from the large minimum size limit will decrease as those fish get larger and larger, and reach that minimum size. The projections that were developed for each size and slot limit option, estimate the change in total female SSB for all year classes, as compared to the status quo.

This is again to target just that question of how the size or slot limit options might affect overall stock productivity. These projections assume that the stock is fished at the target fishing mortality rate over time. The projected change in total SSB looking at each of these options, as compared to the status quo, only range as a small amount, seeing only about a 2-4 percent change, depending on the option.

These projections indicate that the stock recovery timeline for each of these size or slot options would be the same as the recovery timeline for the status quo option. Again, it's important to note for all the options that there is some uncertainty around how angler behavior and effort would change in response to a change in the size in the slot limit. If the Board selected an alternative size or slot limit, Options B through D that I just reviewed, the Board would have to consider whether or not conservation equivalency would be permitted.

That is captured here in this Tier 1 set of options that the Board would need to consider. Under Option A CE would be permitted. Considering any other CE restrictions that we'll discuss later in the CE section, and under Option D, CE would not be permitted for any of these alternative size or slot limit options. As noted in the Draft Amendment, these options do not apply to the moratorium option, as drafted that option would not allow CE for a recreational moratorium.

Another consideration for this section under Tier 2 here, is considering how Addendum VI conservation equivalency program that split the 18 percent reduction between sectors would be affected by changing the recreational status quo. If the Board selected either a different ocean size or slot limit, or if the Board selected a coastwide moratorium, the Board would need to consider how it would impact those CE programs that combine recreational and commercial measures to achieve the 18 percent reduction.

Specifically, those CE programs that implemented a less than 18 percent reduction in commercial quota,

which was offset by a larger reduction in recreational removals. If the recreational status quo changes, the Board needs to consider whether those commercial quota reductions implemented for those CE programs would carry forward.

Under Tier 2 here, Option A is that the commercial quota levels implemented through those CE programs would carry forward for the commercial quota levels implemented through those Addendum VI CE programs would be continued forward, and this would result in some commercial quota levels that should be less than an 18 percent reduction from Addendum IV quotas. Then Option D here is that the commercial quota levels implemented through those CE programs would not carry forward. Under this option those states would be subject to the quotas outlined in the commercial quota section.

This is Table 6, associated with those Tier 2 options, just showing the base quotas and the CE adjusted quotas. Again, if the recreational size limit status quo changes, or the Board selects a moratorium, the Board would need to consider which of these CE adjusted quotas would carry forward. That's all I have for this issue, Mr. Chair. I have the discussion questions up here on the slide again.

CHAIR BORDEN: Okay, thank you, Emilie. Comments on this section.

MS. KERNS: I have Justin Davis, John McMurray, Tom Fote, David Sikorsky, and Megan Ware.

CHAIR BORDEN: Okay, thank you, Toni. Justin.

DR. DAVIS: I think this question is for Dr. Drew, and it has to do with the projections that were done here to compare the different potential regulation options, and their potential impact on SSB (rebuilding). You know I feel like one essential argument we were having during the Addendum VI process was about a slot limit versus a minimum length.

You know proponents of a slot limit, like myself, sort of suggest that what you're essentially doing is declaring a moratorium on all but probably four or five age classes in the population, and that by doing that you're going to hopefully sort of broaden the age structure and have proportionately higher abundance in those larger, older, age classes that anglers find so desirable. Proponents of a minimum length would say you're focusing too much fishing mortality on a narrow band of age classes, and essentially not enough fish are going to make it through the slot.

Overall, you're going to have a negative effect on SSB, and you're not going to have enough fish make it through to have a lot of fish in those older, larger age classes. I view that as sort of like two competing hypotheses, and I think another one that's arisen here is this hypothesis that protecting the 2015-year class is essential for rebuilding the stock.

As I've heard it framed in some quarters, the 2015-year class is our last best hope to rebuild the striped bass stock, and if we fail to protect the year class, we're sort of doomed to failure. I don't know that anyone has really advanced an alternative hypothesis to that, but it's certainly the motivation for the work that was done here. When I looked at the draft amendment and the projections, I guess I was kind of surprised at first to see that, you know as it was noted on Page 56, and I think this was in the slide too.

Projections also indicate that the stock recovery timeline is the same for all four options. I think it's tempting at first to look at Figure 3, and look at that and say, oh it looks like the 35-inch minimum really provides a much greater chance of rebuilding SSB. Then you look at the Y axis and it's essentially a 4 percent difference than the status quo over a projection that goes out to 2032. I think that's sort of probably within the margin of error. I guess I was surprised at first to see that essentially there seems to be no difference between a slot limit and a minimum length, with respect to where we're going to end up with at SSB, 2032. Also, that there does

not seem to be evidence from these projections that measures that are more protective with 2015-year class are going to help us rebuild SSB better or faster.

Thinking about it, I guess it might be reasonable to think these projections aren't that useful in looking at that first comparison of the slot limit versus minimum length. Because this is just SSB, it's not talking about the packets that SSB comes in. This isn't looking at age structure. It's just overall SSB, we can't determine whether there is more fish in those older, larger age classes like we might expect from the slot. But for the second one, the 2015-year class, I guess what I'm interested in knowing is to what degree.

Do these projections suggest that protecting the 2015-year class, or being more protective of it than the 28 to 36 slot isn't beneficial overall? You know largely to achieving our SSB rebuilding timelines, or are there reasons to think these projections are not really that informative of what we might actually get out of changing the regulations. I apologize, I know that was sort of long-winded. But that is my priority question.

CHAIR BORDEN: Thanks, Justin. Katie, do you want to take a shot at some of those? I think that it's probably in your area of expertise.

DR. DREW: Sure, I can take a shot at it, and we'll see if anything useful comes out. I would agree that I think these projections show that sort of, basically the projections were really focused on, if we change the selectivity of the ocean fishery, is there going to be a benefit to the stock? You know as you said, you focus more fishing mortality on the oldest and largest classes as more of them survived those age classes first, or do you focus in on a smaller component, and let more of them survive afterwards?

These projections seem to indicate that it doesn't really matter that much for that total SSB. You're right, we haven't looked at, we didn't break this down by age class. I think in the TC memo that is not part of this, there was some information on how it affected 2015 versus some of those other year classes, and there were some small differences there, in terms of one option would protect 2015 more, and other options would protect '17 and '18 more.

Those kinds of questions are really tinkering around the edges. The big thing that is going to be driving whether or not you recover, is what you can do about the total F and total effort. For these projections we're assuming that we're going to maintain, we're going to be able to stay at F target going forward.

I think maybe we would see something different if we assumed that one set of regulations would lead to more or less effort than the others. But really, what's driving these differences is the effort, the overall fishing mortality, and less about how you are applying it to specific age groups within the population. Also keep in mind that we're still assuming the Chesapeake Bay fishery is unchanged for this, and there is still release mortality on fish that are outside the slot or fish that are below that minimum size. It's not like those fish are completely protected either. Basically, all of that adds up to say the uncertainty about our projective and about recruitment and what that's going to be, and things like that. You know any kind of benefit or detriment to those selectivity changes is really washed out by some of that uncertainty and the larger, overall importance of fishing mortality for the population. That is kind of why you are seeing some of the results that you're seeing for these projections. If there is additional stuff that the Board would like to zero in on, on some of these questions,

I think we can definitely take some guidance on that. But really it seems to be saying that selectivity measures to protect a specific year class, especially one like 2015, which already will have experienced eight years of fishing mortality by the time we even implement these changes, isn't going to give you as much benefit as something that reduces F on the

population as a whole. I hope that helps, I'm also happy to expand on anything if necessary.

CHAIR BORDEN: Justin, do you want to follow up?

DR. DAVIS: If you wouldn't mind one quick follow up, Mr. Chairman, thanks. Dr. Drew, do you expect that these sorts of projections might be more informative if they were done during the assessment update that's coming in 2022, because then we would have some information about how the fishery performed under the slot limit since we had implemented it?

DR. DREW: Yes, absolutely. I think that's part of why we didn't show any of the absolute trajectories coming out of this, is that these selectivity curves are based on kind of this length-based approach of trying to figure out how many fish are going to be vulnerable to the fishery based on size and growth, which is really very different from how the assessment model is figuring out that selectivity curve.

I think those results are not directly comparable to the model results. I think they are informative for this kind of a question, and they are the best that we could do with what we have. But for sure, we would get better information once we can do that assessment update with a couple of years under the new management regulations, and see what actually shows up in the data.

CHAIR BORDEN: Next, I have John McMurray.

MR. McMURRAY: Are we limiting this to questions now, or are you taking comments on whether or not options are viable for implementation?

CHAIR BORDEN: Both at this point.

MR. McMURRAY: Okay, so I would like to comment on Option E, the harvest moratorium. I have some real issues with it. First, it's limited to the recreational sector instead of requiring ocean sectors to share the burden. I would like to hear some rationale on that. But it's for that reason, but not that reason alone, that it's not a politically viable option.

Not only would the recreational folks lose their minds if we went down this road, but it would effectively kill a lot of charter business very quickly, and for what? Do we even know what sort of impact it will have? Right now, the PDT can't even provide an idea of how a moratorium would impact the stock, and whether or not it might significantly accelerate rebuilding, because we don't know how much recreational fishing effort would change if anglers can no longer kill bass. Nobody knows how much is fishing mortality now, until the recreational landings are converted to release mortality if a moratorium was proposed. Furthermore, I'm struggling to understand how anyone here believes that given the current state of the stock that such drastic action is actually needed.

As depleted as the stock is today, the current SSB is between 3 and 4 times as large as it was in the early eighties. The Commission managed to rebuild the bass population by 1995, without ever completely closing the fishery. I would like to see that go away. I would like to hear what some of the other commissioners think about that.

CHAIR BOREN: I've got Mike Luisi.

MR. LUISI: This may be a first, but I completely agree with John, on the idea of Option E. It's just not a viable alternative politically, and for management purposes I think there are too many unknowns within Option E, as to what progress we'll make and what results will come from a harvest moratorium versus a full-scale moratorium across all sectors. This option as written would pit the harvesters against the catch and release fishermen, and the charterboat industry would take an enormous hit.

One of the questions that Emilie asked is, is this a viable option for implementation, and my answer to that question would be no. I would prefer that the moratorium option be stricken from this, and we focus on the slot limit options in the ocean, which

we know based on science, those slot limits will have an effect. But to protecting, based on the goal of this section of the amendment, to protecting the 2015-year class. Thanks for the time.

CHAIR BORDEN: All right, Emilie, before I call on the next speaker, could you put up the options, please, and then highlight the one in red that the suggestion is to take it out? Okay, next I have, let's see, David Sikorski. David.

MR. SIKORSKI: Dr. Drew's comments triggered a lot of different thoughts I've been having, especially after seeing the TC and the PDT discuss that they're looking at the 2015-, 2017-, and 2018-year classes in their analysis. I think that's the right thing to do, and I think something missing from this section completely is the Chesapeake Bay.

When we see Chesapeake Bay defined in 4.2.1 it's 18 inches or greater, and that doesn't even accurately describe our CE proposal, which we're currently fishing under, which is a 19-inch minimum for private anglers, one fish. A 19-inch minimum for those on for-hire vessels, two fish. Just for the clarity for the public, I think I would like to see those pieces highlighted.

As it relates to this analysis that we've done for this 2015-year class, I think it's important that we look at a Chesapeake Bay analysis, not just in the ocean view of these year classes, because the 17s are in our fishery, the 18s are on their way in. They are probably in the commercial fishery at this point, with an 18-inch minimum in the commercial fishery, and eking their way into the recreational fishery. I think we're missing; you know as we were talking earlier about recruitment. That is great, we need to look at these juvenile fish and see what they're doing. But I think a big piece we're missing in our knowledge base here, without an updated assessment, of course, is what happened to those fish between year one and when they're leaving the Chesapeake Bay. It's been a longstanding concern. There have been changes.

I don't know enough about what we used to do here in the Chesapeake Bay, but I remember the term exploitable biomass. I think that's kind of what this analysis does for the coastal fishery, makes us understand what regulations might impact certain year classes, and again, I feel like we're missing that for the Chesapeake Bay.

Definitely for the recreational fishery, and that's what we're talking about here, but also the commercial fishery, to better understand that selectivity, because the quota doesn't tell the whole story, especially when we're really looking at these year classes and really looking at these recruitment challenges that are occurring.

I think we're a bit blind in that section. I did offer a motion or provide a motion to staff related to this topic, and I would like your judgment on it, if this would be the right time for that, or maybe we wait until everybody else goes, similar to like Megan did, and consider it at the end. But ultimately, I would like to add an analysis related to the Chesapeake Bay, if it's the right time.

CHAIR BORDEN: David, I would like to handle it the same way I did for Megan, so I'll come back to you.

MR. SIKORSKI: Thank you, Sir.

CHAIR BORDEN: I've got Megan Ware, the last one on my list.

MS. WARE: My question was actually encompassed in Justin's question, so I'll pass.

CHAIR BORDEN: Okay, so Toni, do you have any other hands up?

MS. KERNS: I have one additional hand, Roy Miller.

CHAIR BORDEN: Roy, you're up.

MR. MILLER: I would just like to quickly add my support for the Option E suggestion from Mike and John. Speaking from the standpoint of someone who was on the Striped Bass Technical Committee

in the late 1970s until the late 1990s, during the period of recruitment failure in the late 1970s and early 1980s through the moratorium years. We are in a vastly different state today, with regard to the striped bass stock, than we were during the period 1985 through 1989. I don't think a moratorium should be on our option list at this point in time.

CHAIR BORDEN: The vast majorities of the speakers have spoken in favor of taking out Option E. Is there anyone here that objects to doing that?

MR. FOTE: Dave, I had put my hand up. I don't know why I was on the list and I all of a sudden disappeared.

CHAIR BORDEN: Tom, that's never happened to you before, so I'm going to recognize you.

MR. FOTE: It's interesting, I thought what John is saying, what Roy is saying. We are all diverse in how we feel about this fishery. But this fishery is totally different than when we rebuilt it in the seventies and when we started rebuilding it in the eighties. Back then we were basically, there was not a huge fishery on it like it is now.

Most of the mortality was not coming from the catch and release fishery, as it is now in the recreational fishery. What we did was protect the year class until it spawned, and moved the size limit. I remember, we did it by statute. I had to go every year to Trenton to raise the size limit one inch or two inches at a time.

I made like nine trips, and one of the Chairmen of the Committee refused to hear it anymore, so I had to move it to the Veterans Committee instead of the Fisheries Committee. I'm looking at this and I'm saying, what are we doing? I mean the economic impact if any of these were put in place, so we're basically getting into a disaster.

Also, what are we really doing? We're going to increase the catch and release mortality, which is the major part of this fishery to begin with right now in the recreational sector. We're not addressing that problem that we made the circle hooks and we did so many different tweaks to it, that I don't think it's going to produce what we thought it was going to produce.

It's also going to be very hard to enforce. I'm looking at this and saying, what are we actually doing here, except spinning our wheels? I'm just completely devastated that after 35 years of bringing striped bass back. It's more than one effort. This is a lot different spawn. Our spawning stock biomass was big enough in 2014, 2017, 2018 to produce great year classes.

We're having an environmental problem and a problem in Chesapeake Bay, and maybe it's not surviving because of the catfish or some other fish. I don't know. But we might have a different thing going on. It was a certain period of time that when the Chesapeake Bay was having problems, that when we were doing the tagging studies that Wilson was doing.

We were actually, they were projecting that 50 percent of the coastal migratory stock were actually coming into the Delaware and the Hudson River. This fishery is totally different than it was in the eighties, just by the way people catch fish, how they release fish, and the numbers of fish we release. But we've got to look at it a little different than we did back then.

CHAIR BORDEN: Thanks, Tom, does anyone object to removing Option E from the document? Toni, are there any hands up?

MS. KERNS: I have John Clark and Marty Gary and Tom Fote with their hands up.

CHAIR BORDEN: Okay, so Tom's already spoken, so I'm going to go to John Clark and Marty.

MR. CLARK: I'm sorry, Mr. Chair, it wasn't to oppose for that, it was just for a clarification. I just wanted to ask Emilie. It isn't clear that Option B through D, if those were kept, whether approved recreational conservation equivalency programs

from Addendum VI would continue with those options.

We discussed keeping the division between recreational and commercial. But for example, we had a special summer slot season on striped bass in Delaware, which is currently approved under Addendum VI, and I just wanted to clarify whether that would continue under these other options.

CHAIR BORDEN: Emilie, to that point.
MS. FRANKE: Thanks, John. The Board would need to consider that very question, how conservation equivalency would apply if the Board selected a different size or slot limit.

CHAIR BORDEN: All right, so I'm going to go back on the list, Marty.

MR. MARTIN GARY: No objection to removing Option E. I just wanted to make sure we noted, and I'm sure everybody on the Board on this call has, that during the public comment period there was a significant number of people that weighed in, mentioning moratorium and the consideration by this Board.

At the same time, what was going through my mind as I listed to Roy and Tom, was there is a significant number of people that sit on this Board, that have a lengthy baseline of experience and knowledge that goes back prior to the moratorium period, that a lot of people are referring to. Tom and Roy just related their experiences. I know personally, I started my career in 1985, when Maryland initiated its moratorium, I was working as a biologist for them.

I think the common theme is, is here and now the same as then? I think universally, everybody that we talked amongst ourselves that knows that timeframe very well acknowledges it, no it is not. John McMurray, you also mentioned it as well. I just wanted to make sure we knew, we were paying attention and were listening to those folks in the public comment period. We did hear you, and we all contemplated that, I think. But no objection, Mr. Chairman to removing Option E.

CHAIR BORDEN: It sounds like there are no objections to removing it. That item is removed. Any other changes on this section? If not, I'm going to go back to David, and ask him for his motion. David, would you like to make your motion?

MR. SIKORSKI: Yes Sir. I know I provided the justification previously, and I would welcome any wordsmithing so we can get at that point, especially by the technical folks. **But I would move to add protection to the 2015-year class, through adding a maximum size limit option/slot option in the Chesapeake Bay recreational fishery in section 4.2.1 Maximum size limit options developed by the PDT should aim to maximize protection for the 2015, 2017, and 2018- year classes, consistent with the Technical Committee advice for the coastal analysis.**

CHAIR BORDEN: That's a motion, is there a second to the motion? Do I have a second?

MS. KERNS: Mike Armstrong.

CHAIR BORDEN: Mike Armstrong. David, do you want to speak to this, and then I'll call on Mike?

MR. SIKORSKI: Well, I think I provided a lot of the justification previously, prior to making the motion, so I will allow Mike to provide his justification, instead of repeating myself.

CHAIR BORDEN: All right, thank you. Mike.

DR. ARMSTRONG: I think most of the justification has been said. But I do think there is a contribution to the mortality of these year classes still coming from the Bay, and I think it's worthwhile to try to protect them everywhere they occur.

CHAIR BORDEN: All right, I'm going to take other comments. If you would like to speak on this motion, please raise your hand.

MS. KERNS: You have Mike Luisi, followed by Adam Nowalsky.

CHAIR BORDEN: Mike Luisi, then Adam.

MR. LUISI: Thanks, Dave, for bringing this up. You and I talked about this earlier. I appreciate you making the motion for discussion. I wonder if, based on the years that you've presented here, to maximize protection for 2017 through 2018, that could make it very difficult, given the availability of fish at certain size limits.

You made the reference, and the '15s are old enough now, or they're becoming part of the coastal stock, yet the '17s and '18s are part of our regiment fish at this time. I wonder instead, maybe not instead of, but included in your size limit option/slot limit option, if there would be something you might want to think about regarding seasonal closures, to help reduce mortality on those particular resident fish.

Instead of a slot limit option, which I think is going to be hard to come by, based on the year span that we're trying to protect. Because we've done seasonal closures of targeting in this past year, and I think we were successful. I think we could use that as a way to minimize dead discards on those particular year classes, as a way of protecting them rather than change the limits and slot limits. I just throw that out there for your thought, and I'll leave it there.

CHAIR BORDEN: All right, then I have Adam.

MR. NOWALSKY: I see two elements with this motion that I'm not clear on. The first is that the first sentence it says to move to add protection, but then the second part of this motion talks about maximizing protection for three different year classes. It almost seems to me that we are ultimately adding protection to all three years classes, so I'm not clear what the direction we're giving to the PDT is in this.

The second element of it is that given that this says that options developed by the PDT, does this motion predispose us to not sending this document therefore out today, and does this motion ultimately need to get discussion now, some degree of perfection, and ultimately on the same table that the other motion is.

Because again, as I read this, we don't have a discreet option here. We're asking the PDT to develop it, which would preclude us from releasing this today. I would appreciate clarity from the maker, on again, what direction we're trying to give with regards to what we're protecting, and direction again as to where this would leave the document if this passes as written.

CHAIR BORDEN: David, please follow up if you would like to respond.

MR. SIKORSKI: Yes, Sir, thank you. As far as the intent is concerned, give us a nearly identical analysis that's been performed under the section of protection of 2015-year class, where the TC added the 2017- and 2018-year classes into that analysis, I think it's Pages 57, 58ish in the draft document.

That's what I'm looking for from a Chesapeake Bay perspective. In this document as a whole, I feel like there is a lot of Chesapeake Bay components that are missing. I thought that this would be a way to put something into the document at this point to highlight that, and give us better guidance as we move forward.

As it relates to how we handle this motion, I would look to the Chair and other members of the Board, in how it relates to this document as a whole. I think it would be logical to treat it the same way that we treated the previous motion at this point. To me it's a key piece that's missing here, especially given the more recent information we saw on the JAI in Maryland three years in a row.

We've really got to be looking closely, and not just assuming that the way we're prosecuting the fishery in the Chesapeake Bay is going to be okay. This is further kind of exacerbated by the way that what Maryland's CE proposal is, or what the one we're operating under, that did not reduce commercial catch.

I've been highly concerned about that, and frankly it's been done in all three Bay jurisdictions, to not limit commercial quota, which is mortality. As Dr. Drew was saying, we're only looking at pieces of the F, but all these things come together to give us our overall F that we're prosecuting on these fish. The more pieces of the puzzle we can have, the more comfortable I am that we're heading in the right direction. I welcome any guidance on how we get there, but I want to fill in the blanks here of what we're not seeing related to the Chesapeake Bay fisheries.

CHAIR BORDEN: Adam, do you have a follow up to that?

MR. NOWALSKY: I just think that as written, I don't have a specific recommendation for rewording this motion, other than I would suggest that if this second part is going to stay, regarding the three different year classes that perhaps we consider changing the first part of the motion to reflect that as well, because that is ultimately what we're looking here for is protection, not just for the 2015-year class, but for all three years classes in this motion.

CHAIR BORDEN: David, that is a question to you. Do you have any objections to adding 2017 and 2018 to the first line?

MR. SIKORSKI: I do not, no objection.

CHAIR BORDEN: Mike Armstrong, do you have any objection?

DR. ARMSTRONG: No objection.

CHAIR BORDEN: It's added without objection by the maker of the motion and the seconder. Further discussion on this.

MS. KERNS: No additional hands.

CHAIR BORDEN: This actually falls under the, as David noted, this falls under the same category as Megan's motion. We don't know the path that this is going to take, if in fact we're going to continue to perfect this document, then clearly, we have the opportunity to refer this option to the PDT, and ask them to work on this and present information at the next meeting. Maybe we should handle it in the same manner. Would someone like to make a motion to table until the end of the meeting?

MS. KERNS: Mr. Chair, before you make that motion, Marty Gary had his hand up, and I don't know if it was related to objecting.

CHAIR BORDEN: Marty. My Vice-Chair, he's going to lead us out of the woods on this.

MR. GARY: I don't know if I'm going to lead you out of the woods here or not, but I was struggling, I think, using the same language Adam has about the intent. Maybe Dave, if I could be so bold to ask you, as you made the motion. I get the reason, '15, '17, '18, they're all in the upper quartile of Maryland's JAI geometric mean. They are good year classes, and I understand where you're coming from. But is your intent then, say for instance '17 and '18.

By the time this Amendment would be implemented, you're looking at what, five- and six-year-old fish, which are right in the middle of our resident fishery. Then the '15s of course, they don't all ever leave the Bay, so there are a few larger fish around, but they would be up there a little bit, they are larger size fish. Is your intention to put, looking at, when you say maximize protection. I look at those two words, maximize protection. Are you looking at a slot limit that would essentially put those fish out of that exploitable stock biomass range? Would it be, let's have a slot limit that's, I don't know, 28-32 inches or something like that? You're protecting those smaller, younger fish, '17 and '18, but also affording protection to some of the '15s that still may be residing in the Bay. Is that where you're headed with this, and is that what you want the PDT to analyze?

MR. SIKORSKI: I am at a point where it's one step at a time. I do think that an ultimate outcome could be protecting these fish with some sort of

measures. But I said earlier, we're kind of blind in this section of the fishery and how we're exploiting it. What I'm really looking for, you know I was really impressed by the assessment that's been already provided to us on the ocean fish.

I feel like that same thing on the Bay fish will help guide the real answer to your question at a later date, if we get that assessment. I don't want to get out in front of anything until some information provides us. I know what my gut tells me, and it's that the Chesapeake Bay has a role to play in reducing our impact on these fish, because they are a big part of recruiting. I'm sorry, big part of rebuilding this stock.

But I need more information to understand exactly what pieces of the puzzle we should put together from a regulation standpoint, and now is the time, I think, to start planning for implanting this in '23, regardless of whether we approve today or not, because if not, what are we going to wait even longer? That is my biggest concern. It's really just more technical guidance. If it passes and if the information is provided to us for us to make another decision at a later meeting.

CHAIR BORDEN: What's the preference of the Board here? Do you want to vote on this or do you want to table it?

MS. KERNS: Marty, is your hand up to answer that question?

MR. GARY: I'm sorry, Mr. Chair, you're looking for a motion either to table or vote on it?

CHAIR BORDEN: Yes, in other words, then the tabled motion would be to handle it the same way Megan Ware's motion was handled. We would take it up at the end of the meeting, while we have a better sense of what course of action is going to be taken.

MR. GARY: Okay, it sounds like we're going to vote on it now or later. I'm really uncomfortable with the way this is being explained and written. I'm happy to vote on it now, I'm not going to support it if we do, or we can table it and vote about it later.

CHAIR BORDEN: All right, does someone want to make a motion on this?

MS. KERNS: Adam Nowalsky.

CHAIR BORDEN: Adam.

**MR. NOWALSKY: I move to table until the end of the Amendment 7 agenda item.**

CHAIR BORDEN: Do I have a second?

MS. KERNS: John Clark.

CHAIR BORDEN: All right, so we have a motion to table, it's non-debatable. Let me just ask, is there any objection to this motion? Does anyone object? Any hands, Toni?

MS. KERNS: No objections.

**CHAIR BORDEN: No objections so the motion passes without objection.** That will be taken up at the end of the session. Okay, Emilie, we're back to you.

MS. FRANKE: Sounds good, thank you, Mr. Chair, I can move on to the next issue here. This next issue is recreational release mortality, and this is in Section 4.2.3 of the Draft Amendment. Again, starting with the statement of the problem. Recreational release mortality is a large component of annual fishing mortality.

It was the largest component from 2017 through 2020, but that's just because the striped bass fishery is predominantly recreational, and the majority of the catch is released alive. The current management program primarily uses bag limits and size limits to constrain recreational harvest, and it is not designed to control effort, which makes it difficult to control overall fishing mortality.

Efforts to reduce overall fishing mortality through harvest reductions may be of limited use, unless recreational release mortality can be addressed. In addition to the circle hook requirement implemented through Addendum VI, which is the Option A status quo option in this section. The Board could consider the following types of options to address recreational release mortality.

The Board could consider effort controls, which are seasonal closures in Option E, additional gear restrictions in Option C, and/or outreach and education options under Option D. It is important to note that although the impact of many of these options are difficult to quantify, they are intended to reduce the number of recreational releases, or they are intended to improve post release survival.

Again, the status quo option here is the circle hook requirement, as implemented through Addendum VI, and this requires circle hooks when fishing recreationally with bait. This does not apply to any artificial lure with bait attached. Also, as guidance approved by the Board, back in March of this year, it is recommended that striped bass caught on any unapproved method of take, be returned to the water immediately without unnecessary injuries. Moving into the first set of options, which are seasonal closures.

Again, these could be selected in addition to the status quo circle hook requirement, and seasonal closures are intended to reduce the number of live releases by reducing effort, and reducing the number of trips that interact with striped bass. The Draft Amendment includes some discussion on the different types of closures, as requested by the Board at the August Board meeting, to help inform the Board and the public's consideration of the different options. The majority of the options developed by the PDT are options for no targeting closures, in order to address recreational releases resulting from both harvest trips and from catch and release trips. Again, these closure options are not associated with a specific reduction.

But for future potential management actions, the draft document notes a PDT recommendation that the TC establish a standardized method for estimating the reduction in removals, associated with a no-targeting closure in advance of any future management actions. I'll go through the different no-targeting closure options at this point.

The Board can select one of these no-targeting closure options. Options B1 and B2 would be no targeting closures during Wave 4. A no-targeting closure during Wave 4 would reduce effort during a time when all states have an active fishery, and during a time when there are environmental stressors like peak air and water temperatures.

Option B1 would be a coastwide no-targeting closure during Wave 4 for a minimum time period selected from the following sub-options. It could be July 1-15, July 16-31, August 1-15, or August 16-31. CE would not be permitted for this option. Option B2 would be a state or a regional no-targeting closure during Wave 4.

Similar to B1, CE would not be permitted for this option. Starting with Sub-option B2-a, this would allow each state to select a two-week period at minimum during Wave 4 for their closure. Under B2-b, each state would select a three-week closure at minimum during Wave 4, except for Maine and New Hampshire, which would select a two-week closure period at a minimum.

This type of option, Option B2-b was developed to address concerns about the relatively large proportion of directed trips that occur in Wave 4 in some states, and the shorter period of time that large striped bass are available in some areas. This option was developed based on MRIP directed trip data from 2017-2019, using a method looking at the standard deviation of Wave 4 directed trips, to identify those two states that would take a shorter closure and the rest of the states that would take a longer closure during Wave 4.

B2-c would be a regional closure that would allow each region to select a two-week closure period at a

minimum during Wave 4. Potential regions as listed here are defined in the Draft Amendment. However, the document notes that the Board can redefine these regions if desired. Just a quick note from the Advisory Panel meeting.

There was some concern about state coordination and accountability associated with a regional closure option. The next type of no targeting closure option is Option B3, and this would allow states to select a two-week closure period minimum to reduce effort during waves when the striped bass fishery is active, and directed trips are occurring.

Similar to the other issues, CE would not be permitted for this option. Sub-option B3-a would require states to select a closure period during a wave with at least 15 percent of the state's striped bass directed trips. B3-d would require states to select a closure period during a wave with at least 25 percent of the state's directed trips. Again, these options were developed based on MRIP data from 2017-2019, and again a note from the Advisory Panel meeting. Some AP members noted that even a two-week closure could have significant negative impacts on the fishing industry. Here is the table from the Draft Amendment showing the proportion of striped bass directed trips by wave for each state, from 2017 through 2019.

The data shown here informs the development of the options that I just described. From the Advisory Panel meeting there was some support for using just MRIP effort data as shown here. There was also a question and concern about whether these directed trip percentages are really accurate, especially for some of the ocean regions, the southern states like Maryland, Virginia and North Carolina.

The next closure option would be Option B4, and this is actually an option the Board needs to consider if the Board selects one of the prior no-targeting closure options. The Board would need to consider whether existing no-targeting closures implemented in 2020, as part of the Addendum VI CE programs would meet the seasonal closure requirements for any new closures or not.

Option B4-a, existing or targeting closures implemented in 2020 would fulfill the new closure requirements. Under B4-b, those existing closures would not fulfill the new closure requirements. Those states would need to implement additional closures to meet the new requirements, and maintain those CE size limits or the states would need to implement the FMP standard size limits along with the new closure.

Then finally, the last option for seasonal closures is spawning closures, and these spawning closures could contribute to stock rebuilding, by eliminating harvest or reducing releases of spawning fish. In this case existing closures would meet the requirements of these options. B5-a would be a no-harvest closure during Wave 1, and Wave 2 in spawning areas.

B5-b would be a no targeting closure for a two-week period on the spawning grounds during peak spawning. CE would not be permitted, and the Board could choose one or both of these spawning closure options. Moving on to Option C in this recreational mortality section, which are gear restrictions.

Again, the Board could consider additional gear restrictions to increase the chance of survival of striped bass that are caught and released. The Board could select one or more of these options. C1 would prohibit the use of any device other than a nonlethal device to remove striped bass from the water, or assist in releasing stripe bass.

The Draft Amendment includes a definition of what a nonlethal device is. Option 2 would prohibit the use of treble hooks, Option C3 would require barbless hooks, Option C4 would prohibit trolling with wire, and then Option C5 would be an option for the Board to consider whether this incidental catch guidance through Addendum VI would become a requirement.

This incidental catch statement would become a requirement that striped bass caught on any unapproved method of take would be returned to the water immediately without unnecessary injuries. Again, if you're seeking a requirement, this would apply to circle hooks and any other gear restrictions selected for this Amendment. A note from the Advisory Panel here that there was some significant concern from AP members about these gear restriction options. The AP noted that these options seem to target certain parts of the fishing industry, and the AP noted that gear is used differently across states, and the benefits of these gear restrictions would vary pretty widely.

Then finally, the AP noted that the circle hook requirement was informed by relatively more science, enrolled public support, and these options presented here are not. Then finally, Option B is related to outreach and education. States have already implemented outreach and education campaigns, but these options are intended to more explicitly recognize these efforts as part of the Draft Amendment.

D-1 would require states to promote best handling and release practices, and the states would be required to provide updates in their compliance reports. Then under D2, education and outreach would be recommended that they continue to promote best practices. Then one AP member noted that this required outreach would need to be clearly defined. With that, Mr. Chair, I'm happy to take any questions on these recreational release mortality options.

CHAIR BORDEN: Questions for Emilie, and then we'll get into the statements and suggested modifications, if any. Questions. Toni.

MS. KERNS: I have Adam Nowalsky and Jason McNamee, and Tom Fote your hand was up and then it went down, and then it was up and then it went down again, so I'm not sure.

CHAIR BORDEN: Adam and then Jason.

MR. NOWALSKY: Given the concerns from the AP with Option C and their comments. Is there anything in the way of mortality studies that we could use to justify the inclusion of those restrictions?

CHAIR BORDEN: Emilie.

MS. FRANKE: Thanks, Adam, let me just get down to that section of the Draft Amendment here. For treble hooks the Draft Amendment referenced a couple of studies, as well as for the barbless hook option one study was referenced there. But there were no studies referenced for the killing with wire option or the nonlethal device option.

CHAIR BORDEN: Adam, do you want to follow?

MR. NOWALSKY: I would just ask if the PDT weighed in at all on what information was provided for the barbless and the treble hook, as to whether or not they felt that there would be quantifiable reductions in mortality that we would be able to go back to the public at some point in the future and say, here is what this got you.

MS. FRANKE: The PDT did not specifically weigh in on that besides the discussion about the difficulty of quantifying the benefits of any gear restrictions. I guess the one note from the PDT is that these options were developed based on public comment unheard through the Addendum VI process and through the PID process.

CHAIR BORDEN: Next, I have Jason McNamee.

DR. McNAMEE: I'll actually start, I was going to ask a different question, but I'll quickly work off what Adam was just talking about. Just to offer, I guess a comment. I'm inclined to drop those, with the exception of C5, drop the gear stuff out of this. The main reason is, I don't know if others enjoyed the circle hook experience that we went through.

But it's clear that individual fishermen have sort of a secret recipe for how they like to fish for striped bass. I'm not interested in getting twisted up in

that again, for what in the end may be very little value. Just some comments on the gear stuff there. But my main question is, the regional options for the seasonal closures, it's a question for Emilie, if you could sort of channel your inner PDT.

With the idea there to try and coordinate states that are sharing water bodies. I do see a sense in trying to group states by shared water bodies, because I think it would be problematic to enact a closure. I'll just use the example of Long Island Sound. You know if New York had one set of two weeks and Connecticut had another set of two weeks, it would probably defeat the purpose of reducing recreational releases and the mortality associated with that. Was that kind of the idea there, was to group states by shared water body, more or less?

MS. FRANKE: Yes, exactly, that was the intent here. The PDT again took a stab at coming up with these regions here on the screen in the Draft Amendment, but noted that it was difficult to kind of get a clean breakdown by shared waterbodies. There was sort of always one or two ways you could go. The PDT recognizes that there is not a straightforward way to break this down, but that was the intent of trying to group them by waterbodies.

DR. McNAMEE: Great, thank you, Emilie.

CHAIR BORDEN: Next, I have John McMurray and then Pat Geer.

MR. McMURRAY: I don't know if I want to see all of the sub-options in C go away. We did hear from the public about treble hooks and barbless hooks and the gaffs. Maybe they can come out later, but for now I think they should stay in for the public to comment on. But I'm really surprised that Sub-option C4 made it into the document, because if I recall correctly, there was very little if any discussion at the Board meetings or in the public comment period about wire line trolling.

I guess my question is, is there some science that supports the contention that wire line trolling exhausts fish any more than any other method? Before you answer, I did want to point out that if this were to go into effect, I mean it would be pretty devastating to the Montauk charterboat industry, and I just don't see the need for it in here.

CHAIR BORDEN: Okay, Pat Geer, and any preface, just whatever comments are going to come after this. It would be really helpful if you would refer to a specific number or letter, and then say, I think this should come out. Then Emilie will follow the same process she followed in the past, and highlight it in red. I think it will make it easier for everyone to keep track of what is being proposed. Pat.

MR. GEER: I would suggest that we remove Option C entirely, and maybe move C5 under our existing circle hook requirement. But what I would like to say is that these are important, but we may get more bang for our buck with education and outreach, and maybe put them into our outreach and education, Option D, where we basically including fish handling techniques, we include these items as probably not the best practices possibly for fishing.

But maybe move them over there. There are better ways of protecting the resource by not using these types of gears, instead of making it a requirement that's going to be very difficult to enforce, move it into our outreach and education, where we try to teach people that it might not be the best use of the resource by using these gears.

CHAIR BORDEN: Thanks, Pat. I think that's useful. Toni, do you have others on the list?

MS. KERNS: I do, I have Justin Davis, Tom Fote, and Adam Nowalsky.

CHAIR BORDEN: Justin.

DR. DAVIS: I would agree with Jason and Pat. I generally would support removing Option C in its entirety. I do have a question relative to Sub-option

C5. It seems to me that the need for Sub-option C5 is predicated on adopting one of the sub-options C1-C4. We already have this provision in place, relative to circle hooks.

Absent adopting a new measure that creates another unapproved method of take. It doesn't seem like C5 is a standalone as needed, unless something else is done. I can't remember who, but I think at some point someone made the comment of, we should get rid of everything but C5, but to me there is no need for C5 if C1-C4 go away, which is what I would be in favor of.

CHAIR BORDEN: Tom Fote and then Adam.

MS. KERNS: Mr. Chair, can we just make one clarifying comment to C5, before you go? C5, it's in the plan, Justin, it's a recommendation, it's not a requirement, if you'll remember, because it wasn't something that went out for public comment, so therefore it's a recommendation. But it occurs, but not a requirement.

CHAIR BORDEN: Justin, do you want to follow up on that?

DR. DAVIS: Yes, thanks, Mr. Chairman. Toni, do you mean relative to circle hooks, it's a recommendation but not a requirement?

MS. KERNS: Correct.

DR. DAVIS: Okay, thanks.

CHAIR BORDEN: Okay, so I'm back on Tom Fote and then Adam.

MR. FOTE: I would like to add one thing in this. It really goes to C5, is that if we have a closure both seasons, no picture taking of any striped bass at all, all fish must be released in the water. I think that any fish that can't be kept, because we know the size of it, should be released in the water, and no picture taking.

I mean, I look at these pictures of all these big fish being held up. We know they're going to be all released, and we put more stress in them pulling them out of the water, loading them into the boat. Some guy holding him there for five or six minutes while he gets the best picture, and then throwing them back overboard.

If we look at what they do with tarpon, they basically release the fish in the water. You're not allowed to take the fish out of the water if you want to protect them during closed seasons, or even during when the fish are not going to be landed for food. You've got to release them in the water without taking a picture. That would save more fish than anything else that's listed on these slides.

MS. FRANKE: Mr. Chair, this is Emilie, can I do a quick response?

CHAIR BORDEN: Go ahead.

MS. FRANKE: Thanks, Tom. The PDT did discuss a potential option for requiring in-water release of striped bass, for the reasons that you mentioned. However, there were some concerns about safety, in terms of making that a requirement. You know if striped bass were incidentally caught or in other scenarios, that it would potentially be a safety concern requiring an in-water release.

CHAIR BORDEN: Adam.

MR. FOTE: Can I answer that?

CHAIR BORDEN: Yes.

MR. FOTE: If we're not supposed to be landing the fish and we're supposed to be releasing them, there are different tools you can get to release fish that are four feet long. I have one downstairs without basically pulling it out of the water. People are required to get them. You are required when you get the gear to take the fish down and when you're fishing groundfish, I mean reef fish.

It basically lets them down easy, so you don't basically blow out the guts. I think we can get around that, but I look at all these pictures, and we know every scientist I have talked to about holding fish up to where they hold them to take those pictures, damages especially the big fish.

CHAIR BORDEN: Adam, you're up.

MR. NOWALSKY: Yes, based on the answers to my earlier questions, this would be another voice of support. I'm leaning towards a complete removal of Option C. I would not be opposed to the inclusion of C5, if there was some other place to put it, as it referred to some other gear restrictions that we've already talked about that are in place already.

But if we don't have C1 through C4 here, I'm having a hard time figuring out how we could leave C5 in. But if staff had a creative way to do it, I would otherwise support it. But beyond that, another voice in favor of removal of Option C.

CHAIR BORDEN: Sounds like we're getting general agreement to remove this with the sentiment being voiced that we try to address some of these issues in our public outreach. On C5, as Adam said, if there is another way to weave that into another portion of the document. It doesn't sound like there is a lot of objections to that. Let me ask, do we have objections to removing this, and handling it that way? Does anyone object?

MS. KERNS: I just want to give a second for the people who had their hands up, I think, and wanted to make questions, a chance to take them down. I have two hands in objection, John Maniscalco and John McMurray.

CHAIR BORDEN: Okay, and to both Johns, could you just clearly state so it's part of the record what your objection is? Johns, either one of you.

MR. MANISCALCO: I am not speaking for John McMurray, only for myself at this point. But I wonder why we would remove formal consideration of prohibiting gaffing. I don't understand how anyone would think that despite, maybe there is not a study that we're planning to remove, but helping a giant point in part of the fish does not seem like it is likely to lead to a low level of release mortality, and I don't know why we wouldn't be considering it at this point.

CHAIR BORDEN: John McMurray.

MR. McMURRAY: The goal is to reduce discard mortality. These seem like very commonsense ways to do it, even if there is difficulty in assessing the effectiveness of them. Well, it's commonsense that pulling three hooks out of a fish is more difficult than pulling one out. The same could be said with barbed hooks versus un-barbed hooks. I'm not going to fight everyone on this, but I do think it should stay in. I think the public should get a crack at it.

CHAIR BORDEN: Okay, so it sounds like the consensus is to take it out. We have two objections. I would ask that those objections be reflected in the minutes. Any other changes on this section?

MS. KERNS: I have Mike Armstrong followed by Max Appelman.

CHAIR BORDEN: Mike and then Max.

DR. ARMSTRONG: I would actually like to register an objection to get rid of C1. We put that in, it's been successful. I think it's something that's doable and should be in there, as is C5. I'll put that out there. Can we go back to B?

CHAIR BORDEN: Certainly.

DR. ARMSTRONG: If we could bring that up on the screen. Anyway, we're willing to do very difficult measures to help this stock. Seasonal closures at the height of tourism are not difficult, that's catastrophic, for benefits that are currently unquantified, and two weeks is not going to get us a lot.

Our whole fishery of striped bass is during the summer essentially, so we're shutting down the recreational fishery in Massachusetts for two weeks, in July and August. That just can't happen for us. If there was a huge quantifiable benefit, sure, we would jump onboard. But that's just not there. I'm okay with leaving an option in that gives the states a little bit more flexibility to move it out of Wave 4, if we have the data. I would advocate for eliminating B1 and the others can stay.

CHAIR BORDEN: Mike, you faded out a little bit, eliminate B1 and what?

DR. ARMSTRONG: And B2.

CHAIR BORDEN: Okay.

DR. ARMSTRONG: Which I think that's the coastwide option, which is just a nonstarter, and then let's see, B2, a bunch of options but all of them are closures during Wave 4. I understand why we would want to do that, but I am not seeing a huge benefit for getting people off the water for two weeks.

The other thing. I think for most people it's completely unenforceable, the no targeting aspect. You know maybe Mike Luisi can jump in and advise us on that. But as long as you have bluefish in the water, you are fishing for striped bass. It's just an unenforceable thing.

CHAIR BORDEN: Okay, I've got Max next, thanks, Mike.

MR. APPELMAN: I put my hand up when we were talking about gear restrictions, and I realized the conversation shifted to the season closures. I'm not prepared to talk about that, but I was just going to speak in support of not removing Option C1 from the gear restrictions, of course in support for that with some of the other commissioners.

CHAIR BORDEN: All right, you've heard the suggestions on this. Do we have any other comments?

MS. KERNS: Yes, I have a slew of hands. The list that I had, and I don't know if any of these hands have now gone down, so I'm going to try to keep track. Megan Ware, Ritchie White, Loren Lustig, Dennis Abbot, Pat Geer, Justin Davis, Marty Gary, and Mike Luisi. I have them all written down if you need me to repeat them later. I just want to note, there is a member of the public that has their hand up, and the Chair did say that he would not be taking public comment at this time, going through the issues, so just letting them know that.

CHAIR BORDEN: Okay, so I'm going to run through these and try to provide some guidance at the end of this. Megan, and then Ritchie White, you're up after that, on bat as they say in Boston.

MS. WARE: Thanks, Mr. Chair, I'll be brief, because that is quite a list. I support removal of B1 and B2. I think what I'm struggling with here is some of the rationale for focusing on Wave 4 is the peak air and water temperatures, which I totally understand is an issue in other states. But the states that are most affected by that are the New England states, which don't have that issue.

I mean, I get hypothermia alerts on my phone in July for Maine water, so I'm struggling to see, to go out to public comment with a Wave 4 closure because of peak air temperature and peak water temperature. I support Mike Armstrong in that, and then I would also keep C1 for the gear restrictions at this point, so perhaps a compromise there is removing C2, C3 and C4.

CHAIR BORDEN: Ritchie White.

MR. WHITE: I agree with Megan, B1 and 2 are just totally unenforceable in the Gulf of Maine with bluefish there. Law Enforcement is very clear about that, so that is just a waste of time. I would agree with Mike to leave in C1.

CHAIR BORDEN: Okay, Loren, you're up.

MR. LOREN W. LUSTIG: Yes, my comment relates to C5. Would you like me to give you the comment now, or perhaps hold it for later?

CHAIR BORDEN: You can do that, because I've allowed other people to stray into the Cs.

MR. LUSTIG: Okay, if I could get the slide back with C5 that would be helpful. Earlier in our discussion, there was a comment made by a staff member that it really was a recommendation not a requirement, and I took note of that. There it is on C5, notice it does use the word requirement. Perhaps if we do any wordsmithing, we should adjust that to be recommendation. That's all my comment.
CHAIR BORDEN: Dennis Abbott.

MS. KERNS: Mr. Chairman, if it's okay, I just want to make sure that it's understood. What is in the plan right now relative to C5 is a recommendation. This document would make it a requirement, as written.

CHAIR BORDEN: Dennis Abbott.

MR. DENNIS ABBOTT: I think Ritchie covered the points that I was going to make, and I will additionally say that a two-week closure with a season for us that runs approximately 12, 13 weeks would be quite an imposition, even if it was enforceable. I strongly would recommend removing those closures for us.

While I have the floor, could I ask the Chair a question, a general question? We've had a lot of discussion today about this document, getting it ready to go out for public comment today. What is the ramification of us putting it off for another meeting week? As I look at it, it doesn't matter whether we finish the document in February or whether we do it in May.

Because our implementation time wouldn't be until 2023. I think as it relates to the two motions that have been tabled. I think that we should be delaying, if possible, and allowing those two motions to go through, and let the PDT do its work, and allow us time to have a better document at the end of the day. Is there any loss of not finishing the document today?

CHAIR BORDEN: That's a good question, Dennis, and that's exactly why I said early in the meeting a couple of times, that regardless of which path we follow, we implement at the same time. There is really nothing lost by deferring action. As far as I know, staff can correct me if I'm wrong, it's still a 2023 implementation timeline, regardless.

MR. ABBOTT: Thank you, Mr. Chair, that was my thinking on that.

CHAIR BORDEN: Emilie, please correct me or Toni if you have a different opinion, please.

MS. KERNS: I think that that is correct, David. I think the one thing that we would look for from the Board is areas that need improvement to, that if it's not going to go out for public comment today that we know that, so that we can send it back to the PDT.

For these motions that have been tabled we would need to address them before the end of the day, so that if they did pass, we could have the PDT work on them, so that you could approve something for public comment in January. Because if we go much past January then you would start to impact the implementation timeline.

CHAIR BORDEN: Okay thank you, so I'm back on the list. I've got Pat Geer and then Justin Davis and then Mike Luisi. Pat.

MR. GEER: This is a clarifying question for the members of the PDT. The 15 day period, do they have to be consecutive days?

MS. FRANKE: Yes.

MR. GEER: They do have to be, okay. As far as going back, I know I'm jumping around a little bit, but as far as the gears with the gaffing. We tried to do that with cobia, and we have a law in our state for no gaffing for cobia, but it's pretty much

unenforceable for the most part, unless we see them. That's why I just felt that it would be better to try to do education and outreach. But if folks feel it's important to leave it in there, you know I'm okay with that too.

CHAIR BORDEN: Justin and then Mike Luisi.

DR. DAVIS: Real quick, I'll just express the opinion that I think we've heard enough folks say they would be in favor of keeping C1 in the document. But I think we should keep it in the document, I just don't think we have consensus on taking it out at this point. I also wanted to comment on Option B as a whole.

From my standpoint, I would be in favor of taking Option B as a whole out of the document. I think that no targeting closures are, certainly speaking from Connecticut's standpoint, I suspect for a lot of other jurisdictions are a regulatory nightmare and unenforceable. After what we just went through with the circle hook mandate and implementing that.

I am really gun shy about creating more mandates with questionable enforceability. I also share the concerns expressed earlier that we can't quantify the benefit from these potential closures, so we can't explain to the public what benefit we're getting for the sacrifice we're asking them to take. I sort of do think there might be some merit to exploring the idea in D5-a of no harvest spawning closures, and putting that idea out in front of the public.

But to me that's not an issue around recreational release mortality, and I think the connection made in the document is pretty tenuous, where it says releases might be reduced during the period if you prohibit harvest, because people will be discouraged from fishing. I don't even know if a harvest spawning closure really belongs in this section.

I understand why it's there, but I think it should remain just that. But in general, I just feel like this whole section is setting us up for implementing something where we can't clearly explain the benefit. It's going to create all kinds of enforcement issues. It's going to agitate a large section of the public.

I think it also just sort of reflects in my mind, a bit of a, I don't know what I would call it, maybe an outdated or inaccurate sort of idea of like, what do we want out of this fishery? I mean I think this is a fishery that is primarily recreational. The benefit we want from this fishery is opportunity for people to go fishing, which in turn provides economic benefits to society, because people are going fishing and spending money to do it.

I don't know why we would want to take opportunity to fish away from people, without a clear idea of exactly what we're getting from it. I'm in favor of removing Option B all together. I sense other folks on the Board may not be as ready to go that far, but I just wanted to put that out there.

CHAIR BORDEN: Mike Luisi.

MR. LUISI: I'm of the complete opposite opinion of some of the folks around the table who are suggesting that we remove Option B, Option B1 and Option B2 from the document, due to the number of different reasons that were mentioned. The one thing that made me most happy about this document when I read through it, was that these options on recreational release mortality were really starting to cut into a new way of thinking and a new way of approaching fishing mortality. Emilie started off this section explaining that part of the problem with this fishery is that we have a tremendous amount of recreational release mortality occurring coastwide, whether it's in the different bays, the estuaries, or along the coast. It is making up a large portion of the mortality associated with the fishery.

Mike Armstrong mentioned it earlier, but we took the path last year at implementing a two-week closure during Wave 4 at the highest air temperature and water quality, it was the most

poor. For two weeks we heard from our fishermen that the sky was going to fall, and everyone would be out of business. Yet that didn't happen.

We had a couple weeks' time when we had a tremendous heat wave. For the most part, fishermen complied with the no targeting provision. There were some warnings and citations written, from my understanding. But it is a learning process. Most people, I think we could agree that the majority of people who are fishing are rule followers, to some degree.

You're not going to capture everyone in a no targeting closure, but you're going to capture the rule followers, the ones that want to see this stock come back. Unless we deal with recreational mortality and release mortality, through non-targeting closures, we've basically done nothing. To modify harvest is one thing, but this is where we really need to put our focus, and we need to change the course of our actions to this non-targeting closure period. It's two weeks.

Yes, maybe there are difficulties in the enforcement. But it's for two weeks. It's not for three months. You know you can do anything for two weeks, and therefore I really feel like it would go against everything I believe in at this point, as far as how we're going to address recreational release mortality, by removing Option B from the document.

I could be inclined to consider removing B1 and B2, and leaving in B3, which gives states a little more flexibility, as far as how they could apply that closure, time periods in their fishery where the F is high. Maybe the middle of the summer isn't great for everyone. But as long as there is a closure during high effort periods, I think that's still going to make some progress in our development of addressing this recreational release mortality.

If we don't do non-targeting closures, we really haven't done anything regarding release mortality. I will say once again, you know we implemented the closure in 2021 the last two weeks in July, which is our peak tourist season and peak fishing time. We made it through, and we know that we saved a lot of fish during that time. I'm against removing it totally, but could be convinced to take some of these options out, as long as Option B3 stays within the document.

MS. KERNS: David, I have more hands. Do you want that list? David, if you're talking, I can't hear you.

CHAIR BORDEN: That was my best speech of the day.

MS. KERNS: I'm sure it was.

CHAIR BORDEN: I would just make the personal observation here that I am, as a recreational angler who targets striped bass with a fly rod, and practices 100 percent catch and release. I am very sensitive on this issue. But I find myself, in listening to both Justin and Mike, agreeing with both of them on parts of what they said. This is a good example, I think, of an issue that just begs us to continue to work on it, figure out ways to continue to work on this.

Maybe we just separate this out from the document, this section, but commit ourselves to working on it over some period of time, six months, nine months, and try to get at some of these nuances and problems. I mean the enforceability problem that has been talked about, I think is real. Some of these other issues, I think would benefit if we had a little bit more time as a Board to kind of focus on it.

I'm not exactly sure what the preferred way is to handle this, but personally it wouldn't trouble me if this entire section came out of the document, and the Board committed itself to dealing with this issue fairly quickly in a trailing action. But that's the only suggestion I have. I'll go back to being the Chair. We have kind of a consensus with some objections. I'm removing the red, and the objections were Mike Luisi and Emilie, can you tell me who else objected?

MS. FRANKE: I don't recall if anyone else objected to removing B1 and B2.

MS. KERNS: Mr. Chair, you have some hands up, and I'm not sure if they're in objection or if they just want to speak.

CHAIR BORDEN: Okay, so who are the hands, Toni?

MS. KERNS: I have Joe Cimino, Emerson Hasbrouck, and Jason McNamee.

CHAIR BORDEN: Joe, you're up.

MR. JOE CIMINO: I've been pretty quiet. You know I sat through our May meeting as a former PDT member, and pretty scared thinking about the tasks that they had at hand. We just spent the past several hours eviscerating their work in what I think was the only options they could have provided us.

I'm not sure the Board knows what they want at this point. But I do agree with Mike Luisi's sentiment, that just because something seems unenforceable, there is a lot in striped bass management that has that same sentiment that we felt was important, like circle hooks and federal water closures for other reasons.

It does disappoint me that we're just going to walk away from one of those unenforceable management options. I think just in general we're not ready for a document to go out to the public yet, if this body has taken the actions that they have today, compared to the requests that they had in May.

CHAIR BORDEN: Emerson and then Jason.

MR. EMERSON C. HASBROUCK: I'm not really opposed to removing Options B1 and B2, but I am completely opposed to removing everything in Section B. I mean we know that the largest component of fishing mortality is discard mortality, right? But if we take all of Section B away, and we've just taken most of Part C away. We've pretty much taken everything away that might address discard mortality in the recreational fishery. You know we've got a motion that's sitting on the table that we may or may not address later today, that's going to start a rebuilding program, and develop either, you know Option 1 I think was going to be status quo target or Option 2 was going to be to establish an F(rebuild).

If we're not going to do anything to address the largest component of F, what's left for us to do if we pick up that motion, or if we're going to do anything to rebuild this resource? We're already down to one fish, you can't go less than one fish. If we're looking at reducing F, then what do we have left, a shorter season? What's the difference in a way between a shorter season and a closed couple of weeks during the season?

I think we need to be careful in what we remove from this, or we're not going to have anything. Then we're going to be in a real tough place to rebuild this resource. Unless there is something else, or unless we want to defer while the Plan Development Team develops some other options to replace B, I'm going to ask, well it's a direct question, but it's somewhat rhetorical. What are we going to do to reduce release mortality, which is the largest component of F?

CHAIR BORDEN: Jason.

DR. McNAMEE: Maybe I'll start by saying, I would be okay with the removal of B1 and B2. I think they are kind of prescriptive, and I think the rest of B can be inclusive of these anyways. The reason I say it in this order is I tend to agree with Emerson, and that is, this is clearly a tool, and an important tool.

I think we're getting to the point where we're kind of limited, so I think it would be a mistake to completely remove B from the document. You know removing B1 and B2 meets this goal that I think we have here, of trying to streamline the document a little bit. I think the rest of these again, can incorporate any of these actions here in B1 and B2.

We slim it down a little bit, we don't remove the notion of closures entirely from our arsenal here of the tools we have available to us. The other thing I wanted to bring up we haven't hit on, but that is B4, Sub-option B4. I think if it's okay with you, I know we're getting late here, Mr. Chair, I don't think we're going to finish in the next two minutes.

But I'm kind of wondering, so this was the part that has to do with existing closures being able to account for this stuff with existing closures. I would like to know a little bit more about the PDTs thinking behind this, specifically, is our goal here to be additive with these options here. Like in that case I would say, no you can't swap in something you already have to account for one of these closures. But if that's not the intent, then I would feel differently about it. I'm just wondering. Emilie might be able to quickly shed a little bit of light on that. If it's not a quick answer, I'm fine just kind of thinking about it on my own.

MS. FRANKE: Mr. Chair, this is Emilie, I can provide a quick answer.

CHAIR BORDEN: Sure.

MS. FRANKE: B4 addresses those, there are two no targeting closures implemented in 2020 as part of Addendum VI CE program, to achieve the 18 percent reduction, and that was for Maryland and PRFC. From the PDTs perspective the PDT just wanted to flag with this option that those existing closures were implemented to contribute to achieving the 18 percent reduction in those states.

Just acknowledging that those closures were part of achieving a reduction, and whether or not the Board's desire to account for those as part of any new sort of closure, or if those states would need to implement additional closures, because those closures are already being used to achieve reductions, if that makes sense.

DR. McNAMEE: Thanks for that, Emilie, that's perfect. I appreciate that context in that one. As long as B is going to be in here in some way, shape or form, I think that's a really important one for us to think on a little bit, and comment on, so thanks for that.

CHAIR BORDEN: Okay, so Toni, do we have anyone else on the list who hasn't already spoken?

MS. KERNS: No, we do not.

CHAIR BORDEN: Okay, we've got kind of two suggestions on the table. Remove the items in red, and then there is a suggestion that we on C, if Emilie could jump to C, please, is to leave C1 in the list, so that would be black, Emilie. My question to the Board is, that is kind of where I see the consensus at this point. Is there anyone that objects to that consensus? We would remove these three red items, and then if Emilie can jump back to the prior slide, and you would remove that. We had a couple of objections, and those objections will be noted.

MS. KERNS: We had Adam and Mike Luisi with their hand up in objection.

CHAIR BORDEN: Any further discussion? If not, the items in red will be removed.

MS. KERNS: You still have Adam and Mike with their hands up, I'm not sure.

CHAIR BORDEN: Adam, do you want to speak?

MR. NOWALSKY: Yes, I would, thank you. On Option B, I agree that we're closer to consensus on the removal of B1 and B2 than we are to a consensus of keeping them in. I wouldn't object to B1 and B2. I think the other Bs provide a range of options for that. With regards to Option C, I have not heard a consensus on leaving C1 in. I've heard what I would believe is a split, in terms of people that I've heard speak. My suggestion would be consideration of, again, finding something else to do with C1 potentially under education, the question of a gaff. There are many ways to use a gaff that is non-lethal, a lift for example. There can be an awful lot of education that can be done.

There is no need to go ahead and gaff fish that you know are borderline. I think that that, from what we've heard today, I think there have been people that have spoken in favor of leaving this in that have raised some very valid points. However, I think if we're going to just leave gear restrictions with this one item in here and say gaff or no gaff. Given the other issues we've heard, and concerns about it, I think the gaff question would be better served as an educational item right now.

We're talking about some really comprehensive changes to the fishery in a lot of ways, to introduce more regulatory and enforcement issues already. Our goal here is to do everything we can to encourage angler compliance and angler satisfaction, which will result in them following the regulations and promote the conservation of the resource.

The farther we get away from that goal, Mr. Chairman, I think the more of a disservice we do to the resource, as well as ourselves. Again, I don't disagree on where you're at with B, but I would disagree that there is a consensus to leave C1 in. Again, I've heard a split. I would be comfortable though with moving language about this topic to the area of information and outreach.

CHAIR BORDEN: Let's just do this sequentially. Emilie, if you would go back to B, please. Okay, so these items are coming out by consensus, with a couple of objections. Now, we'll go back to C, so everyone is clear. We've got a couple of different ways of handling C1, but it seems like we have agreement on the rest of C. If members could comment on whether or not they want to handle it the way Adam is suggesting, or leave it as is that would be useful.

MS. KERNS: I now have Justin Davis, Ritchie White and Cheri Patterson and Dave Sikorski, in addition to Mike Luisi with his hand still up.

CHAIR BORDEN: Okay, Toni, could you just read that over?

MS. KERNS: Justin Davis, Ritchie White, Cheri Patterson, Mike Luisi and Dave Sikorski.

CHAIR BORDEN: Ritchie.

MR. WHITE: I think we should leave it in. New Hampshire already has regulations that do not allow gaffing of striped bass. You know we talk about the potential of now allowing targeting for two weeks, and then we go to something pretty simple, as not gaffing. You know it's kind of mind blowing to me that something as simple as this, not hard for someone to get a device, it's easy to do. It should be left in.

CHAIR BORDEN: Cheri.

MS. CHERI PATTERSON: I agree with Ritchie. He was ahead of me on this. This is an enforceable rule. We have talked about some rules that are questionable as to whether enforceable, or even whether they are functional towards determining if they are going to work or not. This is something that it's understood it will work. Again, New Hampshire already has this in their rules, and I think it needs to stay in.

CHAIR BORDEN: Mike Luisi.

MR. LUISI: I'm fine with leaving C as is. I don't have any trouble striking those three. I do want to make one last comment though regarding Options B1 and B2. While I think you probably heard a few additional people support the removals. I appreciate the sentiment that the objection will be noted.

But the note on that objection will die today, and it will not be carried any further along, because the public won't even have those options to review and discuss and consider. I don't even know how those objections to the removal of B1 and B2 will even be made known to the public, because it's not going to be in the document.

CHAIR BORDEN: Mike, it's going to get reflected in the minutes.

MR. LUISI: Sure, but most of the members of the public aren't going to read the minutes of this discussion over the last four and a half hours. I'm just a little disappointed that we don't take those options out to the public to get the feedback from them, and if that feedback is as strong as those members around the table have suggested, then the Board could consider eliminating them, or not selecting them down the road. I'll just leave it there. As long as B3 stays in, at least there will be one effort control that we can consider.

CHAIR BORDEN: Okay, David Sikorski.

MR. SIKORSKI: I am supportive of effort controls. I support some of what Mike just said today, and I think it was Dr. Davis that had mentioned spawning closures and how they relate to recreational angler recreational release mortality. To me spawning closures is a much bigger issue, how we're treating pre-spawned fish was beyond the recreational fishery. Then they have the Chesapeake Bay ones, there is harvest in both Maryland and Virginia on pre-spawned fish in both sectors. I don't know where it fits, because it doesn't.

But if we're talking about F, we're talking about F at a coastwide level, and the need to manage it. I just wonder if the PDT could provide some more guidance on what our impact is on pre-spawned fish across all sectors and all fisheries. Just to give the Board an understanding of potential places to alleviate F in a strategic way, knowing that these fish are headed to the spawning ground, and recruitment continues to be a challenge. I would look for some guidance from some folks on that. That issue is appropriate.

CHAIR BORDEN: What I'm hearing is that C1 is going to stay in as is. Does anyone object to want to go on the record as objecting?

MS. KERNS: I have no hands.

CHAIR BORDEN: Okay, so Emilie, does that finish this section?

MS. FRANKE: The only thing that hasn't been discussed is Option E, which is education and outreach. There are two options there.

CHAIR BORDEN: Any comments on this, other than the fact that it's a good idea? I think we're through with this section. As I announced right at the start of the meeting, it was my intent to deal with the Addendum VII issue, and then we're going to come back to this document, and pick up exactly where we are, and decide what path we move forward. The meeting is going to continue.

**CONSIDER DRAFT ADDENDUM VII FOR PUBLIC COMMENT**

Emilie, if you would move on to Addendum VII, and just outline this. I think this should be a fairly quick issue to deal with, and then we'll come right back and pick up where we left off.

MS. KERNS: We're going to do that, we're just going to have to flip the PowerPoint back over to Maya, I think. Switching up the PowerPoints here, so just give us a second, please.

MS. FRANKE: All right, Toni, I've got it up here on the screen. I can go through the presentation. Switching gears here to Draft Addendum VII to Amendment 6 for Board review, and this is related to Commercial Quota Transfers for the Ocean Region. Again, just some quick background.

In February the PID for Draft Amendment 7 was approved for public comment, and it included the issue of coastal commercial quota allocation. Coastal commercial quota allocation has been based on harvest data from the 1970s, which may or may not be an appropriate baseline. No other ASMFC managed species is managed with harvest data as old as used for striped bass. The Board did not include this issue for further consideration in Draft Amendment 7.

Many Board members acknowledge the concerns that were raised, but found that it was not the time to address allocation. The Board noted that the

Draft Amendment process would not be the right time, because these allocations especially could make the process more complex. However, in order to provide a management option that could provide some immediate relief to states that were seeking a change in commercial quota.

The Board initiated Draft Addendum VII in August of this year, to consider allowing voluntary commercial quota transfers of the coastal quota. This Draft Addendum considers transfers of commercial coastal quota only, between states with coastal quota. 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 those two areas.

Here is the proposed timeline for Draft Addendum VII. After the Board initiated the Draft Addendum in August, the PDT developed the draft addendum document, which was included in supplemental meeting materials for the Board's review. Today the Board is considering approval of Draft Addendum VII for public comment. If the Draft Addendum is approved for public comment today, the public comment period would take place over the next few months, and the earliest the Board could consider approval would be January of next year. Option A in Draft Addendum VII is the status quo, in which no commercial quota transfers are permitted. The only alternative in this Draft Addendum is Option B, which would allow transfers of coastal commercial quota. Under this option transfers between states may occur upon agreement of two states at any time during the fishing season, up to 45 days after the last day of the calendar year.

All transfers require a donor state and a receiving state, and the administrator commissioner of the agency involved must submit a signed letter to the Commission, identifying the involved state, species, and pounds of quota to be transferred. There is no limit on the amount of quota that can be transferred by this mechanism, and a transfer becomes effective upon receipt of a letter from the 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, and these transfers do not permanently affect the state-specific shares of the quota. Then finally, once the quota has been transferred to a state, the state receiving that quota becomes responsible for any overages of the transferred quota.

The PDT in the development of this Draft Addendum noted some concerns with adding ocean commercial quota transfers to the fishery management program at this time. If the Board approves Draft Addendum VII for public comment, it is recommended that the PDT concerns be added to the Draft Addendum document. The PDT notes similar concerns were previously raised by the Technical Committee in 2014, when transfers were considered in Draft Addendum IV.

The first concern from the PDT is that quota transfer could underline the goals and objectives of the Addendum VI reduction. The commercial ocean fishery has consistently underutilized quota, and during the Addendum VI process the TC noted that the reduction in commercial quota would achieve the necessary Addendum VI reduction, only if the commercial fishery performed as they have in the past, so if they continue to underutilize their quotas to the same degree.

This assumption would be violated if the transfer of commercial quota is permitted, and if Addendum VI quotas were fully utilized by allowing the transfer of latent quota, harvest would be higher than estimated in those Addendum VI projections. The second PDT concern is that a pound of commercial quota is not equal across states.

Through conservation equivalency states have been able to adjust their commercial size limits, and this results in changes to their respective commercial quotas. For example, when implementing Addendum VI, Massachusetts increased its commercial minimum size limit, and this increased

the quota. New York lowered its commercial slot limit minimum, which decreased its quota.

These types of changes in state quota through CE has been occurring since before Addendum VI, so over time there have been several adjustments to commercial size limits, resulting in changes to commercial quotas. Given additional time, the PDT might be able to address this issue, and consider all the changes made to the base quota allocations over time. Mr. Chair, that wraps up my summary of the Draft Addendum, and the memo from the PDT.

CHAIR BORDEN: Emilie has outlined the issue. These concerns came up, honestly, they should have come up earlier in the process, and they did. I think the problem here was the concerns were not voiced during the last session when we discussed this. There were other issues that got raised by New Hampshire.

Now, I spoke to members of the Delaware delegation, and basically told them that I would recognize them at the start of this meeting. They've heard the comments that have been made and the concerns that have been made. I think John Clark would like to speak directly to those, and offer a path forward. John.

MS. KERNS: I think it was, I don' t know, Roy Miller has his hand up, so maybe it was Roy.

MR. CLARK: It was Roy, David, I'll defer to Roy.

CHAIR BORDEN: Okay, Roy, please.

MR. MILLER: I have that motion I would like to put before the group. I had sent it to Toni, hopefully she can load it.

MS. KERNS: Got it up there for you, Roy.

MR. MILLER: I would like to make the following motion. **Move to defer consideration by the Striped Bass Board of Draft Addendum VII to Amendment 6 to the Atlantic Striped Bass Plan to allow further development and review of the transfer options.** Our rationale for this suggestion, the concerns expressed by the PDT. There would be additional time with a deferment to address those concerns, and also the concerns raised by the state of New Hampshire. That is my rationale for deferring this action at this time.

CHAIR BORDEN: All right, so we have a motion by Roy Miller, do we have a second to that motion?

MS. KERNS: Marty Gary.

CHAIR BORDEN: Seconded by Marty Gary. Roy, just for my own edification. The last time that this issue came up, John spoke on behalf of your delegation and basically voiced the opinion that his state and your delegation, would be willing to work with the Commission staff on this. Is that still the intent?

MR. MILLER: Yes.

CHAIR BORDEN: Okay thank you, so questions for Roy, excuse me. Marty, would you like to comment as the seconder?

MR. GARY: Only just to say, I've had a chance to sit on virtually every PDT meeting, so I fully understand their concerns. I think Delaware does too. But also, been talking to the delegation in Delaware, and I think a lot of the folks understand that side of the equation. This is another opportunity to see if we can address their needs, and also the concerns. Hopefully this will get there.

CHAIR BORDEN: Other comments.

MS. KERNS: I have Megan Ware and then Mike Armstrong, then Cheri Patterson and Chris Batsavage.

CHAIR BORDEN: Megan Ware.

MS. WARE: I think this will be a question for staff. I'm just trying to understand what this means, in terms of timing. It's the intent to bring this back to the February Board meeting, or is there potentially going to be too much going on with Amendment 7

that would be a further out task? I'm just trying to understand.

MS. KERNS: Thanks, Megan. Emilie, I'll pinch hit for you. I think it depends on, again what action gets changed in the document, and then how much work the PDT has on Amendment 7. The Board has said the priority is Amendment 7, and so the PDT would work on those issues first, prior to working on changes to Addendum VII. It would depend on what feedback we got from the state. I don't know if it's just Delaware, or we're also going to be getting feedback from other states of what issues to address.

CHAIR BORDEN: Cheri.

MS. PATTERSON: I really appreciate this consideration by Delaware. However, I think that considering what we're dealing with in our current discussion, the discussions we were just having, that we have a larger concern to deal with, not just transfer of commercial options. I would like to do a substitute motion.

CHAIR BORDEN: That's within your right.

MS. PATTERSON: **I would like to move to postpone Draft Addendum VII to Amendment 6, until such time as striped bass is not overfished and overfishing is not occurring.** If I can get a second, I'll provide some rationale.

CHAIR BORDEN: Do I have a second?

MS. KERNS: Tom Fote.

MS. PATTERSON: Thank you, Tom. The rationale is, you know apart from New Hampshire's concerns and questions that are in the materials. You know some of these points that are going to be hashed out, were definitely silent in the approved motion. I think we need to, as Delaware has indicated, need to delve further into that. But I would like to point out more explicitly what came out of the PDT memo in that they're concerned that quota transfers could undermine the goals and the objectives of the reductions taken under Addendum VI. During the Addendum VI process the TC noted the reduction in commercial quota would achieve the necessary reduction in commercial removals, only if the commercial fisheries perform as they have in the past.

Addendum VI commercial quotas were fully utilized by allowing the transfer of latent quota. Commercial harvest would be higher than estimated in the Amendment 6 projections, and states would not maintain the required commercial reduction, thus potentially undermining the goals and objectives of Amendment 6 to end overfishing. A pond of commercial quota is not equal across all states through conservation equivalency.

As the PDT had indicated, they really don't have the time to be looking at this, and they haven't had the time to look at all the changes made to the base quota allocations that have resulted from adjusting the commercial size limits. There are just too many questions here, and we're struggling on how to get out of a fish species that is being overfished and overfishing is occurring. I just don't think that this is a good idea at this point.

CHAIR BORDEN: Okay, so Tom Fote, do you want to comment as the seconder?

MR. FOTE: Yes, I would like to. I'm not against Delaware getting more quota. I think, when I think of when we set up the quota, which was based on the years, because that's when there were no fish spawning in the Delaware River and the Delaware Bay. New York's problem was because of lack of reporting on black sea bass and they asked for more quota, the same thing with Connecticut.

We have now seen the population in the Delaware River greatly increase. We've got to figure out a way to handle Delaware's situation. I support doing that. But to transfer quota at this time, no. I would like to move ahead and try to figure out how to handle the problem with Delaware having a quota that was based on when the bass fishery was really nonexistent in the Delaware River.

CHAIR BORDEN: Okay, so Toni, could we go back on the list? Could you give me the names again, please?

MS. KERNS: You have Chris Batsavage, Max Appelman, John Clark and Mike Armstrong.

CHAIR BORDEN: Okay, Chris, you're up.

MR. CHRIS BATSAVAGE: I guess consideration, I guess speaking to the first motion if we were to go forward with something, and not postpone, is I mean narrowly focus the amount of quota that can be transferred. I mean yes, admittedly if we transferred all the latent quota that would undermine what we're hoping to do in Addendum VI.

I think transferring all of North Carolina's allocation would do the same thing. But if there was a small amount of quota that could potentially be transferred, and I don't know what that amount would be. But stay within the range of what the commercial landings have been over the last few years that was used to kind of base projections from Addendum VI. That might be maybe a short-term solution to address the problems that Delaware has identified over the last several years at least. But I do understand and recognize the concerns of the PDT, that kind of the way the Addendum is written now, with kind of an all or nothing transfer option. That kind of really goes against what we're trying to do overall with striped bass. I just wanted to throw that potential option out there, to see if that's even something worth considering.

CHAIR BORDEN: Max.

MR. APPELMAN: I'm prepared to support the first motion, because I think the PDT really could spend some time and try to address some of these concerns with the transfers, and sort of get them on the same playing field. Maybe propose some additional options to alleviate some concerns about undermining the most recent actions with Addendum VI.

I would support that first motion. But with the motion to substitute, I guess I'm a little confused as to what this would mean to where the Board's priorities were with removing the issue of commercial allocations as a whole from Amendment 7, and putting it aside until after Addendum VII was complete. I believe the intent was, once Amendment 7 is implemented there would be discussions about addressing commercial allocations from a coastwide perspective.

This Addendum was really just to try to provide immediate relief in the interim. If the substitute motion were to pass, and now we wouldn't even consider this until the stock is not overfished or overfishing is not occurring. Where would that leave the Board's priorities with addressing issues with commercial quota?

CHAIRMAN BORDEN: Comments.

MS. KERNS: David, I can tell you that it was staff's intention to bring up an allocation addendum after Amendment 7 was completed, regardless of where Draft Addendum VII went, because that was the direction we received, that this Draft Addendum VII, for lack of a better word, was sort of a quick fix to provide an option for Delaware to get an opportunity for some quota prior to that Addendum on allocation.

MR. APPELMAN: Follow up, Mr. Chair.

CHAIR BORDEN: Yes, go ahead, Max.

MR. APPELMAN: I guess my first question would be, if that is still the intent, would the concept of commercial quota transfers be part of that initiative? Then I guess maybe some clarification from the makers of the motion that this would sort of adjust the Board's priorities with commercial allocation with broader issues with commercial allocations once Amendment 7 is complete. The thought being there that I don't think we would be in an over, you know the stock would not be overfished come that time, so my timeline here is a little confusing.

CHAIR BORDEN: Cheri, do you want to provide clarification on that, or does somebody on the staff want to comment on that?

MS. KERNS: I can comment, David, to the extent that it is up to the Board what would go in the Allocation Amendment. We would need obviously direction from the Board of what to put in the document. There is a possibility, I guess I could say that Max, anything is possible. Then I'll just say you have, I don't have the order anymore, but Mike Armstrong, John Clark and Roy Miller with their hands up.

CHAIR BORDEN: John Clark, you're next on my list, Mike Armstrong is after that.

MR. CLARK: I would like to speak in opposition to the substitute motion and in favor of the original motion. As Roy mentioned, we recognize the concerns of the PDT, and I think it was the Draft Addendum as written is very basic. I think there are options we could put in there that would take care of most of these concerns here.

One of the options that Chris Batsavage just mentioned I think would be helpful, is we would put limits on the amounts. I mean every transfer could go to the Board for Board approval, which could have the effect that there wouldn't be any transfers approved for a long time to come anyhow.

But I just don't think it's right to just put this off until some vague future time. As we know from allocations, when we do get to the point where we're actually looking at striped bass allocation of the commercial quota. We know that's going to be a long-drawn-out process. Amendment 7, as we've just said, won't be approved until 2023. Who knows how long that allocation addendum would take?

I think we're not expecting immediate relief. We recognize the state of the stock right now. But at the same time, we think if we can get an addendum passed that would have some of these guardrails in place, that we would get the Board plenty of input, as to whether a transfer would take place or not. Perhaps we could work something out in the hopefully not for ten years into the future, where we could see some transfers take place.

Obviously, our timing is not great at this point. But we have been bringing this issue up at least since, well pretty much since Amendment 6 went into place. This is not a new issue from us, and I really think that at this point the Board could at least let us go forward with something, because you know it's unfortunate in our timing, but I think we could come up with addendum options that will satisfy the concerns that have been expressed.

CHAIR BORDEN: I next have Mike Armstrong.

DR. ARMSTRONG: I don't think we can support the motion to substitute. We are probably six, seven years from overfishing not being occurring, based on the projections. I think there is a way to reallocate or some other method that will be F neutral. Like clearly, we can't transfer stuff now, because it will raise F.

Going back to the main motion. I'm not sure, I've been listening to Toni. If she says we should kill it and start fresh after Amendment 7, or if we could keep this. If we can keep it, I would love to see it perfected, saying something like defer until after we finish Amendment 7. Not necessarily implement it, but just done reviewing and approving it, which would be next spring. Just because I don't want to raise the hopes of the proponents that the PDT will start working on it right away. I don't think they can. We are about to pass, I think a fair amount of stuff from this Amendment, and that is the priority. We do have to push it down the road, and maybe we stipulate exactly when we'll start working on it.

CHAIR BORDEN: Toni, who else do you have on the list, and I'm getting close to the point where I'm going to call the question on the substitute motion.

MS. KERNS: Roy Miller is next on the list. I just want to make sure it's clear. I was just trying to outline the process for addressing allocation later

down the road. I wasn't necessarily saying you all need to kill this or not. But I was trying to make clear that the PDTs priority will be Amendment 7, and if there is additional time we will address Addendum VII, and bring it to the Board in January as a motion for it to pass. But if there is not time then we would have to postpone longer.

CHAIR BORDEN: Roy, I'm going to give you the last word and then I'm going to call the question.

MR. MILLER: Very quickly, thank you, Mr. Chair. For the reasons that John has stated and Mike Armstrong and Chris. I would recommend against approving the substitute motion. Recreational mortality is the largest component of our mortality that we have to deal with, as a substitute of this Addendum.

Commercial harvest as it presently exists is not the problem. I feel that given sufficient time we can craft a proposal that is close to neutral, in terms of its impacts on the coastal commercial harvest. If not neutral than close to neutral. For that reason, I oppose the substitute motion. I specifically left the original motion indefinite, in terms of how much time to allow. If people are more comfortable with putting finite limits on when the Draft Addendum can be considered, that would be something we would entertain.

CHAIR BORDEN: I'm going to call the question on the substitute motion. Do delegations need time to caucus? Does anyone need time to caucus?

MS. KERNS: I have one hand raised for caucus.

CHAIR BORDEN: Okay, so we'll take a two-minute caucus, and then I'm going to ask Toni to call the roll, and everyone will raise your hand at the appropriate time, depending upon how you're voting. Two-minute caucus. All right, the time is up. Toni, are you ready?

MS. KERNS: I am ready, Mr. Chairman. To expedite it, can we just ask for those in favor, and I will call off the names? It will be faster.

CHAIR BORDEN: Okay, I will do that. All those in favor of the substitute motion, please raise your hand and Toni will call out the names.

MS. KERNS: I have New Hampshire and New York. That is all.

CHAIR BORDEN: Okay, so two in favor, opposed. Please take the hands down and all those opposed to the motion, please raise your hand.

MS. KERNS: Going to let the hands settle. I have Connecticut, Pennsylvania, New Jersey, Maine, District of Colombia, Maryland, U.S. Fish and Wildlife Service, Delaware, Massachusetts, North Carolina, Rhode Island, NOAA Fisheries, and Virginia.

CHAIR BORDEN: If I counted correctly, I had 13.

MR. GARY: Did you get PRFC, Toni?

MS. KERNS: PRFC, 14.

CHAIR BORDEN: Fourteen in opposition. Any null votes?

MS. KERNS: None.

CHAIR BORDEN: None, 0, any abstentions?

MS. KERNS: None.

**CHAIR BORDEN: The vote fails. The vote was 2, 14, 0, and 0.** We're back on the main motion. Is there anyone that requires the need to speak to this motion, to make a point that has not been made before?

MS. KERNS: I have Megan Ware.

MS. WARE: Just to follow up on a comment from Mike Armstrong earlier. If it would be accepted as a friendly from Roy and Marty, you consider a time certain, I guess it would be, for deferring? I would feel much more comfortable looking at this after

Amendment 7, or at least after the PDT work on Amendment 7 is concluded.

CHAIR BORDEN: Roy and Marty, I think that's a question to you. She is suggesting a perfection, you add in some language about after the PDT concludes its work on Amendment 7. Roy, is that acceptable or not? If it's not acceptable I'll just move to call the question.

MR. MILLER: Mr. Chair, it's a little awkward. I would like the opportunity to confer with my colleagues from Delaware.

CHAIR BORDEN: Okay, so how long would you like?
MR. MILLER: Would one minute be, okay?

CHAIR BORDEN: One minute is fine. Marty, are you in agreement with that?

MR. GARY: Yes, Mr. Chairman, thank you.

CHAIR BORDEN: Roy gets a minute.

MR. MILLER: Thanks, Mr. Chair, for your forbearance. We would be more comfortable if we saw the specific wording that Megan suggested, so we make sure it's in the record, and then I can tell you very quickly, as soon as we see it, whether we're comfortable with it.

CHAIR BORDEN: Megan, do you want to make your suggestion? I urge you to keep it simple.

MS. WARE: Yes, I guess after the word defer, I would put until May, 2022, because I think at this point is when I project, we will take final action on the document, on Amendment 7.

MR. MILLER: Mr. Chair, we're comfortable with that.

CHAIR BORDEN: Thanks, Roy. Marty, as the seconder are you comfortable with that perfection?

MR. GARY: Yes, Mr. Chair.

CHAIR BORDEN: Okay, so we have a perfected motion on the table. Is everyone ready to vote? Given the status of the last vote let me ask, is there anyone who objects to this motion?

MS. KERNS: Mr. Chair, I see no hands raised in objection.

**CHAIR BORDEN: Okay, so this motion is approved without objection.**

**CONSIDER DRAFT AMENDMENT 7 FOR PUBLIC COMMENT (CONTINUED)**

CHAIR BORDEN: I believe that concludes the discussion on this issue.

We will go back to Amendment 7, and I'll give the staff a minute to rearrange the PowerPoint.

MS. FRANKE: All right, Mr. Chair, I'm ready whenever you are.

CHAIR BORDEN: All right, Emilie, if you'll lead us through this. Before you do that, I just want to comment that it's almost six o'clock. We'll go until 6:30, and then make a judgment on how we want to move from there, if at all. Emilie, if you could, please move forward with 4.5.2.

MS. FRANKE: As the last section of the draft options that I will review today. This is Section 4.5.2 in the Draft Amendment document for conservation equivalency. Starting with the statement of the problem. There is value in allowing states to implement alternative regulations through conservation equivalency, as noted in the Draft Amendment, to meet the needs of state fisheries.

However, this creates regulatory inconsistency among states, and within shared waterbodies with associated challenges, such as enforcement challenges. Another challenge is that it's difficult to evaluate the effectiveness of CE programs once they are implemented, due to the challenge of separating the performance of management measures from outside variables, such as angler

behavior, and the availability of fish. There have been some concerns raised that some alternative measures implemented through CE could potentially undermine management objectives. Then finally, there is also limited guidance on how and when CE should be pursued, and how equivalency is defined. For this issue, Option A is the status quo and Options B through E consider whether to adopt new default restrictions or requirements for the use of CE, or whether to eliminate the use of CE from the FMP, which is Option F.

Sub-options selected under Options B through E would automatically apply to any new FMP standard approved through Amendment 7, and all subsequent management actions and CE proposals. Options B through E are intended to address concerns about CE at the front end of the CE process. That is considering when CE can be used and requirements for CE proposals.

Alternatively, Option F would eliminate the use of CE from the FMP. If this option is selected, Option F, then Options C through E would not be valid. I just want to note from the Advisory Panel meeting, some AP members noted the importance of accountability, and concern that accountability measures were not included in the draft options.

As a reminder, accountability options were not developed for this Draft Amendment due to the challenge, again of separating out the performance of management measures from factors like angler behavior and fish availability. One other note on this suite of options for CE. The PDT did discuss the request from the August Board meeting to consider incorporating CE proposals into a management document itself.

However, the PDT concluded that this would not be a viable option from the PDT perspective, due to the additional time that would be required to develop CE proposals for each management option for inclusion in draft documents for public comment, and the additional time that would be needed to develop management documents to include CE proposals.

First, just to review the status quo Option A. The Board has final discretion regarding the use of CE, and approval of CE programs. Under the status quo option the Board can restrict the use of CE on an ad hoc basis for any FMP requirement. Potential restrictions could include specifying measures that are not applicable through CE, or limiting the range of measures that may be proposed through CE. For example, along with other types of restrictions, again at the Board's discretion.

Moving on to Option B in Draft Amendment 7. The following sub-options under Option B would establish default restrictions on the use of CE for certain fisheries, depending on the status of the striped bass stock. When the stock conditions are met, CE programs would not be approved, based on the options that would be selected. It's important to note, that previously existing CE programs would remain in place until Board action is taken on a new FMP standard relevant to that fishery.

The first set of sub-options here is B1, which considers what the restrictions would be. B1-a would not allow CE if the stock is overfished. B1-b would not allow CE if the stock is below the SSB target, and B1-c would not allow CE if overfishing is occurring. The next set of sub-options considers the applicability of any of these options selected under B1. At a minimum, any of the selected restrictions that I just went over would apply to non-quota managed recreational fisheries in both the ocean region and the Chesapeake Bay Region, with the exception of the Hudson River, Delaware River, Delaware Bay and Chesapeake Bay spring trophy recreational fisheries. The reason for this is that most of the concern surrounding CE, as identified during the scoping process for Draft Amendment 7, are related to non-quota managed fisheries, and this is due to the use of uncertain data assumptions in modeling, and also challenges with measuring the effectiveness of CE.

The Board could choose to extend these CE restrictions to one or more of the following additional fisheries in Sub-option B2. B2-a would apply to CE restrictions as well to the Hudson River, the Delaware River, the Delaware Bay recreational fisheries. B2-b would extend those restrictions to include the Chesapeake Bay spring trophy fishery.

B2-c would extend those restrictions to include quota managed recreational fisheries, so bonus programs, and then B2-d would extend those restrictions to also apply to commercial fisheries. The next set of sub-options here, Option C, would establish default precision standards for MRIP catch and effort estimates used in CE proposals.

These options are based on the percent standard error, or PSE, associated with MRIP estimates. C1 would not allow any CE proposals to use MRIP estimates with a PSE exceeding 50. C2 the PSE could not exceed 40, and for C3 the PSE could not exceed 30. The PDT notes the statement from NOAA about MRIP estimates with PSEs.

NOAA states that MRIP estimates with PSEs over 30 should be viewed with caution, and that large PSEs, which are those above 50, indicate high variability and low precision. Finally, the Draft Amendment encourages states to increase APAIS sampling as needed, and as resources allow.

I just want to note that one AP member noted the NOAA concern about the use of MRIP for CE proposals, and also noted concern that a PSE threshold of 50 is still too high. The next set of sub-options, Option D would establish a default uncertainty buffer for CE proposals for non-quota managed fisheries. An uncertainty buffer is intended to increase the probability of success in achieving equivalency with the FMP standard. These uncertainty buffer options would provide a proactive accountability measure for non-quota managed fisheries.

Option D1 would require an uncertainty buffer of 10 percent for CE programs. D2 would require a buffer of 25 percent, and D3 would require a buffer of 50 percent. This buffer would apply to the percent reduction that's required, or the liberalization that's being allowed for the non-quota managed fisheries. For example, if a 20 percent reduction is required with a 10 percent uncertainty buffer, proposed CE programs would need to demonstrate a 22 percent reduction.

The Draft Amendment notes that the Board may need to further determine how the buffer is applied for some future management actions, particularly when CE proposals might include measures for both quota managed and non-quota managed fisheries. For example, as in Addendum VI, if the reduction can be split between sectors, the Board may request guidance from the TC or PRT when making those determinations of how exactly the uncertainty buffer would apply. Option E considers establishing a default definition of what equivalency means for CE proposals for non-quota managed fisheries. These options are intended to specify the percent reduction or liberalization that must be met in the CE proposal, when the FMP standard is suggested to have different effects at the coastwide versus the state-specific level. Proposed CE programs would be required to demonstrate equivalencies to either the percent reduction or liberalization projected at the coastwide level, that's Option E1.

For example, this is the requirement for Addendum VI, that each state achieves the 18 percent reduction as projected by the FMP standard at a coastwide scale. Alternatively, Option E2 proposed CE programs would be required to demonstrate equivalency to the percent reduction projected for the FMP standard at the state level, instead of the FMP standard projected at the coastwide level.

For example, if there is an FMP standard that's adopted that achieves a 20 percent change in removals when applied coastwide, in this example state A, when the FMP standard is projected at the statewide level, state A sees a 25 percent change in removals, and state B sees a 10 percent change. Under Option E1, which uses the coastwide level, both states would be required to demonstrate

equivalency to 20 percent, which is that coastwide level projection.

Under Option E2, the state specific projected changes would be, so state A would be required to demonstrate equivalency of 25 percent and state B would be required to demonstrate equivalency for 10 percent. Then finally to wrap up here, Option F would prohibit the use of CE. It would remove the allowance for CE from the striped bass management program until it is reinstated by the Board in a future management action.

Again, previously existing CE programs would remain in place until states are required to implement any new FMP standards that are approved by the Board. Just another note, that if Amendment 7 changes the ocean region status quo recreational slot limit that was discussed in the 2015-year class section.

Any new size limit would apply to the ocean region, including the Hudson River, Delaware River, and Delaware Bay, unless the FMP establishes a separate standard for those fisheries, in this case where CE would be prohibited. With that, Mr. Chair, that's all I have for the CE draft options, and I'm happy to take questions.

CHAIR BORDEN: Are there any questions for Emilie on any of those items?

MS. KERNS: I have one hand, Mike Luisi.

CHAIR BORDEN: Mike Luisi.

MR. LUISI: Emilie, with the changes that are possible here with conservation equivalency, how does it relate to the Commission's conservation equivalency policy document? Is this something, and I thought I had heard that the Policy Board is considering updates to that policy document. Is there a connection between what we're considering here for striped bass and what might be considered for other species that the Commission manages, or is this specific to striped bass only, and the policy document will remain intact as is?

MS. FRANKE: I'm going to defer to Toni on this one.

MS. KERNS: What is being proposed here is specific to striped bass only, Mike. At the Policy Board I'm going to go over a list of questions that the Management and Science Committee have been tasked with. Some of the questions relate to some of the topics here, like for example buffers that we're asking the Management and Science Committee to look into. Then based on information that comes back from the Management and Science Committee, we'll consider changes to the policy or guidance document for CE, that would apply to all species.

MR. LUISI: Okay, thanks. This would be an add on to the possible change for the more holistic group of species that we manage. This would be on top of that. There would be a section on how striped bass are specifically managed, or would the document just refer to Amendment 7 for striped bass?

MS. KERNS: It wouldn't refer to it, it's just that these would be specific requirements for the striped bass fishery. Then David, you have Mike Armstrong.

CHAIR BORDEN: Toni, any other hands up?

MS. KERNS: Mike Armstrong.

CHAIR BORDEN: Mike, question.

DR. ARMSTRONG: Yes, I have a question about the PSEs. I don't want us to go down the wrong road on this. This might be a question for Dr. Drew. That's the PSE applied coming from what? You start with a statewide value for the whole year with a PSE, then you decide to go with a mode, and that's a different PSE.

Then you decide to go with a season built into that. Without walking through it, I can't really wrap my head around it, but it sounds like you have to strap error bars when you're pulling all these pieces in. I just want to make sure what we're getting into when we're recommending this. This is a starting

PSE, whatever you're altering? Someone, help me please.

DR. DREW: I can maybe take a first stab at this, but I think I would defer to the PDT on what their intentions were for this. But yes, the goal would be to, if you are going to do a seasonal measure, then the data that you need to be able to calculate a meaningful value out of that data. You know if you're working then with wave-specific data, or if you're working with mode-specific data, then the PSE would apply to that dataset.

You can pool across years or you could pool across states within a region, to get your PSE to that level. You know the MRIP data, you are able to do small domain estimation on the MRIP data, so you could say, what is Maryland's PSE for Wave 2 over these five years, and have a value of that PSE that takes into account all of the correct statistical weighting on that front. You're not having to do a tailored expansion for example, to combine some of this variance. But I think the goal is that if you are focusing on very narrow datasets, that there is some consideration of the error or the uncertainty around that dataset, and to give kind of clear guidance to the TC when they're working up these analyses, about what level of risk the Board feels is appropriate.

DR. ARMSTRONG: Okay, thank you.

CHAIR BORDEN: Toni, anybody else on the list?

MS. KERNS: I have no other hands.

CHAIR BORDEN: Anyone proposing a change?

MS. KERNS: One hand, John Clark.

MR. CLARK: Just for the sake of moving this along. I would like to see that option removed that totally eliminates CE from striped bass. Would it be possible, Emilie, to put all the options on a single page so we can see them all at once? I think it was the last option, oh there we go, yes. Of course, I'd like to make, well obviously we're going to keep that one. But that's one I would definitely like to see removed, and I think some of the other ones there are going to be pretty tricky. But a prohibition on the use I would like to see removed.

CHAIR BORDEN: Okay, so John has recommended prohibition, so members should speak pro or con on that. Any hands up?

MS. KERNS: You have Ritchie White.

CHAIR BORDEN: Ritchie.

MR. WHITE: The public seemed to be pretty clear the last time we were out to the public, so I think this option ought to stay in, so the public has a chance to comment on it. I would be opposed to removing it.

CHAIR BORDEN: Any other hands up, Toni?

MS. KERNS: I have Adam Nowalsky, John McMurray, and Mike Luisi.

CHAIR BORDEN: Adam.

MR. NOWALSKY: I support John in the removal of Option F from these options. I believe the use of CE is not a Board specific decision to make with regards to universally prohibiting it on the use of a species, given the ongoing work that's going on by the Full Commission. If the Full Commission ultimately decides at the Policy Board level that they would like to discontinue CE, we would certainly have to accept that at the Board level. But given that we currently have Board discretion, whether or not to accept or deny a given CE proposal, I think that's adequate.

I think if this Board wants to consider certain options to put restrictions that are relevant to the species that we manage, I think that's certainly worthy of discussion. But the prohibition element here, I believe that's a much bigger decision that exceeds this species board to make.

CHAIR BORDEN: Mike Luisi.

MR. LUISI: I support the removal of Option F, the prohibition on the use of CE. In this case I support John's suggestion. I think had it been status quo and prohibition of use it would have been a different story, but Option B through E define different ways for which conservation equivalency will be evaluated with the use of uncertainty buffers and other standards.

I think it tightens the grip on how states use conservation equivalency going forward. I think that's a first good step in understanding and using conservation equivalency. I don't think getting rid of it entirely is appropriate, so I would support John.

CHAIR BORDEN: Toni, who is the third name you had on the list?

MS. KERNS: I have more names that are here that signed up, so I have John McMurray and then Cheri Patterson, Tom Fote, and Dennis Abbott.

CHAIR BORDEN: John McMurray.

MR. McMURRAY: I agree with Ritchie White. We can't remove Option F now. The public was clear they wanted the Board to consider this, that's all.

CHAIR BORDEN: Cheri.

MS. PATTERSON: I'm going to reiterate what John and Ritchie have said. We had pretty clear public response on this particular option.

CHAIR BORDEN: Tom Fote.

MR. FOTE: I have to agree with Adam and Mike, because we have just the opposite experience that New Hampshire has.

CHAIR BORDEN: Okay, Dennis Abbott.

MR. ABBOTT: Not to be repetitive. I think it should stay in. I think the public then should have an opportunity to comment, though I do believe that eventually we probably wouldn't enact a prohibition, but I think it's necessary to hear what people have said, will say, and let it go at that.

CHAIR BORDEN: Okay, so Toni, who else have you got on the list?

MS. KERNS: That's all, wait, Justin Davis.

DR. DAVIS: I'm in support of removing this option from the document. I kind of feel like the reality of the situation is that it's highly unlikely when we take final action on this document that we're going to adopt this option, and prohibit the use of CE. I think conservation equivalency has a role to play in the management program for this species.

I think what's most important right now is to put the appropriate guardrails in place on the use of CE. I think we're going to get the most productive feedback from the public when we focus their comment and their input on that, on how do we improve the use of CE for this management program. I just don't think it's realistic that we're going to take it out of the management program, and so I question the value of having it in here.

CHAIR BORDEN: All right, well at this point we don't have a clear mandate one way or another, so it might be simpler if someone made a motion, and then we'll deal with it as a standalone motion.

MS. KERNS: John Clark.

CHAIR BORDEN: John Clark.

**MR. CLARK: I'll make that motion. I move to remove Option F from the CE options.**

CHAIR BORDEN: All right that's a motion by John Clark, is there a second?

MS. KERNS: Mike Luisi.

CHAIR BORDEN: Mike Luisi. John, do you want to speak to that and then I'll ask Mike?

MR. CLARK: I think everything has been said. You know I think Adam made a very valid point that this goes beyond the Striped Bass Board to decide whether CE should be in there. I don't even think it should go out to the public. Why give them an option that is not going to happen?

CHAIR BORDEN: All right, Mike Luisi, you're next.

MR. LUISI: Yes, I agree in a way with Justin Davis, but I think we get more constructive feedback on the other options if we remove Option F. At the time when we got the initial reaction from the public, there weren't the other options for them to really break down and think about. It was easy to say remove it completely. But I think here, when they get a full scope of the guardrails that are being considered, it will be more productive if we get feedback on the guardrails, rather than removal.

CHAIR BORDEN: All right, we've had about eight speakers that have all voiced their preferences on this. Is there somebody new who would like to raise a different point, either pro or con?

MS. KERNS: You have no hands.

CHAIR BORDEN: Okay, I think I'm just going to call the question. I'll provide a one-minute caucus break. If you could put up the clock, please, Toni/staff.

MS. KERNS: That's a little trickier. Emilie, I don't know if you have the clock. I'll set a timer and I'll let you know when you have 10 seconds left.

CHAIR BORDEN: Okay that's great. One minute caucus. Thank you very much, Toni, so we're going to call the vote on this. As before, when you vote raise your hand and Toni will call of the names, and we'll tabulate them accordingly. All those in favor of the motion, signify by raising your hand.

MS. KERNS: Just going to let the hands settle for a second. I have Connecticut, Pennsylvania, New Jersey, District of Colombia, Massachusetts, Maryland, Delaware, North Carolina, PRFC, and Virginia. Emilie, do you have a count on that?

MS. FRANKE: Yes, I have 10 in favor.

MS. KERNS: I will take the hands down. Ready?

CHAIR BORDEN: All those opposed.

MS. KERNS: I have Maine, New Hampshire, New York, and Rhode Island that's four. I'll put the hands down.
CHAIR BORDEN: All right, abstentions.

MS. KERNS: I have two abstentions, NOAA Fisheries, and Fish and Wildlife Service.

CHAIR BORDEN: Any null votes?

MS. KERNS: Let me just get the hands down, now we can do the nulls. I have no null votes.

**CHAIR BORDEN: All right so the vote is 10, 4, 2, 0. The motion passes**. We're back to consensus mode. I don't see any, or I haven't heard any other suggestions for alterations. Here I'll just ask one more time. Does anybody want to change anything else in this section? We've removed one item. Any hands up?

MS. KERNS: No hands.

CHAIR BORDEN: Okay, so we will proceed on that basis, everything else stays in. All right, Emilie. I know we've got two tabled motions to deal with. What else do we have to deal with?

MS. FRANKE: Mr. Chair, that is all I have for my presentation.

CHAIR BORDEN: Okay, could we go back to the first, Megan Ware's tabled motion? We are at the end of the agenda item. Toni, do we need a motion to take this off the table at this point, or is it automatically on the table?

MS. KERNS: I believe we do, but I want Bob to correct me. I could be wrong.

CHAIR BORDEN: Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Actually, we do not need a motion, since it was delayed through a time certain.

CHAIR BORDEN: Time certain, that's what I thought. Thank you. This motion is on the table, it's ready to be voted on. We've had a discussion on the motion. I guess the only thing for members to reflect on is, and this kind of applies to both motions. These motions will basically require some additional work by either staff or PDT, so that would mean, if that's correct.

That would mean that the items would come back to the Board at the next meeting, where the provisions of the Amendment would be actually finalized. Are individuals ready to vote on this? Anyone want to speak to this to raise an issue you have not already raised?

MS. KERNS: I have two hands, Mike Luisi and Justin Davis.

CHAIR BORDEN: Mike, and then Justin.

MR. LUISI: I'm thinking back to the discussion that we had before on this. I absolutely support the development of a rebuilding plan for striped bass. However, I feel that the way that this motion reads it kind of handcuffs the PDT at developing one option for a certain time period to achieve spawning stock biomass rebuild.

I wonder if this could be written in a way which would task the PDT to develop a formal rebuilding plan for striped bass under Amendment 7, under Management Response to Recruitment Triggers, including status quo F target, and additional options to establish an F rebuild calculated for various time periods, not to exceed ten years. I think that gives the PDT a little more flexibility to give the Board and the public a bit more to digest and provide comment on, rather than identifying the time period of 2029 as the only other option other than status quo.

I would be prepared to make a motion, I guess it would be to substitute, since there would be some changes. But I piggy-backed a lot of the language here. That is kind of where I am. I can hold off and wait to get additional comments, but I'm prepared to do that whenever you want to call on me, Mr. Chairman.

CHAIR BORDEN: Let me take Justin and then after I take Justin, maybe I'll go back to Megan, and ask her whether or not she wants to change anything here, having heard the comment. Justin.

DR. DAVIS: I think Mike was kind of getting after what I was wondering is, process. If we voted to approve this motion, it would mean that the PDT has to do some additional work, and the Board has to see the document again before we can approve the whole thing to go out for public comment. Is that correct?

CHAIR BORDEN: Yes.

DR. DAVIS: Okay, thanks. That is just a clarification I was looking for, and I think given what Mike was saying, if we're going to send this back to the PDT either way, I would prefer to give the PDT the latitude to look at this question of a rebuilding plan, and essentially have the freedom to decide if there are other options in here that might want to consider, other approaches they may want to take, rather than the motion being prescriptive about which options have to be put in the document.

CHAIR BORDEN: Megan, I said I was going to come back to you. You've heard the comments. Do you want to change anything? I think it could be a fairly simple change, by including some language like, not later than 2029.

MS. WARE: Yes, I'm generally willing, I guess to be a little more broad in this. I will say, I don't think we can go later than 2029, because the clock has

already started, and according to our current management plan we're on the ten-year clock. I think we're beholden to that, unless we're then changing that element of the plan, which I don't think we can do that in this document and also vote on it. I guess what I'm trying to say. I think we're beholden to no later than 2029, but I am happy to consider language that would say something of no later than 2029, if that helps.

CHAIR BORDEN: You would be adding after the word by, no later than 2029?

MS. WARE: Yes, I think so. I'm just reading it.

CHAIR BORDEN: Take out by.

MS. WARE: Yes, I think that's what people are getting at.

CHAIR BORDEN: John McMurray, would that perfection be acceptable to you?

MR. McMURRAY: Yes, I'm looking at it now. I think that would be okay.

CHAIR BORDEN: Okay, so we have a perfected motion on the table. Any other discussion on this issue?

MS. KERNS: You have Max Appelman.

CHAIR BORDEN: Max.

MR. APPELMAN: Just for clarification. I think I heard this when the motion was initially made, but the intent here is just for the PDT to develop a rebuilding program to be codified into the Amendment, but not to also explore changes in measures to achieve this new F(rebuild) at the same time. That would be a subsequent action, did I hear that right?

CHAIR BORDEN: Does staff want to comment to that point?

MS. WARE: This is Megan, I can speak to my motion. Max, the intent here, I think you are kind of on it, is to establish a rebuilding structure in this Amendment, and then kind of leverage that upcoming 2022 assessment, to tell us what that F(rebuild) is, and where we are associated with it.

I think until we have that information, we don't know what the step is after that. We could find ourselves in a position where we're below F(rebuild) and that's great, or we could find ourselves in a position where we're above that, and that's not so great. I think the important part here is establishing that framework, so that we can leverage the 2022 assessment to tell us the information we need.

CHAIR BORDEN: All right, any other issues on this?

MS. KERNS: I have Mike Luisi.

CHAIR BORDEN: Mike.

MR. LUISI: I hate to be a pain in the ass. I guess it's clear in the record, but I was thinking more along the lines. I mean I think the change here is good, no later than 2029. I just want to make sure it's clear that we are tasking the PDT to develop a formal rebuilding plan, rather than to consider a formal rebuilding plan.

I know that's a small modification for the language, but I think that sets the stage for an understanding that we are not going to formalize it and send this to the public now, that the PDT is going to develop something that we'll get to see at the next meeting. I'll just put that out there. Either way, as long as it's on the record I think it's clear, but it may be better to put it in the motion.

CHAIR BORDEN: All right, so any other changes to this? Do the makers of the motion or anyone else want to suggest a perfection? If not, I'm going to call the question.

MS. KERNS: You have Adam Nowalsky.

CHAIR BORDEN: Adam.

MR. NOWALSKY: I was just going to offer that if you felt, and other members here, I think Mike is leaning in this direction, that this may not be clear. I would prepare to attempt to substitute this that would go ahead and make it clear that we are tasking the PDT to include something, and that we have two options here. If it is your interpretation at this point, Mr. Chairman, that the record is crystal clear, that this motion as written is tasking the PDT to develop something for inclusion, and would not be limited to just these two options, then I'm fine with moving forward. But in the absence of that clarity, I would be prepared to offer that as a substitute at this point.

CHAIR BORDEN: As much as I hate to say this. This is an important issue, and I think we need to deal with this as a motion.

MS. KERNS: I think Megan is willing to take that as a friendly, Mr. Chair, as she has texted me.

CHAIR BORDEN: Megan. If you want to perfect this again, I'll allow that.

MS. WARE: I think the points have been well made, so let's do, move to task the PDT to develop a formal rebuilding plan, and Adam and Mike, if that is not what you were thinking, please let me know.

MS. KERNS: They don't have their hands up, so I'm going to take that as a thumbs up.

MR. NOWALSKY: Yes, the only other addition I would make here would be something that would reflect, not that this isn't limited, just Option 1 and 2, perhaps changing this to Options would include a status quo F target and another option that would establish. That would allow the flexibility for the PDT to develop something else or a variation of one of these options.

MS. WARE: I'm fine with that. I think we can say Options could include status quo, and then the description for the Option 2 I have in there.

CHAIR BORDEN: Okay, so Megan is suggesting another perfection to the motion. John McMurray, are you in agreement with that?

MR. McMURRAY: Yes, I'm okay with that, thank you.

CHAIR BORDEN: Okay, so any other perfections here?

MS. KERNS: No hands.

CHAIR BORDEN: No hands, so is there anyone who objects to this? Any hands up?

MS. KERNS: No hands in objection.

**CHAIR BORDEN: Okay, so the motion is approved without objection.** Now if we can go to the next motion, we're almost done here. We have a second motion. This second motion was tabled, it's now on the table for discussion. Is there anything new to be added to this? Any changes? Any hands up, Toni?

MS. KERNS: No hands.

CHAIR BORDEN: Any objection to approving this motion?

MS. KERNS: I see no hands.

**CHAIR BORDEN: Motion stands approved without objection.** Is there any other business? Is there an AP appointment?

MS. KERNS: Mr. Chair, it's up to Joe, or the state of New Jersey. We can do it through an e-mail vote if you would prefer. It's up to whatever Joe or the state of New Jersey would like.

CHAIR BORDEN: Joe Cimino, do you want to make a nomination for the AP?

MR. CIMINO: I appreciate that thought, Mr. Chair, but I'm perfectly happy doing that via e-mail vote.

CHAIR BORDEN: Okay that's fine, so anything else to come before the Board?

MS. KERNS: I see no hands, Mr. Chairman.

**ADJOURNMENT**

CHAIR BORDEN: Thank you all for your tolerance, I know we're way over the time deadline, but we plowed through a lot of information. This meeting stands adjourned.

(Whereupon the meeting adjourned at 6:37 p.m. on October 20, 2021)

Atlantic States Marine Fisheries Commission

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# MEMORANDUM

**TO:** **Atlantic Striped Bass Management Board**

**FROM:** **Atlantic Striped Bass Plan Development Team**

**DATE:** **January 10, 2022**

**SUBJECT:** **Draft Amendment 7 Updates and PDT Recommendation on Year Class Options**

In October 2021, the Atlantic Striped Bass Management Board (Board) tasked the Plan Development Team (PDT) with developing new options to add to Draft Amendment 7 for the Board's review at the 2022 Winter Meeting. The PDT met multiple times from November 2021 through January 2022 to develop the new options and update the following sections as tasked by the Board:

| | |
|---|---|
| *Section 4.1. Tier 1. Fishing Mortality Management Triggers* | Added an option for a 2-year average of fishing mortality (F) for the F threshold trigger |
| *Section 4.2.1. Measures to Protect Year Classes: Recreational Size and Bag Limits* | Added options for Chesapeake Bay recreational size limits to protect strong year classes<br>*Note: Please see below for the PDT's recommendation regarding Section 4.2.1* |
| *Section 4.4. Rebuilding Plan* | Added a section outlining a rebuilding framework following review of the 2022 stock assessment update, and options that consider a low recruitment assumption in forthcoming rebuilding calculations |

The Draft Amendment was also updated to remove options as specified by the Board in October.

In addition to the Board's specified changes, the PDT updated the Draft Amendment with clarifying edits where necessary. The PDT also modified the following sections to better align with the intent of those options, as described in this memo:

- *Section 4.1. Tier 3. Recruitment Trigger*: Sub-options B2 and B3
- *Section 4.1. Tier 4. Deferred Management Action*: Option E
- *Section 4.2.1.3 CE Consideration for Recreational Measures to Protect Year Classes:* Option B
- *Section 4.6.2. Management Program Equivalency*: Sub-option B2

***PDT Recommendation on Recreational Size Limit Options to Protect Strong Year Classes***

The PDT recommends the Board remove *Section 4.2.1 (Measures to Protect the 2015, 2017, and 2018 Year Classes: Recreational Size and Bag Limits)* from consideration in Draft Amendment 7. If these options are removed, the Addendum VI FMP standard for recreational size and bag limits would be maintained for Draft Amendment 7. The other options considered in Draft Amendment 7 for management triggers, recreational release mortality, conservation equivalency, and stock rebuilding would still move forward on the proposed timeline for Amendment 7.

The PDT recommends removing the options to protect strong year classes from consideration for two primary reasons. First, the projections indicate the stock recovery timeline (i.e., the year female spawning stock biomass (SSB) is projected to exceed the threshold and the year it is projected to exceed the target) is the same for all size limit options, including status quo. The Board added the issue of protecting year classes to Draft Amendment 7 to support stock rebuilding efforts, particularly to address concerns about the 2015 year class entering the status quo ocean recreational slot limit. However, the projections indicate that changing size limits to protect year classes does not have a significant impact on rebuilding the stock if the F rate remains constant. If the Board's goal is to expedite stock rebuilding, reducing the overall F rate would have a greater impact on the stock recovery timeline than only changing fishery selectivity (i.e., sizes and ages available for harvest).

Second, selecting new recreational measures through Amendment 7 before the 2022 stock assessment update presents significant timing challenges given uncertainty with how selected measures would align with the assessment results. For example, if the assessment indicates a reduction is needed, the recreational measures selected through Amendment 7 may or may not achieve that reduction. If not, the Board would have to reconsider recreational measures for the second time in the same year. If the assessment indicates the status quo Addendum VI measures are projected to achieve F rebuild (i.e., the F rate that would achieve the SSB target by 2029), then changes to recreational fishery measures may not be warranted at this time through Amendment 7. The result in either case would be in conflict with the Board's desire for management stability when possible.

These timing challenges coupled with the projection results indicating the same recovery timeline for all options, including the status quo, prompted the PDT's recommendation to remove *Section 4.2.1* from Draft Amendment 7. The Board could reconsider changes to recreational size and bag limits in a subsequent management action following review of the 2022 stock assessment update, as needed.

If the Board does consider changing size limits to protect specific year classes, the proposed size limits may need to be adjusted on a regular basis in order to provide continued protection from harvest through time, as fish from those year classes continue to grow. The Board could plan to adjust measures every few years, while considering how to balance year class protection with a desire for management stability.

***Options Modified by the PDT***
Following further discussion after the October Board meeting, the PDT modified the following options to better align with the intent of those sections.

In *Section 4.1 Tier 3 Recruitment Triggers*, the PDT modified sub-options B2 and B3, which specify management responses if the recruitment trigger is tripped. The PDT removed a previous alternative that would have initiated stock rebuilding, which is a more appropriate management response to a SSB-based trigger and not to the recruitment trigger. The modified alternatives B2 and B3 are based on calculating interim F reference points using a low recruitment assumption. Sub-option B2 would require reducing F to the interim F target if F exceeds that interim F target. Sub-option B3 would require reducing F to the interim F target if an F-based management trigger (as defined in *Section 4.1*) is tripped after reevaluation using the interim F reference points.

Evaluating one point estimate of F against the F target (sub-option B2) is more conservative than the F-based management trigger definitions described in *Section 4.1* (used in sub-option B3). **The PDT recommends the Board consider at the January meeting which of these approaches best aligns with the intent of the recruitment trigger response.** If only one of these approaches aligns with the Board's intent, the Board could remove one of the proposed sub-options in order to narrow the focus and consideration of this trigger moving forward.

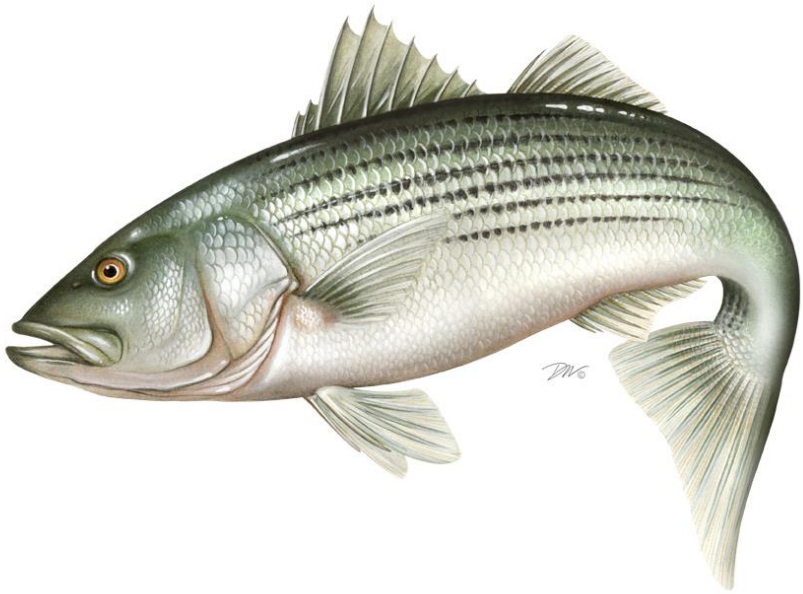
In *Section 4.1 Tier 4 Deferred Management Action*, the PDT modified Option E to require a higher probability of SSB remaining above the SSB threshold over the next 5 years in order to defer management action. Previously, the option specified a 50% probability, but the PDT increased that probability to 75% to increase the confidence that SSB would not fall below the threshold before the next assessment when considering deferred management action.

*Section 4.2.1.3 Conservation Equivalency (CE) Considerations for Recreational Measures to Protect Year Classes*, the PDT added an option that CE could be permitted with limitations (Option B) for alternative recreational measures to protect strong year classes. This provides a middle ground option between allowing CE without any limitations (Option A) and not permitting CE at all (Option C).

In *Section 4.6.2 Management Program Equivalency* (i.e., conservation equivalency), the PDT modified sub-option B2 regarding the default applicability of CE restrictions based on stock status. Any CE restrictions based on stock status would by default apply to non-quota managed recreational fisheries, <u>including the Chesapeake Bay spring trophy fisheries</u>, with the exception of recreational fisheries in the Hudson River, Delaware River, and Delaware Bay. The Chesapeake Bay spring trophy fishery would now be subject to CE restrictions based on stock status by default because the Board decided in October that the Chesapeake Bay spring trophy fishery is considered part of the ocean region for management purposes under Amendment 7.

## *Atlantic States Marine Fisheries Commission*

# Draft Amendment 7 to the Interstate Fishery Management Plan for Atlantic Striped Bass



**This draft document was developed for Management Board review and discussion. This document is not intended to solicit public comment as part of the Commission/State formal public input process. Comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. If approved, a public comment period will be established to solicit input on the issues contained in the document.**

**January 2022**

*Sustainable and Cooperative Management of Atlantic Coastal Fisheries*

# Draft Amendment 7 to the Interstate Fishery Management Plan for Atlantic Striped Bass

Prepared by

Atlantic States Marine Fisheries Commission
Atlantic Striped Bass Plan Development Team

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This is a report of the Atlantic States Marine Fisheries Commission pursuant to U.S. Department of Commerce, National Oceanic and Atmospheric Administration Award No. NAXXXXXX

The Atlantic States Marine Fisheries Commission seeks your input on Draft Amendment 7 to the Atlantic Striped Bass Fishery Management Plan.

The public is encouraged to submit comments regarding this document during the public comment period. Comments must be received by **11:59 (EST) on XXXXX.** Regardless of when they were sent, comments received after that time will not be included in the official record. The Atlantic Striped Bass Management Board will consider public comment on this document before finalizing Amendment 7.

You may submit public comment by attending a public hearing held in your state or jurisdiction or mailing, faxing, or emailing written comments to the address below. Comments can also be referred to your state's members on the Atlantic Striped Bass Management Board or Atlantic Striped Bass Advisory Panel; however, only comments received at a public hearing or written comments submitted to the Commission will become part of the public comment record.

Mail: Emilie Franke
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Arlington VA. 22201

Email: comments@asmfc.org
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If your organization is planning to release an action alert in response to Draft Amendment 7, or if you have questions, please contact Emilie Franke, Fishery Management Plan Coordinator, at 703.842.0740 or efranke@asmfc.org.

The timeline for completion of Amendment 7 is as follows:

| | |
|---|---|
| August 2020 | Board initiated Amendment 7 |
| February 2021 | Board reviewed Draft Public Information Document (PID) and approved PID for public comment |
| February - April 2021 | Public comment on PID |
| May 2021 | Board reviewed public comment; directed Plan Development Team to develop Draft Amendment |
| May - December 2021 | Preparation of Draft Amendment |
| January 2022 | Board reviews Draft Amendment and considers approving for public comment ***Current Step*** |
| February 2022- April 2022 | Public comment on Draft Amendment |
| May 2022 | Board reviews public comment and selects final measures for the Amendment; Policy Board and Commission approve the Amendment |

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## 1.0 INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC), under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, is responsible for managing Atlantic striped bass *(Morone saxatilis)* in state waters (0-3 miles) along the Atlantic Coast. The states and jurisdictions of Maine through North Carolina, including Pennsylvania, the District of Columbia, and the Potomac River Fisheries Commission (PRFC), participate in the management of this species as part of the Commission's Atlantic Striped Bass Management Board (Board). Amendment 7 to the Interstate Fishery Management Plan (FMP) for Atlantic striped bass replaces Amendment 6 (2003) and its Addenda I – VI. Management authority in the exclusive economic zone (3-200 miles from shore) lies with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS).

## 1.1 BACKGROUND INFORMATION

Since Amendment 6 was adopted in 2003, the status and understanding of the striped bass stock and fishery has changed considerably. The results of the 2018 Benchmark Stock Assessment (NEFSC 2019) in particular led the Board to discuss a number of significant issues facing striped bass management. The 2018 benchmark stock assessment indicated the striped bass stock has been overfished since 2013 and is experiencing overfishing, which changed perception of stock status. The Board accepted the assessment for management use in 2019; management triggers established through Amendment 6 tripped at that time, requiring the Board to take action to address both overfishing and the overfished status.

In April 2020, the Board implemented Addendum VI to end overfishing. In August 2020, the Board initiated development of Amendment 7 to the FMP to update the management program to better align with current fishery needs and priorities, and build upon the Addendum VI action to initiate rebuilding.

In February 2021, the Board approved for public comment the Public Information Document (PID) for Draft Amendment 7. Public comment was received and hearings were held between February and April 2021. At their May 2021 and October 2021 meetings, the Board approved the following issues for development in Draft Amendment 7:

- Management Triggers (see *Section 4.1* Management Triggers)*;*
- Measures to Protect the 2015 Year Class (see *Section 4.2.1* Measures to Protect the 2015, 2017, and 2018 Year Classes: Recreational Size and Bag Limits)*;*
- Recreational Release Mortality (see *Section 4.2.2* Measures to Address Recreational Release Mortality)*;*
- Rebuilding Plan (see *Section 4.4* Rebuilding Plan); and
- Conservation Equivalency (see *Section 4.6.2* Management Program Equivalency).

### 1.1.1 Statement of Problem

#### *1.1.1.1 Management Triggers*

The management triggers are intended to keep the Board accountable and were developed at a time when the stock was thought to be at historic high abundance and well above the female spawning stock biomass (SSB) target. However, as perceptions of stock status and fishery performance have changed, shortfalls with how the management triggers are designed have emerged. When female SSB is below the target level, the variable nature of fishing mortality can result in a continued need for management action. The shorter timetables for corrective action are also in conflict with the desire for management stability. As a consequence, the Board is sometimes criticized for considering changes to the management program before the stock has a chance to respond to the most recent management changes. Furthermore, the use of point estimates in decision-making does not account for an inherent level of uncertainty. Lastly, the observed long period of below average recruitment which contributed to recent declines in biomass has raised questions about the recruitment-based trigger and whether it is designed appropriately.

#### *1.1.1.2 Measures to Protect the 2015 Year Class*

A period of low recruitment (age-1 fish entering the population) from 2005 – 2011 is believed to have contributed to the persistent decline in female SSB in recent years. The Board and stakeholders have expressed that protecting emerging, strong year classes is of the utmost importance for rebuilding the striped bass stock. The 2015 year class, which is the strongest year class observed since 2003, has been available to Chesapeake Bay fisheries over the past few years and will soon be entering the recreational ocean region slot limit of 28" to less than 35" implemented by the majority of Atlantic coast states under Addendum VI in 2020. If this ocean slot limit is maintained, the 2015 year class may be subject to high recreational harvest mortality in the ocean for the next several years, in addition to mortality in the Chesapeake Bay, reducing its potential to help rebuild the stock. The 2015 year class will also be subject to recreational release mortality as it approaches the lower bound of the ocean slot, and again once the surviving fish have grown larger than the upper bound of the slot. The 2015 year class is also subject to release mortality in the Chesapeake Bay.

#### *1.1.1.3 Recreational Release Mortality*

Recreational release mortality constitutes a large component of annual fishing mortality—the largest component from 2017 through 2020—because the striped bass fishery is predominantly recreational and an overwhelming majority of the catch is released alive, either due to cultural preferences (i.e., fishing with the intent to catch and release striped bass) or regulation (e.g., the fish is not of legal size). Some stakeholders value the ability to harvest striped bass, while others value the experience of fishing for striped bass regardless of whether they are able to retain fish. The current management program, which primarily uses bag limits and size limits to constrain recreational harvest, is not designed to control fishing effort which makes it difficult to control overall fishing mortality. While the acceptable proportion of recreational release mortality in total removals should reflect the management objectives for the fishery, efforts to reduce overall fishing mortality through harvest reductions may be of limited use unless recreational release mortality can be addressed.

#### *1.1.1.4 Stock Rebuilding and Low Recruitment*

The Board has expressed concern about recent low recruitment estimates and the potential impact of low recruitment levels on the ability of the striped bass stock to rebuild by 2029. If rebuilding measures are implemented based on the standard recruitment method from the stock assessment but recruitment remains lower than average, the population may not be able to rebuild to the female SSB target by 2029. The next stock assessment update (expected in 2022) will calculate the fishing mortality rate required to rebuild the stock, and those rebuilding calculations could take into account different assumptions about recruitment.

#### *1.1.1.5 Management Program Equivalency (Conservation Equivalency)*

There is an essential tension between managing the striped bass fishery on a coastwide basis while affording states the flexibility to deviate from the FMP standard through conservation equivalency (CE). [1] There is value in allowing states to implement alternative regulations tailored to the needs of their fisheries; however, this creates regulatory inconsistency among states and within shared waterbodies with associated challenges (e.g., enforcement). It is difficult to evaluate the effectiveness of CE programs and their equivalency to the FMP standard once implemented due to the challenge of separating the performance of management measures and outside variables (like angler behavior and availability of fish). Concerns have been raised that some alternative measures implemented through CE could potentially undermine management objectives. And finally, there is also limited guidance on how and when CE should be pursued, particularly when the stock is overfished and rebuilding is required, and how "equivalency" is defined.

### 1.1.2 Benefits of Implementation

The status and understanding of the striped bass resource and fishery has changed considerably since implementation of Amendment 6 in 2003. Reevaluation of striped bass management processes, specifically management triggers and conservation equivalency, and consideration of recreational fishery measures, including measures to address release mortality, will support stock rebuilding and promote the sustainable management of the striped bass resource and fishery moving forward.

#### *1.1.2.1 Ecological Benefits*

Striped bass play an important ecological role in coastal marine ecosystems. Managers and stakeholders have expressed interest in the role of striped bass in the ecosystem from both a top-down perspective (as a predator that could affect other species) and a bottom-up perspective (as a consumer affected by prey availability). Young-of-year striped bass feed primarily on small invertebrates, and as they age, they start eating fish and larger invertebrates, including Atlantic menhaden, herring, bay anchovies, blue crabs, and lobster. Striped bass are also preyed on by other species; as young-of-year and juveniles, they are consumed by adult

[1] FMP standard refers to a management measure specified in the FMP.

fish like bluefish, weakfish, and even other striped bass. Sustainable management of striped bass will contribute to maintaining a balanced marine ecosystem.

#### *1.1.2.2 Social/Economic Benefits*

Rebuilding the Atlantic striped bass population will enhance the economic and social benefits attributable to this population in the ASMFC member states. Economic benefits of a rebuilt stock would include increased use values (e.g., consumptive and non-consumptive use values related to commercial and recreational fishing) and non-use values (e.g., existence values) for current and future generations. There are many potential socioeconomic impacts that could result from changes in striped bass management, notably potential changes to the recreational size limit and potential implementation of seasonal closures. These potential changes may result in short-term negative impacts to recreational angler welfare. However, the net positive long-term social and economic benefits stemming from stock recovery and subsequent catch increases in successive years will likely outweigh the short-term impacts. Potential restrictions on how and when states can pursue CE programs could result in socioeconomic impacts if there is less flexibility to implement alternative regulations tailored to the needs of each state's fisheries.

## 1.2 DESCRIPTION OF THE RESOURCE

### 1.2.1 Species Life History

#### *1.2.1.1 Stock Structure and Geographic Range*

Atlantic coastal migratory striped bass inhabit estuaries and the Atlantic Ocean along the eastern coast of North America from the St. Lawrence River in Canada to the Roanoke River and other tributaries of Albemarle and Pamlico Sounds in North Carolina (Merriman, 1941). Some individuals from longer river systems within this range may not undergo coastal migrations, but rather restrict their migrations to within the river and estuary (Morris et al., 2003; Zlokovitz et al., 2003). Stocks which occupy coastal rivers from the Tar-Pamlico River in North Carolina south to the St. Johns River in Florida are primarily endemic and riverine and do not presently undertake extensive Atlantic Ocean migrations as do stocks from the Roanoke River north (Richkus, 1990), based on tagging studies (Callihan et al., 2014; Callihan et al., 2015). Striped bass are also naturally found in the Gulf of Mexico from the western coast of Florida to Louisiana (Merriman, 1941; Musick et al., 1997). Striped bass were introduced to the Pacific Coast using transplants from the Atlantic Coast in 1879 as well as into rivers, lakes, and reservoirs throughout the US and foreign countries such as Russia, France, and Portugal (Hill et al., 1989).

The anadromous populations of striped bass on the Atlantic coast are primarily the product of four distinct spawning stocks: an Albemarle Sound-Roanoke River stock, a Chesapeake Bay stock, a Delaware River stock, and a Hudson River stock (ASMFC 1998). The Atlantic coast fisheries rely primarily on production from the spawning populations in the Chesapeake Bay and in the Hudson and Delaware rivers. Historically, tagging data indicated very little mixing

between the Albemarle Sound-Roanoke River stock and so that stock is managed and assessed separately from the coastal stock.

The Chesapeake Bay stock of striped bass is widely regarded as the largest of the four major spawning stocks (Goodyear et al. 1985; Kohlenstein 1980; Fabrizio 1987). Recent tag-recovery studies in the Rappahannock River and upper Chesapeake Bay show that larger and older (ages 7+) female striped bass, after spawning, move more extensively along the Atlantic coast than stripers from the Hudson River stock (ASMFC 2004).

Striped bass abundance in the Delaware River, as measured by juvenile seine surveys, rose steadily following pollution abatement during the mid-1980s and peaked in abundance in 2003 and 2004. Like the Chesapeake Bay and Hudson stocks, spawning in the Delaware River begins during early April and extends through mid-June (ASMFC 1990). Recent tagging studies in the Delaware River show that larger and older (ages 7+) female striped bass undergo extensive migration northward into New England from July to November that spatially overlap the migratory range of Chesapeake Bay striped bass (ASMFC 2004).

#### *1.2.1.2 Age and Growth*

Generally, longevity of striped bass has been estimated as 30 years, although a striped bass was aged to 31 years based on otoliths (Secor 2000). This longevity suggests striped bass populations can persist during long periods of poor recruitment due to a long reproductive lifespan. In general, the maximum ages observed have increased since 1995 when the striped bass fisheries reopened. From 1995 to 2016, the maximum observed female age increased from 16 to 31, with the oldest fish caught in Chesapeake Bay, Virginia, in 2014. During the same period, the maximum observed male age increased from 16 to 24 with the oldest fish caught in Chesapeake Bay, Virginia, in 2011.

As a relatively long-lived species, striped bass are capable of attaining moderately large size, reaching as much as 125 pounds (57 kg) (Tresselt 1952). Growth rates of striped bass are variable, depending on season, age, sex, competition and location. For example, a 35 inch (889 mm) striped bass can be 7 to 15 years of age and a 10-pound (4.5 kg) striped bass can be 6 to 16 years old (ODU CQFE 2006). Growth occurs during the seven-month period between April and October. Within this time frame, striped bass stop feeding for a brief period just before and during spawning, but feeding continues during the upriver spawning migration and begins again soon after spawning (Trent and Hassler 1966). Growth rates and maximum size are significantly different for males and females. Both sexes grow at the same rate until 3 years old; beginning at age-4, females grow faster than males. Females grow to a considerably larger size than males; striped bass over about 30 pounds (14 kg) are almost exclusively female (Bigelow and Schroeder 1953).

#### *1.2.1.3 Spawning and Reproduction*

Atlantic striped bass are anadromous, meaning they spend most of their adult life in ocean waters, but return to their natal rivers to spawn in the spring. The rivers that feed into the

Chesapeake Bay and the Delaware and Hudson Rivers are the major spawning grounds for the coastal migratory population. The spawning season along the Atlantic coast usually extends from April to June and is governed largely by water temperature (Smith and Wells 1977) and the number of mature ova in female striped bass varies by age, weight, and fork length. Studies have found that older fish produce more eggs than younger fish and heavier fish produce more eggs than smaller fish (Jackson and Tiller 1952; Raney 1952; Goodyear 1984; Mihursky 1987; Richards et al. 2003; Sadler et al. 2006; Gervasi et al. 2019). Newly hatched bass larvae remain in fresh or slightly brackish water until they are about 12 to 15 mm long and move in small schools toward shallow protected shorelines, where they remain until fall. Over the winter, the young concentrate in deep water of rivers.

The 2018 assessment used maturity-at-age values derived from an updated dataset with samples from multiple states along the coast, which estimated that 89% of females are mature by age-8 and 100% are mature by age-9. There are indications that some older striped bass may not spawn every year (Raney 1952) and Jackson and Tiller (1952) reported curtailment of spawning in about 1/3 of the fish age-10 and older taken from Chesapeake Bay, though they also found striped bass up to age-14 in spawning condition.

Striped bass, like many fish populations, shows high interannual variability in recruitment. Environmental effects have been shown to be correlated with recruitment success in striped bass, including over-winter temperatures, hydrological conditions, and zooplankton prey availability (Hurst and Conover 1998; Martino and Houde 2010 and 2012). However, Martino and Houde (2012) found density-dependent effects on growth and mortality in the upper Chesapeake Bay for age-0 striped bass, where growth rates were higher and mortality rates lower in years with lower juvenile density.

#### *1.2.1.4 Mortality*

Because striped bass are a long-lived species, this suggests natural mortality is relatively low. One increasing source of natural mortality is disease. Mycobacteriosis was first detected in the Chesapeake Bay in 1997 (Heckert et al 2001; Rhodes et al. 2001) and may have been apparent in Chesapeake Bay striped bass as early as 1984 (Jacobs et al. 2009a). A rise in *mycobacterium* infection in the Chesapeake Bay could be causing increases in natural mortality (Pieper 2006; Ottinger and Jacobs 2006). Vogelbein et al. (2006) hypothesized that increased natural mortality could be associated with elevated nutrient inputs to the Chesapeake Bay contributing to eutrophication and suboptimal, stressful habitat for striped bass; or, the increased natural mortality could be associated with low abundance of Atlantic menhaden and reductions in Chesapeake Bay forage species resulting in starvation.

Prevalence of *mycobacterium* infection ranges from ~50% (Overton et al. 2003) to 75% with molecular techniques (Kaattari et al. 2005) and is dependent on the age class sampled, with prevalence increasing with age to approximately age 5 and then decreasing in older ages (Kaattari et al. 2005; Gauthier et al. 2008). *Mycobacteriosis* appears to be much less prevalent in other producer areas such as the Delaware Bay (Ottinger et al. 2006) and the Albemarle Sound-Roanoke River (Overton et al. 2006; Matsche et al. 2010). Although fish who are infected

with the disease show overall decreased health (Overton et al. 2003), the slow progression of the disease may take years to become lethal in infected fish, thus allowing for multiple spawning opportunities, making determination of the population level impacts of the disease difficult (Jacobs et al. 2009b). In the most recent study, Groner et al. (2018) suggested disease-associated mortality will likely increase with warming temperatures in the Chesapeake Bay.

Striped bass exhibit a number of characteristics identified by NOAA as increasing their vulnerability to climate change effects, including complexity of reproductive strategy, short duration aggregate spawning, sensitivity to temperature, prey-specificity, and specific larval requirements (Morrison et al. 2015). Temperature is correlated with or impacts a number of aspects of striped bass biology, including time to hatch and egg and larval mortality (Massoudieh et al. 2011); larval growth length and yolk utilization (Peterson et al. 2017); activity levels and metabolic rate (Hollema et al. 2017); consumption, and growth (Secor et al. 2000); and growth and mortality in striped bass larvae (Secor et al. 2017). See *Section 1.4.3* for details on climate change impacts to striped bass habitat.

#### *1.2.1.5 Ecological Roles*

Young-of-year striped bass feed primarily on small invertebrates like amphipods, bristle worms, and mysid shrimp. As they get older, they start eating fish and larger invertebrates (starting around age-2). Adult striped bass consume a variety of species, including Atlantic menhaden, herring, bay anchovies, blue crabs, and lobster (Schaefer 1970; Hartman and Brandt 1995; Walter et al. 2003; Rudershausen et al. 2005; Ferry and Mather 2012). Their diet varies depending on how big they are, what season it is, where they are feeding, and how abundant their different prey species are (Walter and Austin 2003; Overton et al. 2009). Striped bass are also preyed on by other species. As young-of-year and juveniles, they are consumed by adult fish like bluefish, weakfish, and even other striped bass, and larger striped bass may be eaten by sharks or birds like bald eagles and osprey (ASMFC 2011).

Managers and stakeholders have expressed interest in the role of striped bass in the ecosystem from both a top-down perspective (as a predator that could affect other species) and a bottom-up perspective (as a consumer that was affected by prey availability). The high abundance of striped bass in the late 1990s and early 2000s led to concerns that striped bass could have a negative impact on other species that they preyed on, like shad and river herring, or that they competed with for food, like weakfish (Uphoff 2003; Davis et al. 2012). Declines in striped bass condition and the increasing prevalence of mycobacteriosis in Chesapeake Bay raised concerns that the depletion of key prey species like Atlantic menhaden were negatively affecting striped bass (Jacobs et al. 2009; Overton et al. 2003).

In August 2020, ASMFC adopted an ecosystem approach for the management of Atlantic menhaden using ecological reference points (ERPs) for menhaden management. Ecological modeling indicated striped bass were one of the most sensitive species to menhaden abundance. Therefore, the ERP values that sustained striped bass would likely provide sufficient forage for other predators under current ecosystem conditions. ERPs for the management of Atlantic menhaden are as follows:

- ERP target: The maximum fishing mortality rate 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 fishing mortality rate on Atlantic menhaden that keeps Atlantic striped bass at their biomass threshold when striped bass are fished at their fishing mortality rate target.

These ERPs allow ASMFC to take into account menhaden's role as a forage fish, especially its importance to striped bass, when setting harvest limits for menhaden. However, the biological reference points for striped bass are still set using single-species modeling. ASMFC is working on refining the ERP model and improving the understanding of the role of striped bass in the ecosystem beyond the relationship with menhaden.

### 1.2.2 Stock Assessment Summary

The 2018 Benchmark Stock Assessment (NEFSC 2019) provides the most recent status of the coastwide striped bass stock for use in fisheries management. The assessment was peer-reviewed at the 66th Northeast Regional Stock Assessment Review Committee (SARC) meeting in November 2018 and approved by the Board for management use in May 2019. The accepted assessment model is a forward projecting statistical catch-at-age (SCA) model which uses catch-at-age data and fishery-dependent and -independent survey indices to produce annual estimates of recruitment, annual fishing mortality (F), and selectivity parameters in order to calculate abundance and female SSB through the assessment terminal year of 2017. As a complement to the SCA model, an instantaneous tag return model (IRCR) was run on data from the U.S. Fish and Wildlife Service (USFWS) coastwide striped bass tagging program through the 2017 tagging year. The IRCR model makes inferences using the numbers of tagged fish that have been recaptured to the numbers of fish that were originally tagged over time to estimate the survival rate of striped bass from year-to-year, fishing mortality rates and natural mortality rates.

The 2018 benchmark was the first assessment for striped bass to use the improved MRIP survey methods to estimate recreational fishery catches. The new time series of recreational catch estimates is on average 2.3 times higher than the values used in previous stock assessments, resulting in higher estimates of stock size. Although the magnitude of these estimates has changed, the overall trend throughout time remains similar for both harvest and total catch (released fish + harvested fish).

#### *1.2.2.1 Abundance and Structure*

Striped bass abundance (age-1+) increased steadily from 1982 through 1997 when it peaked around 420 million fish. Total abundance fluctuated without trend through 2004 and from 2005-2009, total abundance declined to around 189 million fish. Total abundance increased to 351 million fish by 2016 before dropping to 249 million fish in 2017. The increase in 2012 was due primarily to the abundant 2011 year class from Chesapeake Bay. Abundance of age-8+

striped bass (representing mature fish) increased steadily through 2004. Between 2004 and 2011, age-8+ abundance oscillated followed by a decline since 2011. Age-8+ abundance in 2017 was estimated at 6.7 million fish, a value near the 30th percentile of the time-series.

#### *1.2.2.2 Fishing Mortality*

The current single-stock SCA model separates fishery removals into an ocean fleet and a Chesapeake Bay fleet, but there is one set of coastwide fishing mortality reference points. The ocean fleet includes removals from ocean waters and other areas such as Delaware Bay and Long Island Sound. Fully-recruited fishing mortality in 2017 for the Chesapeake Bay and Ocean fleets was 0.068 and 0.262, respectively. Total fishing mortality has been at or above the threshold in 13 of the last 15 years of the assessment (2003-2017) and was estimated to be 0.31 in 2017.

#### *1.2.2.3 Recruitment*

Striped bass experienced a period of strong recruitment (age-1 fish entering the population) from 1994-2004, followed by a period of lower 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 female SSB that the stock has experienced since 2010. Recruitment of age-1 fish was high in 2012, 2015, and 2016 (corresponding to strong 2011, 2014, and 2015 year classes), but estimates of age-1 striped bass were below the long-term average in 2013, 2014, and 2017. Recruitment in 2017 was estimated at 108.8 million age-1 fish, below the time series average of 140.9 million fish.

#### *1.2.2.4 Female Spawning Stock Biomass (SSB)*

Female SSB peaked in 2003 and has been declining since then; female SSB has been below the threshold level since 2013. Female SSB grew steadily from 1986 through 1996 after which female SSB dropped to just below levels observed in 1995. Female SSB grew steadily between 1999 and 2003 when it peaked around 114,000 thousand metric tons and has generally declined since then.

#### *1.2.2.5 Two-Stock Model Development*

Although the coastwide fishing mortality reference points include the effects of harvesting smaller striped bass in the Chesapeake Bay (and in other areas like the Delaware Bay and Hudson River), they do not reflect the heavily male-skewed sex ratio in the Chesapeake Bay catch. During the 2018 benchmark assessment, the current single-stock SCA model was modified into a competing two-stock SCA model; a Chesapeake Bay stock and a mixed ocean stock which included all other stock components of the population. The intent of the two-stock model approach was to develop separate reference points for the Chesapeake Bay stock and the ocean region (which includes the Delaware Bay/Hudson River stock complex); however, this model requires further testing and was not approved for management by the SARC-66 peer review panel.

### 1.2.3 Current Stock Status

The current stock status determination is based on the 2018 Atlantic Striped Bass Benchmark Stock Assessment (NEFSC 2019). The results of the 2018 benchmark indicate that the Atlantic striped bass stock is overfished and overfishing is occurring. Female SSB in 2017 was estimated at 68,576 metric tons (151 million pounds), which is below the female SSB threshold of 91,436 metric tons (202 million pounds) (Figure 7). Total fishing mortality in 2017 was estimated at 0.31, which is above the fishing mortality threshold of 0.24 (Figure 8). The reference points currently used for management are based on stock conditions in 1995, the year the stock was declared rebuilt. The biomass threshold is the level of female SSB in 1995, the biomass target is 125% of the threshold, and the fishing mortality threshold and target are the levels of fishing mortality projected to achieve the biomass reference points over the long-term, respectively. The specific values of these reference points change when the time series of female SSB is updated with each iteration of the stock assessment model.

## 1.3 DESCRIPTION OF THE FISHERY

The Atlantic striped bass fishery is predominantly recreational with the recreational sector accounting for over 80% of total removals by number each year since 1985 (Table 18). In 2019, total removals (commercial and recreational combined, including harvest and dead releases) were estimated at 5.5 million fish; the recreational sector accounted for 87% of total removals by number. In 2020, total removals were estimated at 5.1 million fish; the recreational sector accounted for 87% of total removals by number (Table 17-18).

### 1.3.1 Commercial Fishery

Commercial striped bass fisheries operate in the waters of Massachusetts, Rhode Island, New York, Delaware, Maryland, the Potomac River Fisheries Commission, Maryland, Virginia, and North Carolina. The primary gear types for the commercial fisheries are gill nets, hook and line, and pound nets/other fixed gears. Additional gears used in the commercial fishery include haul seines and trawls.

The commercial fishery is managed via a quota system resulting in relatively stable landings since Amendment 6 (approved in 2003; implemented in 2004). From 2004 to 2014, coastwide commercial harvest averaged 6.8 million pounds (942,922 fish) annually (Tables 19-21). From 2015-2019, commercial landings decreased to an average of 4.7 million pounds (619,716 fish) due to implementation of Addendum IV and a reduction in the commercial quota. Commercial landings in 2020 were estimated at 3.6 million pounds (577,363 fish). Commercial discards are estimated to account for <2% of total removals per year since 2003 (Tables 17-18). In 2019, commercial removals (landings plus commercial discards) accounted for 13.5% of total removals (commercial plus recreational) in numbers of fish, and 12.6% of total removals in 2020.

There are two sets of quota allocations; one to all states (Maine through North Carolina, excluding Pennsylvania) for harvest in the ocean, and a second allocation to Maryland, PRFC,

and Virginia for harvest in Chesapeake Bay. The ocean region quota is based on average landings during the 1970s and the Chesapeake Bay quota changed annually under a harvest control rule until implementation of a static quota in 2015 through Addendum IV. Although the regional quota allocations are about equal, the majority of commercial harvest comes from Chesapeake Bay; roughly 60% by weight and 80% in numbers of fish since 1990. The differences between landings in weight and in numbers of fish are primarily attributed to the availability of smaller fish and lower size limits in Chesapeake Bay relative to the ocean fishery. Additionally, the ocean fishery tends to underutilize its allocations due to lack of availability in state waters (particularly off of North Carolina) and because commercial fishing is not allowed in some states (Maine, New Hampshire, Connecticut and New Jersey). Furthermore, the underage has increased in recent years since migratory striped bass have not been available to the ocean fishery in North Carolina resulting in zero harvest since 2012 (North Carolina holds 13% of the ocean quota).

### 1.3.2 Recreational Fishery

The recreational fishery is comprised of private and for-hire components. The private component includes anglers fishing from shore (including all land-based structures) and private/rental boats. The for-hire component is composed of charter boats and headboats (also called party boats). Although charter boats tend to be smaller than headboats, the key distinction between the two types of operations is how the fee is typically determined. On a charter boat trip, the fee charged is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a headboat trip is paid per individual angler.

The recreational sector operates in state waters across the entire management unit (Maine through North Carolina) and uses hook and line almost exclusively. The recreational fishery is managed via bag and size limits and therefore recreational catch and harvest vary from year to year with changes in angler effort and the size and availability of fish.

Recreational harvest of striped bass follows a similar trend to the commercial harvest. Since 1984 when recreational harvest was lowest (2.4 million pounds; 264,004 fish), recreational harvest has increased reaching a peak by weight in 2013 at 65 million pounds, and by numbers of fish in 2010 at 5.4 million fish (Tables 23-24). Between 2004 and 2014, recreational harvest remained at a steady level averaging 54.8 million pounds (4.6 million fish) per year. Following the implementation of the size and bag limit changes in the recreational fisheries in Addendum IV due to declining biomass, recreational harvest decreased to an average of 33.6 million pounds (2.8 million fish). In 2020, recreational harvest was estimated at 14.9 million pounds (1.7 million fish).

A large proportion of recreational harvest comes from Chesapeake Bay (Tables 23-24). From 2004-2014, 33% of recreational harvest in numbers of fish came from Chesapeake Bay. From 2015-2019, that percentage increased to 43% in numbers of fish, likely as a result of the strong 2011, 2014, and 2015 year classes moving through the fishery. The majority of recreational harvest in the ocean fishery comes from Massachusetts, New York, and New Jersey.

The vast majority of recreational striped bass catch is released alive either due to angler preference or regulation; roughly 90% annually since 1990 (Figure 13). Based on peer reviewed literature, a 9% release mortality rate is used to estimate the number of fish that die as a consequence of being caught and released. Despite this low rate, the popularity of striped bass as a targeted recreational species means that recreational releases contribute a significant source of mortality to the stock each year. In 2020, recreational anglers caught and released an estimated 30.7 million fish, of which 2.76 (9%) million are assumed to have died; this represents 54% of total striped bass removals (commercial and recreational) in 2020 (Table 17-18).

### 1.3.3 Subsistence Fishing

Data describing the exact magnitude of subsistence fishing, (i.e., catching fish in order to provide necessary food) for striped bass does not exist. However, some anglers, usually fishing from shore, may rely to some degree on striped bass they catch for food. Additionally, the head and carcasses of larger striped bass often discarded by anglers after processing the fillet are highly sought after in some areas.

### 1.3.4 Non-Consumptive Factors

Catch and release fishing for striped bass is often considered a non-consumptive use of the striped bass resource. A large number of fishermen coastwide target striped bass with the intention of releasing all of the fish that are caught. This practice can take place during no-harvest (i.e., no-take) closures, but is not permitted during no-targeting closures. See *Section 1.3.2* for more details on the number of striped bass released alive.

### 1.3.5 Interactions with Other Fisheries

In the recreational fishery, anglers targeting striped bass may also be targeting species that commonly occur with striped bass. Or, striped bass anglers may incidentally interact with non-target species. The 2018 stock assessment (NEFSC 2019) included analysis identifying recreational species that are commonly caught with striped bass in ocean waters (i.e., species that were intercepted at least 100 times over the entire time series) for each state based on private/rental boat trip data that occurred during Waves 3-5 for states from Maine through Virginia. A Jaccard coefficient was calculated for each species, with a higher coefficient indicating the species is caught more often with striped bass. For most states, bluefish or Atlantic mackerel had the highest Jaccard coefficient, meaning it was the species caught most often with striped bass in ocean waters.

Striped bass are caught as bycatch in non-striped bass commercial fisheries. The commercial discard estimates for striped bass incorporate estimated discards from non-striped bass fisheries based on tag return data.

## 1.4 HABITAT CONSIDERATIONS

### 1.4.1 Habitat Use and Migration Patterns

Migration of striped bass occurs at adult and juvenile stages. Adults migrate into rivers to spawn in turbulent fresh water upstream of the estuarine turbidity maximum (ETM) and as far as the Fall Zone (transition zone from Coastal Plain to Piedmont provinces) during spring (Greene et al., 2009). Afterwards, migratory adult striped bass return to the ocean, where they travel north along the coast in summer and fall, and south during the winter; non-migratory adult striped bass return downstream to estuarine waters but do not transit coastal waters during the summer, fall, and winter (Greene et al., 2009).

In general, juveniles migrate downstream in summer and fall. Juvenile striped bass migration varies by locations. In Virginia, the movement of young bass during their first summer is downstream into Chesapeake Bay waters of higher salinity (Setzler et al., 1980). In the Hudson River, striped bass begin migrating in July. Migration was documented through an increase in the number of juvenile striped bass caught along the beaches and subsequent decline in the numbers in the channel areas after mid-July. Downstream migration continues through late summer, and by the fall, juveniles start to move into Long Island Sound (Raney, 1952). The ASMFC Striped Bass Technical Committee (TC) tracks juvenile abundance, and cohort strength, through sampling to produce annual striped bass juvenile abundance indices (JAIs) in six different nursery areas.

Juvenile striped bass rarely complete coastal migrations. The presence of juveniles <20 cm (ages 0-1) in New Jersey's non-natal estuaries indicates some dispersal from Hudson River, Delaware Bay, and Chesapeake Bay (via C&D Canal) estuaries where they were spawned (Able et al., 2012). Many striped bass inhabiting rivers and associated estuaries undergo evacuation into coastal waters following extreme precipitation events that reduce water temperature, salinity, and dissolved oxygen (Bailey & Secor, 2016); events projected to increase in frequency and intensity due to climate change (USGCRP, 2017). In Chesapeake Bay 50% of females, who grow faster, emigrate to coastal waters by age 3 while a significant proportion of young males remain within the estuary (Kohlenstein, 1981); however, emigration cues are under debate and may be more a function of size than age (Secor et al., 2020). From Cape Hatteras (and in some years, Cape Lookout), North Carolina, to New England, fish may migrate in groups along the coast. They migrate north in the summer and south in the winter, however, the extent of the migration varies between sexes and populations (Hill et al., 1989). Larger bass, typically the females, tend to migrate farther distances. Striped bass historically were not usually found more than 6 to 8 km offshore (Bain & Bain, 1982). In the past decade, large schools have been moving between state waters and federal Exclusive Economic Zone (EEZ) waters during the year (Kneebone et al., 2014) and further offshore during the winter months (ASMFC, MDDNR, NCDMF and USFWS, unpublished data) well out into federal EEZ waters (e.g., 25-30 nm, or 46.3 to 55.6 km). These coastal migrations are not associated with spawning and usually begin in early spring, but this time period can be prolonged by the migration of bass that are spawning.

Some areas along the coast are used as wintering grounds for adult striped bass. Historically the inshore zones between Cape Henry, Virginia, and Cape Lookout, North Carolina, served as the wintering grounds for the migratory segment of the Atlantic coast striped bass population (Setzler et al., 1980). Geographic Information Systems (GIS) analysis of cooperative winter tagging cruise data from 1988-2013 did not detect a northward latitudinal shift in highest percent capture of striped bass, although occurrence of a longitudinal shift was not included in the analysis (Osborne, 2018). However, recent Atlantic coastal striped bass winter sampling coordinated by ASMFC indicated that overwintering striped bass have been encountered north of Chincoteague Inlet, Virginia to Ocean City, Maryland and in offshore areas entering the EEZ. There are three or more groups of fish that are found in nearshore ocean waters of North Carolina, Virginia, and Maryland between the months of November and March, the wintering period. These groups include striped bass from Albemarle and Pamlico Sounds, North Carolina, Chesapeake Bay, and Hudson River (ASMFC, MDDNR, NCDMF and USFWS, unpublished data); and of these, large striped bass spend the summer in New Jersey and north (Holland & Yelverton, 1973; Nelson et al., 2010; Pautzke et al., 2010). Based on tagging studies conducted under the auspices of ASMFC and the Southeast Area Monitoring and Assessment Program (SEAMAP) each winter since 1988, striped bass wintering off North Carolina, Virginia, and Maryland range widely up and down the Atlantic Coast, at least as far north as Nova Scotia, and represent all major migratory stocks (US Fish and Wildlife Service, ASMFC, and partners, unpublished data).

### 1.4.2 Identification and Distribution of Habitat

#### *1.4.2.1 Spawning and Egg Habitat*

Striped bass spawn in fresh water or nearly fresh water of Atlantic Coast rivers and estuaries. They spawn above the tide in mid-February in Florida but in the St. Lawrence River they spawn in June or July. The bass spawn in turbid areas as far upstream as 320 km from the tidal zone (Hill et al., 1989). The tributaries of the Chesapeake Bay are the primary spawning areas for the migratory stock of striped bass, but other major areas include the Hudson River, Delaware Bay, and the Roanoke River. Prior to spawning, females pause below the salt front (Hocutt et al., 1990) while eggs ripen and water temperature reaches 12-18 degrees Celsius (Secor, 2000) before continuing into freshwater reaches. Spawning is triggered by increased water temperature, occurs between 10 and 24 degrees Celsius, and generally peaks at temperatures between 14 and 19 degrees Celsius (Setzler et al., 1980). Spawning is characterized by brief excursions to the surface by females surrounded by males, accompanied by much splashing. Females release eggs in the water where fertilization occurs (Raney, 1952). Spawning occurs during all hours of day and night (Setzler et al., 1980). Striped bass spawning runs may be blocked when the concentration of total suspended solids exceeds 350 mg/L (Radtke & Turner, 1967).

An egg is only viable for about an hour for fertilization. Following fertilization, the fertilized eggs are spherical, non-adhesive, and semi-buoyant and will harden within one to two hours at 18 degrees Celsius (Hill et al., 1989). Survival of striped bass eggs is dependent on environmental conditions. In general, cooler and wetter winter and spring conditions are favorable. A

temperature range of 17-19 degrees Celsius is important for egg survival as well as for maintaining appropriate dissolved oxygen levels (Bain & Bain, 1982), although they can tolerate a temperature range of 14-23 degrees Celsius (Mansueti, 1958). Eggs hatch from about 30 hours at 22 degrees Celsius to about 80 hours at 11 degrees Celsius (Hill et al., 1989). Eggs can tolerate dissolved oxygen levels down to 1.5 mg/L and salinities ranging from 0-10 ppt with 1.5-3 ppt being optimal (Mansueti, 1958). Water currents are an important factor for the survival of the eggs. Minimum water velocity of 30 cm/sec, from either current or tidal flow, is needed to keep the eggs suspended in the water column; the optimum flow rate is 100-200 cm/sec (Mansueti, 1958). An oil globule provides some buoyancy for the egg, and it is larger when water velocity is slower (Albrecht, 1964). Without the buoyancy, the eggs sink to the bottom, where the sediment may smother them. It is possible for the eggs to hatch if the sediment is course and not sticky or muddy, but survival is limited (Bayless, 1972). Suspended sediment loads ≥1,000 mg/L were lethal to striped bass eggs but were tolerant to loads of 0-500 mg/L (Auld & Schubel, 1978).

#### *1.4.2.2 Larvae Habitat*

There are three stages of larval development. These are: yolk-sac larvae, finfold larvae, and post-finfold larvae (Hill et al., 1989). The yolk-sac larvae occur right after hatching and the stage usually lasts for about 3 to 9 days. They are 2.0 to 3.7 mm in length and contain an easily identified yolk-sac. Yolk-sac larvae occur in open water at varying depths (Setzler et al., 1980). This phase is finished when the yolk-sac is absorbed. The finfold phase lasts for about 11 days and the striped bass reach a length of 12mm (Setzler et al., 1980). Occurrence of finfold larvae varied with time of day and depth (Hill et al., 1989). The last phase is the post-finfold larvae which lasts for about 20 to 30 days and the larvae reach a length of 20 mm (Bain & Bain, 1982). Post-finfold striped bass larvae are present at varying depths in open waters of estuaries.

Survival of the larvae depends on optimal conditions of three main factors: temperature, salinity, and dissolved oxygen. The optimal temperature for larvae is 18 to 21 degrees Celsius, but temperatures of 12 to 23 degrees Celsius can be tolerated (Bain & Bain, 1982). Studies have shown that striped bass larvae do better and have a higher survival rate when they are in low salinity waters (>0-15 ppt) rather than fresh water (Setzler et al., 1980). Abundance was highest in oligohaline portions of the St. Lawrence Estuary ETM zone; 60 times higher than in tidal fresh water and 330 times higher than in mesohaline ETM waters (Vanalderweireldt et al., 2019). The third factor, dissolved oxygen, is equally critical for larvae as it was for the egg stage. A reduction in the dissolved oxygen level reduces the chances of survival of the larvae (Turner & Farley, 1971), which have a lower limit of 3 mg/L (Chittenden, 1971). Poorly buffered rivers may have significant changes in pH. A pH of 5-6.5 in the absence of contaminants causes significant mortality to 11-13 day old fish and a pH of 5.5 is toxic to 159-day-old fish (Buckler et al., 1987). Another factor that influences the survival of striped bass larvae is turbulence. While at first it is necessary for the larvae to reside in turbulent waters to maintain position, the larvae quickly become motile and then are able to maintain position on their own (Doroshev, 1970). Optimum flow for larvae is 30-100 cm/sec although larvae can survive 0-500 cm/sec (Regan et al., 1968). Suspended sediment loads ≥500 mg/L had a significant negative effect on larval survival (Auld & Schubel, 1978).

#### *1.4.2.3 Juvenile Habitat*

Striped bass become juveniles at about 30 mm, when the fins are fully developed. At this point they resemble adults. Temperature tolerance for young-of-year striped bass 20-100 mm ranges from 10-30 degrees Celsius and 18-19 degrees Celsius is optimal (Bogdanov et al., 1967, as cited in Setzler, 1980). Salinity does affect striped bass' capacity to survive low temperatures. Young-of-year striped bass exposed to 5 degrees Celsius water had greater survival across a broad range of salinities (5-35 ppt); however, when exposed to 1 degree Celsius water young-of-year striped bass survival was greater within a narrower salinity range of 10-25 ppt (Hurst & Conover, 2002). Striped bass juveniles exhibit a warmwater fundamental temperature niche (Coutant, 2013); e.g., 80-270 mm (0.25-0.72 kg) fish selected 24-27 degree Celsius water (Coutant et al., 1984) and 430-626 mm (0.91-3.52 kg) fish occupied 20-24 degrees Celsius water (Coutant & Carroll, 1980). Juveniles can tolerate water up to 30-33.5 degree Celsius provided there is sufficient dissolved oxygen (Coutant, 2013). As the juvenile bass grow, they migrate to nearshore areas and then to higher salinity areas of an estuary (Raney, 1952) usually remaining upstream of polyhaline waters (Able et al., 2012) optimally at 10-20 ppt (Bogdanov et al., 1967, as cited in Setzler, 1980). Young-of-year striped bass are less tolerant of low dissolved oxygen than larvae and egg, having a lower limit of 3 mg/l and optimally ≥6 mg/l (Bogdanov et al., 1967, as cited in Setzler, 1980). Juvenile striped bass often occupy waters having a clean sandy bottom, but they have also been found over gravel beaches, rock bottoms, and soft mud areas suggesting that they do not require specific microhabitat conditions (Bain & Bain, 1982; Hill et al., 1989). Association with emergent marsh banks is common throughout the year and especially during spring and fall and commonly with submerged channel embankments in summer (Able et al., 2012). They are usually found in schools of as many as several thousand fish. However, the location of the schools depends on the age of the fish (Hill et al., 1989) and season. Juveniles 21-46 cm (ages 2-5) were most abundant at depths of 5.5-9.1 m in New Jersey nearshore coastal waters (Able et al., 2012), but during winter in Chesapeake Bay juveniles are known to migrate into holes down to 30.5 m deep (Mansueti, 1954).

#### *1.4.2.4 Adult Habitat*

Mature adult striped bass in the migratory contingents leave the estuaries and migrate along the coast where they have lower temperature requirements and comparable dissolved oxygen requirements as juvenile bass (Bain & Bain, 1982). The fundamental thermal niche of striped bass ≥3.1 kg is cool water at 17.5 (mean) to 19 (mode) degrees Celsius (Bettoli, 2005). Temperatures 25-30 degrees Celsius could be tolerated for limited durations provided sufficient dissolved oxygen concentrations were present (>2 mg/l), although condition declined and higher mortality occurred for fish >10 kg (Coutant, 2013). Lower temperature boundary for activity is 0.1-1 degree Celsius; rapid temperature changes can be tolerated (Greene et al., 2009). Striped bass are tolerant of a broad range of salinities (0-35 ppt) and abrupt changes to salinity (Greene et al., 2009). Depths occupied range from 0.6-46 m although straying into deeper waters does occur (Greene et al., 2009). Tagging studies indicate that fish from all stocks range widely along the Atlantic Coast, historically generally remaining in state (0-3 miles) waters but more recently in some areas entering the EEZ (3-200 miles; Kneebone et al., 2014; ASMFC, MDDNR, NCDMF and USFWS, unpublished data). GIS analysis of tagging data from 1988-2013 detected a 3-11 m vertical shift to deeper water and a shift to coarser sand grain

size associated with the highest percent capture (Osborne, 2018). While in coastal and estuarine waters, striped bass are associated with a variety of habitats including substrates composed of sand, gravel, rock, boulder, eelgrass, and mussel beds; subsurface features such as sand bars, troughs, gullies, and shallow bays; floating rockweed; sandy and rocky shorelines; and in the surf zone (Greene et al., 2009).

### 1.4.3 Chemical, Biological, and Physical Threats to Striped Bass and Their Habitat

Residual chlorine; chlorinated hydrocarbons such as PCBs; monocyclic aromatic hydrocarbons such as benzene; and metals such as, copper, zinc, cadmium, mercury, and aluminum are known to be toxic to life history stages of striped bass. Residual chlorine causes 50% mortality in eggs when the concentration is 0.22 ppm, and there is 50% mortality in larvae when the concentration is 0.20 ppm (Hill et al., 1989). Chlorine was also observed to be a predominant factor in egg mortality by Hall et al. (1981). Ozone is an effective substitute for chlorine to reduce fouling (Marine Research Incorporated, 1976). Studies have shown that ozone has a detrimental effect on striped bass eggs (Kosak-Channing & Helz, 1979). Eggs exposed to 0.05 mg/L and 0.10 mg/L of ozone in an estuarine environment were delayed in hatching, but only 70% of the eggs hatched in fresh water under the expected time frame. There was 6% mortality when the eggs were exposed to 0.06 mg/L of ozone for 12 hours, but there was 100% mortality when they were exposed for 36 hours. Effects of ozone and chlorine on striped bass eggs are comparable in estuarine waters, but ozone can have more of an effect if discharged in fresh water located near striped bass spawning areas (Hall et al., 1981). Exposure to sublethal levels of benzene for 24 hours increases the respiratory rates of juveniles and if they are exposed for longer periods of time, reversible narcosis can occur (Brocksen & Bailey, 1973). Chronic exposure to benzene can also result in difficulty locating and consuming prey (Korn et al., 1976). When striped bass are exposed to 6.9 ppm of benzene for 24 hours there is 50% mortality in juveniles (Benville & Korn, 1977). Copper and zinc have an effect on yolk-sac larvae, but eggs are unaffected by these metals. Juveniles can develop lesions in their gill tissue as well as impaired respiration when they are exposed to cadmium and mercury. Low pH increases the toxicity of aluminum (Rago, 1992) and high aluminum levels can severely alter epidermal microridge structures in larvae (Rulifson et al., 1986).

Increased attention is focused on emerging contaminants such as endocrine disruptors (pharmaceuticals, pesticides, industrial compounds, and personal care products), microplastics, and automotive derived compounds. Endocrine disruption of striped bass has not been studied; however, it is known to cause increased disease susceptibility, intersex (Blazer et al., 2007), and altered sexual development (Oberdörster & Oliver, 2001) in fishes. Microplastics are known to enter trophic pathways through ingestion (Au et al., 2017; Bergmann et al., 2015; Bour et al., 2020; Parker et al., 2020) as are nanoplastics through inhalation and gill uptake (Tetra Tech, 2020). Modeling efforts are underway to understand trophic pathways of microplastics exposure and accumulation in striped bass; however, study of potential physiological and behavioral effects is lacking (Tetra Tech, 2020). Striped bass response to automotive derived contaminants has not been studied, although road runoff has the capacity to cause abnormal behavior and physiological change (Chow et al., 2019; McIntyre et al., 2018).

Historically, physical threats to striped bass habitat were attributed to channelization, creation of dams, and land reclamation. In coastal regions, 50% of the original estuarine areas important to striped bass have been lost to filling, road construction, or real estate development (Clark, 1967; Kennish, 2002). In the South Atlantic region, dams restrict the upstream migration on the Roanoke, Tar, Neuse, and Pee Dee rivers (Baker, 1968). Efforts have been undertaken to restore access to historical striped bass spawning habitats through the provision of fishways or through removal of impediments to migration. Contemporary threats to striped bass access to spawning and nursery habitat include alteration of river flow regime by consumptive uses such as agriculture and manufacturing as well as dam operation (Cimino et al., 2009). Furthermore, access to aquatic habitats is largely driven by precipitation. Elevated spring precipitation and river flow increases volume of spawning and nursery habitat available to striped bass (Secor et al., 2017). Heavy winter and spring precipitation events in the northeast and eastern US continue to increase in frequency and intensity coupled with a northward shift in the rain-snow transition zone (USGCRP, 2017).

Change in water temperature may be localized such as from industrial discharge or regional resulting from climate change. The localized heated water discharged from many power plants can cause thermal shock in the fish with the severity depending on the life stage (Schubel et al., 1976). Eggs are more sensitive and subject to greatly mortality from the high temperatures. Larvae and juveniles decrease in their susceptibility as they grow older, and there is not usually higher than 50% mortality of thermal shock in adults (Hill et al., 1989). Regionally, climate change has the potential to alter temperature and precipitation dynamics which directly affects timing of spawning migration as well as survival, growth, and habitat suitability throughout the year. In Chesapeake Bay, spawning female striped bass migration was earlier when spring water temperature was warmer (~3 days per 1 degree Celsius increase); this trend was more evident for larger females (Peer & Miller, 2014). Model projections for Hudson River spawning indicate occurrence up to 15 days earlier (Nack et al., 2019). Suitable temperatures, precipitation and flow, and prey availability directly affect larval striped bass survival (Martino & Houde, 2010; Millette et al., 2019); the temporal and spatial match of which are subject to disruption by climate change (Cimino et al., 2009). Increased winter temperatures may facilitate feeding efficiency, increase growth, and improve juvenile overwinter survival (Cimino et al., 2009); conversely warming of summer estuarine waters subjected to decreased dissolved oxygen will reduce available juvenile and adult summer habitat (Constantini et al., 2008). Striped bass occupied normoxic Patuxent River (Chesapeake Bay) waters at supraoptimal temperatures up to 31 degrees Celsius because of higher growth rate potential within the tributary (Kraus et al., 2015). The disease mycobacteriosis coupled with elevated summer sea surface temperature (>26 degree Celsius) appears to have a negative effect on striped bass survival in Chesapeake Bay (Groner et al., 2018). Climate warming conditions that raise estuarine and riverine surface water temperatures above 28 degrees Celsius concurrent with hypoxic bottom waters would expose striped bass to annual summer temperature-oxygen squeeze conditions that could limit growth and production (Constantini et al., 2008).

Since colonial times, conversion of forests and wetlands to agricultural, suburban, and urban uses has contributed to increased eutrophication and resultant hypoxic and anoxic conditions in the Chesapeake Bay watershed (Brush, 2009; Kemp et al., 2005) as has happened in many other watersheds. Hypoxic coastal waters reduce the extent of suitable fish habitat. Temperature-oxygen squeeze habitat conditions have been observed in Chesapeake Bay during summer and fall and where striped bass sought to avoid waters >27 degrees Celsius (Itakura et al., 2021). Hypoxia is common in coastal waters receiving inputs of anthropogenic derived nutrients (Hagy et al., 2004); particularly when those waters have strong density stratification, low tidal energy, and high surface temperatures during seasons where oxygen levels are already low (Breitburg, 2002). A contributing factor to hypoxia is the extent of impervious surface within the watershed where increases in impervious surface are associated with increased probability of hypoxic waters and reduced likelihood of young-of-year striped bass presence (Uphoff et al., 2011). In Chesapeake Bay, the volume of suitable juvenile and adult striped bass summer habitat has contracted as the volume of hypoxic water has increased (Cimino et al., 2009). Expansive hypoxia coupled with warming water temperatures due to climate change will further reduce future summer habitat available to striped bass (Coutant, 1990).

Conversion of forested and wetland areas to agricultural, suburban, and urban uses are known to affect aquatic systems through increase of factors such as runoff volume and intensity; physical instability, erosion, and sedimentation; thermal pollution; contaminant loads including endocrine disruptors and microplastics; road salt; nutrients through nonpoint and direct discharges, sewage leaks and spills, and stormwater runoff; and disruption of organic matter dynamics. Watershed development associated with urban sprawl and population growth has resulted in significant impairment of striped bass habitat in Chesapeake Bay due to sedimentation, eutrophication, contaminants, flow alteration, and thermal pollution (Cimino et al., 2009). Increased urbanization is associated with increased mobilization of contaminants in runoff (Kaushal et al., 2020) which will be exacerbated by increasingly common and intense rain events. Percent impervious surface is a commonly used indicator of watershed development whereby 10% is a threshold for aquatic ecosystem deterioration (Cappiella & Brown 2001; Beach 2002). In essence, a watershed's percent impervious surface is a catchall index of aquatic habitat condition. Watershed percent impervious surface has been used to assess suitability of striped bass spawning and nursery habitat in Chesapeake Bay tributaries (Uphoff et al., 2011; Uphoff et al., 2020).

### 1.4.4 Habitat Management as an Element of Ecosystem Management

Migratory striped bass require a broad geographic range to complete their life cycle; consequently, the ecosystems used are vast and variable and the cooperative management approach embodied by ASMFC is necessary. Attempts to incorporate ecosystem management into fisheries management are increasing. Ecosystem management can be interpreted as a) the consideration of how the harvest of one species might impact other species in an ecosystem and incorporating that relationship in management decisions and b) the incorporation of the protection and enhancement of habitat features that contribute to fish production into the fishery management process. While the implementation of multispecies management is

increasingly common, incorporation of habitat condition in the management framework and decision-making process is rare.

Biologists, fisheries managers, and fishermen all recognize that habitat quality is one of the keys to maintaining and improving fish stocks for harvest. Increasing demands for seafood and recreation requires that fisheries regulations provide for maximizing yield, minimizing bycatch, and rebuilding and maintaining adequate spawning stocks. Effective fishery management requires more than issuing regulations governing sizes, seasons and catch limits. Degraded habitat negatively affects aquatic communities necessary to support fish life, reduces levels of fish, and inhibits management to provide adequate fish for food or recreational experiences.

Fisheries managers recognize that provisions must be made for agriculture, housing, commerce, and transportation that support our present and growing population; however, components of an unaltered watershed including forested uplands, wetlands, and tidal and nontidal streams are integral for maintaining suitable fish habitat. By 2020 the terrestrial portions of Chesapeake Bay watershed comprised 17% actively used for agriculture, 11% had been developed, and 60% was forested (Chesapeake Conservation Partnership, 2020). These watershed wide percentages are not uniformly distributed among spawning tributaries. For example, the Potomac River is estimated at 26% agriculture and 26% developed, the Choptank River is estimated at 48% agricultural and 10% developed, and the James River is estimated to be 14% agricultural and 11% developed (Chesapeake Bay Program as cited in Chesapeake Bay Foundation, 2021). Population within the Chesapeake Bay watershed will increase from 18 million in 2020 to a projected 22.5 million by 2050 and with it an estimated additional 570,000 acres or 1.3% of land area converted to developed land (Chesapeake Conservation Partnership, 2020). Inherent in land development is increased impervious surface, its veritable permanence, and resultant exacerbation of chemical, biological, and physical threats to striped bass habitat. As ecosystems are altered, production of coastal fishery resources is typically reduced.

Habitat management, as a tool of fisheries management, was traditionally practiced by installation and manipulation of physical structures in the water for the benefit of aquatic life, remediation of point source pollution, removal of stream blockages, and planting of streamside trees. These traditional practices have demonstrated benefit and continue to be employed. However, fisheries management must consider the myriad of impacts that result from land use change and implement environmental protection and restoration activities outside the traditional scope of fish management.

At the federal level, the coastal Regional Fisheries Management Councils' fisheries management plans (FMPs) and Federal EEZ FMPs all now are required to define Essential Fish Habitat (EFH) including Habitat Areas of Particular Concern (HAPC) and to be proactive in protecting it. A report to Congress by an Ecosystems Principles Advisory Panel, Ecosystem-Based Fishery Management (1999), recommended that Regional Management Councils develop Fisheries Ecosystem Plans that recognizes the interrelationships between species and the habitat needs of the managed species. The ASMFC FMP process has habitat protection as one of its objectives (ASMFC, 2019). Each of the cooperating states of the ASMFC should

incorporate habitat protection recommendations in its state waters as an element of their fisheries management framework. However, state fisheries management agencies often lack jurisdiction to mandate measures to protect and conserve fish habitat. Variously named state and county departments of natural resources, environment, coastal resources, and health have the primary responsibilities for programs that protect, promote, and enhance environmental quality for residents and living resources. Fisheries management agencies must integrate their fish production objectives with activities of these habitat management agencies. For example, North Carolina has mandated the preparation and implementation of a Coastal Habitat Protection Plan, which requires the collaboration of the state's Coastal Management, Environmental Management, and Marine Fisheries commissions.[2] Active involvement of fisheries management agencies in strategic planning, application of regulatory controls and permits that feature protection of environmental quality, and production of fish as objectives can provide for human needs while minimizing the impact on ecosystems.

## 1.5 IMPACTS OF THE FISHERY MANAGEMENT PROGRAM

### 1.5.1 Biological and Ecological Impacts

Options to address recreational release mortality through seasonal closures, gear restrictions, and/or education and outreach may reduce the number of striped bass released alive (through seasonal closures) or may increase the chance of survival of striped bass caught and released in the recreational fishery (through gear restrictions and education/outreach). Some seasonal closure options would offer additional benefit to the stock by reducing effort during seasons associated with higher post-release mortality rates or by protecting spawning or pre-spawn fish, which could contribute to stock rebuilding. Changes to the recreational size limit to protect the relatively strong 2015 year class, and potentially other strong year classes, would shift recreational harvest effort to different age classes as compared to the status quo, which would have potential impacts on total SSB that will vary depending on the size limit considered. Changes to the management triggers may affect how quickly and how often the fishing mortality rate, which is the rate at which striped bass are dying because of fishing, is adjusted.

### 1.5.2 Social and Economic Impacts

This Amendment includes several measures which could carry social and economic impacts, notably potential changes to the recreational size limit to protect strong year classes and potential implementation of seasonal closures. Changes in spatial or seasonal closures, gear restrictions, bag and size limits, and other effort controls affect important attributes of a recreational fishing trip, such as the number of fish of each species that anglers catch and are allowed to keep. In turn, these changes in trip attributes will modify the utility (i.e., level of satisfaction) an angler expects to obtain from the fishing trip (McConnell et al. 1995, Haab and

[2] See https://deq.nc.gov/about/divisions/marine-fisheries/public-information-and-education/habitat-information/chpp for more information.

McConnell 2003). As a result, the angler may shift target species, modify trip duration or location, or decide not to take the trip and do something else instead. These behavioral responses lead to changes in directed fishing effort, with accompanying changes in harvest, fishing mortality, and angler welfare. This is, however, only a short-term response and stock dynamics will dictate any longer-term effects on the resource, which may subsequently feed back and affect future management decisions and angling behavior.

Assessing the fishery impacts and potential success of proposed policy measures requires a predictive model that links angler participation and decision-making to changes in management measures, stock levels, and fishing conditions. When data describing angler trip-taking, species targeting, and/or harvest decisions are available, fisheries economists can utilize bioeconomic models to assess the impact of changes in regulation on recreational fishing. Bioeconomic models seek to assess the total effect of changes in policy, immediate and future.

Bioeconomic models combine an economic sub-model with a biological sub-model, which are linked via the impact of angler behavior and fishing mortality on stock dynamics. The integrated model is characterized by two-way feedback loops between fish stocks and angler decision-making in terms of participation, species targeting, and harvest. The number of trips, angler preferences for harvest and release, stock sizes, and regulations jointly determine fishing mortality which, in turn, impacts both future stock levels and future recreational fishing outcomes (Jarvis 2011, Lee at al. 2017). The economic sub-model uses anglers' preferences for different trip attributes to derive anglers' demand for recreational trips under alternative policy scenarios. The biological sub-model, typically an age-structured or size-structured population dynamics model in discrete time, specifies the effect of recreational fishing on the future structure and abundance of the population. Before conducting simulations under alternative policy scenarios, the integrated bioeconomic model can be calibrated such that the number of predicted trips under existing regulations corresponds to MRIP effort estimates (Lee at al. 2017, Holzer and McConnell 2017). The use of bioeconomic simulations allows for a wide range of analyses regarding policy options, often including novel regulatory alternatives, and provides both expected outcomes, in terms of stock abundances and angler welfare, as well as confidence levels around these outcomes.

Recent research into striped bass anglers' preferences and behavior illustrates the connection between regulatory policies and fishing effort while also providing information that could be used to operationalize a bioeconomic model for striped bass management in the future.

Murphy et al. (2019) surveyed striped bass anglers from Massachusetts, Connecticut, Virginia, and North Carolina, collecting data on angler motivations, attitudes, behavior and responses to alternative policy measures. The authors found that changes in size and bag limits led to changes in trip-taking, species targeting, and harvest decisions; these changes in behavior were correlated with angler characteristics such as consumptive orientation (i.e., different attitudes toward catching fish, keeping fish, catching large numbers of fish, and catching trophy fish) and that attitudes; and motivations of striped bass anglers were considerably diverse.

Carr-Harris and Steinback (2020) developed an angler behavioral model using stated preference choice experiment data collected from striped bass anglers from Maine through Virginia. The model was used to simulate trip-taking, harvest decisions, fishing mortality, and angler welfare across a range of alternative policy measures for anglers in Massachusetts, Rhode Island, and Connecticut, incorporating the impacts of fish size on angler behavior, utility, and resulting size- and sex-specific fishing mortality. The authors found that the range of economically efficient policies (i.e., policies that maximize angler welfare for a given level of recreational fishing mortality) was broad if managers were concerned with controlling recreational fishing mortality only, though considerably narrower if protecting female spawning stock was instead the primary management objective. Carr-Harris and Steinback (2020) note their behavioral model could be extended geographically and combined with a population dynamics sub-model to form an integrated bioeconomic model that would be capable of assessing feedbacks and long-run impacts of management decisions on anglers and the striped bass resource. Such an integrated model would allow the ASMFC to estimate the impact of alternative policy options (such as those in draft Amendment 7), as currently done by the New England Fishery Management Council for the cod and haddock recreational fishery (Lee et al. 2017) (see *Section 6.3 Socio-Economic Research Needs*).

#### *1.5.2.1 Striped Bass Fisheries and the Economy*

A 2019 report from Southwick Associates[3] indicates 97% of the economic impacts associated with striped bass fishing came from the recreational sector in 2016. According to the report, total revenues in the commercial sector (from Maine to North Carolina) were $19.8 million that year, while total expenditures in the recreational sector amounted to $6.3 billion. The contribution of the commercial sector to the region's gross domestic product (GDP), when attempting to account for all industries involved in harvesting, processing, distributing, and retailing striped bass to consumers, was $103.2 million and supported 2,664 regional jobs. In comparison, the contribution of the recreational sector to the region's GDP was $7.7 billion and supported 104,867 jobs. Importantly, the report acknowledges that it is not intended to be used to set fishery regulations, but rather to demonstrate the economic significance of striped bass to local economies. It should also be noted that these numbers are for the entire region and actual economic impacts are expected to vary by state.

The dollar values above refer to economic impacts, not to the economic value (or net economic benefit for society) associated with the recreational and commercial fisheries. While data required to quantify these measures are not currently available, the effects of changes to the striped bass management program for recreational sector can be qualified as follows: further limitations on the size and number of fish that can be kept can lead to increased effort to retain a legal-sized fish and an increase in dead releases. Conversely, increased fishing restrictions could result in a reduction in number of recreational trips which could translate into a reduction

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

in angler welfare. However, as in the case of the economic impacts (and assuming increased restrictions do not permanently deter stakeholders from the striped bass fishery), these effects are expected to be outweighed by the positive effects on anglers', harvesters', and consumers' welfare associated with stock recovery in successive years.

## 2.0 GOALS AND OBJECTIVES

### 2.1 HISTORY OF MANAGEMENT

Atlantic striped bass (*Morone saxatilis*) have supported valuable commercial and recreational fisheries on the U.S. Atlantic coast for centuries. The Commission coordinates interstate management of the species in state waters (0-3 miles from shore), while management authority in the exclusive economic zone (3-200 miles) lies with NMFS. The first Interstate FMP for the species was approved in 1981 in response to poor juvenile recruitment and declining landings. The FMP recommended increased restrictions on commercial and recreational fisheries, such as minimum size limits and harvest closures on spawning grounds. Two amendments were passed in 1984 recommending additional management measures to reduce fishing mortality. To strengthen the management response and improve compliance and enforcement, the Atlantic Striped Bass Conservation Act (P.L. 98-613) was passed in late 1984. The Striped Bass Act mandated the implementation of striped bass regulations passed by the Commission and gave the Commission authority to recommend to the Secretaries of Commerce and Interior that states be found out of compliance when they failed to implement management measures consistent with the FMP.

The first enforceable plan under the Striped Bass Act, Amendment 3, was approved in 1985, and required size regulations to protect the 1982 year class—the first modest size cohort since the previous decade. The objective was to increase size limits to allow at least 95% of the females in the 1982 year class to spawn at least once. Smaller size limits were permitted in producer areas than along the coast. Several states opted for a more conservative approach and imposed a total moratorium on striped bass landings for several years. The amendment contained a trigger mechanism to relax regulations when the 3-year moving average of the Maryland juvenile abundance index (JAI) exceeded an arithmetic mean of 8.0. This was attained with the recruitment of the 1989 year class and led to the development of Amendment 4. Also, in 1985, the Commission determined the Albemarle Sound-Roanoke River (Albemarle-Roanoke) stock in North Carolina contributed minimally to the coastal migratory population, and was therefore allowed to operate under an alternative management program.

Amendment 4, implemented in 1989, aimed to rebuild the resource rather than maximize yield. The amendment allowed state fisheries to reopen under an interim target fishing morality (F) of 0.25, which was half the estimated F needed to achieve maximum sustainable yield (MSY). The amendment would allow an increase in the target F (0.5) once female SSB was restored to levels estimated during the late 1960s and early 1970s. The dual size limit concept was maintained (28" coastal versus 18" producer areas), and a recreational trip limit and commercial season was implemented to reduce the harvest to 20% of that during 1972-1979. A

series of four addenda were implemented from 1990-1994 to maintain protection of the 1982 year class through sequentially higher minimum size limits which reached 34" along the coast by 1994.

In 1990, to provide additional protection to striped bass and ensure the effectiveness of state regulations, NMFS adopted a prohibition on possession, fishing (catch and release fishing), harvest, and retention of Atlantic striped bass in the Exclusive Economic Zone (EEZ), with the exception of a defined transit zone within Block Island Sound (55 Federal Register 40181-02). Atlantic striped bass may be transported through this defined area provided that the vessel is not used to fish while in the EEZ and the vessel remains in continuous transit, and that the fish were legally caught in adjoining state waters. The EEZ has remained closed since 1990. In addition, an Executive Order issued in 2017 prohibits the sale of striped bass caught from the EEZ.

In 1995, the Atlantic striped bass migratory stock was declared recovered by the Commission (the Albemarle-Roanoke stock was declared recovered in 1997 and the Delaware River stock was declared recovered in 1998) and Amendment 5 was adopted to increase the target F to 0.33, midway between the existing F target (0.25) and $F_{MSY}$. Target F was allowed to increase again to 0.40 after two years of implementation. Regulations were developed to achieve the target fishing mortality, which included measures to restore commercial harvest to 70% of the average landings during the 1972-1979 historical period, and recreational season, possession (two fish), and size limits (a return to 28" on the coast and 20" for producer areas). States were allowed to submit proposals to implement alternative regulations that were deemed conservationally equivalent to the Amendment 5 measures, provided no size limits were below 18". From 1997-2000[4], a series of five addenda were implemented to respond to the latest stock status information and adjust the regulatory program to achieve each change in target F.

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

[4] The 1997 reauthorization of the Striped Bass Act also required the Secretaries of Commerce and Interior provide a biennial report to Congress highlighting the progress and findings of studies of migratory and estuarine Striped Bass. The tenth such report was recently provided to Congress (Shepherd et al. 2020).

[5] While NMFS continues to implement a complete ban on the fishing and harvest of striped bass in the EEZ, Amendment 6 includes a recommendation to consider reopening the EEZ to striped bass fisheries. In September 2006, NMFS concluded that it would be imprudent to open the EEZ to striped bass fishing because it could not be certain that opening the EEZ would not lead to increased effort and an overfishing scenario. In 2018, the Consolidated Appropriations Act directed NMFS (in consultation with ASMFC) to review the federal moratorium once the 2018 benchmark was completed, and consider lifting the ban, however, there has not been any update from NMFS on this directive.

commercial fisheries, and coastal and producer area sectors; and 5) excessively frequent changes to the management program.

Amendment 6 modified the F target and threshold, and introduced a new set of biological reference points (BRPs) based on female SSB, as well as a list of management triggers based on the BRPs. The F threshold value was set to achieve MSY and the F target was set to provide a higher long-term yield from the fishery and adequate protection to ensure that the striped bass population is not reduced to a level where the spawning potential is adversely affected. The F target provided a buffer to account for the uncertainty in the estimate of $F_{MSY}$ threshold. The female SSB threshold value was set equal to the female SSB value in 1995, the year that the striped bass stock was declared rebuilt, while the SSB target was set to 125% of the SSB threshold. New management measures were selected based on the F target.

The coastal commercial quotas were restored to 100% of the states' average landings during the 1972-1979 historical period, except for Delaware's coastal commercial quota which remained at the level allocated in 2002[6]. For the recreational fisheries, a two-fish bag limit with a minimum size limit of 28 inches was established, except for the Chesapeake Bay fisheries and North Carolina fisheries that operate in the Albemarle-Roanoke. The Chesapeake Bay and Albemarle-Roanoke regulatory programs were predicated on a more conservative F target than the coastal migratory stock, which allowed these states/jurisdictions (hereafter states) to implement separate seasons, harvest caps, and size and bag limits as long as they remained under that F target. Additionally, states were permitted the flexibility to deviate from the coastwide regulations by submitting conservation equivalency proposals. No minimum size limit could be less than 18 inches under Amendment 6. The same minimum size standards regulated the commercial fisheries as the recreational fisheries, except for a minimum 20 inch size limit in the Delaware Bay spring American shad gillnet fishery.

Five addenda to Amendment 6 have been implemented. Addendum I, approved in 2007, established a bycatch monitoring and research program to increase the accuracy of data on striped bass discards and recommended development of a web-based angler education program. Addendum II was approved in 2010 and established a new definition of recruitment failure such that each index would have a fixed threshold rather than a threshold that changes annually with the addition of each year's data. Addendum III was approved in 2012 and requires all states with a commercial fishery for striped bass to implement a uniform commercial harvest tagging program. The Addendum was initiated in response to significant poaching events in the Chesapeake Bay and aims to limit illegal harvest of striped bass.

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

Addendum IV was triggered in response to the 2013 benchmark assessment, which indicated a steady decline in SSB since the mid-2000s to the point of approaching the SSB threshold in the terminal year. The Addendum established new F reference points, including the elimination of Chesapeake Bay stock-specific reference points due to modeling limitations, and changed commercial and recreational measures to reduce F to a level at or below the new target. While the 1995 female SSB level had proved to be a useful reference point for striped bass, fishing at (and even below) the $F_{MSY}$ target reference point did not maintain female SSB at the 1995 level. To address this issue, the 2013 benchmark stock assessment recommended new F reference points that would maintain SSB at or above its 1995 level which Addendum IV adopted. Chesapeake Bay fisheries were required to implement lower reductions than coastal states (20.5% compared to 25%) since their fisheries were reduced by 14% in 2013 based on their management program; however, this included replacing the Bay's variable commercial harvest cap (based on exploitable biomass) with a fixed level based on reducing 20.5% from the 2021 harvest. Along the coast, the measures included 25% coastal commercial quota reductions and a 1-fish limit and 28" minimum size for recreational fisheries. The addendum maintained the flexibility to implement alternative regulations through the conservation equivalency process, which resulted in some variety of regulations among states. All states promulgated regulations prior to the start of their 2015 seasons.

In February 2017, the Board initiated development of Draft Addendum V to consider liberalizing coastwide commercial and recreational regulations. The Board's action responded to concerns raised by Chesapeake Bay jurisdictions regarding continued economic hardship endured by its stakeholders since the implementation of Addendum IV and information from the 2016 stock assessment update indicating that F was below target in 2015, and that total removals could increase by 10% to achieve the target F. However, the Board chose to not advance the draft addendum for public comment largely due to harvest estimates having increased in 2016 without changing regulations. Instead, the Board decided to wait until it reviewed the results of the 2018 benchmark stock assessment (NEFSC 2019) before considering making changes to the management program.

Addendum VI was initiated in response to the 2018 benchmark assessment which indicated the stock was overfished and experiencing overfishing in 2017. Approved in October 2019, the Addendum aims to reduce total removals by 18% relative to 2017 levels in order to achieve the F target in 2020 and begin rebuilding the stock. Specifically, the Addendum reduces all state commercial quotas by 18%, and implements a 1 fish bag limit and a 28"to less than 35" slot limit for ocean fisheries and a 1 fish bag limit and an 18" minimum size limit in Chesapeake Bay to reduce total recreational removals by 18% in both regions. The Addendum's measures are designed to apply the needed reductions proportionally to both the commercial and recreational sectors, although states were permitted to submit alternative regulations through conservation equivalency that achieve an 18% reduction in total removals statewide. The Board reviewed and approved management options for 2020 on a state-by-state basis in February, and all states promulgated regulations by April 1 (Tables 12-13).

Addendum VI also requires the mandatory use of circle hooks when fishing with bait to reduce release mortality in recreational striped bass fisheries. States are encouraged to promote the use of circle hooks through various public outreach and education platforms to garner support and compliance with this important conservation measure. Circle hook regulations were required to be implemented no later than January 1, 2021. In March 2021, the Board approved a clarification on the definition of bait and methods of fishing that require circle hooks. The Board also approved guidance on how to address incidental catch of striped bass when targeting other species with non-circle hooks with bait attached.[7]

## 2.2 PURPOSE AND NEED FOR ACTION

The purpose of Amendment 7 is to update the management program to align with current fishery needs and priorities given the status and understanding of the resource and fishery has changed considerably since implementation of Amendment 6 in 2003. The Board intends for this amendment to build upon the Addendum VI action to end overfishing and initiate rebuilding in response to the overfished status.

The Board-approved 2018 benchmark stock assessment indicated the striped bass stock is overfished and experiencing overfishing relative to the updated reference points defined in the assessment. By accepting the assessment for management use in 2019, two management triggers were tripped requiring the Board to take action to address both the overfishing and overfished status. Addendum VI was implemented in 2020 to address the overfishing status by implementing measures to reduce fishing mortality back to the fishing mortality target in 2020. To address the overfished status, the Board must adjust the striped bass management program to rebuild the biomass to the target level by no later than 2029 (within 10 years). Addendum VI measures are expected to contribute to stock rebuilding.

This draft amendment presents options that would contribute to stock rebuilding and would update the management program to address concerns raised by the Board and the public (see *Section 1.1.1 Statement of the Problem*). For the recreational fishery, this amendment considers management measures to address recreational release mortality and to protect strong year classes. Regarding management program processes, this amendment considers options to modify the use of conservation equivalency in the Striped Bass FMP and options to modify the management triggers established through Amendment 6. Regarding the rebuilding plan, this amendment considers options for how recruitment assumptions would be applied to the rebuilding calculations and projections in the next stock assessment update (expected in 2022). Besides these five issues, all other management measures are consistent with Amendment 6 and its Addenda; however, other issues can be addressed in a separate management

[7] This guidance on incidental catch could not be implemented as a compliance criterion since incidental catch was not originally part of Addendum VI.

document(s) following approval of the final amendment (see *Section 4.7 Adaptive Management*).

### 2.3 GOAL

The Goal of Amendment 7 to the Interstate Fishery Management Plan for Atlantic Striped Bass is:

> To perpetuate, through cooperative interstate fishery management, migratory stocks of striped bass; to allow commercial and recreational fisheries consistent with the long-term maintenance of a broad age structure, a self-sustaining spawning stock; and also to provide for the restoration and maintenance of their essential habitat.

### 2.4 OBJECTIVES

In support of this goal, the following objectives are specified:

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

### 2.5 MANAGEMENT UNIT

The management unit includes all coastal migratory striped bass stocks on the East Coast of the United States, excluding the Exclusive Economic Zone (3-200 nautical miles offshore), which is managed separately by NMFS. The coastal migratory striped bass stocks occur in the coastal and estuarine areas of all states and jurisdictions from Maine through North Carolina. Inclusion of these states in the management unit is also congressionally mandated in the Atlantic Striped Bass Conservation Act (PL 98-613).

### 2.5.1 Chesapeake Bay Management Area

The Chesapeake Bay management area is defined by the striped bass residing between the baseline from which the territorial sea is measured as it extends from Cape Henry to Cape Charles to the upstream boundary of the fall line. Unlike the Albemarle Sound-Roanoke River stock, the striped bass in the Chesapeake Bay are unquestionably part of the coastal migratory stock and are assessed as part of the coastal migratory striped bass management unit. However, Amendment 7 implements a separate management program for the Chesapeake Bay due to the size availability of striped bass in this area.

### 2.5.2 Albemarle Sound-Roanoke River Management Area

The Albemarle Sound-Roanoke River (Albemarle-Roanoke) stock is currently assessed and managed separately by the State of North Carolina under the auspices of ASMFC.[8] The Albemarle-Roanoke management area is defined by the striped bass inhabiting the Albemarle, Currituck, Croatan, and Roanoke Sounds and their tributaries, including the Roanoke River. The Virginia/North Carolina line bound these areas to the north and a line from Roanoke Marshes Point to the Eagle Nest Bay bounds the area to the south. The Bonner Bridge at Oregon Inlet defines the ocean boundary of the Albemarle-Roanoke management area.

The Albemarle-Roanoke stock is not included in the coastwide assessment and management program because it contributes minimally to the coastal migratory stock. The Albemarle-Roanoke stock is smaller in total abundance relative to the other producer areas and does not participate in the coastal migration until older ages. The female maturation schedule for the Albemarle-Roanoke stock is also different than the Chesapeake Bay stock (ASMFC 2013; NCDMF 2014). The Technical Committee will continue to monitor the contribution of the Albemarle-Roanoke stock to the coastal migratory population and make recommendations to the Management Board regarding future management.

## 2.6 REFERENCE POINTS

The current status of the Atlantic striped bass stock will be determined with respect to its biological reference points through the stock assessment. Amendment 7 maintains the previously existing reference point definitions from Amendment 6, as modified by Addendum IV, for female spawning stock biomass (SSB) and fishing mortality rate (F).

[8] Estuarine striped bass in North Carolina are currently managed under Amendment 1 to the North Carolina Estuarine Striped Bass Fishery Management Plan (FMP) and its subsequent revision and recent supplement (NCDMF 2013, 2014, 2019). It is a joint plan between the North Carolina Marine Fisheries Commission (NCMFC) and the North Carolina Wildlife Resources Commission (NCWRC).

### 2.6.1 Definition of Overfishing and Overfished

A common approach in fisheries management for evaluating the need for management action as determined by stock status is through the use of a control rule. For striped bass, the control rule is based on the level of: 1) fishing mortality rate (F) and 2) female spawning stock biomass (SSB). Overfishing is defined relative to the rate of removals from the population, as determined by the fishing mortality on the stock, whereas overfished status is defined relative to female SSB. For striped bass, the threshold levels of F and SSB are used to determine overfishing and overfished status, respectively. If F exceeds the F threshold, overfishing is occurring, and if SSB falls below the SSB threshold, the stock is overfished.

The management program is designed to achieve the target F and SSB levels. The use of fishing mortality and spawning stock biomass targets and thresholds will provide managers with a series of factors to use when evaluating the status of the stock. *Section 4.1* outlines a series of management triggers associated with the targets and thresholds.

The following sections identify SSB and F reference points for the coastwide population, which includes the Chesapeake Bay, Hudson River and Delaware River/Bay as a metapopulation. These reference points are consistent with those accepted in the Striped Bass 2018 Benchmark Assessment and Peer Review (NEFSC 2019).

Additional work is being conducted by the TC and SAS to develop management area-based reference points (e.g., for the Chesapeake Bay) for future Board consideration.

#### *2.6.1.1 Female Spawning Stock Biomass Target and Threshold*

The biomass target and threshold are based on the weight of sexually mature females in the striped bass population. The 1995 estimate of female SSB is used as the SSB threshold because many stock characteristics, such as an expanded age structure, were reached by this year, and this is also the year the stock was declared recovered. The female SSB target is equal to 125% of the female SSB threshold. Based on the results from the 2018 assessment, the SSB threshold is 91,436 metric tons (202 million pounds) and the SSB target is 114,295 metric tons (252 million pounds) (Table 1). Female SSB target and threshold values will be updated with future stock assessments because these reference point values are estimated based on the best available data.

The striped bass population will be considered overfished when the female SSB falls below the SSB threshold level. *Section 4.1* outlines management triggers based on female SSB reference points.

The use of the word “target” is not intended to imply that the management program will try to limit the population from expanding beyond the target level. In other words, when the population is above the target it is not the intent to reduce the population back to target levels.

### *2.6.1.2 Fishing Mortality Target and Threshold*

Fishing mortality based reference points are designed to manage the rate at which individual striped bass die because of fishing. The fishing mortality target and threshold are the values of F estimated to achieve the respective SSB target and threshold over the long-term. If the current F exceeds the F threshold, then overfishing is occurring. This means the rate at which striped bass are dying because of fishing (i.e., harvest and dead discards) exceeds the stock's ability to maintain itself at the SSB threshold. The value of the F target is set at a cautionary level intended to safeguard the fishery from reaching the overfishing threshold.[9] The F target and threshold values will be updated with future stock assessments because these reference point values are estimated based on the best available data.

*Section 4.1* outlines management triggers based on the F reference points.

Table 1. Coastwide Population Reference Points

| **Reference Point** | **Definition** | **Value (as estimated in 2018 benchmark stock assessment)*** |
|---|---|---|
| $SSB_{THRESHOLD}$ | SSB in 1995 | 202 million pounds |
| $SSB_{TARGET}$ | 125% of SSB in 1995 | 252 million pounds |
| $F_{THRESHOLD}$ | F associated with achieving the SSB threshold | 0.24 |
| $F_{TARGET}$ | F associated with achieving the SSB target | 0.20 |

*The target and threshold values may change through future stock assessments because they are estimated based on the best available data.

### *2.6.1.3 Reference Points for the Albemarle Sound-Roanoke River*

The State of North Carolina will manage the Albemarle Sound-Roanoke River stock using reference points from the latest North Carolina Albemarle Sound-Roanoke River stock assessment accepted by the Technical Committee and approved for management use by the Board (Figures 9-10). The recreational and commercial fisheries in the Albemarle Sound and Roanoke River will operate under North Carolina's Fishery Management Plan while the recreational and commercial fisheries in the Atlantic Ocean will continue to operate under the Commission's management measures as the rest of the coastal fisheries.

[9] F reference points are calculated by the stock assessment model, which includes incorporating recruitment from the values observed from 1990 to the terminal year of the assessment. If an alternative recruitment management trigger is selected from *Section 4.1,* an interim F target and threshold may be calculated based on recruitment values from a low recruitment time period only, as specified in *Section 4.1*.

## 2.7 STOCK REBUILDING PROGRAM

### 2.7.1 Stock Rebuilding Targets

Should the Atlantic striped bass population be overfished at any time, it is the intent under Amendment 7 to rebuild the female spawning stock biomass to the target level (defined in *Section 2.6.1.1*) within the timeframe established in *Section 2.7.2*.

### 2.7.2 Stock Rebuilding Schedules

If at any time the Atlantic striped bass population is declared overfished and rebuilding needs to occur (as specified in *Section 4.1 Management Triggers*), the Management Board will determine the rebuilding schedule at that time. The only limitation imposed under Amendment 7 is that the rebuilding schedule is not to exceed 10 years.

### 2.7.3 Maintenance of Stock Structure

Using the outputs from the stock assessment model, the Technical Committee will monitor the status of the age structure in the striped bass population. If the Technical Committee identifies a persistent change in the age structure that could jeopardize recruitment then the Management Board could modify the exploitation pattern to increase survival of target age classes. In addition, if an individual stock exceeds threshold limits for biomass or exploitation the Board should consider management changes for that stock.

## 3.0 MONITORING PROGRAM SPECIFICATION

In order to achieve the goals and objectives of Amendment 7, the collection and maintenance of quality data is necessary. All state fishery management agencies are encouraged to pursue full implementation of the standards of the Atlantic Coastal Cooperative Statistics Program (ACCSP).

## 3.1 COMMERCIAL CATCH AND LANDINGS INFORMATION

States and jurisdictions with commercial striped bass fisheries are required to collect commercial fishery data elements consistent with ACCSP standards and adhere to the ACCSP standard of mandatory trip-level reporting for catch and effort data collection. These data are used to support commercial quota monitoring efforts to prevent annual quota overages. Commercial quotas are allocated on a calendar year basis with quota monitoring being conducted annually during the Fishery Management Plan Review process based on landings information submitted in state compliance reports. States also conduct quota monitoring during the fishing season. Any overages incurred by a state or jurisdiction is deducted from that state or jurisdictions allowable quota in the following year.

### 3.1.1 Commercial Tagging Program

States and jurisdictions are required to implement a tagging program for all commercially harvested striped bass within state or jurisdictional waters. Further descriptions of the program requirements are provided in the following sections.

Tag Information and Type

All states and jurisdictions with a commercial striped bass fishery are required to submit a Commercial Tagging Report to ASMFC no later than 60 days prior to the start of the first commercial fishery in that state or jurisdiction. The Commercial Tagging Report will include a picture of the tag(s), as well as a description of the tag color, style, and inscription for all gears and/or seasons issued. Additionally, it should include the number of tags issued or printed and a description of the biological metric used to determine the number of tags printed and distributed to participants. All tags used in a state or jurisdictions tagging program must be tamper-evident. Tags are required to be valid for only one year or fishing season. Tags are required to be inscribed with, at a minimum, the year of issue, the state of issue, and a unique number that can be linked back to the permit holder. Where possible, tags should also be inscribed with size limit. States should consider the use of bar codes or QR codes imprinted on tags, for use in tracking fish from harvester to dealer to buyer, as the technology becomes more available. Changes to the tags, with the exception of year, are required to be reported to ASMFC as specified in *Section 5.3*.

Tag Timing

States or jurisdictions with a commercial striped bass fishery may choose to implement their commercial tagging program at either the point of harvest or the point of sale.

Tag Allowance

States and jurisdictions with a commercial striped bass fishery are required to allocate commercial tags to permit holders based on a biological metric. This option is intended to help prevent state or jurisdictional commercial quota overages, which will contribute to the health and sustainability of the striped bass population. The biological metric used to allocate tags to participants is required to be included in the annual Commercial Tag Report.

Tag Accounting

States and jurisdictions with a commercial striped bass fishery must require permit holders to turn in unused tags or provide an accounting report for any unused tags prior to the start of the next fishing season. Tags or the accounting report shall be turned into the agency issuing the tags. The accounting report must include the disposition of all tags issued to the permittee (e.g., used, unused, broken, lost). Permit holders who do not comply with this section may be subject to penalties as set forth below.

Reporting for Tagging Program

States and jurisdictions with a commercial striped bass fishery shall, at a minimum, approve the ACCSP standards for catch and effort data collection. The ACCSP standard for commercial catch and effort data is mandatory, trip-level reporting of all species commercially harvested with reporting of specific minimum data elements; including species, quantity, state and port of landing, market grade and category, areas fished and hours fished. Dealers and/or harvesters landing catches must report to the state of landing monthly or more frequently, if possible. Each gear and area combination should be detailed; such as separate listings each time the fisherman changes gear or fishing area within a trip. Price data are preferred at the trip-level,

but partners may opt to collect prices through dealer surveys.

Striped Bass Processing

For all commercial striped bass tagging programs, tags must remain affixed to the fish until processed for consumption by the consumer. Retail markets may prepare portions of legally tagged striped bass for the consumer but must retain the tagged carcass until all portions are sold. The tag must then be removed from the rack and destroyed (e.g. by cutting the tag in two). Possession of untagged striped bass or striped bass fillets or steaks without the properly tagged carcass in establishments where fish are sold or offered for sale (including wholesale establishments, retail establishments and restaurants) is presumptive evidence of intent to sell, trade, or barter such striped bass.

Striped Bass Exportation

It is unlawful to sell or purchase commercially caught striped bass without a commercial tag. This is to prevent the sale or purchase of untagged striped bass into a state or jurisdiction where there is currently no commercial fishery program.

Penalties

It is recommended that states and jurisdictions strengthen their penalties for striped bass violations, including counterfeit tag operations, so that the penalties are sufficient to deter illegal harvest of striped bass. License revocation or suspension is supported as a primary penalty for state or federal violations. Civil and/or criminal penalties can be effective deterrents.

It is recommended that if the permit holder issued tags cannot account for unused commercial striped bass tags, then that individual will not be issued a commercial striped bass permit for the subsequent fishing year.

### 3.2 RECREATIONAL CATCH AND INFORMATION

The Marine Recreational Information Program (MRIP) contains estimated Atlantic striped bass catches starting in 1981 for shore, private/rental boats, and for-hire modes. Recreational harvest of striped bass was previously collected through the Marine Recreational Fisheries Statistics Survey (MRFSS), which was a recreational data collection program used from 1981-2003. The MRFSS program was replaced by MRIP in 2004 and was designed to provide more accurate and timely reporting as well as greater spatial coverage. The MRFSS and MRIP programs were simultaneously conducted in 2004-2006 and this information was used to calibrate past MRFSS recreational harvest estimates against MRIP recreational harvest estimates.

In 2018, MRIP implemented the Fishing Effort Survey (FES) which used an improved methodology to address several concerns with the prior Coastal Household Telephone Survey. These concerns included under-coverage of the angling public, declining number of households with landline telephones, reduced response rates, and memory recall issues. Past estimates

have been recalibrated to the FES. This calibration resulted in much higher recreational catch estimates compared to previous estimates. The 2018 striped bass benchmark assessment incorporated these newly calibrated MRIP estimates.

Recreational catches of striped bass were downloaded from https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries using the query option.

A description of MRIP survey methods can be found online: https://www.fisheries.noaa.gov/recreational-fishing-data/types-recreational-fishing-surveys#access-point-angler-intercept-survey.

### 3.3 SOCIAL AND ECONOMIC COLLECTION PROGRAMS

Data on a number of variables relevant to social and economic dimensions of striped bass fisheries are collected through existing ACCSP data collection programs and MRIP; however, no explicit mandates to collect socioeconomic data for this species currently exist. In addition to landed quantities, commercial harvesters and dealers may report ex-vessel prices or value, fishing and landing locations, landing disposition, and a variety of measures capturing fishing effort. MRIP regularly collects information on recreational fishing effort and landings, and occasionally gathers socioeconomic data on angler motivations and expenditures.

### 3.4 BIOLOGICAL DATA COLLECTION PROGRAM

#### 3.4.1 Fishery-Dependent Data Collection

Required fishery-dependent data collection programs are as follows:

1. Catch composition information will be gathered by those states/jurisdictions with commercial fisheries (currently Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, Potomac River Fisheries Commission, and North Carolina) and by those states with significant recreational fisheries (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and the Potomac River Fisheries Commission). Samples shall be representative of location and seasonal distribution of catch, and appropriate biological data shall be collected.

2. Representative catch and effort data will be gathered by those states with significant commercial fisheries (currently Massachusetts, New York, Delaware, Maryland, Virginia, and the Potomac River Fisheries Commission) and by those agencies monitoring recreational fisheries (National Marine Fisheries Service, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and the Potomac River Fisheries Commission).

3. Striped bass tagging programs currently executed by the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Southeastern Monitoring and Assessment Program,

Massachusetts Division of Marine Fisheries, New York Department of Environmental Conservation, New Jersey Department of Environmental Protection, Maryland Department of Natural Resources, Virginia Marine Resources Commission, and North Carolina Division of Marine Fisheries will be continued to generate estimates of migration and mortality rates.

### 3.4.2 Fishery-Independent Data Collection

#### *3.4.2.1 Young-of-Year (YOY) Surveys*

Annual juvenile recruitment (appearance of juveniles in the ecosystem) of striped bass which comprise the Atlantic Coast migratory population is measured in order to provide an indication of future stock abundance. When low numbers of juvenile fish (age 0) are produced in a given year, recreational and commercial catches from that year class may be lower four years later when surviving fish become available to the fisheries. Recruitment is measured by sampling current year juvenile fish abundance in nursery areas. Currently, these juvenile abundance indices are determined annually for stocks in the Kennebec River, Hudson River, Delaware River, Chesapeake Bay and its tributaries, and Albemarle Sound-Roanoke River. Since there is a time delay of several years between the measurement of recruitment and initial harvest of those fish, managers have ample time to protect year classes that have not yet been exploited.

The juvenile abundance index values for the Hudson River, Delaware River, Chesapeake Bay and its tributaries serve as input to the assessment model. Juvenile abundance indices can also serve as another indicator of the status, and future status, of the striped bass population. Recruitment failure is defined as an index value that is below 75% of all values in a fixed time series appropriate to each juvenile abundance index. The fixed time series for determining recruitment failure are as follows:

| State JAI | Water Body | Reference Period |
|---|---|---|
| **ME** | Kennebec River | 1987-2009 |
| **NY** | Hudson River | 1985-2009 |
| **NJ** | Delaware River | 1986-2009 |
| **MD** | Chesapeake Bay | 1957-2009 |
| **VA** | Chesapeake Bay | 1980-2009 |
| **NC** | Albemarle-Roanoke | 1955-2009 |

The following states are currently required to conduct juvenile abundance index surveys on an annual basis: Maine for the Kennebec River; New York for the Hudson River; New Jersey for the Delaware River; Maryland for the Chesapeake Bay tributaries; Virginia for Chesapeake Bay tributaries; and North Carolina for the Albemarle Sound-Roanoke River.

The requirements for measurement of juvenile indices are as follows:

1. The sampling protocol (stations, sampling intensity and gear type) shall be consistent throughout the period for which the index is to be used. For new indices, the following information will be required: details of the sampling design of the study yielding the data used to develop the index; a description of the analyses performed; and a presentation of

the results of those analyses. The Technical Committee shall review any such submittal and either accept or reject it. If rejected, the Committee will provide a written explanation to the sponsor explaining the reasons for rejection.

2. In order to be validated, the index should exhibit a significant ($p<0.05$) positive correlation to either the magnitude of future landings (lagged 2-7 years) from the stock, or to the relative abundance of the same year class later in life (i.e., relative abundance of juveniles versus the relative abundance of yearling fish of the same year class).

3. The Management Board may require juvenile abundance surveys in additional river systems to evaluate the level of striped bass productivity.

4. The Technical Committee shall annually examine trends in all required juvenile abundance index surveys and evaluate index values against the recruitment trigger, as defined in *Section 4.1*.

#### *3.4.2.2 Spawning Stock Biomass Surveys*

Spawning stock surveys are required to be monitored in each of the following areas: Hudson River, Delaware River, Chesapeake Bay, and Albemarle Sound-Roanoke River.

The requirements for monitoring spawning stock biomass are as follows:

1. The Technical Committee shall examine output from the stock assessment model when stock assessment benchmarks or updates are conducted and use those estimates to evaluate the status of the striped bass stock relative to the female spawning stock biomass targets and thresholds in this Amendment.

2. Jurisdictions bordering the Hudson River, Delaware River, Chesapeake Bay, and Albemarle Sound/Roanoke River (currently New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina) shall be responsible for conducting spawning stock assessment surveys in those river systems. Accepted studies for fulfilling this requirement currently include: **New York**: Hudson River haul seine survey and shad by-catch analysis; **Maryland**: Gill net surveys; **Virginia**: spring pound net survey; **North Carolina**: spring electroshocking survey of spawning stock; **Pennsylvania-New Jersey-Delaware**: Delaware River electroshocking/gill net survey. Any changes to the survey methodology must be reviewed by the Technical Committee and approved by the Management Board prior to implementation.

#### *3.4.2.3 Observer Programs*

As a condition of state and/or federal permitting, many vessels are required to carry at-sea observers when requested. A minimum set of standard data elements are to be collected through the ACCSP at-sea observer program (refer to the ACCSP Program Design document for details). Specific fisheries priorities will be determined by the Discard/Release Prioritization Committee of ACCSP.

### *3.4.2.4 Tagging Studies/Program*

Tagging of fish with individually-numbered tags is a proven technique for determining movement and migration routes and rates, growth rates and patterns, estimation of mortality/survival, estimation of population size (if assumptions are met), stock identification and determination of movement/migration corridors and habitat use. The use of more sophisticated electronic tags can provide additional habitat information such as temperature (of both water and fish body), depth and specific location. The species' Advisory Panel, Stock Assessment Subcommittee, Technical Committee and/or Management Board (for ASMFC), Advisory Panel or Committee (for Fishery Management Councils) and working groups for International Fisheries Commissions may decide to recommend that tagging studies be performed. Alternatively, such studies may be initiated independently by one or more of the partners in the fishery management process.

Fish tagging is a technical activity which is usually conducted by scientific personnel; however a number of other entities have become involved in or conducted their own tagging studies. If a new tagging study is proposed for striped bass, a number of considerations should be addressed. Any proposed study must have stated objectives, which directly relate to scientific or management purposes. A second important consideration is whether a species can be tagged with minimal mortality, as the utility of study data will be highly questionable if handling/tagging mortality is high. The ideal tag should be one which has a unique alpha-numeric identifier and organization contact information, is easily implanted, has a high rate of retention, is readily visible to potential recoverers without increasing an animal's susceptibility to predation, and remains permanently legible, or in the case of internally-embedded coded wire (CWT) or passive integrated transponder (PIT) tags, is easily and consistently detectable. The implantation location and type of CWT or PIT tags should be fully coordinated with other investigators tagging the same species. Tag number sequences and colors of externally visible tags should be coordinated with other investigators conducting similar studies, via the Interstate Tagging Committee, to ensure that duplication does not occur, and contact information for recoveries and returns should be clearly imprinted on the tag. Tagging should be conducted in a consistent manner by personnel who have been properly trained. Consideration should be given to requiring certification of both professional staff and volunteer angler taggers by the sponsoring organization, in order to increase both the efficiency of tagging and the survival of tagged fish through minimization of handling/tagging mortality. The ASMFC Interstate Tagging Committee has developed a certification for tagging programs, for which sponsoring organizations may wish to apply.

Tagging studies should be highly publicized among the fishing public to maximize the rate of return from both commercial and recreational sectors. In most cases, efforts should be undertaken to accurately measure the rate of tag encounter and reporting. Ideally each study conducted should assess short-term tagging (handling) mortality; short and long-term tag loss; and reporting rates for each fishery sector. Advertised/promised rewards should be provided promptly upon receipt of data. Study managers should insist on complete and accurate return information. Numbers of animals tagged should be sufficiently high to ensure that the desired information will be produced by the study. Careful and appropriate study design (i.e., purpose,

location, sample size, duration, recapture procedures, analysis) is vital to ensure success. Prior to study implementation, a repository for any resultant data should be specified, and long-term commitments made by the sponsoring program, and resources made available to analyze and publish the results. Funds should be provided/reserved to process recaptured tagged fish reported after the program has ended. In angler programs, participants with tagging kits should be notified when the program has ended. All incoming tagging data should be added to the existing database until no additional data are received. Failure to respond to reports of recaptured fish will be detrimental to surrounding tagging programs. Tag reporting apathy develops in anglers when they do not receive replies from the tagging entity.

Investigators may wish to consider collaboration with existing tag database managers (e.g. NMFS Northeast Fishery Science Center, Woods Hole, MA; or U.S. Fish and Wildlife Service, Fishery Resources Office, Annapolis, MD; Atlantic States Marine Fisheries Commission, 1050 N Highland Ave, Suite 200 A-N, Arlington, VA 22201, 703-842-0740, info@asmfc.org) for data entry and analysis. Studies should not be undertaken without adequate consideration of all of these issues. The Interstate Tagging Committee strongly encourages programs which are implemented with: 1) connection to an agency or scientific entity for study design and data analyses; 2) an established constituent base to promote the program; 3) training for individuals on proper fish handling and tagging techniques; and 4) identified research needs and objectives.

Any public or private entity proposing new tagging studies should seek guidelines from and provide a proposal to the Interstate Tagging Committee for review and coordination prior to initiation of any study. The proposal should use the ASMFC's Protocols for Tagging Programs as guidance in developing the proposed study. If the proposed study is an integral component of the FMP, study design should ideally be reviewed and approved by the Stock Assessment Subcommittee and/or Technical Committee as well, during the FMP review process. Tagging studies outside the ASMFC jurisdiction may choose not to participate in the ASMFC review process.

The ASMFC's Interstate Tagging Committee was developed to serve as a technical resource for jurisdictions other than the ASMFC, as well as for private, non-profit tagging groups, who may plan to tag. Protocols have been developed by the Committee as a source of information, advice and coordination for all Atlantic coast tagging programs. A copy of the protocol is available on the ASMFC web site. Copies of proposals for review and coordination should be provided to the Interstate Tagging Coordinator at the ASMFC.

### 3.5 ASSESSMENT OF STOCK CONDITION

An Atlantic striped bass stock assessment update or benchmark assessment will be performed by the Stock Assessment Subcommittee (SAS) on a regular schedule recommended by the Assessment Science Committee and as approved by the Interstate Fisheries Management Program Policy Board (ISFMP Policy Board). The Board can request a stock assessment at any time. The SAS and TC will meet to review the stock assessment and all other relevant data

sources. The stock assessment report shall follow the general outline as approved by the ISFMP Policy Board for all Commission-managed species. In addition to the general content of the report as specified in the outline, the stock assessment report may also address the specific topics detailed in the following sections. Specific topics in the stock assessment may change as the SAS continues to provide the best model and metrics possible to assess the Atlantic striped bass stock.

### 3.5.1 Assessment of Population Age/Size Structure

Estimates of Atlantic striped bass age and size structure are monitored based on results of the stock assessment. As of the 2018 benchmark assessment, the accepted model for use in striped bass stock assessments is a forward projecting statistical catch-at-age (SCA) model, which uses catch-at-age data and fishery-dependent and -independent survey indices to estimate annual population size and fishing mortality. Indices of abundance track relative changes in the population over time while catch data provide information on the scale of the population size. Age structure data (numbers of fish by age) provide additional information on recruitment (number of age-1 fish entering the population) and trends in mortality.

### 3.5.2 Assessment of Annual Recruitment

Recruitment (age-1) of Atlantic striped bass is estimated by the SCA stock assessment model. The SCA model uses several fishery-independent indices of relative abundance for young-of-year (YOY) and age-1 fish (New York and Maryland YOY and Yearling Surveys, and New Jersey and Virginia YOY Surveys).

### 3.5.3 Assessment of Spawning Stock Biomass

Spawning stock biomass is estimated by the SCA stock assessment model and those estimates are compared to target and threshold levels (i.e., biological reference points) in order to assess the status of the stock. The 1995 estimate of female SSB is used as the SSB threshold because many stock characteristics, such as an expanded age structure, were reached by this year, and this is also the year the stock was declared recovered. The female SSB target is equal to 125% of the female SSB threshold.

### 3.5.4 Assessment of Fishing Mortality

The fishing mortality rate is estimated by the SCA stock assessment model and that estimate is compared to target and threshold levels (i.e., biological reference points) in order to assess the status of the stock. The F threshold and target are calculated to achieve the respective SSB reference points in the long term.

## 3.6 STOCKING PROGRAM

Amendment 7 does not include a stocking program for Atlantic striped bass.

### 3.7 BYCATCH DATA COLLECTION PROGRAM

In general, states shall undertake every effort to reduce or eliminate the loss of striped bass from the general population due to bycatch discard mortality. The Technical Committee shall examine trends in estimated bycatch during benchmark stock assessments and stock assessment updates.

The overarching goal of the bycatch data collection program (established through Addendum I to Amendment 6) is to develop more accurate estimates of striped bass discards and discard mortality. Additional sector-specific goals are listed below.

Commercial Fisheries

- Implement at-sea observer coverage on commercial vessels that are targeting striped bass, as well as vessels that may encounter striped bass, to collect information on the number of fish being discarded from various commercial gears. Ideally, the sampling effort will be optimally allocated, both seasonally and spatially, among directed and non-directed fishing that has a strong likelihood of generating striped bass bycatch.
- Determine the discard mortality associated with all of the commercial gear types currently encountering striped bass.
- Document the level of bycatch in identified problem fisheries in annual state compliance reports.

Recreational Fisheries

- Determine proportional use of different gear types and fishing practices (e.g. fly fishing, live bait fishing, circle hooks, treble hooks, etc.).
- Determine the discard mortality associated with each gear type and fishing practice.
- Document the level of bycatch in identified problem fisheries in annual state compliance reports.

For-Hire Fisheries

- Determine proportional use of different gear types and fishing practices (e.g. fly fishing, live bait fishing, circle hooks, treble hooks, etc.).
- Determine the discard mortality associated with each gear type and fishing practice.
- Document the level of bycatch in identified problem fisheries in annual state compliance reports.

#### 3.7.1 Requirements and Recommendations for Bycatch Data and Research

MANDATORY DATA COLLECTION

- Collect commercial fishery data elements consistent with ACCSP standards.
- Coordinate with NMFS to ensure coverage in federal waters.
- Continue collection of quantitative data on the bycatch of finfish species as reported by interviewed fishermen through existing recreational and for-hire intercept surveys (ACCSP standard).

RECOMMENDED DATA COLLECTION

- Implement commercial at-sea observer coverage on 2-5% of the total trips in state waters. Applicable to all states with commercial fisheries (directed and non-directed) that encounter striped bass.
- Develop "add-on" questions for interview surveys to collect information on gear/terminal tackle used (circle hooks, J-Hooks, treble hooks, fly fishing, live bait, etc.) in recreational and for-hire fisheries.
- Develop a survey to estimate size composition of discarded fish. The Board will need to work with the TC to determine an effective way to collect these data. Approaches for consideration include, but are not limited to, volunteer angler surveys, additional questions for intercept survey, and expansion of data collected in for-hire fisheries.

MANDATORY DISCARD MORTALITY STUDIES

- Review existing commercial discard studies to determine what information has already been collected.
- Review existing recreational studies for various species and gears to develop estimates of striped bass discard mortality.

RECOMMENDED DISCARD MORTALITY STUDIES

- Conduct studies to estimate the discard mortality associated with the following commercial gear types: trawl (highest priority), gill net, fixed nets (pound net/fyke net/floating fish trap), hook and line, haul seine. These studies do not need to be conducted in all states, but should be conducted to reflect the fishing activities (gear type, temperature, salinity, etc.) that encounter striped bass.
- Conduct additional studies on recreational post-release mortality associated with a range of temperature, salinity, and gear types.

MANDATORY TECHNICAL COMMITTEE ANALYSES

- Analyze any newly collected commercial at-sea observer data to determine if any discarding "hot spots" can be reliably identified.
- Develop estimates for the proportion of discards based on water temperature and salinity, if possible. Apply existing post-release mortality rates to the proportions to determine the effect on estimated discard mortality. For example, if 20% of the catch occurs in warm brackish water, that portion of the catch is likely to have a higher mortality rate than discards in cold ocean water.

RECOMMENDED TECHNICAL COMMITTEE ANALYSES

- Analyze the number and type of all fishing trips from each state, by season and area if possible, and determine ideal allocation of recommended observer coverage.

MANDATORY DATA REPORTING

- Once any mandatory or recommended elements of this program are implemented, states are required to report any bycatch and/or data monitoring as part of the annual compliance report to the Commission.

## 4.0 MANAGEMENT PROGRAM AND PROPOSED OPTIONS

This section includes the following sections with options for Board consideration and public comment: *Section 4.1 Management Triggers; Section 4.2.1 Measures to Protect the 2015, 2017, and 2018 Year Classes (Recreational Size and Bag Limits); Section 4.2.2 Measures to Address Recreational Release Mortality; Section 4.4 Rebuilding Plan;* and *Section 4.6.2 Management Program Equivalency.*

The striped bass ocean fishery (also referred to as "ocean region") is defined as all fisheries operating in coastal and estuarine areas of the U.S. Atlantic coast from Maine through North Carolina, excluding the Chesapeake Bay and Albemarle Sound-Roanoke River management areas. The Chesapeake Bay fishery is defined as all fisheries operating within Chesapeake Bay, except for the Chesapeake Bay spring trophy fishery. The Chesapeake Bay spring trophy fishery is part of the ocean fishery for management purposes because it targets coastal migratory striped bass.[10]

The Albemarle Sound-Roanoke River stock is managed separately by the State of North Carolina (see *Section 2.5.2*).

Draft Amendment 7 continues to use bag and size limits, as well as a circle hook requirement when fishing with bait, to manage recreational striped bass fisheries, and quotas and size limits to regulate the striped bass commercial fisheries. Draft Amendment 7 also considers options for effort controls (seasonal closures), additional gear restrictions, and outreach efforts to manage the recreational fishery and address recreational release mortality.

### 4.1 MANAGEMENT TRIGGERS

The management triggers are intended to keep the Board accountable and were developed at a time when the stock was thought to be at historic high abundance and well above the SSB target. However, as perceptions of stock status and fishery performance have changed, shortfalls with how the management triggers are designed have emerged. When female SSB is below the target level, the variable nature of fishing mortality can result in a continued need for management action. Additionally, the shorter timetables for corrective action are in conflict with the desire for management stability, and the use of point estimates does not account for an inherent level of uncertainty. Furthermore, the Board is sometimes criticized for considering changes to the management program before the stock has a chance to respond to the most recent set of management changes. Lastly, the observed long period of below average recruitment which contributed to recent declines in biomass has raised questions about the recruitment-based trigger and whether it is designed appropriately.

[10] While the Chesapeake Bay spring trophy fishery is subject to the same requirements as the ocean recreational fishery, Chesapeake Bay trophy fishery removals are counted as part of total removals from the Chesapeake Bay and are included as part of the Chesapeake Bay fleet in the stock assessment model.

The following options consider how to set the management triggers in Amendment 7. Upon reaching any (or all) of the specified management triggers, the Board is required to alter the management program to ensure the objectives of Amendment 7 are achieved. It is important to note that the Board is not limited to taking action only when a management trigger is tripped.

The Status Quo option is defined by the management triggers as specified in Amendment 6 to the Atlantic Striped Bass FMP (listed below). To account for the various combinations of management trigger methods, timeframes, implementation deadlines, and deferment options, the following management alternatives have been divided into four (4) tiers. The first tier outlines the F-based trigger methods, the second tier outlines the SSB-based trigger methods, the third tier outlines the recruitment trigger methods, and the fourth tier outlines deferred management options if a management trigger is tripped and certain criteria are met. Within each tier is a set of primary options and sub-options (alternatives) for the Board to choose from.

An alternative under each primary option within a tier must be chosen to complete each management trigger package. For example, to achieve the current management triggers specified in Amendment 6 (status quo), the Board would select: Tier 1, Sub-options A1, B1, and C1; Tier 2, Sub-options A1, B1, and C1; Tier 3, Sub-options A1 and B1; and Tier 4, Option A. This decision framework is designed to provide the Board the option to maintain, remove, or change any of the existing management triggers individually. The intent is to evaluate the triggers against the most recent year(s) of data from the most recent stock assessment update or benchmark stock assessment accepted by the Board for management use.

**Amendment 6 Management Triggers (Status Quo):**

1) If the fishing mortality threshold is exceeded in any year, the striped bass management program must be adjusted to reduce the fishing mortality to a level that is at or below the target within one year.
2) If female SSB falls below the threshold, the striped bass management program must be adjusted to rebuild the biomass to the target level within an established timeframe [not to exceed 10-years].
3) If the fishing mortality target is exceeded in two consecutive years and the female SSB falls below the target within either of those years, the striped bass management program must be adjusted to reduce the F to a level that is at or below the target within one year.
4) If female SSB falls below the target for two consecutive years and the fishing mortality rate exceeds the target in either of those years, the striped bass management program must be adjusted to rebuild the biomass to a level that is at or above the target within an established timeframe [not to exceed 10-years].
5) If any Juvenile Abundance Index shows recruitment failure (i.e., an index value lower than 75% of all other values in the dataset) for three consecutive years, then the Board will review the cause of recruitment failure (e.g., fishing mortality, environmental conditions, and disease) and determine the appropriate management action.

***TIER 1 OPTIONS: Fishing Mortality (F) Management Triggers***

**Option A: Timeline to Reduce F to the Target**

**Sub-option A1 (status quo):** Reduce F to a level that is at or below the target within one year.

**Sub-option A2:** Reduce F to a level that is at or below the target within two years.

**Option B: F Threshold Triggers**

**Sub-option B1 (status quo):** If F exceeds the F threshold, the striped bass management program must be adjusted to reduce F to a level that is at or below the target within the timeframe selected under Option A.

**Sub-option B2:** If the two-year average F exceeds the F threshold, the striped bass management program must be adjusted to reduce F to a level that is at or below the target within the timeframe selected under Option A. The two-year average F should not include data under different management actions (i.e., the F threshold trigger should not be evaluated unless there are at least two years of data in the assessment under the most recent management action).

**Sub-option B3:** If the three-year average F exceeds the F threshold, the striped bass management program must be adjusted to reduce F to a level that is at or below the target within the timeframe selected under Option A. The three-year average F should not include data under different management actions (i.e., the F threshold trigger should not be evaluated unless there are at least three years of data in the assessment under the most recent management action).

*Note: Although the trigger would only be evaluated when sufficient data years are available for sub-options B2 or B3, the Board is not limited to taking action only when a management trigger is tripped.*

**Option C: F Target Triggers**

**Sub-option C1 (status quo):** If F exceeds the F target for two consecutive years and female SSB falls below the SSB target in either of those years, the striped bass management program must be adjusted to reduce F to a level that is at or below the target within the timeframe selected under sub-option A.

**Sub-option C2:** If F exceeds the F target for three consecutive years, the striped bass management program must be adjusted to reduce F to a level that is at or below the target within the timeframe selected under sub-option A.

**Sub-option C3:** No management trigger related to F target.

***TIER 2 OPTIONS: Female Spawning Stock Biomass (SSB) Management Triggers***

**Option A: Deadline to Implement a Rebuilding Plan**

**Sub-option A1 (status quo):** No Deadline to Implement a Rebuilding Plan
There would not be any requirement regarding how quickly the Board must implement a rebuilding plan when an SSB-based management trigger is tripped, as long as the rebuilding timeframe does not exceed 10-years from when the management trigger was tripped (i.e., the Board may implement a rebuilding plan at any time in response to the management trigger). A management trigger is not considered tripped until the Board formally reviews and accepts, if necessary, the results of the relevant stock assessment.

**Sub-option A2:** Two-Year Deadline to Implement a Rebuilding Plan
The Board must implement a rebuilding plan within two years from when an SSB-based management trigger is tripped. A management trigger is not considered tripped until the Board formally reviews and accepts, if necessary, the results of the relevant stock assessment.

**Option B: SSB Threshold Trigger**

**Sub-option B1 (status quo):** If female SSB falls below the SSB threshold, the striped bass management program must be adjusted to rebuild the biomass to the target level within an established timeframe [not to exceed 10-years].

**Sub-option B2:** No management trigger related to the female SSB threshold. The Board cannot choose this option in combination with Sub-option C3 below (i.e., there must be an SSB-based management trigger). This option recognizes that if managing to the SSB target is more conservative than managing to the SSB threshold, and if the management response is the same (i.e., rebuild to the SSB target within 10 years) for both types of SSB triggers, then there does not necessarily have to be a trigger for both.

**Option C: SSB Target Trigger**

**Sub-option C1 (status quo):** If female SSB falls below the target for two consecutive years and the fishing mortality rate exceeds the target in either of those years, the striped bass management program must be adjusted to rebuild the biomass to a level that is at or above the target within an established timeframe [not to exceed 10-years].

**Sub-option C2:** If female SSB falls below the target for three consecutive years, the striped bass management program must be adjusted to rebuild the biomass to a level that is at or above the target within an established timeframe [not to exceed 10-years].

**Sub-option C3:** No management trigger related to the female SSB target. The Board cannot choose this option in combination with Sub-option B2 above (i.e., there must be an SSB-based management trigger).

***TIER 3 OPTIONS: Recruitment Triggers***

**Option A: Recruitment Trigger Definition**

The status quo recruitment trigger (sub-option A1) was designed and has performed adequately to identify true recruitment failure (i.e., a prolonged period of very low recruitment events as seen during the 1970s and 1980s). Sub-options A2 and A3 are designed to identify periods of recruitment that are not necessarily at historically low levels, but are lower than the period of high recruitment seen in the late 1990s and early 2000s. As requested by the Board, the recruitment trigger alternatives are more sensitive than the status quo in order to alert the Board to periods of low recruitment. Specifically, the alternative trigger options are designed to be an early warning sign of potential reduced productivity of the stock following multiple weak year classes entering the population.

The status quo recruitment trigger includes the years of very low recruitment in the 1970s and 1980s in the trigger reference period. Sub-options A2 and A3 would change the reference period to exclude those years of very low recruitment which results in a more sensitive trigger. Sub-options A2 and A3 use a reference period of 1992-2006, which was identified as a period of high recruitment (i.e., high recruitment regime) by a change point analysis on the Maryland juvenile abundance index (JAI). This period spans the time of high recruitment seen in the late 1990s through the early 2000s. The Maryland JAI was used as the basis for this analysis because it is closely correlated to the coastwide age-1 estimates from the stock assessment model, and provides the longest time series to evaluate changes in high and low periods over time. If sub-option A2 or A3 is selected, the TC will update the change point analysis during benchmark stock assessments to evaluate if the high recruitment period for the trigger has changed with new years of data.

**Sub-option A1 (status quo):** The recruitment trigger is tripped when any of the JAIs (ME, NY, NJ, MD, VA, NC) show recruitment failure, which is defined as a value that is below 75% of all values (i.e., below the 25$^{th}$ percentile) in a fixed time series appropriate to each juvenile abundance index, for three consecutive years. This status quo trigger tripped one time (NC in 2020) since approval of Amendment 6 in 2003 (Table 2). The state JAIs and reference periods are as follows:

| State JAI | Water Body | Reference Period* |
|---|---|---|
| **ME** | Kennebec River | 1987-2009 |
| **NY** | Hudson River | 1985-2009 |
| **NJ** | Delaware River | 1986-2009 |
| **MD** | Chesapeake Bay | 1957-2009 |
| **VA** | Chesapeake Bay | 1980-2009 |
| **NC** | Albemarle-Roanoke | 1955-2009 |

*Reference period established through Addendum II (2010).

***For the following sub-options, the Board could select sub-option A2 (moderate sensitivity trigger) or A3 (high sensitivity trigger). Sub-options A2 and A3 would alert the Board to periods of low recruitment (i.e., while the stock has not quite reached recruitment failure, there have been multiple years of low recruitment).***

**Sub-option A2:** The recruitment trigger is tripped when any of the four JAIs used in the stock assessment model to estimate recruitment (NY, NJ, MD, VA)[11] shows an index value that is below 75% of all values (i.e., below the 25$^{th}$ percentile) in the respective JAI from 1992-2006, which represents a period of high recruitment, for three consecutive years. The high recruitment reference period used for this trigger may be adjusted as recommended by the TC during benchmark stock assessments. This trigger alternative has a moderate sensitivity; it is more sensitive than the status quo but less sensitive than sub-option A3 (Figure 1). This trigger alternative would have tripped three times since 2003: NY in 2006; MD in 2010; MD in 2014 (Table 2).

**Sub-option A3:** The recruitment trigger is tripped when any of the four JAIs used in the stock assessment model (NY, NJ, MD, VA) shows an index value that is below the median of all values in the respective JAI from 1992-2006, which represents a period of high recruitment, for three consecutive years. The high recruitment reference period used for this trigger may be adjusted as recommended by the TC during benchmark stock assessments. This trigger alternative has a higher sensitivity than both the status quo trigger and sub-option A2 (Figure 1). This trigger alternative would have tripped six times since 2003: NY in 2006; MD in 2008; MD in 2009; MD and VA in 2010; NY in 2013; MD in 2014 (Table 2).

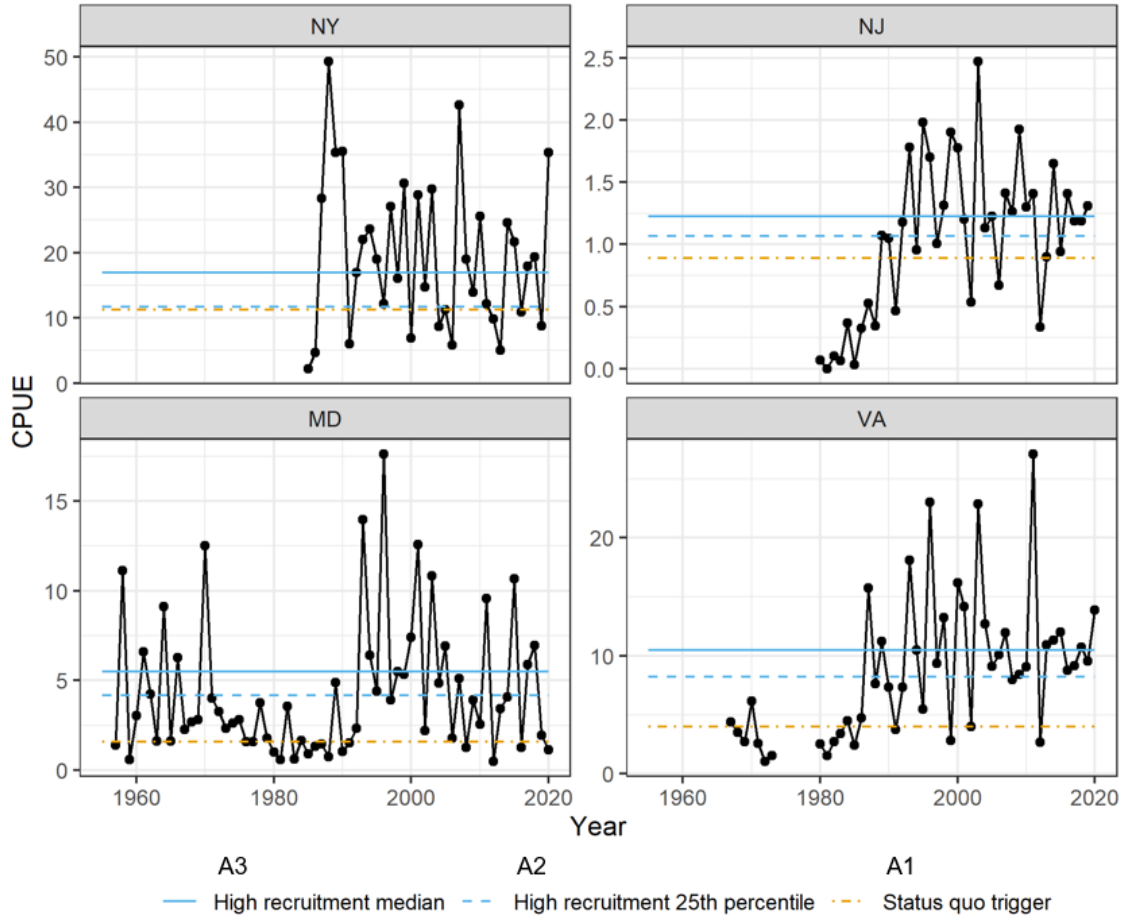
[11] The North Carolina JAI for the Albemarle Sound-Roanoke River is not used in the stock assessment because the Albemarle Sound-Roanoke River stock is managed and assessed separately by the state of North Carolina; the Maine JAI for the Kennebec River is not used in the stock assessment because that stock is assumed to only contribute a small amount to the coastwide stock.

Table 2. When the status quo and alternative juvenile abundance index (JAI) triggers would have tripped (black shaded cells) compared to the model estimates of recruitment. Note: "Core" JAIs are the four JAIs used in the stock assessment model to estimate recruitment (NY, NJ, MD, VA).

| | Recruitment (Model age 1 estimates lagged back 1 year) | Sub-option A1 Status Quo<br>Ref. period = Established through Addendum II<br>One or more JAI below 25th Percentile for 3 consecutive years | Sub-option A2<br>Ref. period = High recruitment (1992-2006)<br>One or more of the "core" JAIs below 25th Percentile for 3 consecutive years | Sub-option A3<br>Ref. period = High recruitment (1992-2006)<br>One or more of the "core" JAIs below Median for 3 consecutive years |
|---|---|---|---|---|
| 2003 | | | | |
| 2004 | | | | |
| 2005 | | | | |
| 2006 | | | | |
| 2007 | | | | |
| 2008 | | | | |
| 2009 | | | | |
| 2010 | | | | |
| 2011 | | | | |
| 2012 | | | | |
| 2013 | | | | |
| 2014 | | | | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| | **# Years tripped** | **1** | **3** | **6** |

Below average recruitment
Above average recruitment
No data available
Trigger not tripped
Trigger tripped

Figure 1. Juvenile abundance indices (JAI) for NY, NJ, MD, and VA showing the trigger reference level for each recruitment trigger alternative. For each sub-option, the trigger would be tripped if any of the four JAIs falls below the specified reference level for three consecutive years.




**Option B: Management Response to Recruitment Trigger**

The following sub-options are alternatives for the management response that would be triggered when the recruitment trigger definition selected under Option A is tripped. Sub-options B2 and B3 are intended to reduce fishing pressure as the weak year classes enter the population. These management response options are not necessarily designed to increase recruitment in the future because the striped bass stock exhibits a weak stock-recruit relationship (i.e., a larger spawning stock does not necessarily correlate with higher recruitment).

Juvenile abundance indices and model recruitment estimates provide information on the near-term productivity of the stock. Several years of poor recruitment may indicate the stock is entering a low recruitment regime, and levels of removals that were sustainable during average or above average recruitment regimes may not be sustainable in the future. If the Board wants to be proactive about responding to periods of lower recruitment, the Board could redefine the F target to be more precautionary (sub-options B2 and B3).

The F target for striped bass is defined as the level of F that will maintain the population at the SSB target in the long-term. F target is calculated by drawing recruitment from the values observed from 1990 to 2017 (this time period includes both high and low recruitment values, but does not include the very low values in the 1980s). If recruitment is only drawn from a below-average period instead of the full 1990-2017 period, for example, the F target would be lower. If the population is fished at the current F target but average recruitment remains lower than the 1990-2017 mean, then the population may not rebuild to the SSB target in the long term.

Based on the change point analysis of the Maryland JAI with data through 2020, the TC identified 1992-2006 to represent the high recruitment period (i.e., high recruitment regime) and 2007-2020 to represent the low recruitment period (i.e., low recruitment regime). This translates to years 1993-2007 and 2008-2017 for age-1 model estimates of recruit abundance used to calculate the interim F target for sub-options B2 and B3. If sub-option B2 or B3 is selected, the TC will update the change point analysis during benchmark assessments to evaluate whether the definition of the high/low recruitment periods for the trigger has changed with new years of data.

**OPTIONS**

**Sub-option B1 (status quo):** If the recruitment trigger is tripped, the Board would review the cause of recruitment failure (e.g., fishing mortality, environmental conditions, and disease) and determine the appropriate management action.

***For the following sub-options, the Board could select sub-option B2 or B3. Note: Sub-option B2 evaluates one point estimate of F against the F target, which is more conservative than the F-based management trigger definitions under Section 4.1 used in sub-option B3.***

**Sub-option B2.** If the recruitment trigger is tripped, an interim F target calculated using the low recruitment assumption is implemented, and if F from the terminal year of the most recent stock assessment is above the interim F target, the striped bass management program must be adjusted to reduce F to the interim F target within one year.

**Sub-option B3.** If the recruitment trigger is tripped, an interim F target and interim F threshold calculated using the low recruitment assumption are implemented, and the F-based management triggers defined in *Section 4.1* would be reevaluated using those interim reference points. If an F-based trigger is tripped upon reevaluation, the striped bass management program must be adjusted to reduce F to the interim F target within the timeline defined in *Section 4.1*.

*Note: Under both Sub-option B2 and B3, the lower interim F target would remain in place at least until the next stock assessment update or benchmark assessment is*

*approved for management use. The Board would determine at that time which F rate (target or interim target) to manage towards moving forward by considering factors such as current stock status, recent JAI data, and TC input.*

***TIER 4 OPTIONS: Deferred Management Action***

Under Amendment 6, if a management trigger is tripped at any time, the Board must take the corresponding action. However, the following options provide the Board flexibility to defer management action when a management trigger is tripped and certain criteria are met. The Board may choose more than one option, unless it chooses Option A (status quo): No Deferred Management Action. Options C, D and E are invalid if the Board chooses Tier 1, Sub-option C3 (no F target management trigger).

These options were developed in response to the Board's concern about the frequent need for management action due to triggers tripping with each stock assessment update or benchmark. Stock assessment updates are typically conducted about every 2 years with benchmark assessments conducted about every 5 years. The alternative Options B-F would defer management action until the following stock assessment. The Board can request an additional stock assessment or request a change to the stock assessment schedule at any time.

**Option A (status quo): No Deferred Management Action.**

If any (or all) of the management triggers are tripped following a benchmark stock assessment or assessment update, the Board is required to respond to that trigger regardless of when the last management action was implemented in response to any management trigger.

**Option B: Management action may be deferred until the next assessment if it has been less than three years since the last management action was implemented in response to a management trigger.**

If any (or all) of the management triggers are tripped following a benchmark stock assessment or assessment update, and it has been less than three years since the last management action was implemented (i.e., the assessment incorporates less than three years of data under the new fishery regulations) in response to a management trigger, the Board may defer the management response until the management triggers are reevaluated after the next stock assessment.

**Option C: Management action may be deferred until the next assessment if the F target management trigger is tripped and SSB is above the target.**

If the F target management trigger is tripped but SSB is at or above the SSB target, the Board may defer the management response until the management triggers are reevaluated after the next stock assessment.

**Option D: Management action may be deferred until the next assessment if the F target management trigger is tripped and SSB is projected to increase or remain at the current level over the next five years.**

If the F target management trigger is tripped, and if none of the SSB management triggers are tripped and projections indicate SSB will increase or remain at the current level over the next five years, the Board may defer the management response until the management triggers are reevaluated after the next stock assessment.

**Option E: Management action may be deferred until the next assessment if the F target management trigger is tripped and there is at least a 75% probability of SSB remaining above the SSB threshold over the next five years.**

If the F target management trigger is tripped, and if none of the SSB management triggers are tripped and projections indicate SSB has at least a 75% probability of remaining above the SSB threshold over the next five years, the Board may defer the management response until the management triggers are reevaluated after the next stock assessment.

**Option F: If a management trigger trips after the Board has already initiated action in response to a different management trigger, the Board can defer management action in response to the subsequent trigger until the next assessment.**

*For example, this scenario would most likely occur if the Board selects a new recruitment trigger that would require reducing F in response. The recruitment trigger could trip and the Board could initiate action in response; however, a few months later an F or SSB trigger could trip based on results of a stock assessment. Under this option, the Board could defer responding to the F or SSB trigger until the next assessment because the Board is already taking action in response to the recruitment trigger.*

Figure 2a. Summary of management trigger options Tiers 1-2: fishing mortality (F) and female spawning stock biomass (SSB) triggers.

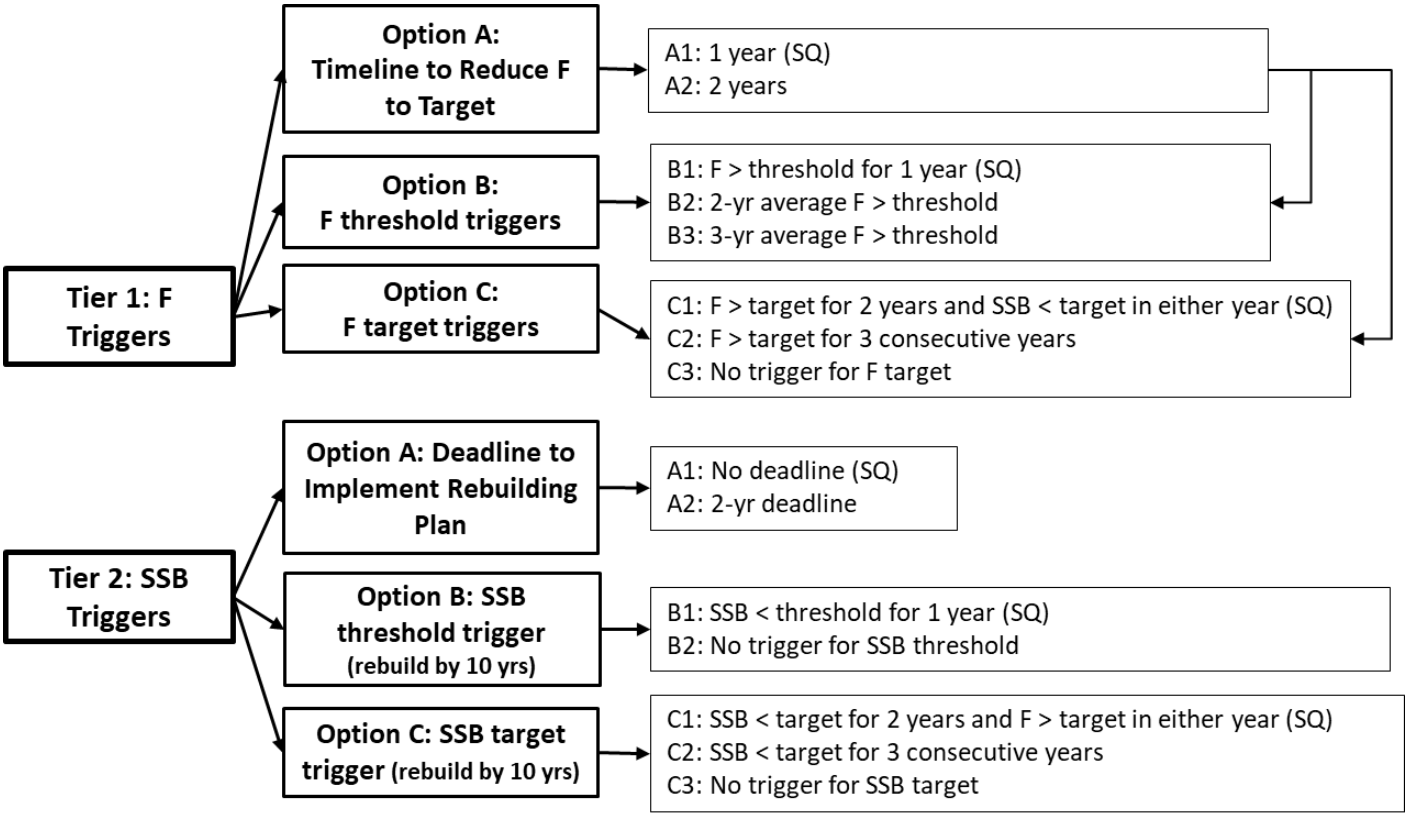



Figure 2b. Summary of management trigger options Tier 3: recruitment-based trigger.

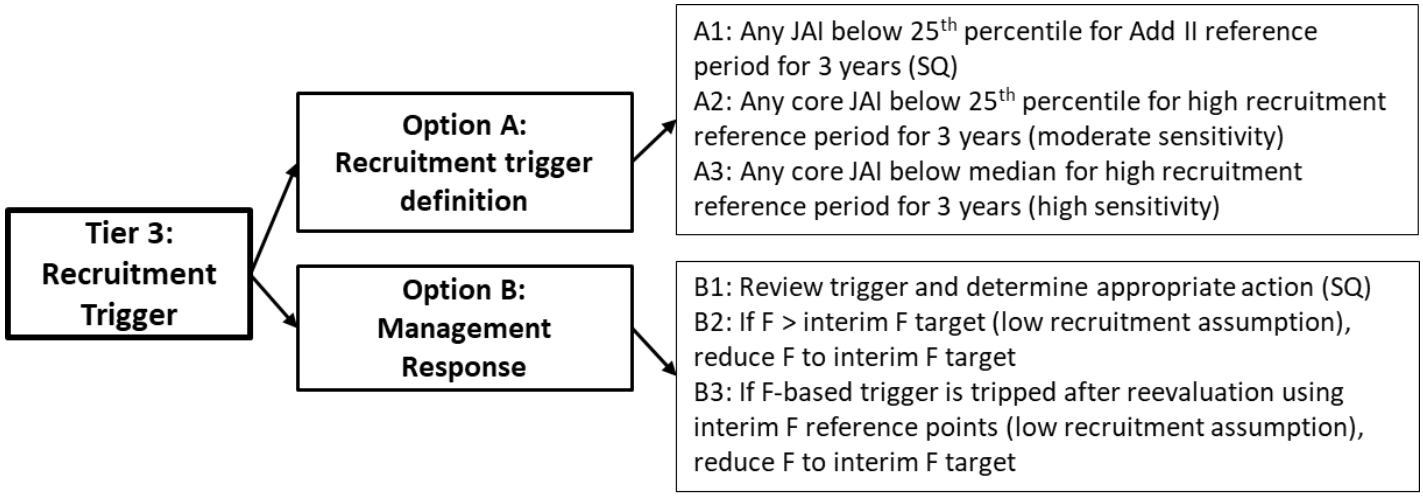
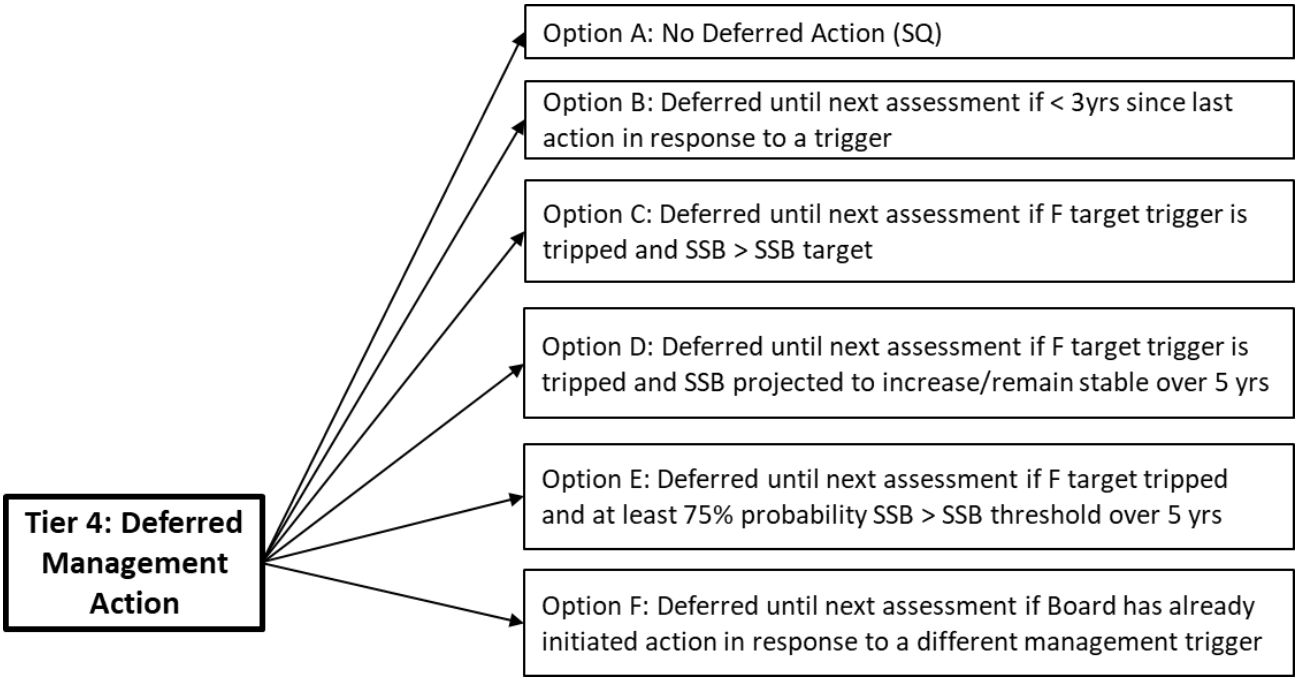


Figure 2c. Summary of management trigger options Tier 4: deferred management action.




### 4.2 RECREATIONAL FISHERY MANAGEMENT MEASURES

All bag limits are per person per day. All minimum and maximum size limits are in total length. States are required to maintain the same seasons that were in place in 2017.[12]

#### 4.2.1 Measures to Protect the 2015, 2017, and 2018 Year Classes: Recreational Size and Bag Limits

***Note for January 2022 Board meeting**: The PDT is recommending the Board remove these options from consideration in Draft Amendment 7 based on the projection results coupled with the timing challenge of selecting new measures before the 2022 assessment results are available. Refer to Memo 22-10 for details. If these options are removed, the Addendum VI FMP standard for recreational size and bag limits would be maintained for Draft Amendment 7.*

The Board and stakeholders have expressed that protecting emerging, strong year classes is of the utmost importance for rebuilding the striped bass stock. The 2015-year class, which is the strongest year class observed since 2003, has been available to Chesapeake Bay fisheries over the past few years and will soon be entering the recreational ocean region slot size limit of 28"

[12] Some states have implemented alternative seasons through conservation equivalency. See Table 17 in *Section 9.0* for each state's 2020 recreational measures.

to less than 35" adopted by the majority of Atlantic coast states under Addendum VI in 2020. If this ocean slot size limit is maintained, the 2015 year class may be subject to high recreational harvest mortality in the ocean for the next several years, in addition to mortality in the Chesapeake Bay and recreational release mortality coastwide, reducing its potential to help rebuild the stock.

In addition to the 2015 year class, the Technical Committee (TC) also noted that both the 2017 and 2018 year classes were above average in multiple juvenile abundance indices (JAIs) and recommended including those year classes in this analysis. The 2017 and 2018 year classes have recently become available to the Chesapeake Bay fishery and will be subject to fishing mortality in the Chesapeake Bay for the next few years before becoming available to the ocean fishery.

The following options consider whether to alter the ocean and/or Chesapeake Bay recreational size and bag limits to enhance protection of emerging strong year classes:

| Ocean Region Size/Bag Limit Options | Chesapeake Bay Size/Bag Limit Options |
|---|---|
| Option A Status Quo. 28" to <35" slot/1 fish | Option A Status Quo. 18" minimum/1 fish |
| Option B. 35" minimum size/1 fish | Option B. 18" to <23" slot/2 fish |
| Option C. 32" to <40" slot/1 fish | Option C. 18" to <28" slot/1 fish |
| Option D. 28" to <32" slot/1 fish | |

These options are directed at the recreational fishery because concerns were raised about the potential impact of the ocean recreational slot limit on the 2015 year class. The intent of these options is to change the size limits to reduce harvest on the 2015, 2017, and/or 2018 year classes by shifting harvest to other year classes. While this would provide those year classes with some protection from harvest in the short term, those year classes will still be subject to release mortality. All of the proposed size limits would need to be adjusted through time in order to provide those year classes continued protection from harvest as fish continue to grow.

Recreational size limits could be changed for either or both the Chesapeake Bay and ocean recreational fisheries. The combination of Chesapeake Bay and ocean size limits should be considered to evaluate the coastwide protection from harvest that different combinations of size limits might provide. For example, some combinations of Chesapeake Bay and ocean size limits would protect some fish from harvest in the Bay but would not protect those same fish from harvest in the ocean.

The analysis for each recreational size limit option assumes fishing effort will remain constant over time. However, there is uncertainty around how angler behavior and fishing effort would change in response to a change in size limit and changes in fish availability (e.g., emerging year classes in the fishery). Reducing effort in the recreational fishery through seasonal closures, which are intended to reduce the number of fishing trips that interact with striped bass, would also provide protection for these and other year classes. *Section 4.2.2* outlines seasonal closure options for consideration.

**ANALYSIS FOR RECREATIONAL SIZE LIMIT OPTIONS**

Each recreational size limit option is analyzed in terms of the level of protection from harvest it would afford a year class as it ages through the population, i.e., the percent of each year class that is below the minimum size limit or outside the slot limit over time based on length-at-age estimates developed by the TC (Table 3). While estimating the percent protection from harvest provided by different size limits is useful to compare relative changes in protection among different size limit options, the percent protected estimates do not account for differences between the ocean and Chesapeake Bay fisheries. For example, the length-at-age estimates used for this analysis are coastwide estimates based on data compiled from several states. Since size-at-age is highly variable along the coast, the average length-at-age for the Chesapeake Bay may differ from these coastwide estimates. Specifically, the coastwide length-at-age estimates are likely an overestimate of length-at-age for Chesapeake Bay resident fish, which are heavily skewed toward males; growth rates and maximum size differ between males and females, with males growing slower and to a smaller size than females. Additionally, the percent protected estimates do not account for fish moving between the ocean and the Chesapeake Bay, which dictates when and which size fish are available to fisheries in each region. The percent protected estimates represent the percent of all fish for each age class that would be protected from harvest for each size limit considered, regardless of whether that age class is typically available in the Chesapeake Bay or ocean fishery.

Table 3. Estimated mean striped bass size-at-age based on the 2012-2016 state age data (weighted by state recreational catch) compiled for the 2018 benchmark stock assessment. The ages of the 2015, 2017, and 2018 year classes are in bold. Note: These are coastwide estimates based on data from several states along the coast; size-at-age is highly variable along the coast and there is overlap among age classes. Source: ASMFC.

| Age | Estimated Mean Total Length (in) | |
|---|---|---|
| 0 | 3.8 | |
| 1 | 6.4 | |
| 2 | 12.7 | |
| 3 | 17.0 | |
| 4 | 20.9 | |
| **5** | **24.1** | **2018 year class in 2023** |
| **6** | **26.4** | **2017 year class in 2023** |
| 7 | 28.7 | |
| **8** | **31.6** | **2015 year class in 2023** |
| 9 | 33.8 | |
| 10 | 35.5 | |
| 11 | 37.2 | |
| 12 | 39.1 | |
| 13 | 41.0 | |
| 14 | 42.2 | |
| 15+ | 44.0 | |

While changing the size limit may protect a year class from harvest in the near-term, the potential effects on long-term stock productivity also need to be considered. Accordingly, stock projections were conducted to compare the alternative options to the status quo. Projections were developed assuming the same level of fishing mortality (F target) and fishing effort for each option scenario, but different selectivity patterns, based on what proportion of each age is vulnerable to the fishery for each option. The projections assume fishing effort will remain constant regardless of which set of regulations are implemented.

Two sets of projections were developed: 1) scenarios for the ocean size limit options assuming the status quo Chesapeake Bay measures would remain in place; and 2) scenarios for combinations of ocean and Chesapeake Bay size limits. The combination scenarios highlight combinations of Chesapeake Bay and ocean size limits that would protect the widest size range of fish from harvest across both the Chesapeake Bay and ocean fisheries. Details on projection scenarios are provided in *Appendix 1*.

The TC noted the following key findings from all projection scenarios:

- The stock recovery timeline (i.e., the year SSB exceeds the threshold and the year SSB exceeds the target) is the same for all scenarios, including the status quo scenarios.
- The overall projected change in total SSB (all year classes combined) relative to the status quo is positive for most scenarios (*Appendix 1*); however, the percent change in total SSB is not statistically significant since it falls within the confidence interval of the SSB estimates from the status quo projections.
- Under all scenarios, the 2015 year class will have a higher contribution to stock productivity than the 2017 and 2018 year classes.
- The projected change in year-class-specific SSB (total SSB for each year class over time) relative to the status quo is mostly positive with some negative changes relative to the status quo for the 2015 year class SSB in some scenarios (*Appendix 1*).
- These results indicate that changing the selectivity does not have a significant impact on rebuilding the stock if the F rate remains constant. If the goal is to expedite stock rebuilding, controlling the overall F rate is more important than only changing the selectivity.

#### *4.2.1.1 Ocean Recreational Fishery*

The status quo 28" to <35" slot limit and 1 fish bag limit (Option A) for the ocean recreational fishery was implemented through Addendum VI to achieve at least an 18% reduction in total recreational removals from 2017 levels in order to reduce F to the F target in 2020. The alternative size limit options for the ocean region include two options from Draft Addendum VI that were projected to achieve a similar level of reduction (Option B and Option C) and a narrower slot limit (Option D) which is projected to result in a greater level of reduction from the 2017 recreational removals (Table 4).

Table 4. Estimated percent change in harvest, recreational release mortality, and total recreational removals relative to 2017 for ocean size options A-D.

| Ocean Size Limit | Bag Limit | % change from 2017 | | |
|---|---|---|---|---|
| | | Harvest | Release Mortality | Total Removals |
| **Option A: 28" to <35" slot Status Quo** | 1 | -46% | +3% | -19% |
| **Option B: 35" minimum** | 1 | -43% | +3% | -18% |
| **Option C: 32" to <40" slot** | 1 | -49% | +4% | -21% |
| **Option D: 28" to <32" slot** | 1 | -62% | +4% | -26% |

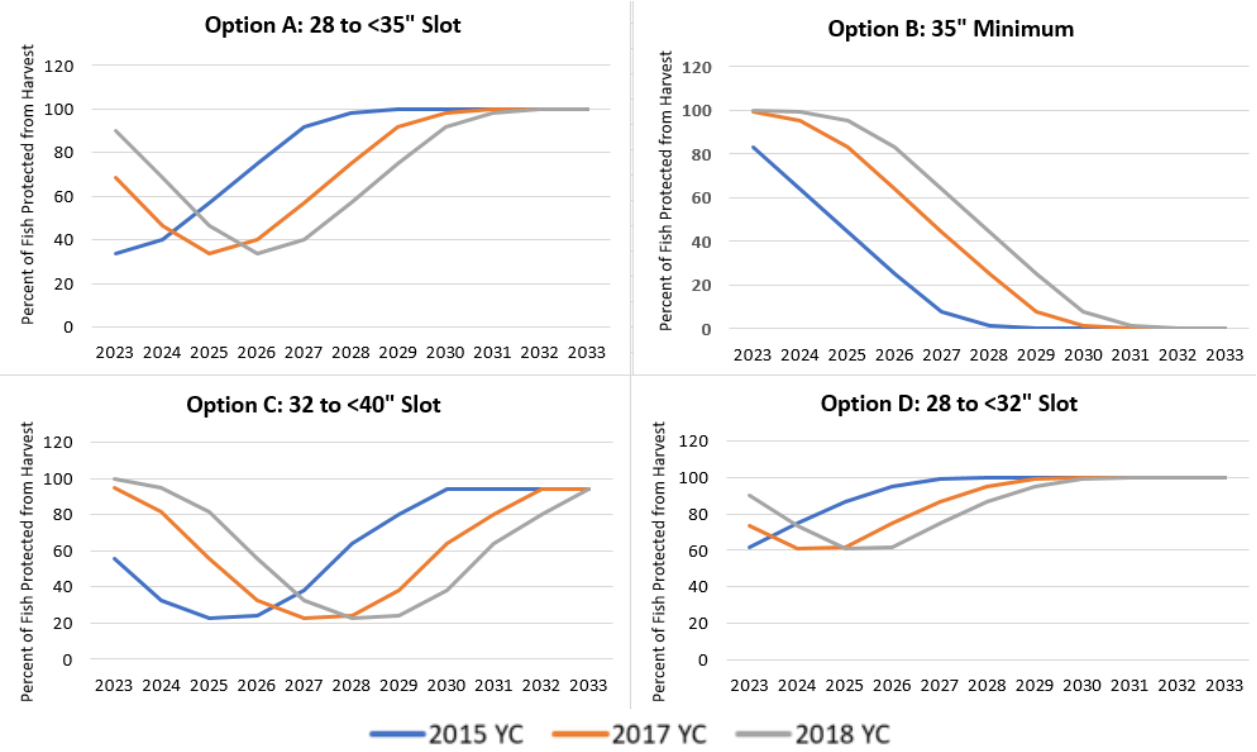
All alternative size limits would provide greater protection from harvest for the 2015, 2017, and 2018 year classes in 2023 relative to the status quo (Table 5). However, the level of protection for each year class will change in future years as those fish grow (Figure 3). For example, a 35" minimum size limit in the ocean (Option B) would provide the 2015 year class more protection from harvest in 2023 compared to the status quo slot limit (Option A) because those age-8 fish would mostly be below 35"; however, the protection afforded by the 35" minimum size limit will decrease over time as those fish grow and reach 35" in length. Under the status quo slot limit, protection for the 2015 year class would be lower in 2023, but this protection would increase over time as those fish reach 35" in length and can no longer be harvested.

Table 5. Percent of fish protected from harvest (outside the size limit) for each age for ocean size limit options based on coastwide size-at-age estimates. The ages of the 2015, 2017, and 2018 year classes in 2023 are in bold. The percent protected for ages 15 and above is the percent of all fish age 15+ combined.

| | | | | | **2018 YC in 2023** | **2017 YC in 2023** | | **2015 YC in 2023** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Option** | A1 | A2 | A3 | A4 | **A5** | **A6** | A7 | **A8** | A9 | A10 | A11 | A12 | A13 | A14 | A15+ |
| **Option A: 28 to <35** | 100 | 100 | 100 | 98.9 | **90.0** | **68.8** | 46.6 | **33.4** | 40.1 | 56.9 | 75.1 | 92.0 | 98.4 | 99.7 | 100 |
| **Option B: 35 min** | 100 | 100 | 100 | 100 | **100** | **99.4** | 95.5 | **82.9** | 64.0 | 44.2 | 25.1 | 8.0 | 1.6 | 0.3 | 0.0 |
| **Option C: 32 to <40** | 100 | 100 | 100 | 100 | **99.5** | **95.1** | 81.3 | **55.8** | 32.7 | 22.9 | 24.2 | 38.1 | 64.1 | 80.3 | 93.9 |
| **Option D: 28 to <32** | 100 | 100 | 100 | 98.9 | **90.5** | **73.2** | 61.0 | **61.4** | 74.6 | 86.7 | 94.8 | 99.3 | 99.9 | 100 | 100 |

Note: Fish protected from harvest in the ocean may be subject to harvest in the Chesapeake Bay, and fish protected from harvest are still subject to release mortality.

Figure 3. Percent of fish in the 2015, 2017, and 2018 year classes that are protected from harvest over time starting in 2023, under each option. The percent protected for ages 15 and above is the percent of all fish age 15+ combined.




**OPTIONS FOR THE OCEAN FISHERY**

***Note for January 2022 Board meeting:*** *The PDT is recommending the Board remove these options from consideration in Draft Amendment 7. If these options are removed, Option A (status quo) would remain the FMP standard for the ocean recreational size and bag limit for Draft Amendment 7.*

*Table 5 and Figure 3 show the estimated protection from harvest provided by each option and how protection changes over time. It is important to note that fish protected from harvest are still subject to release mortality. Stock projections for Option B, C, and D indicate the stock recovery timeline (i.e., the year SSB is projected to exceed the threshold and the year SSB is projected to exceed the target) is the same as the stock recovery timeline under Status Quo (Option A).*

***If the Board selects Option B, C, or D below, the Board must also select an option regarding conservation equivalency under Tier 1 and Tier 2 in Section 4.2.1.3.***

**Option A. (status quo)**: The current recreational slot limit for the ocean fishery of 28" to less than 35" slot limit and a one fish bag limit would be maintained, along with all current

(approved in 2020) state implementation plans and CE programs from Addendum VI.[13] This option would maintain all components of Addendum VI CE programs for the ocean recreational fishery, including recreational size limits, bag limits, seasons, and CE-adjusted commercial quota levels that are combined with reductions in recreational removals. The Chesapeake Bay spring trophy fishery would maintain trophy size and bag limits specified in Addendum VI implementation plans and CE programs.

**Option B. (minimum size)**: The recreational size limit for the ocean fishery would be 35" minimum size and a one fish bag limit. This minimum size and bag limit would also apply to the Chesapeake Bay spring trophy fishery.

**Option C. (larger slot)**: The recreational slot limit for the ocean fishery would be 32" to less than 40" and a one fish bag limit. This slot limit and bag limit would also apply to the Chesapeake Bay spring trophy fishery.

**Option D. (narrower slot)**: The recreational slot limit for the ocean fishery would be 28" to less than 32" and a one fish bag limit. This slot limit and bag limit would also apply to the Chesapeake Bay spring trophy fishery.

#### *4.2.1.2 Chesapeake Bay Recreational Fishery*

The status quo 18" minimum size limit and 1 fish bag limit (Option A) for the Chesapeake Bay recreational fishery was implemented through Addendum VI to achieve at least an 18% reduction in total recreational removals from 2017 needed to reduce F to the target in 2020.[14] As of 2021, Maryland, PRFC, and Virginia are operating under approved CE programs that include alternative size and bag limits, shortened or eliminated trophy seasons, and seasonal closures (Table 6). The Chesapeake Bay recreational fisheries target different size and age fish depending on the season. The spring trophy fishery targets large, migratory striped bass and is therefore considered part of the ocean region for management purposes, while the summer/fall recreational fishery typically targets smaller resident striped bass.

[13] Addendum VI state implementation plans and CE programs were approved in 2020 with the exception of Maryland's updated summer no-targeting closure dates (changed from August 16-31 closure in 2020 to July 16-31 closure in 2021), which was discussed at the August 2021 Board meeting.

[14] The projected reduction associated with the status quo Chesapeake Bay size and bag limit measures implemented through Addendum VI accounted for the trophy season continuing to operate with the same season as 2017.

Table 6. 2021 striped bass recreational measures implemented in Chesapeake Bay jurisdictions.

| STATE | FISHERY | SIZE LIMITS | BAG LIMIT | OPEN SEASON |
|---|---|---|---|---|
| MD | Bay and tribs^ | Catch and release only | Catch and release only | 1.1-2.28, 3.1-3.31, 12.11-12.31 |
| | Bay Spring trophy | 35" min size | 1 fish/day | 5.1-5.15 |
| | Bay Spring | 19" min size; charter only 1 fish >28" | 1 fish/day (2 for charter) | 5.16-5.31 |
| | Bay & tribs Summer and Fall | 19" min size; charter only 1 fish >28" | 1 fish/day (2 for charter) | 6.1-7.15, 8.1-12.10; closed 7.16-7.31 (No Targeting) |
| PRFC | Spring Trophy | 35” min size | 1 fish/day | 5.1-5.15 |
| | Summer and Fall | 20” min size | 2 fish/day | 5.16-7.6 and 8.21-12.31; closed 7.7-8.20 (No Targeting) |
| DC | Summer and Fall | 18” min size | 1 fish/day | 5.16-12.31 |
| VA | Bay Spring Trophy | NO SPRING TROPHY SEASON | | |
| | Bay Spring | 20”-28” slot limit | 1 fish/day | 5.16-6.15 |
| | Bay Fall | 20”-36” slot limit | 1 fish/day | 10.4-12.31 |

^ Susquehanna Flats: catch and release only 1.1 – 3.31 (no treble hooks when bait fishing); 1 fish at 19”-26” slot 5.16 – 5.31.

The alternative size and bag limits for the Chesapeake Bay include one option from Draft Addendum VI that was projected to achieve a similar level of reduction (Option B) and a larger slot limit (Option C) that is projected to result in a greater level of reduction from 2017 recreational removals (Table 7).

For Option C, there are two sub-options. Sub-option C1 would maintain all components of Addendum VI CE programs for the Chesapeake Bay, except the recreational size limits would be modified to include an upper bound of <28” (e.g., PRFC’s summer/fall 20” minimum size and 2-fish bag limit implemented through Addendum VI CE would be modified to a 20” to <28” slot and 2-fish bag limit). Sub-option C2 would require new CE proposals to be submitted, subject to any restrictions or requirements selected under *Section 4.6.2*, if applicable.

The slot limits proposed in Options B and C would provide greater protection from harvest over time for the 2015, 2017, and 2018 year classes relative to the status quo minimum size limit (Table 8). It is important to note the percent protected levels may be overestimated for the Chesapeake Bay, which has a resident striped bass population heavily skewed toward smaller males. Additionally, the percent protected does not account for seasonal migrations between the ocean and Bay, which dictates when and which size fish are available to fisheries in each region.

Table 7. Estimated percent change in harvest, recreational release mortality, and total recreational removals relative to 2017 for Chesapeake Bay options A-C. The percent change is estimated assuming all states would implement the FMP standards for the ocean and Chesapeake Bay. The total overall predicted reduction may differ if CE programs are implemented.

| **Size Limit** | **Bag Limit** | **Trophy Fish Season** | **% change from 2017** | | |
|---|---|---|---|---|---|
| | | | Harvest | Release Mortality | Total Removals |
| **Option A: 18" minimum size Status Quo** | 1 | Same trophy season as 2017 | -40% | +4% | -20% |
| **Option B: 18" to <23" slot** | 2 | Trophy season starts no earlier than May 1 | -33% | +4% | -21% |
| **Option C: 18" to <28" slot**<br>C1. Maintain Add VI CE programs with modification to include an upper bound of <28".<br>C2. New CE proposals required. | 1 | Same trophy season as 2017 | * | * | -32% |

*Only the overall change in total removals can be estimated for Option C.

Table 8. Percent of fish protected from harvest (outside the size limit) for each age for the Chesapeake Bay size limit options based on coastwide size-at-age estimates. The ages of the 2015, 2017, and 2018 year classes in 2023 are in bold. Size limits implemented through CE programs are in grey. The percent protected for ages 15 and above is the percent of all fish age 15+ combined.

| | | | | | **2018 YC in 2023** | **2017 YC in 2023** | | **2015 YC in 2023** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Option** | A1 | A2 | A3 | A4 | **A5** | **A6** | A7 | **A8** | A9 | A10 | A11 | A12 | A13 | A14 | A15+ |
| **Option A: 18" min Status Quo (DC)** | 100 | 97.9 | 63.9 | 17.2 | **2.4** | **0.7** | 0.2 | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MD CE: 19" min | 100 | 99.2 | 75.7 | 26.6 | **5.0** | **1.5** | 0.4 | **0.0** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PRFC CE: 20" min | 100 | 99.7 | 85.1 | 38.2 | **9.3** | **3.0** | 0.9 | **0.1** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| VA (Spring/Summer) CE: 20" to 28" | 100 | 99.7 | 85.1 | 39.3 | **19.3** | **34.7** | 58.8 | **83.8** | 95.9 | 98.9 | 99.8 | 100 | 100 | 100 | 100 |
| VA (Fall) CE: 20"to 36" | 100 | 99.7 | 85.1 | 38.2 | **9.4** | **3.2** | 3.4 | **11.1** | 25.5 | 43.6 | 64.0 | 85.6 | 96.4 | 99.1 | 99.9 |
| **Option B: 18" to <23"** | 100 | 97.9 | 65.8 | 42.5 | **65.9** | **84.8** | 94.1 | **99.1** | 99.9 | 100 | 100 | 100 | 100 | 100 | 100 |
| **Option C: 18" to <28"** | 100 | 97.9 | 63.9 | 18.3 | **12.4** | **32.4** | 58.1 | **83.7** | 95.9 | 98.9 | 99.8 | 100 | 100 | 100 | 100 |

Note: Fish protected from harvest in the Chesapeake Bay may be subject to harvest in the ocean, and fish protected from harvest are still subject to release mortality.

**OPTIONS FOR THE CHESAPEAKE BAY FISHERY**

***Note for January 2022 Board meeting:*** *The PDT is recommending the Board remove these options from consideration in Draft Amendment 7. If these options are removed, Option A (status quo) would remain the FMP standard Chesapeake Bay recreational size and bag limit for Draft Amendment 7.*

*Table 8 shows the estimated protection from harvest provided by each option and how that protection changes over time. It is important to note that fish protected from harvest are still subject to release mortality. Stock projections for Option B and C in combination with various ocean size limits indicate the stock recovery timeline (i.e., the year SSB is projected to exceed the threshold and the year SSB is projected to exceed the target) is the same as the stock recovery timeline under the Status Quo (Option A).*

*Since Chesapeake Bay spring trophy fishery is considered part of the ocean fishery for management purposes under Amendment 7, see Section 4.2.1.1 for size limits applicable to the Chesapeake Bay spring trophy fishery.*

***If the Board selects Option B or C below, the Board must also select an option regarding conservation equivalency under Tier 1 and Tier 2 in Section 4.2.1.3.***

**Option A. (status quo)**: The current recreational size limit for the Chesapeake Bay of 18" minimum size and a one fish bag limit would be maintained, along with all current (approved in 2020) Chesapeake Bay state implementation plans and CE programs from Addendum VI.[15] This option would maintain all components of Chesapeake Bay Addendum VI CE programs, including recreational size limits, bag limits, recreational seasons, and CE-adjusted commercial quota levels that are combined with reductions in recreational removals.

**Option B. (small slot)**: The recreational slot limit for the Chesapeake Bay fishery would be 18" to less than 23" and a two fish bag limit.

**Option C. (larger slot)**: The recreational slot limit for the Chesapeake Bay fishery would be 18" to less than 28" and a one fish bag limit.

> **Sub-option C1.** All current (approved in 2020) Chesapeake Bay CE programs from Addendum VI would be maintained with the modification of recreational size limits to include an upper bound of less than 28". All other components of Chesapeake Bay CE programs would be maintained, including recreational bag limits, seasons, and CE-

[15] Addendum VI state implementation plans and CE programs were approved in 2020 with the exception of Maryland's updated summer no-targeting closure dates (changed from August 16-31 closure in 2020 to July 16-31 closure in 2021), which was discussed at the August 2021 Board meeting.

adjusted commercial quota levels that are combined with reductions in recreational removals.

**Sub-option C2.** New CE proposals would be required to deviate from the FMP standard.

#### *4.2.1.3 Conservation Equivalency Consideration for Recreational Measures to Protect Year Classes*

*This section only applies if alternative recreational measures are selected to replace the status quo under Section 4.2.1.1 (Ocean Recreational Fishery) and/or Section 4.2.1.2 (Chesapeake Bay Recreational Fishery).*

***Tier 1: Conservation Equivalency Consideration for Alternative Recreational Size Limits to Protect Year Classes.***

The following options consider how/if conservation equivalency could be applied to alternative recreational size limits to protect year classes.

**Option A (Status Quo)**: CE would be permitted, subject to any restrictions or requirements selected in *Section 4.6.2*. The selected recreational size/bag limits are selected to protect particular year classes, and are not designed to achieve a specific change in harvest or removals; therefore, the Board would need to specify how states are to demonstrate equivalency. The PDT does not recommend this option because allowing changes to recreational size limits through CE without any limitations could compromise the goal of setting specific size limits to reduce harvest on particular year classes.

**Option B:** CE would be permitted with limitations on the range of CE measures that could be proposed, subject to any restrictions or requirements selected in *Section 4.6.2*. The limitations would be determined by the TC based on Board guidance to ensure CE proposals do not compromise year class protection.

**Option C**: CE would not be permitted.

***Tier 2: Addendum VI Conservation Equivalency Programs Splitting the Reduction between Sectors***

The following options consider how changing the recreational size limits through Amendment 7 would impact current Addendum VI CE programs that combined alternative recreational and commercial measures designed to achieve the required 18% reduction on a statewide basis, rather than within each fishery sector. Specifically, this refers to those CE programs that implemented a less than 18% reduction in commercial quota—offset by a larger reduction in recreational removals (New Jersey, Delaware, Maryland, PRFC, and Virginia). If the FMP standard(s) for Chesapeake Bay and/or ocean recreational size limits are changed through Amendment 7, the recreational measures implemented through Addendum VI CE would no

longer apply for those CE programs; however, the Board needs to consider whether the quota reductions implemented through those CE programs would carry forward.

**Option A**: The recreational component of Addendum VI CE programs that split the Addendum VI required reduction between sectors would no longer be valid under Amendment 7, but the commercial quota levels implemented through those CE programs would carry forward (Table 9). Under this option, the commercial quota levels implemented through Addendum VI CE programs for New Jersey, Delaware, Maryland, PRFC, and Virginia would be maintained at less than an 18% reduction from the Addendum IV quotas.

**Option B**: The recreational and commercial components of Addendum VI CE programs that split the Addendum VI required reduction between sectors would not be valid under Amendment 7. Under this option, New Jersey, Delaware, Maryland, PRFC, and Virginia would be subject to the quotas specified in *Section 4.3*, unless altered by a new CE proposal approved by the Board subject to any restrictions and requirements under *Section 4.6.2*.

Table 9. Addendum VI base quota and 2020 CE-adjusted quota.

| State | Add VI (base) | 2020 CE-Adjusted Quota^ |
|---|---|---|
| **Ocean** | | |
| Maine* | 154 | 154 |
| New Hampshire* | 3,537 | 3,537 |
| Massachusetts | 713,247 | 735,240 |
| Rhode Island | 148,889 | 148,889 |
| Connecticut* | 14,607 | 14,607 |
| New York | 652,552 | 640,718 |
| New Jersey** | 197,877 | 215,912 |
| Delaware | 118,970 | 142,474 |
| Maryland | 74,396 | 89,094 |
| Virginia | 113,685 | 125,034 |
| North Carolina | 295,495 | 295,495 |
| **Ocean Total** | **2,333,409** | **2,411,154** |
| **Chesapeake Bay** | | |
| Maryland | **2,588,603** | 1,442,120 |
| Virginia | | 983,393 |
| PRFC | | 572,861 |
| **Bay Total** | | **2,998,374** |

* 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 by either changing size limit with equivalent 18% quota reduction (MA, NY), or by taking a greater than 18% reduction in recreational removals to offset a less than 18% commercial quota reduction (NJ, DE, MD, PRFC, VA).

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

### 4.2.2 Measures to Address Recreational Release Mortality

Recreational releases are fish caught and released alive during recreational fishing trips. A proportion of releases die as a result of that fishing interaction, which is referred to as release mortality (or dead releases). The number of striped bass that die after being caught and released is estimated by multiplying the total number of live releases by an estimated rate of hooking mortality. The stock assessment currently applies a 9% hooking mortality rate to all recreationally released striped bass. This does not mean that every time a fish is released alive it has a 9% chance of dying. Under some conditions, the released fish has a higher or lower probability of dying, but overall, coastwide, it is assumed that 9% of all striped bass released alive die.

This 9% hooking mortality rate estimate is from a study by Diodati and Richards (1996) which took place in a saltwater environment and encompassed a range of variables including hook types, hooking locations, and angler experience levels. The TC conducted a meta-analysis of other striped bass release mortality studies which confirmed that an overall 9% release mortality rate accounts for the variation in conditions and factors that attribute to release mortality coastwide.

Since 1990, roughly 90% of all striped bass caught recreationally were released alive either due to cultural preferences (i.e., fishing with the intent to catch and release striped bass) or regulation (e.g., the fish is not of legal size, was caught out of season, or the angler already caught the bag limit) (Figure 13). Each year since 2017, more fish were estimated to have died from catch and release fishing than were harvested by the recreational fishery. For example, 2.76 million fish are estimated to have died from catch and release fishing in 2020, whereas 1.71 million fish were harvested in 2020 (Table 16). Since release mortality accounts for a significant proportion of total fishing mortality, Addendum VI sought to lower the rate at which fish die after being released by requiring the use of non-offset circle hooks when fishing for striped bass with bait because circle hooks have been proven to help reduce rates of gut-hooking when fished correctly. In addition to hook type, studies have shown other factors influence release mortality as well, including environmental conditions (e.g., salinity, air and water temperatures), angler experience, and angler behavior (e.g., how fish are handled). Addendum VI also encouraged states to develop education campaigns to increase compliance with circle hook regulations and to encourage responsible angler behavior.

If management action is taken to influence where mortality (harvest vs. discard) is coming from, managers must consider the impacts those actions will have on the fishery. For example, management measures focusing on reducing recreational releases could discourage participation from anglers that value food fish and negatively impact industries that cater to those anglers.

The current management program primarily uses bag limits and size limits to control harvest, and is not designed to control the catch and release fishery which makes it difficult to control overall fishing mortality. Some stakeholders value the ability to harvest striped bass, either

commercially or recreationally, while others value the experience of fishing for striped bass regardless of whether they are able to retain fish. The acceptable proportion of release mortality in total removals should reflect the management objectives for the fishery. Nonetheless, in order to better control all sources of fishing mortality, managers could consider additional gear restrictions to help increase the chance of survival after being released, or additional effort controls (i.e., time and area closures) to reduce the number of trips interacting with striped bass and thus the overall number of striped bass released alive.

In addition to the circle hook requirement implemented through Addendum VI (Option A. Status Quo), the Board could consider the following types of options to address recreational release mortality:

- Option B. Effort Controls (Seasonal Closures)
- Option C. Gear Restrictions
- Option D. Outreach and Education

Although the impact of many of these options on the stock are difficult to quantify, they are intended to reduce the number of recreational releases or improve post-release survival. The Board could select one or more sub-options from one or more primary option categories that would be implemented in addition to the status quo circle hook measures.

***Option A. Status Quo (Addendum VI circle hook measures)***
Under this option, the circle hook requirement implemented through Addendum VI to Amendment 6 (Addendum VI Section 3.2) would remain in place <u>as the only measure implemented</u> specifically to address recreational release mortality:

> *The use of circle hooks, as defined herein, is required when recreationally fishing for striped bass with bait, which is defined as any marine or aquatic organism live or dead, whole or parts thereof. This shall not apply to any artificial lure with bait attached. A circle hook is "a non-offset hook where the point is pointed perpendicularly back towards the shank". The term "non-offset" means the point and barb are in the same plane as the shank (e.g. when the hook is laying on a flat surface, the entire hook and barb also lay flat). States have the flexibility to further specify details of the regulation to address specific needs of the state fishery. In order to promote the use of circle hooks, states are encouraged to develop public education and outreach campaigns on the benefits of circle hooks when fishing with bait. The intent of the requirement is to reduce striped bass discard mortality in the recreational fishery. It is recommended that striped bass caught on any unapproved method of take must be returned to the water immediately without unnecessary injury…*
>
> *The use of circle hooks by anglers targeting striped bass with bait, live or chunk, has been identified as a method to reduce the discard mortality of striped bass in recreational fisheries. When a circle hook begins to exit the mouth of a fish, the shape causes the shaft to rotate towards the point of resistance and the barb is more likely to embed in the jaw or corner of the fish's mouth. Circle hooks can reduce rates of "gut-*

*hooking" and lower the likelihood of puncturing internal organs if the hook is swallowed…*

***For the following Options B – D, any sub-options selected would be implemented in addition to the current circle hook requirements described above in Option A (status quo).***

***Option B. Effort Controls (Seasonal Closures)***

Recreational release mortality could be addressed by reducing fishing effort in the recreational fishery through implementation of seasonal closures, which are intended to reduce the number of live releases by reducing the number of fishing trips (effort) interacting with striped bass. The following options outline a variety of seasonal closures for consideration.[16] Some of the closure options would offer additional benefits to the stock by reducing effort during seasons associated with higher post-release mortality rates or by protecting spawning or pre-spawn fish, which could contribute to stock rebuilding. When considering effort controls, the Board must weigh the cost of limiting access to the fishery with the potential benefit of decreasing recreational release mortality.

Seasonal closures could be no-harvest closures (i.e., catch and release fishing is allowed) or no-targeting closures (i.e. no person may take, attempt to take, target, or have in possession any striped bass). The most appropriate approach may depend on the reason for the closure; for example, implementing a no-targeting closure during high temperature periods when release mortality rates are higher. The majority of the proposed options are no-targeting closures in order to address recreational releases resulting from both harvest trips and catch-and-release fishing trips. Although there are added enforceability concerns and uncertainty about angler compliance with no-targeting closures, the PDT assumes maximum reduction of effort, and thus a reduction in number of releases would be achieved with a no-targeting closure. While no-harvest closures would reduce the number of fish harvested, angler behavior may shift to catch-and-release fishing, thereby increasing the number of recreational releases which is counter to the objective of reducing release mortality.

It is important to note that fishing trips targeting other species that incidentally catch and release striped bass would still occur regardless of closure type. For example, an average of 24% of all trips interacting with striped bass in 2018 and 2019 were non-targeted trips or trips where striped bass was the secondary target species. These trips would likely still occur during a striped bass no-targeting closure. Additionally, seasonal closures for striped bass may shift effort to targeting other species or to other times of year when the striped bass fishery is open.

[16] In the criteria for CE proposals for Addendum VI, the TC noted season closures less than two weeks duration are unlikely to be effective. For that reason, the following options do not include any closures less than two weeks duration.

A coastwide closure would ensure consistency in the timing of closures across all states, but would present an equitability challenge. Recreational fisheries operate very differently along the coast based on timing (availability of fish), among other biological, environmental, and socioeconomic considerations, so coastwide closures would result in different levels of effort reduction across states. State-specific or regional closure options could help account for these differences, but this may result in a patchwork of season closures across the coast. States would need to develop closure proposals to pursue through their state public processes and submit for TC review and Board approval as part of state implementation plans.

*Note on Estimating Reduction in Removals: Estimating the reduction in removals from a no-targeting seasonal closure depends on assumptions about changes in angler behavior, which is highly uncertain. The TC has not established a standardized method for estimating the reduction in removals from a no-targeting closure.[17] Given the no-targeting closure options considered in Draft Amendment 7, as well as the potential for states to propose no-targeting closures in future CE proposals, the PDT recommends the Board task the TC to establish such methods in advance of implementation of subsequent management actions. The TC may need guidance from the Board on this task.*

***If sub-option B1 (state-specific closures) is selected, the Board must also consider options under Tier 1 to determine applicability of existing no-targeting closures. Sub-option B2 (spawning closures) can be selected independent of or in addition to sub-option B1.***

> **Sub-option B1. State-Specific Two-Week Closures:** All recreational targeting of striped bass would be prohibited for a minimum two-week period to reduce fishing effort during times when the striped bass fishery is particularly active in each state. As defined in sub-options B1-a and B1-b, a minimum threshold of directed trips targeting striped bass will be used to define "active" waves for each state in which to implement its closure. In addition to this criteria, state implementation plans should consider protection for spawning and pre-spawn fish, extreme air and water temperatures, and relevant water quality data (dissolved oxygen, salinity, etc.), as well as socioeconomic considerations and regulatory consistency within shared waterbodies.
>
> > **B1-a. Minimum 15% Directed Trips:** Each state's closure must occur during a Wave with at least 15% of the state's annual striped bass directed trips, as provided in Table 10. At least two waves in each state/region meets this 15% minimum threshold. Considering the limited availability of MRIP data for Pennsylvania, Potomac River Fisheries Commission, and District of Columbia,

[17] In their review of Addendum VI CE proposals, the TC noted "the TC supports the use of closed seasons to reduce effort and dead discards, but stresses that the predicted savings, particularly from a "no targeting" provision, are highly uncertain due to current data limitations and predicting changes in angler behavior."

those three jurisdictions would determine which state listed in Table 9 most closely aligns with their distribution of effort.

**B1-b. Minimum 25% Directed Trips:** Each state's closure must occur during a Wave with at least 25% of the state's annual striped bass directed trips, as provided in Table 10. At least one wave in each state/region meets this 25% minimum threshold. Considering the limited availability of MRIP data for Pennsylvania, Potomac River Fisheries Commission, and District of Columbia, those three jurisdictions would determine which state listed in Table 9 most closely aligns with their distribution of effort.

Table 10. Proportion of each state's total annual striped bass directed trips (primary and secondary target) by wave for 2017-2019. Note: the distribution of directed trips reflects closures that were already in place in 2017-2019 and so may not fully reflect when fish are available. Source: MRIP

| | Jan-Feb Wave 1* Percent | Mar-Apr Wave 2* Percent | May-Jun Wave 3 Percent | Jul-Aug Wave 4 Percent | Sep-Oct Wave 5 Percent | Nov-Dec Wave 6* Percent |
|---|---|---|---|---|---|---|
| MAINE | 0.0% | 0.0% | 34.7% | 41.6% | 23.7% | 0.0% |
| NEW HAMPSHIRE | 0.0% | 0.0% | 25.6% | 53.7% | 20.8% | 0.0% |
| MASSACHUSETTS | 0.0% | 2.3% | 33.7% | 34.5% | 23.8% | 5.7% |
| RHODE ISLAND | 0.0% | 12.9% | 30.3% | 20.6% | 19.2% | 17.1% |
| CONNECTICUT | 0.0% | 22.9% | 29.9% | 18.7% | 13.2% | 15.3% |
| NEW YORK | 0.0% | 21.3% | 26.3% | 13.5% | 20.3% | 18.6% |
| NEW JERSEY | 0.0% | 24.7% | 18.4% | 4.1% | 11.7% | 41.1% |
| DELAWARE | 0.0% | 30.9% | 15.3% | 8.1% | 7.8% | 38.0% |
| MD CHES BAY | 0.0% | 14.6% | 21.1% | 26.7% | 17.7% | 19.9% |
| VA CHES BAY | 0.0% | 7.7% | 5.5% | 1.6% | 15.0% | 70.1% |
| MD OCEAN | 0.0% | 0.6% | 20.7% | 0.4% | 40.7% | 37.6% |
| VA OCEAN | 0.0% | 1.3% | 24.1% | 31.4% | 0.0% | 43.2% |
| NC OCEAN | 5.1% | 9.0% | 12.2% | 17.8% | 1.7% | 54.3% |

*The Fishing Effort Survey is not administered in any state except NC during Wave 1, nor in ME during Waves 2 and 6.

***Tier 1. Applicability of Existing No-Targeting Closures*:** If sub-option B1 is selected, the Board needs to consider whether the no-targeting closures implemented in 2020 by Maryland and PRFC through CE to meet the required Addendum VI reduction would also meet the new seasonal closure requirement.

**Option A.** Existing no-targeting closures implemented in 2020 would fulfill the requirements of sub-option B1.

**Option B**. Existing no-targeting closures implemented in 2020 would not fulfill the requirements of sub-option B1. States that implemented no-

targeting closures in 2020 would need to choose between the following actions:

- Implement an additional closure to meet the new seasonal closure requirement as selected in sub-option B1; OR
- Implement only the new seasonal closure requirement as selected in sub-option B1, and implement the FMP standard size limit for the Chesapeake Bay recreational fishery *(Section 4.2.1)*.

**Sub-option B2. Spawning Area Closures**: The Board can select either or both of the following sub-options B2-a and B2-b. Existing spawning closures would be applied toward meeting the requirements of the selected option(s).[18] Spawning area closures during the spawning season could contribute to stock rebuilding by eliminating harvest and/or reducing releases of spawning and pre-spawn fish. Reducing releases during this time is particularly important to reduce stress and injury to fish as they move into lower salinity spawning areas. If new information on the timing of striped bass spawning is published in the future, the TC would conduct a review of that research and recommend changes to the timing of spawning closures if needed. If this option is selected, CE would not be permitted.

**B2-a. No-Harvest Spawning Closure Required**: All recreational harvest of striped bass would be prohibited during Waves 1 and 2 in the following spawning areas to protect pre-spawn and spawning fish: Chesapeake Bay, Delaware Bay/River, Hudson River, and Kennebec watershed). Prohibiting harvest for a long period of time may eliminate some striped bass trips altogether, and therefore reduce releases, during this period. Most spawning areas are already closed to harvest during Wave 1 and some spawning areas are closed for all or part of Wave 2 (Figure 4).

**B2-b. No-Targeting Closure Required**: All recreational targeting of striped bass would be prohibited for a minimum two-week period on all spawning grounds (not necessarily the entire spawning area) during Wave 2 or Wave 3, as determined by states to align with peak spawning. Some spawning areas in New Jersey (Delaware River) and Chesapeake Bay (Maryland) have no-targeting closures in place during part of Wave 2 and/or 3 (Figure 5).

[18] For example, if sub-option B5-a was selected and a state already has a no-harvest closure in place for Waves 1 and 2, that state would already be considered in compliance with the closure requirement.

Figure 4. 2021 seasonal closures in the **ocean region** by state.

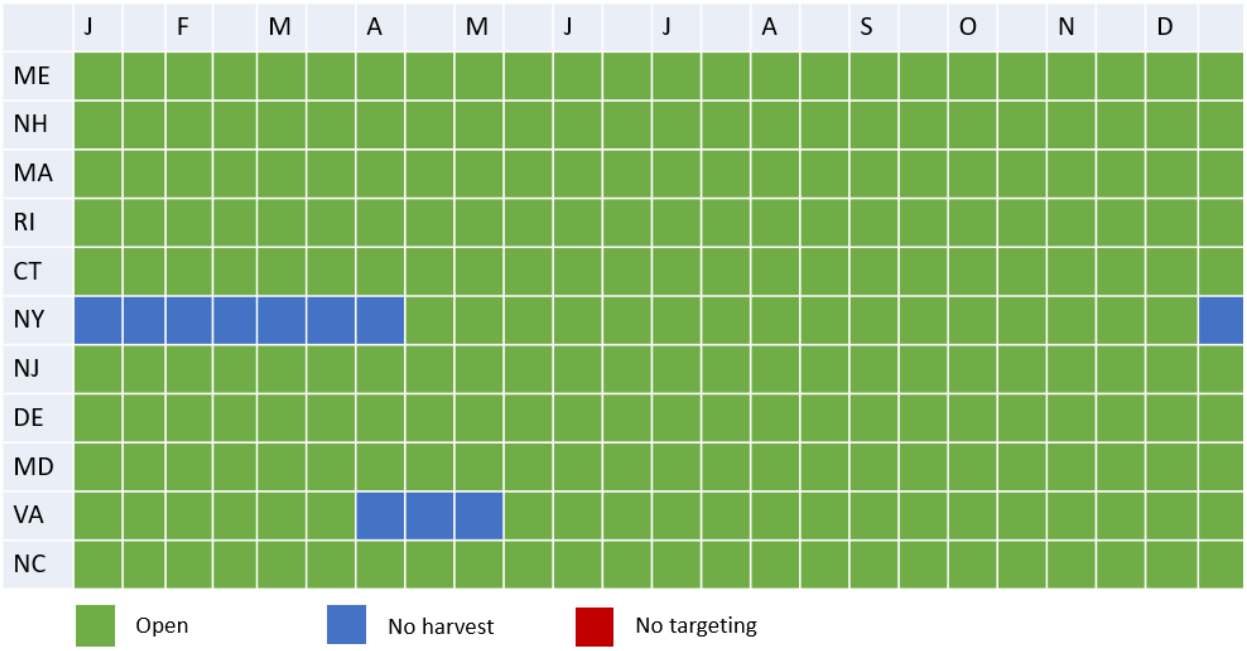
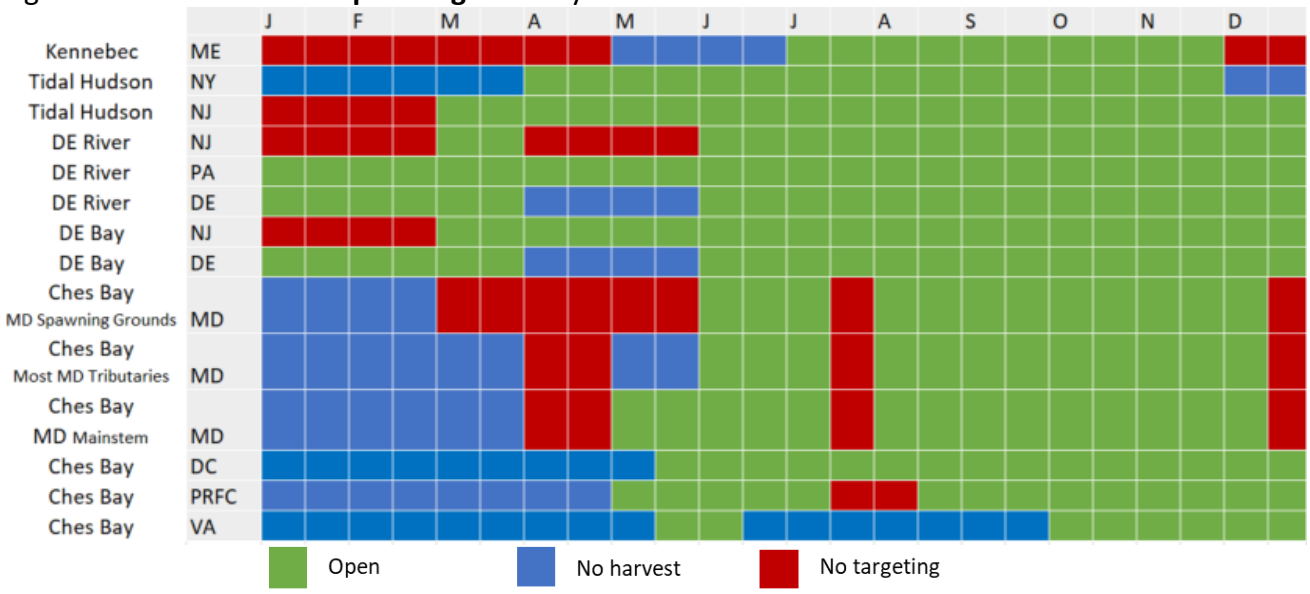



Figure 5. 2021 closures in **spawning areas** by state.




***Option C. Additional Gear Restrictions***

In addition to the status quo circle hook requirement, the Board could consider additional gear restrictions outlined in the following options to increase the chance of survival of striped bass caught and released in the recreational fishery. The benefit of gear restrictions (i.e., how many additional fish could be saved) is difficult to quantify for several reasons, including: 1) it is

unknown how many anglers already use these tactics; 2) possible non-compliance, especially with management measures that can only be observed on the-water and in real-time; and 3) enforcement challenges related to proving angler intent or target species (i.e., gear restrictions are difficult to enforce if the gear is acceptable to use when targeting a different species). Nonetheless, these options would be expected to result in a favorable trend towards a reduction in release mortality.

***The Board may select one or both of the following sub-options C1 and C2.***

> **Sub-option C1**: Recreational anglers would be prohibited from using any device other than a nonlethal device to remove a striped bass from the water or assist in the releasing of a striped bass. A non-lethal device means any tool used in the removal of striped bass from the water or to assist in the releasing of striped bass that does not pierce, puncture, or otherwise cause invasive damage to the fish that may result in its mortality. Some states already have regulations that ban the use of gaffs, but the language presented in this option would encompass a broader suite of lethal devices, including gaffs.
>
> **Sub-option C2**: Striped bass caught on any unapproved method of take would be returned to the water immediately without unnecessary injury. The Board approved this language on incidental catch as guidance to Addendum VI in March 2021; this guidance could not be a compliance criterion as part of Addendum VI since incidental catch was not originally part of Addendum VI. Selecting this option would make this incidental catch provision a requirement under Amendment 7 for striped bass that are incidentally caught on any unapproved method of take, including non-circle hooks with bait attached (as implemented through Addendum VI).

***Option D. Outreach and Education***

States have already implemented outreach and education campaigns related to the use and benefits of circle hooks and to encourage best handling and fishing practices, as recommended by Addendum VI. The following options are intended to more explicitly recognize those efforts as part of Amendment 7. ***The Board may select sub-option D1 or D2.***

> **Sub-option D1**: States would be required to promote best striped bass handling and release practices by developing public education and outreach campaigns. States must provide updates on public education and outreach efforts in annual state compliance reports. Best practices could include**:**
>
> - Be attentive and set the hook immediately to prevent the fish from swallowing the hook (setting the hook is not necessary with circle hooks).
> - If the hook is swallowed, do not forcefully remove it. Cut the line off as close to the mouth as possible and then release the fish.
> - Leave the fish in the water when possible, including while removing the hook, to minimize stress and injury to the fish. If you need to remove the fish from the

water, wet your hands or use a wet rag in order to preserve the protective mucous layer on the outside of the fish.
- Don't use the gills or eyes as a handhold. On larger fish, support under the belly.
- Reduce the fight time.
- Once an angler has retained their bag limit, consider targeting a different species.

**Sub-option D2**: It is recommended states continue to promote best striped bass handling and release practices by developing public education and outreach campaigns. States should provide updates on public education and outreach efforts in annual state compliance reports. Best practices could include those listed in sub-option D1.

## 4.3 COMMERCIAL FISHERY MANAGEMENT MEASURES

### 4.3.1 Size Limits

All commercial fisheries are required to maintain their 2017 size limits.[19]

### 4.3.2 Quota Allocation

Amendment 7 maintains the commercial quotas from Addendum VI to Amendment 6.[20] Table 11 provides the commercial quota in pounds for the ocean region and for Chesapeake Bay. The Chesapeake Bay commercial quota is allocated to Maryland, Virginia, and the Potomac River Fisheries Commission per the jurisdictions' mutual agreement. Table 12 provides each state's commercial quota for the ocean region.

Table 11. Ocean Region and Chesapeake Bay Commercial Quota

| Region | Quota (Pounds of Fish) |
|---|---|
| Chesapeake Bay Total | 2,588,603 |
| Ocean Total | 2,333,408 |

[19] Some states have implemented alternative commercial size limits through current (approved in 2020) conservation equivalency programs. Refer to Table 16 in *Section 9.0* for each state's 2020 commercial regulations.
[20] Some states have implemented adjusted commercial quotas and/or reallocated commercial quota to the recreational sector through current (approved in 2020) conservation equivalency programs. Some states prohibit commercial harvest/sale. Refer to Table 15 in *Section 9.0* for each state's quota for 2020, including CE-adjusted quotas where applicable.

Table 12. Ocean region commercial quota.

| State | Quota (Pounds of Fish) |
|---|---|
| Maine | 154 |
| New Hampshire | 3,537 |
| Massachusetts | 713,247 |
| Rhode Island | 148,889 |
| Connecticut | 14,607 |
| New York | 652,552 |
| New Jersey | 197,877 |
| Delaware | 118,970 |
| Maryland | 74,396 |
| Virginia | 113,685 |
| North Carolina | 295,495 |
| **Ocean Total** | 2,333,408 |

Note: Refer to Table 15 in *Section 9.0* for CE-adjusted quotas, where applicable, for fishing year 2020.

Quotas are allocated on a calendar year basis.[21] In the event a state exceeds its allocation, the amount in excess of its annual quota is deducted from the state's allowable quota in the following year.

*Note: Refer to section 4.2.1.3 for options to consider how changing the recreational size limit through Amendment 7 could impact Addendum VI CE programs that combined recreational and commercial measures to achieve at least an 18% reduction statewide, including changes to commercial quotas.*

#### *4.3.2.1 Commercial Quota Transfers*

Commercial quota transfers are not permitted. In August 2021, concurrent with the development of Draft Amendment 7, the Board initiated Addendum VII to Amendment 6 to consider allowing the voluntary transfer of commercial striped bass quota between states/jurisdictions that have commercial quota. In October 2021, the Board deferred consideration of Draft Addendum VII until May 2022.

### 4.4 REBUILDING PLAN

The 2018 benchmark stock assessment indicated the striped bass stock is overfished and experiencing overfishing relative to the updated reference points defined in the assessment. By accepting the assessment for management use in 2019, two management triggers were tripped requiring the Board to take action to address both the overfishing and overfished status

[21] North Carolina's fishing year is December 1 – November 30.

determinations. Addendum VI was implemented in 2020 to address the overfishing status by implementing measures to reduce F back to F target in 2020. To address the overfished status, the Board must adjust the striped bass management program to rebuild SSB to the target level in a timeframe not to exceed 10 years, no later than 2029. Addendum VI measures are expected to contribute to stock rebuilding, and options for recreational fishery management measures in Draft Amendment 7, including measures to address release mortality (*Section 4.2.2*), could also support stock rebuilding, if implemented.

The stock rebuilding process is iterative in nature given the 10 year rebuilding horizon. The next stock assessment update (expected in 2022) will provide an updated evaluation of stock status that will incorporate two years of management and data under Addendum VI (2020-2021). The most recent estimates of SSB and F currently available for management use are from the 2018 benchmark stock assessment with a terminal year of 2017. The 2022 stock assessment update will provide estimates of SSB and F through 2021, and will update the SSB and F reference point values. Additionally, the 2022 stock assessment will calculate the F rate required to rebuild SSB to the SSB target by no later than 2029 (i.e., F rebuild). F rebuild is distinct from F target such that F target is the F rate required to achieve the SSB target in the long term, with no fixed rebuilding time frame. F rebuild may or may not be lower than F target.

This section includes options to consider which recruitment assumption to apply to rebuilding calculations, and outlines the rebuilding plan framework for responding to the 2022 stock assessment results.

### 4.4.1 Recruitment Assumption for Rebuilding Calculation

The Board has expressed concern about recent low recruitment estimates and the potential impact of low recruitment levels on the ability of the striped bass stock to rebuild by no later than 2029. Several years of poor recruitment may indicate the stock is entering a low recruitment regime, and levels of removals that were sustainable during average or above average recruitment regimes may not be sustainable in the future.

F rebuild could be calculated by drawing recruitment from the values observed from 1990 to the terminal year of the stock assessment (i.e., the standard recruitment method used in the striped bass stock assessment). However, if recruitment is drawn from a below-average period instead of the full period from 1990-forward, for example, the F rebuild would be lower. If the population is fished at F rebuild using the standard recruitment method but average recruitment remains lower than the time series mean, the population may not be able to rebuild to the SSB target by 2029.

As part of the analysis for alternative recruitment trigger options (*Section 4.1*), the TC conducted a change point analysis of the Maryland juvenile abundance index to identify periods of high and low recruitment. This analysis identified 1992-2006 as a high recruitment period (i.e., high recruitment regime) and 2007-2020 as a low recruitment period (i.e., low recruitment regime). This translates to years 1993-2007 and 2008-2017 for age-1 model estimates of recruit

abundance. The age-1 model estimate of recruitment abundance will be updated to include estimates through 2021 during the 2022 assessment.

The following options consider which recruitment assumption would be applied to the rebuilding calculations and projections for the 2022 stock assessment update:

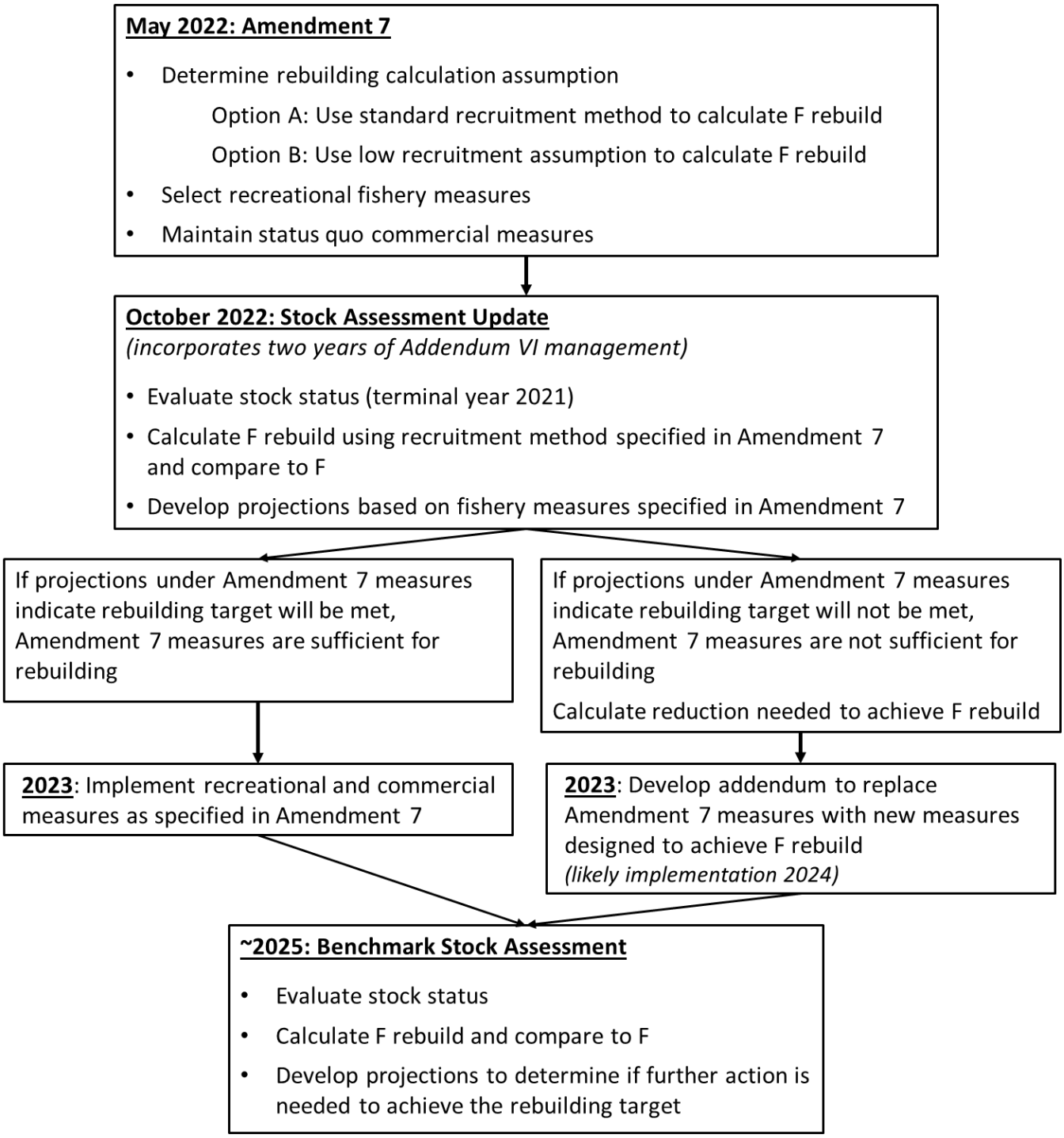
- **Option A (Status Quo)**: Rebuild female SSB to the SSB target level by no later than 2029. F rebuild is calculated to achieve the SSB target by no later than 2029 using the standard recruitment method from the stock assessment.

- **Option B**: Rebuild female SSB to the SSB target level by no later than 2029. F rebuild is calculated to achieve the SSB target by no later than 2029 using the low recruitment regime assumption as identified by the change point analysis. This approach is more conservative than Option A.

### 4.4.2 Rebuilding Plan Framework

The rebuilding plan framework is outlined in Figure 6. The rebuilding framework specifies how the measures selected as part of Amendment 7 will inform rebuilding calculations and projections in the 2022 assessment update, which will then determine whether additional action is needed in response to the assessment results.

Figure 6. Framework to rebuild to SSB target level by no later than 2029.



## 4.5 HABITAT CONSERVATION AND RESTORATION RECOMMENDATIONS

Each State should engage their county, township, and other local jurisdictions to implement protection for striped bass habitat to ensure the sustainability of that portion of the migratory or resident stock. Such a program should inventory historical habitats, identify habitats presently used, specify those targeted for recovery, and impose or encourage measures to retain or increase the quantity and quality of striped bass essential habitats.

Habitats essential for maintaining striped bass populations include spawning, nursery, wintering areas, and migration corridors. Each state jurisdiction should monitor those habitats located within state waters to ensure adequate water and substrate quality; the quantity, timing, and duration of freshwater flows into spawning and nursery areas; water, substrate quality, and integrity of wintering areas; and open and free access to migration corridors, especially ocean inlets. Federal agencies should work with state partners in addressing these needs in state waters and in the EEZ. State and Federal agencies should partner to develop detailed maps of striped bass habitat use, by life stage, to provide a basis for regulatory review of proposed federal or state actions which could adversely affect striped bass populations. Parameters of particular concern to which jurisdictions should be attentive include nutrient loading, long-term adverse changes in water quality, hypoxia events, substrate extraction in areas used by striped bass (e.g., proposed Corps of Engineers sand mining off NJ and NC, as well as navigational dredging), and projects which could potentially jeopardize striped bass habitat quality or access.

### 4.5.1 Preservation of Existing Habitat

1) States in which striped bass spawning occurs should notify in writing the appropriate federal and state regulatory agencies of the locations of habitats used by striped bass. Regulatory agencies should be advised of the types of threats to striped bass populations and recommended measures which should be employed to avoid, minimize, or eliminate any threat to current habitat quantity or quality.

2) Where available, States should seek to designate striped bass essential habitats for special protection. Tools available include High Quality Waters, Outstanding Resource Waters, and Fish Habitats of Concern (as defined by ASMFC, in preparation) designations. Designations should, where possible, be accompanied by requirements of nondegradation of habitat quality, including minimization of nonpoint source runoff, prevention of significant increases in contaminant loadings, and prevention of the introduction of any new categories of contaminants into the area (via restrictions on National Pollutant Discharge Elimination System (NPDES) discharge permits for facilities in those areas).

3) State fishery regulatory agencies should develop protocols and schedules for providing input on water quality regulations to the responsible agency, to ensure that water quality needs for striped bass are met.

4) State fishery regulatory agencies should develop protocols and schedules for providing input on Federal permits and licenses required by the Clean Water Act, Federal Power Act, and other appropriate vehicles, to ensure that striped bass habitats are protected.

5) Water quality criteria for striped bass spawning and nursery areas should be established or existing criteria should be upgraded to levels which are sufficient to ensure successful reproduction. Any action taken should be consistent with Federal Clean Water Act guidelines and specifications.

6) All State and Federal agencies responsible for reviewing impact statements and permit applications for projects or facilities proposed for striped bass spawning and nursery areas should ensure that those projects will have no or only minimal impact on local stocks. Natal rivers of stocks considered depressed or undergoing restoration are of special concern. Any project which would result in the elimination of essential habitat should be avoided.

7) State agencies should engage with local jurisdictions during comprehensive development planning to ensure impacts to striped bass spawning and nursery areas are avoided or minimized.

### 4.5.2 Habitat Restoration and Improvement

1) Each State should survey existing literature and data to determine the historical extent of striped bass occurrence and use within its jurisdiction. An assessment should be conducted of those areas not presently used for which restoration is feasible.

2) Every effort should be made to eliminate existing contaminants from striped bass habitats where a documented adverse impact occurs (e.g., PCBs from the Hudson River).

3) States should work in concert with the USFWS and NMFS, Office of Habitat Conservation, to identify federally-regulated hydropower dams which pose significant impediment to striped bass migration and target them for appropriate recommendations during FERC relicensing.

### 4.5.3 Avoidance of Incompatible Activities

1) Federal and State fishery management agencies should take steps to limit the introduction of compounds which are known to be accumulated in striped bass tissues and which pose a threat to striped bass health or human health.

2) Each State should establish windows of compatibility for activities known or suspected to adversely affect striped bass such as navigational dredging, bridge construction, and dredged material disposal and notify the appropriate construction or regulatory agencies in writing.

3) Projects involving water withdrawal (e.g., power plants, irrigation, water supply projects) should be scrutinized to ensure that adverse impacts resulting from impingement, entrainment,

and/or modification of flow and salinity regimes due to water removal will not adversely impact on striped bass stocks.

4) Each state which encompasses spawning rivers within its jurisdiction should develop water use and flow regime guidelines which are protective of striped bass spawning and nursery areas, and which will ensure the long-term health and sustainability of the stock.

### 4.5.4 Fishery Practices

The use of any fishing gear deemed by management agencies to have an unacceptable impact on striped bass habitat should be prohibited within appropriate essential habitats (e.g., trawling in spawning areas or primary nursery areas should be prohibited).

## 4.6 ALTERNATIVE STATE MANAGEMENT REGIMES

Once approved by the Atlantic Striped Bass Management Board, a state may not amend its regulatory program without the approval of the Board, except when implementing more restrictive measures. All other proposed changes to state regulations must be submitted in writing to the Commission. When implementing more restrictive measures, states should notify the Commission of the new measures in its annual compliance report.

Under no circumstances will states be allowed to institute minimum sizes below 18 inches in alternative management regimes.

### 4.6.1 General Procedures

A state may submit a proposal for a change to its regulatory program or any mandatory compliance measure under this amendment to the Commission. Such changes shall be submitted to the Chair of the Plan Review Team (PRT), who shall distribute the proposal to appropriate groups, including the Board, the PRT, the TC, and the Advisory Panel (AP).

The PRT is responsible for gathering the comments of the TC and the AP. The PRT is also responsible for presenting these comments to the Board for decision.

The Board will decide whether to approve the state proposal for an alternative management program if it determines that it is consistent with the management program detailed in this Amendment.

### 4.6.2 Management Program Equivalency

Management program equivalency (also known as “conservation equivalency” or CE) refers to actions taken by a state which differ from the specific requirements of the FMP, but which achieve the same quantified level of conservation for the resource under management. It is the responsibility of the state to demonstrate that the proposed management program is

equivalent to the FMP standards and consistent with the restrictions and requirements for CE determined by the Board.

The Commission's Conservation Equivalency Policy and Technical Guidance Document (CE Guidance Document) provides specific guidance on development, submission, review and approval of CE proposals[22].

**Option A (Status Quo): Board Discretion on Conservation Equivalency Restrictions and Requirements**

The Board will determine conservation equivalency. The Board has final discretion regarding the use of CE and approval of CE programs. The Board may restrict the use of CE on an ad hoc basis for any FMP requirement. Restrictions may include, but are not limited to:

- measures that are not applicable for CE;
- restrictions on rationale for pursuing CE;
- limitations on the range of measures that may be proposed (e.g., maximum or minimum size limits)
- the definition of "equivalency" (e.g., based on harvest or total removals; achieving the predicted state-specific or coastwide reduction);
- minimum levels of precision for catch and effort data used in CE proposals;
- whether proposals must include an uncertainty buffer on the reduction/liberalization target;
- if states may implement, without further Board review, alternative measures than those specifically approved by the Board if developed using the same methodology; and
- if additional sampling or fishery monitoring is required.

When setting restrictions, the Board should consider such factors as stock status, stock structure, data availability, range of species, socio-economic information, and management goals and objectives.

***The following sets of options consider whether to adopt new default restrictions or requirements for the use of CE (Options B–E). Sub-options selected under Options B–E would automatically apply to new FMP standards approved through Amendment 7 and all subsequent management actions and CE proposals; additional restrictions and requirements for the use of CE could be identified on an ad hoc basis per the Board's discretion (as described above under the Status Quo option). Options B-E are intended to address concerns about the use of CE at the front-end of the CE process (i.e., considering when CE can be used and***

[22] As of September 2021, the CE Guidance Document is under review for potential updates.

***requirements for CE proposals).[23] For each Option B–E, the Board may select one or more sub-options, as applicable. If a sub-option is not selected under an option, the Status Quo (Board discretion) remains in place on that issue.***

***To inform consideration of these options, Table 13 outlines the CE programs implemented for Addendum VI.[24]***

Table 13. CE programs implemented for Addendum VI.

| State | Recreational Fisheries | Commercial Fisheries |
|---|---|---|
| **MA** | N/A | Changed size limit (35" minimum) with equivalent quota change |
| **NY** | Hudson River: Alternative size limit (18" to 28") to achieve 18% removals reduction in combination with standard Ocean slot | Changed size limit (26" to 38") with equivalent quota reduction |
| **NJ** | Alternative size limit (28 to < 38") to achieve 25% removals reduction | Decreased commercial quota reduction (to 0%) with surplus recreational fishery reduction and transferred commercial quota to recreational bonus program fishery (24 to < 28", 1 fish/day) |
| **PA** | DE River and Estuary downstream Calhoun St Bridge: Alternative size and bag limit on limited seasonal basis (2 fish/day at 21 to <24" during 4.1–5.31) to achieve 18% removals reduction | N/A |
| **DE** | DE River/Bay/tributaries: Alternative slot on limited seasonal basis (20" to <25" during 7.1–8.31) to achieve 20.4% removals reduction in combination with standard Ocean slot | Decreased commercial quota reduction (to -1.8%) with surplus recreational fishery reduction |
| **MD** | Chesapeake Bay: Alternative Summer/Fall for-hire bag limit with restrictions (2 fish, only 1 >28", no captain retention) through increased minimum size (19"), April and two-week Wave | Decreased Ocean and Chesapeake Bay commercial quota reduction (to -1.8%) with surplus |

[23] It is difficult to evaluate the effectiveness of CE programs and their equivalency to the FMP standard after program implementation due to the challenge of separating the performance of management measures and outside variables (like angler behavior and availability of fish). Because of this, options for CE accountability were not developed.

[24] The conflict between allowing flexibility through CE and achieving regulatory consistency among states was most recently realized with the implementation of Addendum VI to Amendment 6. For the recreational fishery, the Addendum implemented measures to reduce recreational removals by 18% coastwide. However, at the state level, some states were predicted to reduce removals by more than 18% (and some by less), but CE proposals only had to achieve an 18% reduction regardless. Also, a majority of states pursued CE and submitted a large number of options for TC review, which raised questions for additional guidelines regarding the development of CE proposals.

| | | |
|---|---|---|
| | 4 targeting closures, and shorter spring trophy season (May 1–15) to achieve 20.6% removals reduction; Ocean: FMP standard slot | Chesapeake Bay recreational fishery reduction |
| **PRFC** | Alternative Summer/Fall minimum size and bag limit (20" min, 2 fish/day) with a no targeting closure (7.7–8.20) and shorter spring trophy season (May 1–15) to achieve a 20.5% removals reduction | Decreased Chesapeake Bay commercial quota (to -1.8%) with surplus recreational fishery reduction |
| **VA** | Chesapeake Bay: Alternative slot limits during 5.16–6.15 (20" to 28") and 10.4–12.31 (20" to 36") and no spring trophy season to achieve a 23.4% removals reduction (reduction was the result of lowering prior bag limit from 2 to 1-fish per angler); Ocean: Alternative slot limit (28" to 36") | Decreased Ocean commercial quota (to -7.7%) and Chesapeake Bay commercial quota (to -9.8%) with surplus recreational fishery reduction |

**Option B. Restrict the Use of Conservation Equivalency Based on Stock Status**
The following options would establish default restrictions on the use of CE for certain fisheries depending on striped bass stock status, as determined by the results of the most recent benchmark stock assessment or assessment update reviewed by the Board. When the stock conditions are met, CE programs would not be approved. Currently existing CE programs would remain in place until Board action is taken on new FMP standards relevant to the specific fishery.

**Sub-option B1. Restrictions:** CE programs would not be approved when *[sub-options B1-a and B1-b are mutually exclusive; sub-option B1-c may be selected alone or in addition to sub-option B1-a or B1-b]:*

> **Sub-option B1-a**: the stock is at or below the biomass threshold (i.e., overfished). CE programs would not be considered until a subsequent stock assessment indicates stock biomass is above the threshold level.
>
> **Sub-option B1-b**: the stock is below the biomass target. CE programs would not be considered until a subsequent stock assessment indicates the stock biomass is at or above the target level.
>
> **Sub-option B1-c**: fishing mortality is at or above the fishing mortality threshold (i.e., overfishing is occurring). CE programs would not be considered until a subsequent stock assessment indicates fishing mortality is below the threshold level.

The stock status restriction(s) selected in Option B1 would apply (at a minimum) to the non-quota managed recreational fisheries in the Ocean region and Chesapeake Bay region, with the exception of the Hudson River, Delaware River, and Delaware Bay recreational fisheries. Most of the concerns surrounding CE, as identified during scoping on the Draft Amendment 7 Public

Information Document, pertain to non-quota managed fisheries due to use of uncertain data, modeling assumptions, and challenges measuring the effectiveness of the program post-implementation. Quota-managed fisheries (including commercial fisheries as well as recreational "bonus program" fisheries that operate on a fixed harvest limit with transferred commercial quota[25]) remain accountable to a CE-adjusted quota using census level harvest data. However, non-quota managed fisheries have a CE-adjusted removals target that may be exceeded as subsequently determined by survey-based catch estimates. Commercial state-by-state quota management is also characterized by a wide range of fishery measures (with regards to trip limits, seasons, and gear types) among the states regardless of CE programs being in place, which may have contributed to the minimal concern directed at commercial fishery CE programs.[26] Additionally, the public's concerns were seldom focused on long-standing management program equivalencies for the recreational fisheries in the Hudson River, Delaware River, and Delaware Bay that (due to the size availability of fish in these areas) allow harvest of smaller fish than would otherwise be permitted under the ocean region's measures, hence their exemption here. However, the Board may choose to add to the default list of affected fisheries through Option B2.

**Sub-option B2. Applicability:** The stock status restrictions selected in Option B1 would apply to the following additional fisheries *[one or more sub-options may be selected]*:

> **Sub-option B2-a**: the Hudson River, Delaware River, and Delaware Bay recreational fisheries
>
> **Sub-option B2-b**: quota-managed recreational fisheries (e.g., "bonus programs")
>
> **Sub-option B2-c**: commercial fisheries (all of which are quota managed)

**Option C. Precision Standards for MRIP Estimates Used in Conservation Equivalency Proposals**
The following options would establish default precision standards for MRIP catch and effort estimates used in CE proposals. The options are based on the percent standard error (PSE, a measure of precision) associated with MRIP estimates. NMFS warns that "[MRIP] Estimates should be viewed with increasing caution as PSEs increase beyond 30. Large PSEs—those above 50—indicate high variability around the estimate and therefore low precision."[27] In addition, NMFS is implementing new Recreational Fishing Survey and Data Standards under which estimates will not be published if the PSE is greater than 50 and estimates with a PSE of 30 or

[25] Currently, only New Jersey operates such a recreational bonus program using commercial quota. Connecticut formerly operated a bonus program but suspended it indefinitely in 2020. Such programs are classified herein as commercial CE programs due to commercial quota basis.
[26] States which have different commercial size limits than the FMP standard (i.e., different from the size limits implemented in 2017) through CE at the time this Amendment was developed include Massachusetts and New York.
[27] See: www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

greater will be presented with a warning that they "are not considered sufficiently reliable for most purposes, and should be treated with caution".[28]

CE proposals would not be able to use MRIP estimates associated with a PSE exceeding *[only one sub-option may be selected]*:

**Sub-option C1**: 50

**Sub-option C2**: 40

**Sub-option C3**: 30

All MRIP datasets used in CE proposals would be subject to this precision standard. For example, if a CE proposal uses wave- and/or mode-specific data, the PSEs associated with those specific data cannot exceed the selected precision standard.

Should states find themselves unable to propose certain CE programs because of the MRIP precision standard, they are encouraged to increase MRIP Access Point Angler Intercept Survey (APAIS) sampling to improve the PSE associated with their state's MRIP estimates. Increased APAIS sampling is recommended for all states, as resources allow, regardless of CE programming.

**Option D. Conservation Equivalency Uncertainty Buffer for Non-Quota Managed Fisheries**
The following options would establish a default uncertainty buffer for CE proposals for non-quota managed fisheries. An uncertainty buffer is intended to increase the alternative measures' probability of success in achieving equivalency with the FMP standard (i.e., not exceeding a harvest or removals target). CE programs for quota-managed fisheries have reactive accountability measures of in-season quota monitoring and closures when the quota is reached, and paying back quota overages in the subsequent year. The uncertainty buffer would provide a proactive accountability measure for non-quota managed fisheries operating under CE programs that are not subject to such reactive accountability measures.

Proposed CE programs for non-quota managed fisheries would be required to include an uncertainty buffer of *[only one sub-option may be selected]*:

**Sub-option D1**: 10%

**Sub-option D2**: 25%

**Sub-option D3**: 50%

When CE is pursued to implement new FMP requirements, the uncertainty buffer applies to the percent reduction required or liberalization allowed for the non-quota managed fishery (after

[28] See: www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-survey-and-data-standards

any potential transfer of reduction/liberalization between fisheries). For example, if a 20% reduction is required with a 10% uncertainty buffer, CE proposals would need to demonstrate a 22% reduction. Similarly, if a 20% liberalization is allowed with a 10% uncertainty buffer, proposed CE proposals may demonstrate up to an 18% liberalization. The uncertainty buffer still applies when CE is requested separate from an implementation plan (e.g., a CE proposal submitted after a required 20% reduction was implemented would need to demonstrate a 2% reduction rather than no change).

The Board may need to further determine how the buffer is applied for some future management actions, particularly when CE proposals may include measures for both quota-managed and non-quota managed fisheries (e.g., if a reduction can be split between sectors). The Board may request guidance from the TC and/or PRT.

**Option E. Definition of Equivalency for CE Proposals with Non-Quota Managed Fisheries**
The following options would establish a default definition of what "equivalency" means for CE proposals associated with the implementation of coastwide actions (in non-quota managed fisheries). In other words, the percent reduction or liberalization that must be met in a CE proposal when the FMP standard is projected to have different effects at the coastwide and state-specific levels. The intent is to add transparency and consistency to the use of CE across management actions. Refer to Table 13 for an example of how these options would apply.

Proposed CE programs would be required to demonstrate equivalency to *[only one sub-option may be selected]:*

> **Sub-Option E1**: the percent reduction/liberalization projected for the FMP standard at the coastwide level. (This represents the requirements for CE under Addendum VI to Amendment 6.)
>
> **Sub-option E2:** the percent reduction/liberalization projected for the FMP standard at the state-specific level.
>
> Table 14. *This table provides a hypothetical example to explain the difference between sub-option E1 and E2. Suppose an FMP standard is adopted that is projected to achieve a 20% change in fishery removals when applied coastwide. However, at the state level, the FMP standard is projected to achieve a 25% change in State A and a 10% change in State B. The sub-options vary in the amount of change that State A and State B would need to demonstrate when pursuing alternative measures to the FMP standard through CE.*
>
> *Notably, sub-option E1 may undermine an overall targeted reduction (due to State A's CE) or lead to exceeding an overall targeted liberalization (due to State B's CE). Sub-option E1 may make it impossible for State B to apply for CE under a reduction scenario (no way to meet the higher coastwide reduction amount). Sub-option E2 holds State A's CE to a greater reduction than the coastwide standard, but would allow a greater*

*liberalization than the coastwide standard as well. Sub-option E1 represents the requirements for CE under Addendum VI to Amendment 6.*

| | State Change to be Demonstrated in a CE Proposal under Each Sub-option | |
|---|---|---|
| *FMP Standard achieves a 20% change when applied coast-wide* | Sub-option E1: Use coastwide change | Sub-option E2: Use state-specific change |
| State A (25% state change under FMP standard) | 20% | 25% |
| State B (10% state change under FMP Standard) | 20% | 10% |

### 4.6.3 De Minimis Fishery Guidelines

The ASMFC Interstate Fisheries Management Program Charter (ISFMP Charter) defines *de minimis* as "a situation in which, under the existing condition of the stock and scope of the fishery, the conservation and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coastwide conservation program required by a Fishery Management Plan or amendment," (ASMFC 2016).

#### *4.6.3.1 Qualifications for De Minimis*

States may apply for *de minimis* status if, for the last two years, their combined average commercial and recreational landings (by weight) constitute less than one percent (1%) of the coastwide commercial and recreational landings for the same two-year period. When petitioning for *de minimis* status, the state should also propose the type of exemption associated with *de minimis* status. In addition to determining if the state meets the criteria for *de minimis* status, the Board will evaluate the proposed exemption to be certain it does not compromise the goals and objectives of Amendment 7. The States may petition the Atlantic Striped Bass Management Board at any time for *de minimis* status, if their fishery falls below the threshold level. Once *de minimis* status is granted, designated states must submit annual reports to the Management Board justifying the continuance of *de minimis* status. States must include *de minimis* requests as part of their annual compliance reports.

#### *4.6.3.2 Procedure to Apply for De Minimis Status*

States must specifically request *de minimis* status each year. Requests for *de minimis* status will be reviewed by the PRT as part of the annual FMP review process (*Section 5.3: Compliance Reports*). Requests for *de minimis* must be submitted to the ASMFC Atlantic Striped Bass FMP Coordinator as a part of the state's yearly compliance report. The request must contain the following information: all available commercial landings data for the current and 2 previous full years of data, commercial and recreational regulations for the current year, and the proposed management measures the state plans to implement for the year *de minimis* status is requested. The FMP Coordinator will then forward the information to the PRT.

In determining whether or not a state meets the *de minimis* criteria, the PRT will consider the

information provided with the request, the most recent available coastwide landings data, any information provided by the TC and SAS, and any additional information deemed necessary by the PRT. The PRT will make a recommendation to the Board to either accept or deny the *de minimis* request. The Board will then review the PRT recommendation and either grant or deny the *de minimis* classification.

The Board must make a specific motion to grant a state *de minimis* status, including the measures the state would be excused from implementing. The state should request which measures they would like to be excused from as part of the *de minimis* request.

If landings in a *de minimis* state exceed the *de minimis* threshold, the state will lose its *de minimis* classification, will be ineligible for *de minimis* in the following year, and will be required to implement all provisions of the FMP. If the Board denies a state's *de minimis* request, the state will be required to implement all the provisions of the FMP. When a state rescinds or loses its *de minimis* status, the Board will set a compliance date by which the state must implement the required regulations.

If the coastwide fishery is closed for any reason through Emergency Procedures (*Section 4.7*), *de minimis* states must close their fisheries as well.

Any additional components of the FMP, which the Board determines necessary for a *de minimis* state to implement, can be defined at the time *de minimis* status is granted.

### 4.7 ADAPTIVE MANAGEMENT

The Board may vary the requirements specified in this Amendment as a part of adaptive management in order to conserve the Atlantic striped bass resource. The elements that can be modified by adaptive management are listed in *Section 4.7.2*. The process under which adaptive management can occur is provided below.

#### 4.7.1 General Procedures

The PRT will monitor the status of the fishery and the resource and report on that status to the Board annually or when directed to do so by the Board. The PRT will consult with TC, the SAS, and the AP in making such review and report.

The Board will review the report of the PRT, and may consult further with the TC, SAS, or AP. The Board may, based on the PRT report or on its own discretion, direct the PDT to prepare an addendum to make any changes it deems necessary. The addendum shall contain a schedule for the states to implement the new provisions.

The PDT will prepare a draft addendum as directed by the Board, and shall distribute it to all states for review and comment. A public hearing will be held in any state that requests one. The PDT will also request comment from federal agencies and the public at large. After a 30-day

review period, staff, in consultation with the PDT, will summarize the comments received and prepare a final version of the addendum for the Board.

The Board shall review the final version of the addendum prepared by the PDT, and shall also consider the public comments received and the recommendations of the TC, LEC, and AP. The Board shall then decide whether to adopt, or revise and then adopt, the addendum.

Upon adoption of an addendum by the Board, states shall prepare plans to carry out the addendum, and submit them to the Board for approval according to the schedule contained in the addendum.

### 4.7.2 Measures Subject to Change

The following measures are subject to change under adaptive management upon approval by the Board:

(1) Goal
(2) Objectives
(3) Management areas and unit
(4) Reference points, including:
    (a) overfishing and overfished definition
    (b) region-specific reference points
(5) Rebuilding targets and schedules
(6) Management triggers and planning horizon
(7) Recreational Fishery Management Measures
(8) Commercial Fishery Management Measures, including:
    (a) commercial quota allocation
(9) Management Program Equivalency
(10) Recommendations to the Secretaries for complementary actions in federal jurisdictions
(11) Any other management measures currently included in Amendment 7

## 4.8 EMERGENCY PROCEDURES

Emergency procedures may be used by the Board to require any emergency action that is not covered by, is an exception to, or a change to any provision in Amendment 7. Procedures for implementation are addressed in the ASMFC Interstate Fisheries Management Program Charter, Section Six (c)(10) (ASMFC 2016).

## 4.9 MANAGEMENT INSTITUTIONS

The management institutions for Atlantic striped bass shall be subject to the provisions of the ISFMP Charter (ASMFC 2016). The following is not intended to replace any or all of the provisions of the ISFMP Charter. All committee roles and responsibilities are included in detail in the ISFMP Charter and are only summarized here.

### 4.9.1 Atlantic States Marine Fisheries Commission and ISFMP Policy Board

The ASMFC (Commission) and the ISFMP Policy Board are generally responsible for the oversight and management of the Commission's fisheries management activities. The Commission must approve all fishery management plans and amendments, including Amendment 7. The ISFMP Policy Board reviews any non-compliance recommendations of the various Boards and, if it concurs, forwards them to the Commission for action.

### 4.9.2 Atlantic Striped Bass Management Board

The Board was established under the provisions of the Commission's ISFMP Charter (Section Four; ASMFC 2016) and is generally responsible for carrying out all activities under this Amendment.

The Board establishes and oversees the activities of the PDT, PRT, TC, SAS, Tagging Subcommittee, and the AP. In addition, the Board makes changes to the management program under adaptive management, reviews state programs implementing the amendment, and approves alternative state programs through conservation equivalency. The Board reviews the status of state compliance with the management program annually, and if it determines that a state is out of compliance, reports that determination to the ISFMP Policy Board under the terms of the ISFMP Charter.

### 4.9.3. Atlantic Striped Bass Plan Development Team

The Plan Development Team (PDT) is composed of personnel from state and federal agencies who have scientific knowledge of Atlantic striped bass and management abilities. The PDT is responsible for preparing and developing management documents, including addenda and amendments, using the best scientific information available and the most current stock assessment information. The ASMFC FMP Coordinator chairs the PDT. The PDT will either disband or assume inactive status upon completion of Amendment 7.

### 4.9.4 Atlantic Striped Bass Plan Review Team

The Plan Review Team (PRT) is composed of personnel from state and federal agencies who have scientific and management ability and knowledge of Atlantic striped bass. The PRT is responsible for providing annual advice concerning the implementation, review, monitoring, and enforcement of Amendment 7 once it has been adopted by the Commission. After final action on Amendment 7, the Board may elect to retain members of the PDT as members of the PRT, or appoint new members.

### 4.9.5 Atlantic Striped Bass Technical Committee

The Atlantic Striped Bass Technical Committee (TC) consists of representatives from state or federal agencies, Regional Fishery Management Councils, the Commission, a university, or

other specialized personnel with scientific and technical expertise, and knowledge of the Atlantic striped bass fishery. The Board appoints the members of the TC and may authorize additional seats as it sees fit. The role of the TC is to assess the species' population, provide scientific advice concerning the implications of proposed or potential management alternatives, and respond to other scientific questions from the Board, PDT, or PRT. The SAS reports to the TC.

### 4.9.6 Atlantic Striped Bass Stock Assessment Subcommittee

The Atlantic Striped Bass Stock Assessment Subcommittee (SAS) is appointed and approved by the Board, with consultation from the Atlantic Striped Bass TC, and consists of scientists with expertise in the assessment of the Atlantic striped bass population. Its role is to assess the Atlantic striped bass population and provide scientific advice concerning the implications of proposed or potential management alternatives, and to respond to other scientific questions from the Board, TC, PDT or PRT. The SAS reports to the TC.

### 4.9.7 Atlantic Striped Bass Tagging Subcommittee

The Tagging Subcommittee will consist of those scientists with the expertise in analysis of tag and recapture data for striped Bass. Its role is to assess the available data for inclusion in the assessment of the striped bass populations, which will be provided to the Stock Assessment Subcommittee for inclusion in the annual status of the stock report. The Tagging Subcommittee is also responsible for responding to Management Board questions using the available tagging data, when possible. The Tagging Subcommittee will report to the TC.

### 4.9.8 Atlantic Striped Bass Advisory Panel

The Atlantic Striped Bass Advisory Panel (AP) is established according to the Commission's Advisory Committee Charter. Members of the AP are citizens who represent a cross-section of commercial and recreational fishing interests and others who are concerned about Atlantic striped bass conservation and management. The AP provides the Board with advice directly concerning the Commission's Atlantic striped bass management program.

### 4.9.9 Federal Agencies

#### *4.9.9.1 Management in the Exclusive Economic Zone*

Management of Atlantic striped bass in the EEZ is within the jurisdiction of the three Regional Fishery Management Councils under the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.). In the absence of a Council Fishery Management Plan, management is the responsibility of the National Marine Fisheries Service as mandated by the Atlantic Coastal Fishery Cooperative Management Act.

#### *4.9.9.2 Consultation with Fishery Management Councils*

At the time of adoption of Amendment 7, none of the Regional Fishery Management Councils had implemented a management plan for Atlantic striped bass, nor had they indicated an intent to develop a plan.

### 4.10 RECOMMENDATION TO THE SECRETARY OF COMMERCE FOR COMPLEMENTARY MEASURES IN FEDERAL WATERS

*The Board will discuss this during final approval of the Draft Amendment.*

### 4.11 COOPERATION WITH OTHER MANAGEMENT INSTITUTIONS

The Board will cooperate, when necessary, with other management institutions during the implementation of this amendment, including NMFS and the New England, Mid-Atlantic, and South Atlantic Fishery Management Councils.

## 5.0 COMPLIANCE

The full implementation of the provisions included in this amendment is necessary for the management program to be equitable, efficient, and effective. States are expected to implement these measures faithfully under state laws. ASMFC will continually monitor the effectiveness of state implementation and determine whether states are in compliance with the provisions of this fishery management plan.

The Board sets forth specific elements that the Commission will consider in determining state compliance with this fishery management plan, and the procedures that will govern the evaluation of compliance. Additional details of the procedures are found in the ASMFC Interstate Fishery Management Program Charter (ASMFC 2016).

### 5.1 MANDATORY COMPLIANCE ELEMENTS FOR STATES

A state will be determined to be out of compliance with the provision of this fishery management plan according to the terms of Section Seven of the ISFMP Charter if:

- Its regulatory and management programs to implement Amendment 7 , or any addendum prepared under adaptive management (*Section 4.7*), have not been approved by the Board; or
- It fails to meet any schedule required by *Section 5.2* or within any addendum prepared under adaptive management (*Section 4.7*); or
- It has failed to implement a change to its program when determined necessary by the Board; or
- It makes a change to its regulations required under *Section 4* or any addendum prepared under adaptive management (*Section 4.7*), without prior approval of the Board.

### 5.1.1 Regulatory Requirements

To be considered in compliance with this fishery management plan, all state programs must include a regime of restrictions on Atlantic striped bass fisheries consistent with the requirements of *Section 3.1: Commercial Catch and Landings Programs; Section 3.4: Biological Data Collection Programs; Section 4.2 Recreational Fishery Management Measures;* and *Section 4.3: Commercial Fishery Management Measures*. A state may propose an alternative management program under *Section 4.6: Alternative State Management Regimes*, which, if approved by the Board, may be implemented as an alternative regulatory requirement for compliance.

States may begin to implement Amendment 7 after final approval by the Commission. Each state must submit its required Atlantic striped bass regulatory program to the Commission through ASMFC staff for approval by the Board. During the period between submission and Board approval of the state's program, a state may not adopt a less protective management program than contained in this Amendment or contained in current state law or regulation. The following lists the specific compliance criteria that a state/jurisdiction must implement in order to be in compliance with Amendment 7:

- Recreational fishery management measures as specified in *Section 4.2*
- Commercial fishery management measures as specified in *Section 4.3*
- Monitoring requirements as specified in *Section 3.0*, including the Commercial Tagging Program (*Section 3.1.1*), Fishery-Dependent Data Collection (*Section 3.4.1*), and Fishery-Independent Data Collection (*Section 3.4.2*)
- All state programs must include law enforcement capabilities adequate for successful implementation of the compliance measures contained in this Amendment.
- There are no mandatory research requirements at this time; however, research requirements may be added in the future under Adaptive Management, *Section 4.7*.
- There are no mandatory habitat requirements in Amendment 7. See *Section 4.4* for habitat recommendations.

For monitoring programs, states must submit proposals for all intended changes to required monitoring programs, which may affect the quality of the data or the ability of the program to fulfill the needs of the fishery management plan. State proposals for making changes to required monitoring programs will be submitted to the Technical Committee. Proposals must be on a calendar year basis. The Technical Committee will make recommendations to the Management Board concerning whether the proposals are consistent with Amendment 7.

In the event that a state realizes it will not be able to fulfill its fishery independent monitoring requirements, it should immediately notify the Commission in writing. The Commission will work with the state to develop a plan to secure funding or plan an alternative program to satisfy the needs outlined in Amendment 7. If the plan is not implemented 90 days after it has been adopted, the state will be found out of compliance with Amendment 7.

### 5.2 COMPLIANCE SCHEDULE

States must implement this Amendment according to the following schedule:

Month Day, 202X: Submission of state programs to implement Amendment 7 for approval by the Board. Programs must be implemented upon approval by the Board.

Month Day, 202X: States with approved management programs must implement Amendment 7. States may begin implementing management programs prior to this deadline if approved by the Board.

### 5.3 COMPLIANCE REPORTS

Each state must submit to the Commission an annual report concerning its Atlantic striped bass fisheries and management program for the previous year, no later than June 15th. A standard compliance report format has been prepared and adopted by the ISFMP Policy Board. States should follow this format in completing the annual compliance report.

The report shall cover:

- The previous calendar year's fishery and management program including mandatory reporting programs (including frequency of reporting and data elements collected), fishery dependent data collection, fishery independent data collection, regulations in effect, harvest and catch information, and *de minimis* requests.
- The planned management program for the current calendar year summarizing regulations that will be in effect and monitoring programs that will be performed, highlighting any changes from the previous year.

#### 5.3.1 Commercial Tagging Program Reports

States and jurisdictions with a commercial striped bass fishery must annually report any changes to the tag program such as tag type, which includes color, text (with the exception of year), and style; the biological metric used; or any other requirements as specified under Section 3.1.1 no later than 60 days prior to the start of the first fishing season in that state or jurisdiction. This information will be compiled and distributed to law enforcement officials to aid in commercial tag enforcement in the striped bass fishery.

### 5.4 PROCEDURES FOR DETERMINING COMPLIANCE

Detailed procedures regarding compliance determinations are contained in the ISFMP Charter, Section Seven (ASMFC 2016). In brief, all states are responsible for the full and effective implementation and enforcement of fishery management plans in areas subject to their jurisdiction. Written compliance reports as specified in the Amendment must be submitted annually by each state with a declared interest. Compliance with Amendment 7 will be reviewed at least annually; however, the Board, ISFMP Policy Board, or the Commission may

request the PRT to conduct a review of state's implementation and compliance with Amendment 7 at any time.

The Board will review the written findings of the PRT within 60 days of receipt of a State's compliance report. Should the Board recommend to the Policy Board that a state be determined out of compliance, a rationale for the recommended noncompliance finding will be addressed in a report. The report will include the required measures of Amendment 7 that the state has not implemented or enforced, a statement of how failure to implement or enforce required measures jeopardizes Atlantic striped bass conservation, and the actions a state must take in order to comply with Amendment 7 requirements.

The ISFMP Policy Board will review any recommendation of noncompliance from the Board within 30 days. If it concurs with the recommendation, it shall recommend to the Commission that a state be found out of compliance.

The Commission shall consider any noncompliance recommendation from the ISFMP Policy Board within 30 days. Any state that is the subject of a recommendation for a noncompliance finding is given an opportunity to present written and/or oral testimony concerning whether it should be found out of compliance. If the Commission agrees with the recommendation of the ISFMP Policy Board, it may determine that a state is not in compliance with Amendment 7, and specify the actions the state must take to come into compliance.

Any state that has been determined to be out of compliance may request that the Commission rescind its noncompliance findings, provided the state has revised its Atlantic striped bass conservation measures.

### 5.5. ANALYSIS OF THE ENFORCEABILITY OF PROPOSED MEASURES

All state programs must include law enforcement capabilities adequate for successfully implementing that state's Atlantic striped bass regulations. The LEC will monitor the adequacy of a state's enforcement activity.

### 5.6 RECOMMENDED (NON-MANDATORY) MANAGEMENT MEASURES

The following management measures are recommended for states to fully or partially implement. These measures are not part of the compliance criteria for Amendment 7. Through the Draft Amendment 7 development process, the PDT identified additional potential recommendations for the Board's consideration:

- States are encouraged to increase APAIS sampling above the MRIP baseline to provide more extensive coverage of their state recreational fisheries;
- States should consider complimentary/uniform regulations in shared water bodies if pursuing CE.

### 5.6.1 Spawning Area Closures

Consideration should be given to the prohibition of fishing on the spawning grounds during the spawning season. In addition to the mandatory spawning closures in Section 4.2.2 [delete if not-selected], states are encouraged to maintain existing spawning closures and evaluate the need for additional spawning closures.

### 5.6.2 Survey of Inland Recreational Fishermen

The states/jurisdictions are encouraged to conduct a survey of inland fishermen to evaluate the landings, catch rate, discards, participation, and number of trips.

### 5.6.3. Angler Education and Outreach

*NOTE: If the option to require outreach is selected in Section 4.2.2 (Option D1), this would be incorporated into that section.*

Through the ASMFC, if possible, states are recommended to develop and implement an angler education program. The main tool of the education program will be a website accessible from each state fisheries agency website. When funding is available, states should develop posters and/or brochures for posting and distributing at boat launches, shore-based fishing areas, and for placement on charter and rental boats. State agencies should also coordinate outreach to anglers through influential fishing organizations.

In order to promote the use of circle hooks, states are encouraged to develop public education and outreach campaigns on the benefits of circle hooks when fishing with bait. Angler education on the benefits of using circle hooks and on the effective safe handling of fish caught and released remains a critical component to improve post release survival.

## 6.0 RESEARCH NEEDS

The following list of research needs have been identified in order to enhance the state of knowledge of the Atlantic striped bass resource. Research recommendations are broken down into several categories: data collection, assessment methodology, life history, habitat, and socioeconomic. Some research needs are further categorized into high and moderate priority levels.

### 6.1 STOCK ASSESSMENT, DATA COLLECTION, AND LIFE HISTORY RESEARCH NEEDS

The following categorized and prioritized research recommendations were developed by the 2018 Benchmark Stock Assessment Subcommittee and the 66$^{th}$ SARC (NEFSC 2019).

### 6.1.1 Fishery-Dependent Data

*High*

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

*Moderate*

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

### 6.1.2 Fishery-Independent Data

*High*

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

*Moderate*

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

### 6.1.3 Stock Assessment Modeling/Quantitative

*High*

- Develop better estimates of tag reporting rates; for example, through a coastwide tagging study.
- Investigate changes in tag quality and potential impacts on reporting rate.
- Explore methods for combining tag results from programs releasing fish from different areas on different dates.
- Develop field or modeling studies to aid in estimation of natural mortality and other factors affecting the tag return rate.
- Compare M and F estimates from acoustic tagging programs to conventional tagging programs.

*Moderate*

- Examine methods to estimate temporal variation in natural mortality.

*Low*

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

### 6.1.4 Life History and Biology

*High*

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

*Moderate*

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

## 6.2 HABITAT RESEARCH NEEDS

- See *Section 4.4* for habitat conservation and restoration recommendations, which include reviewing striped bass habitat use and data (e.g., water quality criteria) to inform habitat conservation and restoration.

## 6.3 SOCIO-ECONOMIC RESEARCH NEEDS

- Conduct research on a coastwide scale to analyze striped bass anglers' preferences and behavior in response to regulatory changes and changes in fishery conditions (e.g., changes in fish availability). This research could inform an economic sub-model component of a bioeconomic model for striped bass (see *Section 1.5.2*).
    - The economic sub-model would use anglers' preferences for different trip attributes to calculate anglers' demand for recreational trips under alternative policy scenarios. In modern applications, this is often achieved by parameterizing recreational demand using survey data from choice experiments in which anglers make trip decisions based on expectations about catch, harvest, and regulatory releases or discards. Choice experiment surveys and revealed preference studies could be used to estimate the effects of changes in regulations in the absence of market data and behavioral observations.
- When the above research is available, work with stock assessment scientists to develop a bioeconomic model for striped bass, which would combine an economic sub-model

and biological sub-model to assess feedbacks and long-run impacts of management decisions on anglers and the striped bass resource (see *Section 1.5.*2).

- Conduct research on angler preferences and behavior regarding targeting of substitute species (e.g., which species are targeted with striped bass and what species would anglers target if they were unable to keep striped bass) and how that behavior is influenced by regulations and how preferences differ across regions. This would inform understanding and predictions of changes in effort in response to future regulations and changes in fish availability (e.g., due to climate change).
- Improve understanding of non-consumptive value by region, including value of the catch and release fishery.

## 7.0 PROTECTED SPECIES

In the fall of 1995, Commission member states, NMFS, and USFWS began discussing ways to improve implementation of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) in state waters. Historically, these policies had been only minimally implemented and enforced in state waters (0-3 miles). In November 1995, the Commission, through its ISFMP Policy Board, approved an amendment to its ISFMP Charter (Section Six (b)(2)) requiring protected species/fishery interactions to be discussed in the Commission's fisheries management planning process. As a result, the Commission's fishery management plans describe impacts of state fisheries on MMPA protected and ESA-listed (endangered or threatened) species, collectively termed "protected species". The following section outlines: (1) the federal legislation which guides protection of marine mammals and sea turtles, (2) the protected species with potential fishery interactions; (3) the specific types of fishery interaction; (4) information about the affected protected species; and (5) potential impacts to Atlantic coast state and interstate fisheries.

### 7.1 MARINE MAMMAL PROTECTION ACT REQUIREMENTS

Since its passage in 1972, and subsequent Amendment in 1994, one of the underlying goals of the MMPA has been to reduce the incidental serious injury and mortality of marine mammals in the course of commercial fishing operations to insignificant levels approaching a zero mortality and zero serious injury rate. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). The Act also requires NMFS to develop and implement a take reduction plan to assist in the recovery of, or prevent the depletion of, each strategic stock that interacts with a Category I or II fishery. A strategic stock is defined as a stock: (1) for which the level of direct

human-caused mortality exceeds the potential biological removal (PBR)[29] level; (2) which is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) which is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA.

Under 1994 mandates, the MMPA also requires fishermen in Category I and II fisheries to register under the Marine Mammal Authorization Program (MMAP). The purpose of this is to provide an exception for commercial fishermen from the general taking prohibitions of the MMPA. All fishermen, regardless of the category of fishery in which they participate, must report all incidental injuries and mortalities to a marine mammal caused by commercial fishing operations within 48 hours.

Section 101(a)(5)(E) of the MMPA allows for authorization of the incidental take of ESA-listed marine mammals in the course of commercial fishing operations if it is determined that: (1) incidental mortality and serious injury will have a negligible impact on the affected species or stock; (2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and (3) where required under MMPA Section 118, a monitoring program has been established, vessels engaged in such fisheries are registered, and a take reduction plan has been developed or is being developed for such species or stock. MMPA Section 101(a)(5)(E) permits are not required for Category III fisheries, but any serious injury or mortality of a marine mammal must be reported.

### 7.2 ENDANGERED SPECIES ACT REQUIREMENTS

The taking of endangered or threatened species including sea turtles, marine mammals, and fish, is prohibited and considered unlawful under Section 9(a)(1) of the ESA. In addition, NMFS or the USFWS may determine Section 4(d) protective regulations to be necessary and advisable to provide for the conservation of threatened species. There are several mechanisms established in the ESA which allow for exceptions to the prohibited take of protected species listed under the ESA. Section 10(a)(1)(A) of the ESA authorizes NMFS to allow the taking of listed species through the issuance of research permits, which allow ESA species to be taken for scientific purposes or to enhance the propagation and survival of the species. Section 10(a)(1)(B) authorizes NMFS to permit, under prescribed terms and conditions, any taking otherwise prohibited by Section 9(a)(1)(B) of the ESA if the taking is incidental to, and not the purpose of, carrying out an otherwise lawful activity. In recent years, some Atlantic state fisheries have obtained section 10(a)(1)(B) permits for state fisheries.

[29] PBR is the number of human-caused deaths per year each stock can withstand and still reach an optimum population level. This is calculated by multiplying the minimum population estimate by the stock's net productivity rate and a recovery factor ranging from 0.1 for endangered species to 1.0 for healthy stocks.

Section 7(a)(2) requires federal agencies to consult with NMFS to ensure that any action that is authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species. If, following completion of the consultation, an action is found to jeopardize the continued existence of any listed species or cause adverse modification to critical habitat of such species, reasonable and prudent alternatives need to be identified so that jeopardy or adverse modification to the species does not occur. Section (7)(o) provides the actual exemption from the take prohibitions established in Section 9(a)(1), which includes Incidental Take Statements that are provided at the end of consultation via the ESA Section 7 Biological Opinions.

### 7.3 PROTECTED SPECIES WITH POTENTIAL FISHERY INTERACTIONS

Commercial striped bass fisheries operate in the state waters (0-3 miles) of Massachusetts, Rhode Island, New York, Delaware, Maryland, the Potomac River Fisheries Commission, Maryland, Virginia, and North Carolina.[30] The Chesapeake Bay typically accounts for roughly 60 percent of striped bass commercial landings by weight each year. The primary gear types for the striped bass commercial fishery are gill nets (roughly 50 percent of commercial landings by weight each year), hook and line (typically 20-30 percent of commercial landings by weight each year), and pound nets/other fixed gears (typically 10-20 percent of commercial landings by weight each year). Haul seines and trawls are also used in the commercial fishery to a lesser extent (combined less than 5 percent of commercial landings by weight each year). The recreational sector operates in state waters across the entire management unit (0-3 miles from Maine through North Carolina) and uses hook and line almost exclusively.

A number of protected species occur within the striped bass management unit for Atlantic striped bass. Ten are classified as endangered or threatened under the ESA; the remainder are protected under provisions of the MMPA. The species found in coastal Northwest Atlantic waters are listed below.

| | |
|---|---|
| <u>Endangered</u> | |
| North Atlantic Right whale | (*Eubalaena glacialis*) |
| Fin whale | (*Balaenoptera physalus*) |
| Leatherback sea turtle | (*Dermochelys coriacea*) |
| Kemp's Ridley sea turtle | (*Lepidochelys kempii*) |
| Shortnose sturgeon | (*Acipenser brevirostrum*) |
| Atlantic sturgeon<br>(New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments (DPS)) | (*Acipenser oxyrinchus oxyrinchus*) |

[30] North Carolina has reported zero offshore commercial harvest since 2013.

Threatened

| | |
|---|---|
| Loggerhead sea turtle (NW Atlantic Ocean DPS) | *(Caretta caretta)* |
| Green sea turtle (North Atlantic DPS) | *(Chelonia mydas)* |
| Giant Manta Ray | *(Manta birostris)* |
| Atlantic Sturgeon (Gulf of Maine DPS) | *(Acipenser oxyrinchus oxyrinchus)* |

MMPA

*Includes all marine mammals above in addition to:*

| | |
|---|---|
| Minke whale | *(Balaenoptera acutorostrata)* |
| Humpback whale | *(Megaptera novaeangliae)* |
| Bottlenose dolphin[31] | *(Tursiops truncatus)* |
| Atlantic-white sided dolphin | *(Lagenorhynchus acutus)* |
| Short Beaked Common dolphin | *(Delphinus delphis)* |
| Harbor seal | *(Phoca vitulina)* |
| Gray seal | *(Halichoerus grypus)* |
| Harp seal | (*Phoca groenlandica*) |
| Harbor porpoise | (*Phocoena phocoena*) |

In the Northwest Atlantic waters, protected species utilize marine habitats for feeding, reproduction, nursery areas, and migratory corridors. Some species occupy the area year round while others use the region only seasonally or move intermittently nearshore, inshore, and offshore. Interactions may occur whenever fishing gear and protected species overlap spatially and temporally.

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and observed records of protected species interaction with particular fishing gear types, to understand the potential risk of an interaction.

### 7.3.1 Marine Mammals

Large whales, small cetaceans (e.g., bottlenose dolphins), and pinniped (e.g., harbor seals) species co-occur with the Atlantic striped bass fishery.

Large whales

Large whales, including Humpback, North Atlantic right, fin, and minke whales, occur in the Northwest Atlantic. Generally speaking, large whales follow an annual pattern of migration

[31] The following bottlenose dolphin stocks occur within the striped bass management unit: Western North Atlantic Northern Migratory Coastal; Western North Atlantic Southern Migratory Coastal; Northern North Carolina Estuarine System; Southern North Carolina Estuarine System.

between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer/fall foraging grounds (primarily north of 41°N). This is a simplification of whale movements, particularly as it relates to winter movements. It is unknown if all individuals of a population migrate to low latitudes in the winter, although increasing evidence suggests that for some species, some portion of the population remains in higher latitudes throughout the winter (Clapham et al. 1993; Davis et at. 2017; Davis et al. 2020; Hayes et al. 2020; Swingle et al. 1993; Vu et al. 2012). For additional information on the biology, status, and range wide distribution of humpback, North Atlantic right, fin, sei, and minke whales, refer to the marine mammal SARs provided at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

Small Cetaceans and Pinnipeds

Small cetaceans can be found throughout the year in the Northwest Atlantic Ocean (Maine to Florida), including in harbors, bays, gulfs, and estuaries; however, within this range, there are seasonal shifts in species distribution and abundance. Pinnipeds are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N).

For additional information on the biology and range wide distribution of each species of small cetacean and pinniped, as well as information on other marine mammals that occur on the Atlantic coast, refer to the marine mammal SARs provided at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region

#### *7.3.1.1 Gear Interactions with Marine Mammals*

Marine mammal interactions have been documented in the primary fisheries that target striped bass, including the pound net and gillnet fisheries as well as trawl, haul seine, and hook and line. The following sections are not a comprehensive review of all fishing gear types known to interact with a given species and the bycatch reports included below do not represent a complete list. It should be noted that without an observer program for many of these fisheries, actual numbers of interactions associated with the striped bass fishery are difficult to obtain.

Gillnets

The mid-Atlantic gillnet fishery is listed as a Category I fishery in the 2021 LOF (86 FR 3028, January 14, 2021). The fishery was originally listed as a Category II fishery but in 2003, it was elevated to a Category I fishery after stranding and observer data documented the incidental mortality and serious injury of bottlenose dolphins (68 FR 41725, July 15, 2003). Other species with documented interactions include the common dolphin, harbor seal, gray seal, and hooded seal; however, since gillnet fisheries target many species, not all incidents may have occurred while harvesting striped bass. Between 1995 and 2018, observer coverage has ranged from 1% to 9%.

The Chesapeake Bay inshore gillnet and the North Carolina inshore gillnet are all listed as Category II fisheries in the 2021 LOF (86 FR 3028, January 14, 2021). The primary species reported interacting with these gears is the bottlenose dolphin. Both the Chesapeake Bay inshore gillnet and the North Carolina inshore gillnet fisheries were elevated from a Category III fishery to a Category II fishery in the 2006 and 2001 LOFs, respectively (66 FR 42780, August 15, 2001; 71 FR 48802, August 22, 2006).

The Delaware River inshore gillnet, the Long Island Sound inshore gillnet, and the Rhode Island/Southern Massachusetts/New York Bight inshore gillnet fisheries are listed as Category III fisheries in the 2021 LOF (86 FR 3028, January 14, 2021). There have been no documented interactions with marine mammals in the past five years of data.

Hook and Line

Large whales have been documented entangled with hook and line gear or monofilament line (Greater Atlantic Region Marine Animal Incident Database, unpublished data; Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). In the most recent (2008-2017) mortality and serious injury determinations for baleen whales, the majority of cases identified with confirmed hook and line or monofilament entanglement did not result in the serious injury or mortality to the whale (84.8 % observed/reported whales had a serious injury value of 0; 15.2 % had a serious injury value of 0.75; none of the cases resulted in mortality; Cole and Henry 2013; Henry et al. 2017; Henry et al. 2020). In fact, 75.8 % of the whales observed or reported with a hook/line or monofilament entanglement were resighted gear free and healthy; confirmation of the health of the other remaining whales remain unknown as no resightings had been made over the timeframe of the assessment (Cole and Henry 2013; Henry et al. 2017; Henry et al. 2020). Based on this information, while large whale interactions with hook and line gear are possible, there is a low probability that an interaction will result in serious injury or mortality to any large whale species. Therefore, relative to other gear types, such as fixed gear, hook and line gear represents a low source serious injury or mortality to any large whale (Henry et al. 2020).

Based on the most recent 10 years of data provided in the marine mammal SARs (i.e., 2008-2017) for small cetaceans and pinnipeds that occur within the striped bass management unit, only bottlenose dolphin stocks have been identified (primarily through stranding records/data) as entangled in hook and line gear (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). In some cases, these entanglements have resulted in the serious injury or mortality to the animal. Specifically, reviewing stranding data provided in marine mammal SARs from 2008-2017, estimated mean annual mortality for each bottlenose stock due to interactions with hook and line gear was approximately one animal (Palmer 2017; https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). Based on this, although interactions with hook and line gear are possible, relative to other gear types, such as trawl gear, hook and line gear represents a low source serious injury or mortality to any bottlenose dolphin stock. For other species of small cetaceans or pinnipeds, hook and line gear is not expected to be a source of serious injury or mortality.

Pound Nets

The Virginia pound net fishery is listed as a Category II fishery in the 2021 LOF due to documented interactions with bottlenose dolphins (86 FR 3028, January 14, 2021). During 2014–2018, there were no documented mortalities or serious injuries to bottlenose dolphins involving pound net gear in Virginia. There is no formal observer coverage for the Virginia pound net fishery but there has been sporadic monitoring by the Northeast Fishery Observer Program. All other Atlantic coast pound net fisheries are listed as a Category III fishery.

NOAA Fisheries issued a final rule in 2015 amending the Bottlenose Dolphin Take Reduction Plan and its implementing regulations under the Marine Mammal Protection Act (MMPA) requiring gear restrictions for VA pound nets in estuarine and coastal state waters of Virginia to reduce bycatch (80 FR 6925, February 9, 2015). NOAA Fisheries also amended regulations and definitions for Virginia pound nets under the Endangered Species Act (ESA) for sea turtle conservation to be consistent with this final rule. More information on this rule is available here: https://www.fisheries.noaa.gov/action/amendment-virginia-pound-net-regulations.

Fyke Net and Floating Fish Traps

The Rhode Island Floating fish trap and the Northeast/Mid-Atlantic fyke net fisheries are listed as a Category III fishery in the 2021 LOF (86 FR 3028, January 14, 2021). There are no documented interactions between marine mammals in the Northeast/Mid-Atlantic fyke net fishery nor the floating fish trap fishery.

Bottom Trawls

The Mid-Atlantic bottom trawl fishery is listed as a Category II fishery in the 2021 LOF (86 FR 3028, January 14, 2021). In 2005, Mid-Atlantic bottom trawl fishery was elevated to Category II based on mortality and injury of common dolphins and pilot whales (later removed from the list of species killed or injured by this fishery). This fishery continues to be listed as a Category II fishery due to interactions with bottlenose dolphins, common dolphins, and gray seals. Interactions with other species include the harbor seal, Risso's dolphin, and white-sided dolphin.[32]

With the exception of minke whales, there have been no observed interactions with large whales and bottom trawl gear.[33] In 2008, several minke whales were observed dead in bottom

[32] For additional information on small cetacean and pinniped interactions, see: Chavez-Rosales et al. 2017; Hatch and Orphanides 2014, 2015, 2016, 2019; Josephson et al. 2017; Josephson et al. 2019; Lyssikatos 2015; Lyssikatos et al. 2020; Orphanides 2020; Read *et al*. 2006; Waring et al. 2015b; Marine Mammal SARS: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; MMPA LOF at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries.

[33] Refer to Greater Atlantic Region Marine Animal Incident Database (unpublished data); Marine Mammal SARs: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-

trawl gear attributed to the northeast bottom trawl fishery; estimated annual mortality attributed to this fishery in 2008 was 7.8 minke whales (Waring et al. 2015). Since 2008, serious injury and mortality records for minke whales in U.S. waters have shown zero interactions with bottom trawl (northeast or Mid-Atlantic) gear.[34] Based on this information, large whale interactions with bottom trawl gear are expected to be rare to nonexistent.

Haul/Beach Seine

The Mid-Atlantic haul/beach seine fishery is listed as a Category II fishery in the 2021 LOF due to interactions with coastal bottlenose dolphin (86 FR 3028, January 14, 2021). NMFS has recorded one observed take of a bottlenose dolphin in this fishery in 1998 (Waring and Quintal 2000). During 2014–2018, one serious injury of a common bottlenose dolphin occurred associated with the mid-Atlantic haul/beach seine fishery. During 2014, a common bottlenose dolphin was found within a haul seine net in Virginia and released alive seriously injured (Maze-Foley and Garrison 2020). Harbor porpoise was removed from the list of species killed or injured in the Mid-Atlantic haul/beach seine fishery due to no other interactions between 1999 and 2003. The fishery was observed from 1998-2001 but there has been limited observer coverage since 2001.

### 7.3.2 Sea Turtles

All sea turtles that occur in U.S. waters are listed as either endangered or threatened under the ESA. Four sea turtle species likely to overlap with the striped bass fishery are loggerhead (*Caretta caretta*), Kemp's Ridley (*Lepidochelys kempi*), green (*Chelonia mydas*), and leatherback (*Dermochelys coriacea*) sea turtles.

The Atlantic seaboard provides important developmental habitat for post-pelagic juveniles, as well as foraging and nesting habitat for adult sea turtles. The distribution and abundance of sea turtles along the Atlantic coast is related to geographic location and seasonal variations in water temperatures. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly et al. 1995a,b,c; Griffin et al. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April

region; NEFSC observer/sea sampling database, unpublished data ; MMPA LOF: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html

[34] Refer to: Greater Atlantic Region Marine Animal Incident Database (unpublished data); Waring et al. 2016; Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Cole and Henry 2013; and, Henry et al. 2014, 2015, 2016, 2017, 2019, 2020; MMPA LOF: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries.

and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; Shoop & Kenney 1992).

Juvenile Kemp's ridleys sea turtles use northeastern and mid Atlantic waters of the U.S. Atlantic coastline as primary developmental habitat, with shallow coastal embayments serving as important foraging grounds during the summer months. Juvenile ridleys migrate south as water temperatures cool, and are predominantly found in shallow coastal embayments along the Gulf Coast during the fall and winter months. Kemp's ridleys can be found from New England to Florida, and are the second most abundant sea turtle in Virginia and Maryland waters (Keinath et al. 1987; Musick and Limpus, 1997). In the Chesapeake Bay, ridleys frequently forage in shallow embayments, particularly in areas supporting submerged aquatic vegetation (Lutcavage and Musick, 1985; Bellmund et al., 1987; Keinath et al,. 1987; Musick and Limpus, 1997). These turtles primarily feed on crabs, but also consume mollusks, shrimp, and fish (Bjorndal, 1997).

The leatherback is the largest living turtle and its range is farther than any other sea turtle species (NMFS, 2013). Leatherback turtles are often found in association with jellyfish, with the species primarily feeding on Cnidarians (*medusae, siphonophores*) and tunicates (*salps, pyrosomas*). While these turtles are predominantly found in the open ocean, they do occur in coastal water bodies such as Cape Cod Bay and Narragansett Bay, particularly the fall. The most significant nesting in the U.S. occurs in southeast Florida (NMFS, 2013). Leatherbacks are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (James *et al.* 2005; Eckert *et al.* 2006; Murphy *et al.* 2006; NMFS and USFWS 2013b; Dodge *et al.* 2014). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters; they are found in more northern waters (i.e., Gulf of Maine) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (NMFS and USFWS 1992; James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014).

More information about sea turtles can be found here: https://www.fisheries.noaa.gov/sea-turtles.

#### *7.3.2.1 Potential Impacts of Striped Bass Fishery on Sea Turtles*

The following sections are not a comprehensive review of all fishing gear types known to interact with a given species and the bycatch reports included below do not represent a complete list.

Gillnet

An observer program for protected species has not been established for the striped bass fishery. However, under the ESA Annual Determination to Implement Sea Turtle Observer

Requirement (80 FR 14319, April 18, 2015), one fishery that targets striped bass is included, the Chesapeake Bay Inshore Gillnet Fishery.

Hook and Line

Interactions between ESA listed species of sea turtles and hook and line gear have been documented, particularly in nearshore waters of the Mid-Atlantic (e.g., Greater Atlantic Region Sea Turtle and Disentanglement Network, unpublished data; NMFS Sea Turtle Stranding and Salvage Network, unpublished data; Palmer 2017). Interactions with hook and line gear have resulted in sea turtle injury and mortality and therefore, poses an interaction risk to these species. However, the extent to which these interactions are impacting sea turtle populations is still under investigation, and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of sea turtle populations.

Pound Nets

Populations of loggerhead, Kemp's ridley, and leatherback sea turtles are at risk in areas where pound net fishing is abundant, such as the Chesapeake Bay and surrounding waters. NOAA Fisheries issued a final rule in 2015 amending the Bottlenose Dolphin Take Reduction Plan and its implementing regulations under the MMPA requiring gear restrictions for VA pound nets in estuarine and coastal state waters of Virginia to reduce bycatch (80 FR 6925, February 9, 2015). NOAA Fisheries also amended regulations and definitions for Virginia pound nets under the ESA for sea turtle conservation to be consistent with this final rule. Pound net regulations were enacted to protect both sea turtles and bottlenose dolphins. More information on this rule is available here: https://www.fisheries.noaa.gov/action/amendment-virginia-pound-net-regulations.

Bottom Trawl

Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso and Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the Gulf of Maine, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the Gulf of Maine (Murray 2008; Murray 2015b; Murray 2020; NMFS Observer Program, unpublished data; Warden 2011 a, b). Murray (2020) provided information on sea turtle interaction rates from 2014-2018 and estimated 571 loggerhead, 46 Kemp's ridley, 20 leatherback, and 16 green sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads, and 6 leatherback interactions. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

### 7.3.3 Atlantic Sturgeon

Since 1998, there has been a moratorium on the harvest of Atlantic Sturgeon in both state and federal waters; however, the population has continued to decline and, in 2012, Atlantic sturgeon became listed under the ESA. The listing identifies five distinct population segments

(DPS), which include the Gulf of Maine, the New York Bight, the Chesapeake Bay, Carolina, and the South Atlantic (77 FR 5914 and 77 FR 5880, February 6, 2012). All DPSs are listed as endangered except for the Gulf of Maine population, which is listed as threatened. Primary threats to the species include historic overfishing, the bycatch of sturgeon in other fisheries, habitat destruction from dredging, dams, and development, and vessel strikes (77 FR 5914; 77 FR 5880). In April 2017, NOAA Fisheries published a final rule (82 FR 39160) to designate Atlantic sturgeon critical habitat (i.e., specific areas that are considered essential to the conservation of the species) in each of the DPSs.

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein et al. 2004 a,b; Erickson et al. 2011; Dunton et al. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein et al. 2004a,b; Dunton et al. 2010; Erickson et al. 2011). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon may undertake seasonal movements along the coast (Dunton et al. 2010; Erickson et al. 2011; Wipplehauser 2012); however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year.

For additional information on the biology, status, and range wide distribution of each distinct population segment (DPS) of Atlantic sturgeon please refer to 77 FR 5880 and 77 FR 5914, as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007) and the Atlantic States Marine Fisheries Commission 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017).

#### *7.3.3.1 Potential Impacts of Striped Bass Fishery on Atlantic Sturgeon*

The following sections are not a comprehensive review of all fishing gear types known to interact with a given species and the bycatch reports included below do not represent a complete list.

<u>Bottom Trawl and Gillnet</u>

Since 1989, Atlantic sturgeon interactions (i.e., bycatch) with sink gillnet and bottom trawl gear have frequently been observed in the Greater Atlantic Region, with most sturgeon observed captured falling within the 100 to 200cm total length range; however, both larger and small individuals have been observed (ASMFC 2007; ASMFC 2017; Miller and Shepard 2011; NEFSC observer/sea sampling database, unpublished data; Stein et al. 2004). For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths of less than 40 meters, mesh sizes of greater than 10 inches, and the months of April and May (ASMFC 2007). Hager et al. (2021) found that subadult Atlantic sturgeon are particularly susceptible to interactions with striped bass sink gillnet gear in the James River, VA.

For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch have been associated with depths less than 30 meters (ASMFC 2007). More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic surgeon, with Atlantic sturgeon encountered primarily at depths less than 20 meters (ASMFC 2017).

The ASMFC (2017) Atlantic sturgeon benchmark stock assessment represents the most accurate predictor of annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The stock assessment analyzes fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2015, the timeframe which included the most recent, complete data at the time of the report. The total bycatch of Atlantic sturgeon from bottom otter trawls ranged between 624-1,518 fish over the 2000-2015 time series, while the total bycatch of Atlantic sturgeon from gillnets ranged from 253-2,715 fish. Focusing on the most recent five-year period of data provided in the stock assessment report[35], the estimated average annual bycatch during 2011-2015 of Atlantic sturgeon in bottom otter trawl gear is 777.4 individuals and in gillnet gear is 627.6 individuals.

Hook and Line

Interactions between ESA-listed species of Atlantic sturgeon and hook and line gear have been documented, particularly in nearshore waters (ASMFC 2017). Interactions with hook and line gear have resulted in Atlantic sturgeon injury and mortality and therefore, poses an interaction risk to these species. However, the extent to which these interactions are impacting Atlantic sturgeon DPSs is still under investigation and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of Atlantic sturgeon DPSs (NMFS 2011b; ASMFC 2017).

### 7.3.4 Shortnose Sturgeon

Shortnose sturgeon occur in estuaries large coastal rivers on the Atlantic coast from Canada to Florida, including the Chesapeake Bay and its tributaries. Shortnose sturgeon spend most of their life in their natal river system and estuaries and tend to spend little time in ocean waters (NMFS 1998). Adults generally migrate upriver in spring to spawn and move back downstream after spawning to higher salinity habitats for foraging (SSSRT 2010). Shortnose sturgeon have been listed as endangered under the ESA since 1967 and the 1998 recovery plan identified 19 DPSs across 25 river systems.

#### *7.3.4.1 Potential Impacts of Striped Bass Fisheries on Shortnose Sturgeon*

[35] The period of 2011-2015 was chosen as it is the period within the stock assessment that most accurately resembles the current trawl fisheries in the region.

Bycatch of shortnose sturgeon in fisheries targeting other species has been documented throughout its range (SSSRT 2010). Bycatch of shortnose sturgeon primarily occurs in gillnet fisheries, but has also occurred in other gear types including pound nets, fyke nets, and hook and lines. Adult shortnose sturgeon are thought to be especially vulnerable to fishing gears targeting anadromous species (such as shad, striped bass, alewives and herring) during times of extensive migration, particularly their spawning migration (SSSRT 2010; Litwiler 2001).

### 7.3.5 Giant Manta Ray

While there is considerable uncertainty regarding the species' current abundance throughout its range, the best available information indicates that the species has experienced population declines of potentially significant magnitude within areas of the Indo-Pacific and eastern Pacific portions of its range (Miller and Klimovich 2017). While it's assume that declining populations within the Indo-Pacific and eastern Pacific will likely translate to overall declines in the species throughout its entire range, there is very little information on the abundance, and thus, population trends in the Atlantic portion of its range (Miller and Klimovich 2017).

Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast (Miller and Klimovich 2017). Along the U.S. East Coast, giant manta rays are usually found in water temperatures between 19 and 22 degrees Celsius (Miller and Klimovich 2017) and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller and Klimovich 2017).

#### *7.3.5.1 Potential Impacts of Striped Bass Fishery on Giant Manta Rays*

The following sections are not a comprehensive review of all fishing gear types known to interact with a given species and the bycatch reports included below do not represent a complete list.

<u>Bottom Trawl and Gillnet Gear</u>

Giant manta rays are potentially susceptible to capture by gillnet and bottom trawl gear based on records of their capture in fisheries using this gear types (NEFSC observer/sea sampling database, unpublished data). Review of the most recent 10 years of NEFOP data showed that between 2010-2019, two (unidentified) Giant Manta Rays were observed in bottom trawl gear and two were observed in gillnet gear (NMFS NEFSC observer/sea sampling database, unpublished data). Additionally, all of the giant manta ray interactions in gillnet or trawl gear recorded in the NEFOP database (13 between 2001 and 2019) indicate the animals were encountered alive and released alive. However, details about specific conditions such as injuries, damage, time out of water, how the animal was moved or released, or behavior on release is not always recorded. While there is currently no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0 to 16 giant manta rays captured per year between 1998 and 2015 and estimated that approximately 89% survived the interaction and release (see NMFS reports available at: http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm).

Hook and Line

The most recent 10 years of data on observed or documented interactions between giant manta rays and fishing gear, there have been no observed/documented interactions between giant manta rays and hook and line gear (NEFSC observer/sea sampling database, unpublished data). Based on this information, hook and line gear is not expected to pose an interaction risk to giant manta rays and therefore, is not expected to be source of injury or mortality to this species

### 7.3.6 Seabirds

Like marine mammals, seabirds are vulnerable to entanglement in commercial fishing gear. Under the Migratory Bird Treaty Act, it is unlawful "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory birds except as permitted by regulation (16 U.S.C. 703). Given that an interaction has not been quantified in the Atlantic striped bass fishery, impacts to seabirds are not considered to be significant. Endangered and threatened bird species, such as the piping plover, are unlikely to be impacted by the gear types employed in the striped bass fishery. Other human activities such as coastal development, habitat degradation and destruction, and the presence of organochlorine contaminants are considered to be the major threats to some seabird populations.

## 7.4 POTENTIAL IMPACTS TO ATLANTIC COASTAL STATE AND INTERSTATE FISHERIES

There are several take reduction teams, whose management actions have potential impacts to coastal striped bass fisheries.

The Mid-Atlantic coastal gillnet fishery is one of two fisheries regulated by the Harbor Porpoise Take Reduction Plan (50 CFR 229.33 and 229.34). Amongst other measures, the plan uses time area closures in combination with pingers in Northeast waters, and time area closures along with gear modifications for both small and large mesh gillnets in mid-Atlantic waters. Although the plan predominately impacts the dogfish and monkfish fisheries due to higher porpoise bycatch rates, other gillnet fisheries are also affected.

The Atlantic Large Whale Take Reduction Plan (50 CFR 229.32) (ALWTRP) addresses the incidental bycatch of large baleen whales, primarily the North Atlantic right whale and the humpback whale, in several fisheries including Mid-Atlantic coastal gillnet fishery. Amongst other measures, the plan closes right whale critical habitat areas to specific types of fishing gear during specific seasons, and modifies fishing gear and practices. The Atlantic Large Whale Take Reduction Team continues to identify ways to reduce possible interactions between large whales and commercial gear. In 2014 and 2015, the ALWTRP was modified to reduce the number of vertical lines associated with trap/pot fisheries and required expanded gear markings for gillnets and traps in Jeffrey's Ledge and Jordan Basin (79 FR 35686, June 27, 2014; 80 FR 30367, May 28, 2015).

The Bottlenose Dolphin Take Reduction Team first convened in 2001 to discuss incidental catch of coastal bottlenose dolphins in Category I and II fisheries. In 2006, a Bottlenose Dolphin Take Reduction Plan was established, which created gear regulations for the mid-Atlantic coastal gillnet fishery, the Virginia pound net fishery, the mid-Atlantic beach seine fishery, and the North Carolina inshore gillnet fishery, among others. Specifically, the plan established mesh sizes for the gill net fisheries and prohibited night fishing for some regions and gear types (71 FR 24776, April 26, 2006).

Based on a consensus recommendation from the Bottlenose Dolphin Take Reduction Team, NOAA Fisheries issued a final rule in 2015 amending the Bottlenose Dolphin Take Reduction Plan and its implementing regulations under the Marine Mammal Protection Act (MMPA) to require the year-round use of modified pound net leaders for offshore Virginia pound nets in specified waters of the lower mainstem Chesapeake Bay and coastal state waters (80 FR 6925, February 9, 2015). The rule also finalized Virginia pound net-related definitions, gear prohibitions, and non-regulatory measures. NOAA Fisheries also amended regulations and definitions for Virginia pound nets under the Endangered Species Act (ESA) for sea turtle conservation to be consistent with this final rule. Pound net regulations were enacted to protect both sea turtles and bottlenose dolphins. More information on this rule is available here: https://www.fisheries.noaa.gov/action/amendment-virginia-pound-net-regulations.

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## 9.0 TABLES

***Note: Tables 1-14 are in-text.***

Table 15. Base quota, 2020 quota, and 2020 harvest by state in pounds. Source: 2021 state compliance reports. 2020 quota was based on Addendum VI and approved conservation equivalency programs.

| State | Base Quota | 2020 Quota^ | 2020 Harvest |
|---|---|---|---|
| **Ocean** | | | |
| Maine* | 154 | 154 | - |
| New Hampshire* | 3,537 | 3,537 | - |
| Massachusetts | 713,247 | 735,240 | 386,924 |
| Rhode Island | 148,889 | 148,889 | 115,891 |
| Connecticut* | 14,607 | 14,607 | - |
| New York | 652,552 | 640,718 | 473,461 |
| New Jersey** | 197,877 | 215,912 | - |
| Delaware | 118,970 | 142,474 | 137,986 |
| Maryland | 74,396 | 89,094 | 83,594 |
| Virginia | 113,685 | 125,034 | 77,239 |
| North Carolina | 295,495 | 295,495 | 0 |
| **Ocean Total** | **2,333,409** | **2,411,154** | **1,275,095** |
| **Chesapeake Bay** | | | |
| Maryland | **2,588,603** | 1,442,120 | 1,273,757 |
| Virginia | | 983,393 | 611,745 |
| PRFC | | 572,861 | 400,319 |
| **Bay Total** | | **2,998,374** | **2,285,821** |

* 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 by either changing size limit with equivalent 18% quota reduction (MA, NY), or by taking a greater than 18% reduction in recreational removals to offset a less than 18% commercial quota reduction (NJ, DE, MD, PRFC, VA).
Note: Maryland's Chesapeake Bay quota for 2020 was adjusted to account for the overage in 2019.

Table 16. Summary of Atlantic striped bass commercial regulations in 2020. Source: 2021 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL). *Commercial quota reallocated to recreational bonus fish program.

| STATE | SIZE LIMITS (TL) and TRIP LIMITS | SEASONAL QUOTA | OPEN SEASON |
|---|---|---|---|
| **ME** | Commercial fishing prohibited | | |
| **NH** | Commercial fishing prohibited | | |
| **MA** | ≥35" minimum size; no gaffing undersized fish. 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit. | 735,240 lbs. Hook & Line only. | 6.24 until quota reached, Mondays and Wednesdays only. (In-season adjustment added Tuesdays effective Sept 1.) July 3rd, July 4th and Labor Day closed. Cape Cod Canal closed to commercial striped bass fishing. |
| **RI** | Floating fish trap: 26" minimum size unlimited possession limit until 70% of quota reached, then 500 lbs. per licensee per day | Total: 148,889 lbs., split 39:61 between the trap and general category. Gill netting prohibited. | 4.1 – 12.31 |
| | General category (mostly rod & reel): 34" min. 5 fish/vessel/day limit. | | 5.20-6.30, 7.1-12.31, or until quota reached. Closed Fridays, Saturdays, and Sundays during both seasons. |
| **CT** | Commercial fishing prohibited; bonus program in CT suspended indefinitely in 2020. | | |
| **NY** | 26"-38" size; (Hudson River closed to commercial harvest) | 640,718 lbs. Pound Nets, Gill Nets (6-8"stretched mesh), Hook & Line. | 6.1 – 12.15, or until quota reached. Limited entry permit only. |
| **NJ*** | Commercial fishing prohibited; bonus program: 1 fish at 24" to <28" slot size | 215,912 lbs. | 5.15 – 12.31 (permit required) |
| **PA** | Commercial fishing prohibited | | |

(Table 16 continued – Summary of commercial regulations in 2020).

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

Table 17. Summary of Atlantic striped bass recreational regulations in 2020. Source: 2021 State Compliance Reports. Minimum sizes and slot size limits are in total length (TL).

| STATE | SIZE LIMITS (TL)/REGION | BAG LIMIT | GEAR/FISHING RESTRICTIONS | OPEN SEASON |
|---|---|---|---|---|
| **ME** | 28” to <35" | 1 fish/day | Hook & line only; circle hooks only when using live bait | All year, except spawning areas are closed 12.1-4.30 and C&R only 5.1-6.30 |
| **NH** | 28” to <35" | 1 fish/day | Gaffing and culling prohibited; Use of corrodible non-offset circle hooks required if angling with bait | All year |
| **MA** | 28” to <35" | 1 fish/day | Hook & line only; no high-grading; gaffs and other injurious removal devices prohibited. Private angler circle hook requirement when fishing with natural bait (exception for artificial lures). | All year |
| **RI** | 28” to <35" | 1 fish/day | The use of circle hooks is required by any vessel or person while fishing recreationally with bait for striped bass | All year |
| **CT** | 28” to <35" | 1 fish/day | Inline circle hooks only when using whole, cut or live natural bait (Dec 1st, 2020). Spearing and gaffing prohibited | All year |
| **NY** | Ocean and DE River: Slot Size: 28 -35 | 1 fish/day | Angling only. Spearing permitted in ocean waters. C&R only during closed season. | Ocean: 4.15-12.15<br>Delaware River: All year |
| | HR: Slot Size: 18 -28 | 1 fish/day | Angling only. | Hudson River: 4.1-11.30 |
| **NJ** | 1 fish at 28” to < 38” (effective 4/1/2020) | 1 fish/day | Non-offset circle hooks must be used when using bait with a #2 sized hook or larger in Delaware River & tributaries from 4.1-5.31. | Closed 1.1 – last day of Feb in all waters except in the Atlantic Ocean, and closed 4.1-5.31 in the lower DE River and tributaries |
| **PA** | Upstream from Calhoun St Bridge: 1 fish at 28” to <35" | | | |
| | Downstream from Calhoun St Bridge: 1 fish at 28” to <35”, and 2 fish at 21-24” slot size limit from 4.1 – 5.31 | | | |

(Table 17 continued – Summary of recreational regulations in 2020).

| STATE | SIZE LIMITS/REGION | BAG LIMIT | GEAR/FISHING RESTRICTIONS | OPEN SEASON |
|---|---|---|---|---|
| **DE** | 28” to <35" | 1 fish/day | Hook & line, spear (for divers) only. Circle hooks required in spawning season. | All year. C&R only 4.1-5.31 in spawning grounds. 20”-25”slot from 7.1-8.31 in DE River, Bay & tributaries |
| **MD** | Ocean: 28” to <35" | 1 fish/day | | All year |
| | Chesapeake Bay and tribs^ | C&R only | no eels; no stinger hooks; barbless hooks when trolling; circle or J-hooks when using live bait; max 6 lines when trolling | 1.1-2.28, 3.1-3.31, 12.11-12.31 |
| | Chesapeake Bay: 35" min | 1 fish/day | Geographic restrictions apply. | 5.1-5.15 |
| | Chesapeake Bay: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28" | | Geographic restrictions apply; circle hooks if chumming or live-lining; no treble hooks when bait fishing. | 5.16-5.31 |
| | Chesapeake Bay and tribs: 1 fish/day, 19" minimum size; 2/fish/day for charter with only 1 fish >28" | | All Bay and tribs open; circle hooks if chumming or live-lining; no treble hooks when bait fishing. | 6.1-8.15 (no targeting 8.16-8/31)*, 9.1-12.10 |
| **PRFC** | Spring Trophy: 1 fish/day, 35” minimum size | | No more than two hooks or sets of hooks for each rod or line; no live eel; no high-grading | 5.1-5.15 |
| | Summer and Fall: 2 fish/day, 20” min | | No more than two hooks or sets of hooks for each rod or line. | 5.16-7.6 and 8.21-12.31; closed 7.7-8.20 (No Direct Targeting) |

^ Susquehanna Flats: C&R only Jan 1 – March 31 (no treble hooks when bait fishing); 1 fish at 19”-26” slot May 16 – May 31.
*Open season in 2021 changed to 6.1-7.15 (no targeting 7.16-7.31), 8.1-12.10.

(Table 17 continued – Summary of recreational regulations in 2020).

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

Table 18. Total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2020. Note: Harvest is from state compliance reports/MRIP (July 8, 2021), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

| Year | Commercial | | Recreational | | Total Removals |
|---|---|---|---|---|---|
| | Harvest | Discards* | Harvest | Release Mortality | |
| 1990 | 93,888 | 47,859 | 578,897 | 442,811 | 1,163,455 |
| 1991 | 158,491 | 92,480 | 798,260 | 715,478 | 1,764,709 |
| 1992 | 256,476 | 193,281 | 869,779 | 937,611 | 2,257,147 |
| 1993 | 314,526 | 115,859 | 789,037 | 812,404 | 2,031,826 |
| 1994 | 325,401 | 166,105 | 1,055,523 | 1,360,872 | 2,907,900 |
| 1995 | 537,412 | 188,507 | 2,287,578 | 2,010,689 | 5,024,186 |
| 1996 | 854,102 | 257,749 | 2,487,422 | 2,600,526 | 6,199,800 |
| 1997 | 1,076,591 | 325,998 | 2,774,981 | 2,969,781 | 7,147,351 |
| 1998 | 1,215,219 | 347,343 | 2,915,390 | 3,259,133 | 7,737,085 |
| 1999 | 1,223,572 | 337,036 | 3,123,496 | 3,140,905 | 7,825,008 |
| 2000 | 1,216,812 | 209,329 | 3,802,477 | 3,044,203 | 8,272,820 |
| 2001 | 931,412 | 182,606 | 4,052,474 | 2,449,599 | 7,616,091 |
| 2002 | 928,085 | 199,770 | 4,005,084 | 2,792,200 | 7,925,139 |
| 2003 | 854,326 | 131,319 | 4,781,402 | 2,848,445 | 8,615,492 |
| 2004 | 879,768 | 157,724 | 4,553,027 | 3,665,234 | 9,255,753 |
| 2005 | 970,403 | 146,126 | 4,480,802 | 3,441,928 | 9,039,259 |
| 2006 | 1,047,648 | 158,808 | 4,883,961 | 4,812,332 | 10,902,750 |
| 2007 | 1,015,114 | 160,728 | 3,944,679 | 2,944,253 | 8,064,774 |
| 2008 | 1,027,837 | 106,791 | 4,381,186 | 2,391,200 | 7,907,013 |
| 2009 | 1,049,838 | 130,200 | 4,700,222 | 1,942,061 | 7,822,321 |
| 2010 | 1,031,430 | 134,817 | 5,388,440 | 1,760,759 | 8,315,446 |
| 2011 | 944,777 | 85,503 | 5,006,358 | 1,482,029 | 7,518,667 |
| 2012 | 870,684 | 198,911 | 4,046,299 | 1,847,880 | 6,963,774 |
| 2013 | 784,379 | 114,009 | 5,157,760 | 2,393,425 | 8,449,573 |
| 2014 | 750,263 | 111,753 | 4,033,746 | 2,172,342 | 7,068,103 |
| 2015 | 621,952 | 84,463 | 3,085,725 | 2,307,133 | 6,099,273 |
| 2016 | 609,028 | 88,171 | 3,500,434 | 2,981,430 | 7,179,063 |
| 2017 | 592,670 | 98,343 | 2,937,911 | 3,421,110 | 7,050,035 |
| 2018 | 621,123 | 100,646 | 2,244,765 | 2,826,667 | 5,793,201 |
| 2019 | 653,807 | 84,013 | 2,150,936 | 2,589,045 | 5,477,801 |
| 2020 | 577,363 | 65,319 | 1,709,973 | 2,760,231 | 5,112,886 |

* 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 19. Proportion of total removals (harvest plus discards/release mortality) of Atlantic striped bass by sector in numbers of fish, 1990-2020. Note: Harvest is from state compliance reports/MRIP (July 8, 2021), discards/release mortality is from ASMFC. Estimates exclude inshore harvest from North Carolina.

| Year | Commercial | | Recreational | |
|---|---|---|---|---|
| | Harvest | Discards* | Harvest | Release Mortality |
| 1990 | 8% | 4% | 50% | 38% |
| 1991 | 9% | 5% | 45% | 41% |
| 1992 | 11% | 9% | 39% | 42% |
| 1993 | 15% | 6% | 39% | 40% |
| 1994 | 11% | 6% | 36% | 47% |
| 1995 | 11% | 4% | 46% | 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% | 3% | 51% | 35% |
| 2003 | 10% | 2% | 55% | 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% |

* 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. Note: Percent may not sum to 100 due to rounding.

Table 20. Total harvest of Atlantic striped bass by sector, 1990-2020. Note: Harvest is from state compliance reports/MRIP (Query July 8, 2021). Estimates exclude inshore harvest from North Carolina.

| Year | Numbers of Fish | | | Pounds | | |
|---|---|---|---|---|---|---|
| | Commercial | Recreational | Total | Commercial | Recreational | Total |
| 1990 | 93,888 | 578,897 | 672,785 | 715,902 | 8,207,515 | 8,923,417 |
| 1991 | 158,491 | 798,260 | 956,751 | 966,096 | 10,640,601 | 11,606,697 |
| 1992 | 256,476 | 869,779 | 1,126,255 | 1,508,064 | 11,921,967 | 13,430,031 |
| 1993 | 314,526 | 789,037 | 1,103,563 | 1,800,176 | 10,163,767 | 11,963,943 |
| 1994 | 325,401 | 1,055,523 | 1,380,924 | 1,877,197 | 14,737,911 | 16,615,108 |
| 1995 | 537,412 | 2,287,578 | 2,824,990 | 3,775,586 | 27,072,321 | 30,847,907 |
| 1996 | 854,102 | 2,487,422 | 3,341,524 | 4,822,874 | 28,625,685 | 33,448,559 |
| 1997 | 1,076,591 | 2,774,981 | 3,851,572 | 6,078,566 | 30,616,093 | 36,694,659 |
| 1998 | 1,215,219 | 2,915,390 | 4,130,609 | 6,552,111 | 29,603,199 | 36,155,310 |
| 1999 | 1,223,572 | 3,123,496 | 4,347,068 | 6,474,290 | 33,564,988 | 40,039,278 |
| 2000 | 1,216,812 | 3,802,477 | 5,019,289 | 6,719,521 | 34,050,817 | 40,770,338 |
| 2001 | 931,412 | 4,052,474 | 4,983,886 | 6,266,769 | 39,263,154 | 45,529,923 |
| 2002 | 928,085 | 4,005,084 | 4,933,169 | 6,138,180 | 41,840,025 | 47,978,205 |
| 2003 | 854,326 | 4,781,402 | 5,635,728 | 6,750,491 | 54,091,836 | 60,842,327 |
| 2004 | 879,768 | 4,553,027 | 5,432,795 | 7,317,897 | 53,031,074 | 60,348,971 |
| 2005 | 970,403 | 4,480,802 | 5,451,205 | 7,121,492 | 57,421,174 | 64,542,666 |
| 2006 | 1,047,648 | 4,883,961 | 5,931,609 | 6,568,970 | 50,674,431 | 57,243,401 |
| 2007 | 1,015,114 | 3,944,679 | 4,959,793 | 7,047,179 | 42,823,614 | 49,870,793 |
| 2008 | 1,027,837 | 4,381,186 | 5,409,023 | 7,190,701 | 56,665,318 | 63,856,019 |
| 2009 | 1,049,838 | 4,700,222 | 5,750,060 | 7,217,380 | 54,411,389 | 61,628,769 |
| 2010 | 1,031,430 | 5,388,440 | 6,419,870 | 6,996,713 | 61,431,360 | 68,428,073 |
| 2011 | 944,777 | 5,006,358 | 5,951,135 | 6,789,792 | 59,592,092 | 66,381,884 |
| 2012 | 870,684 | 4,046,299 | 4,916,983 | 6,516,761 | 53,256,619 | 59,773,380 |
| 2013 | 784,379 | 5,157,760 | 5,942,139 | 5,819,678 | 65,057,289 | 70,876,967 |
| 2014 | 750,263 | 4,033,746 | 4,784,009 | 5,937,949 | 47,948,610 | 53,886,559 |
| 2015 | 621,952 | 3,085,725 | 3,707,677 | 4,829,997 | 39,898,799 | 44,728,796 |
| 2016 | 609,028 | 3,500,434 | 4,109,462 | 4,848,772 | 43,671,532 | 48,520,304 |
| 2017 | 592,670 | 2,937,911 | 3,530,581 | 4,816,395 | 37,952,581 | 42,768,976 |
| 2018 | 621,123 | 2,244,765 | 2,865,888 | 4,741,342 | 23,069,028 | 27,810,370 |
| 2019 | 653,807 | 2,150,936 | 2,804,743 | 4,284,831 | 23,556,287 | 27,841,118 |
| 2020 | 577,363 | 1,709,973 | 2,287,336 | 3,560,917 | 14,858,984 | 18,419,901 |

Table 21. Commercial harvest by region in pounds (x1000), 1995-2020. Source: state compliance reports. ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | Chesapeake Bay | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MA | RI | NY | DE | MD | VA | NC^ | Total | MD | PRFC | VA | Total | |
| 1995 | 751.5 | 113.5 | 500.8 | 38.5 | 79.3 | 46.2 | 344.6 | 1,874.3 | 1,185.0 | 198.5 | 517.8 | 1,901.3 | 3,775.6 |
| 1996 | 695.9 | 122.6 | 504.4 | 120.5 | 75.7 | 165.9 | 58.2 | 1,743.2 | 1,487.7 | 346.8 | 1,245.2 | 3,079.7 | 4,822.9 |
| 1997 | 784.9 | 96.5 | 460.8 | 166.0 | 94.0 | 179.1 | 463.1 | 2,244.4 | 2,119.2 | 731.9 | 983.0 | 3,834.2 | 6,078.6 |
| 1998 | 810.1 | 94.7 | 485.9 | 163.7 | 84.6 | 375.0 | 273.0 | 2,287.0 | 2,426.7 | 726.2 | 1,112.2 | 4,265.1 | 6,552.1 |
| 1999 | 766.2 | 119.7 | 491.8 | 176.3 | 62.6 | 614.8 | 391.5 | 2,622.9 | 2,274.8 | 653.3 | 923.4 | 3,851.4 | 6,474.3 |
| 2000 | 796.2 | 111.8 | 542.7 | 145.1 | 149.7 | 932.7 | 162.4 | 2,840.5 | 2,261.8 | 666.0 | 951.2 | 3,879.0 | 6,719.5 |
| 2001 | 815.4 | 129.7 | 633.1 | 198.6 | 113.9 | 782.4 | 381.1 | 3,054.1 | 1,660.9 | 658.7 | 893.1 | 3,212.6 | 6,266.8 |
| 2002 | 924.9 | 129.2 | 518.6 | 146.2 | 93.2 | 710.2 | 441.0 | 2,963.2 | 1,759.4 | 521.0 | 894.4 | 3,174.9 | 6,138.2 |
| 2003 | 1,055.5 | 190.2 | 753.3 | 191.2 | 103.9 | 166.4 | 201.2 | 2,661.7 | 1,721.8 | 676.6 | 1,690.4 | 4,088.7 | 6,750.5 |
| 2004 | 1,214.2 | 215.1 | 741.7 | 176.5 | 134.2 | 161.3 | 605.4 | 3,248.3 | 1,790.3 | 772.3 | 1,507.0 | 4,069.6 | 7,317.9 |
| 2005 | 1,102.2 | 215.6 | 689.8 | 174.0 | 46.9 | 185.2 | 604.5 | 3,018.2 | 2,008.7 | 533.6 | 1,561.0 | 4,103.3 | 7,121.5 |
| 2006 | 1,322.3 | 5.1 | 688.4 | 184.2 | 91.1 | 195.0 | 74.2 | 2,560.2 | 2,116.3 | 673.5 | 1,219.0 | 4,008.7 | 6,569.0 |
| 2007 | 1,039.3 | 240.6 | 731.5 | 188.7 | 96.3 | 162.3 | 379.5 | 2,838.1 | 2,240.6 | 599.3 | 1,369.2 | 4,209.1 | 7,047.2 |
| 2008 | 1,160.3 | 245.9 | 653.1 | 188.7 | 118.0 | 163.1 | 288.4 | 2,817.6 | 2,208.0 | 613.8 | 1,551.3 | 4,373.1 | 7,190.7 |
| 2009 | 1,134.3 | 234.8 | 789.9 | 192.3 | 127.3 | 140.4 | 190.0 | 2,809.0 | 2,267.3 | 727.8 | 1,413.3 | 4,408.4 | 7,217.4 |
| 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 | 473.5 | 138.0 | 83.6 | 77.2 | 0.0 | 1,275.1 | 1,273.8 | 400.3 | 611.7 | 2,285.8 | 3,560.9 |

Table 22. Commercial harvest and discards by region in numbers of fish (x1000), 1995-2020. Source: harvest is from state compliance reports, discards is from ASMFC. ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | Chesapeake Bay | | | | Discards* | | | Grand Total Removals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MA | RI | NY | DE | MD | VA | NC^ | Total | MD | PRFC | VA | Total | Ocean | Bay | Total | |
| 1995 | 39.9 | 19.7 | 43.7 | 5.6 | 4.0 | 9.9 | 23.4 | 146.1 | 267.0 | 29.3 | 95.0 | 391.3 | 141.7 | 46.8 | 188.5 | 725.9 |
| 1996 | 37.3 | 18.6 | 40.5 | 20.7 | 9.0 | 14.1 | 3.3 | 143.5 | 486.2 | 46.2 | 178.2 | 710.6 | 168.8 | 89.0 | 257.7 | 1,111.9 |
| 1997 | 44.0 | 7.1 | 37.6 | 33.2 | 8.4 | 17.3 | 25.8 | 173.4 | 620.3 | 87.8 | 195.2 | 903.2 | 249.7 | 76.3 | 326.0 | 1,402.6 |
| 1998 | 44.3 | 8.8 | 45.1 | 31.4 | 10.3 | 41.1 | 14.2 | 195.2 | 729.6 | 93.3 | 197.1 | 1,020.1 | 313.9 | 33.5 | 347.3 | 1,562.6 |
| 1999 | 40.9 | 11.6 | 49.9 | 34.8 | 10.2 | 48.7 | 21.1 | 217.2 | 776.0 | 90.6 | 139.8 | 1,006.3 | 305.2 | 31.9 | 337.0 | 1,560.6 |
| 2000 | 42.1 | 9.4 | 54.9 | 25.2 | 13.3 | 54.5 | 6.5 | 205.8 | 787.6 | 91.5 | 132.0 | 1,011.0 | 176.9 | 32.5 | 209.3 | 1,426.1 |
| 2001 | 45.8 | 10.9 | 58.3 | 34.4 | 11.1 | 42.3 | 25.0 | 227.7 | 538.8 | 87.8 | 77.1 | 703.7 | 140.5 | 42.2 | 182.6 | 1,114.0 |
| 2002 | 49.8 | 11.7 | 47.1 | 30.4 | 10.2 | 38.8 | 23.2 | 211.3 | 571.7 | 80.3 | 64.7 | 716.8 | 151.2 | 48.6 | 199.8 | 1,127.9 |
| 2003 | 56.4 | 15.5 | 68.4 | 31.5 | 11.6 | 10.5 | 5.8 | 199.6 | 427.9 | 83.1 | 143.7 | 654.7 | 98.8 | 32.5 | 131.3 | 985.6 |
| 2004 | 63.6 | 16.0 | 70.4 | 28.4 | 14.1 | 10.4 | 31.0 | 233.9 | 447.0 | 92.6 | 106.3 | 645.9 | 111.4 | 46.3 | 157.7 | 1,037.5 |
| 2005 | 60.5 | 14.9 | 70.6 | 26.3 | 6.1 | 11.3 | 27.3 | 217.1 | 563.9 | 80.6 | 108.9 | 753.3 | 87.2 | 58.9 | 146.1 | 1,116.5 |
| 2006 | 70.5 | 15.4 | 73.6 | 30.2 | 10.9 | 11.5 | 2.7 | 214.9 | 645.1 | 92.3 | 95.4 | 832.7 | 99.0 | 59.8 | 158.8 | 1,206.5 |
| 2007 | 54.2 | 13.9 | 78.5 | 31.1 | 11.6 | 10.6 | 16.8 | 216.7 | 587.6 | 86.5 | 124.3 | 798.4 | 94.3 | 66.4 | 160.7 | 1,175.8 |
| 2008 | 61.1 | 16.6 | 73.3 | 31.9 | 14.0 | 10.8 | 13.4 | 221.0 | 580.7 | 82.0 | 144.1 | 806.8 | 63.6 | 43.1 | 106.8 | 1,134.6 |
| 2009 | 59.4 | 16.8 | 82.6 | 21.6 | 12.5 | 8.9 | 9.0 | 210.9 | 605.6 | 89.6 | 143.8 | 839.0 | 60.5 | 69.7 | 130.2 | 1,180.0 |
| 2010 | 60.4 | 15.7 | 82.4 | 19.8 | 5.4 | 9.4 | 13.7 | 206.7 | 579.2 | 90.6 | 154.9 | 824.7 | 40.4 | 94.5 | 134.8 | 1,166.2 |
| 2011 | 58.7 | 14.3 | 87.4 | 20.5 | 2.1 | 12.2 | 10.9 | 206.0 | 488.9 | 96.1 | 153.7 | 738.7 | 35.0 | 50.5 | 85.5 | 1,030.3 |
| 2012 | 61.5 | 15.0 | 67.1 | 15.7 | 6.9 | 10.8 | 0.3 | 177.3 | 465.6 | 90.7 | 137.0 | 693.4 | 25.5 | 173.4 | 198.9 | 1,069.6 |
| 2013 | 58.6 | 13.8 | 76.2 | 17.7 | 7.6 | 10.0 | 0.0 | 183.8 | 391.5 | 78.0 | 131.0 | 600.5 | 36.5 | 77.5 | 114.0 | 898.4 |
| 2014 | 58.0 | 10.5 | 52.9 | 14.9 | 8.5 | 10.0 | 0.0 | 154.8 | 362.2 | 81.5 | 151.8 | 595.5 | 46.3 | 65.5 | 111.8 | 862.0 |
| 2015 | 42.3 | 11.3 | 45.6 | 11.0 | 2.6 | 7.7 | 0.0 | 120.4 | 298.3 | 71.0 | 132.2 | 501.5 | 33.8 | 50.7 | 84.5 | 706.4 |
| 2016 | 48.0 | 11.7 | 51.0 | 8.8 | 1.2 | 7.6 | 0.0 | 128.3 | 284.9 | 73.7 | 122.2 | 480.8 | 41.3 | 46.8 | 88.2 | 697.2 |
| 2017 | 41.2 | 10.1 | 61.6 | 9.5 | 3.5 | 7.6 | 0.0 | 133.5 | 263.6 | 67.5 | 128.0 | 459.2 | 78.1 | 20.2 | 98.3 | 691.0 |
| 2018 | 37.8 | 10.1 | 52.2 | 11.4 | 3.5 | 6.9 | 0.0 | 121.9 | 286.4 | 64.4 | 148.4 | 499.3 | 61.4 | 39.3 | 100.6 | 721.8 |
| 2019 | 29.6 | 7.3 | 29.6 | 8.2 | 3.3 | 6.9 | 0.0 | 84.9 | 356.7 | 62.6 | 149.6 | 568.9 | 19.4 | 64.6 | 84.0 | 737.8 |
| 2020 | 19.6 | 5.0 | 44.1 | 8.4 | 3.4 | 4.4 | 0.0 | 84.9 | 299.9 | 66.6 | 125.9 | 391.3 | 18.6 | 46.7 | 65.3 | 642.7 |

* 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 23. Total recreational catch, releases, and release mortality in numbers of fish by region (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). Estimates exclude inshore harvest from North Carolina.

| Year | Harvest (A+B1) | | | Releases (B2) | | | Total Catch (A+B1+B2) | | | Release Mortality (9% of B2) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ocean | Bay | Total | Ocean | Bay | Total | Ocean | Bay | Total | Ocean | Bay | Total |
| 1995 | 1,260 | 1,028 | 2,288 | 16,587 | 5,754 | 22,341 | 17,847 | 6,782 | 24,629 | 1,493 | 518 | 2,011 |
| 1996 | 1,362 | 1,125 | 2,487 | 22,384 | 6,511 | 28,895 | 23,746 | 7,636 | 31,382 | 2,015 | 586 | 2,601 |
| 1997 | 1,514 | 1,261 | 2,775 | 22,819 | 10,178 | 32,998 | 24,333 | 11,439 | 35,773 | 2,054 | 916 | 2,970 |
| 1998 | 1,647 | 1,268 | 2,915 | 29,294 | 6,918 | 36,213 | 30,941 | 8,187 | 39,128 | 2,637 | 623 | 3,259 |
| 1999 | 1,758 | 1,366 | 3,123 | 26,139 | 8,760 | 34,899 | 27,897 | 10,125 | 38,022 | 2,353 | 788 | 3,141 |
| 2000 | 2,198 | 1,604 | 3,802 | 25,090 | 8,734 | 33,824 | 27,289 | 10,338 | 37,627 | 2,258 | 786 | 3,044 |
| 2001 | 2,758 | 1,294 | 4,052 | 21,073 | 6,145 | 27,218 | 23,831 | 7,440 | 31,270 | 1,897 | 553 | 2,450 |
| 2002 | 2,756 | 1,249 | 4,005 | 23,653 | 7,371 | 31,024 | 26,409 | 8,620 | 35,030 | 2,129 | 663 | 2,792 |
| 2003 | 3,124 | 1,658 | 4,781 | 20,678 | 10,971 | 31,649 | 23,802 | 12,628 | 36,431 | 1,861 | 987 | 2,848 |
| 2004 | 3,078 | 1,475 | 4,553 | 27,868 | 12,857 | 40,725 | 30,946 | 14,332 | 45,278 | 2,508 | 1,157 | 3,665 |
| 2005 | 3,182 | 1,299 | 4,481 | 28,663 | 9,580 | 38,244 | 31,845 | 10,879 | 42,724 | 2,580 | 862 | 3,442 |
| 2006 | 2,789 | 2,095 | 4,884 | 41,239 | 12,232 | 53,470 | 44,028 | 14,327 | 58,354 | 3,711 | 1,101 | 4,812 |
| 2007 | 2,327 | 1,618 | 3,945 | 25,135 | 7,579 | 32,714 | 27,462 | 9,196 | 36,659 | 2,262 | 682 | 2,944 |
| 2008 | 3,025 | 1,356 | 4,381 | 21,878 | 4,691 | 26,569 | 24,904 | 6,046 | 30,950 | 1,969 | 422 | 2,391 |
| 2009 | 2,898 | 1,803 | 4,700 | 16,740 | 4,838 | 21,578 | 19,638 | 6,641 | 26,279 | 1,507 | 435 | 1,942 |
| 2010 | 3,906 | 1,483 | 5,388 | 13,606 | 5,957 | 19,564 | 17,512 | 7,440 | 24,952 | 1,225 | 536 | 1,761 |
| 2011 | 3,617 | 1,389 | 5,006 | 12,644 | 3,823 | 16,467 | 16,261 | 5,212 | 21,473 | 1,138 | 344 | 1,482 |
| 2012 | 3,071 | 975 | 4,046 | 11,242 | 9,290 | 20,532 | 14,314 | 10,265 | 24,578 | 1,012 | 836 | 1,848 |
| 2013 | 3,723 | 1,435 | 5,158 | 19,463 | 7,131 | 26,594 | 23,186 | 8,565 | 31,751 | 1,752 | 642 | 2,393 |
| 2014 | 2,276 | 1,758 | 4,034 | 15,107 | 9,031 | 24,137 | 17,382 | 10,789 | 28,171 | 1,360 | 813 | 2,172 |
| 2015 | 1,770 | 1,316 | 3,086 | 15,419 | 10,216 | 25,635 | 17,189 | 11,532 | 28,721 | 1,388 | 919 | 2,307 |
| 2016 | 1,817 | 1,683 | 3,500 | 17,794 | 15,333 | 33,127 | 19,611 | 17,016 | 36,627 | 1,601 | 1,380 | 2,981 |
| 2017 | 1,738 | 1,200 | 2,938 | 28,963 | 9,050 | 38,012 | 30,701 | 10,249 | 40,950 | 2,607 | 814 | 3,421 |
| 2018 | 1,195 | 1,050 | 2,245 | 22,739 | 8,669 | 31,407 | 23,933 | 9,719 | 33,652 | 2,046 | 780 | 2,827 |
| 2019 | 1,342 | 809 | 2,151 | 21,131 | 7,636 | 28,767 | 22,473 | 8,445 | 30,918 | 1,902 | 687 | 2,589 |
| 2020 | 923 | 787 | 1,710 | 22,710 | 7,959 | 30,669 | 23,633 | 8,746 | 32,379 | 2,044 | 716 | 2,760 |

Table 24. Recreational harvest by region in pounds (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | | | | | Chesapeake Bay | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ME | NH | MA | RI | CT | NY | NJ | DE | MD | VA | NC^ | Total | MD | VA | Total | |
| 1995 | 83 | 127 | 2,739 | 1,049 | 1,331 | 5,594 | 8,587 | 301 | 0.0 | 141 | 232 | 20,184 | 3,115 | 3,773 | 6,889 | 27,072 |
| 1996 | 95 | 183 | 2,983 | 1,626 | 1,405 | 10,739 | 3,959 | 795 | 0.0 | 812 | 392 | 22,990 | 2,789 | 2,847 | 5,636 | 28,626 |
| 1997 | 223 | 538 | 5,133 | 1,997 | 2,263 | 8,543 | 2,179 | 374 | 0.0 | 1,096 | 865 | 23,211 | 3,203 | 4,203 | 7,405 | 30,616 |
| 1998 | 305 | 262 | 7,359 | 1,544 | 1,807 | 4,889 | 4,182 | 645 | 579 | 545 | 636 | 22,754 | 3,023 | 3,826 | 6,849 | 29,603 |
| 1999 | 196 | 181 | 4,995 | 1,904 | 1,327 | 7,414 | 9,473 | 312 | 3.8 | 110 | 339 | 26,256 | 2,323 | 4,986 | 7,309 | 33,565 |
| 2000 | 347 | 109 | 4,863 | 2,008 | 890 | 7,053 | 9,768 | 925 | 0.0 | 416 | 277 | 26,656 | 3,503 | 3,892 | 7,395 | 34,051 |
| 2001 | 446 | 334 | 7,188 | 2,044 | 1,101 | 5,058 | 12,314 | 695 | 314 | 382 | 1,082 | 30,959 | 2,928 | 5,376 | 8,304 | 39,263 |
| 2002 | 775 | 322 | 10,261 | 2,708 | 1,251 | 5,975 | 9,621 | 589 | 0.0 | 1,135 | 998 | 33,634 | 2,643 | 5,563 | 8,206 | 41,840 |
| 2003 | 458 | 466 | 10,252 | 4,052 | 2,666 | 10,788 | 12,066 | 763 | 14 | 392 | 966 | 42,882 | 5,246 | 5,964 | 11,210 | 54,092 |
| 2004 | 554 | 268 | 9,329 | 2,460 | 2,229 | 6,437 | 13,303 | 870 | 57 | 1,067 | 6,656 | 43,230 | 4,860 | 4,941 | 9,801 | 53,031 |
| 2005 | 546 | 384 | 7,541 | 3,155 | 3,133 | 11,637 | 14,289 | 680 | 7.7 | 487 | 3,947 | 45,808 | 7,753 | 3,860 | 11,614 | 57,421 |
| 2006 | 610 | 244 | 6,787 | 1,569 | 2,854 | 9,845 | 12,716 | 586 | 2.8 | 921 | 2,975 | 39,109 | 6,494 | 5,071 | 11,565 | 50,674 |
| 2007 | 422 | 93 | 7,010 | 2,077 | 2,786 | 10,081 | 8,390 | 207 | 0.0 | 516 | 1,965 | 33,547 | 5,249 | 4,027 | 9,277 | 42,824 |
| 2008 | 607 | 182 | 8,424 | 970 | 2,273 | 18,000 | 12,407 | 847 | 0.0 | 1,690 | 750 | 46,150 | 5,639 | 4,877 | 10,515 | 56,665 |
| 2009 | 781 | 222 | 9,410 | 2,185 | 1,458 | 7,991 | 17,040 | 940 | 138 | 48 | 187 | 40,399 | 8,672 | 5,340 | 14,012 | 54,411 |
| 2010 | 218 | 238 | 9,959 | 2,102 | 2,323 | 18,190 | 17,454 | 895 | 107 | 206 | 1,198 | 52,891 | 6,482 | 2,059 | 8,541 | 61,431 |
| 2011 | 245 | 659 | 11,953 | 3,066 | 981 | 13,151 | 15,715 | 605 | 8.6 | 308 | 4,467 | 51,157 | 6,220 | 2,214 | 8,435 | 59,592 |
| 2012 | 152 | 432 | 14,941 | 2,096 | 1,835 | 13,096 | 11,551 | 644 | 21 | 1.7 | 0.0 | 44,768 | 3,819 | 4,670 | 8,488 | 53,257 |
| 2013 | 331 | 831 | 9,025 | 4,428 | 4,236 | 16,819 | 19,451 | 1,073 | 1,051 | 67 | 0.0 | 57,313 | 5,137 | 2,607 | 7,744 | 65,057 |
| 2014 | 423 | 203 | 7,965 | 3,402 | 2,665 | 13,998 | 8,886 | 381 | 159 | 0.0 | 0.0 | 38,083 | 8,877 | 989 | 9,866 | 47,949 |
| 2015 | 132 | 202 | 7,799 | 1,394 | 2,585 | 8,695 | 9,982 | 340 | 28 | 0.0 | 0.0 | 31,156 | 7,786 | 957 | 8,743 | 39,899 |
| 2016 | 189 | 191 | 3,731 | 1,776 | 912 | 12,053 | 12,790 | 86 | 7.2 | 0.0 | 0.0 | 31,735 | 10,912 | 1,024 | 11,936 | 43,672 |
| 2017 | 318 | 394 | 5,664 | 1,655 | 1,560 | 8,885 | 10,886 | 666 | 0.0 | 1.8 | 0.0 | 30,030 | 7,309 | 613 | 7,922 | 37,953 |
| 2018 | 142 | 130 | 4,925 | 1,121 | 1,165 | 3,453 | 7,012 | 33 | 0.0 | 0.0 | 0.0 | 17,982 | 4,683 | 404 | 5,087 | 23,069 |
| 2019 | 415 | 291 | 2,698 | 2,300 | 685 | 7,072 | 6,674 | 44 | 7.3 | 0.0 | 0.0 | 20,187 | 3,145 | 224 | 3,370 | 23,556 |
| 2020 | 180 | 29 | 776 | 483 | 830 | 2,202 | 6,584 | 16 | 0.0 | 0.0 | 0.0 | 11,100 | 3,480 | 280 | 3,759 | 14,859 |

Table 25. Recreational harvest by region in numbers of fish (x1000), 1995-2020. Source: MRIP (Query July 8, 2021). ^Estimates exclude inshore harvest.

| Year | Ocean | | | | | | | | | | | | Chesapeake Bay | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ME | NH | MA | RI | CT | NY | NJ | DE | MD | VA | NC^ | Total | MD | VA | Total | |
| 1995 | 4.0 | 7.4 | 124.3 | 70.9 | 75.8 | 250.3 | 671.4 | 25.8 | 0.1 | 13.4 | 16.5 | 1,259.8 | 491.1 | 536.7 | 1,027.7 | 2,287.6 |
| 1996 | 4.1 | 11.0 | 156.6 | 100.6 | 95.9 | 511.6 | 301.2 | 59.7 | 0.0 | 89.6 | 31.7 | 1,362.0 | 564.2 | 561.3 | 1,125.5 | 2,487.4 |
| 1997 | 43.0 | 29.9 | 365.6 | 124.7 | 149.0 | 450.5 | 171.2 | 29.1 | 0.0 | 91.1 | 60.1 | 1,514.1 | 552.4 | 708.4 | 1,260.8 | 2,775.0 |
| 1998 | 65.3 | 14.8 | 500.9 | 91.1 | 114.1 | 383.8 | 289.2 | 51.0 | 24.3 | 71.3 | 41.2 | 1,647.0 | 596.2 | 672.2 | 1,268.4 | 2,915.4 |
| 1999 | 37.5 | 9.9 | 327.1 | 116.6 | 88.2 | 450.9 | 657.1 | 28.3 | 1.6 | 14.1 | 26.4 | 1,757.8 | 530.9 | 834.8 | 1,365.7 | 3,123.5 |
| 2000 | 77.3 | 6.0 | 306.2 | 156.8 | 84.0 | 494.6 | 939.8 | 88.3 | 0.0 | 27.2 | 18.1 | 2,198.3 | 810.9 | 793.3 | 1,604.2 | 3,802.5 |
| 2001 | 91.9 | 23.5 | 551.0 | 149.8 | 78.2 | 364.2 | 1,267.5 | 70.6 | 64.1 | 36.7 | 60.7 | 2,758.1 | 513.3 | 781.1 | 1,294.4 | 4,052.5 |
| 2002 | 135.2 | 28.1 | 723.5 | 181.5 | 92.5 | 439.3 | 957.6 | 65.7 | 0.0 | 76.4 | 56.3 | 2,756.1 | 464.4 | 784.6 | 1,249.0 | 4,005.1 |
| 2003 | 99.7 | 41.3 | 797.2 | 226.4 | 181.7 | 678.4 | 942.8 | 75.7 | 0.9 | 29.3 | 50.4 | 3,123.8 | 816.0 | 841.6 | 1,657.6 | 4,781.4 |
| 2004 | 118.3 | 22.1 | 666.7 | 159.6 | 134.5 | 458.1 | 1,042.1 | 66.6 | 11.0 | 75.9 | 323.2 | 3,078.1 | 657.5 | 817.4 | 1,474.9 | 4,553.0 |
| 2005 | 118.3 | 35.5 | 536.1 | 195.6 | 202.6 | 854.6 | 958.1 | 48.8 | 3.6 | 34.2 | 194.9 | 3,182.2 | 815.5 | 483.1 | 1,298.6 | 4,480.8 |
| 2006 | 140.9 | 20.9 | 483.2 | 129.3 | 168.3 | 614.8 | 972.2 | 44.5 | 0.4 | 80.6 | 134.2 | 2,789.0 | 1,342.0 | 753.0 | 2,094.9 | 4,884.0 |
| 2007 | 95.5 | 8.1 | 471.9 | 135.8 | 163.9 | 602.8 | 722.2 | 17.2 | 0.0 | 28.0 | 81.8 | 2,327.1 | 1,127.3 | 490.3 | 1,617.6 | 3,944.7 |
| 2008 | 133.4 | 11.9 | 514.1 | 73.4 | 132.8 | 1,169.9 | 791.0 | 67.7 | 0.0 | 94.4 | 36.9 | 3,025.4 | 779.7 | 576.1 | 1,355.8 | 4,381.2 |
| 2009 | 146.5 | 17.3 | 695.0 | 138.4 | 100.3 | 574.2 | 1,141.5 | 64.8 | 10.2 | 3.0 | 6.5 | 2,897.7 | 1,094.4 | 708.1 | 1,802.5 | 4,700.2 |
| 2010 | 37.3 | 21.4 | 808.2 | 162.0 | 170.2 | 1,449.0 | 1,091.4 | 61.4 | 12.5 | 25.3 | 67.1 | 3,905.9 | 1,139.3 | 343.2 | 1,482.6 | 5,388.4 |
| 2011 | 48.5 | 54.2 | 873.5 | 202.2 | 91.1 | 1,005.3 | 1,038.9 | 43.7 | 0.8 | 51.2 | 207.6 | 3,617.1 | 1,112.1 | 277.2 | 1,389.3 | 5,006.4 |
| 2012 | 31.4 | 37.3 | 1,010.6 | 130.7 | 137.1 | 927.5 | 742.4 | 51.3 | 2.9 | 0.3 | 0.0 | 3,071.5 | 716.7 | 258.1 | 974.8 | 4,046.3 |
| 2013 | 73.3 | 63.2 | 658.7 | 308.3 | 269.6 | 902.5 | 1,324.2 | 70.6 | 48.4 | 4.4 | 0.0 | 3,723.2 | 1,136.7 | 297.9 | 1,434.5 | 5,157.8 |
| 2014 | 86.4 | 16.5 | 523.5 | 172.0 | 131.8 | 804.5 | 501.9 | 26.2 | 12.6 | 0.0 | 0.0 | 2,275.5 | 1,627.0 | 131.2 | 1,758.2 | 4,033.7 |
| 2015 | 14.4 | 10.0 | 485.3 | 67.0 | 140.8 | 406.8 | 600.3 | 41.9 | 3.5 | 0.0 | 0.0 | 1,770.1 | 1,108.0 | 207.7 | 1,315.7 | 3,085.7 |
| 2016 | 14.2 | 17.6 | 230.1 | 128.4 | 63.3 | 697.7 | 659.6 | 5.9 | 0.5 | 0.0 | 0.0 | 1,817.2 | 1,545.1 | 138.1 | 1,683.2 | 3,500.4 |
| 2017 | 22.0 | 37.7 | 392.3 | 59.8 | 94.9 | 477.3 | 626.4 | 27.8 | 0.0 | 0.1 | 0.0 | 1,738.3 | 1,091.6 | 108.0 | 1,199.6 | 2,937.9 |
| 2018 | 16.0 | 13.4 | 389.5 | 39.2 | 85.5 | 181.7 | 465.3 | 4.2 | 0.0 | 0.0 | 0.0 | 1,194.6 | 993.3 | 56.8 | 1,050.1 | 2,244.8 |
| 2019 | 38.0 | 14.7 | 195.6 | 104.1 | 67.1 | 498.0 | 412.9 | 10.9 | 1.0 | 0.0 | 0.0 | 1,342.2 | 764.1 | 44.6 | 808.7 | 2,150.9 |
| 2020 | 19.0 | 3.2 | 67.2 | 36.9 | 71.2 | 203.7 | 520.1 | 1.6 | 0.0 | 0.0 | 0.0 | 922.9 | 734.8 | 52.2 | 787.0 | 1,710.0 |

## 10.0 FIGURES

***Note: Figures 1-6 are in-text.***

Figure 7. Atlantic striped bass female spawning stock biomass and recruitment, 1982-2017. Source: 2018 Benchmark Stock Assessment.

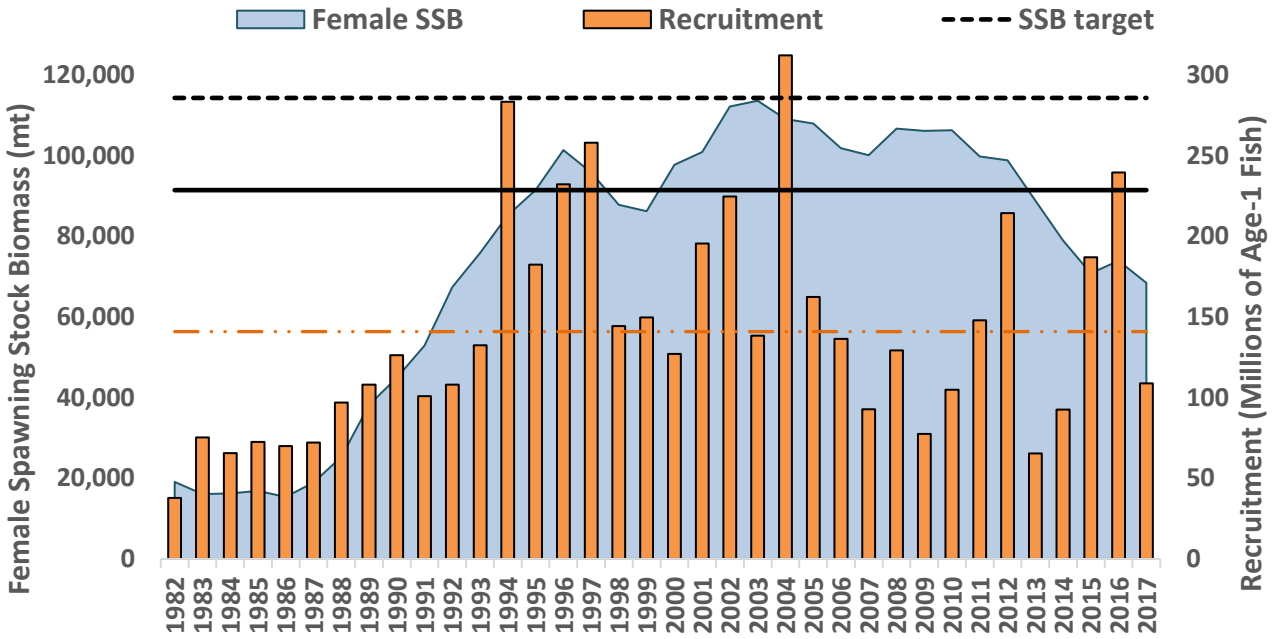



Figure 8. Atlantic striped bass fishing mortality, 1982-2017. Source: 2018 Benchmark Stock Assessment.

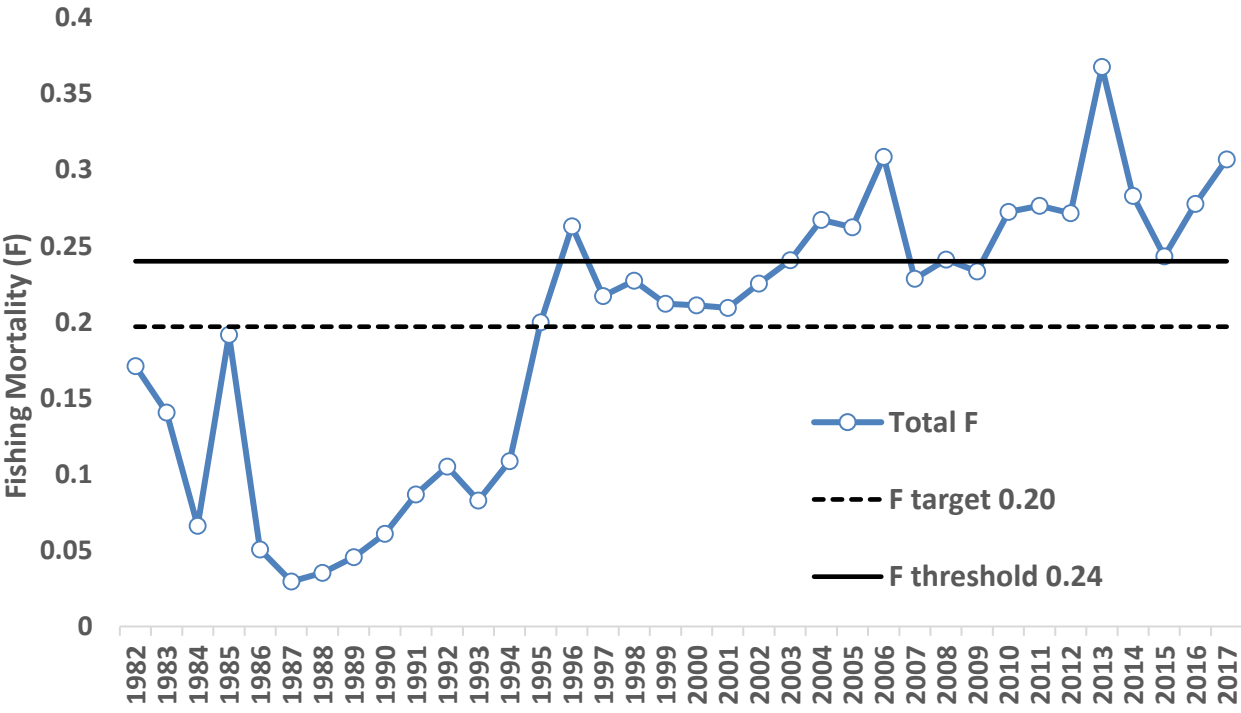


Figure 9. Albemarle Sound-Roanoke River striped bass female spawning stock biomass and recruitment (abundance of age-1), and biological reference points, 1991-2017. Source: 2020 Albemarle Sound-Roanoke River Stock Assessment (Lee et al. 2020).

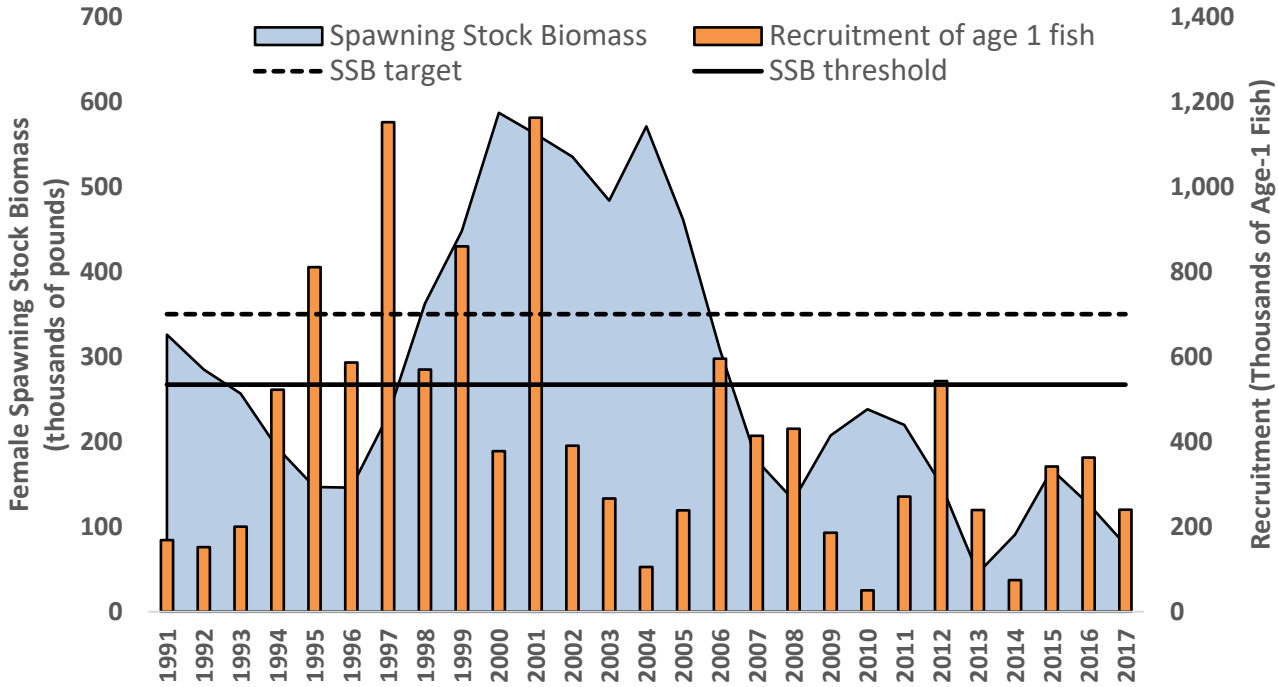



Figure 10. Albemarle Sounds-Roanoke River striped bass fishing mortality (F) estimates, and biological reference points, 1991-2017. Source: 2020 Albemarle Sound-Roanoke River Stock Assessment (Lee et al. 2020).

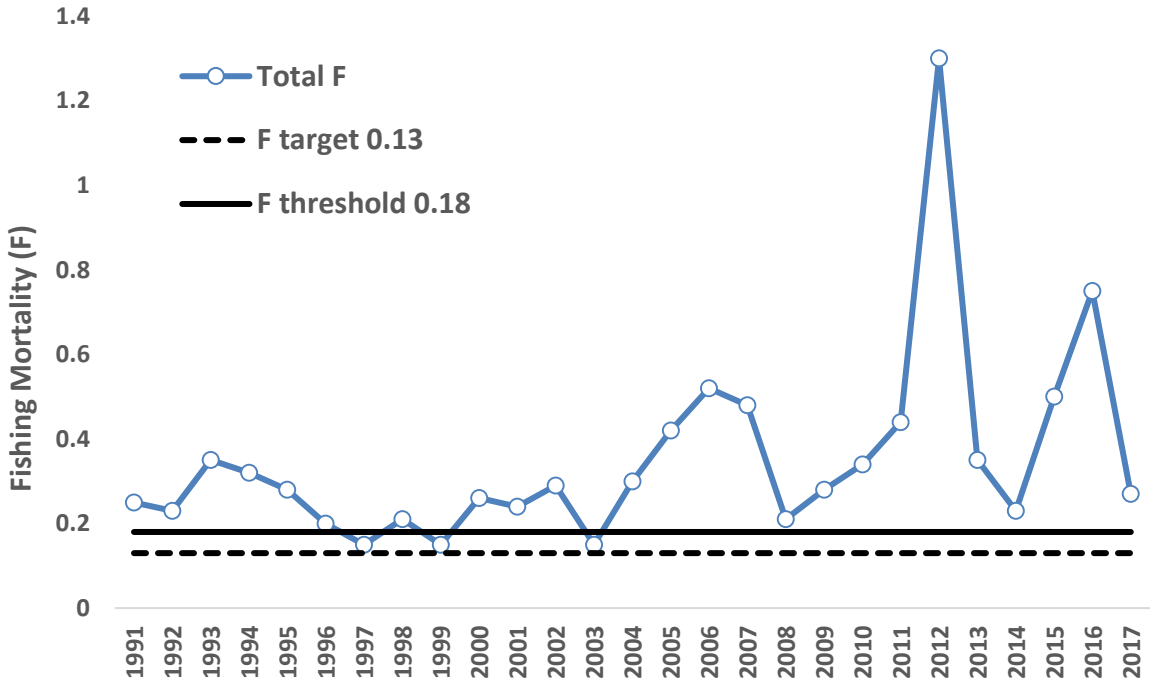


Figure 11. Total Atlantic striped bass removals by sector in numbers of fish, 1982-2020. Note: Harvest is from state compliance reports/MRIP, discards/release mortality is from ASMFC. Estimates exclude inshore harvest from Albemarle Sound-Roanoke River.

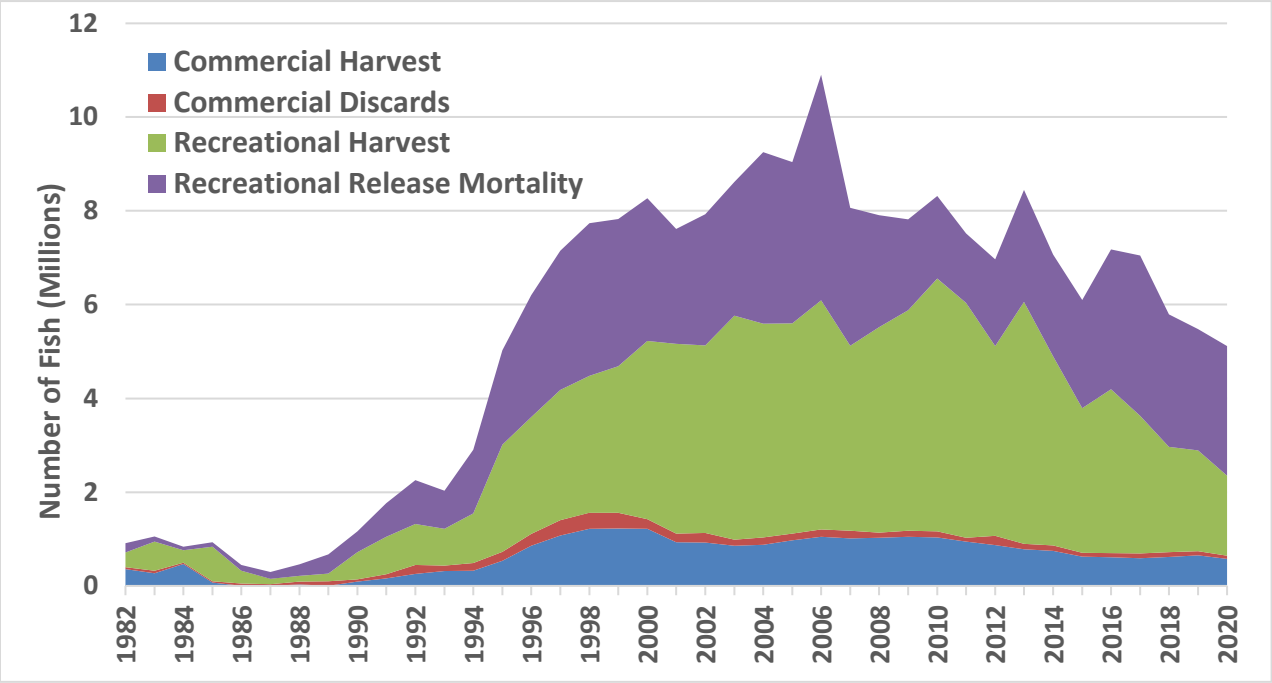



Figure 12. Commercial Atlantic striped bass landings by state in pounds, 1990-2020. Source: State compliance reports. Commercial harvest and sale prohibited in ME, NH, CT, and NJ. NC is ocean only.

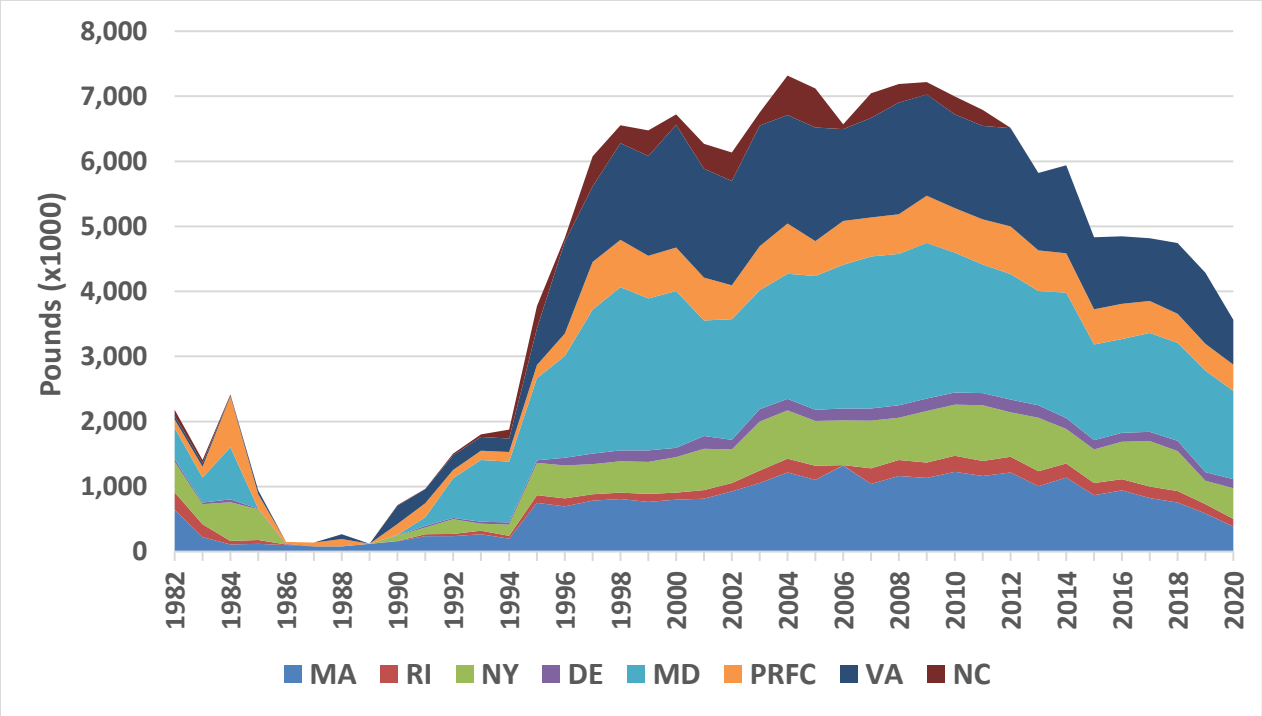
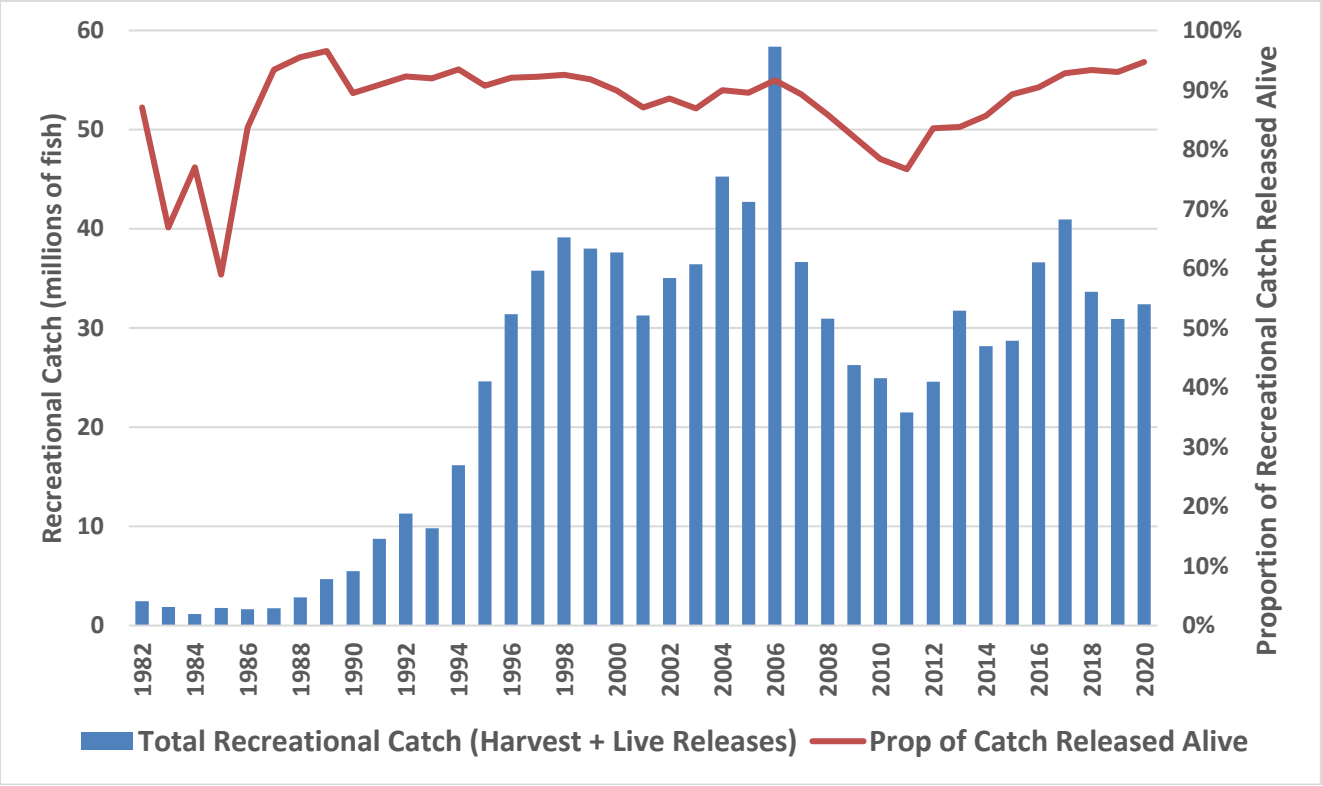


Figure 13. Total recreational catch and the proportion of fish released alive, 1982-2020. Source: MRIP/ASMFC. Estimates exclude inshore harvest from Albemarle Sound-Roanoke River.



## APPENDIX 1. Projection Results and Technical Committee Findings for Recreational Size Limit Options to Protect Strong Year Classes

### *Projection Scenarios*

The TC discussed the importance of developing stock projections to evaluate the potential impact on SSB and stock productivity of changing the size/slot limit, as compared to the status quo. While changing the size/slot limit may protect a year class from harvest in the near-term, the potential effects on long-term stock productivity need to be considered.

Projections were developed to compare the impacts of alternative size/slot limits on SSB over the next 12 years (timeframe allowing all three year classes of interest to reach age-14) by changing the selectivity for each size/slot limit.

In September 2021, projections were developed for the alternative ocean slot/size options assuming the Chesapeake Bay recreational measures would remain status quo (Table A-1). In December 2021, projections were developed for combinations of alternative ocean and Chesapeake Bay slot limits to compare to the status quo scenario (Table A-2). Each scenario uses a combined selectivity comprised of ocean and Bay length-based selectivity vectors for the size/slot limits of interest. This second set of projections focused on scenarios in which both the Chesapeake Bay and ocean size/slot limits changed from the status quo. As recommended by TC members, the projection scenarios highlight combinations of Chesapeake Bay and ocean size/slot limits that would protect the widest range of sizes from harvest in both the Chesapeake Bay and the ocean. For example, the combination of an 18" to <28" slot in the Chesapeake Bay with a 35" minimum size in the ocean would protect fish between 28" and <35" from harvest across both fisheries.

Table A-1. Ocean-only change projection scenarios and selectivity vectors developed in September 2021.

| | | Period | | | |
|---|---|---|---|---|---|
| | | Add VI 2020-2022 | | Amendment 7 2023-forward | |
| **Scenarios** | **Description** | **Ches Bay** | **Ocean** | **Ches Bay** | **Ocean** |
| Status Quo 1 | Ocean status quo slot (Ches Bay status quo) | selectivity from 2018 assessment | 28-<35 | selectivity from 2018 assessment | 28-<35 |
| 2 | Ocean min size (Ches Bay status quo) | selectivity from 2018 assessment | 28-<35 | selectivity from 2018 assessment | 35 min |
| 3 | Ocean large slot (Ches Bay status quo) | selectivity from 2018 assessment | 28-<35 | selectivity from 2018 assessment | 32-<40 |
| 4 | Ocean narrower slot (Ches Bay status quo) | selectivity from 2018 assessment | 28-<35 | selectivity from 2018 assessment | 28-<32 |

Table A-2. Chesapeake Bay and ocean change projection scenarios and selectivity vectors developed in December 2021.

| | | Period | | | |
|---|---|---|---|---|---|
| | | **Add VI 2020-2022** | | **Amendment 7 2023-forward** | |
| **Scenarios** | **Description** | **Ches Bay** | **Ocean** | **Ches Bay** | **Ocean** |
| Status Quo 1 | Ches Bay status quo with ocean status quo slot | selectivity from 2018 assessment | 28-<35 | selectivity from 2018 assessment | 28-<35 |
| 2 | Ches Bay small slot with ocean large slot | selectivity from 2018 assessment | 28-<35 | 18-<23 | 32-<40 |
| 3 | Ches Bay small slot with ocean min size | selectivity from 2018 assessment | 28-<35 | 18-<23 | 35 min |
| 4 | Ches Bay large slot with ocean large slot | selectivity from 2018 assessment | 28-<35 | 18-<28 | 32-<40 |
| 5 | Ches Bay large slot with ocean min size | selectivity from 2018 assessment | 28-<35 | 18-<28 | 35 min |

***Projection Discussion***

The projections were developed based on certain assumptions, including an assumption of fishing at constant F target for 2018 forward and assuming constant effort for all scenarios. Changes in effort associated with different size/slot limits cannot be predicted. If effort were to increase relative to the status quo in response to a size/slot limit change, SSB levels may be less than projected. If effort were to decrease relative to the status quo in response to a size/slot limit change, SSB levels may be higher than projected.

For 2020 forward, the projections use new selectivity values generated from the length-at-age analysis described above. These length-based selectivity values will be reviewed as part of the next stock assessment update, which will generate updated selectivity values based on new data years added to the stock assessment.

It is important to note that these projections assume both the commercial and recreational sectors adopt the alternative slot limits, due to the difficulty of developing sector-specific selectivity vectors. If only the recreational sector implements the new slot limits, the change in SSB would likely be less than the projection results indicate.

The projection analysis indicates the following key findings for all scenarios:

- The stock recovery timeline (i.e., the year SSB exceeds the threshold and the year SSB exceeds the target) is the same for all scenarios, including the status quo scenarios.
- The projected overall change in total SSB (all year classes combined) relative to the status quo is positive for most scenarios (Table A-3; Figures A-1-2); however, the

percent change in total SSB is not statistically significant since it falls within the confidence interval of the SSB estimates from the status quo projections.

- Under all scenarios, the 2015 year class will have a higher contribution to stock productivity than the 2017 and 2018 year classes.
- The projected change in year-class-specific SSB (total SSB for each year class over time) relative to the status quo is mostly positive with some negative changes for the 2015 year class SSB for some scenarios (Table A-3; Figures A-3-4).
- These results indicate that changing the selectivity does not have a significant impact on rebuilding the stock if the F rate remains constant. If the goal is to expedite stock rebuilding, controlling the overall F rate is more important than only changing the selectivity.

The TC notes that for all scenarios, there is uncertainty around how angler behavior and effort will change in response to change in size/slot limit. Additionally, slot limits are associated with higher discards, particularly for narrower slot limits. A large minimum size limit could also result in higher discards. While discard mortality is included in the projections through the selectivity patterns, the projections assume that total effort is the same across all scenarios.

The TC emphasized that while these projections can inform a comparison between the relative impacts of different size/slot options, these projections are not intended to inform discussion about the recovery timeline for the stock. For example, the projection analysis indicates that all the scenarios evaluated in the projections, including the status quo, will result in the same stock recovery timeline; however, the estimated year in which SSB exceeds the target or threshold may change after additional data from recent years are incorporated into the assessment model during the next stock assessment update. If the Board would like to see projections to inform the stock rebuilding plan, the TC can be tasked to develop those projections as part of the next assessment update.

Table A-3. Percent change in median total year-class-specific SSB relative to the status quo and maximum percent change in total SSB (all year classes) relative to the status quo for projection scenarios developed for changing both the Chesapeake Bay and ocean size limits (green) and changing only the ocean size limit (blue) assuming implementation by both the commercial and recreational sectors. SQ=Status Quo.

| | **Chesapeake Bay and Ocean Size Limit Change Scenarios** | | | | **Ocean Only Size Limit Change Scenarios** | | |
|---|---|---|---|---|---|---|---|
| **Ches Bay** | **18-<23** | **18-<23** | **18-<28** | **18-<28** | **SQ** | **SQ** | **SQ** |
| **Ocean** | **32-<40** | **35 min** | **32-<40** | **35 min** | **32-<40** | **35 min** | **28-<32** |
| **2015 YC SSB** | -2% | +11% | -2% | +11% | -4% | +6% | +4% |
| **2017 YC SSB** | +6% | +24% | +4% | +22% | +2% | +17% | +2% |
| **2018 YC SSB** | +14% | +35% | +9% | +29% | +8% | +22% | -0.5% |
| **Total SSB** | **+5%** | **+14%** | **+1%** | **+8%** | **+1%** | **+5%** | **-3%** |

Note: If only the recreational sector implements the new slot limits, the change in SSB would likely be less than the projection results in this table.

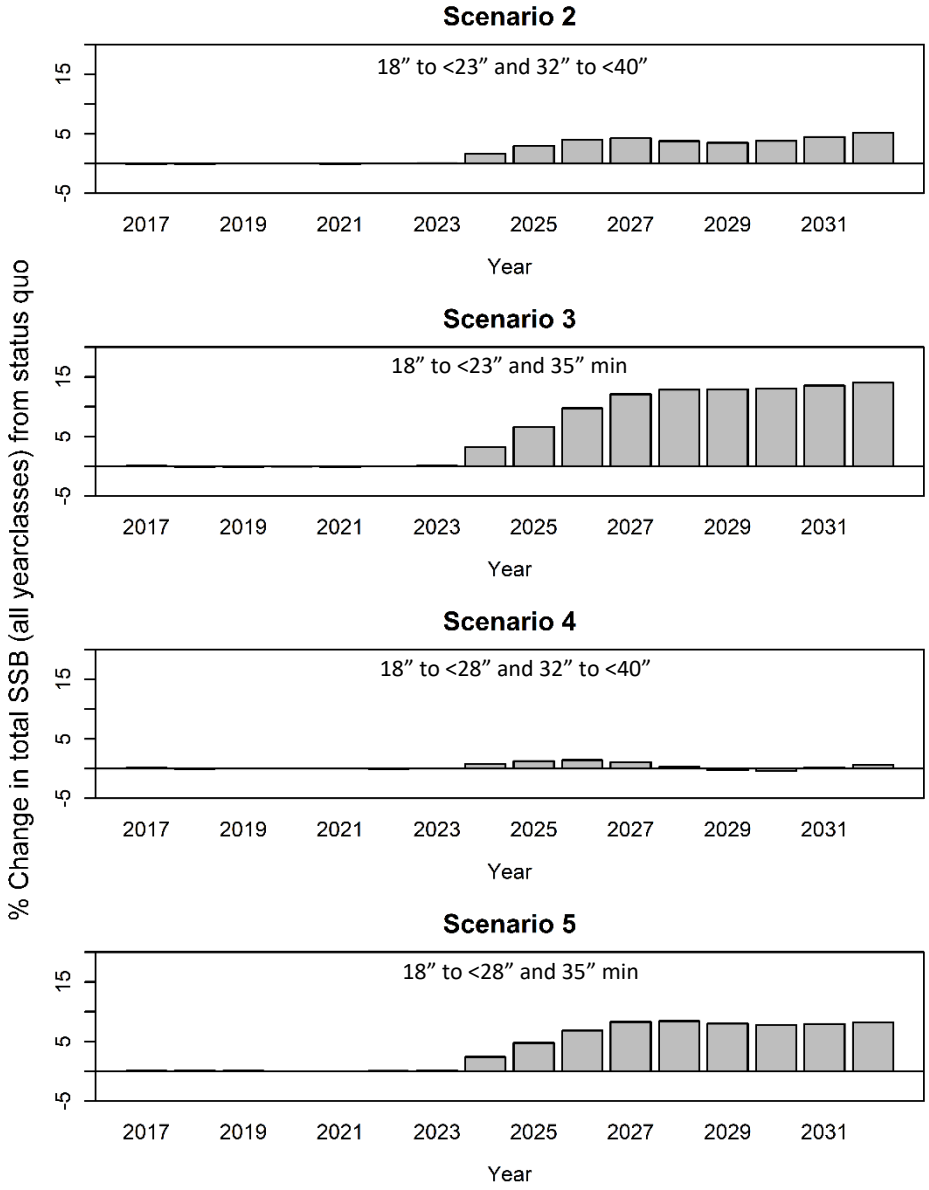



Figure A-1. Change in total female SSB for all year classes under scenarios 2-5 (Chesapeake Bay and ocean size limit changes compared to scenario 1 (status quo).

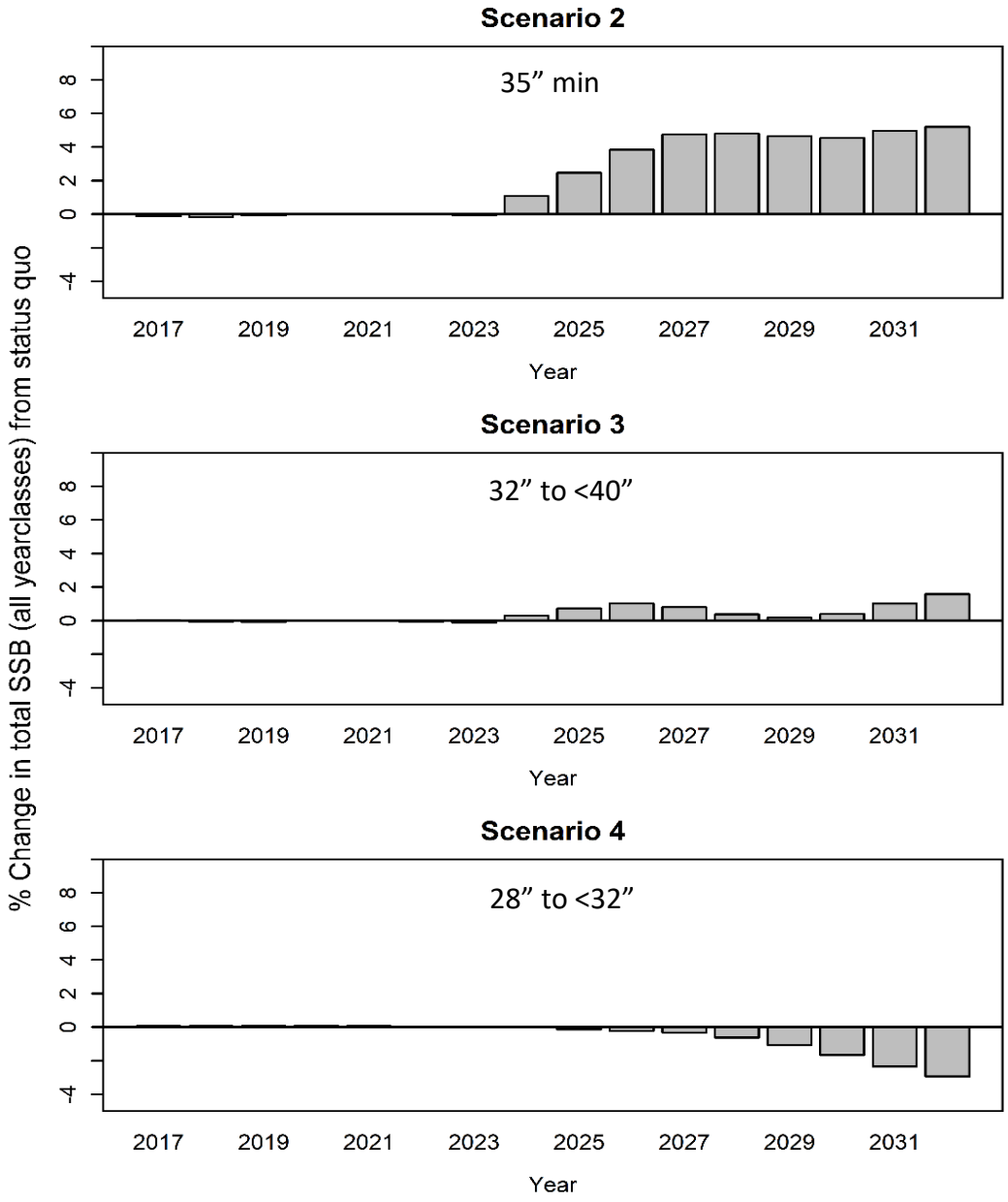



Figure A-2. Change in total female SSB for all year classes under scenarios 2-4 (ocean only size limit changes) compared to scenario 1 (status quo).