Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

May 5, 2026
8:30 – 11:30 a.m.

Draft Agenda

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

1.	Welcome/Call to Order (*J. Cimino*)	8:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from February 2026	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Consider Approval of Draft Addendum II on Chesapeake Bay Reduction Fishery for Public Comment *(J. Boyle)* **Action**	8:45 a.m.
5.	Review Technical Committee Report on Board Task • Impacts of Changing Environmental Conditions *(C. Craig)*	10:15 a.m.
6.	Review Committee on Economics and Social Sciences Report on Board Task • Economics Impacts from Changes in Total Allowable Catch *(A. Scheld, T. Scott)*	10:45 a.m.
7.	Update on Chesapeake Bay Research Request for Proposals *(B. Beal)*	11:20 a.m.
8.	Elect Vice Chair **Action**	11:25 a.m.
9.	Other Business/Adjourn	11:30 a.m.

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

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Atlantic States Marine Fisheries Commission

MEETING OVERVIEW

Atlantic Menhaden Management Board
May 5, 2026
8:30 – 11:30 a.m.

Chair: Joe Cimino (NJ) Assumed Chairmanship: 5/26	Technical Committee Chair: Caitlin Craig (NY)	Law Enforcement Committee Representative: David Bailey (MD)
Vice Chair: Vacant	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: February 4, 2026
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (18 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 2026

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

4. Consider Approval of Draft Addendum II on Chesapeake Bay Reduction Fishery for Public Comment (8:45 –10:15 a.m.) Action

Background

- In October 2025, the Board initiated a draft addendum to consider changes to the Chesapeake Bay Reduction Fishery Cap.
- The Plan Development Team (PDT) incorporated the Board's feedback from February into the Draft Addendum **(Briefing Materials)**. The PDT also drafted a memo of additional information requested by the Board and options that the PDT considered and rejected **(Briefing Materials)**.

Presentations

- Overview of Draft Addendum II to Amendment 3 by J. Boyle

Board Actions for Consideration

- Approve Draft Addendum II to Amendment 3 for public comment

5. Review Technical Committee Report on Board Task (10:15 –10:45 a.m.)

Background

- In October 2025, the Board provided two tasks to the Technical Committee (TC) to evaluate the effects of changing environmental conditions on the Atlantic menhaden stock.
- The TC conducted a literature review on the key topics identified by the Board **(Briefing Materials)**.

Presentations

- Overview of TC Report by C. Craig

6. Review Committee on Economics and Social Sciences Report on Board Task (10:45–11:20 a.m.)

Background

- In October 2025, the Board requested input from the Committee on Economics and Social Sciences (CESS) on the socioeconomic impacts to different fishery sectors from changes in the coastwide Total Allowable Catch.
- CESS representatives developed a report on the available literature **(Briefing Materials)**.

Presentations

- Overview of CESS Report by A. Scheld and T. Scott

7. Update on Chesapeake Bay Research Request for Proposals (11:20–11:25 a.m.)

Background

- In January 2026, federal appropriations included funding for Chesapeake Bay menhaden research.
- The Commission will be developing a Request for Proposals (RFP) to evaluate research projects for funding.

Presentations

- Update on RFP development by B. Beal

8. Elect Vice Chair Action

9. Other Business/Adjourn

Atlantic Menhaden

Activity level: High

Committee Overlap Score: High (SAS, ERP WG overlaps with American eel, striped bass, northern shrimp, Atlantic herring, horseshoe crab, weakfish)

Committee Task List

- Evaluate FMP biological sampling requirement
- Board tasks on changing environmental conditions coastwide and in Chesapeake Bay
- Annual compliance reports due August 1st

TC Members: Caitlin Craig (NY, Chair), Mike Mangold (USFWS), Claire Pelletier (NC), Keilin Gamboa-Salazar (SC), Nichole Ares (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ingrid Braun-Ricks (PRFC), Micah Dean (MA), Kelli Mosca (CT), Catherine Wilhelm (VA), Chris Swanson (FL), Sydney Alhale (NMFS), Amy Schueller (NMFS), Alexei Sharov (MD), Garry Glanden (DE), Heather Walsh (USGS), Katie Drew (ASMFC), James Boyle (ASMFC)

SAS Members: Amy Schueller (NMFS, SAS Chair), Caitlin Craig (NY, TC Chair), Brooke Lowman (VA), Matt Cieri (ME), Chris Swanson (FL), Sydney Alhale (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ), Keilin Gamboa-Salazar (SC), Katie Drew (ASMFC), James Boyle (ASMFC)

ERP WG Members: Matt Cieri (ME, ERP Chair), Andre Buchheister (HSU), Jason Boucher (NOAA), Michael Celestino (NJ), David Chagaris (FL), Micah Dean (MA), Jason McNamee (RI), Amy Schueller (NFMS), Alexei Sharov (MD), Genny Nesslage (UMD), Howard Townsend (NFMS), Jainita Patel (ASMFC), Katie Drew (ASMFC), James Boyle (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC MENHADEN MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

February 4, 2026

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

TABLE OF CONTENT

Call to Order 1

Approval of Agenda 1

Approval of Proceedings 1

Public Comment 1

Progress Update on Development of Draft Addendum II for Public Comment 6

Advisory Panel Report on 2025 Single-Species and Ecological Reference Points Stock Assessments 18

Progress Update on Technical Committee Tasking on Changing Environmental Conditions 19

Other Business 22

Adjournment 24

INDEX OF MOTIONS

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

2. **Approval of Proceedings of October 2025** by consent (Page 1).

3. **Move to adjourn** by consent (Page 24).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for C. Wilson (AA)
Steve Train, ME (GA)
Rep. Allison Hepler, ME (LA)
Renee Zobel, NH (AA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)
Nicole Lengtel-Costa, RI, proxy for J. McNamee (AA)
Matthew Gates, CT (AA)
Bill Hyatt, CT (GA)
Robert LaFrance, CT proxy for Rep. Gresko (LA)
Marty Gary, NY (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (AA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Michael Luisi, MD, proxy for K. Charbooneau (AA)
Russel Dize, MD (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Joe Grist (Acting AA)
James "JJ" Minor, VA (GA)
Andrew Minkiewicz, VA, proxy for Sen. Diggs (LA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Rep. Brian Turner (LA)
Ben Dyar, SC, proxy for B. Keppler (AA)
Malcolm Rhodes, SC (GA)
Robert Boyles, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Jeff Renchen, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Ron Owens, PRFC
Max Appleman, NMFS
Rick Jacobson, US FWS

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

Ex-Officio Members

Caitlin Craig, Technical Committee Chair
Meghan Lapp, Advisory Panel Chair
David Bailey, Law Enforcement Committee Rep.

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Caitlin Starks
Emilie Franke
Tracey Bauer
James Boyle
Chelsea Tuohy
Katie Drew
Samara Nehemiah
Jainita Patel

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Wednesday, February 4, 2026, and was called to order at 1:15 p.m. by Chair John Clark.

CALL TO ORDER

CHAIR JOHN CLARK: Welcome to the Atlantic Menhaden Management Board meeting. The meeting is now called to order. The meeting is being chaired by John Clark; the Administrative Commissioner from Delaware. I am joined up here at the front table by our Advisory Panel Chair, Meghan Lapp.

Also, from Atlantic States Marine Fisheries Commission we have James Boyle, who is the FMP Coordinator and Katie Drew, the Stock Assessment Scientist for Atlantic menhaden. Online we have our Technical Committee Chair Caitlin Craig, and we have our Law Enforcement Committee Chair, David Baily. Toni told me we have several commissioners online, so I will throw it over to her.

MS. TONI KERNS: Again, I apologize if I leave anybody out, it's never on purpose. We have Steve Train from Maine, we have Drew Minkiewicz from Virginia, we have Brian Turner from North Carolina, and Malcolm Rhodes from South Carolina, Spud Woodward from Georgia, and Emerson Hasbrouck from New York, and Joe Gresko from Connecticut. I think that is everybody.

CHAIR CLARK: We've got a full table and a full online contingent, that's great. Let's move right on, excuse me, we have a hand up from Joe Grist, Joe.

MR. JOSEPH GRIST: Just to double check, I believe you have JJ Minor online as well from Virginia.

MS. KERNS: Very possible, I'm doublechecking to make sure he's there. Yes, he is.

MR. GRIST: Thank you.

APPROVAL OF AGENDA

CHAIR CLARK: Okay, I think that takes care of all the online commissioners, we'll move on to the consent items. Are there any revisions to the agenda? Seeing none; the agenda is approved as written.

APPROVAL OF PROCEEDINGS

CHAIR CLARK: Are there any revisions to the proceedings from the October 2025 meeting? Seeing none; the proceedings are approved.

PUBLIC COMMENT

CHAIR CLARK: We'll move on to Agenda Item 3, Public Comment. Once again, this is for comment on items that are not on the agenda. Those of you who wish to comment to items on the agenda, we hope we will have enough time to take some public comments at that point. But if anybody has comments, they would like to make that are not on the agenda, please come to the public microphone, state your name.

If you have an affiliation state that and then please make your comment and you'll have, could I have a show of hands, how many people would like to make public comments? Okay, we have one, two, three, four. Oh, there is one online. Okay, we've got six people that would like to make public comments, and we are going to give you two minutes a piece. Thank you, so please push the button until it turns red, and please proceed.

MS. ROBERTA KELLAM: Hi, I'm Roberta Kellam, from the eastern shore of Virginia, and I've been coming here frequently to just keep reminding you about the osprey situation, and the connection to the menhaden. I hadn't mentioned this before, but my husband actually was on the Atlantic States Marine Fisheries Commission for Virginia several years ago, and he will be your boat captain if you

would like to come to the eastern shore this spring, April and May.

April, see all the osprey nests and see the thriving situation and then in May when everything is desecrated and starving to death. That being said, I wanted to make a couple comments about the study that I just read about you getting several funding to do additional studying on the menhaden in the Chesapeake Bay.

There were a couple of points I would really hope that you will include or involve an osprey scientist at the level of expertise of Professor Brian Watts, somebody of that caliber, that really understands the relationship between the menhaden and the osprey and the life cycle and what not.

The other thing that I would hope that you can start looking at restoration of the menhaden population in the Bay, because it is clear that it used to be a lot higher. The landings were a lot more, and I think that just having a bare minimum of sustainability, we deserve more than that. The ecosystem deserves more, and the public deserves more. Thank you.

CHAIR CLARK: Thank you, Ms. Kellam. Next up from the audience, if one of you would just walk right up to the public microphone, state your name and affiliation and start your comment.

MR. JOHN GOODMAN: Good afternoon, Chairman, members of the Board. Thank you for the opportunity to speak.

CHAIR CLARK: Please state your name, sir, and your affiliation.

MR. GOODMAN: Affiliation, I'm a charterboat captain, I have a representation of folks here with Bay Defenders Alliance. John Goodman. Sorry, I'm not really a big public speaker, so I apologize.

CHAIR CLARK: No problem, just go right ahead.

MR. GOODMAN: I would like to invite anyone here who would like to visit the Rappahannock River or the Chesapeake Bay to see first hand of what we're dealing with. There is definitely a problem. Again, my name is John Goodman, I am a United States Coastguard Captain, licensed captain, and my livelihood, along with many other commercial watermen, charterboat operators and small waterfront businesses depend directly on the Chesapeake Bay and its shared marine resources.

I want to speak plainly about a structural issue in how this fishery is being managed, in my perspective. The framework currently being used is assessed to manage the Atlantic menhaden was designed for coastwide management across the Atlantic states. Unfortunately, the assessment does not have the capability to examine discreet Chesapeake Bay needs or the impacts that industrial menhaden harvest currently is having.

Without this science, which has been repeatedly blocked by the reduction industry, menhaden management should be far more conservative minded in this estuary, and that because the services are crucial in the Chesapeake as a nursery. We are having issues with striped bass; we are having issues with menhaden themselves not being present like we're used to seeing.

There are many other species that I feel, and many others feel that are in danger. I do not understand why the nursery system, with a fundamental difference between ecology functions and risk profiles is being counted as the same as open water fishing, particularly when the Commonwealth has acknowledged that current assessment models cannot independently evaluate menhaden significantly within the Chesapeake Bay.

CHAIR CLARK: Mr. Goodman, will you please wrap it up, thank you.

MR. GOODMAN: There is also a serious data gap that must be acknowledged, reduction fishery data and catch compositions are largely self-reported

with no independent third-party observation programs overseeing the Chesapeake Bay. That means we do not have verified data on how many nontargeted species are being caught, discarded, or just dying during their operations. I see that this is an economic consequence of this fishery. Thank you for your time.

CHAIR CLARK: Thank you, Mr. Goodman. Next, please. From the audience just please step up to the mic, your name and affiliation. Thank you.

MR. REMY MONCRIEFFE: Hello, everybody. My name is Remy Moncrieffe, and I am with the National Audubon Society. I am doing conservation policy measures for the National Audubon Society, and over the last several years it's been this conscientious debate about menhaden going to the Chesapeake Bay to help with the Bay, and everything between.

Audubon has maintained that proactive and threatened fisheries management is key towards maintaining the health in the Bay, that's just been consistent. However, last year the Technical Committee recommended a 50% reduction in the Total Allowable Catch for the coastwide and however, instead of adopting that 50% reduction a 20% reduction, which is less than half of what was recommended was adopted. As we move into the future you are going to keep seeing concerned citizens, as we've seen before and we'll see after, advocating for menhaden before it's fished, before ecological reference point that recommended best available science, and just adopting the recommendations of committees like the Technical Committee are key towards maintaining the health of the Chesapeake Bay. Just keep that in consideration and just know that anyone here is as concerned or more concerned about the data than I am.

They are here on their own volunteer time trying to defend what they believe is the right here, and I know that feeling and these concerns over and over again can get tiring, and I know that even concerns can get political conscientious, and as far as I can see don't know who's right and who is wrong.

But I also know that everyone here just wants what is best for the day, as small businesses with their boats, with their livelihood. Again, just keeping the science as pinpoint as possible, and just when the time leads us in a direction stopping it is going to be key to us now into the future, more of a use of conscientious environment their way. Thank you.

CHAIR CLARK: Thank you, Mr. Moncrieffe. Next up, do we have anybody else from the audience? Here we go. Once again, just state your name and affiliation and begin your comment.

MR. MARCUS KAUFMAN: Good afternoon, Marcus Kaufman, Bay Defender Alliance, also I own a charter business here in Virginia. Thank you, I am here as a local business owner in Virginia, part of the lower Bay, also someone who believes deeply in the public trust responsibilities tied to Virginia waters.

What we're experiencing right now should concern everybody, not just fishermen. From '23 to '24 we've seen a drastic decline in the life out in the Bay. I can't speak for all of the Bay; I can speak from the York River down to the bridge. But I can say, '25 was the hardest and worst year that we've seen so far.

Catches consistently continue to fall, and the absence of the menhaden is something residents and watermen alike are all talking about. These are public waters, when they decline the consequences are public. Commercial watermen are seeing it, charter operators are seeing it, waterfront communities are seeing it, and when people who live and work on the water all say the same thing, it deserves some urgent attention.

This has already begun to translate into an economic downturn for Bay and coastal communities, lost trip, lost income, growing uncertainty about the future. Stewardship means acting before damage becomes irreversible. For

where we stand on the water that moment is now. Thank you.

CHAIR CLARK: Thank you, Mr. Kaufman. Is there anybody else in the audience that would like to make a public comment on items not on the agenda? Yes, sir, come right up to the microphone. State your name and affiliation, and then just begin your comment. Thanks.

MR. NORMAN MACARTHUR: Good afternoon, my name is Norman Macarthur from Richmond, Virginia, and I'm here representing the Bay Defenders Alliance. Really, all of my friends here that have spoken to you this afternoon. But more importantly, I'm also here representing my four young sons under ten years old, who enjoy fishing. Some of my information is anecdotal, but I just want to get this out here to you folks who are the decision makers. I own property in Lancaster County on the Rappahannock River, in the process of building a home there.

The Chesapeake Bay Act has a lot of hoops to jump through to build a home on the water. As a private citizen, it is my responsibility to follow all the rules and the regulations, and I understand why. These were put there because people before me didn't make good choices, and they led to a lot of things that have potentially led to the demise of the Chesapeake Bay.

I would urge this Board to take the comments of all the folks that are here today discussing the overfishing of menhaden, and the need for more scientific research on the reduction fishing that is occurring in the Chesapeake Bay and the Rappahannock to heart, and understand that this is something ecologically that could be irreversible if it's not addressed here in the near future.

I appreciate you're giving me the time and opportunity today, and certainly this is something that is important to a lot of folks, and I'm sure that's why you are all here as well, so thank you very much.

CHAIR CLARK: Thank you, Mr. Macarthur. Was that the last commenter from the audience, oh we have another one. Please come right up to the microphone, sir, and state your name and affiliation and just begin your comment.

MR. TYLER SMITH: Good afternoon, my name is Tyler Smith, I'm a third-generation commercial waterman on the Rappahannock River, also Chesapeake Bay. I wanted to come up and just state the fact that in my lifetime of crabbing on the Rappahannock River I've watched a huge decline in multiple species.

I would urge the Board to know that we're talking about a fish that is on the lower part of the boom chain, so the catch of that fish is not just affecting itself, there are other species that depend on it. The Bay needs all those fish to come and do their part. If we knock out the menhaden, the menhaden population is getting too low as it is now, you'll stop getting your filter fish, which also filter the water and clean up the Bay.

The Bay is a big contributor to the whole east coast. A lot of our fish are migrating, there may be things up and down the coast, so I'll urge you all to also realize that the Chesapeake Bay is a nursery. A lot of fish, their early stage is born there and depend on being in that area to make it to their mature level to go up the east coast and do their thing. That is just what I wanted to shine a light on, and I appreciate you all hearing.

CHAIR CLARK: Thank you, Mr. Smith. Are there any other comments from the audience? Yes, sir. Right to the mic, state your name and affiliation and begin your comment.

MR. ED GARVICH, JR.: Hi, my name is Ed Garvich, Jr. I'm from Richmond, I'm here to support the Bay Defenders Alliance. A lot of these guys are my friends and their livelihood is dependent upon the natural resources in the Bay. I'm here to address the management of the Atlantic menhaden within

Virginia waters and the Chesapeake Bay, which function as a primary nursery for the Atlantic coast. As reflected in the Commission's 2025 assessment materials, Atlantic menhaden are currently assessed and managed as a single coastwide stock. The Commission has also acknowledged that existing assessment models cannot provide quantitative estimates of abundance, depletion or sufficiency of smaller, spatial scales, including within the Chesapeake Bay.

As a result, the current framework does not allow the Board to determine whether menhaden availability within the Bay is adequate to support predator demand during critical life stages. The Chesapeake Bay differs materially from offshore systems. It is a shallow, self-reliant and ecologically sensitive body of water.

Fishing activity within the Bay is inherently dependent upon its tributaries, and localized impacts cannot be assumed to average out at the coastwide level. While the Chesapeake Bay reduction fishery cap has served as precautionary measure, it is based on historical landings rather than ecological thresholds or forage demand.

The Board has also identified concerns related to the timing and concentration of fishing effort and its interaction with other fisheries within the Bay. This creates a management mismatch, which coastwide reference points are used to guide decisions in a nursery system that cannot be evaluated independently within the current assessment framework.

To address this mismatch, I respectfully recommend the Commission establish a mandatory Chesapeake Bay buffer for industrial menhaden reduction fishing, recognized at the Commission level and implemented through state action. Such a buffer would align offshore designated fishing practices with offshore environments and reduce concentrated ecological risk within the nursery. This would not constitute a prohibition on the fishery.

CHAIR CLARK: Would you please wrap it up, Mr. Garvich?

MR. GARVICH: Sure, I can. With a spatial management boundary consistent with ecosystem-based principals and the Commission's responsibility to prevent localized depletion. Once again, I appreciate everybody's time in listening to me. I hope these comments help you make some good decisions and thank you for your time.

CHAIR CLARK: Thank you, Mr. Garvich. Is there anybody else in the audience? Okay, not seeing any more hands we have at least one online, correct, and that is Tom Lilly. Well, we just said your name, Tom, so if you want to say your affiliation go right ahead, and then start your comment.

MR. THOMAS LILLY: Okay, my affiliation is with the Menhaden Organization that is seeking you all to reverse what you're doing. In May, this Board heard the Protective Options Workgroup report back that the best thing you could do for the ospreys and all the other wildlife in Chesapeake Bay was to stop the fishing in May and June. Now, another group, which did not have as its objective protecting the Chesapeake Bay, is going to be reporting. I know you can see from what they have in mind that they want to do exactly the opposite, remove the fishing from the summer, when most of the fish are being caught and the least damage is being done to our Bay, to move that into the spring, where it would cause the worst damage that it could possibly cause, and be in complete opposition to your first workgroup's recommendations, or to move it into the fall where they would be catching all the migrating spawning fish, the second worse thing that could happen.

What do we do? You have two workgroups that have reached 180 degrees opposite conclusions. If you just adopt what the second group says you will be leaving all the great recommendations of the first group on the table. Wouldn't it make sense for the Board to hold a hearing allowing both groups an

opportunity, and make a decision, take the best from what both groups have to recommend.

Another thought, maybe these groups could get together with a mediator and try and reach common ground, because as it is right now, I'm afraid that what you are going to hear later on today will be very destructive to the Bay. Thank you so much and you all have a wonderful day.

CHAIR CLARK: Thank you, Mr. Lilly. We have another online comment from Mr. Steve Atkinson. Mr. Atkinson, if you have an affiliation, please state it, and then begin your comment.

MR. STEVE ATKINSON: Yes, thank you, this is Steve Atkinson, I'm with the Virginia Saltwater Sportfishing Association. A couple comments. We know the stock has been overstated badly. We know that your own ERP science suggested the need for a 54% decrease in the TAC, and we know that the industry has been blocking funding for a menhaden study for at least three years now.

I just want to encourage the Board. You've heard a number of good comments here. I want to encourage the Board to act and lower the Bay cap by at least 50%. I think that is necessary to protect what is going on in the Chesapeake Bay. I would also like to note that the industry sometimes claims that if you pass this regulation or that regulation that they will be out of business.

If you look back at the industry's harvest in the Bay over the last decade, you will note that in three of those years over the last ten, they have only caught about 50% of their Bay Cap. Let me say that again, they have only hit about 50% of their Bay Cap in three of the last ten years. As far as I know, they are certainly not out of business and they certainly didn't lay off any employees during those years.

I think the idea that if you were to pass a significant reduction in the Bay Cap, the idea that somehow that is going to put them out of business, honestly makes no sense whatsoever. I just encourage the Commission to act. I appreciate you taking the time to hear these comments, and it's been a long time. I know there is discussion about more science. I don't think the Bay can wait another five or more years to gain additional science. We really encourage you to act now. Thank you very much.

CHAIR CLARK: Thank you, Mr. Atlkinson, that concludes our public comments. Many thanks to our commenters on behalf of the Board. We greatly appreciate you taking time to come up here and address us.

PROGRESS UPDATE ON DEVELOPMENT OF DRAFT ADDENDUM II FOR PUBLIC COMMENT

CHAIR CLARK: With that we will move on to our next agenda item, which is Progress Update on Development of Drat Addendum II for Public Comment, and I'm going to turn it over to James Boyle.

MR. JAMES BOYLE IV: At the annual meeting in October the Board initiated Draft Addendum II to develop options to distribute the Chesapeake Bay Reduction Fishery TAC more evenly throughout the fishing season, and to reduce the Bay Cap by up to 50%. The PDT met four times in December and January, but due to a delay in gaining access to confidential data the PDT was unable to complete the analyses necessary for the quota periods portion of this assignment in time for this meeting.

The memo in supplemental materials summarizes the PDTs work and seeks for its guidance to aid the PDT in continuing the development of the draft addendum. In the memo is a draft statement of the problem for the first portion of the quota periods. They looked to capture the Board discussion in initiating this action, in particular the statement highlights the delayed harvest in the Bay in recent years, and how that coincides with significant declines in pound net baith fisheries throughout the Bay.

Based on statements from the Board, the PDT is analyzing options that divide the Bay Cap into three, four and five quota periods, with no individual quota period exceeding one-third of the total Bay Cap. However, the Board also requested options that would shift harvest later in the season to protect menhaden ingress into the Bay.

The PDT notes that if it is to develop options that delay harvest that may require some quota periods to receive more than one-third of the Bay Cap and/or could involve periods of differing lengths or different sizes. This is a truncated version of Table 1 in the PDT memo for visibility on the slide, and also to approximate the range of the reduction fishing season, which starts on the first Monday in May and ends on the third Friday in November.

On the right you'll see the average proportion of annual landings reached by the reduction and pound net bait fisheries by each week of the year, with some 2026 dates that serve as an example of where those weeks fall on the calendar. The landings are averaged from 2018 and 2024 to represent the time period since Amendment III set the cap at its current level of 51,000 metric tons. In the middle are what quota periods could look like to distribute the reduction harvest in equal proportions in three, four and five quota periods.

The PDT notes the logistical difficulty in monitoring quota effectively over short periods due to lag time in reporting and processing that data, and recommends removing the five-period option, where you can see periods in the column is as short as three to four weeks. In working on these issues, the PDT developed three questions for feedback, and I'll have a slide with all the questions at the end of the presentation, so we can use them before the Board begins their discussion.

One is that the Board wants to maintain a maximum of one-third of the cap in each quota period or in one quota period. Similarly, does the Board want to maintain equal season lengths, or can unequal season lengths be considered? Lastly, does the Board want to maintain a five-period option? Additionally, the PDT is considering developing several options regarding in-season rollover and overages. Regarding rollover, the range of options the PDT had discussed include no rollover, a proportional rollover, where the unused portion is divided equally between the remaining quota periods, and a delayed rollover, which shifts any unused quota to the last quota period.

Then for overages the PDT is considering a full pound for pound payback in the subsequent quota period, and also a full payback distributed equally throughout the remaining quota periods. For this topic, the PDT developed the questions. First, if the Board chooses to maintain the stipulation that no period may exceed one-third of the cap, does that limit include rollover if rollover is to be allowed?

Second, are there any other additions or subtractions for the range of options the Board would like considered? The Board did not previously provide any guidance on rollovers or overages for this topic, and so the PDT put these together to consider what would the full range of possibilities be.

They are, of course, open to more Board direction on what the Board would like to see in that topic. The second portion of the memo focuses on the reduction in the Bay Cap, include a statement of problem that references the precautionary nature of the Cap, its current level, and the intention of the Board to reduce it by up to 50%; in response to cuts to the coastwide Cap.

Once the options are included in a draft addendum, the Board will, as a note, have the ability to choose anywhere within the range of options, but for analysis and public consideration the PDT has drafted five options between the status quo, which is not listed in the memos, it is implied, and the requested maximum cut of 50%.

Those options include a cut of 10%, 20%, 30%, and finally 50%. The 10% option may be adjusted during

analysis and represents a smaller cut that may result in a larger reduction in the Cap, depending on the Board's decision regarding quota periods and rollover. If the Board does not allow for rollover between quota periods, and a period is underharvested, then the unharvested portion may act as an additional reduction in the Cap.

The 20% option matches the lasts cuts to coastwide TAC. The 30% option creates an additional buffer to account for the uncertainty of menhadens abundance within the Bay, and the 50% cut being the most conservative measures requested by the Board. During PDT discussions the PDT did note that a mechanism to revise the Bay Cap based on changes to the Cap may be useful.

The PDT also recognizes that the Board already discussed this topic at the annual meeting, but it did come up during our discussions of specific options. On the slide here will be a summary of the PDTs questions for all the topics, and I am happy to take any questions or further direction from the Board.

CHAIR CLARK: Okay, before we go to comments on direction for the PDT. First, I just want to clarify, James, that this is just going to be advice to the Plan Development Team, so there won't need to be any motions here, right. This is just Board consent as to what we want to see the PDT work further on. With that, shall we take these one at a time? Shall we start with probably the easiest one, which is do we keep the five divisions of the year in that one option there, or just remove that one totally? Any comments on that? Nicole, Ms. Costa there, go right ahead.

MS. NICOLE LENGYEL COSTA: First, I just want to thank James and the PDT for putting together the memo, and I think we have talented people on the PDT, so I am very trustworthy in the options you guys are going to come up with. But I did have an overarching question about the intent of the addendum and the quota periods. I think you mentioned on your first slide that it was the task to distribute the Bay Cap throughout the fishing season more evenly.

But when you look back at the motion, the motion was specifically to develop periods for the Bay Cap that distributes fishing effort more evenly throughout the season. It appears from the memo all the options the PDT has explored thus far focuses on harvest. Do you plan on also presenting options for effort, since effort is not always synonymous with harvest?

MR. BOYLE: My recollection of the discussion at the annual meeting regards there was a discussion on the definition between effort and harvest, and the clarification was that the word effort was to be synonymous with harvest as it was preferred to be on this meeting.

The intention we took from the Board was that the meaning was for harvest, to use landings as an indication of effort. While we would like to see some different options regarding next steps or something like that, then that can also be considered. But that is not the direction that we understood it so far.

CHAIR CLARK: Follow up, Nicole?

MS. COSTA: Yes, thank you. I think that's fine. I think it might be helpful to even include just a table that has average net sets for each sub period, just so we can see how effort does compare to the sub periods, if possible.

CHAIR CLARK: Thank you, Nicole, and I apologize, I should ask for questions first. Are there any other questions for James about this before we go into recommendations? Okay, I'm not seeing any. In that case, can we go back, oh sorry about that. We did have a question online. Go ahead, Mr. Minkiewicz.

MR. DREW MINKIEWICZ: Looking over this, I'm trying to figure out, well what is the problem we're trying to solve, and so then that can sort of guide us on how to best lay out different options to solve

that problem. Looking at the data provided on the catch rates between the reduction fishery and then the pound nets.

If since it was put forward that the reduction fishery is not negatively impacting the catch rates of the pound net fishery. But if you look at the graphs for the pound net fishery, especially in the '22 and '24 years they seem to be the ones of most concern. They seem to be pretty constant throughout the year once catch starts, and there doesn't seem to be a change in catch rate after the reduction fishery catch rate, so it starts off basically zero for the first part of the year, and then ramps up. Am I reading this correctly, or would you expect to see a change in catch rate if there was a relationship between the catch of the reduction fishery and the pound net fishery?

MR. BOYLE: I think you're referring to some of the figures in the memo. The PDT did note these are as included in the table in the slide that they are looking at cumulative catch as a way to cover for confidentiality, so these are not referring to overall landings. While they do talk about catch rate it is not including the fact that landings overall are significantly lower in '23 and '24, especially compared to previous years.

MR. MINKIEWICZ: No, I understand that landings are lower, but if the reduction fishery isn't fishing, then they wouldn't be impacting landings, correct? Then when the reduction fishery starts fishing, you don't see any change in the catch rate. What does that tell us?

MR. BOYLE: I will look into the catch rates and have a question for them; I am happy to do some further analysis.

MR. MINKIEWICZ: That would be great. I think that would be really helpful, because from my impression, you would expect to see a difference in the catch rate, you would see a different slope for the curve once you go from no fishing or no catch in the reduction fishery to an increased catch in the reduction fishery. If there was an impact you would expect to see a difference in curve, right? I think some more analysis for everybody; I think that would be really helpful in trying to address these issues.

CHAIR CLARK: Thank you, Mr. Minkiewicz, any other questions? Nicole.

MS. COSTA: I just had a question on the number of sub periods. The PDT is recommending removing the five-period option, because there would be one sub period with three weeks and one sub period with four weeks. However, the four-period option also appears to have a sub period with three weeks.

Did the PDT discuss the minimum number of weeks that they would recommend be in a sub period in order to be manageable? I guess we would have to consider the quota reporting from the states, which I think at the minimum level for Virginia is they are doing daily reporting, but submitting reports weekly. Would it be four weeks is enough or five weeks?

MR. BOYLE: The PDT discussed it on our most recent call, and while they are hesitant to put forward a definitive number, we're still looking to some analysis for that. I do think a starting point would be five weeks; from other discussions we've had outside the meeting. But that is not set in stone, that is kind of rule of thumb we're going off right now as we can take a look at it.

CHAIR CLARK: Follow up.

MS. COSTA: Did they also discuss removing a four-period option in that case, since you would have one sub period with three weeks?

MR. BOYLE: No, I think it depends a lot on what is the type of option being developed. In the example there is a shorter period there, but also it depends on like how you are distributing that harvest as well, and if the periods can be changed in length and shifted around. Reflect ability of the one-third also could affect that as well.

CHAIR CLARK: Question from Allison Colden.

DR. ALLISON COLDEN: Thank you for putting this together and to the efforts of the PDT, and James, for your presentation. With respect to the quota period options that are currently included, do you have any further information on how those breakpoints were determined for the quota periods? How were those specific dates throughout the season chosen to switch from one quota period to another?

MR. BOYLE: Those represent equal or as close as possible within a week, equal distribution of harvest. For the three-period option, the first period would be a third of reduction harvest, the second period would be a second third of reduction harvest, on the average from 2018 to 2024 and then the last period being the last third and then 21%, 20%.

DR. COLDEN: Just for clarification. This is all based on current operations of the fishery, how it's currently working?

MR. BOYLE: Yes.

CHAIR CLARK: Any further questions before we start commenting on the options themselves? I'm not seeing any, so why don't we go back to what I jumped the gun to before, which is, what does the Board think about the five-period option? Rob LaFrance.

MR. ROB LaFRANCE: Thank you, and I also want to thank James and the whole PDT for everything they put together. I am open to looking at something other than the one-third cap, and that is the question we're trying to take a look at. What I guess I'm trying to understand is two questions.

One is, is this all going to begin in May? My things were all maybe a little bit different from what you're presenting now, there were some zero periods there. But I'm assuming we're starting in May and then going a third, a third, a third, depending on which years you go, is that right?

MR. BOYLE: Yes, so the PDT, in the table is the whole calendar year, but the fishery only operates between May and November, so the PDT is looking at that range specifically for dividing it up throughout that whole range.

MR. LaFRANCE: Thank you, and so in general comments, I would be very open to taking a look at a more heavily weighted last period. Rather than just looking at a third, a third a third, maybe look at 25, 25, and 50 as another alternative to take a look at, because part of what we're trying to do here, I believe is to allow the ecosystem the time for some of these fish to grow and become bigger and become available for other harvest methods. I would be interested in looking at these perspectives with a 50% last period.

CHAIR CLARK: Okay, so you were addressing question number one up there on the quota period. I had jumped to number three, I see, but if people would rather discuss question number one that is fine too. Any other comments on this? Come on, somebody has got to have opinions. Doug.

MR. DOUGLAS E. GROUT: Yes, I would look at, I would be okay with getting rid of the five-period option. I think to give the PDT and the Board the flexibility of having different options. I would also not constrain them with the maximum of one-third of the cap in these quota periods, because if we went to something like what Robert suggested, 25, 25, 50. That would mean that middle period would be even shorter than five weeks, likely, which may be beyond what we can really monitor for our quota landings.

MR. LaFRANCE: I'll just respond by saying, that's what I guess I would like to see. I am trying to get a better feel for the fact that rather than a third, a third, a third and what that turns out to. I would like to look at other options, right. If it turns out that that is a problem, we'll at least know that the PDT can give us alternatives other than a third, a third a third. My 25, 25, 50 was just one example of

that. For clarity, I hope that was clear that I am looking for alternatives within that, not for the PDT to be constrained by a third, a third a third.

CHAIR CLARK: We got it, Rob, thanks. Yes, Joe Grist.

MR. JOSEPH GRIST: Just wanted to point out, just because of how we receive the daily, count the daily reports every week, oftentimes by mail. The more periods we build this into is going to make it more difficult for us to sit there and track a very small quota period and do the projections before the next on where we're going.

There may be some additional issues here, logistically for us, the tighter you make this to do it. But without us having to maybe change how we do our operations and actually spend some money, which I don't have right now, to make some type of upgrade to the system. Just something to keep in mind, the logistical side of us managing what is being asked for here could be a challenge, the more challenging we make whatever ends up in this addendum. You know, just want to point that out.

CHAIR CLARK: Joe, just to clarify. Are you saying the more periods the more challenge, but the amount of quota per period. Would that present a challenge also, or does that not matter? Just following up on what Rob said.

MR. GRIST: If it's a set amount. I think it comes down to provision and whether there are rollovers and how we deal with overages and everything else. We have to adapt to respond to what we're looking at too. But just the devil is in the details here. I'm just making that out. I'm not sitting here saying one way or the other on the five and three and four, I'm just saying the more complicated you make this the more complicated it becomes on our end. I just don't know what that means for us. We have to actually be able to implement it if we do something like this. We don't want to be set up for failure.

CHAIR CLARK: We have a couple of online comments, first is Drew Minkiewicz.

MR. MINKIEWICZ: I appreciate this, Mr. Chairman. Looking at this in permission in front of us right now. Over the five years, you know with the last two years there seems to be a significant change in the catch rates of the reduction fishery within the Bay. Fish seem to be entering the Bay later and staying longer.

You see significantly more catch later in the season in the last couple years, and significantly less than the beginning. With this change coming out, and this change seems to be part of the impetus for this addendum. I think it is in our interest to have a broader set of options to try to really hone in on what maybe is the new reality of fishing in the Bay.

I think the third, the third and third is probably too restrictive given this change, and now we should look at different options and be creative in how we look at it, to best address what seems to be maybe two years is a blip, but maybe this is the future of the fishery going forward. I think we need to be able to give ourselves the tools to address that new reality.

CHAIR CLARK: Just to be clear, you're talking about not limit each period to a third, but you're not commenting about the number of periods.

MR. MINKIEWICZ: Correct. I'm really of a belief of more of an all of the above strategy here of really putting out a lot of different ideas. This is a unique situation, it's a new process for this fishery and we seem to be going through changes. But I think that all screams for more options rather than less.

CHAIR CLARK: Next up we have Emerson Hasbrouck.

MR. EMERSON HASBROUCK: I've actually had my hand up for quite some time here. I initially raised it when Drew was talking, I don't know ten minutes or so ago about pound net landings, and I wanted to ask a question and make a comment relative to pound net landings.

But we've already moved into trying to address the questions that we have here from the PDT. Rather than disrupt the flow right now, Mr. Chairman, please come back to me before this agenda item is over, so I can raise that issue that I wanted to raise about ten minutes ago. Thank you.

CHAIR CLARK: Will do, Emerson. Okay, anybody else. Nicole.

MS. COSTA: Yes, given what Mr. Grist just said about the feasibility of managing sub periods, I think I would be fine removing the five-period option. But I also wonder if the PDT discussed or maybe there is Board interest in looking at periods that are equal lengths in time not equal distribution of harvest.

MR. BOYLE: The PDT hasn't reviewed that possibility yet, but is certainly open to the Board directing on that.

CHAIR CLARK: At this point, just to summarize, we're looking at, it doesn't seem like there is any objection to removing the five-period option, but for the three or four period option we want to look at varying amounts allocated per period and also varying amount of time per period. Was that it, Nicole?

MS. COSTA: It would be equal length of time, so for example with the three-period option you could have each period have nine or ten weeks, a four-period option they would be seven or eight weeks long.

CHAIR CLARK: Oh, I see. Instead of assigning the quota per period it would be more like the period itself would determine how much quota would be caught in that period.

MR. COSTA: Yes, I think James has an understanding.

CHAIR CLARK: Very good, very good. We've got that. Going back to the Board, any other comments? Mr. Luisi.

MR. MICHAEL LUISI: I support what Nicole just said. I think not only on the five-period option, I think we can get rid of that. There is no objection from me on that. Looking at the way that the periods are in the document now, the first one that we're looking at, which is the three period option.

If that is reflective of the current state of when those fish are caught, and you have some periods that are long and some periods that are short. To me it doesn't address the need to take the time periods that are the hot spots or that the focal point of when that fishery is being prosecuted and spreading it out over time.

In my opinion, that first option, that three-period option isn't doing anything to spread out catch over time, especially if there are rollovers that we'll have a discussion about at some point. But I do agree that if we were to establish consistent nine- or ten-week periods for the entirety of the season and then use the one third, one third, one third approach within that type of setup.

Then we would be essentially taking what right now is a six-week quota period in the summer, which is a critical point in time for the Bay. It takes that six weeks, it takes that one-third of the quota that has been caught during that time in recent years and spreads it out into ten weeks. The local depletion and the effort that is going in at that time then gets diffused into more time.

I agree, I think that is something that the PDT should develop and work on. I know you're not working on doing consensus right now, but if we get to the point where we need a motion, I would be happy to make a motion about that.

CHAIR CLARK: No, we don't need motions and we're just looking for advice right now that the Board agrees to. I think everybody has been pretty much in agreement with what we've got so far. We're still working on these first two questions. Is there any further comment here, and I believe Emerson wanted to come back in on this one, if there are no further comments. I'm not seeing any

around the Board, so Emerson why don't you go ahead again.

MR. HASBROUCK: What I wanted to briefly discuss here is, James there was a graphic in the PDT memo that showed pound net landings over time. Do you have that available?

MR. BOYLE: I don't have it in the slides, but I do have the memo open to sort of see what you're referring to.

MR. HASBROUCK: Can you share that on the screen, or no?

MS. KERNS: It's going to take us a minute, but we 'll get it up there, Emerson, if you want to start talking about it.

MR. HASBROUCK: It would be easier to talk about it, I guess, if it's on the screen. What I wanted to mention, and I'm mentioning it now because it is in the PDT memo, is that if you took the inshore Bay pound net landings for New York, as well as the inshore Bay beach seine landings, both for menhaden, and overlaid it on the graphic you have for Chesapeake Bay pound nets for the different states, it would correlate quite well.

Yes, if you overlaid the New York pound net and beach seine bait fishery over that graphic, starting, yes in the 2021, 2022 timeline when we were up at around 4 million pounds in New York, and now we're down to less than a half a million pounds, it would overlay perfectly on that graphic. Again, I'm raising the issue now, because it is in the PDT memo.

I think something else is going on here. I mean it certainly may be related to the reduction fishery in the Chesapeake, but this issue goes beyond the Chesapeake. I'm going to raise it in the agenda item in a little while here on the TC presentation on environmental issues, but I just wanted to kind of queue it up here, because this graphic was in the PDT memo. Just keep that in mind, I'm going to raise the issue here in a couple minutes again.

CHAIR CLARK: Back to the table here and I see Allison Colden.

DR. COLDEN: I had another comment that was more related to the statement of the problem for this portion of the PDT memo, so I was wondering if I could share that at this point. It wasn't related to the question.

CHAIR CLARK: Sure.

DR. COLDEN: Emerson actually set it up pretty well. The PDT does show pound net landings as well as reduction fishery landings and then obviously Table 1, which we've been looking at with respect to development of these quota periods shows cumulative harvest over time. What I think is missing here, which was really part of the discussion at the last meeting that kicked off this addendum is the catch-per-unit effort information that was included in the Chesapeake Bay Workgroup Report, which obviously since we have that information, I think is more informative than the cumulative landings on their own or the harvest the catch on its own. I did think the statement of the problem was a little bit light on the bait fishery side of the description of some of the CPUE data that we reviewed at the last meeting, so I would love if that could be expounded upon in the next draft of the memo. But it also suggests that we include some of that information in addition to or in place of things that are just looking at catch alone or effort alone, because I think it is more informative. Similarly, you know we're looking at cumulative landings.

But what is not reflected there is the quota attainment, and that is what has been absolutely abysmal for our pound net fisheries, not just in Maryland but also with PRFC and Virginia, which is shown in that graph. I think it tells a more holistic picture if we can add a little bit more of those data pieces in there in the background and statement of the problem.

CHAIR CLARK: This would be in addition. The PDT would include this in the next memo; any document would have the CPUE and the attainment of quota. Okay. Anybody else have comments? For the PDT on this issue. We have online Drew Minkiewicz. Go right ahead, Mr. Minkiewicz.

MR. MINKIEWICZ: I would also ask that the PDT include historical numbers of pound net fishery participants. I believe that is publicly available information, because I think we need to get the whole picture. It would be interesting to see just how many pound nets are being tended to, how many people are participating in the fishery as well.

CHAIR CLARK: Okay, so these are all additions to any draft addendum, correct, James. Got it. Back to the quota periods. Do we have enough direction here for the PDT? We can move on then to overages and rollovers. Now let's move on to the last two questions there, the overages and the rollovers. What is the will of the Board on this one, any hands? Okay, Rob LaFrance.

MR. LaFRANCE: I do want to see an additional question that I don't think was added in, I think we're in the right section now, is when you take a look at the portion in the middle, talking about overages and paybacks. The PDT can consider an option for overage, how it should be paid back in the event the fishery exceeds the sub allocation. You have payback, you have payback, but you don't have an option for no payback.

I guess my point would be is if you were over in a particular period, I would like to see the option of if you were over, you've lost that from an allocation, you don't get to get that back. I guess that would be more in the overage section. I would like to see that option considered. If you go over in the period that you are there you lose that allocation. That is what I would like to see happen.

CHAIR CLARK: What do you mean lose? The payback would mean like in the next period you would have less. It would come out of the next period's quota.

MR. LaFRANCE: You're deducting it from the next period's quota, maybe I'm misunderstanding.

CHAIR CLARK: Right, so the payback would be if you go over in this period the Board could say, then you will pay it back in the next period or the next two periods. Similarly, if you are under quota, do you want a rollover to allow them to get more to the next period or the next two periods.

MR. LaFRANCE: I guess I'm not being clear, but what I am trying to say is, you shouldn't be allowed to go over in that quota, in that quota period, because that is defeating the purpose.

CHAIR CLARK: Right, well I mean that is why there is going to be sub quotas, but as we know at times quotas do get exceeded for various reasons. That is why we're asking whether it should be payback or rollover. Nichola Meserve.

MS. NICHOLA MESERVE: On the subject of the overage paybacks. The two options presented here don't really address if there were an overage in the final period, would we want to roll it forward or take it off of the next. It seems like it's missing an option that would apply the payback in the subsequent year.

CHAIR CLARK: Would you like to suggest that we add that? So that should be added to the PDT direction and Dave, did I see your hand?

MR. DAVID V.D. BORDEN: I would think if there is an overage you apply it to the remaining periods equally, and Nicole can correct us if this is wrong. I think that is the process we use in the state of Rhode Island. It's part of overages, but I think that is an entirely separate issue, just has been pointed out we need to discuss that.

CHAIR CLARK: Just to clarify, you're saying that if there is overage in period one, for example, then

you take an equal amount out of periods two and three if there were three periods. Okay, just want to be clear on that. Any other comments? Joe Grist and then Megan Ware.

MR. GRIST: Just to clarify, we already have the regulations about payback of Bay Cap if there is any overage in a year they have to pay back in the next year. That is already in our regulations. That is pretty standard. They just can't have an overage and not have to pay it back. They have to pay it back the next year.

CHAIR CLARK: In this case then, if the overage was in the last third of the year it would be taken off the first period in the next year.

MR. GRIST: You're talking about the management of both basically sectors, and then overall end of the season. The overall end of the season is the ultimate overage. If there was an overall overage at the end of the year, it's going to have to come back out from the next year.

CHAIR CLARK: No, I get that. I think the point was, just wanted to make sure that would happen, and so what you're saying is it will happen.

MR. GRIST: Yes, it's already in our regulations.

CHAIR CLARK: We don't need to belabor that point now. Megan, you're up and then Allison.

MS. MEGAN WARE: I'm wondering if James could maybe just provide a little more color to the PDT conversation on rollovers and overages, because my sense is rollovers to the subsequent period or paybacks in the subsequent period allow for more bunching of landings, as opposed to trying to spread that out equally, if that is the goal of the addendum.

MR. BOYLE: Yes, I understand that concern. I think mostly the PDT, since there was no Board directive we were trying to think of all the different possibilities and put them out there for the Board to consider and remove if some didn't seem to fit the intention of the addendum.

MS. WARE: Yes, also I think the combination of options here could result in a situation where you could actually bunch quota quite easily into one period versus another. That may be something for the PDT to consider, in terms of how these options can be paired together.

CHAIR CLARK: Did you want to suggest something, Megan? Something to be taken out or something to be considered? Just ask them to look at the bunching possibility.

MS. WARE: I think it's more the combination of options, so I don't have anything to take out at this point, but just raising that as a concern.

CHAIR CLARK: Allison.

DR. COLDEN: I realize this may be a violation, since you just said we don't want to belabor this point. But I think it's important to clarify Nichola's suggestion, and then the response from Joe, because I think we're talking about two different things. Obviously, the FMP includes the stipulation that there are no rollovers for an overage of the overall Bay Cap from year to year.

But I believe, and please correct me if I'm wrong, Nichola, but what you were suggesting is that within the final quota period if there is an overage, regardless of whether or not there is a total overall overage of the Bay Cap, that that last period quota overage would be taken off the front side of the following year. I think there were two different discussions happening with respect to the regulations, and perhaps what I thought was being suggested.

CHAIR CLARK: Oh, I see what you were saying. In other words, like periods one and two were under, but period three was over and then that would be taken off. In that case, there would be no rollovers, but an overage in the final period would still count as an overage that would have to be accounted for

in the following year. Got it. Further comments, suggestions? Nicole.

MS. COSTA: Going back to that, I think there are multiple ways to achieve that. When you have an overage in the last sub period, you can either A, take it off next year's annual quota or TAC and then just distribute your quota throughout your sub period based on your allocations for each sub period with what you have remaining for your quota.

The other option is if you have an overage in the last sub period then you can penalize the last sub period in the following year. You could always just take it out of the last sub period the following year. I do think that is something that needs to be thought about a little bit more, as there is not just one way to do it.

CHAIR CLARK: Yes, so there are plenty of options for the PDT to develop here and Nichole.

MS. MESERVE: Just to clarify, I think that could potentially be an option for each of the sub periods, but it wouldn't be paid back in that year, but it could be the next year for each sub period. I don't know if the PDT already ruled that out for some reason. Maybe I'm missing something. But if that could just be something to discuss and see if that is a viable option as well.

CHAIR CLARK: Okay, James said they did not rule that out, so that is a valid option also, Nichola. Then Rob.

MR. LaFRANCE: I think Nichola was going to what I was trying to get to, which is if the overages are in a particular time of year, having them in the next year at that same time makes sense. I'll also propose something, which may be beyond our possibility of discussion.

But should there be a penalty when you go over, so that you don't get all of that overage in the next year or in the next period? Taking it out of sequence gets to I think the issue that Megan was talking about. You are scrunching those takes all in one timeframe, and there should be a disincentive for that not like a neutral impact.

CHAIR CLARK: Right, I think that point has been made, Rob, that they will look at bunching on that. I think we've gotten a lot of ideas here, suggestions for the PDT, but we're still on the second set of questions there about the overages and rollovers, so is there any further suggestions for the PDT about the overages and rollovers?

I am not seeing any, and I believe we've already taken care of well, just the number two there, James, other options the Board wants added/removed. Is that just specific to the rollovers/overages or is this in general anything else that anybody thinks has been missed on the option side?

MR. BOYLE: It was referring to the overage and rollovers, but we seem to be having a lot of feedback here that is really helpful. But certainly, if there is anything else remaining for other options also, happy to hear that, including for the percentages as well if they want to see further options for analysis. The PDT figured the 10 to 50 divisions was sufficient.

CHAIR CLARK: Okay, so I guess in that case we can move on to the Bay Cap reduction options. That was a question though, right, was whether we wanted to retain all the Bay Cap reduction options or to remove a couple of them. I think they went from 10 to 50 percent reductions.

Just looking to the Board, any thoughts about the Bay Cap reductions? Okay, seeing none; we'll just keep in all the options that were in the PDT memo. Okay, well the timing. James has corrected me; we have covered it all. Before we leave this agenda item, I just want to ask for one final chance to make a comment and Rob LaFrance.

MR. LaFRANCE: I do think there was some discussion at the beginning of this about whether or not we wanted to talk about the relationship that

when the coastwide cap TAC is reduced, whether that would also have sort of a relationship with the Bay Cap. I just raised that, because I thought it was part of the conversation.

I am also interested, because right now the Bay Cap is independent of the coast cap. I guess we'll be looking at that in the options, because we'll have a 20% reduction in the Bay Cap as an option. But tethering those together into future TAC reductions is something I think we should at least be considering.

CHAIR CLARK: Is that something that requires more than just a single addendum?

MR. BOYLE: Yes, that was definitely something the PDT had talked about. As we talked about at the PDT, it was something that the Board had discussed and voted down at the last meeting, but it is something the Board could, if they are interested in bringing it back again that is certainly a possibility.

The PDT thought it would be efficient in some ways, especially considering the time it takes to implement a new Bay Cap within the addendum process to have it set in some other fashion that was quicker or tied to the TAC in some way. As far as instruction from the Board, the PDT knows the Board has turned that down for now, unless it was reconsidered.

CHAIR CLARK: First, I'll go to Nicole.

MS. COSTA: Since the Board voted that down at the last meeting, is that something that would require a motion with two-thirds to revisit?

MS. KERNS: No, it would not be two-thirds at the new meeting, it was not final action.

CHAIR CLARK: Just to refresh. The reason that we didn't pursue that was because linking the two would go back to the amendment. What was the?

MS. KERNS: I would have to go back through the minutes, unless James remembers what the rationale was for why. But Lynn provided a rationale, I believe. There is nothing in the document that wouldn't allow it to be linked to the TAC, and then it would go up and down proportionately with the TAC.

CHAIR CLARK: Okay, I thought there was something, I guess I'm misremembering, but Roy Miller.

MR. ROY W. MILLER: Can you clarify for me what relationship there is of any to reductions in the Bay Cap with regard to the coastwide Cap? In other words, if there is a Bay Cap, additional Bay Cap of let's say 20%, is the coastwide Cap affected by that or can they make up the difference by adding on to the coastwide Cap?

MR. BOYLE: They are not linked in any way. The 51,000 metric tons of the Bay Cap is a subset of the coastwide TAC but it just limits how much is caught in the Bay, so the TAC changes independently of the Cap and vice versa.

CHAIR CLARK: We have Drew Minkiewicz online.

MR. MINKIEWICZ: I just want to follow on that point. Is the purpose of this portion of the addendum somehow link the Bay Cap to the overall coastwide Cap? You just talk about this reduction and the cap has been in place for 20 years, the overall coastwide cap has gone up and down in that time, and this is sort of ratcheted down over the years.

But what is the intent here, is it to just reduce the Bay Cap full stop, or is it to somehow link it to the overall coastwide cap, and then that really should be something where it rises and falls as the coastwide cap does, which established before us. Being new to the Board here I just wanted some clarification on that, because I am not understanding the rationale behind this, if it's not just to the coastwide cap then let's link it to the coastwide cap.

CHIAR CLARK: Right, so the options we're discussing here, Drew, are that the PDT has percentage reductions of the Bay Cap itself and the question came up here that we're now talking about is whether the Bay Cap should be linked to the overall TAC. For right now that was not put into the list of items that the PDT was considering, and based on the conversation now, I don't believe we are adding that, or am I wrong? Does anybody want that pursued further?

MR. LaFRANCE: Since I raised the question, I'll just respond. I apologize, I just raised it as a point of reference, historical consideration, not that it needs to be part of the current process. I think the current process is moving along well and I think we need to allow it to continue, before we try to make the link or not or not make the link.

MR. MINKIEWICZ: Just some point of clarification, sorry, Mr. Chairman, if you can indulge me. The point of this Addendum is to reduce the Bay Cap, just for the sake of reducing the Bay Cap. That is all we're doing here.

CHAIR CLARK: Yes, there are options to reduce the Bay Cap without it in relation to the TAC, correct. Anything else, or have we completed this item? It looks like we have completed this item. Thanks everybody for the good discussion of that. Now we move on to Item Number 5, which is the Advisory Panel Report on 2025 Single-Species and Ecological Reference Points Stock Assessments. Meghan Lapp, the Chair of the Advisory Panel will be giving us a report on that, so take it away, Meghan.

ADVISORY PANEL REPORT ON 2025 SINGLE-SPECIES AND ECOLOGICAL REFERENCE POINTS STOCK ASSESSMENTS

MS. MEGHAN LAPP: The Advisory Panel met on January 8. We had 3 AP members in attendance. One additional AP member commented via e-mail after the meeting. I will point out that we have 18 AP members, but only 3 attended. Repopulating some of those dormant seats might be something that the Board wants to consider. We did have a lot of members of the public who attended. We had 14 members of the public in attendance, and we reviewed the results of the 2025 Ecological Reference Points stock assessment and the single species assessment update. We had 2 AP members who advocated for maintaining the 2026 TAC for '27 and '28, and rejecting further cuts to the TAC. One AP member recommended that for the next ERP benchmark assessment a multispecies statistical catch at age model would be considered as an alternative to the current MICE model.

One AP member noted that none of the surveys included in the assessment occurred north of Rhode Island, but observed increased availability of menhaden in Massachusetts, kind of suggesting that the biomass is larger than what the assessment is considering and advocated for reallocation of quota to the New England states, citing bait needs while supporting the ecosystem model.

No motions were made for lack of a quorum. We had 6 public comments. There was general support for preventing future cuts to the TAC. We had general support from the public for considering reallocation to New England states, particularly Maine, raising the bait issues there. There was also public concern that the surveys used in the assessment don't occur north of Rhode Island, and most of the public commenters came from Maine, and they said that there was a lot of fish in that region.

They also raised concern regarding lack of coastwide and/or state quota utilization. There was some discussion about that. And so suggested that if we do have another AP meeting on anything to do with reallocation it would be useful to have that data in front of us, so that it isn't just folks' kind of making allegations, but we actually have some numbers that we can discuss. That was basically it, I am happy to take any questions from the Board.

CHAIR CLARK: Any questions for Meghan and the AP Report?

MS. MESERVE: Not a question, Mr. Chair, but a comment if I may. I just wanted to support the Advisory Panel's request to look at the quota utilization trends and have a meeting prior to the Board's October meeting, when we'll have the reallocation revisit on our agenda and some Advisory Panel input would be helpful for that discussion.

CHAIR CLARK: Any further questions for Meghan? Not seeing one. One of the comments that came up had to do with the methodology used in the multispecies assessment. Katie, would you be able to address that?

DR. KATIE DREW: Sure, the recommendation was to continue development of the multispecies statistical catch at age as opposed to the EwE model that we currently use, and I think the intent of the Committee is to continue developing sort of supportive or alternative models as we go forward.

You know we struggled a little bit with the multispecies statistical catch at age in incorporating the true bottom-up effects of menhaden on the predators and not just the effective predators on menhaden. That's why it has never kind of been the final model to choose, but there are definitely some benefits to that model that if we can get this linkage more robustly developed that we would certainly consider that from the table as we go forward.

CHAIR CLARK: I know we've been talking about it through the past several multispecies assessments. Is it getting closer or is it still one of those so difficult that like going to Mars it's five years in the future?

DR. DREW: We've made progress, but I would say yes, it's not clear to us if we will have something that could pass peer review by the time we get to the next assessment, especially not something that fully incorporates the spatial dynamics that the Board is interested in.

I think we certainly understand the APs interest in that, and we agree that there are benefits to that type of modeling framework. If we could get it to work that would be beneficial down the line, so we'll continue to work on it. But we just want to maybe set expectations that it is definitely a real challenge for this system.

CHAIR CLARK: We'll probably need a dedicated data center just to process all that. We don't have the electricity, sorry.

PROGRESS UPDATE ON TECHNICAL COMMITTEE TASKING ON CHANGING ENVIRONMENTAL CONDITIONS

CHAIR CLARK: Next up then we have Progress Update on Technical Committee Tasking on Changing Environmental Conditions, and that is Technical Committee Chair Caitlin Craig, and Caitlin, are you ready to present?

MS. CAITLIN CRAIG: Today I will be discussing the progress of several tasks that were assigned to the TC by the Board at prior meetings. The first of these tasks was to one, evaluate the information available from NOAAs Ecosystem Dynamics and Assessment Branch and Chesapeake Bay Office, and the Woods Hole Oceanographic Institution, to evaluate the possible effect of cold water on the Continental Shelf on menhaden migration and migratory patterns, particularly in relation to the timing of osprey arrivals, nesting and breeding.

The second is to consider what role water temperature, dissolved oxygen levels, shoreline hardening and other environmental factors play in the local abundance of menhaden and other forage species in the Chesapeake Bay. The TC met in early January, and we discussed several different avenues to take in pursuing this task, including a literature review, a correlation analysis and a spatial distribution model.

But upon weighing out the pros and cons of those three different approaches, the TC came to a consensus that at this time it makes the most sense to move forward with doing a review of the existing literature. The topics of this literature review will include cold water patterns in the Bay and the Coast, for example looking at ecosystem reports.

Timing of osprey arrival, nesting and breeding, menhaden preferences for temperature, dissolved oxygen and other environmental factors and other forage fish environmental preferences, including Atlantic herring, river herring, bay anchovy and some other species if applicable.

The TC will have a follow up call in mid-March, where we will discuss the findings from this literature review, and then the plan will be to update the Board with these findings at the 2026 spring meeting. The second task that was discussed by the TC was to review the current bait sampling requirements that are in place. This was brought about by the states asking if the current bait sampling requirements are still appropriate. ASMFC staff replicated the 2012 analysis, and then this resulted in the recommended sample sizes being higher than what was recommended in the original 2012 analysis. For the New England and the Mid-Atlantic region, it was pretty close to the current sampling requirements of the 10 fish per 300 metric tons, but for the Chesapeake Bay the results were much higher sampling requirement.

The TC discussed that they would like to explore additional analysis, including what was done by Nesslage et al. and then used to revisit the reduction fishery sampling requirements. One issue that was discussed by the TC was that menhaden bait aging is currently in transition to the state aging labs from the NOAA Lab in Beaufort.

There have been some delays in fully moving aging to the state labs if the aging exchange and the aging workshops have resulted in a lot of variance and discrepancies and in ages across labs. The work on improving consistency across labs is still ongoing, and we are making progress but it hasn't been finalized, so the states have not fully taken over aging.

The TC discussed if this would impact timing of the analysis or if it would impact the analysis itself. Currently all available bait ages do come from NOAA, so would the recommendations for sample sizes that come from NOAA ages, which just has the sole ager, still be applicable to future samples that are going to be aged by the states, which would have multiple agers.

For the next steps the TC decided to maintain the current sampling levels and pause any additional analyses, until we have an acceptable dataset of state bait ages. Then additionally, the TC noted that in the northern end of the range where there tend to be larger menhaden there is also greater variance on the ages within a certain size range. The TC will have to, or we will consider possibly having different sample sizes by regions once the analysis for these resumes. That's all I have for the presentation, so I am happy to take any questions.

CHAIR CLARK: Thank you, Caitlin. If I recall, Emerson had a question about the environmental conditions, so why don't we go to him. Then if there are other questions from the Board, why don't we start with the environmental questions and then we'll go to the sampling.

MR. HASBROUCK: Thank you, Caitlin, for your presentation. If you can recall on the graphic that I had asked James to put up. I mentioned how if you took New York's pound net and beach seine bait fishery and overlaid it on that graphic it would match up pretty well with what is going on in the Chesapeake.

There is something going on in the Bays of Long Island, particularly the eastern bays of Long Island, maybe south shore and western bays as well, but the fishery doesn't take place there. I don't know if

there has been an issue in Rhode Island as well, with the pound net fishery catch for menhaden.

In the tasks, Task 2 was to consider what role water temperature, dissolved oxygen levels, shoreline hardening and other environmental factors play in the local abundance of menhaden and other forage species in the Chesapeake Bay. I would like to see that expanded to include at least eastern Long Island Bays as well. What is the process if I would like to do that? Do you need a motion to do that, Mr. Chairman? How should I proceed here?

CHAIR CLARK: Oh, oh, that is a very good question. Let me turn that over to Commission staff. Just TC tasking, I've been told, so simple as pie. Did you already get that, James? Wow, already taken care of, Emerson.

MR. HASBROUCK: Wow, that's probably the easiest thing I've done yet.

CHAIR CLARK: Okay, do we have any other questions? Okay, Drew Minkiewicz online.

MR. MINKIEWICZ: Just in reviewing the TC memo, thank you. There is a line that caught my interest in the first full paragraphs after the two bullet points, particularly the disconnect between the targeted ages and sizes between osprey and the fishery. Can you please expand on that line, what you are getting at there, please? Thank you.

MS. CRAIG: Katie, do you have an answer for that one?

DR. DREW: I think there is kind of the question of what size classes are most relevant, you know what chunk of the population are osprey and other predators feeding on versus what percent of the population or what age groups the fishery is mostly operating on. I think kind of the question is, it's not just about total availability.

It's about availability of the preferred size classes for the predators, the preferred size classes for the fishery, and understanding sort of the availability of things like, if recruitment is driven by temperature and water and salinity and things like that. But the young recruit, the young of year is not necessarily what osprey or the fishery is most interested in. I think the emphasis was just, you know as we go through this literature review.

We want to make sure that we are understanding the factors that are affecting different age groups within the population, so that we're making the right conclusions about that. Then depending on the availability of information on say environmental preferences of larger, older menhaden versus the availability of data on environmental preferences or environmental factors that are driving recruitment. Our ability to draw inferences may be limited. But I think it's just to kind of highlight some of the potential questions and data needs as we go through this process.

MR. MINKIEWICZ: Okay, thank you very much, appreciate it.

CHAIR CLARK: Thanks, Katie, and thank you, Drew. Are there further questions for Caitlin about the environmental factors? Joe Cimino.

MR. JOE CIMINO: I think the TC has enough to deal with already. I just haven't heard any discussion. I think some recent work has come out about the changing SAV within the Bay, particularly, but obviously this is a coastal issue of kind of a switch from eel grass to widgeon grass and the productivity of that for species. To me it is more of an issue maybe for osprey, but I haven't heard anything about it, and I do think that is also something that needs to be tracked in others. I think that research suggested that there is greater than a 50% reduction in invertebrate biomass in those areas. Obviously, that forage for other species becomes an issue. I just think it's something for the TC to track as well.

CHAIR CLARK: Did you get all that, Caitlin? Okay, and we have a question from Craig Pugh, go right ahead, Craig.

MR. CRAIG D. PUGH: Question after Joe's comment. Locally we see a lot of changing of our grasses also. Not really knowing what causes that. But the one thing I've watched build has been the vibrio. Bacteria seems to have built year after year. In 2025 at the fourth of July, it was determined from Long Island to Rehoboth Beach, Delaware, vibrio was detected along those coastlines.

That is alarming me, impressive but alarming and still working out what the impacts may be of those bacterial loads being dumped into all of our estuaries. It seems like we're all guilty of that with the Chesapeake, Hudson River, wherever. How does that impact, the fecundity, how does that impact young of year?

To me, I would think if it's swimming around in that heavy bacteria load that seems to be fertilizing the bottoms, as we see it. Then it is having some kind of large impact on a great big scale. I'm not sure how we approach this, but it is something that concerns me.

CHAIR CLARK: Thanks, Craig, and Caitlin, I assume you got that comment?

MS. CRAIG: Yes, I did, thank you.

CHAIR CLARK: Anything further about the environmental conditions? Not seeing any; are there any questions about the bait sampling? I had one question, Caitlin. Did you say that NOAA only had one ager that did all their menhaden aging?

MS. CRAIG: I believe, at least historically, I don't know if there was one more, but it has usually been one person, I believe, please correct me if I'm wrong, anyone.

CHAIR CLARK: It's been a while since I've aged, but I remember we always used to do duplicate, you know have at least two people age it to come to a conclusion about the age. Oh, go right ahead, Nicole.

MS. COSTA: I think at any given time there was only a single ager, and historically there was one age for a very long time, Ethel, who many of us know. Then when Ethel retired Amanda took over. There have been two agers, but there weren't two agers at the same time.

CHAIR CLARK: Got it, okay. Just like I said, just curious about that. Any other questions about the aging or the number of samples that are being recommended? Not seeing any, okay. Well, I guess in that case that concludes Item Number 6. Thank you, Caitlin.

OTHER BUSINESS

CHAIR CLARK: That brings us on to Other Business, and Bob, you have some other business?

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, just a quick update. I think it's been referenced a couple times this week that in the latest CJS budget that was approved and signed by the President at the end of January. There is two and a half million dollars in that budget for menhaden research within the Chesapeake Bay.

We anticipate that that money will be moved to ASMFC, and then ASMFC will have the responsibility of prioritizing projects and potentially issuing RFPs and selecting projects and conducting that or facilitating the conduct of that research. The primary road map for that will be the research planning document that was developed at the Virginia Institute of Marine Science in October of 2023.

That was developed by a group of state scientists from Maryland and Virginia, academics representatives from the reduction fishery, bait fishery, recreational fishery, at least one environmental interest was on it, so it is a pretty broad group of individuals that developed that, what I call the road map for menhaden research in

the Bay. That is going to be the primary starting point, essentially, for prioritizing menhaden projects within the Bay. There is also a SCEMFIS project.

CHAIR CLARK: Bob, was this the study that Virginia was going to fund but their legislature did not fund?

EXECUTIVE DIRECTOR BEAL: Yes.

CHAIR CLARK: It worked out well for them.

EXECUTIVE DIRECTOR BEAL: Well, they still have a bill in the legislation. To continue, there is a SKEMFIS project that is going on right now that is being conducted by a number of the same scientists that participated in the VIMS survey design. They are going to do some further work on designing menhaden projects for the Chesapeake Bay.

I think there may be value in having some money. The federal dollars go towards priorities that have already been identified. New priorities are identified with the next effort to plan, and funding is available through the Commonwealth of Virginia. Maybe that pot of money can help with that research.

I envision, and we haven't done any of this yet, but the development of some sort of steering committee at the Commission to prioritizes projects, develop RFPs potentially, select projects and sort of administer this work. We don't have access to the money yet. It has been approved, but where there are a few steps before we can actually start planning and soliciting projects. But I just want to give everyone a heads up. We know the money is coming and we are setting up a plan to start distributing that money and getting the work done.

CHAIR CLARK: Thanks, Bob, anybody have any questions for Bob? I see Bill Hyatt.

MR. WILLIAM A. HYATT: Bob, this is a question for you or maybe somebody else in the room might know the answer. My understanding is that that study that was 2.5 million back in 2023 is guesstimated at 3 million now. I'm thinking just even for the existing work that was proposed that there would be a need for additional money. Am I thinking of that correctly?

EXECUTIVE DIRECTOR BEAL: Everything has gone up in the last few years. I think that may be part of the job of this, what I'm calling a steering committee, to figure out. You know if we don't have enough money to fully fund all the pieces of that VIMS design, what pieces are the priority and what should be funded if we can't fund the whole thing?

CHAIR CLARK: I see Dennis Abbott and then Rob LaFrance. Go ahead, Dennis.

MR. DENNIS ABBOTT: As a closing note, I assume this is your last meeting as Board Chair.

CHAIR CLARK: That is true, yes, it is. But before we get to that, I think, Rob, did you have a question for Bob?

MR. LaFRANCE: I did, just a quick one. I didn't hear, Bob, how much money are you thinking we'll be able to get in this go around from what you described?

EXECUTIVE DIRECTOR BEAL: The best number I can give you is Congress has appropriated 2.5 million. We don't know exactly how much of that is going to come to ASMFC. We assume most if not all of that, but it has to work its way through NOAA then come to us. I am not being critical, I'm just unsure what may happen between Congress and ASMFC.

MR. LaFRANCE: That's not being critical, and great work in getting that money for us, Bob, thank you.

CHAIR CLARK: I'm sure Delaware has some things we would like to add. You go up to Capitol Hill and ask. Back to you, Dennis.

MR. ABBOTT: Sorry to interrupt at the wrong time. But knowing that this is your last meeting, I think that we as Board members owe you, you know our praise for the difficulties and all the solid leadership that you've exhibited during your term as Chair. You've done a heck of a good job. Thank you, John.

CHAIR CLARK: Well, thank you very much, Dennis. (Applause) Good to know that my semi-competent chairmanship here has been appreciated. I really appreciate the Board and all the public that we've had come out to these meetings. It has really been a very interesting process.

I got to sit in on all the working group meetings, and really just so much information out there about menhaden, but still so much we don't know. This process will certainly continue to be interesting, so thanks. Is there any other business to come before the Board? How do you like that? Not only are we done, but we are done early, and next meeting is all yours, Joe.

MR. CIMINO: I was going to say, who's the moron that decided to take that. Thanks, John, appreciate it.

EXECUTIVE DIRECTOR BEAL: Just before everyone gets up and runs away, we're going to start the Summer Flounder, Scup, Black Sea Bass meeting in about 15 minutes, so we'll get that started a little bit early and see if we can get done early, 3:20, 3:20 it is. Just also, don't forget, this is the first coastwide board of the day.

I want to remind everyone there is a card over, kind of behind Mike Luisi where he is standing there for Mel Bell. If you haven't yet, please sign the card for Mel, he is still recovering. He's got a long way to go. He is doing better. He is in a rehab facility, he is out of the hospital and he's continuing to make great strides.

The feeding tube has been removed; he is eating on his own and all these positive things. He's up a little bit trying to walk and make progress through physical therapy and occupational therapy and all these things. He is still fighting really hard to get better. I think support from the Commission and folks in this room would be really great for Bell to hear. Please sign the card, and Mel would definitely appreciate it. Thank you.

ADJOURNMENT

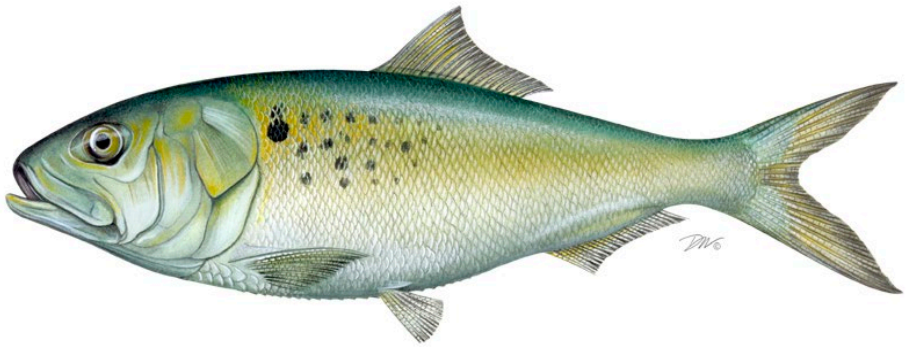
CHAIR CLARK: Thank you, and we are adjourned.

(Whereupon the meeting adjourned at 2:54 p.m. on Wednesday, February 4, 2026)

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM II TO AMENDMENT 3 OF THE ATLANTIC MENHADEN INTERSTATE FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT

Chesapeake Bay Reduction Fishery



This draft document was developed for Board review and discussion at the May 2026 meeting week. This document is not intended to solicit public comment as part of the Commission/State formal public input process. However, comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. Also, if approved, a public comment period will be established to solicit input on the issues contained in the document.

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

May 2026

Draft Document for Board Review. Not for Public Comment

Atlantic States Marine Fisheries Commission Seeks Your Input on Atlantic Menhaden Management

The public is encouraged to submit comments regarding this document during the public comment period. Comments will be accepted until 5:00 p.m. EST on **DAY, MONTH 2026**. Regardless of when they were sent, comments received after that time will not be included in the official record.

You may submit public comment in one or more of the following ways:

1. Attend public hearings pertinent to your state or jurisdiction.
2. Refer comments to your state's members on the Atlantic Menhaden Board or Atlantic Menhaden Advisory Panel, if applicable.
3. Mail, fax, or email written comments to the following address:

James Boyle
Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201
Fax: (703) 842-0741
comments@asmfc.org (subject line: Atlantic Menhaden Draft Addendum II to Amendment 3)

If you have any questions please contact James Boyle at jboyle@asmfc.org or 703.842.0740.

Commission's Process and Timeline

Date	Action
October 2025	Atlantic Menhaden Board Tasks Staff to Develop Draft Addendum II
November 2025 – April 2026	Staff Develops Draft Addendum I for Board Review
May 2026	**Atlantic Menhaden Board Reviews Draft Addendum II and Considers Its Approval for Public Comment**
June– July 2026	Board Solicits Public Comment and States Conduct Public Hearings
August 2026	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum II
TBD	Provisions of Addendum II are Implemented

1. INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) coordinates Atlantic menhaden (*Brevoortia tyrannus*) management in state waters (0–3 miles from shore) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act, and has done so through an interstate fishery management plan (FMP) since 1981. The states of Maine through Florida have a declared interest in the fishery and are responsible for implementing management measures consistent with the interstate FMP. For the purposes of this addendum, the term "state" or "states" also includes the Potomac River Fisheries Commission. Management authority in the Exclusive Economic Zone (3-200 miles from shore) lies with NOAA Fisheries.

At its October 2025 meeting, the ASMFC's Atlantic Menhaden Management Board approved the following motion:

Move to initiate Addendum II to the Atlantic menhaden FMP to address Chesapeake Bay Management concerns. The addendum shall develop periods for the Chesapeake Bay Cap that distributes fishing effort more evenly throughout the season and a range of options to reduce the Bay Cap from status quo up to 50%.

The addendum proposes options to reduce the concentration and volume of reduction harvest within Chesapeake Bay from recent levels to allow the ingress of menhaden to distribute throughout Chesapeake Bay.

2. OVERVIEW

2.1 Statement of the Problem

From 2018-2022, 50% of the reduction fishery effort and 45% of the reduction fishery landings in Chesapeake Bay occurred before July 15th. However, in 2023 and 2024, only 26% of the effort and 20% of the harvest occurred in the same timeframe (Figure 1). The shift in harvest later in the season has corresponded with declines in harvest and catch-per-unit effort (CPUE) of pound net bait fisheries in Maryland, Virginia, and the Potomac River (Figures 2 and 3), which typically peak during the summer months. Declines in pound net harvests have occurred even as quotas increased through the increased Total Allowable Catch (TAC) from 2023 to 2025. To address this issue, the addendum addresses two separate but related components of the management program: 1) reducing the Cap from its current level of 51,000 mt and 2) dividing the Chesapeake Bay Reduction Fishery Cap (Cap) into quota periods.

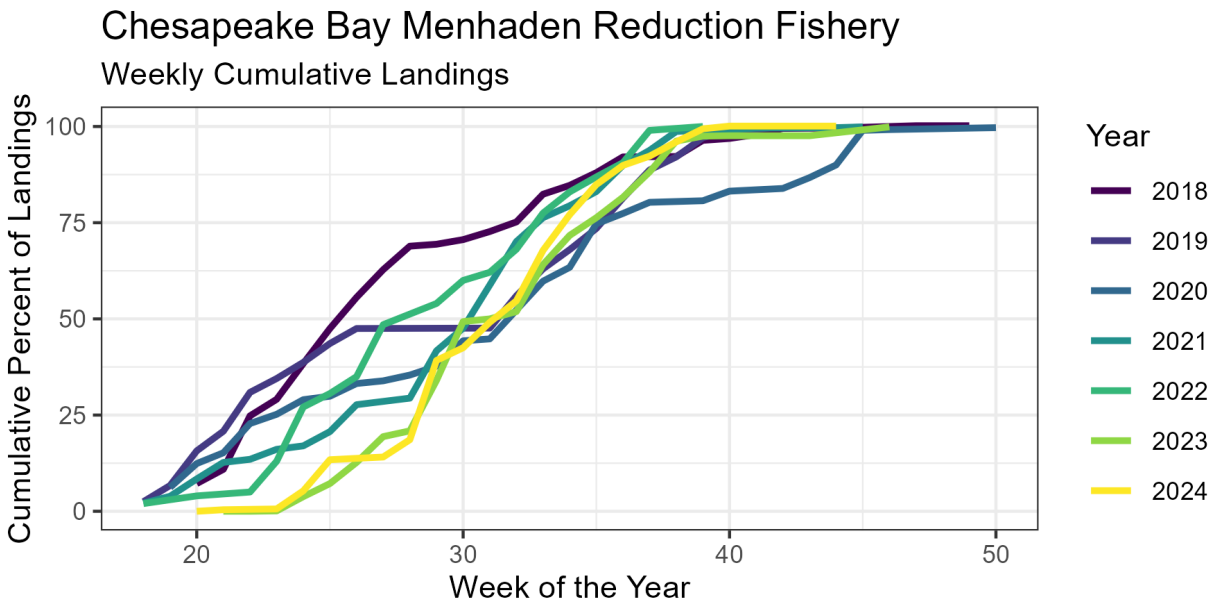


Figure 1. Cumulative percent of annual landings in the Chesapeake Bay menhaden reduction fishery 2018-2024.

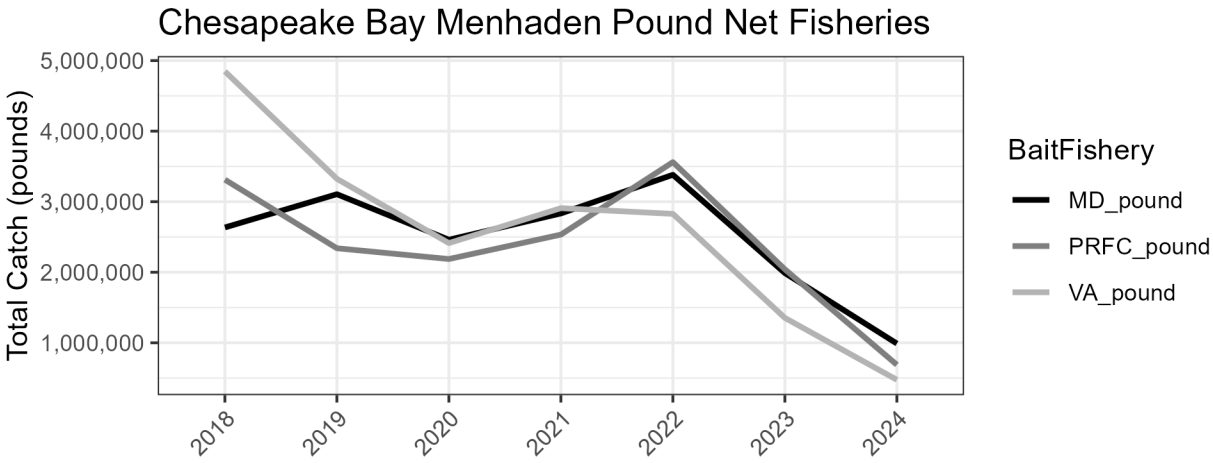
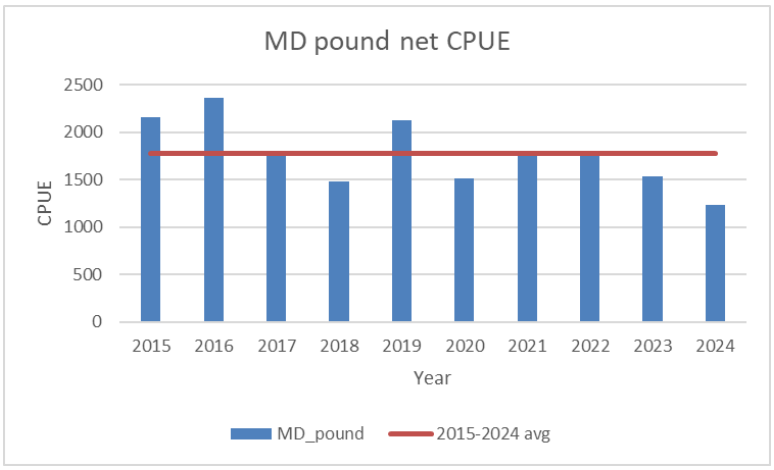
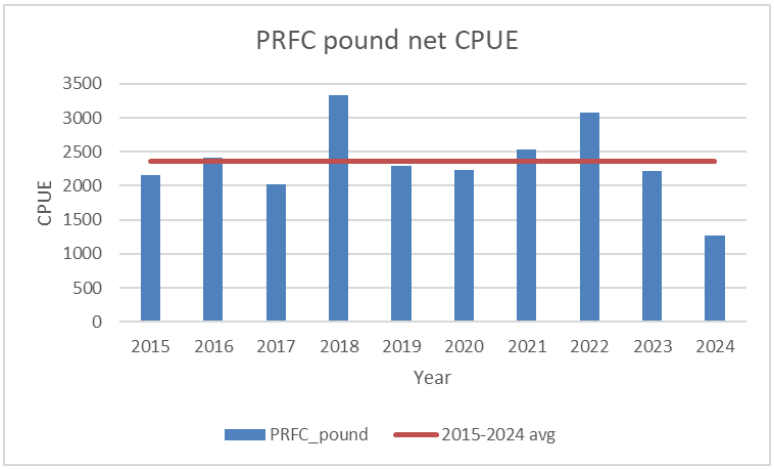


Figure 2. Total catch in MD, PRFC, and VA menhaden pound net fisheries 2018-2024.





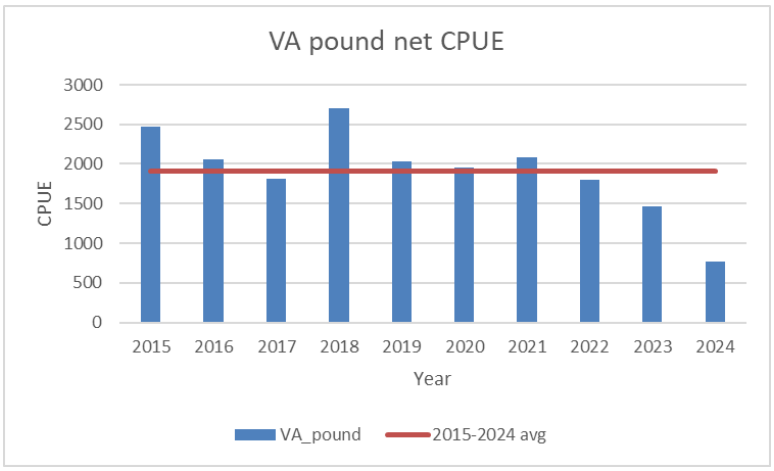


Figure 3. Annual menhaden Pound Net CPUE from Maryland, Potomac River, and Virginia. CPUE is in pounds per net day. Sources: MD DNR, PRFC, and VMRC.

2.2 Background

The Chesapeake Bay Cap was first established in 2006 as a precautionary measure in response to concerns about localized depletion and was set at the average landings from 2001- 2005 (109,020 mt) through Addendum III to Amendment 1. Amendment 2, implemented in 2012, reduced the Cap by 20% to 87,216 mt. Amendment 3, implemented in 2018, further reduced the Cap to its current level of 51,000 mt, which represents an approximation of the average Bay reduction fishery landings from 2012-2016.

In May 2025, the Board reviewed the report from the Work Group on Precautionary Management in Chesapeake Bay, which was formed in response to renewed public concerns over the potential for localized depletion of menhaden in the Bay and the ecological effects on predator species. The report discussed a number of precautionary management options the Board could consider for further action (see Work Group Report) based on the life history of certain predators, the nature of Chesapeake Bay menhaden fisheries, and recent changes in menhaden availability. The Work Group addressed its task without determining if there is or is not an adequate supply of menhaden to support predatory demand in the Bay.

The report included data that showed an increase in reduction fishery effort in the summer months coinciding with decreasing pound net harvests and CPUEs from the jurisdictions within the Bay. In order to alleviate a concentration of effort that may be affecting other fisheries within the Bay, as well as other potential ecological impacts, the Board approved a Plan Development Team (PDT) task to begin investigating options to establish quota periods that would distribute harvest of the Chesapeake Bay reduction fishery Cap throughout the fishing season. In October 2025, the Board continued to discuss concerns of the declining pound net harvest and CPUE within the Bay with increasing reduction harvest in the summer months and initiated the development of a management document to include quota period options, along with options to reduce the Cap level.

2.3 Social and Economic Impacts

This Addendum includes measures that could influence the size of the Chesapeake Bay Reduction Fishery Cap and introduce quota periods to distribute removals more evenly over the course of the year. These measures may produce socioeconomic impacts to the commercial reduction fishery and dependent communities as they could limit harvest within the Chesapeake Bay and affect seasonal operations. Additionally, the measures are intended to provide increased ecosystem benefits through enhanced forage opportunities, which could impact individuals who derive value from species that prey upon menhaden.

Two prior socioeconomic studies on the commercial menhaden fisheries provide important context: Kirkely et al. (2011), who assess the economic importance of the reduction sector under alternative harvest scenarios in the Chesapeake Bay, and Whitehead and Harrison (2017), who conducted a socioeconomic study of the commercial bait and reduction fisheries to

inform development of Amendment 3. Kirkley et al. (2011) estimated that the reduction sector supported approximately 519 full- and part-time jobs in Maryland and Virginia, including 347 in Northumberland County, Virginia, associated with total landings of about 141,000 metric tons, of which roughly 85,000 metric tons were harvested from the Chesapeake Bay. Under an extreme scenario in which no harvest was allowed in the Bay and effort could not be shifted to coastal waters, employment losses in Northumberland County were estimated at up to 176 jobs, including 98 direct losses in the reduction sector. The analysis also indicated that a reduction of 1,000 metric tons in Chesapeake Bay quota corresponded to an estimated loss of approximately $630,000 in regional economic output (~$940,000 in 2025) and 3.7 total jobs, including 2.1 direct jobs in the reduction sector. Whitehead and Harrison (2017) applied a similar modeling framework to evaluate economic impacts associated with coastwide quota changes and found a 6.45% increase in total quota (≈12,100 metric tons) would result in combined impacts from the bait and reduction sectors of approximately $6.3 million in economic output and 99 jobs, corresponding to about $520,000 in regional economic output (~$680,000 in 2025) and 8.2 jobs per 1,000 metric tons. Both studies use Leontief input-output models, which do not account for market adjustments or adaptive industry behavior and may overstate long-term employment effects of quota changes.

While neither Kirkley et al. (2011) nor Whitehead and Harrison (2017) explicitly evaluate seasonal harvest restrictions within Chesapeake Bay, both studies suggest that economic impacts are driven primarily by total landings rather than the timing of harvest. Evidence that effort and harvest respond flexibly to economic and regulatory conditions implies that seasonal limits may reallocate fishing activity across the season with limited overall economic impact, provided that total allowable harvest is not substantially reduced. However, impacts may arise if seasonal restrictions constrain periods of high catch efficiency or limit the ability of the reduction sector to maintain consistent processing throughput.

3. PROPOSED MANAGEMENT PROGRAM

This addendum considers modifying the Chesapeake Bay Reduction Fishery Cap component of the management program. An objective is listed for each component to guide evaluation of proposed alternatives in addressing the issues identified for each component in the statement of the problem. **When the Board takes final action on the addendum, there is the opportunity to select any measure within the range of options that went out for public comment, including combining options across issues.**

3.1 Chesapeake Bay Cap

If adopted, this would replace section 4.3.7 of Amendment 3

3.1.1 One Time Chesapeake Bay Cap Reduction

The intent of the Cap is to prevent all of the reduction fishery harvest from occurring in the Chesapeake Bay, a critical nursery area for Atlantic menhaden. Harvest for reduction purposes shall be prohibited within the Chesapeake Bay when 100% of the cap is harvested from Chesapeake Bay, which is defined as areas shoreward of the Chesapeake Bay Bridge Tunnel.

Harvest above the Cap in any given year will be deducted from the next year's allowable harvest. Furthermore, unused quota from a region or state cannot be transferred to the Cap to reduce an overage. Any amount of un-landed fish under the Cap cannot be rolled over into the subsequent year.

Option A. Status Quo: The Chesapeake Bay Reduction Fishery Cap is maintained at 51,000 mt. This value represents an approximation of the five-year average of reduction harvest from the Chesapeake Bay between 2012 and 2016. An approximate value is used because reduction landings in the Chesapeake Bay are confidential.

Option B. Reduce the Chesapeake Bay Reduction Fishery Cap

Sub Option 1: Reduce the cap by 10%.
A 10 % Cap reduction results in a Cap of 45,900 mt

Sub Option 2: Reduce the cap by 20%.
A 20 % Cap reduction results in a Cap of 40,800 mt

Sub Option 3: Reduce the cap by 30%.
A 30 % Cap reduction results in a Cap of 35,700 mt

Sub Option 4: Reduce the cap by 50%.
A 50 % Cap reduction results in a Cap of 25,500 mt

The PDT notes under sub option 1 the reduction coupled with the in-year quota periods selected in 3.2 below may provide a similar reduction to the TAC cut adopted by the Atlantic Menhaden Management Board in October 2025 in an average year. This is due to the quota periods making full utilization of the annual Bay Cap highly unlikely in a given year. Under sub option 2, the reduction in the Bay Cap approximates the same reduction in the coastwide TAC adopted by the Atlantic Menhaden Board in October of 2025 for the 2026 fishing year. Under sub option 3, the reduction in the Bay Cap provides an additional buffer, compared to the coastwide TAC reduction of 20% adopted for the 2026 fishing year, to account for the uncertainty in how abundance in the Chesapeake Bay correlates to the abundance of the coastwide stock. Sub option 4 provides the most conservative buffer to menhaden migrating into Chesapeake Bay for ecological and socioeconomic benefit of the middle and upper portions of tidal rivers and main stem Chesapeake Bay.

3.1.2 Automatic Chesapeake Bay Reduction Fishery Cap Adjustment with Changes to the Coastwide TAC

Option A: Status Quo. Changes to the Chesapeake Bay Reduction Fishery Cap can only be made through Adaptive Management (Amendment 3, Section 4.6).

Option B. The Chesapeake Bay Reduction Fishery Cap would automatically be adjusted proportionally to the Coastwide TAC within the limits of the sub option selected below. This would be accomplished by multiplying the Bay Cap to TAC conversion factor into the annual Coastwide TAC. The Bay Cap to TAC conversion factor is the Bay Cap selected in 3.1.1 above divided by the current Coastwide TAC of 186,840mt (Table 1); once set the conversion factor would not change, unless adjusted through adaptive management. **Example:** Option B2 (a 20% reduction) is selected in 3.1.1 above resulting in a 40,800mt Bay Cap and the current TAC is 186,840mt, which results in a Bay Cap to TAC conversion factor of 40,800/186,840 = 0.218369. If the TAC were reduced to 150,000mt in a future year the Bay Cap would be adjusted to 150,000mt X 0.218369 = 32,755mt. Table 2 illustrates Bay Cap values corresponding to hypothetical future TAC values under each of the conversion factors as determined by the option chosen in Section 3.1.1. Table 3 illustrates Coastwide TAC values corresponding to the upper and lower limits on the Chesapeake Bay Cap as defined in the sub options below. Changes to the TAC beyond these limits would not entail adjustment to the Cap until the TAC is within the limits again (i.e., if the TAC increases well beyond the value corresponding to the maximum Bay Cap, then decreases in future years, the Bay Cap does not automatically decrease until the TAC is back within the range of adjustments).

Sub Option 1. The Bay Cap cannot exceed 51,000 mt. This option provides the same minimum protection as the current Bay Cap (the Bay Cap could not reach zero unless the TAC reached zero).

Sub Option 2. The Bay Cap cannot exceed 51,000 mt or be less than 25,500 mt. This option uses the current Bay Cap as the maximum value and the maximum reduction contained in Section 3.1.1 (50% reduction) as the minimum Bay Cap value.

Sub Option 3. The Bay Cap cannot exceed 87,216 mt, the highest Bay Cap value during the time period a TAC was in place, with no minimum value (the Bay Cap could not reach zero unless the TAC reached zero).

Sub Option 4. The Bay Cap cannot exceed 87,216 mt or be less than 25,500 mt. This option uses the highest Bay Cap value during the time period a TAC was in place as the maximum Bay Cap value and the maximum reduction contained in Section 3.1.1 (50% reduction) as the minimum Bay Cap value.

Sub Option 5. The Bay Cap cannot exceed 75,000 mt or be less than 29,000 mt. This option uses the approximate upper and lower 95% confidence intervals around the 2012-2016 approximate mean Chesapeake Bay reduction harvest (approximate values used to protect confidentiality). This time period is the one used to calculate the current Bay Cap and incorporates the variability around the harvest when the Bay Cap was set at a higher level than the current Bay Cap. Note: if Option B, Sub Option 4 is selected in Section 3.1.1 the lower limit for this sub option will be lowered to 25,500mt, since that would be the current selected Bay Cap value, and it is less than 29,000mt.

Table 1. Chesapeake Bay Cap values in metric tons and conversion factors by option in section 3.1.1 Conversion factors are round, but all calculations will be done on unrounded values.

Option	Bay Cap Value	2026 TAC	Conversion Factor
A	51,000	186,840	0.2729608
B1	45,900	186,840	0.2456647
B2	40,800	186,840	0.2183687
B3	35,700	186,840	0.1910726
B4	25,500	186,840	0.1364804

Table 2. Chesapeake Bay Cap values in metric tons calculated from example Coastwide TAC values by option using the conversion factors from Table 1

	Coastwide TAC Values					
Option	125,000	150,000	175,000	200,000	225,000	250,000
A	34,120	40,944	47,768	54,592	61,416	68,240
B1	30,708	36,850	42,991	49,133	55,275	61,416
B2	27,296	32,755	38,215	43,674	49,133	54,592
B3	23,884	28,661	33,438	38,215	42,991	47,768
B4	17,060	20,472	23,884	27,296	30,708	34,120

Table 3. Coastwide TAC values corresponding to the upper and lower limits on the Chesapeake Bay Cap as defined in the sub options in Section 3.1.2 and calculated using the conversion factors based on the option/sub option chosen in section 3.1.1. Changes to the TAC beyond these limits would not entail adjustment to the Cap until the TAC is within the limits again. Note: If Option B, Sub Option 4 is selected in section 3.1.1 the lower limit would need to be adjusted down, due to being below the calculated lower limit.

	Bay Cap Option From 3.1.1		**A** 51,000	**B1** 45,900	**B2** 40,800	**B3** 35,700	**B4** 25,500
Sub Option From 3.1.2	**Conversion Factor**		0.2729608	0.2456647	0.2183687	0.1910726	0.1364804
	Bay Cap		**Corresponding TAC**				
1	**Max**	51,000	186,840	207,600	233,550	266,914	373,680
	Min	--	--	--	--	--	--
2	**Max**	51,000	186,840	207,600	233,550	266,914	373,680
	Min	25,500	93,420	103,800	116,775	133,457	186,840
3	**Max**	87,216	319,518	355,020	399,398	456,455	639,037
	Min	--	--	--	--	--	--
4	**Max**	87,216	319,518	355,020	399,398	456,455	639,037
	Min	25,500	93,420	103,800	116,775	133,457	186,840
5	**Max**	75,000	274,765	305,294	343,456	392,521	549,529
	Min	29,000	106,242	118,047	132,803	151,775	186,840

3.2 Chesapeake Bay Cap Distribution

3.2.1 Quota Periods

Table 4 outlines a series of options to divide the Bay Cap into three or four quota periods with the objective of alleviating a concentration of reduction harvest that may prevent menhaden from distributing throughout the Bay to stationary gears. The options aim to more evenly distribute harvest throughout the fishing year or delay harvest even further to reduce the pressure on the initial ingress of menhaden into the Bay.

Even Period Lengths: Options B through E present options with three or four seasons of roughly equal length. Options B and C represent the most equal distribution of harvest whereas Options D and E give greater emphasis on delaying harvest to lessen the pressure on the influx of menhaden into the Bay.

Uneven Period Lengths: Options F and G present options with three periods of unequal length. The extended first period delays reduction harvest until later in the year compared to recent performance. The short middle period is reflective of the peak reduction harvest period in recent years, and the proposed allocations during this season are intended to allow the fishery to operate as usual during this peak period.

See Figures 4 and 5 for projected landings for the reduction fishery and historical landings of the reduction and bait fisheries.

Table 4. Options to divide the Bay Cap into quota periods of even length with reduction harvest distributed evenly (B-C), even length with harvest distributed unevenly (D-E), uneven length with harvest distributed evenly (F), or uneven length with harvest distributed unevenly (G). *Depending on the year, the length of the fishing season is either 28 weeks and 5 days or 27 weeks and 5 days. The table outlines the length of each quota period for a season of 28 weeks and 5 days. For years with 27 weeks and 5 days, one week is removed from the final quota period.

Option	Description	Length of Quota Periods*	Percentage of total Bay Cap
A	Status Quo	No quota periods	
B	Even Length, Even Harvest, 3 Quota Periods	9 weeks	33%
		10 weeks	33%
		9 weeks and 5 days	34%
C	Even Length, Even Harvest, 4 Quota Periods	7 weeks	25%
		7 weeks	25%
		7 weeks	25%
		7 weeks and 5 days	25%
D	Even Length, Uneven Harvest, 3 Quota Periods	9 weeks	25%
		10 weeks	25%
		9 weeks and 5 days	50%
E	Even Length, Uneven Harvest, 4 Quota Periods	7 weeks	20%
		7 weeks	20%
		7 weeks	30%
		7 weeks and 5 days	30%
F	Uneven Length, Even Harvest, 3 Quota Periods	11 weeks	33%
		6 weeks	33%
		11 weeks and 5 days	34%
G	Uneven Length, Uneven Harvest, 3 Quota Periods	11 weeks	25%
		6 weeks	50%
		11 weeks and 5 days	25%

Option A. Status Quo: The Chesapeake Bay Reduction Fishery Cap would not be managed using quota periods.

Option B: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option B.

Option C: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option C.

Option D: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option D.

Option E: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option E.

Option F: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option F.

Option G: The Chesapeake Bay Reduction Fishery Cap would be allocated according to the percentages in Table 4 Option G.

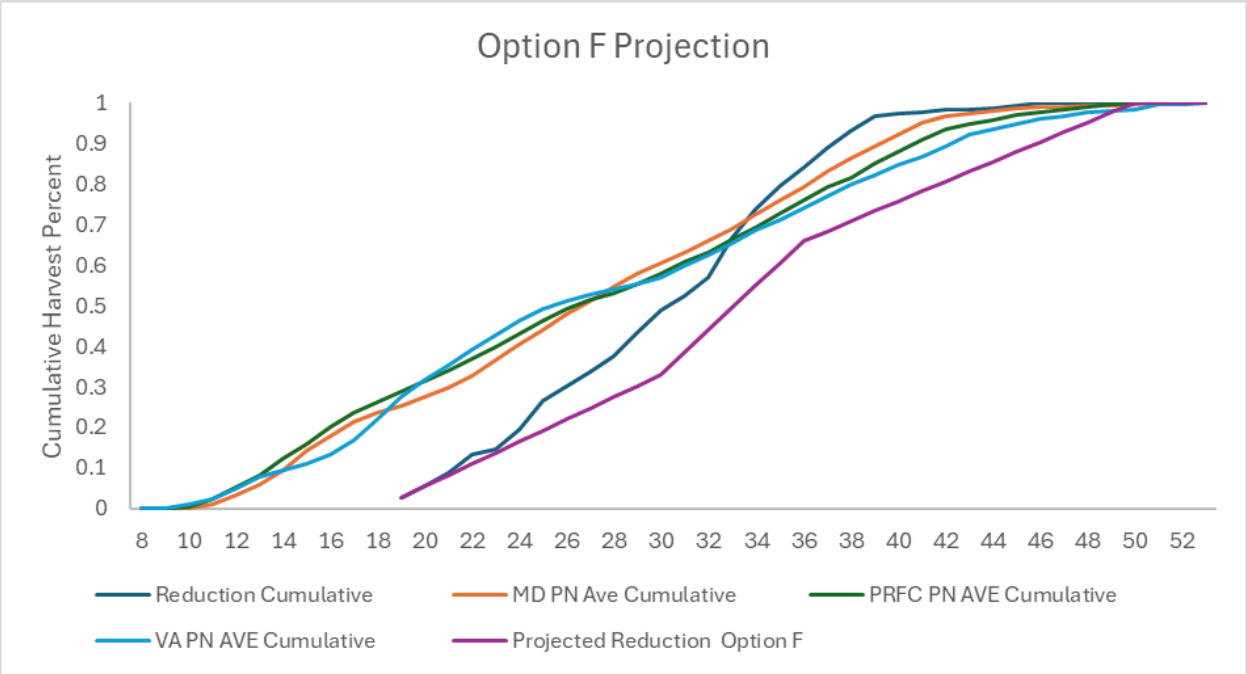


Figure 4. Historical average cumulative harvest by week (2018 - 2024) for the reduction fishery and the MD, VA, and PRFC pounds net, and projected reduction fishery under Option F.

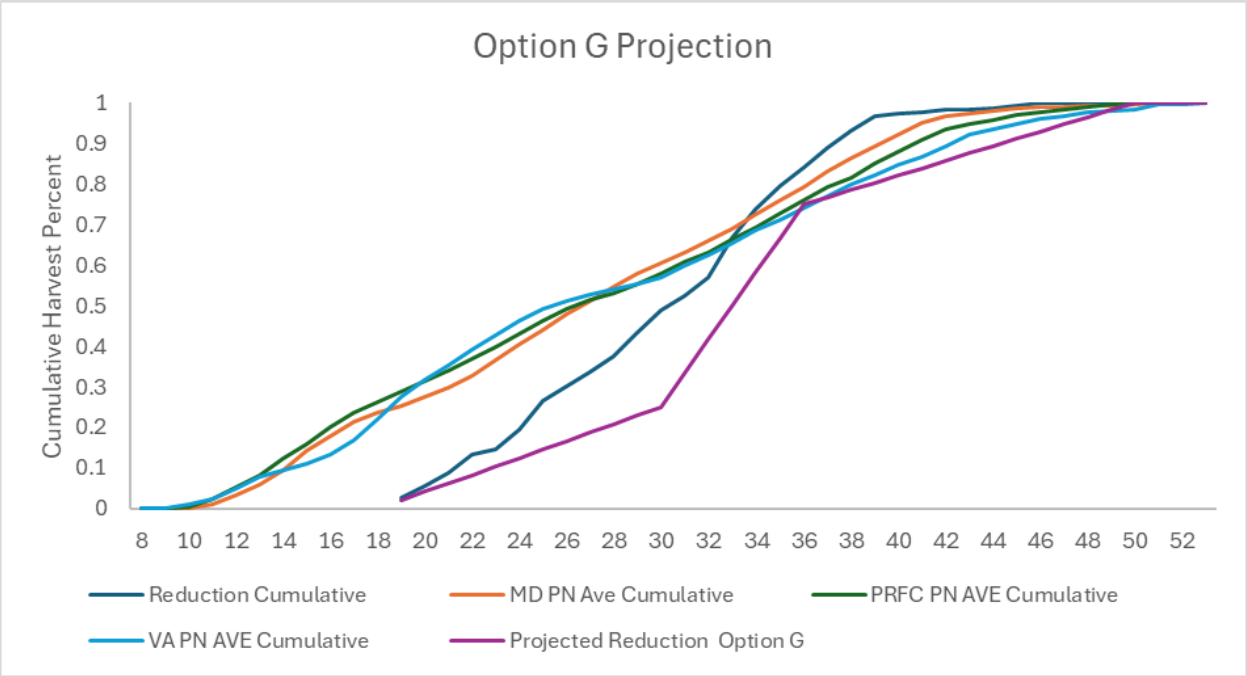


Figure 5. Historical average cumulative harvest by week (2018 - 2024) for the reduction fishery and the MD, VA, and PRFC pounds net, and projected reduction fishery under Option G.

3.2.2 Overages and Rollovers. Note: This section is only required if Option B-G is selected above in section 3.2.1 to implement quota periods to redistribute the reduction harvest.

3.2.2.1 Overages
If adopted, this would revise section 4.3.7 of Amendment 3
The following options outline how an overage of a quota period would be paid back. Without a payback provision there would be little incentive for industry to abide by the in-year quota periods. As outlined in Amendment 3, any overage of the total Bay Cap would be deducted from the following year's total Bay Cap. Should there be a quota period overage and a total Bay Cap overage, the Bay Cap reduction would be taken into account prior to the application of any quota period paybacks.

Option A. Status Quo. There would be no paybacks for exceeding the allocation of a quota period.

Option B. Any overage of a quota period would be deducted from the same quota period in the following year and redistributed to the final quota period in the following year. If the final quota period of the year incurs an overage that does not result in an overage of the total Bay Cap, there would be no adjustments to the final quota period in the following year.

Example: A three quota period split was selected with allocations of 5,000/5,000/10,000 pounds (25%/25%/50%). If the fishery catches 7,000/3,000/10,000 pounds, then the following

year, period one would be reduced by 2,000 pounds and period 3 would be increased by 2,000 pounds.

The PDT notes the objective of creating quota periods is to ensure most of the quota is not taken early in the year, so in this scenario the objective would have been obtained. This stipulation would only apply to the final quota period of the year; all other quota period overages would be paid back the following year regardless of whether the Bay Cap was exceeded or not.

Quota paybacks for an overage in a quota period that is equal to or greater than two times the quota period's allocation. If the reduction fishery harvests more than two times the allocation in a quota period, that period would be set to zero the following year and any additional reduction would be taken first from the preceding quota period, if there is one. If an additional reduction still needs to be taken it would be taken from the next earliest quota period if one is available. If there are no earlier quota periods than the one exceeded with enough quota to cover the overage, the next quota period would be reduced by the remaining overage. See table below for examples.

Example: A three quota period split was selected with allocations of 5,000/5,000/10,000 pounds (25%/25%/50%). If the fishery catches 1,000/12,000/7,000 pounds, then the following year (assuming the base quota period allocations remain the same), the resulting allocations would be 3,000/0/17,000 pounds.

All quota that is deducted from early periods in the following year would be moved to the last quota period of that year. Any quota period overages that were not greater than two times a quota period allocation would be reduced first, then any two times a quota period allocation would be reduced afterward.

3.2.2.2 Fishery Closure

The options below consider whether to close the fishery for the remainder of a quota period when 90% of the quota is projected to be harvested to mitigate the potential for an overage that would need to be paid back the following year.

Option A. No fishery closure.

Option B. When 90% of the quota period allocation is projected to be harvested, that period's reduction fishery would be closed. The reduction fishery would reopen at the start of the next quota period.

3.2.2.3 Rollovers

This section addresses what happens if a quota period harvest limit is not met. Any rollovers would be rolled to a later period within a year. No quota can be rolled over from one year to the following year. Therefore, if the final quota period has an underage it would not be carried over to a subsequent year.

Option A. Unused quota from any quota period prior to the last quota period would be rolled over to the last quota period. **Example**: A three quota period split was selected with allocations of 5,000/5,000/10,000 pounds (25%/25%/50%). 3,000 pounds were caught in period one leaving a 2,000 pound underage of that period. Under this option the last quota period would be adjusted up 2,000 pounds, with the adjusted remaining quota periods being 5,000/12,000 pounds. This would allow for the potential to recoup underutilized quota at the end of the fishing year, while not impacting the ingress of fish into the Bay.

Option B. Unused quota would be rolled over to subsequent quota periods proportional to the number of quota periods remaining. **Example**: A three quota period split was selected with an overall allocation of 5,000/5,000/10,000 pounds (25%/25%/50%). 3,000 pounds were caught in period one leaving a 2,000 pound underage of that period. Under this option the remaining quota periods would be adjusted up 1,000 pounds each, with the adjusted remaining quota periods being 6,000/11,000 pounds. This would potentially allow for recouping of underutilized quota for the remaining parts of the fishing year and ensure not all of the underage is caught in the following quota period.

> Sub Option 1. (This sub option can only be selected if a four quota period option is selected.) Unused quota from either quota period 1 or 2 would be rolled over to quota periods 3 and 4 evenly, and any unused quota from quota period 3 would be rolled over to the quota period 4. **Example**: A four quota period split was selected with a 4,000/4,000/6,000/6,000 pound (20%/20%/30%/30%) split. 2,000 pounds was caught in period one leaving a 2,000 pound underage of that period. Under this option, quota periods 3 and 4 would be adjusted up 1,000 pounds each (the second would be unchanged), with the adjusted remaining quota periods being 4,000/7,000/7,000 pounds. This would allow for the potential of some recouping of underutilized quota at the end of the fishing year, and ensure none of the underage is caught in the first half of the fishing year to maintain the goal of redistributing quota later in the year.

4. COMPLIANCE SCHEDULE

The Atlantic Menhaden Management Board would need to determine a compliance schedule when considering approval of the draft Addendum.

5. LITERATURE CITED

ASMFC. 2006. Addendum II to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 31 p.

ASMFC. 2006. Addendum III to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 6p.

ASMFC. 2009. Addendum IV to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 5 p.

ASMFC. 2012. Amendment 2 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 114 p.

ASMFC. 2017. Amendment 3 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 111 p.

ASMFC. 2025. Work Group Report on Precautionary Management in Chesapeake Bay. ASMFC, Arlington, VA. 59 p.

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • asmfc.org

MEMORANDUM

TO: **Atlantic Menhaden Management Board**

FROM: **Atlantic Menhaden Plan Development Team**

DATE: **April 20, 2026**

SUBJECT: **PDT Analyses and Rejected Options on Draft Addendum II to Amendment 3**

At the 2026 Winter Meeting, the Atlantic Menhaden Management Board provided additional guidance to the Plan Development Team (PDT) on drafting options to reduce the Chesapeake Bay Reduction Fishery Cap by up to 50% and distribute the cap more evenly throughout the fishing season. The Board also requested analyses for further consideration including:

- Compare reduction effort with harvest data within quota periods
- Investigate pound net and reduction catch rates to determine if pound net landings are correlated with the timing of the reduction fishery
- Pound net participation over time

Below are the results of the PDT's analyses, as well as options that were considered and rejected by the PDT for inclusion in the draft addendum.

Additional Analyses

Reduction Harvest vs. Effort

The proposed options consider potential ways to spread reduction fishery harvest more evenly and/or later in the fishing season in the Chesapeake Bay. The Board also requested information on the distribution of reduction fishery effort during the season. Since 2020, the distribution of effort is generally spread relatively evenly across the fishing season with about 5-10% of the total effort occurring in most weeks with occasional spikes and drop-offs (Figure 1). In 2018, more effort occurred early in the fishing season, and in 2019, effort occurred primarily in two stanzas with very little effort for most of the month of July. The relative trend in catch per unit of effort (CPUE) was most variable in 2018 and 2019 (Figure 2). The approximate average (2018-2024) percent of landings and effort per quota period for the options in Table 4 of Draft Addendum II are presented in Memo Table 1.

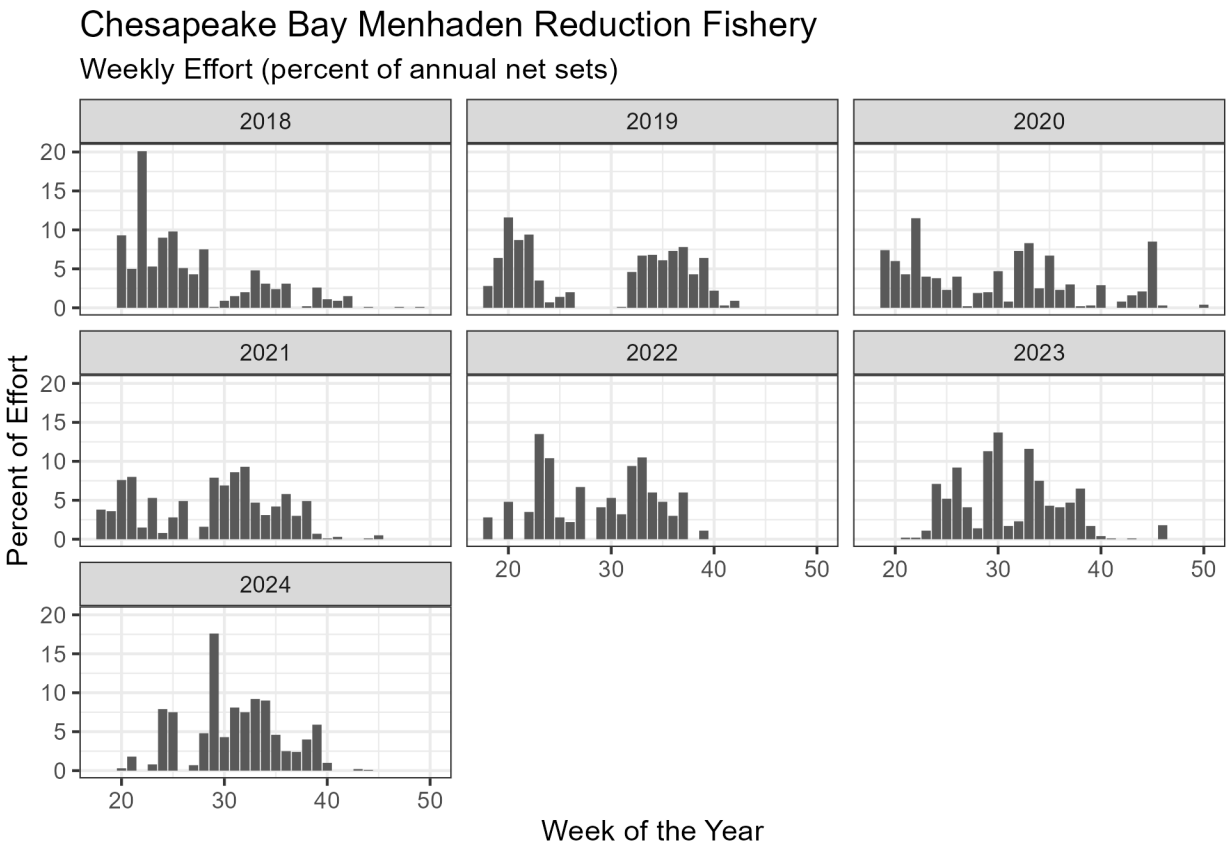


Figure 1. Percent of annual effort (number of net sets) by week for the menhaden purse seine reduction fishery in the Chesapeake Bay 2018-2024.

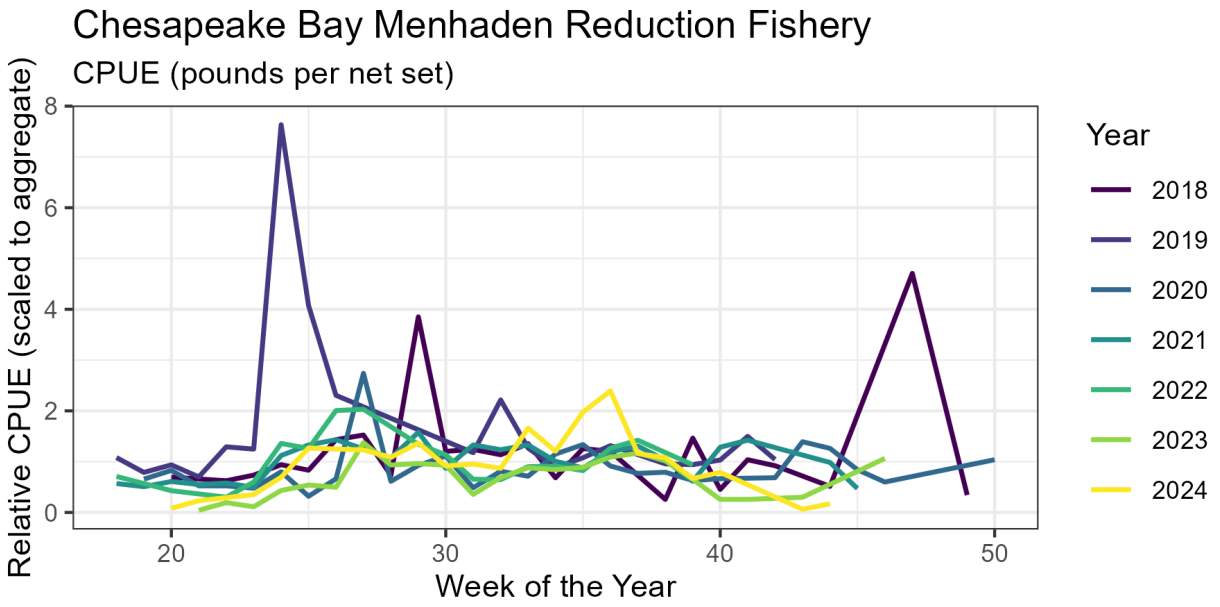


Figure 2. Catch per unit of effort (CPUE in pounds per net set) scaled to the time series aggregate CPUE by week for the menhaden purse seine reduction fishery in the Chesapeake Bay 2018-2024

Table 1. Approximate average percent purse seine reduction landings and effort in the Chesapeake Bay 2018-2025 corresponding to the quota periods as presented in Options B-G in section 3.2.1 of Draft Addendum II.

Option	Length of Quota Period	Average (2018-2024) Percent Landings	Average (2018-2024) Percent Effort
B/D	9 weeks	30%	39%
	10 weeks	54%	48%
	11 weeks	16%	13%
C/E	7 weeks	20%	31%
	7 weeks	33%	28%
	7 weeks	41%	35%
	8 weeks	7%	7%
F/G	11 weeks	38%	44%
	6 weeks	36%	34%
	12 weeks	26%	22%

Pound Net and Reduction Catch Rates

The Atlantic Menhaden Management Board has recently expressed concern that a recent shift in timing of the Chesapeake Bay menhaden reduction fishery has resulted in reduced availability of fish in the upper bay and consequent reductions in Maryland pound net harvest of menhaden. The PDT conducted a preliminary analysis using readily available data to evaluate any potential link between the two fisheries but recommends to the Board that the Technical Committee would be a more appropriate avenue to conduct a detailed analysis.

Menhaden harvest in MD's pound net fishery varied without trend during 2018-2022 but had declined by over 60% by 2024 (Figure 3). Generally speaking, changes in harvest may be caused by changes to abundance or availability, changes to effort, and/or changes to fishing efficiency. Assuming there were no major changes to the fishery that would affect efficiency (*e.g.* gear modifications), the PDT investigated variability in effort and availability as potential causes for the decline in harvest.

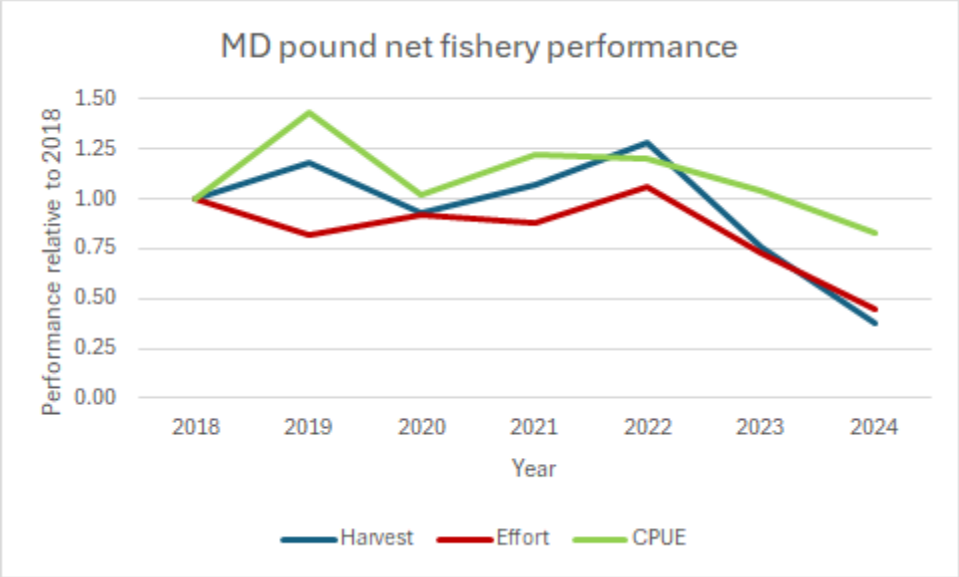


Figure 3. Relative performance of the Maryland pound net fishery in 2018-2024 for harvest (pounds), effort (net trips) and CPUE (pounds per net trip). Annual values are scaled to the 2018 value for each metric to preserve confidentiality.

Effort in the MD pound net fishery is reported on mandatory monthly reporting forms as nets used per trip. Annual effort for this analysis is the sum of nets per trip across all trips within a year. Figure 3 shows that, similar to harvest, total effort in the pound net fishery was stable during 2018-2022, followed by a 50% decline during 2023-2024.

While true abundance (or availability) is not known, catch per unit effort can be used as a proxy for abundance if it is assumed there are no major changes to how the fishery operated between years. For this analysis, CPUE was calculated as annual harvest divided by annual effort (sum of nets per trip). These data show that although CPUE has declined in recent years, the decline is not as dramatic as observed in catch and effort (Figure 3). This suggests that the decline in landings in recent years is primarily driven by reduced effort.

Data were also available from a fishery independent survey of the Choptank River in Maryland (Figure 4). The survey has been conducted by MD DNR using gillnet gear during June-Aug since 2013. Between 2018 and 2023, the abundance appears to have been relatively stable with moderate interannual variability. In 2024, abundance dropped dramatically and remained low in 2025.

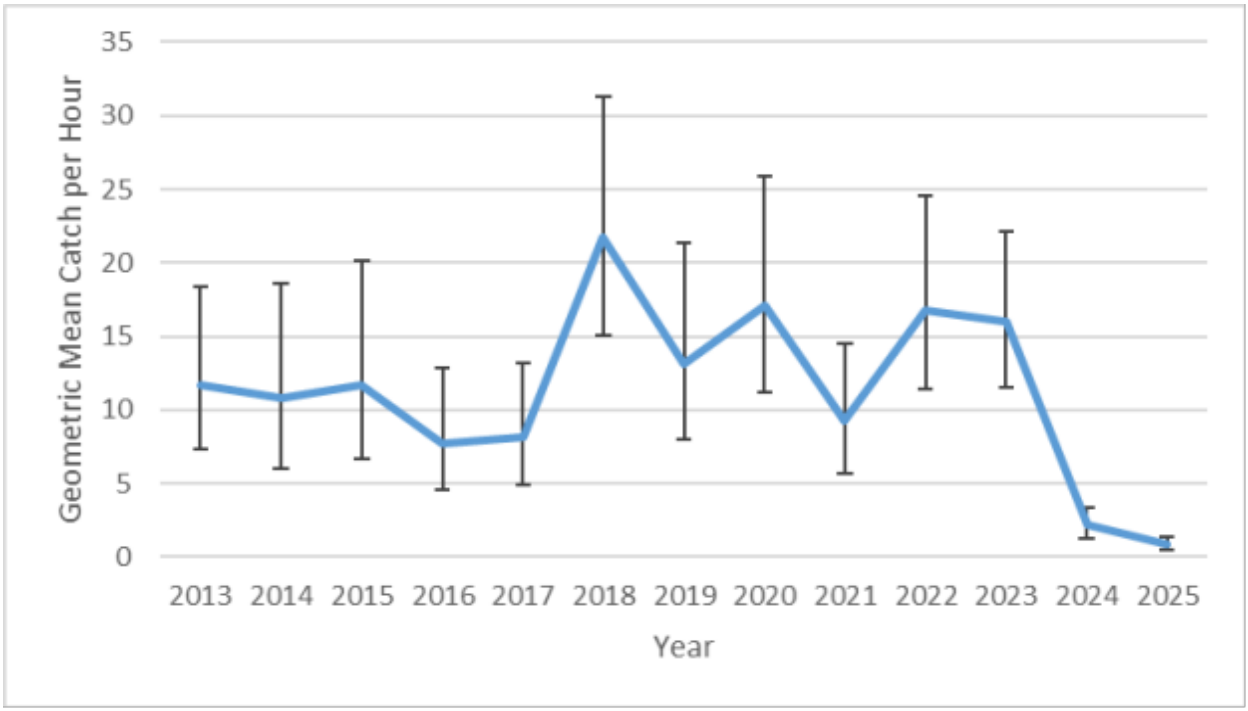


Figure 4. MD DNR Choptank River Gillnet Survey geometric mean catch per effort.

While the annual data suggest that availability has remained relatively constant, the PDT was concerned that data at the annual scale may mask variability at the seasonal level. To investigate seasonal impacts, CPUE was evaluated on a weekly scale (weekly harvest divided by weekly net trips), beginning in week 13 of each year.

During weeks 13-26, weekly CPUE in both 2023 and 2024 is low relative to the average in 2018-2022 (Figure 5). It is unlikely that this is due to the reduction fishery, as reduction harvest does not usually begin until week 19 and was delayed until after week 23 in 2023-2024 (Figure 6).

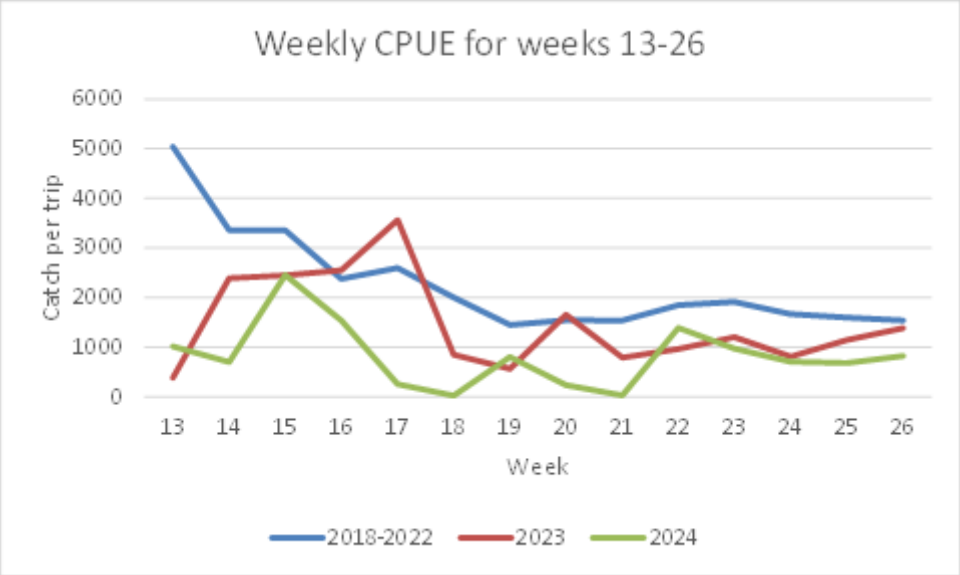


Figure 5. Weekly CPUE in MD pound net fishery for weeks 13 to 26.

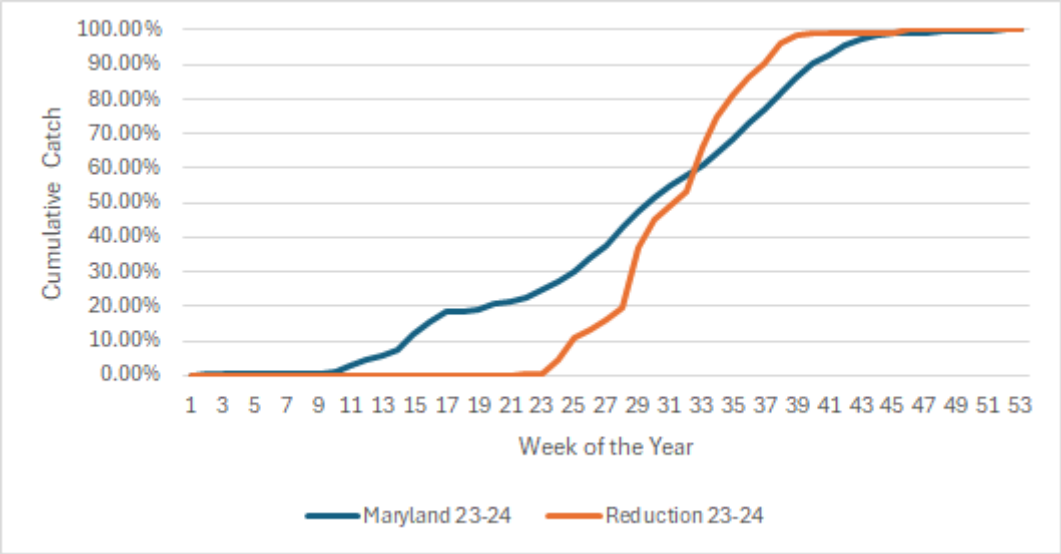


Figure 6. Timing of the MD pound net fishery relative to the Chesapeake Bay reduction fishery.

During the second half of the year (weeks 27+), weekly CPUE in 2023 is generally equal to or greater than the 2018-2022 average (Fig 7), suggesting little influence of the reduction fishery on pound net catches. Starting in week 46, pound net CPUE in 2023 falls below the 2018-2022 average, but by this time both fisheries have achieved greater than 95% of the annual catch and are winding down for the year.

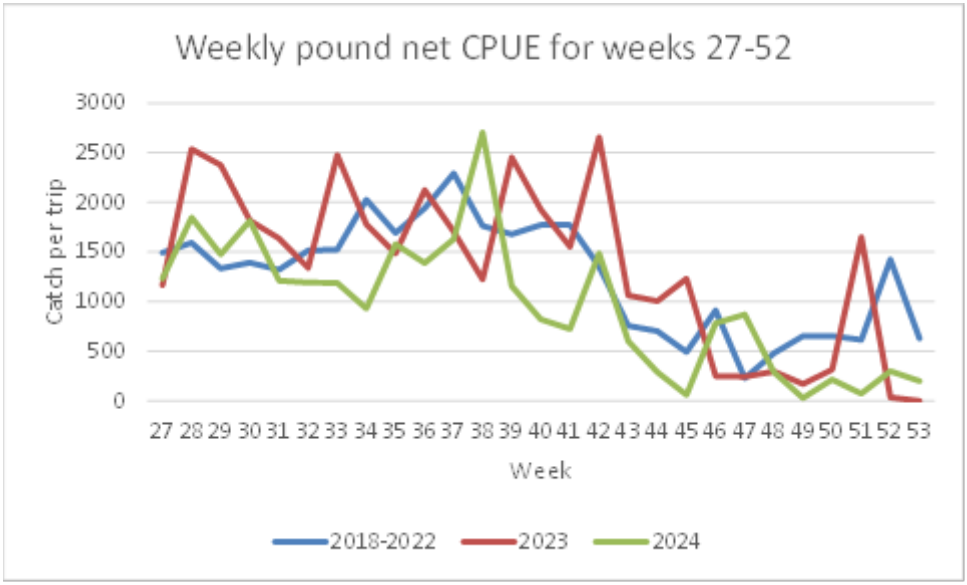


Figure 7. Weekly CPUE in MD pound net fishery for weeks 27-52.

Weekly pound net CPUE in 2024 shows a different pattern. Beginning in week 31 and continuing through the end of the year, CPUE in 2024 is generally below the 2018-2022 average (Fig 7). Just prior to this time period, the reduction fishery was experiencing higher than normal catch rates (Figure 8). The reduction fishery began in week 23, approximately five weeks later than 2018-2022, but by week 33 had caught approximately 60% of the annual catch, which is in

line with earlier years. It is possible that these higher than normal catch rates may have affected availability of fish in the upper bay, thereby affecting pound net catches. However, these data are inconclusive at the resolution at which they were evaluated. Although catch rates were higher than normal, total catch was equivalent among years. Any link between reduction harvest and availability in the upper bay would be a joint function of fishery dynamics and migratory patterns (*e.g.* timing and location) at a finer scale than were considered for this analysis.

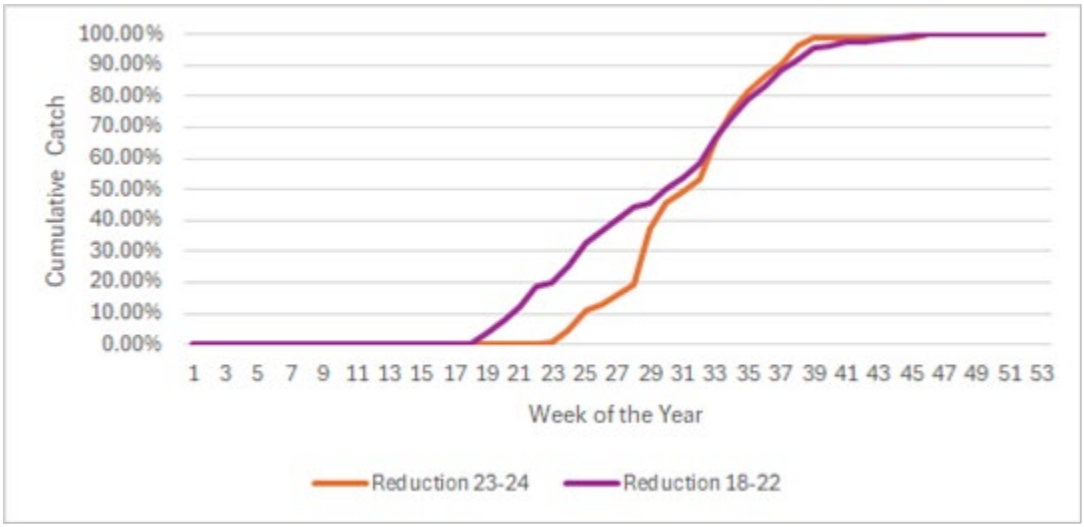


Figure 8. Timing of the Chesapeake Bay reduction fishery showing a delayed start with higher than average catch rates in weeks 23-33 in 2023-2024.

Results of this analysis suggest that reduced pound net harvest in 2023 was a result of lower than normal effort. CPUE in the Choptank River gillnet survey in 2023 was approximately equal to the 2018-2022 average, and weekly CPUE in the Maryland pound net fishery was generally higher than the 2018-2022 average. These two observations suggest continued availability of menhaden to the pound net fishery. Assuming no change to fishery efficiency, reduced effort remains as the primary cause of reduced harvest.

In contrast, higher than normal catch rates in the reduction fishery in 2024 may have reduced availability to the pound net fishery, although this cannot be confirmed at the resolution at which this analysis was conducted. Higher than average harvest rates in the Chesapeake Bay reduction fishery during weeks 23-33 were followed by lower than average pound net CPUE beginning in week 27. Although reduction harvest rates were higher than normal, overall removals were typical. A more detailed analysis would be required to elucidate the effects of reduction harvest on the pound net fishery.

Pound Net Participation Over Time

The Board requested additional analysis to explore trends in the number of participants in the pound net fisheries for Maryland, Potomac River Fisheries Commission (PRFC), and Virginia. Overall, all three jurisdictions saw a decline in the number of unique participants from 2018 through 2024, with Maryland seeing the biggest decline from 2018 through 2021 (Figure 9). Since 2021, all three states have seen between 10 to 16 participants per year.

PRFC notes that the pound net fishery has been a limited entry fishery since the 1970's, and allows for a maximum of 100 pound nets in the Potomac Mainstem. They have not noted any major historical trends in the number of participants fishing for menhaden.

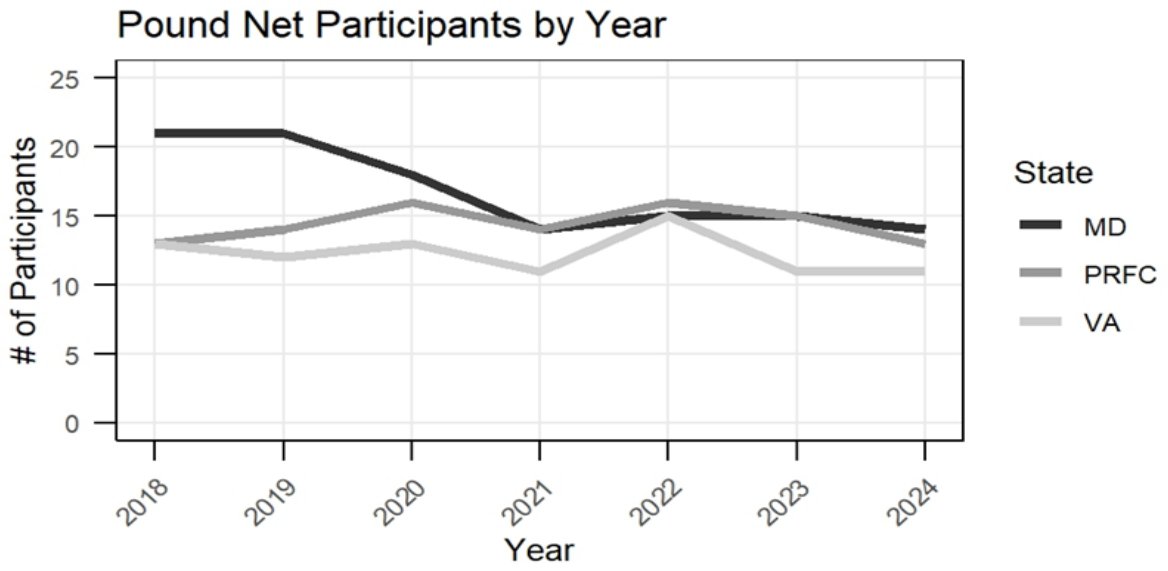


Figure 9. Number of Pound Net Participants by year for Maryland, Potomac River Fisheries Commission and Virginia, 2018-2024.

When looking at the number of unique participants by month there appears to be less participants by month during 2023 and 2024 for all three jurisdictions when compared to 2018 through 2022 (Fig. 10, Fig. 11, Fig. 12). However, there seems to be consistent variability by month throughout this time series with no clear trends.

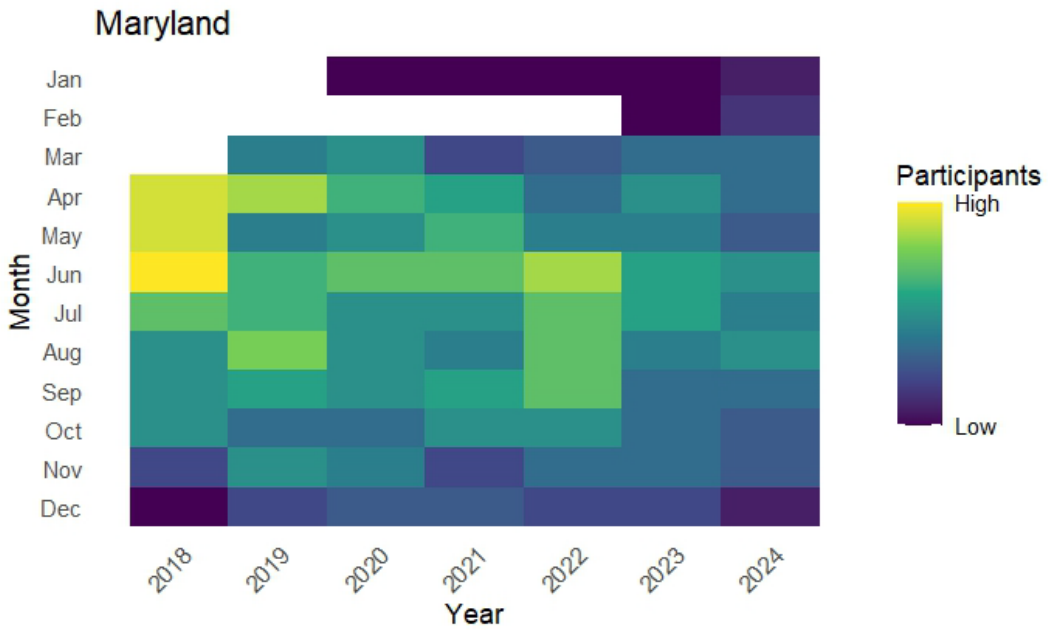


Figure 10. Number of Pound Net Participants by month for Maryland, 2018-2024.

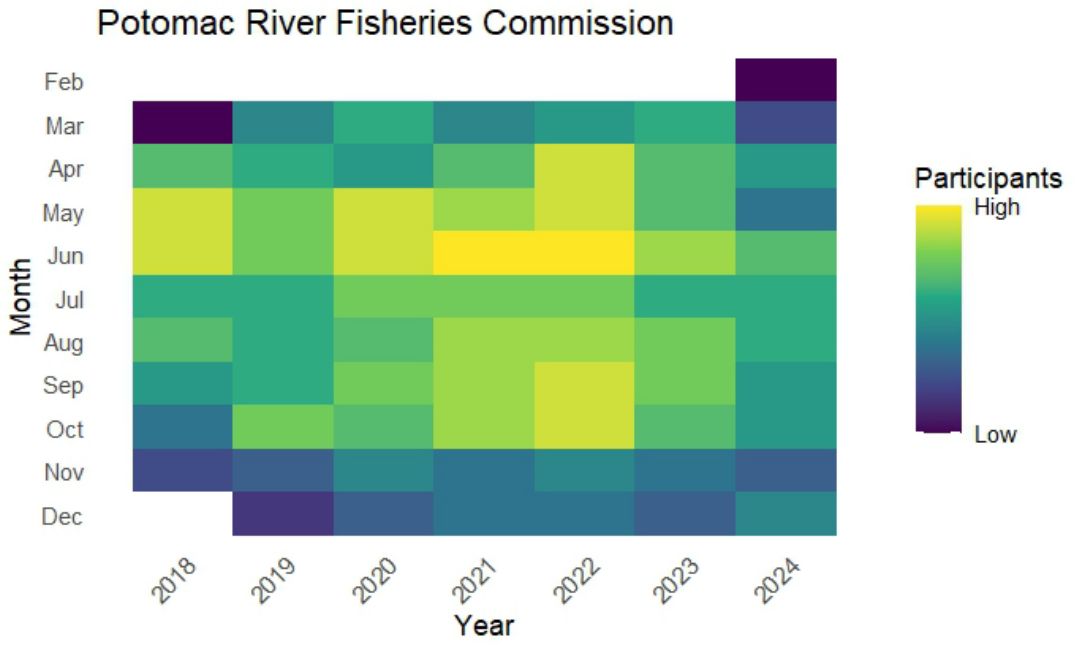


Figure 11. Number of Pound Net Participants by month for Potomac River Fisheries Commission, 2018-2024.

Figure 12. Number of Pound Net Participants by month for Virginia, 2018-2024.

Rejected Options

Overages and Rollovers

The options below were developed in consideration of quota period overages that did not result in an overage of the total Bay Cap. In the draft addendum options, once a quota period is exceeded, the overage amount is deducted from the equivalent period in the subsequent year. However, since the Bay Cap is not exceeded, the options in the draft addendum do not subtract the overage amount from the total Cap, which requires the deducted quota to be redistributed to a different quota period.

The first option below would subtract a quota period overage from the total Bay Cap in addition to reducing the equivalent quota period the following year, thereby eliminating the need to redistribute the deducted quota to a different quota period. The PDT rejected this alternative option to prevent reducing the total Bay Cap when it is not exceeded the previous year. Similarly, the PDT considered and rejected an option to prohibit rollover to prevent reducing the total Bay Cap when it is not exceeded due to an overage only in the final quota period.

The third option below would have distributed the deducted quota proportionally over the remaining later quota periods, given the stated objective to shift harvest later in the year. The PDT believes that the option in the document, which redistributed the overage to the final quota period, satisfies the objectives of the draft addendum and removed this option to simplify the document.

Quota Period Overage Deducted from Total Bay Cap: Any overage of a quota period will be deducted from the same quota period in the following year.

Rollover Prohibited: No rollover of unused quota is permitted within a year. This would lead to unused quota not being available later in the year. If the final quota period is exceeded, then there is a pound for pound payback in the Cap the following year.

Proportional Redistribution of Quota Period Overage Payback: All quota that is deducted from early periods in the following year will be redistributed to the remaining quota periods based on the proportion of the remaining quota periods that did not need a reduction. See table for example.

Automatic Chesapeake Bay Reduction Fishery Cap Adjustment

The PDT considered the option below as it would utilize both the TAC and Bay Cap for 2027 to set the conversion factor to use moving forward (2027 Bay Cap/2027 TAC). However, the PDT rejected this option as it is uncertain what the 2027 TAC might be, which makes giving numeric examples difficult. Utilizing the 2026 TAC that is in place while the decision on the Bay Cap level is being made is also logical and allows for known conversion factor values to be included in the draft for public comment.

Adjust Based on Potential Changes to the 2027 Coastwide TAC*:* Option to set the Bay Cap to Coastwide TAC conversion factor in 3.1.2 (Automatic Chesapeake Bay Reduction Fishery Cap

Adjustment with Changes to the Coastwide TAC) based on the Coastwide TAC for 2027 selected by the Board later this year and the Bay Cap selected in this Addendum in section 3.1.1.

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • asmfc.org

MEMORANDUM

TO: Atlantic Menhaden Board

FROM: Atlantic Menhaden Technical Committee

DATE: April 21, 2026

SUBJECT: Menhaden Environmental Literature Review

Board Tasking

At the Commission's 2025 Annual Meeting, the Atlantic Menhaden Board tasked the Technical Committee (TC) with reviewing information from NOAA's Ecosystem Dynamics and Assessment Branch and Chesapeake Bay Office, and the Woods Hole Oceanographic Institution to evaluate the possible effect of cold water on the Continental Shelf on menhaden migration and migratory patterns, particularly in relation to the timing of osprey arrival, nesting, and breeding. The Board also tasked the TC with considering what role water temperature, dissolved oxygen levels, shoreline hardening, and other environmental factors play in the local abundance of menhaden and other forage species in the Chesapeake Bay.

To address this task in a comprehensive, quantitative manner requires a significant amount of time and data. As a first step, the TC conducted a literature review on the key topics identified by the Board. If the Board would like the TC to pursue a more quantitative approach, this literature review can also serve as the basis for that task.

2025 State of the Ecosystem Report

The original impetus for this tasking was NOAA's 2025 State of the Ecosystem Report for the Mid-Atlantic region (Gaichas et al. 2025), which highlighted the fact that water temperatures on the NE shelf were colder than average in 2024 and members of the fishing community reported that some species were outside of the typical fishing grounds and in higher abundance than recent years (ex. Atlantic mackerel), as well as delayed fishing due to multiple species migrating into fishing areas later in the season.

The Northeast US shelf has experienced a long-term warming trend in annual sea surface temperature as well as seasonal surface and bottom temperatures. However, in 2024, surface and bottom temperatures were near normal/cooler than normal in all seasons in the Mid-Atlantic Bight (MAB). Variability in the Gulf Stream contributes significantly to the temperature variation on the Northeast shelf. The Gulf Stream has been less stable and shifting northward in the last decade, moving closer to the Grand Banks, which reduces the amount of cold water from the Labrador current coming onto the shelf. In 2024, the northern extent of the Gulf Stream was further south than in recent years, allowing colder, fresher and less buffered water into the Northwest Atlantic compared to 2020-2023. The cooler water seen in 2024 was linked anecdotally to the delay in migration of some species (longfin squid, black sea bass, haddock) and the redistribution of other species (pollock, bluefin tuna, Atlantic mackerel, longfin squid, bluefish, and bonito observed in unusual locations). Some species were also reported as having higher abundance, such as Atlantic mackerel on the shelf and red drum in the Chesapeake Bay,

which saw record high numbers in the Poplar Island survey. However, this cooler water on the shelf did not extend to all parts of the region, with Chesapeake Bay seeing sea surface temperatures above the 2000-2020 average as well as low dissolved oxygen, leading to a less suitable environment for high profile species like striped bass and blue crabs in the Bay. The extent of marine heatwaves was also reduced compared to recent years. Bottom marine heatwaves are defined as warming events with temperature above the 90th percentile of daily climatology that last for 30 or more days. Only the southern MAB had any bottom habitat that exceeded 24^{o}C and that was for less than 30 days.

In addition to the overall warming trend in the MAB, there have also been long term changes to the timing of seasonal changes like the transition from spring to fall and the formation and extent of the Atlantic cold pool. Summer conditions have been lasting longer in the MAB, with the time between the spring and fall transitions increasing over time. Although the transition in 2024 was shorter than 2020-2023, it was still in line with the overall increasing trend in this metric. Changes in transition timing can affect biological processes like migration and spawning for fish species and may also affect the timing of the fall phytoplankton bloom. There is no clear trend in overall primary production, but there has been a decrease in chlorophyll in September and an increase in January compared to the start of the time series, suggesting the fall bloom could be shifting later as warmer water temperatures persist longer. The cold pool in the MAB – the remains of cold winter waters that persist into spring and summer near the bottom – has been getting warmer and smaller as well as lasting for a shorter period. The cold pool represents important spawning and nursery habitat for some species like yellowtail flounder, therefore changes to the extent and persistence of the cold pool can affect their dynamics. However, the cold pool in 2024 was near the long-term average in terms of temperature, extent, and persistence, more similar to 2017-2019 values than other recent years.

In addition to highlighting the physical environment, the Ecosystem Report also noted changes in the zooplankton and forage community over time. Zooplankton in this region have shown a significant increasing trend in diversity over the time-series. Large-bodied copepod biomass has been variable without a significant trend, while small-bodied copepod biomass has shown a declining trend and Euphausiids (e.g., krill) biomass has been increasing. This changing mix of species can affect the forage fish that feed on them, since smaller bodied copepods and krill have lower energy content than larger bodied copepods.

The center of biomass for forage species in the Northwest Atlantic has shifted northward and eastward (i.e., more offshore) for the species encountered by the NEFSC trawl surveys. This change in distribution may be driven by the changes in the physical environment over time. Similar changes in distribution have been detected for some predator species, including marine mammals like whales and dolphins, which may be responding to the environment or following distributions of forage species, or both.

Overall, the report notes that the episodic or short-term events like the cooler conditions in 2024 result in more variable conditions, but species distributions are unlikely to revert to historical ranges in the short-term. While 2024 conditions were notable compared to 2020-2022 conditions, SST, the Gulf Stream index, spring to fall transition timing, and cold pool conditions all remain elevated/warmer compared to even the early 2000s. Long-term projections forecast a temporary pause in warming over the next decade because of the variability in the Gulf Stream, but short-term projections are highly uncertain.

Menhaden Environmental Preferences

Atlantic menhaden spawn off the coast of the Carolinas in the winter months (Nicholson 1978; Lewis et al. 1987), as well as spawning during their coastal migration (Ahrenholz 1991). Atlantic menhaden are multiple spawners with indeterminate, batch spawning (Latour et al. 2023); ichthyoplankton surveys have found significant levels of Atlantic menhaden larvae in shallow waters along the Atlantic coast during most of the year (September – June; Simpson et al. 2016). Atlantic menhaden rely on ocean currents to deliver larvae from the offshore spawning grounds to inshore nursery grounds along the coast, where juveniles develop before recruiting to the adult population. Depending on physical processes and ocean circulation, larvae can be transported hundreds of kilometers from the spawning ground to estuaries (Epifanio and Garvine 2001). Nursery ground productivity may vary annually due to environmental and biological factors such as the amount of larvae near estuarine mouths, time and location of spawning, number of eggs produced and the size of the spawning stock biomass, changes in the Gulf Stream, temperature, accessibility of estuarine mouths, and winter storms (Nelson et al. 1977; Checkley et al. 1988; Quinlan et al. 1999; Werner et al. 1999). In Chesapeake Bay, Houde et al. (2016) found that the abundance of age-0 Atlantic menhaden was positively correlated with chlorophyll *a* and Secchi depth (i.e., turbidity) and negatively correlated with Susquehanna River discharge. Also in Chesapeake Bay, Atkinson and Secor (2017) found evidence that cold winter water temperatures could cause a recruitment bottleneck due to increased larval mortality and reduced growth of early winter hatched Atlantic menhaden. Coastwide, Simpson et al. (2016) found that cooler temperatures, intermediate wind speeds, and negative-phase Atlantic Multidecadal Oscillation (AMO) were the most favorable for the survival of larval Atlantic menhaden. Deyle et al. (2018) determined there was clear evidence that recruitment of young-of-year menhaden is driven nonlinearly by ecosystem interactions, but incorporating sea surface temperature, the best indicator of environmental effects on recruitment in their study, did not improve model predictions of recruitment in the Atlantic. While Deyle et al. (2018) conducted their analysis at the coastwide level, Buchheister et al. (2016) found that the AMO was the best predictor of regional recruitment abundance, but the relationship between the AMO and recruitment differed across the region, showing a positive relationship in the southern New England region and a negative relationship in the Chesapeake Bay region. Midway et al. (2020) found relationships between environmental variables in the size-at-age of age-1 Atlantic menhaden in the north Atlantic, with the AMO and northern wind patterns having a negative effect on growth and eastern wind patterns having a positive effect on growth; no relationships were detected between temperature and wind for age-1 menhaden in the south or mid-Atlantic.

Atlantic menhaden migration patterns have been documented through historical tagging data, fishery data, and ichthyoplankton survey data (Roithmayr 1963; Dryfoos et al. 1973; Nicholson 1978; Simpson et al. 2016; Liljestrand et al. 2019). Adults begin migrating inshore and north in early spring following the end of the spawning season off the Carolinas during December-February. The oldest and largest fish migrate farthest, reaching southern New England by May and the Gulf of Maine by June. Adults that remain in the south Atlantic region for spring and summer migrate south later in the year, reaching northern Florida by fall. In the fall, a large proportion of the adult population that summered north of Chesapeake Bay moves south. However, even during the winter, not all fish migrate. Liljestrand et al. (2019) estimated that approximately a third of the fish in mid-Atlantic and southern New England waters and three-quarters of the fish in the Chesapeake Bay region remained in those respective regions over the winter, which is consistent with the presence of larvae in those regions during that time period (Simpson et al. 2016).

While there is a large body of literature on the environmental factors influencing Atlantic menhaden recruitment and growth, there is less information on the environmental preferences of adults and how

environmental conditions affect their abundance and migration patterns. Woodland et al. (2021) found a positive relationship between menhaden abundance in Chesapeake Bay and river discharge, the AMO, and years with a long warming trajectory in spring months. The 2020 Atlantic menhaden benchmark assessment inferred habitat preferences from state surveys ranging from CT to northern Florida and found broad habitat envelopes with peak mean abundance occurring around 10°C bottom temperature, 30 ppt salinity, and 8 ft of depth (SEDAR 2020). An analysis of the NEFSC bottom trawl data found that more of the population was present in the northern end of the stock area in the spring than in earlier years, consistent with overall warming trends in the region (SEDAR 2020). Although the results should be interpreted with caution as the NEFSC bottom trawl does not reliably capture Atlantic menhaden, this is consistent with fishery data in recent years as well.

Osprey Timing

There have been several studies on osprey behavior within the Chesapeake Bay from the 1970s (Kennedy 1971, 1973; Reese 1972, 1975; Henny et al. 1974, 1977; Seek 1977) as well as some more recent work (Watts and Paxton 2007; Glass 2008). Overall, the literature indicates that osprey arrive in Chesapeake Bay in March and lay eggs in April. The eggs hatch between mid-May and mid-June, depending on when individual clutches were laid (incubation is 38-42 days), and fledging occurs from mid-July to early August. Osprey begin leaving the Bay during the last week of August and have generally fully departed by mid-October. Osprey in the mid-Atlantic Bight area and the New England area had similar timelines, arriving slightly later than in Chesapeake Bay and departing slightly earlier (Henny and van Velzen 1972; Poole and Agler 1987; Martell et al. 2001). None of the literature identified relationships between environmental factors and the timing of osprey migration, nesting, or fledging, nor were changes in the timing of these events over time noted.

Environmental Preferences of Other Forage Species in Chesapeake Bay

The TC reviewed literature on the environmental preferences of several species that have been identified as important forage species based on stomach content analysis and life history: alewife, blueback herring, bay anchovy, and juvenile spot and croaker.

Alewife (*Alosa pseudoharengus*) and blueback herring (*A. aestivalis*) are anadromous species that undergo spawning migrations cued by temperature, with a minimum spawning temperature of 10.5°C for alewife and 14°C for blueback herring (Mullen et al. 1986). Both species cease spawning at 27°C. Alewife typically begin the spawning migration when water temperatures are 5-10°C, while blueback herring typically migrate to spawn when water temperatures are 14-22°C, meaning alewife arrive earlier than blueback herring to the rivers and estuaries (Brown et al. 2024). Larvae and YOY nursery grounds include low-salinity tributaries near the salt/freshwater interface and high salinity waters in early fall before departure to ocean in late fall; as temperatures drop in fall, juveniles are less abundant in surveys (NMFS 2019; Able et al. 2020). Smith et al. (2025) identified a temporal pattern in the distribution of juveniles within the Virginia portion of the Chesapeake Bay, with juveniles concentrated in the upper portions of the sub-estuaries during autumn, the middle of the sub-estuaries during winter, and the mouth of the sub-estuaries during spring.

Bay anchovy (*Anchoa mitchilli*) tolerate a wide range of temperatures (as evidenced by extensive geographic range), and salinity appears to have little influence over their distribution (Morton 1989). Spawning occurs when water temperatures are at least 12°C, with peak spawning occurring at temperatures of 20.8-23.5°C and salinities of 13-15 ppt (Morton 1989, Castro and Cowen 1991). In Chesapeake Bay, spawning occurs May – September with peak in July; the spawning season is shorter further north and earlier spawning induced by earlier warming and sustained higher temperatures

(Zastrow et al. 1991). Bay anchovy undertake some seasonal offshore/onshore migrations. Biomass of bay anchovy in Chesapeake Bay peaks in summer and fall, with abundance in the winter being positively correlated with water temperature, suggesting that emigration out of the Bay may be more pronounced during cold winters (Wang and Houde 1995).

Juvenile spot (*Leiostomus xanthurus*) and croaker (*Micropogonias undulatus*) are tolerant of a wide range of conditions (Diaz and Onuf 1985, Parker 1971). Juvenile spot are generally found between 6–20^{o}C, with a tolerable temperature range extending from 1.2–35.5^{o}C, and in salinities ranging from 0–30 ppt (polyhaline to freshwater) (Parker 1971, Akin et al. 2012). Juvenile croaker are found in waters from 0.4–35.5^{o}C and tolerate colder temperatures than adults; they are primarily associated with salinities of 0.5 to 18 ppt (Diaz and Onuf 1985).

Shoreline Hardening Impacts

Studies that have looked at the effect of shoreline type on Atlantic menhaden abundance have either found a positive relationship with hardened shorelines compared to natural shorelines (Bilkovic and Roggero 2008) or no relationship (Balouskus and Targett 2017; Kornis et al. 2017, 2018). A number of studies have found lower species diversity at hardened shorelines compared to natural shorelines in some estuaries (Bilkovic and Roggero 2008; Seitz and Lawless 2008; Gittman et al., 2016a,b; Balouskus and Targett 2017), while others have found no relationship with diversity (Seitz et al. 2006; Seitz and Lawless 2008; Long et al. 2011; Lawless and Seitz 2014; Lovall et al., 2017). Effects of shoreline hardening varied by species and, in some studies, by estuary. These studies also found no significant differences in temperature, dissolved oxygen or salinity by shoreline type (Seitz et al. 2006; Seitz and Lawless 2008, 2014; Long et al. 2011; Davenport et al. 2017; Lovall et al. 2017; Kornis et al. 2018). Atlantic menhaden had a positive relationship with total nitrogen, but that was more related to land cover/land use than shoreline hardening (Kornis et al. 2017).

TC Discussion

Many factors within a species' physical environment will influence abundance, distribution, and timing of population events such as spawning and migration. The TC has conducted this literature search to establish a baseline of knowledge regarding menhaden preferences and environmental conditions. If the Board would like a more detailed, quantitative analysis of the influence of recent environmental conditions on availability of menhaden on the continental shelf and within Chesapeake Bay, the TC would request additional guidance on the parameters and relationships of greatest interest to the Board in order to prioritize the work and complete it in a timely fashion. However, the TC also stresses that the existing datasets may not be sufficient to fully address the Board's questions, given the limited spatial and temporal coverage of both fishery dependent and fishery independent data.

Literature Cited

Able, K.W., T.M., Grothues, M.J. Shaw, S.M. VanMorter, M.C. Sullivan and D.D. Ambrose. 2020. Alewife (*Alosa pseudoharengus*) spawning and nursery areas in a sentinel estuary: spatial and temporal patterns. Environmental Biology of Fishes.

Akin, S., and K.O. Winemiller. 2012. Habitat use and diets of Juvenile spot *(Leiostomus xanthurus)* and Atlantic croaker (*Micropogonias undulatus*) in a small estuary at Mad Island Marsh, Texas. Texas J. of Sci. 64(1):0:00.

Ahrenholz, D. W. 1991. Population biology and life history of the North American menhadens, Brevoortia spp. Marine Fisheries Review 53(4): 3-19.

Atkinson, A. N., & Secor, D. H. (2017). Influence of winter conditions on the age, hatch dates, and growth of juvenile Atlantic Menhaden in the Choptank River, Maryland. Transactions of the American Fisheries Society, 146(6), 1126-1136.

Balouskus, R. G., & Targett, T. E. (2018). Impact of Armored Shorelines on Shore-Zone Fish Density in a Mid-Atlantic, USA, Estuary: Modulation by Hypoxia and Temperature. Estuaries and Coasts, 41, 144–158. https://doi.org/10.1007/s12237-017-0258-6

Bilkovic, D. M., & Roggero, M. M. (2008). Effects of coastal development on nearshore estuarine nekton communities. Marine Ecology Progress Series, 358, 27–39. https://doi.org/10.3354/meps07279

Brown, C.R., A.J.A. Sergio, C.S. Bate, N. Koopman, J.B.Roland, O.D.P. Notman-Grobler, P.M.B. Mastrodimitropolous, M. L. Piczack, and R.J. Lennox. 2024. A review of migratory Alosidae marine ecology in the northwest Atlantic. Fish Biology. 106: 677-695.

Buchheister, A., T.J. Miller, E.D. Houde, D.H. Secor, and R.J. Latour. 2016. Spatial and temporal dynamics of Atlantic menhaden (*Brevoortia tyrannus*) recruitment along the Northwest Atlantic Ocean. ICES Journal of Marine Science 73: 1147-1159.

Castro, L. R. and R.K. Cowen. 1991. Environmental factors affecting the early life history of bay anchovy Anchoa mitchilli in Great South Bay, New York. Mar. Ecol. Prog. Ser. 76:235:247.

Checkley, D. M., P. B. Ortner, F. E. Werner, L. R. Settle, and S. R. Cummings. 1999. Spawning habitat of the Atlantic menhaden in Onslow Bay, North Carolina. Fisheries Oceanography 8(SUPPL. 2): 22-36.

Davenport, T. M., Seitz, R. D., Knick, K. E., & Jackson, N. (2018). Living Shorelines Support Nearshore Benthic Communities in Upper and Lower Chesapeake Bay. Estuaries and Coasts, 41, 197–206. https://doi.org/10.1007/s12237-017-0361-8

Deyle, E., A. M. Schueller, H. Ye, G. M. Pao, and G. Sugihara. 2018. Ecosystem-based forecasts of recruitment in two menhaden species. Fish and Fisheries 19(5): 769-781.

Dryfoos, R. L., R. P. Cheek, and R. L. Kroger. 1973. Preliminary analyses of Atlantic menhaden, *Brevoortia tyrannus*, migrations, population structure, survival and exploitation rates, and availability as indicated from tag returns. Fishery Bulletin 71(3):719-734.

Epifanio, C.E., and R. W. Garvine. 2001. Larval Transport on the Atlantic Continental Shelf of North America: a Review. Estuarine, Coastal and Shelf Science 52: 51-77.

Diaz, R.J., and C.P. Onuf. 1985. Habitat suitability index models: juvenile Atlantic croaker (revised). U.S. Fish Wildl. Serv. Biol. Rep. 82(10.98). 23 pp.

Gaichas, Sarah (editor) et al. (2025). State of the Ecosystem 2025: Mid-Atlantic. https://doi.org/10.25923/23nx-qf59

Gittman, R. K., Peterson, C. H., Currin, C. A., Fodrie, F. J., Piehler, M. F., & Bruno, J. F. 2016aa. Living shorelines can enhance the nursery role of threatened estuarine habitats. Ecological Applications, 26(1), 249–263.

Gittman, R. K., Scyphers, S. B., Smith, C. S., Neylan, I. P., & Grabowski, J. H. 2016b. Ecological consequences of shoreline hardening: A meta-analysis. In BioScience (Vol. 66, Issue 9, pp. 763–773). Oxford University Press. https://doi.org/10.1093/biosci/biw091

Glass, K. A. (2008). Broad Spatial Trends in Osprey Provisioning, Reproductive Success, and Population Growth Within Lower Chesapeake Bay [Masters Thesis, The College of William and Mary]. https://doi.org/10.21220/s2-1n55-ph30

Henny, C. J., & Van Velzen, W. T. (1972). Migration Patterns and Wintering Localities of American Ospreys. The Journal of Wildlife Management, 36(4), 1133–1141. https://doi.org/10.2307/3799242

Henny, C. J., Smith, M. M., & Stotts, V. D. (1974). The 1973 distribution and abundance of breeding ospreys in the Chesapeake Bay. Chesapeake Science, 15(3), 125–133. https://doi.org/10.2307/1351027

Henny, C. J., Byrd, M. A., Jacobs, J. A., McLain, P. D., Todd, M. R., & Halla, B. F. (1977). Mid-Atlantic Coast Osprey Population: Present Numbers, Productivity, Pollutant Contamination, and Status. The Journal of Wildlife Management, 41(2), 254–265. https://doi.org/10.2307/3800602

Houde, E. D., Annis, E. R., Harding Jr, L. W., Mallonee, M. E., & Wilberg, M. J. (2016). Factors affecting the abundance of age-0 Atlantic menhaden (*Brevoortia tyrannus*) in Chesapeake Bay. ICES Journal of Marine Science, 73(9), 2238-2251.

Kennedy, R. S. (1971). Population Dynamics of Ospreys in Tidewater Virginia, 1970-1971 [Masters Thesis, The College of William and Mary]. https://scholarworks.wm.edu/handle/internal/6467

Kennedy, R. S. (1973). Notes on the Migration of Juvenile Ospreys from Maryland and Virginia. Bird-Banding, 44(3), 180–186. https://doi.org/10.2307/4511958

Kornis, M. S., Bilkovic, D. M., Davias, L. A., Giordano, S., & Breitburg, D. L. (2018). Shoreline Hardening Affects Nekton Biomass, Size Structure, and Taxonomic Diversity in Nearshore Waters, with Responses Mediated by Functional Species Groups. Estuaries and Coasts, 41, 159–179. https://doi.org/10.1007/s12237-017-0214-5

Kornis, M. S., Breitburg, D., Balouskus, R., Bilkovic, D. M., Davias, L. A., Giordano, S., Heggie, K., Hines, A. H., Jacobs, J. M., Jordan, T. E., King, R. S., Patrick, C. J., Seitz, R. D., Soulen, H., Targett, T. E., Weller, D. E., Whigham, D. F., & Uphoff, J. (2017). Linking the Abundance of Estuarine Fish and Crustaceans in Nearshore Waters to Shoreline Hardening and Land Cover. Estuaries and Coasts, 40(5), 1464–1486. https://doi.org/10.1007/s12237-017-0213-6

Lawless, A. S., & Seitz, R. D. (2014). Effects of shoreline stabilization and environmental variables on benthic infaunal communities in the Lynnhaven River System of Chesapeake Bay. Journal of Experimental Marine Biology and Ecology, 457, 41–50. https://doi.org/10.1016/j.jembe.2014.03.010

Lewis, R.M. 1966. Effects of salinity and temperature on survival and development of larval Atlantic menhaden, *Brevoortia tyrannus*. Transactions of the American Fisheries Society 95: 423-426.

Liljestrand, E.M., M.J. Wilberg, and A.M. Schueller. 2019a. Estimation of movement and mortality of Atlantic menhaden during 1966-1969 using a Bayesian multi-state mark recapture model. Fisheries Research 210: 204-213.

Long, W. C., Grow, J. N., Majoris, J. E., & Hines, A. H. (2011). Effects of anthropogenic shoreline hardening and invasion by Phragmites australis on habitat quality for juvenile blue crabs (Callinectes sapidus). Journal of Experimental Marine Biology and Ecology, 409(1–2), 215–222. https://doi.org/10.1016/j.jembe.2011.08.024

Lovall, C. D., Seitz, R. D., & Knick, K. E. (2017). Direct & indirect impacts of shoreline development on shallow-water benthic communities in a depauperate estuarine system. Bulletin of Marine Science, 93(3), 715–741. https://doi.org/10.5343/bms.2016.1076

Martell, M. S., Henny, C. J., Nye, P. E., & Solensky, M. J. (2001). Fall Migration Routes, Timing, and Wintering Sites of North American Ospreys as Determined by Satellite Telemetry. The Condor: Ornithological Applications, 103(4), 715–724. https://doi.org/10.1093/condor/103.4.715

Midway, S. R., Schueller, A. M., Leaf, R. T., Nesslage, G. M., & Mroch III, R. M. (2020). Macroscale drivers of Atlantic and Gulf Menhaden growth. Fisheries Oceanography, 29(3), 252-264.

Morton, T. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--bay anchovy. U. S. Fish Wildl. Serv. Biol. Rep. 82(11.97). 13 pp.

Mullen, D.M, C.W. Fay, and J.R. Moring. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic)--alewife/blueback herring. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.56). U.S. Army Corps of Engineers, TR EL-82-4. 21 pp.

NMFS. 2019. Status Review Report: Alewife (*Alosa pseudoharengus*) and Blueback Herring (*Alosa aestivalis*). Final Report to the National Marine Fisheries Service, Office of Protected Resources. 160 pp.

Nelson, W. R., M. C. Ingham, and W. E. Schaaf. 1977. Larval transport and year-class strength of Atlantic Menhaden, Brevoortia tyranus. Fishery Bulletin 75(1): 23-41.

Nicholson, W.R. 1978. Movements and population structure of Atlantic menhaden indicated by tag returns. Estuaries 1(3): 141-150.

Parker, J.C. 1971. The Biology of the Spot, *Leiostomus xanthurus* Lacepede, and Atlantic Croaker, *Micropogon undulatus* (Linnaeus), in Two Gulf of Mexico Nursery Areas. TAMU-SG-71-210.

Poole, A. F., & Agler, B. (1987). Recoveries of Ospreys Banded in the United States, 1914-84. The Journal of Wildlife Management, 51(1), 148–155. https://doi.org/10.2307/3801646

Prosser, D. J., Jordan, T. E., Nagel, J. L., Seitz, R. D., Weller, D. E., & Whigham, D. F. (2018). Impacts of Coastal Land Use and Shoreline Armoring on Estuarine Ecosystems: an Introduction to a Special Issue. In Estuaries and Coasts (Vol. 41, pp. 2–18). Springer New York LLC. https://doi.org/10.1007/s12237-017-0331-1

Quinlan, J. A., B. O. Blanton, T. J. Miller, and F. E. Werner. 1999. From spawning grounds to the estuary: using linked individual-based and hydrodynamic models to interpret patterns and processes in the oceanic phase of Atlantic menhaden *Brevoortia tyrannus* life history. Fisheries Oceanography 8(2): 224-246.

Reese, J. G. (1972). Osprey nesting success along the Choptank River, Maryland. Chesapeake Science, 13(3), 233–235. https://doi.org/10.2307/1351075

Reese, J. G. (1975). Osprey nest success in Eastern Bay, Maryland. Chesapeake Science, 16(1), 56–61. https://doi.org/10.2307/1351084

Reintjes, J.W. 1969. Synopsis of biological data on the Atlantic menhaden, *Brevoortia tyrannus*. FAO Species Synopsis 42. 30 p.

Reish, R.L., R.B. Deriso, D. Ruppert, and R.J. Carroll. 1985. An investigation of the population dynamics of Atlantic menhaden (*Brevoortia tyrannus*). Canadian Journal of Fisheries and Aquatic Sciences 42 (Suppl 1): 147-157.

Roithmayr, C.M. 1963. Distribution of fishing by purse seine vessels for Atlantic menhaden, 1955-59. U.S. Fish and Wildlife Service, Special Scientific Report – Fisheries 434, 22 p.

SEDAR. 2020. SEDAR 69 – Atlantic Menhaden Benchmark Stock Assessment Report. SEDAR, North Charleston SC. 691 pp. available online at: http://sedarweb.org/sedar-69

Seek, G. L. (1977). The Tidewater Virginia Osprey Population, 1972 and 1973 [Masters Thesis, The College of William and Mary]. https://dx.doi.org/doi:10.21220/s2-c9rv-hd12

Seitz, R. D., & Lawless, A. S. (2008). Landscape-Level Impacts of Shoreline Development on Chesapeake Bay Benthos and Their Predators. Living Shoreline Summit, 63–70.

Seitz, R. D., Lipcius, R. N., Olmstead, N. H., Seebo, M. S., & Lambert, D. M. (2006). Influence of shallow-water habitats and shoreline development on abundance, biomass, and diversity of benthic prey and predators in Chesapeake Bay. Marine Ecology Progress Series, 326, 11–27.

Simpson, C. A., M. J. Wilberg, H. Bi, A. M. Schueller, G. M. Nesslage, and H. J. Walsh. 2016. Trends in relative abundance and early life survival of Atlantic menhaden during 1977–2013 from long-term ichthyoplankton programs. Transactions of the American Fisheries Society 145(5): 1139-1151.

Smith, S.C.F., M.C. Fabrizio, and T.D. Tuckey. 2025. Multidecadal assessment of Blueback Herring egress in mid-Atlantic subestuaries and implications for Management. Marine and Coastal Fishers. 17.

Wang, S. and E. D. Houde. 1995. Distribution, relative abundance, biomass and production of bay anchovy *Anchoa mitchilli* in the Chesapeake Bay. Mar. Ecol. Prog. Ser. 121:12-38.

Watts, B. D., & Paxton, B. J. (2007). Ospreys of the Chesapeake Bay: Population Recovery, Ecological Requirements, and Current Threats. Waterbirds, 30(sp1), 39–49. https://doi.org/10.1675/1524-4695(2007)030%255B0039:OOTCBP%255D2.0.CO;2

Woodland, R.J., Buchheister, A., Latour, R.J., Lozano, C., Houde, E., Sweetman, C.J., Fabrizio, M.C. and Tuckey, T.D., 2021. Environmental drivers of forage fishes and benthic invertebrates at multiple spatial scales in a large temperate estuary. Estuaries and Coasts, 44(4), pp.921-938.

Zastrow, C.E., E.D. Houde, and L.G. Morin. 1991. Spawning, fecundity, hatch-date frequency and young-of-the-year growth of bay anchovy *Anchoa mitchilli* in mid-Chesapeake Bay. 1991. Mar. Ecol. Prog. Ser. 73:161-171.

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • asmfc.org

MEMORANDUM

TO: **Atlantic Menhaden Management Board**

FROM: **Committee on Economics and Social Sciences**

DATE: **April 20, 2026**

SUBJECT: **Evaluation of potential employment and economic impacts resulting from a TAC reduction**

Executive Summary
In the fall 2025, the Committee on Economics and Social Sciences (CESS) was tasked with looking into how changes in menhaden management could impact jobs within the fishery. This memorandum provides a summary of available information, including model-based approaches used to estimate the economic impacts of changes in Atlantic menhaden landings. Key findings from these prior studies are highlighted, along with study limitations, data gaps, and considerations for future work.

Leontief input–output models are commonly used to evaluate how changes in production by one sector or industry affect regional economies. These models apply fixed production relationships to estimate how output changes in one industry translate into direct, indirect, and induced effects on output, employment, and income across all sectors. While these models can be useful for understanding inter-industry responses and evaluating short-run economic impacts of marginal output changes, the approach assumes constant input proportions in industry production functions, no price adjustments, and no behavioral responses or business adaptation. As a result, firms are assumed to not substitute inputs, shift sourcing, or modify production processes in response to changing constraints (e.g., input prices, output constraints, etc.). Thus, use of this modeling approach to evaluate large-scale or long-term policy changes may overstate impacts.

There were two studies identified that address employment impacts associated with landings changes in the Atlantic menhaden fishery: Kirkley et al. 2011 and Whitehead and Harrison 2017.

Kirkley et al. (2011) assessed the economic importance of the reduction sector under alternative harvest scenarios in the Chesapeake Bay, including an approach that allowed for increasing costs associated with shifting harvest to coastal waters in response to reductions in the Chesapeake Bay quota. The study estimated that the reduction sector supported approximately 519 full- and part-time jobs in Maryland and Virginia, including 347 in Northumberland County, Virginia, associated with total landings of about 141,000 metric tons, of which roughly 85,000 metric tons were harvested from the Chesapeake Bay. Under an extreme scenario in which no harvest was allowed in the Bay and effort could not be shifted to coastal waters, employment losses in

Northumberland County were estimated at up to 176 jobs, including 98 direct losses in the reduction sector. The analysis also indicated that a reduction of 1,000 metric tons in the Chesapeake Bay quota corresponded to an estimated loss of approximately 3.7 total jobs, including 2.1 direct jobs in the reduction sector. Whitehead and Harrison (2017) applied a similar modeling framework and produced employment impact estimates consistent with Kirkley et al. (2011). In addition, this study estimated that employment changes in Northumberland County scale with output at approximately one job per $45,000 in landings (roughly $60,000 in 2026 USD).

These estimates should be interpreted cautiously in a management context. Because Leontief input–output models do not account for market adjustments or adaptive behavior, they likely overstate long-term employment effects. It is likely that economic impacts and employment effects associated with output reductions would respond non-linearly and be characterized by threshold triggers due to high fixed costs in the industry. This would suggest that there are critical output levels, past which employment could change dramatically. Importantly, these studies note that the reduction industry is a critical and central sector for the local economy around Reedville, Virginia. Job losses in this sector could, potentially lead to structural unemployment rather than frictional transition, as we might expect in larger or more diversified economies.

The CESS recommends additional socioeconomic research to support menhaden management decisions. In particular, studies that evaluate industry employment over time and in relation to changes in quota, landings, or other exogenous factors, assess costs and estimate production functions for the reduction sector, or expand consideration of the bait sector, including its costs, demand drivers, and economic contributions, would be strongly supported.

I. Introduction

The Atlantic menhaden (*Brevoortia tyrannus*) fishery serves as an important component for the Atlantic Coast. It is characterized by a geographically concentrated reduction fishery based in Reedville, Virginia, and a more geographically diverse bait sector that supports various other fisheries. While the Atlantic menhaden stock is not overfished, there has been a downward trend in TAC to help maintain ecosystem level and predator-prey balance. Management actions are driven by updated stock assessments that have indicated higher than estimated fishing mortality and the full implementation of ERPs.

This literature review was conducted to support the Board's evaluation of potential employment and economic impacts resulting from the reduction in the TAC for the 2026 fishing year, as well as proposed changes to the Chesapeake Bay harvest cap under Addendum II. The review synthesizes the key findings from two documents: Kirkley et al. (2011) and Whitehead & Harrison (2017).

II. Review of Economic Assessments

A. Establishing the Baseline: Kirkley et al. (2011)

The study serves as the foundational text for understanding the localized economic dependency of the Chesapeake Bay region on the menhaden reduction fishery. It should be noted that the study characterizes the fishery using data from the United States Bureau of Census for the years 2000 and 2008 cost and earnings data from Omega Protein. These data represent conditions prior to recent management shifts (such as Ecological Reference Points ERPs) or any changes in the industry that may have occurred over the last two decades.

Key findings:

- The study highlights the extreme concentration of economic activity in Northumberland County, Virginia (Reedville).
- The study demonstrates that unlike many other fisheries where infrastructure is diffused, the reduction fishery acts as a "monopsony-like" anchor for the local economy.
- The study notes the closure of other processing plants along the coast left Reedville as the sole processor for reduction landings, creating a high degree of vulnerability to regulatory changes.
- The study estimates the ripple effects of the various quota reduction scenarios on employment using an Input-Output model and generating estimates using the software platform IMPLAN.
- The study estimates that the reduction sector supported approximately 519 full- and part-time jobs in Maryland and Virginia, including 347 in Northumberland County, Virginia, associated with total landings of about 141,000 metric tons, of which roughly 85,000 metric tons were harvested from the Chesapeake Bay.
- The study suggests robust multipliers for the reduction sector, indicating that for every job directly in harvesting or processing, a significant number of support jobs (mechanics, logistics, local services) were sustained in the rural Virginia economy.
- The study underscores that alternative employment opportunities in the immediate vicinity of the reduction plant were limited, suggesting that job losses in this sector could lead to structural unemployment rather than frictional transition.
- Under an extreme scenario in which no harvest was allowed in the Bay and effort could not be shifted to coastal waters, employment losses in Northumberland County were estimated at up to 176 jobs, including 98 direct losses in the reduction sector.
- The analysis also indicates that a reduction of 1,000 metric tons in the Chesapeake Bay quota corresponded to an estimated loss of approximately 3.7 total jobs, including 2.1 direct jobs in the reduction sector.

B. Analysis and Valuation of Sectors: Whitehead and Harrison (2017)

The study was commissioned to update the economic understanding of the fishery and provide a more detailed analysis between the reduction and bait sectors. Whitehead and Harrison constitute the "best available economic science" currently on record for the Commission.

Key findings:

- The study characterizes the reduction sector as high-volume, low-unit-price, and high-fixed infrastructure cost, while the bait sector had a lower volume and a higher unit price and infrastructure cost, which were more diffuse across the Atlantic Coast.
- Similar to Kirkley et al. (2011), the study utilizes IMPAN software to generate economic impact estimates.
- The study provides estimates on the total economic contribution (i.e., direct, indirect, and induced effects) across the coastal states.
- In addition, this study estimates that employment changes in Northumberland County, Virginia scale with output at approximately one job per $45,000 in landings.
- The report provides specific employment numbers per metric ton of fish landed.
- These ratios have historically been used by the ASMFC to estimate “jobs at risk” for every percentage point cut in the total allowable catch.
- The assessment suggests that as volume decreases, profitability and employment stability may decline non-linearly.

III. Studies Relevance to 2026 TAC Reductions

Kirkley’s work provides the historical baseline for the "Reedville dependency" argument. However, the data reflects the economic landscape prior to 2010. The cost structures, fuel prices, and labor markets have evolved, meaning the raw dollar values from this report must be inflation-adjusted and contextually updated.

Whitehead and Harrison constitute the "best available economic science" currently on record for the Commission. However, the ASFMC Menhaden Board should note that the reduction sector's economic footprint is highly sensitive to economies of scale. The study suggests that as volume decreases (e.g., via the 2026 TAC cut), the profitability and thus employment stability of the capital-intensive reduction plant may decline non-linearly.

IV. Methodological Limitations

Leontief input–output models are commonly used to evaluate how changes in production by one sector or industry affect regional economies. These models apply fixed production relationships to estimate how output changes in one industry translate into direct, indirect, and induced effects on output, employment, and income across all sectors.

While these models can be useful for understanding inter-industry responses and evaluating short-run economic impacts of marginal output changes, the approach assumes constant input proportions in industry production functions, no price adjustments, and no behavioral responses or business adaptation. As a result, firms are assumed to not substitute inputs, shift sourcing, or modify production processes in response to changing constraints (e.g., input prices, output constraints, etc.). Using this type of modeling approach to evaluate large-scale or long-term policy changes may overstate impacts.

Both Kirkely et al. (2011) and Whithead and Harrison (2017) utilize Input-Output models, which, as noted above, assume a linear relationship between input (fish landings) and output (revenue

or employment). In reality, a processing plant would require a minimum volume of fish to cover its fixed costs of operation (e.g., maintaining shore-side facilities, maintaining its fleet, insurance). If the TAC reduction pushes landings below this break-even threshold, the result is not a 20 percent layoff but potentially a 100% shutdown of the facility. Under this linear relationship, the employment impact for the reduction sector would likely be scaled incorrectly due to its high fixed cost, while the bait sector with lower volume, higher unit price, and lower infrastructure cost is more dispersed across the Atlantic Coast.

These estimates should be interpreted cautiously in a management context. Because Leontief input–output models do not account for market adjustments or adaptive behavior, they likely overstate long-term employment effects. Results are also sensitive to parameterizations of costs and industry production functions, including assumptions regarding the ability of the reduction sector to shift harvest outside Chesapeake Bay.

V. Conclusions and Recommendations

Based on Kirkley et al. (2011), the economic hardship of a TAC reduction will be acutely felt in Northumberland County (Reedville), Virginia. However, Whitehead and Harrison (2017) suggests that the bait sector, while economically valuable, has more elasticity and geographic diversity to absorb shocks. The CESS recommends the following considerations when assessing the forthcoming TAC reductions:

Whitehead and Harrison (2017) should be a directional guide, acknowledging that the employment figures are likely overestimates for marginal TAC changes.

While Kirkley et al. 2011 is more dated, it is more contextually relevant to Chesapeake Bay-related decisions as it specifically explores reductions in the Chesapeake Bay quota cap.

For comparison purposes, it's important to note that the inflation-adjusted estimates and caveats reflect change in current market conditions.

VI. Future Research Needs

The CESS recommends additional socioeconomic research to support menhaden management decisions. We strongly support additional studies that focus on the following core areas: Analysis of employment changes over time in relation to quota and landings changes, controlling for other factors. Information on the reduction fishery (vessel and plant cost structures) should be updated.

VII. References

Kirkley, J.E., Hartman, T., McDaniel, T., McConnell, K. and Whitehead, J., 2011. An assessment of the social and economic importance of menhaden (*Brevoortia tyrannus*) (Latrobe, 1802) in Chesapeake Bay region. Virginia Institute of Marine Science, College of William and Mary, School of Marine Science, Department of Fisheries

Whitehead, J.C. and Harrison, J., 2017. Socioeconomic Analysis of the Atlantic Menhaden Commercial Bait and Reduction Fishery: A Report to the Atlantic States Marine Fisheries Commission. Arlington, VA: Atlantic States Marine Fisheries Commission, 180.

From: Kelly White
To: Info (ASMFC); web.info@mrc.virginia.gov
Subject: [New] [External] Request for More Research on Osprey Populations
Date: Monday, March 9, 2026 9:18:56 AM

Dear Members of the Atlantic States Fisheries Management Commission and the Virginia Marine Resources Commission,

I am writing to urge your agencies to support additional research into the recent decline in osprey productivity in the Chesapeake Bay region. Ospreys are an important indicator of ecosystem health, and understanding the causes of these declines—particularly related to prey availability such as menhaden—is essential.

Please prioritize further studies to understand better how fisheries management and other environmental factors may be affecting osprey populations. Strong science will help ensure effective decisions that protect both fish stocks and the wildlife that depend on them.

Thank you for your time and consideration.

Sincerely,
Kelly White

--

Kelly White
Middle School Science Teacher
kwhite@mcdonogh.org
443-544-7362
(he/him/his)

McDonogh School
Owings Mills, Maryland
mcdonogh.org

James Boyle

From: Emilie Franke
Sent: Tuesday, February 10, 2026 12:13 PM
To: James Boyle
Subject: FW: [New] [External] fisheries
Attachments: New York State DEC Issues Urgent Warning For Hudson River.pdf; A Maryland way to help the Bay _ Columns _ stardem.com.pdf; Maryland Eyes August Rockfish Ban to Save Struggling Striped Bass - The Southern Maryland Chronicle.pdf; Chesapeake Bay Foundation Encourages the Public to Support Maryland's Striped Bass Fishing Season Adjustment • Chesapeake Bay Foundation.pdf; Watershed Woes - NumbersUSA.pdf; Third Year Of Poor Hudson River Striped Bass Reproduction Could Mean Fewer Fish Ahead_ DEC _ Ossining Daily Voice.pdf; New plan aims to protect striped bass as Maryland seeks feedback.pdf; Guest Opinion_ Save Omega Protein - Rappahannock Record.pdf; Menhaden research receives federal funding, but advocates want action now _ Fisheries _ bayjournal.com.pdf

From: Alex Balboa <alexbalboa_us@yahoo.com>
Sent: Friday, February 6, 2026 10:02 PM
To: Emilie Franke <EFranke@ASMFC.org>
Subject: [New] [External] fisheries

Friday 6 February 2026 2200 hours

To whom it may concern

I was reading the latest news media articles regarding the striped bass and menhaden fishery with great interest. Media reports continue to underscore alleged widespread destruction of the striped bass and menhaden fishery and habitat at all levels by commercial and recreational overharvesting in federal and state waters throughout the Chesapeake Bay and surrounding ocean ecosystem, despite strong documentation indicating such problems exist. This is also allegedly contributing to the significant precipitous decline in the health of striped bass as well. Please coordinate, collaborate and cooperate on Federal, State and/or local jurisdictional levels in addressing these concerns potentially impacting adversely the public's finances, policies, trust, confidence, and quality of life issues.

Thank you for your time in this matter and hope to hear from you soon.

Sincerely,
Alex Balboa
1996 Waverly Drive
Bel Air, MD 21015-1100
USA

https://www.stardem.com/opinion/columns/a-maryland-way-to-help-the-bay/article_c0e77b57-28c0-4fc1-a769-132d7e350841.html

A Maryland way to help the Bay

DAVID REEL
Jan 31, 2026

David Reel.

The prospect for the Chesapeake Bay to survive and thrive is threatened regularly by events that negatively impact the ecology of the Bay.

They include, but are not limited to periodic overflows from wastewater treatments in Baltimore, periodic discharges of silt from the Conowingo Dam, stormwater runoff from farmland, residential, commercial, and industrial properties, and the always unpredictable naturally recurring changes in weather by season of the year.

The current most serious threat to the Bay's rich diversity of native inhabitants occurs every day. It is the steadily increasing numbers of blue catfish. They are an invasive species that first appeared in the Bay over fifty years ago after they were introduced into rivers on Virginia's Western Shore by recreational fishing enthusiasts. Expectations were that they would remain in those rivers since conventional thinking was blue catfish prefer a freshwater environment.

Defying expectations, blue catfish migrated to the Chesapeake Bay and adapted to higher salinity levels there. Their numbers in the Bay and beyond continue to expand. They are also in every major tidal river in Maryland.

Blue catfish are voracious predators of native Bay species such as blue crabs, clams, mussels, oysters, striped bass (rockfish), menhaden, American eel, and other critically economically and ecologically important species. After they reach maturity, natural predators for blue catfish are limited to humans, osprey, and bald eagles. Mature blue catfish, other fish, turtles, and raccoons may also eat juvenile blue catfish.

Scientists who study the Bay ecosystem have concluded that completely eradicating blue catfish in the Bay is not realistic. Instead, they suggest a realistic goal is reducing their numbers to a point where native species can coexist with them. They also further suggest a way to achieve that goal is harvesting more blue catfish for public consumption.

To date, that goal has yet to be achieved. In fact, we are far from it.

There are a variety of reasons:

Widespread negative public perceptions that catfish are foul-tasting bottom feeders.

Marketing efforts by Maryland's Department of Agriculture to promote eating blue catfish to chefs, consumers, restaurants, and grocery stores, that blue catfish are delicious and nutritious, have not made a meaningful increase in public demand.

Unnecessary and cumbersome federal mandates for inspections of freshly harvested blue catfish (the only harvested seafood in Maryland requiring such inspections).

Reluctance by state regulators to revise current regulations that limit the manner of harvesting blue catfish by watermen and waterwomen and to allow commercial electrofishing, a blue catfish harvesting technique permitted in Virginia.

Less than projected surplus blue catfish caught and sent to seafood processing plants by recreational fishing clients on charter boat excursions.

Winston Churchill once said, "In times of great uncertainty, look for great opportunities."

Recent news from former Virginia Governor Glenn Youngkin provides a suggestion for a great opportunity for Maryland.

Youngkin announced his approval of a $3,500 planning grant for an Eastern Shore Hub Opportunity Assessment for two Eastern Shore Virginia counties, Accomack and Northampton, and three Eastern Shore of Virginia towns, Wachapreague, Parksley, and Onancock.

The planning grant will help fund a feasibility study on renovating the former Robert S. Bloxom Shore Agriculture Complex in Accomack County. The complex includes an abandoned 35,411, square-foot building once used for

seafood processing, marketing, and storage. One renovation option is turning the property into a blue catfish processing plant.
Now is the time for Maryland to explore funding a grant on the costs and benefits of building new or upgrading existing sea food processing plants in Maryland.

Some may say state funding for such a grant is not realistic given the ongoing debates and deliberations in Annapolis on spending cuts to address a state budget deficit.

Maybe so, but there may be another unexpected funding source available for a similar feasibility study in Maryland.

That unexpected source is the Federal government. In a rare display of bipartisanship in Washington, the U.S. Senate and the U.S. House of Representatives approved and sent a bill to President Trump that includes $2 million to address blue catfish in Maryland. The bill is before President Trump for a signature which should occur given the Senate vote on the bill was eighty-two yes votes and only eighteen no votes.

Regardless of the final outcome on any federal funding on the Chesapeake Bay, a Maryland version of an Eastern Shore Hub Opportunity is an idea that merits further immediate and serious consideration.

This hub could:

• Generate jobs.

• Generate local tax revenue.

• Generate state tax revenue.

• Help preserve the historical and unique lifestyle of Maryland's watermen and women with greater incentive for harvesting blue catfish.

• Increase the markets for distribution of Maryland blue catfish beyond Maryland.

Most importantly, it is a way for Maryland to help native species in the Chesapeake Bay and Maryland rivers survive and thrive by harvesting and processing more blue catfish.

David Reel is a public affairs consultant and public relations consultant who lives in Easton.

Chesapeake Bay Foundation Encourages the Public to Support Maryland's Striped Bass Fishing Season Adjustment

FEB 4, 2026 Valerie DiMarzio

Changes could better protect rockfish when they're most vulnerable

Marylanders who want to help protect the Chesapeake Bay's iconic striped bass should make their voices heard to the Department of Natural Resources (DNR) this month. The agency is seeking public comment through Feb. 23 on proposed changes to the state's striped bass recreational fishing seasons.

The adjustment would close all striped bass fishing in Maryland waters for the month of August, while reopening a few days of catch-and-release fishing in April. If enacted, this would simplify Maryland's current, complex fishing calendar. It would also better reflect the latest science and trends striped bass are experiencing in Maryland.

"We're seeing two major trends in Maryland: young striped bass are struggling to survive their early life, and mature fish are suffering high rates of summer mortality," said Chesapeake Bay Foundation (CBF) Maryland Executive Director Allison Colden. "It's critical we consider these realities and protect Maryland's striped bass however we can—especially considering up to 90% of the entire Atlantic Coast stock spawn here in the Bay."

For six consecutive years, Maryland's juvenile striped bass numbers have been well below average. Not enough young fish are surviving the challenges of early life — such as habitat loss and invasive predators like blue catfish — to maintain a healthy population.

At the same time, mature striped bass are experiencing high rates of catch-and-release mortality in the hot summer months. Low oxygen levels and heat-induced stress make striped bass most vulnerable during this time.

DNR's proposed August closure could help reduce that stress. The proposed change would also add a few more days for catch-and-release fishing in April when air and water temperatures are cooler and fish are much less likely to die.

Lastly, the proposed season adjustment would simplify Maryland's fishing schedule. The current calendar is a complex patchwork of some harvest days, some catch-and-release, and some closed entirely for a few weeks at a time. Simplifying to a single month-long closure would leave less margin for error and help improve angler compliance with fishing regulations.

"Our understanding about the health of the striped bass population is based on the assumption that anglers are fishing according to regulations," added Colden. "Ensuring the rules are clear and easy to follow is key to conservation efforts."

DNR is currently accepting public comments through Feb. 23 to formalize the proposed regulatory changes. Those who want to help preserve the striped bass's future in Maryland can learn more and make their voices heard here.

In addition to Maryland's efforts, the Atlantic States Marine Fisheries Commission (ASMFC) Striped Bass Board, which manages the striped bass fishery along the entire Atlantic Coast, will meet at its annual winter meeting on Feb. 5. CBF will remain engaged at every step and level, urging ASMFC to protect striped bass across the coast while Maryland takes local action.

Guest Opinion: Save Omega Protein

February 4, 2026

by Jim Hendrickson and David Cariens

The lower Northern Neck's economy is about to suffer a near-mortal economic blow unless action is taken quickly. Pending Virginia House of Delegates legislation, House Bill 1048 and House Bill 1049, would prohibit or limit menhaden fishing in the Chesapeake Bay. Local business Omega Protein is the only operation targeted by these bills.

If either bill passes, the region's largest private employer will close and move to its other facilities in Louisiana. The move would be calamitous to our counties. A company that has been an integral part of the Northern Neck's civic and economic lives for over 150 years would be gone. And for what? Because of falsehoods and distortions of the facts.

The warning signs are flashing, yet no local politician or leader is speaking out. The silence is defeating. No local, state, or federal official appears willing to expose the misconceptions and distortions about the menhaden industry.

Their failure is nothing less than a betrayal of people who elected them and the continued political neglect of this area.

The bills

The foundation of HB1048 and HB1049, sponsored by Del. Betsy Carr, of District 78, rests on quicksand. Del. Carr apparently did not do her homework. There is no credible science pointing to menhaden fishing causing harm to the Chesapeake Bay, striped bass, or osprey.

We are both strong environmentalists. We take our stand on menhaden fishing and Omega Protein based on facts, current scientific studies, and rebut the anecdotal falsehoods that will result in economic catastrophe.

Let's look at the evidence and facts:

The Atlantic States Marine Fisheries Commission Stock Assessment (ASMFC) Updated 2025 reported, "the Atlantic menhaden population is not overfished and overfishing is not occurring."

The Bay Trawl Survey Data, October 15, 2025, stated, “The Atlantic menhaden and Bay anchovies were widespread for the third consecutive year.”

Omega Protein is harvesting menhaden at the lowest levels in nearly 100 years. The truth is Atlantic menhaden adult biomass has been on the upward trend since the 1990s. There is no other single entity that cares more about a healthy menhaden population or a healthy bay than Omega Protein; without a healthy fishery they cannot operate and remain in business.

The osprey

The misconceptions about ospreys appear to know no bounds. Contrary to public opinion, the U.S. Geological Survey (USGS) reported the number of osprey in the Chesapeake Bay were up 1800% from the 1960s to 2022.

There was a 5-8% decrease in the last few years due to nest/baby chick failures. Similar declines in osprey population are occurring on the West Coast and along the coastal areas of five states ranging from Delaware to Florida. The slight decline in osprey population, then, is not just a Chesapeake phenomenon, it is widespread. The reason for the decline is not unique to the Chesapeake Bay; it is something widespread.

Omega does not operate on the West Coast or Florida. Osprey in these locations do not hunt for prey here.

If not Omega, what is causing their decline?

Scientists speculate the osprey chick and nest failures are caused by one or more of the following: competition from an influx of pelicans and cormorants; eagles attacking osprey nests; excessive heat on the chicks; and environmental contaminants.

If Omega Protein is not the culprit and there is no depletion of menhaden, why then is no one speaking up to correct misconceptions about the company’s activities? Why are Northern Neck leaders and politicians not screaming about the economic havoc Omega’s closing would cause?

Who and what will replace Omega, the area’s largest public employer? Is there a plan?

The history

Omega has been a part of the region's history for 150 years. The company's policies and values represent the best of the Northern Neck. It supports the region in a variety of ways.

The company's civic support is second to none. For example, Omega Protein donated half a million dollars to the youth club in Kilmarnock and just donated the scoreboard for the gym at Northumberland High School.

Omega Protein has 260 employees and creates an additional 390 indirect, support jobs and contract work. With $300 million in sales, and generating $100 million in economic activity, Omega Protein is the largest private economic engine, employer and minority employer in the area.

The company's payroll is $29 million a year. Who or what is going to replace that? The loss in tax revenue to Northumberland and Lancaster counties would be devastating.

What's at stake?

Northumberland County local tax revenue is approximately $31 million per published 2025–2026 budgets. Research suggests Omega business activity contributes 14%, or $4.3 million of that tax. Millions more Omega-originated dollars flow into the local economy through payroll taxes, property taxes, sales tax, and Omega employees' car taxes—to name a few.

Without that money, there will be drastic cuts in services in both Lancaster and Northumberland counties while necessitating tax rate increases. Our counties themselves are the only other large employers in the area and depend on Omega tax generating activities to operate and pay county employees.

Quality of life

Omega improves the quality of life for its employees and for those who benefit from the money it pours into our economy. Omega is a union shop and pays its employees' dues and health insurance. The company has a "buy locally" philosophy. All business support and sustainment supplies are purchased locally further injecting millions into the regional economy. These purchases help keep local vendors viable and create jobs.

The company has an employee development program second to none, providing 90% college reimbursement. It pays for employees' commercial pilot licensing, as well as Coast Guard Captain, Navigator, and Engineer licenses. It also provides employee on-the-job training in fields such as welding and other career trades.

What to do?

To prevent the devastating loss of Omega Protein—a crippling blow to the Northern Neck's economy—please contact Del. Hillary Pugh Kent, 698-1067; Del. Betsy Carr, 698-1078; and Sen. Richard Sturt, 698-7525. Tell them to support the people of the Northern Neck, their constituents and stop HB1048 and HB1049.

The Southern Maryland Chronicle

Maryland Eyes August Rockfish Ban to Save Struggling Striped Bass

by **David M. Higgins II, Publisher/Editor** February 4, 2026

Rouge 40 inch rockfish caught and released by Miss Susie Charters Saturday out of Arnold, MD. Took a wrong turn on his way to Nantucket?

Maryland anglers and conservationists have until Feb. 23 to weigh in on proposed changes to striped bass recreational fishing seasons that aim to bolster protection for the species during its most vulnerable periods in the Chesapeake Bay.

The Maryland Department of Natural Resources (DNR) is accepting public comments on a “baseline reset” that would impose a full no-targeting closure for striped bass throughout August in Maryland waters, including the Chesapeake Bay and its tidal tributaries. The proposal also includes reopening limited catch-and-release fishing in

April, while maintaining harvest opport
December, with catch-and-release only

This adjustment addresses documented challenges facing striped bass, locally known as rockfish. Maryland's juvenile striped bass survey has shown below-average recruitment for six consecutive years, meaning fewer young fish are surviving early life stages due to factors such as habitat degradation and predation by invasive species like blue catfish. Meanwhile, mature striped bass face elevated mortality risks during summer catch-and-release due to high water temperatures, low oxygen levels, and heat stress. Maryland-specific studies indicate release mortality rates can reach 30 to 40 percent in summer conditions, far higher than the 9 percent assumed in coastwide models.

A full August closure targets this peak vulnerability period, when heat stress peaks from mid-July through August. Shifting any catch-and-release opportunity to cooler April conditions reduces post-release death risks for fish. The simplified calendar replaces the current patchwork of partial closures, including a no-targeting period in late July, with a single month-long ban. This clearer structure is expected to boost angler compliance and support overall conservation.

Allison Colden, Maryland Executive Director of the Chesapeake Bay Foundation (CBF), emphasized the stakes. “We’re seeing two major trends in Maryland: young striped bass are struggling to survive their early life, and mature fish are suffering high rates of summer mortality,” Colden said. “It’s critical we consider these realities and protect Maryland’s striped bass however we can—especially considering up to 90% of the entire Atlantic Coast stock spawn here in the Bay.”

Colden added, “Our understanding abou
anglers are fishing according to regulati
efforts.”

The Chesapeake Bay serves as a primary spawning ground for Atlantic striped bass, underscoring Maryland’s role in coastwide recovery efforts. The proposal aligns with broader management trends, as the Atlantic States Marine Fisheries Commission (ASMFC) oversees the interstate fishery.

The ASMFC Striped Bass Management Board held its winter meeting Feb. 3-5, 2026, in Arlington, Virginia, providing a forum for regional discussions on striped bass status and regulations. CBF has committed to advocating for protective measures at both state and interstate levels.

Public input is crucial to finalizing the changes, which could take effect in spring 2026 if adopted. Comments can be submitted through DNR’s online form, with details available on the **agency’s fisheries regulations page**. The proposal was published in the Maryland Register on Jan. 23, 2026, following review by the Joint Committee on Administrative, Executive, and Legislative Review.

These steps reflect ongoing efforts to reverse striped bass declines amid environmental pressures, ensuring the iconic species remains viable for future generations of anglers and the Bay ecosystem.

https://www.bayjournal.com/news/fisheries/menhaden-research-receives-federal-funding-but-advocates-want-action-now/article_4eba342d-02e6-4b2e-9af4-b17a48b4420c.html

Menhaden research receives federal funding, but advocates want action now

Lauren Hines-Acosta and Timothy B. Wheeler

Feb 2, 2026

Atlantic menhaden are used as bait to catch and release sharks during research conducted by the Virginia Institute of Marine Science.

Jeremy Cox

President Donald Trump signed a three-bill spending package on Jan. 23 that will fund multiple departments — and it provides $2.5 million for research on menhaden in the Chesapeake Bay.

After waiting two years for legislators to fund menhaden research at the state level, businesses, scientists and anglers welcome federal dollars for the study. But some advocates say precautionary action to protect the fish is needed now instead of waiting even longer to get answers on the state of the population in the Bay.

Menhaden are fatty fish that are a food source for wildlife throughout the Bay, including osprey and striped bass. In the Bay, watermen catch menhaden in pound nets, or near-shore traps, selling the harvest as bait for catching crabs and other fish. That harvest is dwarfed, though, by the menhaden "reduction" fishery in the Bay, which accounts for tens of thousands of tons of the fish caught annually for Omega Protein in Reedville, VA, which pulverizes them to make fish oil, fish meal and other products.

Many debate whether menhaden are overharvested in the Bay specifically and whether that affects the wildlife whose diet depends on menhaden and other fish.

The Atlantic States Marine Fisheries Commission (ASFMC) **lowered** the allowable menhaden catch along the East Coast by 20% in October. The commission, which regulates near-shore harvesting of migratory fish, made the change after a new study found that the menhaden population was lower than previously thought. The commission still says the overall coastwide population is not overfished. In the absence of a Bay-specific study, though, debate has swirled for years about whether the reduction fishery causes a localized depletion of menhaden there.

The reduction fishery's harvest in the Bay has been capped since 2018 at 51,000 metric tons per year. The entire catch comes from Virginia waters because Maryland does not allow purse seining, the method used by Omega Protein's fishing partner, Ocean Harvesters.

At its winter meeting on Feb. 4, the commission will consider two sets of proposals in response to concerns from Maryland fishery managers. One would distribute the Bay catch more evenly throughout the year by dividing the harvest cap among three or five time periods. The other would reduce the overall Bay harvest cap by 10% to 50%.

A ship in the Ocean Harvesters fleet, used to catch menhaden, sits at the dock of Omega Protein in Reedville, VA. (Pburka/CC BY-SA 4.0)

Maryland fishery managers contend that the fleet operating in Virginia waters is depriving the state's watermen of menhaden to catch for use as bait. There have been significant declines in recent years in reported pound-net harvest of menhaden by bait fishermen.

Ocean Harvesters denies that its fleet is preventing menhaden from reaching Maryland and opposes any limits on the Bay harvest.

The Virginia Institute of Marine Science designed a **study** in 2023 to evaluate the behavior and population of menhaden in the Bay along with the population's impact on predators. Legislators have tried twice to secure the funds needed for the study — more than $3 million — and failed.

The partial 2026 appropriations package passed by Congress in January and signed by Trump includes text from U.S. Sen. Chris Van Hollen (D-MD) stipulating that $2.5 million of the National Oceanic and Atmospheric Administration's funds will be earmarked for the menhaden study.

"There's a lot riding on the health of the menhaden population, and we worked to fund this study to inform any future steps we need to take to protect it," Van Hollen said in a statement.

To complement the federal funding, Virginia Sen. Dave Marsden (D-Fairfax) has introduced a **bill** at the state level to establish a fund for scientific research that would inform a "meaningful harvest limit" for menhaden in the Bay.

Chris Moore, Virginia executive director for the Chesapeake Bay Foundation, said the combination of federal dollars and potential state funding "could help us cover all the bases" because the $2.5 million won't cover the full cost of the proposed VIMS study.

Bob Beal, executive director of the ASMFC, said NOAA will send the federal funding to the commission. The commission will assemble a workgroup to identify what kind of study the money should support.

A crew on a pair of boats harvest Atlantic menhaden on the Chesapeake Bay using purse seine fishing.

Dave Harp

Beal said the 2023 VIMS study is at the top of their list. So is a **research "roadmap" being developed by the Science Center for Marine Fisheries** — a partnership between academic scientists and the seafood industry, including Omega, which is funded by the National Science Foundation. The center's effort will review current science on menhaden in the Bay, outline what new information is needed to inform a Baywide cap and recommend how to go about that research.

Almost everyone welcomes more money to study menhaden, including groups that want to further limit the harvest and groups involved with the menhaden fishery itself, which comprises Omega Protein and its partner fishing fleet, Ocean Harvesters. But some are tired of waiting.

Steve Atkinson, chairman of the Virginia Saltwater Sportfishing Association, said the industry-backed research roadmap is "kicking the can down the road."

"The biggest concern about [the roadmap] is that this could take years and years to complete and, meanwhile, conditions in the Bay continue to decline," Atkinson said. "We need action now, not 10 years from now."

Del. Betsy Carr (D-Richmond) has filed two menhaden bills for the 2026 session of the Virginia General Assembly. One calls for the Bay's reduction fishery harvest to be spread more evenly over the year. The other would pause the fishery in the Bay altogether until research can explore whether it negatively impacts the menhaden population.

Ocean Harvesters said in a statement that the bills threaten hundreds of jobs and that the commission already ensures there is enough menhaden to support the larger ecosystem.

Lauren Hines-Acosta

Tim Wheeler

LOCAL

Maryland proposes August pause to help struggling striped bass

Janis Reeser Reporter assisted by AI

Feb. 6, 2026, 5:04 a.m. ET

The Maryland Department of Natural Resources is seeking public input on proposed changes to the state's striped bass fishing season.

The proposed adjustment would close all striped bass fishing in Maryland waters for the month of August, while reopening a few days of catch-and-release fishing in April. The department is accepting comments through Feb. 23, according to a community announcement.

The change aims to simplify Maryland’s current fishing calendar and align it with recent scientific findings on the striped bass population.

Population faces challenges

Allison Colden, executive director of the Chesapeake Bay Foundation in Maryland, highlighted concerns about the striped bass population.

“We're seeing two major trends in Maryland: young striped bass are struggling to survive their early life, and mature fish are suffering high rates of summer mortality," Colden said in the announcement. “It’s critical we consider these realities and protect Maryland’s striped bass however we can — especially considering up to 90% of the entire Atlantic Coast stock spawn here in the Bay.”

For six consecutive years, Maryland’s juvenile striped bass numbers have been well below average. Habitat loss and invasive predators, such as blue catfish, are among the challenges young fish face, according to the announcement.

Mortality rates high during summer months

Mature striped bass are experiencing high rates of catch-and-release mortality in the hot summer months. Low oxygen levels and heat-induced stress make the fish most vulnerable during this time.

The proposed August closure could help reduce this stress. The change would also add a few more days for catch-and-release fishing in April when air and water temperatures are cooler and fish are much less likely to die.

The adjustment would simplify Maryland's fishing schedule, which is currently a complex patchwork of harvest days, catch-and-release days and complete closures.

"Our understanding about the health of the striped bass population is based on the assumption that anglers are fishing according to regulations," Colden said in the announcement. "Ensuring the rules are clear and easy to follow is key to conservation efforts."

The department is accepting public comments through Feb. 23.

The Chesapeake Bay Foundation will engage at every step and level, urging the commission to protect striped bass across the coast while Maryland takes local action, according to the announcement.

The long-term outlook for the Hudson River is looking grim.

If you fish the Hudson River, this one is worth paying attention to.

DEC Issues Warning After Hudson River Striped Bass Numbers Drop

StephanieFrey

The New York State DEC just released new data showing Atlantic striped bass reproduction in the Hudson River has been poor for the third year in a row.

According to DEC, its latest survey found young striped bass numbers remain well below average.

The agency says the 2025 survey recorded just 8.27 fish per haul, a level that falls under the long-term average and landed in the bottom quarter of all survey years for a third straight time.

For all the news that the Hudson Valley is sharing, make sure to follow Hudson Valley Post on Facebook, and download the Hudson Valley Post Mobile App

This is sparking growing concerns about long-term impacts on fishing and the coastal ecosystem.

FtLaudGirl

DEC says its latest survey found young striped bass numbers well below average, raising concerns about future fishing seasons.

DEC Commissioner Sean Mahar said the findings mean the state needs to stay heavily involved in interstate fishery management

Because of the decline here and similar problems in the Chesapeake Bay, state officials helped launch a new interstate working group to plan how striped bass will be managed in the coming decades.

DEC warns if the trend continues, anglers could start seeing fewer catchable fish by the 2030s.

Third Year Of Poor Hudson River Striped Bass Reproduction Could Mean Fewer Fish Ahead: DEC

Striped bass reproduction in the Hudson River has now fallen short for the third year in a row, a troubling trend that state officials say could lead to fewer catchable fish in the years ahead.

A striped bass.
Photo Credit: *Wikimedia Commons/D Ross Robertson*

Ben Crnic

02/05/2026 4:30 p.m.

The New York State Department of Environmental Conservation (DEC) announced Wednesday, Feb. 4, that its annual juvenile striped bass survey once again found weak reproduction in the Hudson River— a key spawning ground that helps sustain the East Coast population.

According to DEC, the 2025 juvenile abundance index measured 8.27 fish per haul, a level below the long-term average. For the third consecutive year, results landed below the 25th percentile, signaling poor spawning success.

State officials warned that continued weak reproduction now could translate into noticeably smaller striped bass populations beginning around 2030, when today's juveniles would normally enter the fishery.

The Hudson River and the Chesapeake Bay together produce about 90 percent of the Atlantic striped bass population, officials said. Poor reproduction in both systems, including seven straight weak years in the Chesapeake Bay, suggests anglers could face tougher fishing seasons in the next decade.

Striped bass spawning naturally fluctuates year to year and depends heavily on environmental conditions such as rainfall, water temperature, and salinity. However, DEC said the reasons behind the extended downturn remain unclear.

In response to the trend, DEC pushed for the creation of a new striped bass working group within the Atlantic States Marine Fisheries Commission. The group is set to begin meeting Thursday, Feb. 5, at the commission's winter meeting in Virginia.

The goal, officials said, is to prepare fisheries managers for a future with lower striped bass numbers, while still preserving access to a species that supports recreational fishing, coastal economies, and long-standing traditions.

The next formal striped bass stock assessment is scheduled for 2027, with management changes expected to follow in 2028 based on those findings.

DEC conducts its Hudson River survey through biweekly beach seine sampling at 13 sites along the lower river, typically from July through November.

Watershed Woes

NumbersUSA®

February 4, 2026 Published by **Philip Cafaro**

Despite half a century of efforts to improve water quality and restore fisheries in America's Chesapeake Bay, its ecological health continues to decline. A **new study** from NumbersUSA quantifies this ecological decline within the Chesapeake Bay watershed, explores its causes, and discusses possible futures.

The Bay

As the third largest estuary on Earth, the Chesapeake Bay is an essential nursery for global marine life, a key feeding stop on the Atlantic migratory bird flyway and a priceless resource for residents and visitors alike. **Between 1982 to 2017, new development eliminated more than 5,000 square miles of natural and agricultural lands in the Chesapeake Bay's watershed** (Figure 1). **Analysis** of the most recent official data finds that most of this rural land conversion was caused by rapid population growth — a nearly six million increase during the study period — and most population growth was driven by immigration into the region.

Figure 1. Boundary of the Chesapeake Bay Watershed, encompassing 41 million acres (64,000 square miles) spread across six U.S. states

The new study, **Watershed Woes**, finds that sprawling development within the Chesapeake Bay watershed (CBW) has led to significant habitat loss and increased air and water pollution over the past four decades (Figure 2). Between 1982 and 2017, **the study found**:

> Over three million acres of natural and agricultural land was paved over and permanently lost to development.
>
> Populations declined for dozens of threatened and endangered species inhabiting the watershed.
>
> 5.2 million tons of sediment were dumped into the Bay annually, along with urban runoff including road salts, household chemicals, microplastics, herbicides and pesticides.
>
> Sport and commercial fisheries such as shad and striped bass plummeted, as have oysters and blue crabs.
>
> By reducing access to nature and increasing commute times and housing costs, sprawl also reduced area residents' quality of life.

Figure 2. Sprawl proliferating across the Chesapeake Bay Watershed landscape

The CBW has seen many land use changes over the past forty years, including conversion of dirt and two-lane roads to paved multi-lane highways, the creation of new suburbs and towns, and recently the proliferation of **data centers** and their associated utility infrastructures. But the most consequential change, according to the new study, has been a massive increase in the regional population (Figure 3).

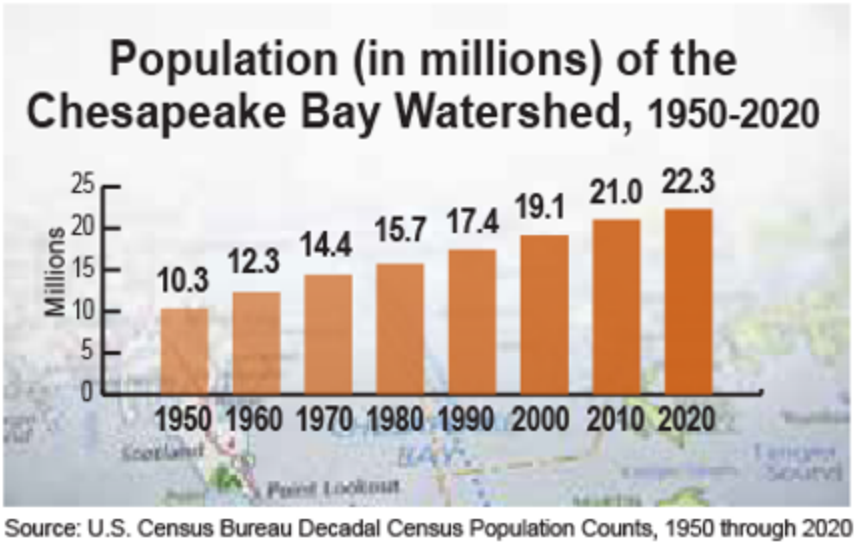


Figure 3. Population Growth in the Chesapeake Bay Watershed Counties from 1950 to 2020

Key Findings

The **new study** quantifies the loss of rural lands (both natural and agricultural areas) to urban and suburban development in the CBW's 191 counties and independent municipalities in six U.S. states: Virginia, Maryland, Delaware, West Virginia, Pennsylvania and New York. It analyzes the relative importance of the two main drivers of rural land loss: population growth and growth in per capita land use. It projects future sprawl rates for the CBW based on a range of immigration levels and associated population growth rates. And it considers the likely ecological impacts of different population policies going forward. Among its findings:

Sprawl is devouring rural land in the CBW at a rapid and unacceptable rate

Between 1982 and 2017, according to the most recent data from the U.S. National Resources Conservation Service, 3,228,600 acres (5,045 square miles) of natural and agricultural land were converted to developed uses in the CBW. 84 percent of all sprawl in the CBW occurred in three of the six watershed states: Virginia (36%), Pennsylvania (31%), and Maryland (17%) (Table 1).

State	Total Sprawl 1982 to 2017 (acres)	% of Sprawl Related to Population Growth	% of Sprawl Related to Growth in Per Capita Developed Land Use
Delaware	138,700	85%	15%
Maryland	561,300	80%	20%
New York	291,100	7%	93%
Pennsylvania	948,800	34%	66%
Virginia	1,163,000	76%	24%
West Virginia	125,700	60%	40%
Total Sprawl	3,228,600	58%	42%

Table 1. Amount and Sources of Sprawl in CBW Watershed Counties and Municipalities, 1982-2017

The area of developed land in the CBW increased by 71% during the study period. Although official figures are not yet available for the eight years since 2017, it appears development has continued apace in the region.

Population growth is the main driver of sprawl in the watershed

The study compared changes in per capita land use, which are influenced by multiple factors, with the single factor of **population**, which **increased by 5.9 million in the CBW from 1982 to 2017**. Analysis of recent data finds that **58% of rural land conversion was caused by population growth, with 42% caused by increased per**

person land use (Table 1 and Figure 4). Both factors thus appear to be important in driving overall sprawl.

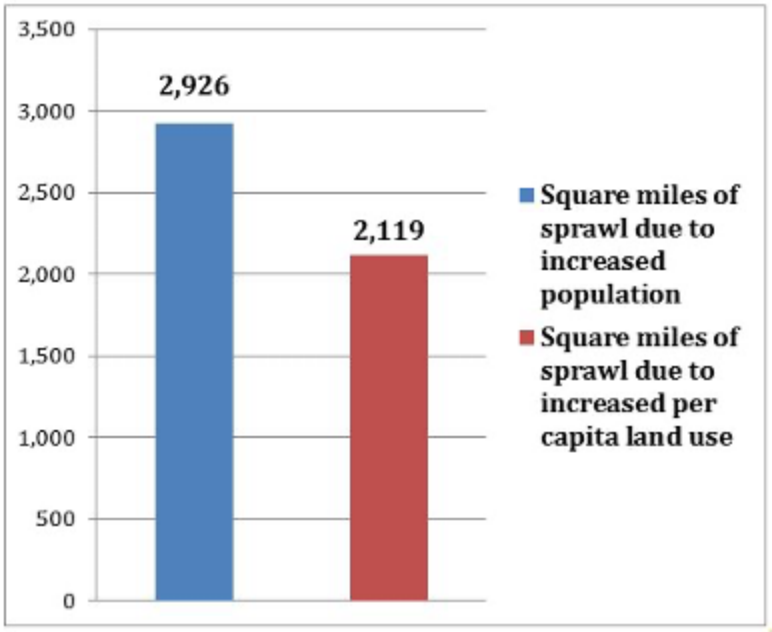


Figure 4. Rural Land Lost to Population Growth vs. Rural Land Lost to Increased Per Capita Land Use in CBW Counties, 1982-2017

In a more recent 15-year subset of the study period, 2002-2017, the study found population growth accounted for 71% of the 742,400 acres (1,160 square miles) of sprawl in the total watershed, while growth in per capita developed land use caused only 29%. Thus **population growth's role as a driver of sprawl in the watershed appears to have become more pronounced over time**.

In the future, the scale of rural lands lost to development in the CBW will depend primarily on whether the region's

population continues to grow

Per capita land use has been increasing in the Chesapeake Bay watershed over the past four decades. Optimistically assuming this problem can be solved, and projecting the same rate of per capita land use that existed in 2017 for the rest of this century, Figure 5 shows the implications for rural land loss in the CBW by 2100 under three plausible population scenarios.

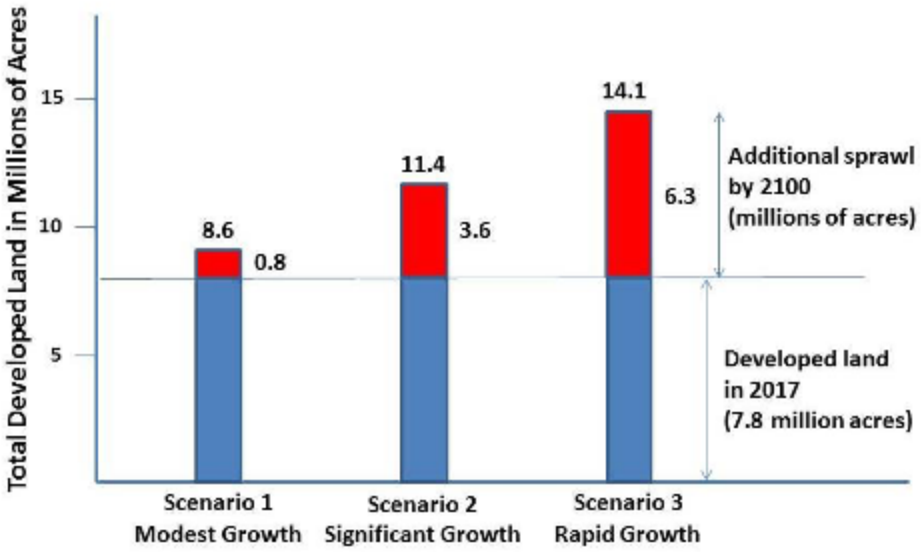


Figure 5. CBW Sprawl Projections to 2100 under Modest, Significant and Rapid Population Growth Scenarios

Under Scenario 1 with modest population growth, total developed land would increase from approximately 7.8 million acres to 8.6 million acres in the CBW (a 10% increase). Under Scenario 2 with significant population growth, developed land would increase to 11.4 million acres (a 46% increase). Under Scenario 3 with rapid population growth, developed land would sprawl to 14.1 million acres (an 81% increase), or 6.3 million more acres lost to development.

Any changes in per capita land use, up or down, will also influence future sprawl rates. With population growth driving 71% of sprawl in the most recent period analyzed, population trends seem set to largely determine whether sprawl continues to displace agriculture and native species in the CBW.

In the future, whether the CBW's population grows or stabilizes will largely be determined by U.S. immigration levels

During the study period, the population of the CBW increased at essentially the same rate as the U.S. as a whole (38% and 40% respectively) and the authors assume that in the future these populations will continue to move roughly in tandem. With U.S. fertility rates projected to remain well below replacement level, future population growth in the CBW will primarily be a function of future immigration levels. Figure 6 depicts projected population growth in the CBW under three plausible scenarios of annual net national immigration: one million, two million and three million. All three scenarios hold fertility rates steady and gradually increase longevity.

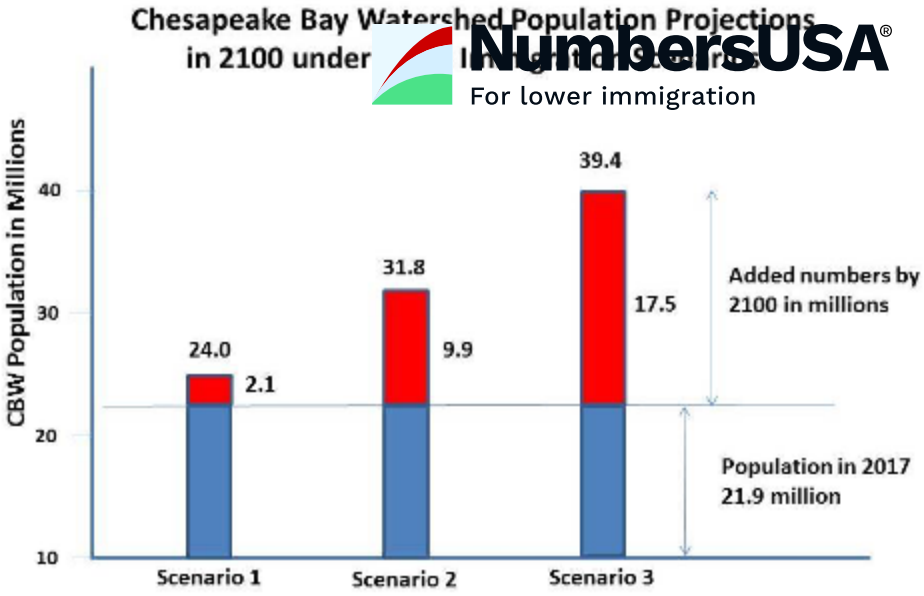


Figure 6. CBW Population Projections to 2100 under Three Different Net Immigration Scenarios: one, two and three million annual net migration into the U.S. as a whole

At one million annual net migration nationwide, the CBW population would increase by 2.1 million to 24.0 million by 2100, or an increase of 10%. At two million annual net migration, population increases by 9.9 million to 31.8 million, or an increase of 45%. And at three million annual net migration, the CBW population would increase by 17.5 million to 39.4 million, or an increase of 80%.

Clearly, U.S. immigration numbers will have an enormous effect on the number of residents in the CBW in the future — each one a consumer of resources generating pressure to use and develop rural land.

Policy Implications

As a wise person once said, “an estuary provides a report card on its watershed.” **A recent report from the non-profit Chesapeake Bay Project confirmed that the six watershed states are failing to protect the CBW or restore the Bay to health.** This new report card gave area governments a C for protecting wetlands, a D for

phosphorus pollution in the Bay and an F for water clarity and preserving the region's oysters and anadromous fish stocks.

In response, the report's authors advocate better land use planning, tightened pollution controls and efforts to restore degraded lands. All these efforts are necessary. But so is **ending sprawl**: the continued loss of agricultural and wild lands to new development. And the reality is that going forward, whether the human population continues to grow and devour land in the CBW and degrade water quality in Chesapeake Bay will largely be determined by U.S. immigration policy.

Sprawl in the CBW is driven primarily by population growth. State and local **"smart growth" efforts can reduce sprawl somewhat through good planning, zoning and transportation policies. But such efforts are bound to be swamped if the U.S. population continues to increase** by many millions every decade, with significant numbers of these additional residents seeking a home within the Chesapeake Bay watershed.

Watershed Residents Speak

The good news is that **the region's residents support strong action to rein in sprawl**. In conjunction with this study, NumbersUSA commissioned a **randomized, controlled poll** from Rasmussen Reports of 1030 likely voters from across the CBW. Of note, **80 percent or more of poll respondents were concerned about sprawl and rapid population growth in the Chesapeake Bay watershed** (questions 1 and 2) and **more than 90 percent of respondents believe it is important to protect the remaining farmland, forests, wetlands and open spaces within the CBW from development** (question 6). Three quarters of respondents believe recent population growth in the Chesapeake Bay region has been too rapid and should be slowed (question 11), while a majority believe the

federal government should reduce immigration as part of doing so (question 12).

The science is clear. The people have spoken. Will the politicians listen ? **A healthy and vibrant Chesapeake Bay is within reach** (Figure 7) — **but only if Americans are willing to limit their own numbers.**

Figure 7. Salt marsh in Dorchester County, Maryland. The Transquaking River discharges into Fishing Bay near Blackwater National Wildlife Refuge. Photo credit: Will Parson/Chesapeake Bay Program.