Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

August 7, 2025
8:30 – 9:30 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. Clark*)	8:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from May 2025	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Discuss Technical Committee Direction in Response to Work Group Report on Precautionary Management in Chesapeake Bay	8:45 a.m.
5.	Progress Update on 2025 Ecological Reference Point Benchmark Stock Assessment *(K. Drew)*	9:20 a.m.
6.	Other Business/Adjourn	9:30 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

MEETING OVERVIEW

Atlantic Menhaden Management Board
August 7, 2025
8:30 – 9:30 a.m.

Chair: John Clark (DE) Assumed Chairmanship: 5/24	Technical Committee Chair: Caitlin Craig (NY)	Law Enforcement Committee Representative: David Bailey (MD)
Vice Chair: Joe Cimino (NJ)	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: May 7, 2025
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 May 2025

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. Discuss Technical Committee Direction in Response to Work Group Report on Precautionary Management in Chesapeake Bay (8:45 –9:20 a.m.)

Background

- In August 2024, in response to concerns about the Chesapeake Bay ecosystem, the Board established a Work Group to evaluate potential actions for additional precautionary management in Chesapeake Bay.
- The Work Group met nine times from September 2024 to April 2025 to consider potential management options, including time/area closures, and develop a report based on Chesapeake Bay predator and fishery data **(Briefing Materials)**.
- In May 2025, after reviewing the report and in consideration of the ongoing single-species assessment update and ecological reference points benchmark assessment, the Board decided to continue the discussion of the report at the Summer Meeting.

5. Progress Update on 2025 Ecological Reference Point (ERP) Benchmark Stock Assessment (9:20 –9:30 a.m.)

Background

- The ERP benchmark assessment will be peer-reviewed by a panel of independent experts at SEDAR 69 the week of August 11th, 2025.
- The ERP Benchmark Assessment and the Atlantic Menhaden Single-Species Assessment Update are both scheduled to be completed for the 2025 Annual Meeting.

Presentations

- Update on the ERP Stock Assessment by K. Drew

6. Other Business/Adjourn

Atlantic Menhaden

Activity level: High

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

Committee Task List

- 2025 Single-species and Ecological Reference Point Stock Assessments
- Annual compliance reports due August 1st

TC Members: Caitlin Craig (NY, Chair), Mike Mangold (USFWS), Robert Corbett (NC), Keilin Gamboa-Salazar (SC), Jason McNamee (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ingrid Braun-Ricks (PRFC), Micah Dean (MA), Kelli Mosca (CT), Shanna Madsen (VMRC), 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), Shanna Madsen (VMRC), 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

May 7, 2025

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, Chair John Clark 1

Approval of Agenda 1

Approval of Proceedings from October 22, 2024 1

Public Comment 1

Consider Final Report from Work Group on Precautionary Management in Chesapeake Bay 2

Progress Update on 2025 Ecological Reference Point Benchmark Stock Assessment 16

Provide Direction to Technical Committee on 2026-2028 Stock Projections 23

Adjournment 25

INDEX OF MOTIONS

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

2. **Approval of Proceedings of October 22, 2024** by consent (Page 1).

3. **Move to adjourn** by consent (Page 25).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for C. Wilson (AA)
Rep. Allison Hepler, ME (LA)
Cheri Patterson, NH (AA)
Doug Grout, NH (GA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Armini (LA)
Nicole Lengyel Costa, RI, proxy for J. McNamee (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Matthew Gates, CT, proxy for J. Davis (AA)
William Hyatt, CT (GA)
Robert LaFrance, CT, proxy for J. Gresko (LA)
Marty Gary, NY (AA)
Emerson Hasbrouck, NY (GA)
Joe Cimino, NJ (AA)
Jeff Kaelin, NJ (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Lynn Fegley, MD (AA)
Robert Brown, MD, proxy for R. Dize (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for J. Green (AA)
JJ Minor, VA (GA)
Sen. Danny Diggs, VA (LA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Ben Dyar, SC, proxy for Blaik Keppler (AA)
Malcolm Rhodes, SC (GA)
Mel Bell, SC, proxy for Sen. Cromer (LA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Carolyn Belcher, GA, proxy for Rep. Rhodes (LA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Ron Owens, PRFC
Max Appelman, NMFS
Rick Jacobson, US FWS

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

Ex-Officio Members

Caitlin Craig, Technical Committee 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
Jeff Kipp
Jainita Patel
Samara Nehemiah

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, May 7, 2025, and was called to order at 1:15 p.m. by Chair John Clark.

CALL TO ORDER

CHAIR JOHN CLARK: It is 1:15 p.m. and the Atlantic Menhaden Management Board is now called to order. The Chair of this meeting is John Clark, that's me. I am the Administrative Commissioner from Delaware.

I'm joined up here at front by fellow Commissioner and Workgroup Chair, Marty Gary. From the Law Enforcement Committee, we have David Bailey from Maryland, and from the Commission, we have FMP Coordinator Extraordinaire James Boyle, and Stock Assessment Dynamo, Dr. Katie Drew.

APPROVAL OF AGENDA

CHAIR CLARK: Without further ado, let's move on to Item Agenda 2, which is the consent items. Does anyone have any revisions to the agenda? Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR CLARK: Does anybody have any revisions to the proceedings from the October 2024 meeting? Seeing none there, the proceedings are approved by consent.

PUBLIC COMMENT

CHAIR CLARK: Now we move on to Item Agenda Number 3, which is Public Comment, public comment for items that are not on the agenda.

For the Item Number 4, which as we know, has generated very much public interest, we will be taking comments on that during the Item 4 at points there, but this is for items that are not on the agenda. Mr. Zalesak, I saw your hand was up. Is that for something that is not on the agenda? Okay, come up to the microphone then, introduce yourself and make your comment. You have three minutes.

MR. PHIL ZALESAK: My name is Phil Zalesak; I am President of the Southern Maryland Recreational Fishing Organization. There are two items missing on today's agenda. First, violations of federal law and second, and option to end all purse seine harvesting of Atlantic menhaden in Virginia waters.

Oh, by the way, you all have a copy of this. This Board and Virginia are in violation of the Magnuson-Stevens Act, a federal law that defines the requirements for allocation of fisheries among states. Be advised, there is absolutely no reference to the importance of historical catch in the law, when it comes to allocation of a fishery to the Atlantic states, none. In fact, National Standard 4 specifies the exact opposite. There are four direct quotes from the Act. Requirement one states, conservation and management measures shall not discriminate between residents of different states. This Board allocated over 75 percent of the Total Allowable Catch of Atlantic menhaden for the Atlantic Coast of Virginia. Virginia is also in violation of this Act for allocating over 98.42 percent of this quota of purse seine harvesters, and only 1.58 percent to the non-purse seine bait fishermen.

Requirement two states, if it becomes necessary to allocate or assign fishing privileges among the various U.S. fishermen, such allocations shall be fair and equitable to all such fishermen. Virginia's 1.58 percent allocation to non-purse seine bait sector is clearly not fair and equitable. Requirement three states, reasonably calculated to promote conservation.

In the case of Virginia, there is no science, empirical data or economic analysis which supports allocating over 90 percent of the Virginia quota to the reduction fishery Omega Protein, a Canadian owned company. The vast majority of their harvest comes from the Chesapeake Bay and its entrance, which amounts to 158,000 metric tons or 348 million pounds, or 3/4 of a billion fish. This is science.

There is science, empirical data and economic analysis, which supports the position that localized depletion of Atlantic menhaden is occurring in Virginia waters. The impact on Maryland and Virginia since 2016, is conservatively 500 million dollars in GDP and 5,000 jobs. Requirement four states, "carried out to such a manner that no particular individual corporation or other entity acquires an excessive share of privilege."

Virginia allocation of over 90% of its quota to Omega Protein, again a Canadian owned company, is clearly in violation of the law. In summary, the Atlantic States Marine Fisheries Commission is in violation of federal law, and will be defunded if this continues, based on the current Trump administration policy.

I strongly recommend that you, as Chairman of the Board, add the following option for consideration for the Board today's discussion, and all purse seine harvesting of Atlantic menhaden in Virginia waters. American Protein, Omega Protein and Ocean Harvester would simply conduct purse seine harvesting of Atlantic menhaden three nautical miles off of Virginia coast. They wouldn't lose any employees, they've just got to drive a little bit further out to get all these fish, which they both testify.

CHAIR CLARK: Phil, could you finish up, please.

MR. ZALESAK: I thank you for your time, Mr. Chairman. Oh, by the way, I gave you that economic analysis. I gave a copy of that to you, do you, have it?

CHAIR CLARK: I do have that, thank you very much. Thanks, Phil. Is there any other comment, once again for items not on the agenda? Seeing none.

CONSIDER FINAL REPORT FROM WORK GROUP ON PRECAUTIONARY MANAGEMENT IN CHESAPEAKE BAY

CHAIR CLARK: We are now going to move on to the Item Number 4, which is Consider the Final Report from the Work Group on Precautionary Management in Chesapeake Bay. I just want to commend the Work Group. I think you've all had a chance to see the tremendous report they put out. The amount of work that was put in, I was able to attend all nine of the Work Group meetings. The really in-depth discussions, the amount of work the Work Group put in, really fantastic. Marty did a wonderful job of chairing this, and James, writing everything up, just amazing. Without further ado, let me turn it over to Marty Gary, Chair of the Work Group.

MR. MARTIN GARY: Thank you, Mr. Chairman, for those kind words, and as Chairman Clark said, my name is Marty Gary. I am the Administrative Appointee for the state of New York to the Atlantic States Marine Fisheries Commission, and I'm the Chair for the Work Group on Precautionary Management in Chesapeake Bay.

We have a short slide show, James or I guess Madeline, if you could pull that up to walk you through the summary. While that is coming up, I'll just mention so everybody should know by now. James did a phenomenal job condensing all the information from the Work Group meetings, and as an executive summary followed by the formal report.

In total it's about 60 pages, but hopefully if everybody took the time to read those first four pages, you'll get a pretty good taste of what went into all the work we put together. We'll go ahead and get started. The Work Group was comprised of myself as Chair, Ray Kane from the Commonwealth of Massachusetts.

Rob LaFrance from Connecticut, Loren Lustig from Pennsylvania, Joe Cimino from New Jersey, Allison Colden from Maryland, Pat Geer from Virginia, and Spud Woodward from Georgia. I want to just pause

here for a moment. This group, I think a lot of us around the table in the room have had the privilege to have the opportunity to work with Work Groups or chair them like I did. The chemistry of those groups is critical to the success of it.

I will say working with those folks that had experiential and academic knowledge of the fisheries in Chesapeake Bay like Pat Geer and Joe Cimino, Allison Colden, myself to a lesser degree from my previous experience, coupled with some of the out of state, out of region experience from folks like Loren and Ray Kane up in Massachusetts, and Spud Woodward down in Georgia, contributing to the information on the sciaenids and the cobia, and the things that are changing in the Chesapeake Bay.

None of these things were really critical. I just want to pause for a moment and just acknowledge how important it was to have the right people there, and I really felt like we did have the right people. We've worked hard on this document. We'll go to the next slide and walk you through this.

This is the genesis of the Work Group and the task that was presented to us. The motion from the August, 2024 Board meeting: Move to establish a Board Work Group to consider and evaluate options for further precautionary management of Chesapeake Bay menhaden fisheries, including time and area closures, to be protective of piscivorous birds and fish during critical points of their life cycle.

I would just stress the consideration and evaluation of options as we go forward in this presentation. As far as a Work Group task goes, this Work Group is addressed with this charge without determining if there is or is not an adequate supply of menhaden to support predatory demand in the Bay. The Work Group developed the following questions as a guide for their consideration of potential management approaches, they developed. The questions were composed of, what was the problem in any management act that any management action would address. What are the priority species to consider, and what are the critical points of their life cycle?

What data can be used to support this discussion, and for each management strategy discussed, what are the benefits and implications? How would the performance of potential measures be evaluated? This timeline, it starts with the August, 2024 Board Meeting where the motion was made, Work Group was formed.

Then between September 2024 and April 2025, the Work Group held 11 meetings, 9 full Work Group meetings and then 2 subgroup meetings. We had a piscivorous bird and a fish subgroup that were formed. A lot of meetings over a long time and a lot of work went into this. Then here we are, May, 2025 with the Board, meeting to consider the Final Report.

I will also note that there was an external group of osprey experts that met and provided a separate report to inform the Work Group discussions. I will say, we'll go into the summary document and just highlight some areas. Based on the life history of predators examined in the nature of Chesapeake Bay menhaden fisheries, the recent changes in menhaden availability, the Work Group discussed a number of precautionary management options that the Board could consider for further action.

The approaches listed that I'm going to follow, could be implemented individually or in combination, depending on the Board's risk tolerance and management goals, and I'll go into a brief description of each. The first one is the seasonal closures. The Work Group discussed a suite of possible seasonal closure options that focus on ospreys, due to their consistent seasonal habits and signs of food stress.

Possible options ranged temporally from May 1st to August 15th, to cover ospreys highest and most critical bioenergetic requirements. The most critical time period is earlier in that timeframe. The Work

Group noted concerns over unknown or unintended concentration of effort at other times of year.

Next, we focused on area closures, and we looked at a Watts study that concluded in 2024, studying and documenting osprey reproductive deficiencies in certain high salinity areas. Therein we saw a different scenario as we went up into riverine habitats and lower salinities. From that paper, potential closure options included all of Chesapeake Bay, including or excluding existing Memo of Understanding.

There is a Memo of Understanding related to harvest in certain areas at certain times. Targeted areas based on fishing effort, and targeted areas with the most scientific information on osprey reproduction and survival. That is the quick bullet on area closures. Next to effort controls, similar to management of Atlantic herring fishery, the Work Group discussed methods to distribute fishing effort more evenly throughout the season, including quota periods, which could be bimonthly, trimester or seasonal, and Days Out. Then gears that were included in potential management actions, I'll note that the Work Group did not reach consensus on restricting potential seasonal and/or spatial closures to certain gear types or sectors. But issues that were noted included socioeconomic impacts; the bait and/or reduction fisheries, including impacts to fisheries that utilize menhaden bait; impacts to gears with limited mobility to move out of potential closure areas; and impacts to nondirected gears.

Next area we looked at was decreasing the Chesapeake Bay Reduction Fishery Cap. A few items to note here. This could leave additional menhaden as forage in the Bay water for all predators. This could be combined with quota periods or other effort controls, to help distribute the effort more evenly throughout the fishing season, and as a precautionary measure, based on past landings, we noted that further research is needed to develop a biologically based cap, and may require the Board to consider a novel approach to setting the cap.

Research recommendations, recommendations developed by both the Work Group and the external osprey group to improve our understanding of both species and relationship. That was it, so there was just a general theme of additional research requirements being advanced to the full Board. I'll stop there, and again I'll just say, this was a really challenging subject to tackle.

But I just applaud my colleagues on the Work Group, and it was an honor to have the ability to chair that Work Group and work with you. I think we did our very best for you. I hope you are pleased with the effort we put forward, and we'll take, Mr. Chair, any questions the Board has, and I'll also look to some of my fellow Work Group members to help answer some of those questions.

CHAIR CLARK: That was an understatement saying there was a lot to consider there. Great effort, great presentation, thanks. What we're going to do is take questions for Marty and the Work Group right now, and following the questions we will take public comment on this issue. Following that we will go right into Board discussion of where we want to go with this report from the Work Group. Who has questions? David Borden.

MR. DAVID V. BORDEN: Marty, my compliments to you and all the members of the committee. I think this is a perfect example of how a work group should perform, in spite of the differences of opinion that are represented. My question is on the purse seine fishery, particularly in Virginia, so I don't know if this is a Marty or Pat. What depth can those purse seines fish in, and I recognize you've got reduction purse seines and then normal purse seines. What are the depth constraints?

MR. GARY: This is absolutely a question for Pat Geer, so I'll just go to Pat.

MR. PAT GEER: I think I'm just going to leave the mic on. The purse boats themselves do go out, their depth is about 6 to 9 feet, that's all, and then

when they are fully loaded it is about 13, so they usually do not fish in less than 20 feet of water.

CHAIR CLARK: Go ahead, Dave.

MR. BORDEN: Pat, that's reduction boats or is that all? As I understand it, and please correct me if I've got the wrong impression, you've got the seine boats, smaller seine boats.

MR. GEER: Those are the small boats.

MR. BORDEN: Those are the small boats, how about the constraints on the reduction fleet?

MR. GEER: Well, that is the reduction fleet. They have two small boats that leave the large vessel, and they go out with the purse and they set the purse.

CHAIR CLARK: Pat, I think David might be referring to the bait for seines.

MR. GEER: Oh, okay. Are you talking about the purse seine, the bait versus the reduction?

MR. BORDEN: Yes.

MR. GEER: It's the exact same vessels and the exact same gear.

MR. BORDEN: Okay, that answered the question, thank you.

CHAIR CLARK: Other questions, anybody online? I'm sorry, Lynn Fegley.

MS. LYNN FEGLEY: Also, what a great report. It's the first time I've seen this much information and the right information, correct information all in one place. It's a brilliant resource and thank you. I just had a question, in this write up in the background, there is a sentence that talks about the osprey reproduction.

It says local reproductive rates have declined sharply since 1975 to below the population maintenance level. I guess, is that correct? Is it going on that long? I had thought it was a more recent phenomenon, the reproductive rate decline.

MR. GARY: On the bird questions, I will defer to either Allison or Rob, so whoever wants to jump in.

DR. ALLISON COLDEN: Just briefly, I know I can speak on behalf of the other Work Group members, reflecting back to you the good time we had working with you, Marty as the chair, so thank you. One of the reasons, Lynn, that may be so striking a number, is because there have been relatively few studies.

The reproductive rate is not a parameter that is measured on an annual time step. There have been three or four studies since the tail end of the DDT era, and the reproductive rate in the 2006, 2007, 2021 studies that are listed further down in the report have shown that the reproductive rates are below that 1.15 maintenance level.

CHAIR CLARK: Thanks, Allison, any further questions? Nichola Meserve.

MS. NICHOLA MESERVE: Thank you to the Work Group for a really great job. I was struck by the figure that shows the cumulative purse seine reduction harvest over a number of years, how different 2023 and 2024 were from the prior years. Just looking for a little bit of explanation as to that timing change.

It's also notable, because it kind of looks like one of the options that is in the document about waiting until June to open fishing. I don't know if this is a question for you, Pat, but is there any information about the ongoing work of the nest studies in those two years, to consider what that change was from.

MR. GEER: Yes, I'm glad you brought that up, because when I first showed that graph in one of the workshops, everybody's eyebrows went up. The harvest was much delayed in those two years, much later, like almost two months later than

normal. As a result, their effort usually in the springtime is much higher.

I don't know if there is a table in there that shows, I don't have the numbers in front of me. The harvest, we look at a two-week period, was well below average until like almost August. But by August it tapered off and got back to about normal. It was very unusual to see for two consecutive years being that low that early on.

But there is another graph in there that shows, I call them spaghetti graphs, because there is like 20 years in there. You can kind of see there is a wide range of how that fishery operates from year to year. But seeing those two years that were very low, and realizing that the critical periods for osprey were occurring during that period, you can make the conclusion that the menhaden weren't in the Bay at that time. We might have a mismatch with time.

CHAIR CLARK: Next question we have is from Jeff Kaelin.

MR. JEFF KAELIN: If I could just add to that. You know New Jersey has a very active menhaden purse seine fishery, and includes that 11.5% of the coastwide stock allocated to us there. First of all, I wanted to say to Marty and the Work Group, tremendous job. I think I listened to every single discussion. It's a tremendous resource document.

But we experienced, we've gone through the same thing in New Jersey, where the water was very cold those two years, and we have an ITQ, a transferrable ITQ program in New Jersey, both for the boats and the carry boats. We only caught 75% of the quota fishing right up until Christmas, and usually we're catching fish in, I guess in March, April generally.

I think this year is a little warmer. There is cold water on the Continental Shelf, and we've learned this, we're in the squid business also, and we spent a lot of time with the Science Center people looking at the oceanography on the Shelf, looking for the squid bridges. We've learned that this cold-water phenomenon has set up, up in Newfoundland Labrador Strait, and has persisted at least a couple years before we experienced it down here. It really looks like there is a cold-water regime on the Shelf, and there is documentation that that was cold water all the way down to the mouth of the Chesapeake Bay. It doesn't kill the fish, they just go to find suitable temperature, and bunker has a very wide temperature tolerance. Cold water, the fish weren't available to any fishery, either in the Chesapeake Bay or off the coast of New Jersey at exactly the same time. I thought the Board might be interested in learning that. Thank you.

CHAIR CLARK: Thank you for that info, Jeff. Joe, did you have questions or just to add more?

MR. JOE CIMINO: Just a little bit of a follow up there too. In 2022 and 2023, especially on the Atlantic Coast, New Jersey saw some osprey nest values at rates as high as like 66% in Vonnegut Bay in those years.

CHAIR CLARK: Thanks for that information. Any other hands here for questions? David Borden.

MR. BORDEN: It is noted in the Work Group of what the differential in the survival rates between the coastal osprey population and the ones that are upriver. My question is, what are the possible reasons that explain that differential? I mean there must be some theories. Some people will point at the menhaden fishery, but what are the other theories that explain that differential?

CHAIR CLARK: Allison, do you want to take that?

DR. COLDON: Sure, with the caveat that the Osprey Expert Workgroup, the memo that is included in the information in the report will be much more eloquent in answering this than I am. But my understanding is obviously they come into the Bay and they develop areas, you know territories if you would call it that, and establish their nests. Just because the community of fishes exist in the upper

portions of those tributaries, relative to the higher salinity tidal areas, you see the difference in the species composition, just based on the species that are present in the area.

CHAIR CLARK: Joe, is that follow up? Joe Cimino?

MR. CIMINO: New Jersey DEP works with some other groups on the surveys in New Jersey, and one of the things they've been attributing to success or failure is storms, particularly severe nor'easters. I think part of that might play into water clarity too, and just visibility for the birds.

CHAIR CLARK: Rob, did you have some follow up, Rob LaFrance?

MR. ROB LaFRANCE: Yes, I just wanted to point out in the supplemental materials there is a very good letter that does really explain all of what is happening. It came from Sarah Ryker, the Acting Director, and I think that is really worthwhile taking a closer look at, because it clearly lays out all the options that we're talking about. It gives some good rationale for what the output should be.

CHAIR CLARK: Thanks, Rob, and Lynn Fegley. Before you go, Pat, did you have anything else you wanted to add?

MR. GEER: I was just going to add food availability and competition, you know competition with other birds, possibly.

CHAIR CLARK: Lynn Fegley, do you have a question?

MS. FEGLEY: Thanks, Mr. Chair, for the second bite at the apple. Just similar to where Nichola was going. I was really struck by Table 2, which is sort of a heat map of effort in the Chesapeake Bay. It's from 2015 to '24, and I guess my first question is, am I interpreting this correctly? My second question is, what might be the reason for this? Although, I think you had answered it about the weather. But when you look at the table and you see where green boxes are, our effort that is well above average, and red boxes are well below average. What it looked to me like, we're seeing this in recent years beginning in 2021, but really in 2022, that the effort in the Bay is becoming less spread out, and more concentrated in that midsummer timeframe.

It's not about what was caught, it's just about how that effort was distributed within the Bay. I find that to be really interesting on a number of levels, like I would really like to take some time to sit with that. But I wondered if A, my first question is, am I interpreting that correctly, and 2, I would love to hear some potential reasons why that might be the case.

CHAIR CLARK: Pat, I think that's for you.

MR. GEER: You are not going to have effort if there is no menhaden around. The effort was so low last year, the menhaden weren't here at that time of the year, so that is part of it. Yes, there is an increase, but the fleet is going to fish where the fish are. If they are in the Bay, the way they work it their captains all get an allocation of the Bay TAC. But if they are not there, they are going to go out in the ocean. But they clearly were not, in the last couple of years they just weren't in the Bay that early in the season.

CHAIR CLARK: Let me look around the table for any other questions. Loren Lustig.

MR. LOREN LUSTIG: I don't have a question, but I do have a comment, and it relates to my participation on April 12, as a speaker for the Virginia Osprey Federation; their major event here on the shores of the Potomac. I was very impressed with the public knowledge and concern about these various issues. My speech related to the importance of environmental education.

In working effectively with these various concerns, as part of that I wanted to mention that I was really pleased with the first four pages of the report

submitted by the Menhaden Workgroup, because it was so readable. You had a reader who had basic ecological understanding, and accurate concerns for conservation. That reader was able to digest that information. I am really happy about that and thought that I should maybe share that information with everyone here.

CHAIR CLARK: Thanks, Loren, and thank you to James for his great job of writing everything up. Do we have any further questions from the Board? Okay, not seeing any, what we're going to do at this point is open up discussion of this topic to the public. If you would like to speak, please raise your hands if you're here in the audience. If you're online, raise your hand online. We will then go, let me see, I see one hand in the audience. Is that you, Pete? Okay, looks like you're the only one who would like to speak, and then we have two online. We'll start with Mr. Himchak, so if you want to come up and introduce yourself. For three minutes, Pete. Okay, three people online. Sorry, three people online, two minutes. You have two minutes, Pete, thank you.

MR. PETER HIMCHAK: Thank you, Mr. Chairman. My name is Peter Himchak, I'm a fisheries scientist for Omega Protein, and I hearken back to, Oh God, decades of work on horseshoe crabs and shorebirds. But what I find interesting is, you know in the message that the USGS scientists presented to the Board back in August of 2024, about population dynamics of ospreys.

Not just in the Chesapeake, Mid-Atlantic, but in the other areas along the east coast and the west coast. There are patterns of meteor increases in numbers, following the ban of DDT. The issue of what you need to study that may be affecting ospreys outside on their wintering grounds, during the migration move.

These are all issues. This is a very complex problem, and I think, I'm not recommending that the ASMFC invest in the Piscivorous Nearshore Technical Committee, but I think the Board would benefit more from the wealth of knowledge that the US Geological Service scientists have on ospreys' population dynamics and issues along other areas of the east coast and the west coast.

CHAIR CLARK: Thank you, Pete, next up we have online, Mr. John Millward, Joan, oh, excuse me, Ms. Joan Millward, please, go ahead Ms. Millward.

MS. JOAN MILLWARD: Thank you so much, and thank you for your time. My name is Joanie Millward, I'm President of the Virginia Osprey Foundation, and hopefully you all received my correspondence in your package. When I began to study ospreys, I read again and again, ospreys are a sentinel species.

I did not fully understand what that meant until recently. In other words, when ospreys have a problem we have a problem, our water has a problem. They are the canary in the coalmine. This problem is staring us square in the face, as we have watched chicks starve to death in past seasons. Here we are in a new season, and nothing has been done to correct a deadly imbalance to decrease abundance of menhaden.

I understand the need for a study on menhaden in the Chesapeake Bay, but even if that study begins tomorrow, it will take two to three years for completion. In that period of time, we could see population collapses all throughout the Chesapeake Bay Watershed. In the meantime, it would be my recommendation to move purse seine fishing three miles off the coast of Virginia, in an abundance of caution. We need to act before it's too late. Thank you.

CHAIR CLARK: Thank you, Ms. Millward. Our next public speaker we have Kate Wilke, you can unmute yourself and speak, Kate.

MS. TONI KERNS: Kate, you just need to press the microphone and unmute yourself.

CHAIR CLARK: Kate, we still can't hear you. We'll go to our next speaker or next public participant, and then come back to you. Next up is Mr. Tom Lilly. Tom, you can unmute yourself and speak.

MS. KERNS: Tom, you are unmuted on our end.

MR. LILLY: Members of the Board, as things stand right now, you are allowing factory fishing to catch 50,000 tons in the Virginia Bay. In terms of ten-ton schools, that is 5,000 schools taken from the Bay for spawning. Of those 5,000 schools coming into Virginia, let's say half or 2,500 of those schools would have migrated to Maryland, but they are all being caught.

That is the crux of the problem today, just as it has been for the last 20 years. Measures to protect the 2,500 schools coming into Maryland is what is needed here, desperately needed. The Work Group concentrated on ospreys, and Dr. Watson's peer reviewed science. There were critics. The U.S. Department of the Interior, in a letter in your materials, has answered this further.

They say that while there may be other factors involved in the osprey's decline, the principal driver of the nesting failures is limited prey and availability. Limited prey and availability, and we mention the resource and this means menhaden. We have thousands of chicks starving; we have the collapse of the commercial/recreational and charter striped bass fishing in the Bay.

You have your ERT science, which pins the cause of reproductive failure of both of these species on overharvesting. Respectfully, what are you going to do about it? The gravity of the situation on the Bay calls for decisive, effective and immediate action. It's substantial delay in opening the season could accomplish a lot, if you put on an area restriction on purse seines fishing within10 miles of the Bay entrance. Otherwise, they will just sit at the Bay entrance and catch everything coming in anyway. As we see it, the only real way to restore fairness to Maryland is to require the purse seine fishing only occur in the U.S. Atlantic Zone. Fairness to Maryland in this division with Virginia. What Charter 6 requires, anything short of that will mitigate the problem but not cure it.

What this comes down to is will you take the steps necessary to cure the problem once and for all. If you take that step, you will benefit tens of millions of people and millions of children, that want to use and enjoy Chesapeake Bay as they could be, to protect their Bay's food supply. Thank you.

CHAIR CLARK: Thank you, Mr. Lilly. Next, we're going to try Kate Wilke again. Kate, do you want to try it again, please?

MS. KATE WILKE: Yes, thank you so much for coming back to me, and apologies for my voice, I am home sick. But I just wanted to say, my name is Kate Wilke, I'm with the Nature Conservancy, based in Fairfax, Virginia, and I just want to thank the Work Group for the time and effort they put into assembling all this information. It's really great to hear it all in one place. It's a lot, and it's pretty clear that there are some local, spatial and temporal issues related to both the ecology and the fishery that occurs in the Bay. I would love to sees the Board initiate an action to consider potential management within the Bay.

That would enable a Plan Development Team or an FMAT to kind of pick up this information and then dig deeper, because I know that the Work Group was only able to go so far, and I would love to see this investigation into the ecology and the fishery specific in the Bay, to continue. Thank you.

CHAIR CLARK: Thank you, Kate. We have two more people, let me go to the person in the room. If you would just introduce yourself and then who you're with, if you're representing an organization. Thank you.

MR. WILL POSTON: My name is Will Poston; I'm with the Chesapeake Bay Foundation. Much like everyone else, I think this is a great effort and a great product developed by the Work Group. It's an incredibly expansive document, but I think we can all agree it's an incomplete document.

I think that underpins the decision here today, and later on into the future with this Board that we are operating in an incredibly data deficient situation with this species, and in this region. To kind of highlight that I wanted to quote a quote from a letter that VIMS submitted to the VMRC a couple weeks ago, to guide your discussion.

Over the past two and a half years, VIMS has invested considerable time and effort in designing a suite of studies and pursuing funding to conduct them to reduce the uncertainty around the ecological impact of this fishery. These efforts have not so far resulted in the funding necessary to complete this work, and we remain uncertain about the likelihood of future funding.

As such, VMRC finds itself in the position of needing to make management decisions on this important issue with data limited context. In such a situation it is perhaps the wisest course of action to take a precautionary approach. VIMS submitted that a couple weeks back to VMRC again, and then in closing,

The Bay is changing, fisheries are changing, there are new species, as you all saw in the Work Group report that are increasing in landings and effort. Menhaden underpin all of those species, the entire Chesapeake Bay ecosystem. Acting precautionary is the reasonable approach. Thank you.

CHAIR CLARK: Thank you, Mr. Poston. We have two more public comments we're going to take. Both of them are online. First up is Roberta Kellam.

MS. ROBERTA KELLAM: Hi, I'm Robert Kellam, I am with Birding Eastern Shore. I am on the eastern shore of Virginia, Northampton County. Last year I was helping to monitor the 20 osprey nests on my creek where I live, Nassawaddox Creek, which is in the saline portion of the Bay. We only had 5 chicks survive out of 20 active nests, so 60 eggs, 5 chicks. The question about timing I think is the most critical, because there was a group of Omega boats right at the mouth of Nassawaddox Creek in around the third week of May. Shortly after that, a lot of chicks were lost. The fishing, even if they are not getting a great quantity, if they are fishing during that time of year, they might be getting everything that is available.

I guess I'm just hoping that even Omega would just agree to just not fish in the Bay for at least May and June, to early July, best case scenario. The osprey nesting study is continuing this year, and we would be able to know right away if that was successful. Thank you.

CHAIR CLARK: Thank you, Ms. Kellam, and our final public commenter is Joseph Smith. Mr. Smith, you can unmute yourself and start your comment.

MR. JOSEPH SMITH: Joe Smith here. In another life I was at the National Marine Fisheries Service, Beaufort Lab. I handled the fishery dependent data for the menhaden fisheries. My complements to the Work Group, a tremendous amount of work in a short amount of time. I read over the report.

I'm a little dismayed that there is not a historical perspective on removals from the Bay of menhaden. That data exists in a public document, my technical report NMFS 144. I would just like to make the Board aware of decades ago there were two fish factories in Reedville, Omega Protein, formerly Zapata and Extended Products or AMPRO.

From 1985 to 1996, removals from the Bay, based on the logbook data that vessels volunteered, removals were on average those 12 years, 150,000 metric ton. One year, 1987, there were 177,000 metric tons, at one year, 3.5 times as many fish is being removed from the Bay currently.

Some of the Watt's data I've seen says that the reproductive coefficients for ospreys in the Bay were quite high, above that threshold of 1.1, I think, back then in those years '85 to '96. Clearly, I would like to reiterate something Pete Himchak said, something else is going on. There is something more than just removals of menhaden versus osprey reproductive success. Thank you.

CHAIR CLARK: Thank you, Mr. Smith. Now we come back to the Board. We all had a chance to read the report. Chairman Gary has given a great summary of what the Work Group did. We've asked questions about the Work Group. We've heard some very interesting public comment here. Now there is just a little matter of what the Board is going to do next with this. With that, I will open it up for discussion. Who would like to lead the discussion? Going once, going twice, there we go, Lynn Fegley.

MS. FEGLEY: I think I have a plan; I would like to try projecting a plan forward. I want to reiterate what I said before that the information in this report is extensive, it's fascinating. There is a lot to consider here, you know in addition to the information we were given by USGS around ospreys and the work on ospreys. You know we certainly have a problem in Maryland, and nobody said it more eloquently than Russ Dize, who is looking online today, that we are not catching menhaden in Maryland, and we haven't been for the last few years. There is a lot to unpack here. I would really like for this to have deeper consideration and potentially have our Technical Committee help us unpack things that we could maybe take forward. But we all know that the Technical Committee right now is really busy, and we want them to take focus on that task to get the stock assessment ready.

I'm going to suggest, and if folks around the table, we really just got this document, we haven't had a ton of time to read it. There is also the Whitman letter in supplemental materials that has a lot of information. I would like to suggest that we take this home, we read it, we think about it and we start to develop tasking that we could give to the TC in August.

What I'm suggesting is that we bring this back up for a more detailed conversation in August that will potentially allow the Technical Committee, once the assessment is wrapped up, to help us move forward in a rational way with this document. That is my spiel.

CHAIR CLARK: Thank you very much, Lynn, so Lynn has given us an idea for possible next steps. Does anyone want to comment on that or come up with some other ideas? I see Pat Geer, go ahead, Pat.

MR. GEER: I think Lynn made some very good points. I mean there is a lot of good information in this. I enjoyed working with everybody on this, but we are not the analytical experts, let's just face it. We're a bunch of managers now. This needs to have a further look at. Mr. Smith just said something else is going on.

I fully agree with that. Something else is going on, we don't know what that is. Every question we answer we found three more gaps. There are a lot of problems with the Watt's paper that everybody is quoting. VIMS incidentally wrote a commentary that stated that they do not establish a clear relationship with menhaden in abundance and availability, and that was by Rob Latour, Jim Gartland and Sarah, I'm sorry, I can't remember her last name.

I'm very reluctant to give this to the TC right now, with everything they have to do. But I think we don't want to just put this on the shelf and leave it there. I'm okay with taking a look at this more, and if there are any questions the Board wants us to look at, from the result of what we've done.

We might be able to look at some more, and come back in August and see if we have any plans, something we can give the TC. But I am really reluctant to do that, because of the work they are doing on the stock assessment, which that needs to take number one priority.

CHAIR CLARK: Thank you, Pat, Allison Colden.

DR. COLDEN: Pat, it sounds like you are investing more time to hang out, so thank you. It was great working with you too. I think, just to reiterate some of the things that Lynn said, and even Pat said. This is a moving target. Even the Watt's paper and the Latour rebuttal had a Watt's response that was published like two weeks ago now at this point. Obviously, there is information coming in all the time, and like Pat said, it would be a real shame, I think, for this document that we spent months on, for folks not to be able to fully absorb all of the detail that is in it, and all the nuances, because there are some really important connections that I think were made. Obviously, would like to hear whether others are in the same boat there.

CHAIR CLARK: Do we have any other hands? Rob LaFrance?

MR. LaFRANCE: I just want to align my comments with what Lynn Fegley said. It's clear from my perspective, that the TC needs to focus on the work that it's doing in the short run. There is a lot to do. One of the beautiful things about menhaden management is we're using an ecological reference point, and we're spending a lot of time and effort on pulling that together.

The TCs focus has got to be on being certain you have the data right. What I learned from this experience is there is a lot of information that is driving the train in one direction or another, but we need to spend a little bit more time to understand it. I think there are a lot of really bright minds around this table, and I would really encourage folks to start dig into the data.

I look at some of the work that Pat Geer did, notably the table that Nichola talked about earlier, and looking at how harvest takes place. Let's think about this in a positive way. What can we do to actually help improve the management of the species, such that the ecology of Chesapeake is doing better? I think we can do that. I think this document is the beginning of that. I really want to kind of congratulate everybody in the Working Group. It was one of the most collaborative groups I've worked on. I really enjoyed working with everybody. When we had a difference of opinion we talked through it.

I think we're on the beginning of a really good opportunity to make progress here. I guess I would support the idea of bringing this back, letting the TC do what it needs to do, and then start to bring them back for additional questions. Let's spend some time and digest this, and think about what all the benefits we could get from it are. Thank you.

CHAIR CLARK: Thank you, Rob, and now I'll go to Joe Cimino.

MR. CIMINO: Just agree with everything that has been said, and as Pat pointed out, we're kind of the retired technical folks. I was chair of the Weakfish TC for the four years that they disappeared, and I don't know if all of Delaware is mad at me for that or not, but.

CHAIR CLARK: Yes, we are, Joe.

MR. CIMINO: I kind of figured. But you know, we also learned this week that the states of Delaware through North Carolina were not a reasonable region for striped bass, because there are almost no coastal striped bass caught in Delaware through North Carolina. This is something larger than what is happening in the Chesapeake Bay.

I think for those reasons, we can't assume there is a simple solution to this. That is just not fair to the resources in any way, shape or form. I think we need to get past the ERP work and really make the tough decisions on what are the next steps for this species, and for all the ones we manage.

CHAIR CLARK: Thank you, Joe, and Lynn, just to get a little more clarity on, were you talking about each individual Board member would come up with ideas for the TC, or were you thinking more that the Work Group would continue to meet and, yes, you're

welcome, Work Group? I'm trying to give you more to do. Just wanted to clarify that as to how you saw this as going ahead. Then I saw your hand, Mel, I'll get to you right next.

MS. FEGLEY: It was not necessarily my thought process to task the Work Group. I sort of leave it open to the Board if that is a good idea. But I think some of the questions that I've heard around the table, and a lot of the questions that I have, I was really appealing to each individual Board member to look at this information and look at this data, and try to think deeply about how we can move this forward.

Also, I'll just take, because I have the mic, a minute to say that this is a coastal board, and what happens in the Bay doesn't necessarily stay in the Bay. I mean this really is, this estuary is very important to many of the species that we manage. I would just encourage people; there is a lot of information here. Go home, digest it, and I think we could come up with some good guidance for our TC, and have a robust discussion about how to move this forward in August. That was my thought.

CHAIR CLARK: Thank you, Lynn, thanks for that clarification. I guess I've got Mel and then Jeff Kaelin.

MR. MEL BELL: I agree that the approach that we seem to be taking has been kind of started, so that makes sense to me. One thing specifically in looking at the reports that came to mind, maybe this is something that would be a specific question to the Technical Committee on how this is fleshed out.

But the research recommendations on Page 28 of the report. Those are general recommendations, but they identify areas where perhaps data gaps and things that we need to know to effectively manage. I'm not real familiar with what sorts of things might be going on or potentially going on in the Chesapeake Bay area, but that would be helpful, I guess for me.

There are 11 things identified in their general areas. Are some of those potentially have a better chance of being something that somebody may already be starting, or could be implemented? That would be helpful, I think, and for us to kind of see if there is low hanging fruit in there, or things that if there are potential, and I know funding is an issue.

But if there are ways that we can identify specific projects and what approximate costs might be, we could perhaps support those sorts of things. If we could kind of enhance, you know between now and down the road here, enhance that one page and some of those ideas, and maybe flex some of that out, put price tags on it, potentially. I mean that could be useful, because I think we've identified that there are certain things that we need to know and have data. If that is a reasonable list in a general sense of where to start. They're just kind of fleshing that out a little bit. Again, I'm not familiar with what might be going on, what is potentially even possible. Maybe the price tags are pretty extensive, but that would be helpful, I think, in allowing us to move forward with this.

CHAIR CLARK: Thanks, Mel, and that sounds like something that based on what we've been saying, that you could write up that you would like to sees the TC look into. Next, we have Jeff Kaelin.

MR. KAELIN: I agree with it; we shouldn't be tasking the TC right now and just let the ERP run out. I've been going to those meetings over the last year, and also five years ago. I think we ought to be happy with our outcome. There is a lot of fish in the water, I think four million metric tons coastwide is projected to be available for forage everywhere, from North Carolina up into the Gulf of Maine.

I'm going to go out on a limb here. I have read all this, I did listen to all the meetings, and I've been a commercial fisherman, and I'm reading the data, describing the Chesapeake Bay fisheries. I think it goes from Page 11 to 15, focusing on the overlap areas, particularly around Mobjack Bay.

Honestly, if the Board were to take any action at all, I think it could be justifiable to eliminate pound nets

and gillnets operating in the March, April, May timeframe up in the upper areas of the Chesapeake Bay off Maryland. I'm not going to make a motion about that, but looking at this objectively. That is what I take away as some kind of a meaningful relationship between those birds and the dead fish that are coming out of that area.

Because we have a saying in the commercial fishing industry, a dead fish is a dead fish. I think if we do move ahead, we've got to be clear about the fact that it's not just one company, it's not just one gear type that are taking fish in that Bay. That is the kind of review that I would like to see the TC do, in addition to some of the other ideas that Board members have around the table.

CHAIR CLARK: Thanks, Jeff, that sounds like something you'll be bringing for the TC at the next meeting. Next, I saw Mr. Minor.

MR. JAMES MINOR: I've heard a lot of conversations, and this topic is like it's been here forever. The questions I want to ask is, why are we just focusing on the Bay if there are problems on the West Coast and all throughout the East Coast in the decline of osprey? You know where is the real-world evidence in reference to where predators are suffering, because of the menhaden fishery.

Before we make any decisions, I think we need real world evidence. Before we make any decisions on anything that we do. I mean where is the scientific proof, the real scientific proof. That is what I want to hear. I'm not hearing that. That's just my take on it, thank you so much.

CHAIR CLARK: Thank you, Mr. Minor. Next up we have Bill Hyatt.

MR. WILLIAM HYATT: I have a question, I believe it is sort of a follow-up to what Mel was saying, and I apologize if I missed this somewhere along the lines. But relative to those research recommendations that are on Page 28. I'm wondering how many of those, and possibly of all of them, are inclusive within the VIMS study that has been referenced on a number of occasions?

CHAIR CLARK: I'll turn that over to the Work Group. Allison.

DR. COLDEN: I haven't seen the study plan in a while, but some of these research recommendations do reflect the consensus report recommendations or study report recommendations that our group, which included myself, Lynn, saltwater anglers, representatives from the reduction industry, all agreed on things about environmental conditions, the surveying of menhaden abundance and biomass.

I will say at that time when we came up with the report, maybe two or three years ago now, I think it was three years ago. There was not a specific discussion that I can recall about ospreys in that Work Group. Some of the research recommendations relating specifically to osprey were more from our Work Group conversations. But there are several items listed here that coincide.

CHAIR CLARK: Bill, did that answer your question?

MR. HYATT: It does. At some point I would be very curious if somebody could run the sidebar conversation just with checkmarks, say which ones are in the VIMS study and which ones are additional. I feel it would be helpful.

CHAIR CLARK: Okay, David Borden.

MR. BORDEN: Quick question. If I understand the timeline and the workload issue. We come back with our questions, we finalize, the Board considers the different perspectives that have been brough forth at the next meeting. My question to staff is, at that point is the workload going to accommodate action by the technical folks at that point? Is there enough free time, so between the August meeting and the fall meeting we could get a report?

DR. KATIE DREW: I think it depends on the extent of the tasking. There may be time to do one or two items and report back to the Board that are high priority. However, basically the peer review will be the week after the August meeting, and then we will need to do some of the projection work and other follow up work from once the peer review is complete, and bring all of that to the Board in October.

I think there is the potential to have a few, maybe one item, depending on the scale of what the Board is interested in, et cetera. If the requests are too extensive, we're definitely going to have to prioritize. I think there is time to do a small amount of work on this between August and October, but I certainly don't want to commit to maybe a full answer to all of the questions that have been brought up so far.

CHAIR CLARK: It's a heck of a lot going on right here. Next up we have Roy Miller.

MR. ROY W. MILLER: Thank you, Mel Bell and Bill for highlighting this group of 11 research needs. I was wondering if I could focus on one for just a second. Can anyone give me an update on where we are, regarding the long-term need for a biomass survey of menhaden in Chesapeake Bay?

I mean this topic has been ongoing since the Commission first started to manage menhaden, dating back to the eighties or nineties, and we keep talking about it. Is there any progress, anything in the winds that we can look forward to maybe addressing this particular survey need?

CHAIR CLARK: Did you want to answer, Katie, and then Allison.

DR. DREW: I guess the short answer is, we have no updates on this because we have no funding to do the kind of survey that we need for the Bay. It remains a high priority research recommendation, and we definitely, you know the Board has seen those pilot studies that have potential, but funding remains elusive.

DR. COLDON: Just to follow on to that a little bit more. There have been bills considered in the General Assembly of Virginia for the past three years to fund the menhaden studies, and they have not moved forward. All of them, every year have failed, you know dur to interference or due to the priorities of the General Assembly.

I know, just for others around the table who may not know, Alexander Law and several of the menhaden delegation have also been including this in our federal appropriations ask, as has the Commission, and have been visiting our Maryland delegation to try to push this forward, and so far, that has not been successful either.

CHAIR CLARK: That points out that it costs a lot of money to get some of these answers. Further discussion among the Board here? Does anybody have anything else they would like to add? Joe Cimino.

MR. CIMINO: This is mostly because Lynn gave us homework assignments and I'm going to turn mine in right now. We are seeing advances with EDMA work, so going back to when we were in the pandemic and the states got some money back from ASMFC, because we weren't having in-person meetings.

New Jersey purchased a lot of equipment for EDMA work. We now do that on every fishery independent survey that we do. We do it on every tow for our trawl survey, you know we do it for every haul, for our seines, and that work is getting to a point where it's going beyond just presence and absence understandings.

Even if we're just seeing trends on population sizes, but they are starting to get to a point where they believe they could start looking at population estimates. It's actually a very inexpensive option once you are up and running on that kind of work, adding it to surveys that are not necessarily meant

for menhaden, but seeing that EDMA presence would be a huge help.

CHAIR CLARK: Anybody else? Okay, not seeing any hands. What we have is to put this in summary. The Board has decided that each Board member will think about this, come up with questions, possible tasks for the TC, that we will discuss at the next meeting. I think we will need some kind of reminders. I probably will forget this assignment by tomorrow.

Then when I do think about it, I'll probably think somebody else will come up with that idea, I'll go back to scratching my butt. Let's get some scheduled reminders, maybe, to go out about what these tasks are. I mean would that be helpful? I know it will be helpful for me. Does everybody think that would be useful to have? That looks like something I'm giving you to do, James, you don't have to thank me.

At this point, I think we are, unless anybody has anything else they want to bring on Item Number 4, I think we're ready to move on to Number 5. With that, thank you very much, and once again, thanks to Marty and the Work Group, just a phenomenal job with that.

PROGRESS UPDATE ON 2025 ECOLOGICAL REFERENCE POINT BENCHMARK STOCK ASSESSMENT

CHAIR CLARK: Now we'll move on to Item Number 5, which is Progress Update on 2025 Ecological Reference Point Benchmark Stock Assessment, and that will be Dr. Drew. Thanks, Katie.

DR. DREW: Today I'm going to be giving you an update on the timeline and then giving you an update on the decision by the M Workgroup and the SAS on the estimate of M for the base case. Just to kind of prepare your expectations, I have one slide on the timeline, and then I have 20 slides on the other topics, because we are going to get really into it here.

Starting with the timeline, I appreciate the Board being conscious about our timeline and where we are with the stock assessment. We are really in crunch time now for this, and trying to finalize the results and the writing. In mid-June, ERP Workgroup will have a call to finalize the assessment results, and the menhaden staff will have a call to approve their update report.

In mid early July, the ERP Workgroup will approve the final report, and the Menhaden TC will approve the final update report for that, so that by July 25, we can provide both of these reports to SEDAR for the peer review panel. The Peer Review Panel will meet with us during the Peer Review Workshop in Charleston, the week of August 12.

That is essentially the week after August meeting week, so that by October 27, or the week of October 27, i.e. Annual Meeting, we will be able to present the assessment and peer review results to this Board. This is our current timeline. It is tight, but we are optimistic that we are going to stay on it and get this all done in time. That is where we are with the timeline. I guess I will pause and see if there are any questions on the timeline, before I get to the next longer topic.

CHAIR CLARK: Okay, not seeing any, go right ahead.

DR. DREW: As many of you are aware, the M in the single species model is based on a large-scale tagging study that occurred in the late 1960s. A published paper was done on this by Liljestrand et al in 2019, and the estimate from that study is used to inform the estimate of M used in the single-species model. Dr. Ault and his colleagues in 2023 presented to the staff a reanalysis of the tagging data that resulted in a lower estimate of M than Liljestrand et al had gotten in their paper. The SAS formed a workgroup to review the data and the analyses, and consult with the authors, and understand what was causing the differences, and what the best estimate of M to use in the single-species model is. I'm here to kind of provide some background on what exactly we did, and the final decision that the SAS made on this particular topic,

that is being used to inform the assessment update, as well as the ERP affects.

For some background on the menhaden tagging study. From 1966 to 1969, the Southeast Fisheries Science Center tagged over one million menhaden with coated wire tags, and released them along the Atlantic Coast. This is one of the largest scale tagging studies every conducted. These tags were recovered by magnets installed at reduction plants.

Essentially, the fish would be caught, they would be processed into scrap. The fish scrap would pass by the magnets, and the metal tags would be pulled out of the scrap and retained, and then researchers would clean the magnets regularly to collect the tag, and no untagged fish had been recaptured.

These data are used in a tagging model, and to simplify a tagging model very much, basically what happens is a tagged fish are released and then there are sort of two outcomes of those tags. The tags can be recovered by the fishery, which the model interprets as fishing mortality, or that tag is never recovered. The model interprets that as natural mortality.

Now, obviously these tags can be lost for reasons other than the fish dying, and that could be because the tag is lost or shed, so it just sort of pops off or pops out of the fish. It can be lost because the fish dies as a result of being tagged, or it can be lost or disappear, because it's caught, but never reported that it was caught.

I think we see this a lot with striped bass. You know that reporting rate has gone down over time. People were really enthusiastic about reporting those tags initially, but now we hear a lot of stories about, oh people have cans of these tags and they are in their offices, but they never report to us.

We have to understand all of these parts, in order to understand what is natural mortality and what is fishing mortality, and what are the sort of extraneous losses. The Southeast Fisheries Science Center, as part of this larger tagging study, also conducted studies to understand tag shedding rate, tag mortality rate and the magnet efficiency rate, which all help the model understand what has happened to these disappeared tags, and help them understand how much of that is these other extraneous factors, and how much of that is natural mortality.

The magnet efficiency rate is equivalent to the recording rate. If a tagged fish is caught, how likely is it that that tag will actually be recovered by a magnet and seen again by the researcher? As part of this larger tagging study, the Southeast Fishery Science Center also did the plant-test study, where they would release fish with tags in batches of 100.

They would just toss them into the catch as it was getting offloaded into a plant, and then check and see how many of those tags that they knew they released into the catch were picked up by the magnet, and how long it took from the time that they threw it into the catch to the time that it was recovered. Basically, I just want you to understand the scale of this study, which is a huge amount of eggs were released, and a huge amount of work was done to understand these confounding factors, like the tag shedding, the tag mortality and the magnet efficiency rate, in order to be able to develop reliable estimates of natural mortality, and movement rate out of this study.

After the M working group looked at these two papers, the Liljestrand et al analysis and the Ault et al analysis, we realized that different subsets of the data had been used. There were issues with confidential versus nonconfidential data being used, and there were different ways of estimating that magnet efficiency or that reporting rate that were all contributing to the differences that we were seeing in natural mortality.

We really dug into what exactly these differences were, to understand what was causing the final answer to be different. Starting with the differences in the data. First of all, Liljestrand et al

is using what we're calling the Coston dataset, and this was a published white paper that summarized the tag/recapture information to the month and region level, so 1966 to 1969.

In this dataset they had records for about 121 million tag releases over this time period. However, it does not include recoveries after 1969. Unfortunately, the raw data from this study, the digital version has been lost. We have the Coston dataset, which was the summarized results, and we also have what we're calling the NMFS re-digitized dataset.

Recently, well not so recently anymore, but the NMFS, some of the paper records from this study were found and were re-digitized, and so we have a very fine scale record now of each individual tag that was recovered. This covered the years from 1966 to early 1971. However, when we looked at this period from 1966 to 1969, and compare it to the Coston dataset, we can see that what was re-digitized was not a complete record.

Some of those hard copies have also been lost, in addition to that digital data. You can see that for 1966 to '69, the re-digitized records had about 768,000 releases, compared to that 1.1 million from Coston. Meaning that about 28% of the Coston releases are missing in this re-digitized dataset. This is what we're saying, we have sort of two different subsets of the data and neither of them are complete.

Coston does not have the recaptures that occurred after 1969, and the NMFS re-digitized dataset is missing some of the releases that we know occurred from 1966 to '69. There are sort of pros and cons to both of these datasets. They provide just slightly different views of the information. The second difference in the data was the issue of confidential data.

Liljestrand et al, when they were working on this, received permission from industry to access the confidential fishing effort and landings data by plant, month and year. Ault et al did not receive permission to access the confidential data, and so they have to reconstruct the effort, in order for the model to work, by region, month and year from available nonconfidential data sources.

I think probably the biggest difference is this difference in method specifically about that magnet efficiency question. In addition to the tag recovery information, some of the plant-test data was also re-digitized at the same time. Liljestrand et al used that data to estimate the magnet efficiency rate for each plant. Each plant was tested multiple times, they did multiple tasks to throw in factors of 100 fish to see how many of those tags they recovered, and see who could get an idea of how good the magnets were at recovering these tags for each plant.

Then in order to sort of take that information and go from the plant level up to the region level, Liljestrand et al created a weighted average of the plants within a region, weighting them by the landings of each plant in that region, in that month and year. If a plant was not active during a specific month, it's efficiency rate would not be included in that regional average.

If a plant was responsible for most of the landings in that region in that year and month, its average would get a higher weight in that overall average. Liljestrand et al used the empirical estimates as a fixed input to their model. Ault et al calculated a regional plant efficiency weighted by the sample size of the plant-test data, instead of the landings, because again, they did not have access to the confidential data.

The plants were tested sort of roughly, relative to how active or how much they contributed to landings. I think using the sample size is not a bad proxy for landings. However, what they did was they then modified those efficiency estimates, using what they call a stepwise approach, to improve the fit of the observed recovery within the tagging model to the predicted recoveries by the model.

They would essentially set the tagging model, come up with an estimate of M, adjust those estimates of magnet efficiency, and run the model again, until the model fit could no longer be improved. Having reviewed all of those decisions, we could understand kind of where these differences were coming from and what was causing these differences.

The SAS then had to sort of decide what the best approach was to develop an estimate of M from the dataset. The first decision was to use the Coston dataset instead of the NMFS re-digitized dataset. This is because the Coston dataset has a more comprehensive spatial coverage, which is important for getting good estimates of movement rates to support spatial models in the future.

The NMFS re-digitized dataset, like I said, was missing about 28% of the releases in the Coston dataset and they were not evenly distributed across the regions. They had a lot of overlap in the central regions, but less sort of at the edges of the range. Then furthermore, when we ran sensitivity runs to kind of look at the effects of these differences in data.

There were really minimal differences in the estimates of M, between using the Coston dataset and using that full time series of the NMFS re-digitized data. We felt it was better to use the Coston dataset, where there is more comprehensive spatial coverage. The SAS also decided to use the confidential effort and landings data. SAS members who have confidential access to these data.

We felt this was more accurate and would rely less on assumptions than the recreated nonconfidential time series. Then finally, the SAS decided to use the empirical estimates of magnet efficiency from the plant-test data, but identified a mistake in the Liljestrand et al original paper, and recommended revising that. This mistake was essentially that Liljestrand et al used the recoveries on all magnets in the plant test data to estimate that efficiency.

However, the Coston datasets only included primary magnets. What are primary magnets? Up here we have a little figure of, basically where these magnets are located, and what happens to fish that are caught.

Basically, fish that are caught by these menhaden purse seine vessels are offloaded into the reduction plant, where they are processed into fish oil and fish meal. The primary magnets basically are set up so that as the fish scrap is transferred from the reduction plant to the drying shed, they pass by these primary magnets.

They are then put into the scrap shed; they hang out there. They are stirred regularly until the meal is fully processed and dried and ready to go to a buyer. At that point it is transferred from the scrap shed to a truck for transport to the buyer, and they pass through or by the secondary magnets at that point.

The original study looked at basically, when were tags recaptured, and when were they captured on primary magnets versus secondary magnets. The reason Coston only reported primary magnets is that tags could be recovered weeks or even months later on the secondary magnets, because they would get missed by the first primary magnet, and then they would hang out in that scrap shed until the drying process was complete, until you had a buyer, et cetera.

There is a potential that they would be recovered much later, and so you couldn't tell exactly when they were caught. Coston was summarizing to the month level, and wanted to make sure that if we're reporting tags that were caught in month X, it was actually caught in month X and was not recovered on a primary magnet two months later, but you didn't know when exactly it was caught.

The original Southeast Fishery Science Center analysis of this data said that you can tell with some reliability when that tag is actually caught from the recaptures on the primary magnet, but not from the recaptures on the secondary magnet. That is why Coston only reported the primary magnet. Looking

at the plant-test data, they did not separate it and say, these are primary and these are secondary.

But we were able to determine, by comparing the Coston data with the counts in the re-digitized data, which included the magnet number, that magnets 1 and 2 were primary magnets, and all the other magnets were secondary magnets. Liljestrand et al originally included both the primary and the secondary magnets from the plant-test data in their efficiency calculations, which was sort of a mismatch with the Coston data, because Coston was, again, only reporting the recoveries on primary magnet.

Effectively, Liljestrand et al in the 2019 paper overestimated the magnet efficiency for the Coston dataset. The SAS recalculated the magnet efficiency, using only the data from magnets 1 and 2 for use with the Coston dataset. The SAS could not come to consensus with Ault et al on the use of the stepwise method to adjust the magnet efficiency within the tagging model. Ault et al argue that this improves the likelihood and the fit to the observed data with this approach. But the SAS noted that this comes at the expense of the empirical plant efficiency data, that the final stepwise magnet efficiencies that Ault is using in their model are much lower than we actually observed in the plant-test data, and that is what is driving that lower estimate of natural mortality. That essentially, it's saying these tags disappear, but they disappear because they are caught by the fishery but not seen, not recaptured on the magnet.

When in fact we know the magnets are actually not bad at recovering these tags. The SAS felt that the stepwise approach was not appropriate, and resulted in estimates of tag efficiency that did not reflect the actual empirical observed estimates of magnet efficiency. We decided to use the empirical estimates of magnet efficiency as the base run of the tagging model, but we would use the stepwise approach as a sensitivity run.

We used the Coston dataset for both, and used the confidential effort time series for both, but did one base run with the empirical estimates of magnet efficiency and one with the stepwise estimate, as a sensitivity run. The final results, the Liljestrand et al estimate of M for this study was 1.17. Once that mistake with the magnet efficiency data was corrected, the M Working Group's revised M base run was an estimate of 0.92, so about 20% lower than the Liljestrand effort.

The sensitivity run with the stepwise approach got a much lower M, an M of 0.47. Based on the sizes of the tagged fish, most fish in the study, were about one and a half years old. Similar to the last benchmark assessment, the SAS developed an age varying estimate of M to use in the BAM, by basically scaling that Lorenzen Curve so that the M at age 1.5 is equal to the M from this tagging model.

That means that menhaden of age 0 and 1 have a slightly higher M, and the older menhaden have a lower M, compared to that sort of point estimate from the tagging model. This is a comparison of the estimates of the 2020 benchmark M that scaled that Lorenzen curve to the Liljestrand et al estimate of M in the orange with the circles.

The base run from the M Working Group is the black with the low triangles, and then the sensitivity run using the stepwise approach is this blue curve lowest down. This is what is actually going into the single species BAM model. Our next steps for this, step 1, we've run the BAM with the new base model and the sensitivity run.

Using the lower estimate of M, both the base and the sensitivity run result in lower biomass in abundance and a higher F, as you would expect from this model. We cannot tell you anything about stock status of the TAC yet, because we have to propagate these results through the ERP models, which we are in the process of doing right now.

Our next step will be to develop these ERPs with the new M, and the sensitivity run M, and then take this decision as part of the benchmark assessment to peer review, so that the SAS and the workgroups decision on the handling of M can be reviewed by external experts through the ERP peer review process. With that, I am happy to take any questions.

CHAIR CLARK: Wow, Katie, that was a tour de force. That was amazing. Wow, just hats off to you and the SAS, what a lot of work that must have been. Thinking about magnets at menhaden plants is really interesting. Amazing presentation, and let's go to some questions. Rob LaFrance.

MR. LaFRANCE: Thank you, Dr. Drew, really good stuff. Just so I understand. The sensitivity run is really reflective of what the Ault paper sort of said, and you're going to run both basically, and give the Board back information, so we'll be able to see what is happening. Although the real number your recommendation would be the 20% lower one?

DR. DREW: While I guess we will take to the Peer Review Panel saying, this is our base run and these are the decisions that we made, and here is the impact of the base run versus the sensitivity run. We will try to develop that sensitivity run as equally and fully as we can, so that if the Peer Review Panel is like, we don't agree with those decisions, you made the wrong choices. We have a sort of a fallback position to be able to bring to the Board the version that the Peer Review Panel says is the best available science.

MR. LaFRANCE: I just want to complement you. That is a really great way to figure out what this problem was. I saw the scientist's kind of going from either side of it. Hats off to you of actually working through that. Thank you.

CHAIR CLARK: Thanks. Megan Ware.

MS. MEGAN WARE: Yes, I was curious who was going to have the task of explaining my notes to the Board, but you did a great job, Katie. My question is, so I think the Liljestrand paper uses overestimating magnet efficiency. I haven't noodled through yet if that it thinks we're catching more fish or less fish. I think it's more, because natural mortality went down. Is that correct?

DR. DREW: Right, what it's saying is that the model looked at, we tell it, we recaptured 100 tags, if we recaptured 100 tags, how many tagged fish actually were caught, and we just didn't see them, they got all the way through the process. Liljestrand et al said, you should see, it said these magnets are very good at recovering the tag.

If you caught 100 fish, it means you actually caught 110 fish were caught by the fishery. That was an overestimate. We're saying, actually, if you caught 100, maybe you only really caught 105, or maybe you caught fewer, but from the fishery, which means more of those missing tags are missing for a non-fishery reason, and as a result it's basically trying to figure out, where did those missing tags go?

Liljestrand et al we're saying, more of those missing tags went to the fishery, and less of them stayed out in the environment. We're saying, actually, the efficiency is lower. I don't know if I'm explaining this correctly. We're saying the magnet efficiency is lower, so actually more of them were caught by the fishery and 150 of them were caught by the fishery, we just didn't see those extra ones. Those would count as fishing mortality, not as natural mortality.

CHAIR CLARK: Any further questions? Erika Burgess.

MS. ERIKA BURGESS: I want to thank you, that is the most fascinating presentation on natural mortality I've ever gotten to sit through. I thoroughly enjoyed it, and I liked the simplistic genius that went into the original design of that tagging study. You left me with one question though, wondering about it.

But before I get to it, one more comment. This question about M has been really challenging for this Board, for ASMFC. I really want to commend you for presenting this so that you are extremely transparent with the logic and process that the SAS went through, that everyone can understand very clearly how you arrived at your choice of M going into the peer review.

I think that is really important, and so I think that is incredibly valuable to our process, and that is what I want to thank you more for, in addition to that great presentation. Lingering question, what proportion of tags were picked up by the secondary magnet?

DR. DREW: I would have to go back and look at this. I will have to get back to you on this. I think there was not a huge difference between. I think a good chunk of them were captured by the primary. We're not losing a ton of data by not using the secondary magnets. But I can get back to you with sort of the exact breakdown of that.

CHAIR CLARK: Next question is from Allision Colden, then we have an online question from Emerson Hasbrouck.

DR. COLDEN: Katie, just want to reiterate everyone's complements on that presentation. I listened in to several of the meetings trying to discuss this, and maybe the fourth time, and I think I'm like 60% there, in terms of understanding, so thank you again. Two questions, if I could. You mentioned that the Liljestrand paper was able to get access to the confidential data but Ault was not. Were they requesting the data directly from industry, were they requesting it from the Commission? What was the breakdown there?

DR. DREW: These data are held by the Southeast Fishery Science Center, and they fall under kind of an MOU with industry on this specific topic. Basically, because there is only one dealer or person involved in this, they are fully confidential, and they get the final say on who can access the confidential data or not.

Ault et al and Liljestrand et all applied through the Southeast Science Center to receive access to these data. I think it was just a matter of when Liljestrand et al applied and when Ault et al applied. I will also say, industry refused a request for similar confidential data for menhaden, like Chesapeake Bay versus the Coast for that Liljestrand's lab, the Wilberg Lab for a more recent project on menhaden as well.

I think it's not necessarily specifically about who was asking, but maybe just like the current vibes at the time, but yes. They applied through the Southeast Fishery Science Center, but industry has the final say on that, because it is only one entity that has those data back in time.

DR. COLDEN: One other quick question. You showed the graph that had the different Ms for the different scenarios. But do you have the number for what the Ault run was?

DR. DREW: Yes, that was a 0.47 compared to the 0.92 of the M Workgroup revised base M.

CHAIR CLARK: Next up we have Emerson Hasbrouck. Emerson, you can unmute yourself now.

MR. EMERSON C. HASBROUCK: Thank you, Katie, for that great presentation. Are you looking for anything specific from the Board today on this, or is this just reviewing with us how the SAS is developing an assessment model?

DR. DREW: Yes, we don't need anything from the Board. I mean obviously, we welcome the Board's comments on this if you have further questions or directions that you would like to consider. But we are just providing an update on this, because we know the Board has received a lot, this particular issue has generated a lot of interest and comments from stakeholders, directed toward the Board. We wanted to make sure that we are reporting back to you this issue as we go forward.

MR. HASBROUCK: Thank you, if you're looking for a comment, I guess I would say great job, Katie, great job. Then also, thinking, I guess you were giving your presentation, you know back to that original study and then the work afterward. I guess there is a lesson here for all of us researchers in the room, and that is to never throw out your original hardcopy data for any of your projects. You know at Cornell we were just recently discussing about what to do with our hardcopy data from projects 20 years ago. I guess a lesson is, just hold onto it. Thanks, Katie.

DR. DREW: For sure, I would agree with that completely.

CHAIR CLARK: Emerson, it was the sixties, man, things happen. Any further questions and not seeing any. Katie, just so I'm clear, the fact that M is going to be lower means that F will be higher, and when you do the ERP, that means the F will be then broken up further. We could be looking at lower TAC.

DR. DREW: Right, I think it is difficult to say right now what the final outcome of this will be. I think, you know obviously if this were a single species model, it's much easier to understand how all these pieces play together. But we'll really have to wait for the ERP assessment to kind of understand the impact on reference points and the TAC going forward.

CHAIR CLARK: Once again, thanks for that amazing work that you and the SAS did on this, and great presentation.

CHAIR CLARK: With that we will move on to Number 6, which I guess is this a separate item? Oh, oh my goodness, here we go.

PROVIDE DIRECTION TO TECHNICAL COMMITTEE ON 2026-2028 STOCK PROJECTIONS

DR. DREW: The thing we are looking for, maybe for you guys to have more input on is some guidance to the TC on projections. Next steps are, you know I've given you the next steps for the assessment, the next steps for you guys are the annual meeting 2025, a lot is going to be happening. You will receive the ERP benchmark assessment and the single species update. You will decide whether to accept that ERP assessment for management use, and then you will need to set that for 2026 up to 2028. As a result of that, we're not going to have a lot of the usual sort of back and forth with the Board on projections. The single-species assessment update will include projections using the results of the new ERP benchmark.

After the peer review is complete, and we've sort of gotten the thumbs up, or I guess the thumbs down, you know what should be their reference point going forward. The TC will do a series of projections to bring to you guys about what the TAC could be for 2026, all the way through 2028 if the Board is so inclined.

We want to provide a set of projections that are most useful to you, because there is not going to be sort of that usual back and forth, we present the assessment in August, and you guys ask for projections and we come back to you in October. It's all coming to you in October. Obviously, I know right now, it's a difficult request, because it is going to depend on what the results of the assessment are.

But we just want to make sure if you guys have concerns or thoughts initially, that we are as prepared as we can be coming out of that peer review after August meeting. Kind of as a reminder of what we have presented to you before, the projections in 2022, we did essentially two sets of projections. Number one was, providing the TAC associated with a 40% to 60% probability of exceeding the ERP target for 2023 through 2025.

Basically, if you wanted a 40% chance of exceeding the target here was your TAC. If 45, 50, 55, 60, so that would be the range of TACs that we provided, and then we also provided basically what's the risk of exceeding the ERP target or the threshold, for five different TAC projections, based on like 10%

less than status quo, 5% less than status quo, 5% more than status quo, and 10% more than status quo.

This is what we provided last time to you, based on your feedback. I think we would look to you to see, is this good, or is there something else you would like to see? Basically, we can provide a range of probabilities of exceeding that F target. Last time it was 40 to 60, is that good? Do you want to see a different range of values?

Last time we provided a range of increases and decreases to the current TAC, which at the moment is 233,550 metric tons. Going from basically a 10% increase to a 10% decrease. Do you want to see a different range or other values on that front? Are there any other projection scenarios that you would like to see?

Like I said, I recognize that you may not be prepared to make any decisions now. You can think about this and come back to us in August, then we can also consider that going forward. But we wanted to get you guys thinking about this, so that when we come to you in October, we have something that is as useful for you as possible.

CHAIR CLARK: Thank you, Katie. Are you looking for feedback right now, or?

DR. DREW: I mean if people have feedback right now, for sure. Like if you're looking at this and thinking, I know I want to see X and it's not on this list. You can tell us it now. If you would like to reach out over e-mail, we can definitely do that. But sometime between now and, I guess after the peer review would be ideal.

CHAIR CLARK: Before I open it up to the Board, is there any reason why with this new M that you would think these range of projections we've used in the past would be affected, like they wouldn't be as useful as they would currently be?

DR. DREW: I think the range of probabilities of exceeding the F target will still be useful. I am not sure as much about sort of the increases or decreases from the current TAC, because it is not clear to me where our sort of starting TAC will be on that front. But it might be helpful for the Board to think, if we have to take a cut to the quota, you know how risky or how averse would we be? Maybe we would want a wider range on that. But I don't know.

CHAIR CLARK: Wow, my brain already hurts just thinking about all the stuff we have to do. Any questions, comments for Katie on the projections? Nicole Costa.

MS. NICOLE LENGYEL-COSTA: Real quick. You're saying after the peer review, we could still get you recommendations. What is the drop-dead date to get you a recommendation?

DR. DREW: I would say probably September 1st, would be the drop-dead date. I think we will have the peer review in mid-August. I think we'll have a pretty decent sense of where we can go from there. Then we'll probably start out with these, and if there is anything new, we can take it up to September 1st.

CHAIR CLARK: I know we have Emerson online, but was there another hand over here? Oh, Megan Ware. We'll go to Megan then Emerson then Rob.

MS. WARE: I think this is a good starting point, because I feel like the projections we got in the last spec setting process were really helpful, and it was a good range. I think this is a good place to start. I agree that probability projections are probably going to be more useful. Something that was really helpful last time is we had combined years and then each year, so I would just ask for that again. That was particularly helpful.

DR. DREW: Got it, we can definitely do that.

CHAIR CLARK: Okay, next up is Emerson.

MR. HASBROUCK: I would like to see pretty much what was brought to us last time. You know that range of probabilities of exceeding F, 40% to 60% looks okay to me as a starting point. Also, range of the increase/decrease to current TAC. Maybe change that up a little bit from 10% increase to 10% decrease. Let's look at the bounds being 12% increase and 12% decrease, or maybe somebody else would like to see something else. I think what you provided us last time is a great starting point.

CHAIR CLARK: Next up we have Rob LaFrance.

MR. ROB LaFRANCE: I just kind of agree with what Emerson said. I guess the question I have for you, Dr. Drew, is depending upon what the TAC is, if we get a big movement in the TAC, I wouldn't want to see that either 10% increase or decrease expanded. You know if the TAC is pretty close to where it is then those numbers are fine. But if the projected TAC is, say 10 or 20% lower, then we should make those differentials the same. That would be my commentary.

CHAIR CLARK: Lynn Fegley.

MS. FEGLEY: Just to put the cap on these last few comments. For the TAC increases, rather than going to 12%, I would just suggest maybe we see minus 5, minus 10 and minus 15, 5 to 15, maybe 5 to 20 on each side, in increments of 5. I think we can really work with that.

CHAIR CLARK: Do we have anything else for Katie? No, in that case, wow! A lot of things we've got to consider here. Probably won't have time for that screen door factory tour at the annual meeting.

ADJOURNMENT

Okay, now we're moving on to Item Number 7, which is Other Business. Is there any other business? There isn't any other business to come before the Board. In that case we are adjourned.

(Whereupon the meeting adjourned at 3:05 p.m. on Wednesday, May 7, 2025)

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 Work Group

DATE: April 23, 2025

SUBJECT: Precautionary Management of Chesapeake Bay

Executive Summary

At its August 2024 meeting, the Atlantic Menhaden Management Board (Board) agreed to form a Work Group of Board members to "consider and evaluate options for further precautionary management of Chesapeake Bay menhaden fisheries, including time and area closures to be protective of piscivorous birds and fish during critical points of their life cycle." This charge asserts there is an inadequate supply of menhaden to support overall predatory demand in the Bay. However, the Work Group addressed this charge without determining if there is or is not an adequate supply of menhaden to support predatory demand in the Bay. Instead, it has developed feasible management approaches, and it is the responsibility of the Board to determine if or when it is necessary to implement them. The Work Group represented a balance of different backgrounds, regions, and perspectives; the members were:

Martin Gary (NY, Chair), Ray Kane (MA), Rob LaFrance (CT), Loren Lustig (PA), Joe Cimino (NJ), Allison Colden (MD), Pat Geer (VA), Spud Woodward (GA).

The Work Group met nine times between September 2024 and April 2025 via webinar and in-person to discuss alternatives for precautionary management in Chesapeake Bay that could be considered if the Board chooses to initiate a management document. Additionally, the Work Group created two subgroups, which each met once in September 2024, to begin evaluating data sources for piscivorous bird and fish species, respectively. In addressing the Board task, the Work Group developed the following questions to guide their consideration of potential management approaches:

1. What is the problem any management action would address?
2. What are the priority species to consider, and what are the critical points of their life cycle?
3. What data can be used to support this discussion?
4. For each management strategy discussed, what are the benefits and implications?
5. How would the performance of potential measures be evaluated?

The availability of menhaden may be affected by changes in total abundance, size distribution of the population, and timing of presence and spatial distribution in the Bay, which can be caused by fishing pressure, environmental conditions, habitat suitability, and/or changing predation pressures on a limited spatial and temporal scale. Such changes in menhaden availability may affect the species' ability to fulfill its ecological and/or economic functions. Recent observations of below average commercial fisheries landings and declining population reproductive rates of ospreys within the mainstem Chesapeake Bay suggest that availability of menhaden in Chesapeake Bay is likely changing due to one or more of the above drivers.

Potential Management Approaches

Based on the life history of the predators examined, the nature of Chesapeake Bay menhaden fisheries, and recent changes in menhaden availability, the Work Group discussed a number of precautionary management options that the Board could consider for further action. The approaches listed below could be implemented individually or in combination, depending on the Board's risk tolerance and management goals. A full description of the background information considered and the potential management options under each approach can be found in the Work Group report.

A. Seasonal Closures

Many of the species examined are seasonal inhabitants of Chesapeake Bay, utilizing the area as spawning and nursery grounds. Some species, like striped bass, have population contingents that are full-time residents in the Bay while other individuals leave the Bay to join the coastal migratory stock. Bird predators, particularly osprey, show high consistency in their arrival and departure times in the Chesapeake Bay, with only slight variations from year to year due to weather patterns.

Due to the seasonality of predator demand in the Bay, seasonal closures may be a management option that could reduce menhaden harvest during certain times of the year that are critical to predators' life cycles. This option presumes that decreasing menhaden harvest during these times of year will allow more menhaden to be available as forage for predators. Although, the Work Group noted concerns that implementing seasonal closures may lead to a concentration of harvest effort during other times of the year with unknown or unintended consequences. The Work Group discussed a suite of possible seasonal closure options, which focus primarily on the needs of the osprey population as a proxy for other predators as they exhibit relatively predictable seasonal habits and are showing signs of food stress. Ospreys have the highest and most critical bioenergetic requirements between May 1st and August 15th, and the range of options discussed includes subsets of this timeframe with considerations for the impacts to ospreys and menhaden fisheries.

B. Area Closures

A September 13, 2024, press release by Dr. Bryan Watts of the College of William and Mary's Center for Conservation Biology, compiled the 2024 osprey breeding performance in Chesapeake Bay. The study found all nesting pairs in waters with salinity greater than 10 ppt had some level of deficiency while the upriver sites were considered reference sites having a surplus at 1.36 young per nesting pair. Six of the Bay sites had what was defined as "major deficit" with < 0.6 young/pair.

Based on the results of this study and the Board task, the Work Group discussed a range of spatial closures that may increase the availability of menhaden for ospreys throughout the Bay, particularly in areas that exhibited the highest reproductive deficit. The Work Group considered mapping fishing effort over the 12 study areas to better inform potential targeted closures, but there was not a consensus within the group on the use of this method.

Additional closure options discussed by the Work Group include closure of all Chesapeake Bay (including or excluding existing MOU areas), closures based on fishing effort, or closures based on areas with the most scientific information on osprey reproduction and survival.

C. Effort Controls

The implementation of quota periods or days out provisions could be used to distribute fishing effort more evenly throughout the season. These provisions are similar to management of the Atlantic herring fishery in which quota periods are used to manage catch toward bimonthly, trimester, or seasonal quotas to effectively manage catch to meet the needs of the fishery and bait market demand.

D. Gears Included in Potential Management Actions

The Work Group discussed the possibility of restricting potential seasonal and/or spatial closures to certain gear types or sectors based on landings or potential impacts to other fisheries but did not reach a consensus on the use of this approach. The Board will need to closely consider the applicability of management options across gears and sectors if further action is taken.

E. Decreasing Chesapeake Bay Reduction Fishery Cap

The Board could further reduce the Chesapeake Bay reduction fishery cap, which is currently based on historical landings, to reduce the impacts of reduction fishing in Virginia waters of the Chesapeake Bay. This would presumably leave additional menhaden as forage in Bay waters for all predators. This option could be combined with quota periods or other effort controls to help

distribute effort more evenly throughout the fishing season. In the past, reductions in the Bay cap have reflected recent Bay landings, usually from the previous five years. While more than 5 years have elapsed since the last update of the Bay cap, average landings have been at or near the 51,000 metric ton cap, indicating a reduction based on landings is likely to be small, if there is a reduction at all. Therefore, the Board may need to consider a novel approach to setting the Bay cap based on information provided by the Work Group or from other sources.
Reduction of the Bay cap is a conservative option considering it only impacts the reduction fishery within Chesapeake Bay. Reducing the Bay cap does not impact the quota allocation of the reduction fleet, only the amount of the allocation that may be caught within Chesapeake Bay waters. This option also precludes any negative impacts to bait fisheries which serve crab and lobster fisheries along the coast as it only applies to the reduction fishery. The Work Group also noted that the Bay cap is a precautionary measure and further research is needed to develop a biologically-based cap.

F. Research Recommendations

In reviewing the information to meet its charge, the Work Group identified several areas in need of additional research and data to address questions beneficial to ecological management of menhaden fisheries in Chesapeake Bay and beyond. The resulting research recommendations can be found in the Work Group report.

Work Group Report

Contents

List of Tables 6
List of Figures 7
Background 9
Osprey Residence and Prey Needs in Chesapeake Bay 9
Menhaden Fisheries in Chesapeake Bay 11
Virginia Purse Seine Fisheries 12
Purse Seine Reduction Fishery 12
Purse Seine Bait Fishery 13
Non-Purse Seine Bait Fisheries 14
Pound Net Fisheries 14
Gill Net Fisheries 15
Background on Additional Piscivorous Bird and Fish Predators 16
Cormorants and Pelicans 16
Striped Bass, Cobia, Red Drum, Spanish Mackerel, Spotted Seatrout, Weakfish and Blue Catfish 17
Abundance of Key Bay Predators 18
Diet Studies in Chesapeake Bay 19
Species Health 22
Potential Management Approaches 24
Seasonal Closures 24
Area Closures 25
Effort Controls 26
Gears Included in Seasonal and/or Area Closures 26
Decreasing Chesapeake Bay Reduction Fishery Cap 27
Research Recommendations 28
References 29
Tables 33
Figures 38

List of Tables

Table 1. Estimates of osprey population reproductive rates and brood size 1970's to 2021. Source: Watts et al., 2024 33
Table 2. Semi-monthly purse seine reduction Bay effort by year (2015-2024) compared to the ten-year average. Shaded cells indicate a how a specific period and year compared to the ten-year average. Source: NOAA CDFRs. 33
Table 3. Purse seine reduction Bay harvest shown as cumulative percent across the season for the past five years (2020-2024). Source: NOAA CDFRs..... 34
Table 4. Menhaden purse seine fishing effort (number of net sets) in proximity to the 12 osprey nesting locations (N=571 nests) in 2024. Sources: Osprey Nesting Efficiency: Watts, 2024. Menhaden Fishing Effort: NOAA CDFRs. 34
Table 5. Commercial harvest in pounds and recreational catch (A+B1+B2) in number of fish by year, species, and Bay state. Sources: ACCSP and MRP. 35
Table 6. Diet studies of Chesapeake Bay piscivorous fishes with reference to the relevance of menhaden to the diet. 37

List of Figures

Figure 1. Seasonality of population-level metabolic demand for osprey in Chesapeake Bay. The period of highest energy demand is mid-May through mid-August. (B. Watts, unpublished data). 38
Figure 2. Virginia purse seine reduction effort separated into Bay and Ocean net sets. 39
Figure 3. Semi-monthly purse seine reduction ten-year average(2015-2024) compared to the last 5 years (2020-2024). Percentages on the bar the percent of effort for that semi-monthly time period compared to the entire season. 39
Figure 4. Cumulative percent of purse seine reduction harvest over the season for the most recent 5 years compared to the 5-year average. 40
Figure 5. Cumulative percent of purse seine reduction harvest over the season for the most the past 25 years (2000 – 2024). Red dashed line is the 25-year average. 41
Figure 6. NMFS menhaden reporting areas for the Bay and coastal water of Virginia. From: Smith, J.W. and W.B. O'Bier. 2010. 42
Figure 7. Menhaden purse seine reduction (top) and bait (bottom) effort by NMFS Chesapeake Bay reporting area and semi-monthly periods 2020 – 2024. Numbers above each bar present the percent of effort for that time period relative to the total effort. 43
Figure 8. Cumulative purse seine bait weekly harvest reports compared to the 5-year average (2020-2024). 44
Figure 9. Menhaden purse seine fishing effort (2020-2024) relative to the Watts 2024 osprey reproductive success and nesting study areas. 45
Figure 10. Annual menhaden Pound Net CPUE from Maryland, Potomac River, and Virginia. CPUE is in lbs per net day. Sources: MD DNR, PRFC, and VMRC. 46
Figure 11. Menhaden monthly pound net harvest for Maryland (top) and Virginia (bottom) for the last three years relative the 10 and 5-year averages. 47
Figure 12. Location of 2024 licensed pound nets in Virginia. 48
Figure 13. Virginia monthly pound net harvest by VMRC reporting area 2020-2024 Smaller water bodies were collapsed to reduce the number of reporting areas (see map). 49
Figure 14. Menhaden gill net harvest for Maryland (top) and Virginia (bottom). Note that the scales on the y-axis are different: MD in thousands and VA in millions. Potomac River gill net data is not yet available. Sources: MD DNR and VMRC 50
Figure 15. Menhaden monthly gill net harvest for Maryland (top) and Virginia (bottom) for the last three years relative the 10 and 5-year averages. 51
Figure 16. Virginia monthly pound net harvest by VMRC reporting area 2020-2024 Smaller water bodies were collapsed to reduce the number of reporting areas (see map). 52
Figure 17. Mobjack Bay gill net menhaden harvest by year and month relative to the 5-year average (2020-2024) and ten-year average (2015-2024). 53

Figure 18. Commercial Harvest for Key Bay Predators. Source: ACCSP 54
Figure 19. Recreational Catch of Key Bay Predators. Source: MRIP 55
Figure 20. Blue Catfish Commercial (A) harvest and recreational catch (B) for Maryland and Virginia. Sources: ACCSP and MRIP 56
Figure 21. Striped Bass annual Fulton's Condition Factor by agency and project: 1 = normal, > 1.2 = very healthy, < 0.8 = stressed. 57
Figure 22. Striped Bass Fulton's Condition Factor by month for all agencies and projects combined. 58
Figure 23. Fulton's Condition Factor for other bay predators for Virginia based projects only. Information for blue catfish and spiny dogfish is not available currently. 59

Background

In August 2024, USGS staff presented to the Board a summary of the latest information regarding osprey abundance, spatial and temporal distribution, dietary demands, and timing of fledge in the Chesapeake Bay region, as well as ongoing research and information gaps. Osprey data comes from two primary sources: the North American Breeding Bird Survey and the eBird database. Long term trends show significant population growth from both a continental and regional perspective. Since 1966, osprey abundance has shown a 299% increase in North America, a 587% increase on the Atlantic coast, and a 1,801% increase in Chesapeake Bay. However, since 2012, eBird data estimates show declines in some areas around Chesapeake Bay, particularly in the lower Bay where local reproductive rates have declined sharply since 1975 to below the population maintenance level. There are numerous pressures that may affect osprey reproduction, including food availability, habitat loss leading to greater levels of inter- and intraspecific competition, disease, algal blooms, inexperienced breeders, environmental contaminants, and water depth and clarity. Additionally, abundance indices in other Atlantic and Pacific coast states show similar plateauing and short-term declines since 2012. Osprey diet composition varies by salinity in different regions of the Bay with menhaden being the second-most consumed species in the higher salinity areas, including the lower Bay. Ongoing research in Chesapeake Bay seeks to compare the availability of osprey prey, including menhaden and other fish species, between current and historical populations.

Osprey Residence and Prey Needs in Chesapeake Bay

Ospreys begin to arrive in lower Chesapeake Bay in late February and arrival peaks by mid-March, and slightly later in the more northerly portions of the Bay (Bent 1937; Reese 1991; Watts and Paxton 2007). Most breeders are here by late March. A cutoff for arrival of breeders is typically taken to be 15 April.

Departure schedules for breeding adults and hatch-year birds differ by as much as a month with adults initiating migration in late August through mid-September and hatch-year birds leaving later (Poole 1989; Watts and Paxton 2007). It should be noted that during the early fall there is a mix of resident birds and migrants (from northern breeding populations beyond the Bay).

The most bioenergetically demanding period during the annual cycle is when osprey pairs are raising broods. Historically, this period has been from mid-May through mid-July (B.D. Watts, The Center for Conservation Biology, William and Mary, written communication, December 4, 2024). Figure 1 indicates that the period of highest energy demand at the population level is

from mid-May through mid-August. It is important to note that the period of peak demand is not necessarily the period of critical demand. Most broods are lost within the first 2 weeks of development. Their demand is relatively low at that age, but the adults must meet that demand, or they will die. Older chicks have more energetic reserves and can overcome short periods of food deficit; young chicks cannot. It is critical that enough fish be available that can be captured by adults and delivered to the nest during the May period so that broods can make it through this bottleneck.

Ospreys prefer to nest over water when appropriate substrates are available, presumably related to the "escape from ground predator" benefits (Poole 1989). Prior to the 1960s, the majority of nests were on snags and live trees. Since the 1960s, the majority of nests have shifted to human-made structures (Watts et al. 2004; Watts and Paxton 2007). There have been a couple of waves of the appearance of human-made structures including the rapid expansion of aids to navigation during the 1970s, and then later the rapid expansion of private osprey platforms since the 1990s. Thus, there have been shifts in substrate use over time, but the general requirements remain unchanged. Ospreys prefer stable structures that offer protection from predators and are near adequate sources of fish (Poole 1989; Watts and Paxton 2007).

Ospreys exhibit high nest site fidelity. Generally, once a nest site has been established, the pair will use it for many years or until there has been a change to the structure (Poole 1989). If the nest is lost to weather or to human removal, the pair will rebuild the nest. However, if the structure itself is lost or altered in some functional way, the pair is forced to select another structure typically within a short distance of the original nest. If no appropriate structure is available after its loss, the pair will move and find a new place. Nest substrate can certainly be limiting in various parts of the Bay, but more so historically than now due to the proliferation of nestable human-made structures.

In some populations most of the foraging is within site of the nest (< 2 km), but in others it can range much further (15-20 km). Some individuals have preferred hunting areas and spend quite a bit of their time in those areas, while others are much more variable in where they forage. Across pairs, a high proportion of prey come from within 10 km of the nest site (Poole 1989).

Osprey have evolved a behavioral mechanism to match the brood demand to the available food. Many pairs in Chesapeake Bay hatch three chicks. If there is enough food to provision all of the chicks, then all will develop and grow synchronously and survive. If there is not enough food to sufficiently provision the three chicks, then a dominance hierarchy will form, and subordinate chicks will be fed last and may die. This process is referred to as brood reduction – reducing the brood and associated metabolic demand to match food availability. If the dominant chick does

not get enough food, the nest will fail. Brood reduction on a large scale is an indicator of food stress (Poole 1982; Hagan 1986; Eriksson 1986; Bowman et al. 1989; Steidl and Griffin 1991; Machmer and Ydenberg 1998).

For Mobjack Bay, substantial declines in reproductive rates, overall provisioning rates, provisioning rates with menhaden, proportion of the diet comprised of menhaden and diet quality have been documented. An increase in male foraging time and brood reduction has also been observed. Importantly, reproductive rates have transitioned from surplus to deficit (Academia and Watts 2023; Watts et al. 2024) and brood size has declined significantly (Watts et al. 2024; Table 1).

In 2024, 12 study areas were monitored in Chesapeake Bay including 10 within the main stem of the Bay (salinity >10 ppt) and 2 in the lower salinity reaches (<1 ppt). All main stem sites were in reproductive deficit, while the 2 lower salinity reference sites were in reproductive surplus. During the nesting period, osprey are dependent on one to two species for prey. In Mobjack Bay, menhaden comprised nearly 75% of fish provided to broods in the late 1980s (Watts et al. 2024). Currently, it is believed that ospreys nesting in much of the main stem of the Bay are menhaden dependent with menhaden comprising 44% of the osprey diet at Poplar Island and 24% in the lower Bay near the Eastern Shore of Virginia. Osprey in low salinity areas do not depend on menhaden as prey (Glass and Watts 2009; Lazarus et al. 2016), instead relying on fish abundant in these regions, including catfish, gizzard shad, and Atlantic croaker.

Menhaden Fisheries in Chesapeake Bay

The Atlantic menhaden commercial fishery in Chesapeake Bay consists of a reduction fishery and a bait fishery. The Virginia reduction fishery has been in operation for 147 years in Reedville, Virginia, and provides fish meal, fish oil, and fish soluble products. The bait fishery is the primary source for the blue crab pot fisheries and chum bait from Delaware to Florida, as well as a provider to the New England lobster fishery.

Virginia's menhaden quota for 2023 was 388,140,547 pounds (75.21% of coastwide quota); Maryland's quota was 5,965,566 pounds (1.17% of coastwide quota). Virginia further allocates its in-state quota between sectors with the reduction fleet receiving 90.04%, the purse bait sector receiving 8.38% and the non-purse seine bait fisheries receiving 1.58%. Purse seine gears including bait purse seiners comprise the overwhelming percent of Virginia's menhaden harvest over the past five years (2000 – 2024) at 98.4% (88.7% reduction and 9.7% bait). Gill net and pound net harvest for bait are 0.80% and 0.77% respectively. Maryland's commercial fishery is

exclusively a bait fishery and is primarily harvested by pound nets. Between 2019-2023, Maryland has landed an average of 35.9% of its total quota, approximately 2.8 million pounds.

Virginia Purse Seine Fisheries

The Virginia purse seine fisheries (both reduction and bait) use spotter aircraft to locate schools of menhaden and direct vessels to the fish. When a school is located, two purse boats, with a net stretched between them, are deployed. The purse boats encircle a portion of the school and close the net to form a purse, or bag. The net is then retrieved to concentrate the catch, and the mother ship comes along the side and pumps the catch into refrigerated holds. Individual sets can vary from 10 mt to more than 100 mt, and large vessels can carry 400-600 mt of refrigerated fish.

Purse Seine Reduction Fishery

The menhaden reduction fishery is seasonal as the presence of menhaden schools is dependent on the temperature of coastal waters. Two fairly distinct fishing seasons occur: the "summer fishery" and the "fall fishery". The summer fishery begins in April with the appearance of schools of menhaden off the North Carolina coast. The fish migrate northward, appearing off southern New England by May-June. The fall fishery begins when migratory fish appear off Virginia and North Carolina. In early fall, this southward migration is initiated by cooling ocean temperatures. By late November-early December, most of the fish are found between Cape Hatteras and Cape Fear, North Carolina.

The Virginia Chesapeake Bay menhaden purse seine season starts the first Monday in May and ends the third Friday in November, while the ocean season (east of the Chesapeake Bay Bridge Tunnel) ends the Thursday before Christmas (Code of Virginia, § 28.2-410). In 2024, the Bay season was May 3 through November 15, or 197 days, and the ocean season through December 19 (231 days). The presence of menhaden schools is dependent on water temperature, as such, catch and effort varies across the season. The industry logs daily activity on the Captain's Daily Fishing Reports (CDFRs), which include information on vessel, date, time, location, estimated catch, reporting area and weather conditions for each set.

In general, there has been a decline in the overall effort in the reduction sector since the early 2000's with effort in the Bay accounting for just under half the total effort (49.29%) over the past five years (Figure 2), though effort in the Bay is capped at 51,000 metric tons based on the current Chesapeake Bay reduction fishing cap established in Amendment 3 to the Atlantic menhaden FMP. Over the past ten years (2015-2024), 49.50% of the reduction Bay effort and

46.09% of the Bay harvest occurred prior to July 15 (Figure 3, Tables 2 and 3). However, this is highly variable with the past two years' catch and effort significantly below average until the end of June (Table 3), after June both years were near or above the 5-year and 25-year averages (Figures 4 and 5, Table 3).

Spatially, each net set is reported to one of 7 areas in the Bay and 2 areas in Virginia's coastal waters (Figure 6). Catch and effort are greatest in the northwest area of Smith Point, with 33.20% of effort and 27.96% of harvest over the five most recent years (2020-2024) (Figure 7). Through July the Smith Point area has the highest activity, after which activity is highest in areas of the lower Bay near the mouth and along the Eastern Shore (Oceanview, Cape Charles, and York River) August 1 through September 15 (Figure 7). Activity in the Bay wanes beginning in October with less than 4% of the total bay effort occurring the remainder of the season.

Purse Seine Bait Fishery

The purse seine bait fishery catch and effort shows similar trends, with 2023 weekly harvest reports well below average through the week ending July 21, while 2024 reports were similarly below average nearly the entire season (through the week of November 8) (Figure 8). Purse seine catches are typically low the first two weeks in May but pick up substantially through the end of the month and into July. This increasing harvest trend was not observed in 2023 until late June (Figure 8). These below average and significantly below average purse seine harvest reports early in the 2023 and 2024 seasons warrant further examination given the latter part of the season was at or above normal.

Activity of the purse seine bait fishery is distributed differently than the reduction sector with effort rising steadily in late May and remaining consistent through July, following by a steady decline through October (Figure 7). The Smith Point reporting area again dominates catch (34.25%) and effort (37.87%), followed by Cape Charles (C=23.24%, E=16.68%), Silver Beach (C=15.47%, E=12.62%), and the northeasterly area, Pocomoke Sounds with 11.71% of the catch and 14.72% of the effort over the most recent 5-year time period (Figure 7).

Overlap with Osprey Study Areas[1]

Of the 6,257 menhaden Bay purse seine net sets reported on the CDFR's between 2020 and 2024, only 113 net sets (1.81%) occurred in just four of the Watts et al. 2024 osprey study areas (Fleeton Bay, Mobjack Bay, Eastern Shore, and Piankatank River) (Figure 9 and Table 5). The osprey workgroup indicates that May and June are the most sensitive times for osprey (USGS,

[1] Members of the external Osprey Work Group cautioned the Board Work Group against using the Watts et al. 2024 study areas in this manner as they assume menhaden biomass is static and that the effects of menhaden harvest are restricted to the local area of harvest

personal communication, ASMFC Menhaden Board Meeting, August 2024). The CDFRs indicate that 8.41% of the May effort occurred in one three study areas: Fleeton Bay – 59 sets or 7.88%; Eastern Shore – 3 net sets or 0.40%; and Piankatank River – 1 net set (0.13%) (Figure 7 and Table 5). June had 1.15% of the purse seine net sets in proximity to the Fleeton Bay (N=7, 0.54%) and Eastern Shore osprey study areas (N=7, 0.62%) (Table 5). Mobjack Bay has been the center of attention regarding recent osprey nesting studies, however only 22 menhaden purse seine net sets occurred in the osprey study areas over the past five years, and none during the critical May to June window for osprey (Table 5). Most of that Mobjack Bay purse seine effort occurred in August of 2021 (N=14) and 2022 (N=7).

Non-Purse Seine Bait Fisheries

Menhaden from bait fisheries is primarily harvested by pound nets, gill nets, and haul seines. Virginia's non-purse bait harvest is dominated by gill nets (50.84%) and pound nets (48.95%) with haul seines at 0.15% over the past five years. The pound net fishery in the Chesapeake Bay region is carried out by numerous small, non-refrigerated vessels. Maximum hold capacity of these pound net vessels is 9 mt or less, but daily catches are usually well below vessel capacity and are limited by the number of fish encountered in the fixed gear. The majority of these fish supply the local blue crab fishery.

Pound Net Fisheries

Pound nets comprise 0.16% of the overall menhaden harvest annually in Virginia (average= 2.10 million lbs) and 97.23% in Maryland (average=2.24 million lbs) over the past five years. Annual catch-per-unit effort (CPUE) measured as lbs per net-day has been relatively stable on the Potomac River (2,434 lbs per net day) with the exception of 2023 and 2024 when CPUE declined sharply. Similar estimates in Virginia and Maryland have been significantly below the 10-year average (MD = 2,242 lbs per net-day, VA=2,053 lbs per net day) for both 2023 and 2024 (Figure 10). On a monthly basis, menhaden first appear in pound net catches in March, peak during the summer months, with a steady decline in harvest into the fall (Figure 11). Harvest for the last two years (2023 and 2024) was generally at or below both the 5 and 10-year averages in Maryland, while Virginia's monthly harvest was significantly below average April through October, 2024 (Figure 11).

As shown in Figure 12, pound net distribution in the Chesapeake Bay is primarily located on the lower Eastern Shore and Northern Neck on the western side of the Bay with a small number of pounds in Virginia Beach, northern Eastern Shore, and the tributaries. VMRC harvest reporting areas were used to represent spatial coverage by month (Figure 13). Pound net harvest tracks

the location of pound nets well, with 83.62% of all harvest (2020-2024) occurring in the Chesapeake Bay Upper West Area (CBUW) with the Rappahannock River at 10.42% (Figure 13).

Overlap with Osprey Study Areas

Of the 136 Virginia licensed pound nets in 2024, 10 occurred within the Fleeton Bay osprey study area with another 22 just to the north (Figures 12 and 13). Eight pound nets were located in the Eastern Shore osprey study area and 6 in proximity to the Lynnhaven study area. The MRC reporting area CBUW (Chesapeake Bay Upper West) (Figure 13) is where the bulk of the pound net harvest originates (83.62%) – Fleeton Bay occurs in that reporting area. Over the past 5 years (2020-2024), 37.54% of all pound net harvest was reported from this area during March to June (Figure 13).

Gill Net Fisheries

Gill nets comprise 0.15% of the overall menhaden harvest annually in Virginia (average= 2.06 million lbs) and 2.73% in Maryland (average=62,988 lbs) over the past five years (Figure 14). Maryland harvest has averaged 206,508 lbs annually over the past ten years but has observed significantly lower harvest since 2021. Virginia has averaged 2,132,885 lbs the past ten years but significantly below that value in 2023 and 2024 (Figure 14). Gill net harvest of menhaden is primarily February to April in Virginia waters and March to April in Maryland (Figure 15). Catches appear to be delayed somewhat in Maryland with the peak month of harvest in April. The 2024 harvest for nearly every month was significantly below the 5 and 10-year averages in Virginia waters.

Spatial distribution of gill net activities is more dispersed than pound nets. In Virginia, Western Upper Bay (CBUW) dominates harvest during the peak months of March and April and comprises 32.92% of the total gill net harvest. The Eastern Upper Bay (CBUE) represented 20.30% of the 5-year total but harvest was down in that area in 2024 compared to previous years.

Overlap with Osprey Study Areas

Menhaden harvest from gill nets is more complicated than that from pound nets. In Virginia, various types of gill nets are utilized (anchored, staked, drift, etc), targeting a number of species (bluefish, blue catfish, croaker, black and red drum, striped bass, Spanish mackerel, speckled trout, gizzard shad, and menhaden) throughout the year. Maryland banned the use of anchored and staked gill nets in 1992. Drift gill nets are permitted but must be attended at all times.

Menhaden are mostly caught with anchored gill nets in the spring months (March to May) in Virginia's western Bay (CBLW and CBUW - (Figure 16) with 68.71% of the 5-year harvest occurring during that three-month period (Figure 16). The Eastern Shore osprey study area is included in the CBUE reporting area with 9.48% of the overall harvest, with the lower Chesapeake Bay reporting area at 3.15% (Figure 16). The York River reports 15.05% of the overall menhaden harvest with gill nets, James River has less than 0.7%, the Poquoson River at 0.53%, Piankatank River at < 0.5%, and Rappahannock River at 6.41%. Overall, the Mobjack Bay gill net harvested was 7.52% over the past five-years, with 6.07% of that harvest in March and April. The single highest month of harvest in Mobjack Bay occurred in March 2021 (Figure 17).

Background on Additional Piscivorous Bird and Fish Predators

Cormorants and Pelicans

Double-crested cormorants and brown pelicans are two additional predators of menhaden whose numbers are increasing in Chesapeake Bay. Atlantic menhaden make up 50-55% of the diet of cormorants and 74% of the diet of brown pelicans by weight. Other important fish for cormorants were spot (8-27% of diet) and Atlantic croaker (13-16% of diet). For brown pelicans, bay anchovies were also important (14% of their diet)(Watts and Duerr 2009). Breeding of the Double-crested Cormorant in Virginia was first confirmed in 1978 on a small, vegetated island in the James River near Hopewell. Colonization of Virginia represents an expansion beyond the historic range following a low during the DDT era (1940s-1972). After 1984, the Virginia population expanded rapidly to 5 colonies by 1995 containing more than 400 pairs. The seaside of the Delmarva was not colonized until 1995. Between 1993 and 2018 the population has increased by 1416% from 354 to 5,012 pairs. Most of this increase is accounted for by the rapid expansion of the Shanks Island colony. The colony has expanded from 6 pairs in 1993 to 907 pairs in 2003 to 1, 636 in 2008 to 2,369 in 2013 to 5,012 in 2018. This trend continued until 2023, when erosion significantly deteriorated Shanks Island, leading to a significant drop in cormorants located within Virginia to just over 3000 breeding pairs (Watts et al. 2019).

Double-crested cormorants live in the Chesapeake Bay area year-round, but winter is an especially important time, as they overwinter around the bay and along the south Atlantic. There are two migration dates; initial arrival in the spring, with the earliest departure for spring migration around March 26th, and the latest around May 12th and departure for the winter, where some populations migrate south to wintering grounds in the fall, with the average departure date for fall migration around October 1st (Watts et al. 2019).

The Brown Pelican was first found breeding in Virginia on Fisherman Island in 1987. During this same year, birds were also found nesting on Metomkin Island. Colonization of Virginia represents a northward range expansion from North Carolina that extends beyond the historic range and follows recovery of southeastern populations from contaminants. Since its discovery, the Shanks Island colony has grown exponentially apparently fueled by continued immigration. In 1993, there were only 53 pairs documented in this colony. By 1999, the colony supported 913 breeding pairs. The colony reached a peak in 2013 with 1,857 pairs and has now declined to 1,753 pairs. The Wreck Island colony has shifted south on the island over the past couple of years, expanding dramatically and now including 1,493 pairs (Watts et al. 2019).

Virginia is the northernmost state that supports a year-round brown pelican population, especially further south in the state near Virginia Beach and at the mouth of the Chesapeake Bay. Nesting and egg laying occurs between March and May, with females laying 2 to 3 eggs per clutch. Eggs then take about 30 days to hatch, and first flight takes around 75 days (Watts et al. 2019).

Striped Bass, Cobia, Red Drum, Spanish Mackerel, Spotted Seatrout, Weakfish and Blue Catfish

The present Ecological Reference Point (ERP) assessment models developed for Atlantic menhaden consider only four predatory fish species (striped bass, bluefish, weakfish, and spiny dogfish), with striped bass fitting the models best. These species have historical significance in the Chesapeake Bay and have been well studied. The latest coastwide assessments indicate striped bass is overfished, bluefish are presently rebuilding, weakfish are depleted due to high levels of natural mortality, and spiny dogfish reproductive output is declining but stabilizing (ASMFC, 2024).

Commercial and recreational harvest for all these species (with the exception of spiny dogfish) have shown a negative trend for the last ten to twenty years in the Chesapeake Bay (Figures 1 and 2). To the contrary, other migratory species, such as cobia, red drum, spotted seatrout and Spanish mackerel have increased in abundance and length of residency in the bay due to warming water temperatures (Figures 18 and 19). In addition to these estuarine species, the introduced blue catfish population is expanding (Figure 20), causing concerns for the Bay states due to its diet of important species such as blue crabs, alosines, and menhaden. As the Bay's population of these traditional species declines, so does their ecological demand for forage species such as menhaden. As other species abundance increases, their forage demands will increase but the overall effect of this species shift on predatory demand of piscivorous fishes on menhaden is unknown.

Abundance of Key Bay Predators

Commercial and recreational harvest data can be used to reflect the abundance of a species within the Chesapeake Bay in recent years. Blue catfish numbers are up as much as 287% (MD) and 72% (VA) compared to the 20-year average (Figure 20 and Table 4). Both states have seen a doubling of recreational cobia catch compared to the 20-year average with Virginia seeing a 76% increase in commercial harvest. Red drum commercial harvest is strictly controlled by the Red Drum Fishery Management Plan (ASMFC, 2022) with recreational catch trending upwards - especially in Virginia. Spanish mackerel and spotted seatrout have seen some of the largest increases in catch in recent years with mackerel increasing 129% commercially in VA and recreational catch up 157% (VA) and 192% (MD). Seatrout has observed a 70% increase commercially (VA) and with recreational catch up 46% (MD) and 57% (VA) over the past 20 years (Table 4, Figures 18-20).

Commercial harvest data from ACCSP and recreational total catch information (A+B1+B2) from MRIP were explored back to 1990. Three of the four species used to model the Menhaden ERP assessment have shown declines in both commercial harvest and recreational catch during the past 5-years compared to the 10-year and 20-year averages (Table 4, Figures 18 and 19). Commercial striped bass harvest has declined 28% in VA and 19% in MD, with declines of 58% and 27% respectively in the recreational catch. Bluefish recreational catch has declined 65% (MD) and 25% (VA) compared to the 20-year average, while commercial harvest has declined 77% (MD) and 50% (VA) (Table 4). Weakfish have observed the largest decline with recent years 88% (MD) and 66% (VA) below the 20-year commercial average and 84% (MD) and 29% (VA) below the 20-year recreational catch. Spiny dogfish has a mixed signal with recreational catch increasing in Maryland (24%) as is commercial harvest in Virginia (77%) (Table 4). However, only 2.39% of the Virginia dogfish harvest has occurred in the Bay over the past five years (2000 – 2024), with the bulk coming from coastal waters (95.88%) and seaside tributaries and lagoons (1.73%).

The predators included in the ERP assessment model were chosen because of their dependence on menhaden as forage, though the relative dependence on menhaden varies by species with striped bass having the largest relative dependence (15.9% by weight; 11.7% by number) and weakfish having the smallest relative dependence (<1%) (Bonzek et al. 2022).
Other species with increasing abundance in Chesapeake Bay that may be influencing forage species demand have few to no Chesapeake Bay diet studies and no fishery independent surveys designed to monitor their abundance. However, diet studies from southern states (North Carolina to Georgia) with a longer history of surveys and diet studies may clarify the

forage demand of these species. All of the species increasing in abundance in Chesapeake Bay are known to prey on menhaden, with the relative importance varying by season or ontogeny. Large spotted seatrout and Spanish mackerel had the highest diet composition of menhaden (31.5% and 40%, respectively) followed by small red drum (27.4%), and cobia (1.53%). A study of the upper portions of Virginia major tributaries (James, York and Rappahannock Rivers) found menhaden comprised 0.425 to 5.00% of blue catfish diet by weight (Schmitt, et al. 2018).

Diet Studies in Chesapeake Bay

The VIMS Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) and Northeast Area Monitoring and Assessment Program (NEAMAP) are the most comprehensive diet studies of ecologically, commercially, and recreationally important fishes in the Chesapeake Bay and adjacent coastal waters. The ChesMMAP began in 2002 and samples four times a year (March, June, September, and November) in the mainstem bay from the head of the Bay at Poole's Island, MD to the mouth of the Bay just outside the Chesapeake Bay Bridge Tunnel. (ChesMMAP 2024). NEAMAP began conducting both a spring and fall survey in 2008, sampling from Cape Cod, MA south to Cape Hatteras, NC, targeting both juvenile and adult fishes (NEAMAP 2024). Both surveys develop age specific abundance estimates of various species for stock assessments, as well as complete annual representative ageing and gut contents on a suite of species. The diet data were instrumental in developing the ERP predator prey models for menhaden. Included below are a diet summary of those ERP predators. A summary of the menhaden percent of diet for each of the species below along with location and time of the study and reference appear in Table 6.

Striped Bass diet in the Bay is known to consist of numerous species from mollusks, annelids (worms), Arthropods (shrimp, crabs, mysids, etc.) and a number of finfishes (CHESMMAP, 2024). From the stomach contents collected from 2002 to 2020 cruises, diet composition of striped bass consists of 63.2% fish by weight (%W), 17.0%W and 26.1% by number (%N) for crustaceans, 11.7%W and 9.9%N for worms, 6.2%W miscellaneous items, and 1.9%W mollusks (Bonzek et al. 2022). Bay Anchovy comprises the largest portion of the diet with 33.0% by weight(%W) and 33.8% by numbers (%N). Mysids are second with 7.3% by weight and 12.2% by number. Menhaden comprise 15.9% of Striped Bass diet by weight and 11.7% by number during this 19- year period. (Bonzek et al. 2022).

Bluefish are highly piscivorous with CHESMMAP data from 2000-2021 indicating bay anchovy constitutes 53.4% of the diet by weight (%W) and 52.0% by number (%N). Spot constitute 9.3%W and 5.8%W, with all fish species representing 88.9%W and 83.0%Wr (Bonzek et al. 2022). Menhaden comprise 5.0%W and 4.7%N (Bonzek et al. 2022).

Weakfish diet data from CHESMMAP (2000-2021) suggest the diet is primarily fishes (68.3%) and crustaceans (25.6%) by volume. By numbers, fishes comprise 53.3% and crustaceans 39.9% (primarily mysids at 21.8%). Bay Anchovy are 31.3% of the diet by number and 40.5% by volume. Menhaden make up only a small portion of the weakfish diet < 1% (possibly due to truncation of the weakfish size range associated with high natural mortality of Age 1+ fishes) (Bonzek et al. 2022).

Spiny Dogfish do not typically venture far into the bay (< 2.5% of harvest) and are generally observed in coastal waters by NEAMAP. Diet information collected from spiny dogfish indicates roughly half of their diet by both weight (%W) and numbers (%N) were fishes. Menhaden (7.8%W, 5.1%N), striped bass (2.3%W), butterfish (2.1%W, 2.1%N) and scup (2.2%W, 2.0%N) are the most prevalent identified fishes, with longfin squid (9.7%W, 7.1%N) and bloodworm species (10.1%W, 10.6%N) the most prevalent invertebrates over a 10-year period (2007 – 2016) (Bonzek et al. 2017).

Other species with increasing abundance that may be influencing forage species demand have little to no Chesapeake Bay diet studies. None of these species have effective fishery independent surveys in the Bay to monitor abundance or diet composition. States to the south (GA to NC) have numerous studies in the literature that may clarify the forage demand of these species.

Cobia: Commercial and recreational cobia harvest has increased substantial over the past 10 years (Figures 18 and 19). The species feeds mostly on crabs (blue crab and lady crabs) with the relative importance of those species (index of relative importance) 2-3 orders of magnitude higher than any other species (Arendt et al. 2001). This study found these two species comprising 76.82% of the diet by numbers and 78.62% by volume. Menhaden were found to be 0.14% of the diet by numbers and 1.53% by volume (Arendt et al. 2001).

Red Drum are opportunistic feeders, and diet can shift with changes in age, habitat, season variability, and fluctuations in prey availability. In North Carolina red drum diet composition is comprised primarily of decapod crustacea (shrimp and crabs) and finfishes. Age 0-1 fish (100-400mm) eat primarily penaeid shrimp 30.7%W, menhaden 27.4%W and blue crabs at 9.6%W, with all decapod crustacea at 42.6%W and finfishes at 55.8%W (Facendola and Scharf, 2012). Diets in Age1-2 fish (400-700 mm) is shifted primarily to blue crabs (35%W), menhaden (15.4%W), Pinfish (10.1%W), and only 1.1%W of penaeid shrimp, with the percent of finfishes increasing to 61.1%W (Facendola and Scharf, 2012). In a study of larger fish (> 750 mm) diets consisted mainly of blue crabs (50.7%W), menhaden (11.9%W), and shrimp (3.0%W), with all

finfish totaling 38.8%W and all decapod crustacean at 56.7%W (Peacock, 2014). These and other studies had similar species composition in the diet for fishes typically found in the Bay, including spot, croaker, mullet, tonguefish and mullet.

Spotted Seatrout: As juvenile spotted seatrout grow (greater than 30 mm in length), the dominant prey shifts to penaeid and palaemonid shrimps, which remain important in the diet of adults (McMichael and Peters 1989). As adult spotted seatrout increase in size, pelagic fishes and penaeid shrimps become increasingly important in their diet (Mercer 1984). Diet analysis of spotted seatrout in the lower Cape Fear River, North Carolina, revealed that Atlantic menhaden and brown shrimp are the dominant prey items of spotted seatrout during the summer and fall, and other important prey species included pinfish, spot, and striped mullet, indicating that spotted seatrout are mainly piscivorous after reaching age 1 (Tayloe and Scharf 2006). By size in coastal Georgia, small spotted seatrout < 300 mm consume primarily grass shrimp (13.2%N) and menhaden (9.4%N). Medium fish (301-500 mm) primary food items were fish (56.8%N), specifically menhaden (15.6%N,) with penaeid shrimp (12.1%N) the most prevalent invertebrate. Large specimens (> 500 mm) were exclusively piscivorous with menhaden at 31.5%N (Music and Pafford, 1984). For all size classes combined fishes comprises 41.8%N of diet (menhaden 20.1%N), with crustacean at 9.2%N (penaeid shrimp at 13.1%N and grass shrimp at 7.6%N) (Music and Pafford, 1984).

Spanish Mackerel: Nearly exclusively piscivorous, particularly at large size classes. A study off the Georgia coast found the fish portion of the diet of juveniles (9-42cm) to be 97.9% by weight (%W) and 89.6% by number (%N), with anchovy species comprising the bulk (64.9%W and 39.5%N, with an occurrence rate, of 44.5%) (Finucane et al. 1990). A study from North and South Carolina samples found fishes to be a similar portion of the diet (97.7%W) with anchovy species consisting of 29.7%W, nematodes 1.5%W, squid species 0.4%W, and digested fish material at 58.7%W (Saloman and Naughton, 1983). A study off Cape Canaveral, FL found fishes to comprise 93.5% of diet by weight (%W) and 86.7% by number (%N), with key species being anchovies (21.3%N, 22.6%W) clupeids – including menhaden (5.3%N, 22.6%W) and squid species (13.3%N, 6.5%W) (Naughton and Saloman, 1981). A recent NOAA study in the Gulf of Mexico indicated that age 0-1 Spanish mackerel diet can consist of up to 40%W Gulf menhaden (over 5-year classes) while Age 1+ mackerel diet is around 20%W menhaden (Berenshtein et al. 2021).

Often menhaden are not easily identified in gut contents and may be labeled as “clupeids” or “unidentified fish”. A study in the Northern Gulf of Mexico/America to quantify the importance of Gulf menhaden as a prey item found the estimated contribution of identifiable menhaden to the diets of all predators generally ranged between 2% and 3% (Sagarese et al. 2016). Diet

compositions were then adjusted for unidentified prey using the proportion of fish species biomass in the ecosystem, indicating five predator groups with a relatively large dependence on Gulf menhaden prey were juvenile King Mackerel, juvenile and adult Spanish Mackerel, Red Drum, and Blacktip Sharks (Sagarese et al. 2016).

Blue Catfish were introduced to the Chesapeake Bay upper tributaries in Virginia beginning in 1973 to 1985 to enhance trophy fishing opportunities for freshwater anglers. The species has a much higher salinity tolerance (typically found at 17 ppt) then native catfish species and become piscivorous at a smaller size and age. They have been very prolific (Figure 20) spreading to nearly all tributaries of both the western and eastern side of the bay. They are an omnivorous, or trophic generalist species of fish. Because of this, their diet varies by waterbody, salinity and the availability of prey items, but studies indicate that their diet most often consists of small fish, crayfish, mollusks, and plant matter. At larger sizes, Blue Catfish become increasingly piscivorous, and transition to primarily consuming other fish. A study of the upper portions of Virginia major tributaries (James, York and Rappahannock Rivers) found menhaden comprised 0.425 to 5.00% of blue catfish diet by weight (Schmitt, et al. 2018).

Species Health

A standardized health condition index could be used to examine if striped bass and other piscivores are stressed in the Bay. One of the simplest methods is the Fulton's Condition Factor (k_c) which has been used for over 100 years. (Fulton, 1911; Stevenson and Woods, 2006). While this analysis can track the relative condition of fish over the season and interannually, the opportunistic foraging habits of many of the species described above precludes the direct relation of health indices to fluctuations in menhaden biomass or availability.

Condition factors may vary seasonally during spawning and when stressed by environmental conditions such as water temperature or low dissolved oxygen, as well as species specific physiological and morphological differences. For this exercise, an annual factor is produced from a number of datasets from the Maryland Department of Natural Resources, Potomac River Fisheries Commission, and Virginia Marine Resources Commission for striped bass and other known predators of menhaden in the Bay.

Fulton's Condition Factor

The Factor is simple to compute and only requires length (in cm) and weight (in grams). A factor of 1.0 is considered normal for most finfishes with 1.2 very healthy, and below 0.8 under stress. The formula is:

$k_c = (\text{Weight} / \text{Length}^3) * 100,$ Weight in grams, Length in cm

Eight data sources were used to develop annual condition factors for striped bass. A total of 298,232 individual striped bass were evaluated with the average annual number of samples from the projects ranging from 243 to 3473. A cursory review of the samples was conducted with outliers from the linear length vs weight curve removed from the analysis .

Striped Bass Health: The use of Fulton's Condition Factor as a measure of the Bay's Striped Bass population health would indicate the fish are not starving and would be considered healthy (Figure 21). These datasets represent the entire Chesapeake Bay, numerous gear types, across all months in any given year. The time series was examined back to 1990 when Striped Bass were still under a moratorium. In general, these data suggest the Bay's striped bass are healthy, with k_c's above the 0.8 threshold on an annual basis (Figure 21). Conditions appear to be trending upward and often exceeding the very healthy 1.2 threshold for data collected primarily during cool water months (October – March) (Figures 21 and 22). These data all show similar trends and appear to capture expected declines in k_c during warm weather months (when fish are most stressed) suggesting this reflects expected seasonal dynamics in foraging behavior and physiological stress (Figure 22).

Health of other Bay Predators: Similar methods were applied to other Bay predatory species to develop Fulton's Condition Factor for each. Only information from VMRC projects was used for this exercise. Long-term blue catfish and spiny dogfish length/weight data was not available at this time. Red drum, spotted seatrout, and weakfish all had k_c values fluctuating around the normal threshold of 1.0 or above (Figure 23). Interestingly, the pelagic species (bluefish, cobia and Spanish Mackerel) all have k_c values typically well below the 1.0 normal threshold, with the median for bluefish at 0.93 (range from 0.83 to 122). Cobia ranged from 0.80 and 1.37 (median=0.90). Spanish mackerel was much lower with k_c values ranging from 0.49 to 0.89, median = 0.54 (Figure 23). Given the k_c values were generally stable for each of these species over the time series, there may be morphological differences with pelagic species compared to sciaenids that requiring scaling the condition threshold for specific species.

In general, the health index measured by Fulton's Condition Factor, seems to be slightly increasing or stable for all species, suggesting the health of these species over time has not changed substantially.

Potential Management Approaches

Based on the life history of predators examined, the nature of Chesapeake Bay menhaden fisheries, and recent changes in menhaden availability, the Work Group discussed a number of precautionary management options the Board could consider for further action. The options listed below could be implemented individually or in combination, depending on the Board's risk tolerance and management goals.

Seasonal Closures

Benefits and challenges of potential strategies discussed are summarized below for several potential scenarios:

1. May 15 – August 15: This period covers the period of highest energy demand for the osprey population in Chesapeake Bay. Cormorants, striped bass, and red drum are also present in Chesapeake Bay during this time. Between 2020-2024, 60.72% (Table 3) of the cumulative reduction harvest of menhaden in Chesapeake Bay occurred during this time. Purse seines harvesting bait had a cumulative harvest for that same time period of 47.51%.. Virginia's gill net and pound net fisheries harvest 43.42% and 49.28% of the annual harvest during this time period.

2. May 1 – June 30: This period covers the period of critical demand for early chick survival for osprey in Chesapeake Bay. Cormorants, striped bass, red drum, and cobia are also present in Chesapeake Bay during this time. Between 2020-2024, 29.36% of the cumulative reduction harvest of menhaden in Chesapeake Bay occurred during this time. Bait purse seines harvested 22.08% of its annual average during these two months, with gill nets at 60.14% and pound nets at 21.41%.

3. May 1 – May 31: This period is a smaller subset of the options listed above to cover the first two weeks of the typical hatching season. This period would impact 10.69% of the purse seine reduction sector's annual Bay harvest (2020-2024) and 3.74% of the purse seine bait harvest based on the past 5 years. Gill nets are typically catching menhaden in the early spring with a May closure impacting 9.26% of the average annual harvest. The pound net harvest for the month of May in Virginia is 13.55% of the annual harvest. The pound net harvest for the month of May in Maryland is 5.76%.

Area Closures

Spatial Analysis of Fishing Activity

To explore if menhaden may play a role in the deficiencies outlined in Watts (2024), Captain Daily Fishing Reports (CDFRs) from menhaden purse seine activities were mapped against these 12 areas (Figure 9). Male osprey are known to travel up to 10 km from their nest while hunting for food (Pool, 1989). If the precise location of these 571 nests was available, a 10km buffer could be placed around each nest to determine the timing and level of fishing activity occurring in these 12 study areas. Unfortunately, the location of the sprey nests is not available at this time so similar polygons representing the 12 areas were created (as they appear in Dr. Watt's September 13th press release) (Figure 9).

It should be noted that members of the external osprey Work Group, which included representatives from USGS, USFWS, Maryland National Capital Park & Planning Commission and Dr. Watts from the College of William and Mary cautioned the Work Group against using the Watts et al. 2024 study areas in this manner as they assume menhaden biomass is static and that the effects of menhaden harvest are restricted to the local area of harvest. Instead, they suggest that the high concentration of reduction fishery net sets at the mouth of Chesapeake Bay could act as an 'intercept' fishery, preventing the ingress of large numbers of fish into Chesapeake Bay during key points of the season. Fishery-dependent data from daily CDFR's suggests that reduction fishing effort near the mouth of the Bay is concentrated during August and September compared to the upper Bay in May and June. Fishery-dependent data from daily CDFR's suggests that reduction fishing effort near the mouth of the Bay is concentrated during August and September compared to the upper Bay in May and June (Figures 6 and 7). This could suggest that reduction harvest is not limiting menhaden ingress, but surveys of menhaden migration and biomass in the Bay would be required to determine whether these trends are driven by menhaden availability or fishing operations.

Management Area Restrictions

Chapter 4 of Title 28.2 of the Code of Virginia addresses the taking of menhaden with purse seines. Closed areas are defined in § 28.2-409 and excludes most tributaries, bays and creeks off the mainstem Bay. The Bay season is defined as the first Monday in May until the third Friday in November (§ 28.2-410). In April 2023 a memorandum of understanding was signed between industry and VMRC to agree not to deploy or set a net around particularly sensitive areas. A one-half nautical mile buffer was created on either side of the Chesapeake Bay Bridge Tunnel (CBBT) to reduce user conflicts with recreational anglers. Two one-nautical mile buffers were

established from the shoreline: 1) along the Eastern Shore of the Chesapeake Bay from the Occohannock Creek south to the CBBT; and 2) From the James T. Wilson Fishing Pier (Buckroe Beach) south along the Hampton Roads Bridge Tunnel to Sandbridge Fishing Pier in Virginia Beach. Since being established, the purse fisheries have a 98.85% compliance rate in 2023 and a 99.47% in 2024 based on the location coordinates reported on the CDFRs.

Based on the areas of operation of menhaden fisheries, the Work Group discussed the following spatial closure options. These spatial closures can be considered on their own or in combination with seasonal closures and/or effort controls.

1. All Chesapeake Bay
    a. Virginia waters of Chesapeake Bay as defined by § 28.2-409 of the Code of Virginia and excluding areas covered by MOU
2. CDFR areas at the mouth of the Bay (Ocean View and Cape Charles)
3. By landings in CDFR reporting areas
4. Watts (2024) study locations
5. Mobjack Bay – Mobjack Bay is the most well-studied area for osprey in the lower Chesapeake Bay with considerable historical and recent data. Declining osprey reproductive rates, provisioning rates, provisioning of menhaden, diet quality, brood reduction, and an increase in male osprey foraging time have all been observed in Mobjack Bay.
6. Fleeton Bay – most likely to be impacted by all menhaden fisheries; purse seine, gillnet, and pound net fishing effort

Effort Controls

The implementation of quota periods or days out provisions could be used to distribute fishing effort more evenly throughout the season. These provisions are similar to management of the Atlantic herring fishery in which quota periods are used to manage catch toward bimonthly, trimester, or seasonal quotas to effectively manage catch to meet the needs of the fishery and bait market demand.

Gears Included in Seasonal and/or Area Closures

The application of seasonal or spatial closures to Chesapeake Bay menhaden bait fisheries, particularly pound nets and gill nets, would likely have significant economic and follow-on fishery impacts. Bait harvested in Chesapeake Bay typically supports in-state blue crab fisheries as well as crab and lobster fisheries along the Atlantic coast. It is unknown whether other states

or sources of bait would be available to backfill the landings that would not occur under closures of bait fisheries in the Bay, depending on the magnitude of the closures. These fisheries are also promulgated by small-scale and/or stationary gears with limited capacity (due to regulation or safety concerns) to move fishing efforts offshore. These actions could also impact the ability of watermen to land other species from non-directed gears, resulting in unintended economic impacts to other fisheries. The Board must weigh what would likely be an economic hardship for menhaden bait harvesters and those dependent on that bait for other fisheries with the potential for biological implications for their predators. A time or area closure could mean the reduction fleet has farther to travel to harvest fish at added expense. Further the purse seine skiffs that set the purse seine nets are only 40 ft in length and are subject to the same safety concerns as other bait harvesters when seas exceed 3 ft. The work group is unable at this time to provide a full analysis of the impacts these closures could have on the reduction fishery.

Decreasing Chesapeake Bay Reduction Fishery Cap

Recognition of the potential impacts of reduction fishing in Chesapeake Bay have been reflected in ASMFC's management of the menhaden fishery for at least two decades. In 2005, Addendum II to Amendment 1 instituted a harvest cap on the reduction fishery in the Chesapeake Bay. This cap was based on average landings from 2000-2004 and was set for the 2006-2010 fishing seasons. Addendum III (2006) to Amendment 1 revised the cap to 109,020 mt, based on average landings from 2001-2005, for the 2006-2010 fishing seasons. Addendum IV (2009) extended the cap through 2011-2013 at the same levels as established in Addendum III. Amendment 2 (2012) reduced the Chesapeake Bay cap by 20% to 87,216 mt. Amendment 3 (2017) reduced the Chesapeake Bay cap to 51,000 mt, based on average landings from 2012-2016. In 2019, the Commonwealth of Virginia was found out of compliance by ASMFC for failing to update the Bay cap to the new level of 51,000 metric tons. The decision was appealed to the Department of Commerce where the Secretary upheld the ASMFC action. Virginia updated their regulations and came into compliance prior to the start of the fishing season. The development of the Bay cap, the Board's continued action to update the cap, and the actions of the Department of Commerce reinforce that managing reduction harvest within the Chesapeake Bay is appropriate and necessary.

The Board could further reduce the Chesapeake Bay reduction fishery cap, which is currently based on historical landings from the 5 years prior to enactment. This would presumably leave additional menhaden as forage in Bay waters for all predators. Landings in recent years have been at or near the full Bay cap; therefore, the Board would need to consider a novel approach to setting the Bay cap based on information provided by the Work Group or from other sources if this option is implemented.

Research Recommendations

In reviewing data and information to meet its charge, the Work Group identified several areas in need of additional research and data to address questions beneficial to ecological management of menhaden fisheries in Chesapeake Bay and beyond. Those research recommendations are as follows:

1. Investigate menhaden environmental condition preferences to analyze potential shift in seasonal availability
2. Diet studies on other key predators in Chesapeake Bay (fish, birds, mammals, etc.)
3. Survey of menhaden abundance and biomass in Chesapeake Bay
4. Investigate osprey in other estuaries to determine if there are similar issues
5. ERP Work Group continue to explore inclusion of other predator species in future assessments
6. Study specific osprey areas with major deficiencies in reproductive output relative to menhaden fisheries (e.g. Mobjack and Fleeton Bays)

Additionally, the external osprey Work Group provided research recommendations to the Board Work Group which are as follows:

1. Execute a menhaden biomass survey in the Chesapeake Bay
2. Evaluate long-term datasets for osprey breeding performance
3. Relate historical data with menhaden abundance estimates
4. Create an economical metric of food stress to measure at scale
5. Develop an osprey-menhaden CPUE model

References

Academia, M.H. and Watts, B.D. 2023. Food supplementation increases reproductive performance of ospreys in the lower Chesapeake Bay. Frontiers in Marine Science 10:1172787.

Arendt, M.D., J.E. Olney and J.A. Lucy. 2021. Stomach content analysis of cobia, Rachycentron canadum, from lower Chesapeake Bay. Fish. Bull. 99:665–670.

ASMFC. 2024. Managed Species. https://asmfc.org/species/. Accessed 3/1/24.

ASMFC. 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. June 2022. 159 pp.

Bent, A.C. 1937. Life Histories of North American Birds of Prey: Order Falconiiformes (part 1). U.S. National Museum Bulletin 167, Washington, D.C.

Berenshtein, I., S. Sagarese, M. Lauretta, M. Nuttall, and D. Chagaris. 2021. Technical documentation of a U.S. Gulf of Mexico-wide Ecosystem model. NOAA Technical Memorandum. NMFS-SEFSC-751, 229 p. https://doi.org/10.25923/zj8t-e656.

Bonzek, C. F., Gartland, J., Gauthier, D. J., & Latour, R. J. (2022) Annual Report - 2021 Data collection and analysis in support of single and multispecies stock assessments in Chesapeake Bay: The Chesapeake Bay Multispecies Monitoring and Assessment Program. Virginia Institute of Marine Science, William & Mary. doi: 10.25773/k7xj-e205

Bonzek, C. F., Gartland, J., Gauthier, D. J., & Latour, R. J. (2017) Northeast Area Monitoring and Assessment Program (NEAMAP) 2016 Data collection and analysis in support of single and multispecies stock assessments in the Mid-Atlantic: Northeast Area Monitoring and Assessment Program Near Shore Trawl Survey. Virginia Institute of Marine Science, William & Mary. https://doi.org/10.25773/7206-KM61

Bowman, R., Powell, G.V.N., Hovis, J.A., Kline, N.C. and Wilmers, T. 1989. Variations in reproductive success between subpopulations of the osprey (Pandion halietus) in south Florida. Bulletin of Marine Science 44:245–250.

ChesMMAP. What is ChesMMAP? College of William and Mary's School of Marine Science, Virginia Institute of Marine Science. https://www.vims.edu/research/units/programs/multispecies_fisheries_research/chesmmap/. Accessed 2/26/24

Eriksson, M.O.G. 1986. Fish delivery, production of young, and nest density of osprey (Pandion haliaetus) in southwest Sweden. Canadian Journal of Zoology 64:1961-1965.

Facendola, J. J. & F. S. Scharf (2012) Seasonal and Ontogenetic Variation in the Diet and Daily Ration of Estuarine Red Drum as Derived from Field-Based Estimates of Gastric Evacuation and Consumption, Marine and Coastal Fisheries, 4:1, 546-559, DOI: 10.1080/19425120.2012.699018

Finucane, J. H., C. B. Grimes and S. P. Naughton. 1990. Diets of Young King and Spanish Mackerel Off the Southeast United States. Northeast Gulf Science 11 (2).
Retrieved from https://aquila.usm.edu/goms/vol11/iss2/7

Fulton, T.W., 1911. In: The sovereignty of the sea: An historical account of the claims of England to the dominion of the British seas, and of the evolution of the territorial waters. W. Blackwood, Edinburgh, London (1911), p. 799

Glass K.A. and Watts, B.D. 2009. Osprey diet composition and quality in high-and low-salinity areas of lower Chesapeake Bay. Journal of Raptor Research 43:27-36.

Hagan, J.M. 1986. Temporal patterns in pre-fledging survival and brood reduction
in an osprey colony. Condor 88:200-205.

Lazarus, R.S., Rattner, B.A., McGowan, P.C., Hale, R.C., Karouna-Renier, N.K., Erickson, R.A. and Ottinger, M.A. 2016. Chesapeake Bay fish-osprey (Pandion haliaetus) food chain: evaluation of contaminant exposure and genetic damage. Environmental Toxicology and Chemistry 35:1560-1575.

Machmer, M. M. and Ydenberg, R.C. 1998. The relative roles of hunger and size asymmetry in sibling aggression between nestling ospreys, Pandion haliaetus. Canadian Journal of Zoology 76:181-186.

McMichaels, R.H. Jr. and K.M. Peters. 1989. Early life history of spotted seatrout *Cynoscion nebulosus* (Pisces: Sciaenidae), in Tampa Bay. Estuaries 12(2) p. 96-110.

Mercer, L.P. 1984. A biological and fisheries profile of spotted seatrout, Cynoscion nebulosus. North Carolina Department of Natural Resources and Community Development, Division of Marine Resources, Morehead City, North Carolina. Special Scientific Report Number 40. 87 p.

Music, J.L. Jr. and J.M. Pafford. 1984. Population dynamics and life history aspects of major marine sportfishes in Georgia's coastal waters. GADNR CRD Contrib. Series No. 38. March 1984. 382 pp.

Naughton, S. P. and C. H. Saloman. 1981. Stomach Contents of Juveniles of King Mackerel (Scomberomorus cavalla) and Spanish Mackerel (S. maculatus). Northeast Gulf Science 5 (1). Retrieved from https://aquila.usm.edu/goms/vol5/iss1/12

NEAMAP. What is NEAMAP? College of William and Mary's School of Marine Science, Virginia Institute of Marine
Science. https://www.vims.edu/research/units/programs/multispecies_fisheries_research/neamap/ Accessed 2/26/24

Peacock, T. 2014. A Synthesis of Red Drum Feeding Ecology and Diets from North Carolina and South Carolina. MS Thesis, Eastern Carolina University. 88pp

Poole, A.F. 1982. Brood reduction in temperate and sub-tropical ospreys. Oecologia 53:111-119.

Poole, A.F. 1989. Ospreys: A Natural and Unnatural History. Cambridge University Press, New York.

Reese, J.G. 1991. Osprey (Pandion haliaetus). Pages 20.1-20.11 in Habitat Requirements for Chesapeake Bay Living Resources (S. L. Funderburk, S. J. Jordan, J.A. Mihursky and D. Riley, Eds.). Chesapeake Research Consortium, Inc., Solomons, Maryland.

Sagarese, S.R. M.A. Nuttall, T.M. Geers, M.V. Lauretta, J.F. Walter III, and J.E. Serafy. 2016. Quantifying the Trophic Importance of Gulf Menhaden within the Northern Gulf of Mexico Ecosystem. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 8:23–45, 2016. DOI: 10.1080/19425120.2015.1091412

Saloman, C.H. and S.P. Naughton. 1983. Food of Spanish mackerel, Scomberomorus maculatus, from the Gulf of Mexico and southeastern seaboard of the United States. NOAA Technical Memorandum NMFS-SEFC-128. December 1983. 22 pp.

Schmitt, JD, BK Peoples, L Castello, and DJ Orth. 2018. Feeding ecology of generalist consumers: a case study of invasive blue catfish Ictalurus furcatus in Chesapeake Bay, Virginia, USA. Environmental Biology of Fishes, 102, 443-465 Environ Biol Fish, https://doi.org/10.1007/s10641-018-0783-6

Smith, J.W. and W.B. O'Bier. 2010. The Bait Purse-seine Fishery for Atlantic Menhaden, *Brevoortia tyrannus,* in the Virginia Portion of Chesapeake Bay. Marine Fisheries Review 73(1) pp 1-12.

Steidl, R.J. and Griffin, C.R. 1991. Growth and brood reduction in mid-Atlantic coast ospreys. Auk 108:363-370.

Stevenson, R. D. and W.A. Woods, 2006. Condition indices for conservation: new uses for evolving tools. Integrative and Comparative Biology, volume 46, number 6, pp. 1169–1190.

Tayloe WB, Scharf FS. 2006. Age, growth, and feeding habits of spotted seatrout (Cynoscion nebulosus) in the lower Cape Fear River [poster]. In: Tidewater Chapter (AFS) Annual Meeting; February 2006; Atlantic Beach (NC). *From SEDAR, 2011. Omnibus Amendment to the Interstate Fishery Management Plans for Spanish mackerel, spot, and spotted seatrout. Amendment to the Interstate Fishery Management Plans for Spanish mackerel, spot, and spotted Seatrout. ASMFC 2011 SEDAR28-RD07 2 December 2011.*

Watts, B.D. College of William & Mary Center for Conservation Biology. Personal communication. December 4, 2024.

Watts, B.D. and Duerr, A. 2009. Flexibility of cormorant and pelican diet assemblages. Webpage. https://ccbbirds.org/2009/09/05/flexibility-of-cormorant-and-pelican-diet-assemblages/. Accessed February 2025.

Watts, B.D., Byrd, M.A. and Watts, M.U., 2004. Status and distribution of breeding ospreys in Chesapeake Bay: 1995-1996. Journal of Raptor Research 38:47-54.

Watts, B.D. and Paxton, B.J., 2007. Ospreys of the Chesapeake Bay: Population recovery, ecological requirements, and current threats. Waterbirds 30:39-49.

Watts, B. D., B. J. Paxton, R. Boettcher, and A. L. Wilke. 2019. Status and distribution of colonial waterbirds in coastal Virginia: 2018 breeding season. Center for Conservation Biology Technical Report

Series, CCBTR-19-06. College of William and Mary & Virginia Commonwealth University, Williamsburg, VA. 28 pp.

Watts, B.D., Stinson, C.H., McLean, P.K., Glass, A.K., Academia. M.H. and Byrd, M.A. 2024. Demographic response of osprey to menhaden stocks within the lower Chesapeake Bay. Frontiers in Marine Science 10:1284462.

Tables

Table 1. Estimates of osprey population reproductive rates and brood size 1970's to 2021. Source: Watts et al., 2024

Parameter	1974-75	1985	2006-07	2021	F-statistic	p-value
Nests (N)	75	68	132	68		
Clutch Size	2.7 ± 0.08	3.0 ± 0.09	3.0 ± 0.27	2.7 ± 0.09	2.2	0.084
Reproductive Rate	1.7 ± 0.10	1.4 ± 0.11	0.8 ± 0.08	0.3 ± 0.11	34.9	<0.001
Brood Size	2.0 ± 0.10	1.8 ± 0.10	1.5 ± 0.09	1.2 ± 0.17	10	<0.001
Estimated reproductive rate required for a stable population within the Chesapeake Bay is 1.15						

Table 2. Semi-monthly purse seine reduction Bay effort by year (2015-2024) compared to the ten-year average. Shaded cells indicate a how a specific period and year compared to the ten-year average. Source: NOAA CDFRs.

Temporal Distribution of Reduction Purse Seine Effort 2015-2024

	Year										2015-2024 Net Sets		
Period	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	N	$Avg_{2015-24}$	Pct
15-May	208	4	0	48	206	128	117	39	0	4	754	75.4	6.23%
31-May	288	428	29	217	412	108	229	100	2	22	1,835	183.5	15.17%
15-Jun	207	275	221	199	77	121	85	346	92	106	1,729	172.9	14.30%
30-Jun	101	130	82	138	60	60	113	96	175	92	1,047	104.7	8.66%
15-Jul	87	13	77	108	6	20	23	104	64	125	627	62.7	5.18%
31-Jul	36	7	74	9	0	72	236	132	311	268	1,145	114.5	9.47%
15-Aug	75	59	43	58	146	108	231	235	95	232	1,282	128.2	10.60%
31-Aug	72	80	73	70	225	122	166	260	210	185	1,463	146.3	12.10%
15-Sep	75	154	27	58	197	66	112	119	103	59	970	97.0	8.02%
30-Sep	77	25	0	26	200	5	92	37	97	128	687	68.7	5.68%
15-Oct	36	20	13	30	47	28	5	0	6	5	190	19.0	1.57%
31-Oct	9	56	19	5	3	43	0	0	1	3	139	13.9	1.15%
15-Nov	1	93	10	0	0	82	9	0	21	0	216	21.6	1.79%
30-Nov	0	2	0	1	0	2	0	0	0	0	5	0.5	0.04%
15-Dec	0	0	0	2	0	4	0	0	0	0	6	0.6	0.05%
Total	1,272	1,346	668	969	1,579	969	1,418	1,468	1,177	1,229	12,095	1209.5	
	Below Avg (2015-2024)												
	Significantly Below Avg												
	Significantly Above Avg												

Table 3. Purse seine reduction Bay harvest shown as cumulative percent across the season for the past five years (2020-2024). Source: NOAA CDFRs.

Purse Harvest by Date Relative to the Annual Harvest (as CumPct)								
		Year				Overall Average		
Date	2020	2021	2022	2023	2024	2020-24	2015-24	2000-24
15-May	12.34%	4.24%	2.08%	0.00%	0.02%	2.45%	4.27%	2.45%
31-May	20.32%	13.62%	5.02%	0.01%	0.38%	10.69%	18.08%	11.49%
15-Jun	28.92%	16.91%	21.77%	3.39%	5.30%	19.79%	28.09%	19.79%
30-Jun	33.15%	27.76%	30.96%	12.69%	13.40%	29.36%	40.19%	30.01%
15-Jul	35.33%	29.48%	46.23%	20.95%	22.62%	36.13%	46.09%	36.13%
31-Jul	44.73%	49.68%	55.46%	49.87%	46.25%	48.02%	56.91%	48.63%
15-Aug	55.52%	70.63%	67.08%	58.85%	65.03%	60.72%	68.08%	60.72%
31-Aug	73.02%	83.05%	84.91%	76.31%	84.82%	74.91%	81.21%	75.38%
15-Sep	80.56%	93.33%	97.00%	88.22%	92.22%	84.55%	90.54%	84.55%
30-Sep	81.02%	99.15%	100.00%	97.53%	99.69%	90.69%	95.88%	91.11%
15-Oct	83.47%	99.63%		97.69%	99.98%	94.66%	97.51%	94.66%
31-Oct	90.25%	99.69%		97.72%	100.00%	97.54%	98.88%	97.95%
15-Nov	99.33%	100.00%		100.00%		99.74%	99.91%	99.74%
30-Nov	100.00%					100.00%	100.00%	100.00%
Red Cells are at least 15% below the 5-year average								

Table 4. Menhaden purse seine fishing effort (number of net sets) in proximity to the 12 osprey nesting locations (N=571 nests) in 2024. Sources: Osprey Nesting Efficiency: Watts, 2024. Menhaden Fishing Effort: NOAA CDFRs.

				Purse Seine Sets in Proximity to Osprey Study Areas															
	Osprey Nesting Deficiency			May		Jun		Jul		Aug		Sep		Oct		Nov		Total	
Location	Color	Status	Rate	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Fleeton Bay		Major	< 0.6	59	7.88%	7	0.54%	9	0.66%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	75	1.20%
Mobjack Bay		Major	< 0.6	0	0.00%	0	0.00%	0	0.00%	21	1.14%	1	0.12%	0	0.00%	0	0.00%	22	0.35%
Eastern Shore		Moderate	0.6 - 0.8	3	0.40%	8	0.62%	3	0.22%	1	0.05%	0	0.00%	0	0.00%	0	0.00%	15	0.24%
Piankatank R		Minor	0.8 - 0.9	1	0.13%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	0.02%
Poquoson R		Major	< 0.6	0	0.00%		0.00%		0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
York R		Major	< 0.6	0	0.00%		0.00%		0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Subtotal by Area and % of Total Effort				63	8.41%	15	1.17%	12	0.89%	22	1.19%	1	0.12%	0	0.00%	0	0.00%	113	1.81%
Total Purse Seine Sets 2020-2024				749		1,286		1,355		1,844		818		91		114		6257	
Choptank R (MD)		Major	< 0.6	Purse Seines Prohibited															
Patuxent R (MD)		Major	< 0.6																
Upper Rappahannock R		Surplus	> 1.1																
Upper James R		Surplus	> 1.1																
Elizabeth R		Moderate	0.6 - 0.8																
Lynhaven R		Minor	0.8 - 0.9																

Table 5. Commercial harvest in pounds and recreational catch (A+B1+B2) in number of fish by year, species, and Bay state. Sources: ACCSP and MRP.

Commercial Harvest in Pounds by Species and State								
	BLUEFISH*		SPINY DOGFISH*		STRIPED BASS*		WEAKFISH*	
YEAR	MD	VA	MD	VA	MD	VA	MD	VA
2019	22,990	192,431	678,625	6,113,834	1,747,499	1,389,039	912	39,724
2020	21,011	164,151	396,076	6,010,225	1,589,350	924,116	1,622	41,527
2021	11,063	123,721	442,508	3,597,475	1,610,800	1,123,353	897	28,952
2022	10,285	182,901	0	4,568,864	1,601,070	1,102,622	1,048	29,521
2023	16,422	142,025	850,527	6,018,055	1,705,809	1,179,060	1,498	33,356
Avg(90-23)	102,026	451,956	1,342,668	2,294,812	1,854,123	1,218,711	93,460	573,591
Avg(04-23)	72,291	323,993	640,888	2,975,707	2,033,468	1,579,655	9,797	102,308
Avg(14-23)	37,464	170,892	876,021	4,322,315	1,768,500	1,264,451	1,189	29,659
Avg(19-23)	16,354	161,046	473,547	5,261,691	1,650,906	1,143,638	1,195	34,616
5yr vs 20yr	-77.38%	-50.29%	-26.11%	76.82%	-18.81%	-27.60%	-87.80%	-66.16%
5yr vs 10yr	-56.35%	-5.76%	-45.94%	21.73%	-6.65%	-9.55%	0.53%	16.71%

Recreational Catch (A+B1+B2) in Numbers of Fish by Species and State								
	BLUEFISH*		SPINY DOGFISH*		STRIPED BASS*		WEAKFISH*	
	MD	VA	MD	VA	MD	VA	MD	VA
2019	311,736	723,012	24,015	13,113	7,745,291	699,617	17,929	840,088
2020	445,093	434,589	59,813	27,631	7,772,516	973,698	730	303,924
2021	242,964	448,744	13,692	4,179	4,479,971	600,768	9,756	279,865
2022	453,830	1,360,375	17,128	3,175	3,931,722	377,008	9,486	334,404
2023	615,459	430,776	59,591	137,804	3,635,178	629,242	52,803	230,594
Avg(90-23)	1,209,118	875,212	29,679	39,751	6,602,198	1,760,484	456,290	946,230
Avg(04-23)	1,198,840	903,227	28,154	42,398	7,582,510	1,567,275	113,529	561,252
Avg(14-23)	518,240	687,756	25,157	22,043	7,972,787	1,037,445	67,332	476,353
Avg(19-23)	413,816	679,499	34,848	37,180	5,512,936	656,067	18,141	397,775
5yr vs 20yr	-65.48%	-24.77%	23.78%	-12.31%	-27.29%	-58.14%	-84.02%	-29.13%
5yr vs 10yr	-20.15%	-1.20%	38.52%	68.67%	-30.85%	-36.76%	-73.06%	-16.50%

Table 5. (Continued) Commercial harvest in pounds and recreational catch (A+B1+B2) in number of fish by year, species, and Bay state. Sources: ACCSP and MRP.

Commercial Harvest in Pounds by Species and State

	BLUE CATFISH		COBIA		RED DRUM		SPANISH MACKEREL		SPOTTED SEATROUT	
YEAR	MD	VA	MD	VA	MD	VA	MD	VA	MD	VA
2019	2,093,539	3,020,489	0	38,711	0	2,616	0	213,290	0	135,729
2020	1,805,310	2,475,379	0	30,728	0	8,257	7,111	81,662	0	67,794
2021	2,209,281	3,110,369	0	30,798	0	18,671	6,006	173,514	0	52,692
2022	2,637,344	3,579,156	313	38,601	0	18,056	6,658	240,453	0	75,516
2023		3,987,460	0	31,277	0	16,885	0	199,843	0	75,868
Avg(90-23)	504,448	1,104,963	186	15,134	659	7,144	7,932	140,522	2,821	35,807
Avg(04-23)	876,108	1,877,376	56	19,353	565	7,824	4,191	79,214	182	47,963
Avg(14-23)	1,722,301	2,978,777	31	31,530	130	8,991	4,379	101,439	0	60,165
Avg(19-23)	2,186,369	3,234,571	63	34,023	0	12,897	3,955	181,752	0	81,520
5yr vs 20yr	149.55%	72.29%	11.99%	75.81%	-100.00%	64.83%	-5.62%	129.44%	-100.00%	69.96%
5yr vs 10yr	26.94%	8.59%	100.00%	7.91%	-100.00%	43.44%	-9.67%	79.17%		35.49%

Recreational Catch (A+B1+B2) in Numbers of Fish by Species and State

	BLUE CATFISH		COBIA		RED DRUM		SPANISH MACKEREL		SPOTTED SEATROUT	
YEAR	MD	VA	MD	VA	MD	VA	MD	VA	MD	VA
2019	743,596	2,339,025	251	226,324	6,998	606,226	168,596	414,441	371,100	3,114,208
2020	866,136	3,957,508	8,962	184,039	259,318	765,369	212,144	210,155	246,192	3,301,962
2021	632,878	1,113,286	16,775	235,244	20,005	1,505,470	237,737	452,598	101,964	3,399,938
2022	697,576	946,615	0	115,074	15,382	930,447	72,140	240,866	105,980	2,538,250
2023	1,292,298	1,725,268	0	214,053	102,338	1,268,608	74,183	565,362	68,570	3,960,041
Avg(90-23)	190,086	723,473	1,213	64,271	59,213	532,454	35,287	125,479	99,016	1,375,702
Avg(04-23)	306,803	1,123,705	1,951	95,689	94,200	713,407	52,360	146,656	123,013	2,079,124
Avg(14-23)	591,053	1,755,239	3,903	158,367	47,728	823,441	86,575	229,508	157,311	2,894,368
Avg(19-23)	846,497	2,016,340	5,198	194,947	80,808	1,015,224	152,960	376,684	178,761	3,262,880
5yr vs 20yr	175.91%	79.44%	166.35%	103.73%	-14.22%	42.31%	192.13%	156.85%	45.32%	56.94%
5yr vs 10yr	43.22%	14.88%	33.18%	23.10%	69.31%	23.29%	76.68%	64.13%	13.64%	12.73%

Table 6. Diet studies of Chesapeake Bay piscivorous fishes with reference to the relevance of menhaden to the diet.

Species	Menhaden ERP	Age or Size	Menhaden % of Diet		Years	Source/Location	Reference
			Weight	Number			
Striped Bass	Yes		15.9%	11.7%	2002-2020	ChesMMAP / Bay	Bonzek et al. 2021
Bluefish	Yes		5.1%	4.7%	2002-2020	ChesMMAP / Bay	Bonzek et al. 2021
Weakfish	Yes		< 1.0%	< 1.0%	2002-2022	ChesMMAP / Bay	Bonzek et al. 2021
Spiny Dogfish	Yes		7.8%	5.1%	2002-2022	NEAMAP / Ocean	Bonzek et al. 2007
Cobia	No		1.5%	0.1%	Jun-Jul 1997	Chesapeake Bay	Arendt et al. 2001
Blue Catfish	No		5.2%		2013-2016	James R.	Hilling et al. 2023
	No		0.4%		2013-2016	James R.	Schmidt et al. 2019
	No		3.5%			Pamunkey R	Schmidt et al. 2019
	No		5.0%			Mattaponi R	Schmidt et al. 2019
	No		1.1%			Rappahannock R	Schmidt et al. 2019
Red Drum	No	100-400mm	27.4%		2007-2009	New River, NC	Facendola and Scharf, 2012
		400-700mm	15.4%				
		> 750mm	11.9%		2007-2010, 2011-2012	NC DMF Longline Survey	Peacock, 2014
Spotted Seatrout	No	< 300mm		9.4%	1978-1983	Coastal Georgia	Music and Pafford, 1984
		301-500mm		15.6%			
		> 500mm		31.5%			
		Combined		20.1%			
Spanish mackerel	No	All Clupeids	22.6%*	5.3%	1978-1979	Cape Canaveral, FL	Naughton and Saloman, 1981
		Age0-1	40.0%		1980-2016	Gulf of Mexico	Berenshtein et al. 2021
		Age1+	20.0%				
*: Includes all Clupeids							

Figures

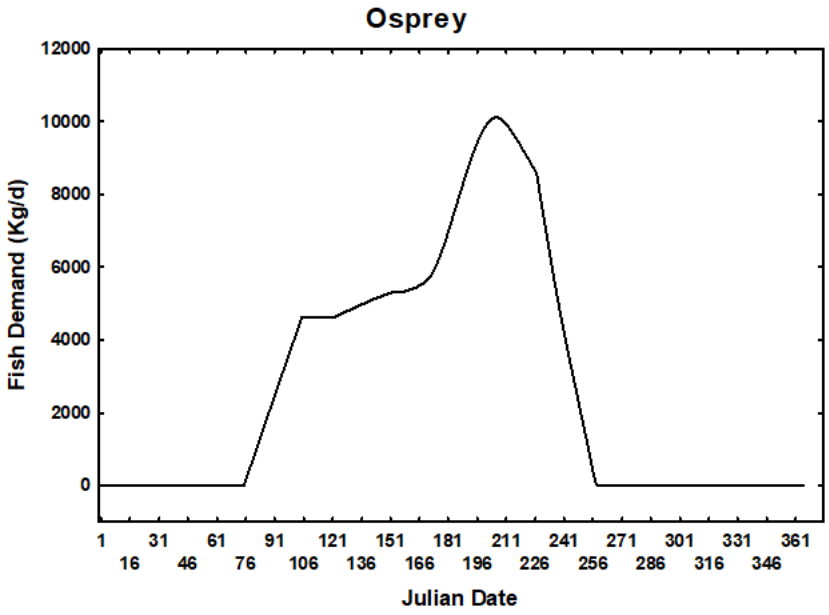


Figure 1. Seasonality of population-level metabolic demand for osprey in Chesapeake Bay. The period of highest energy demand is mid-May through mid-August. (B. Watts, unpublished data).

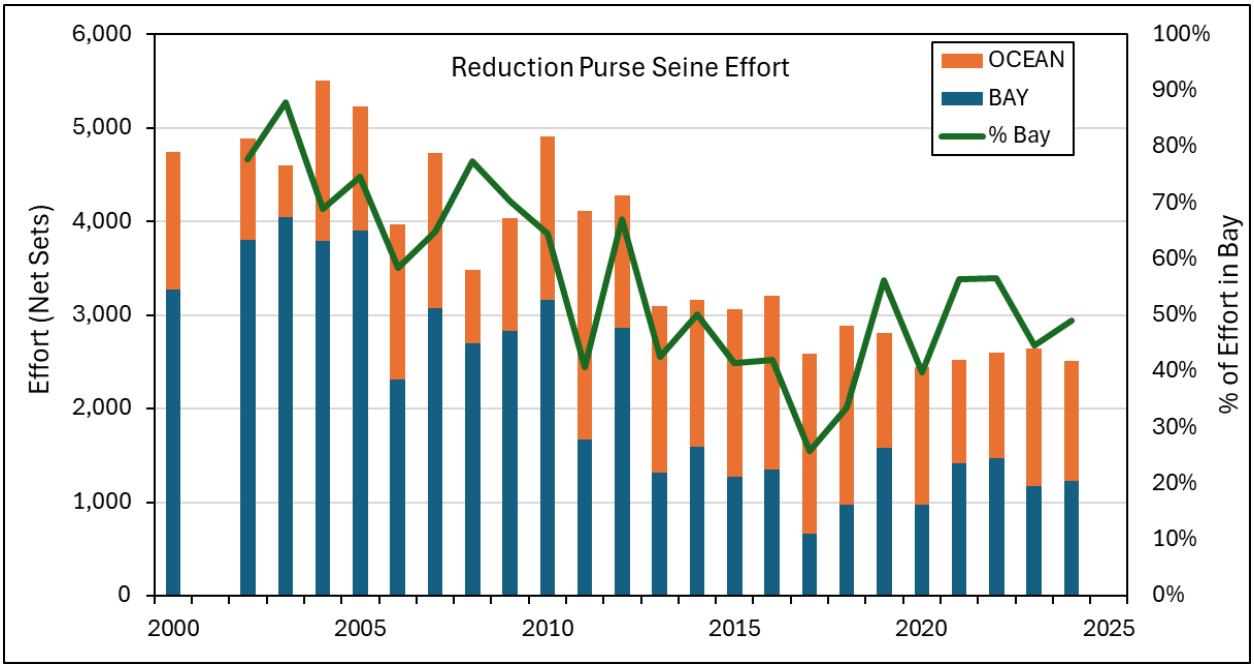


Figure 2. Virginia purse seine reduction effort separated into Bay and Ocean net sets.

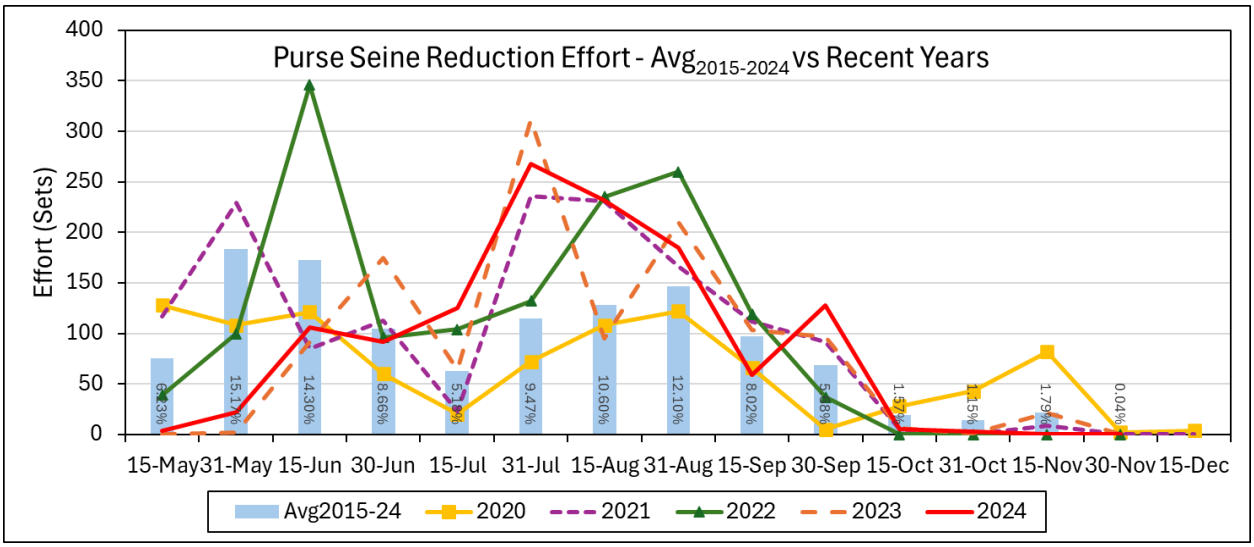


Figure 3. Semi-monthly purse seine reduction ten-year average(2015-2024) compared to the last 5 years (2020-2024). Percentages on the bar the percent of effort for that semi-monthly time period compared to the entire season.

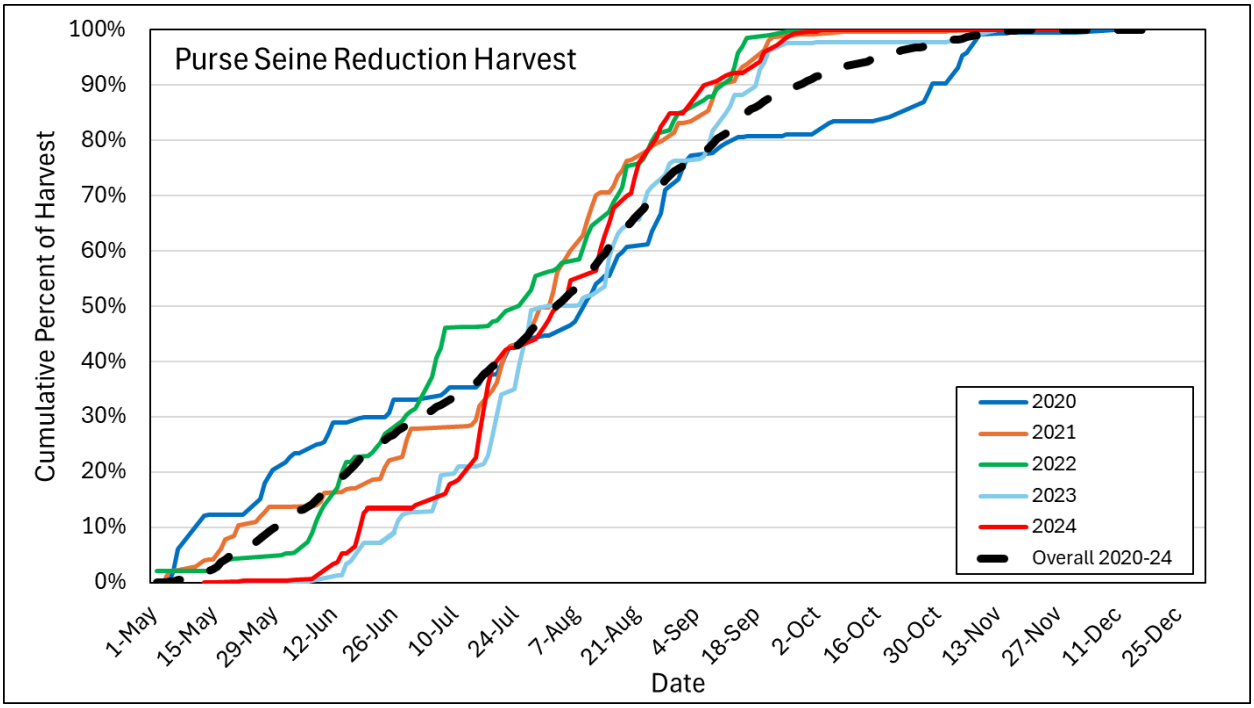


Figure 4. Cumulative percent of purse seine reduction harvest over the season for the most recent 5 years compared to the 5-year average.

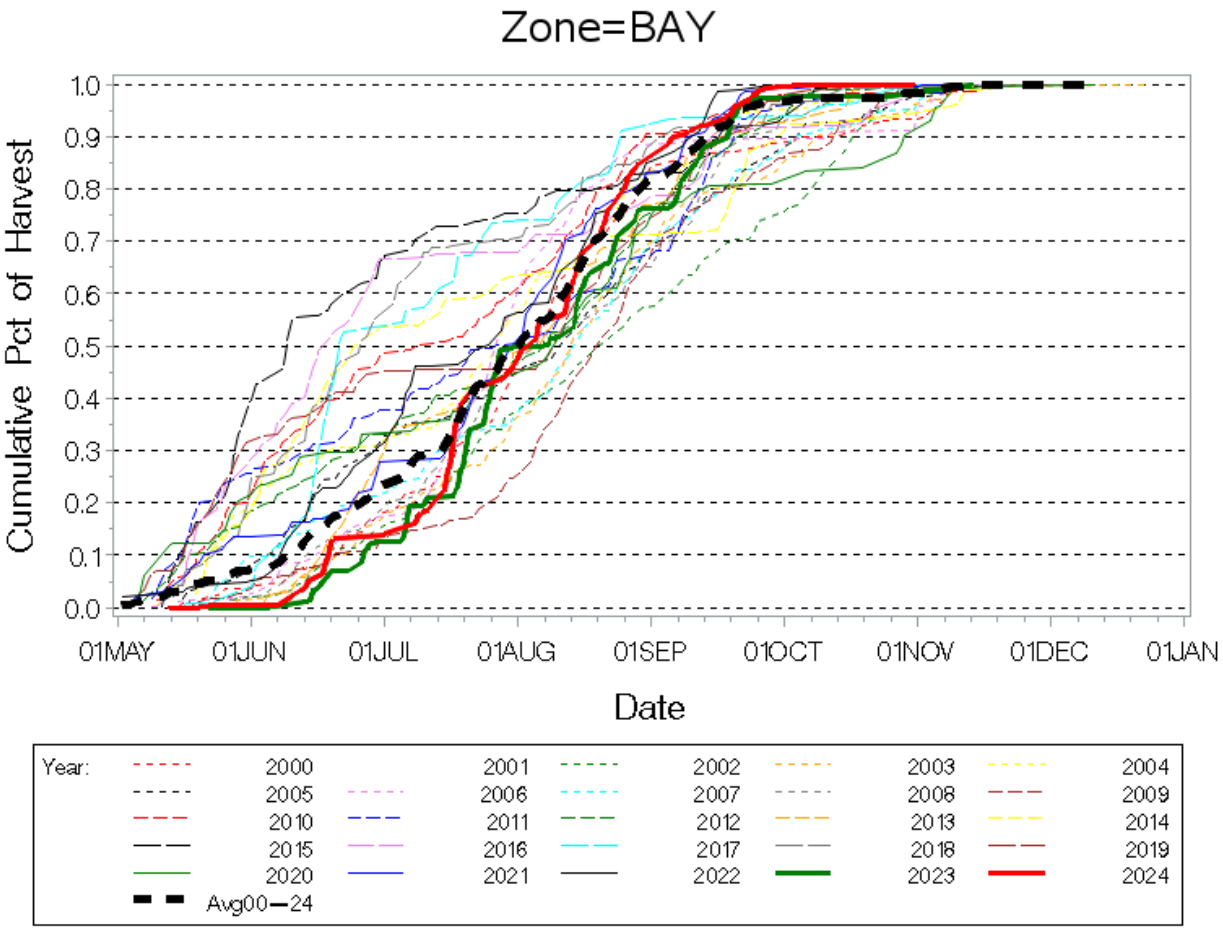
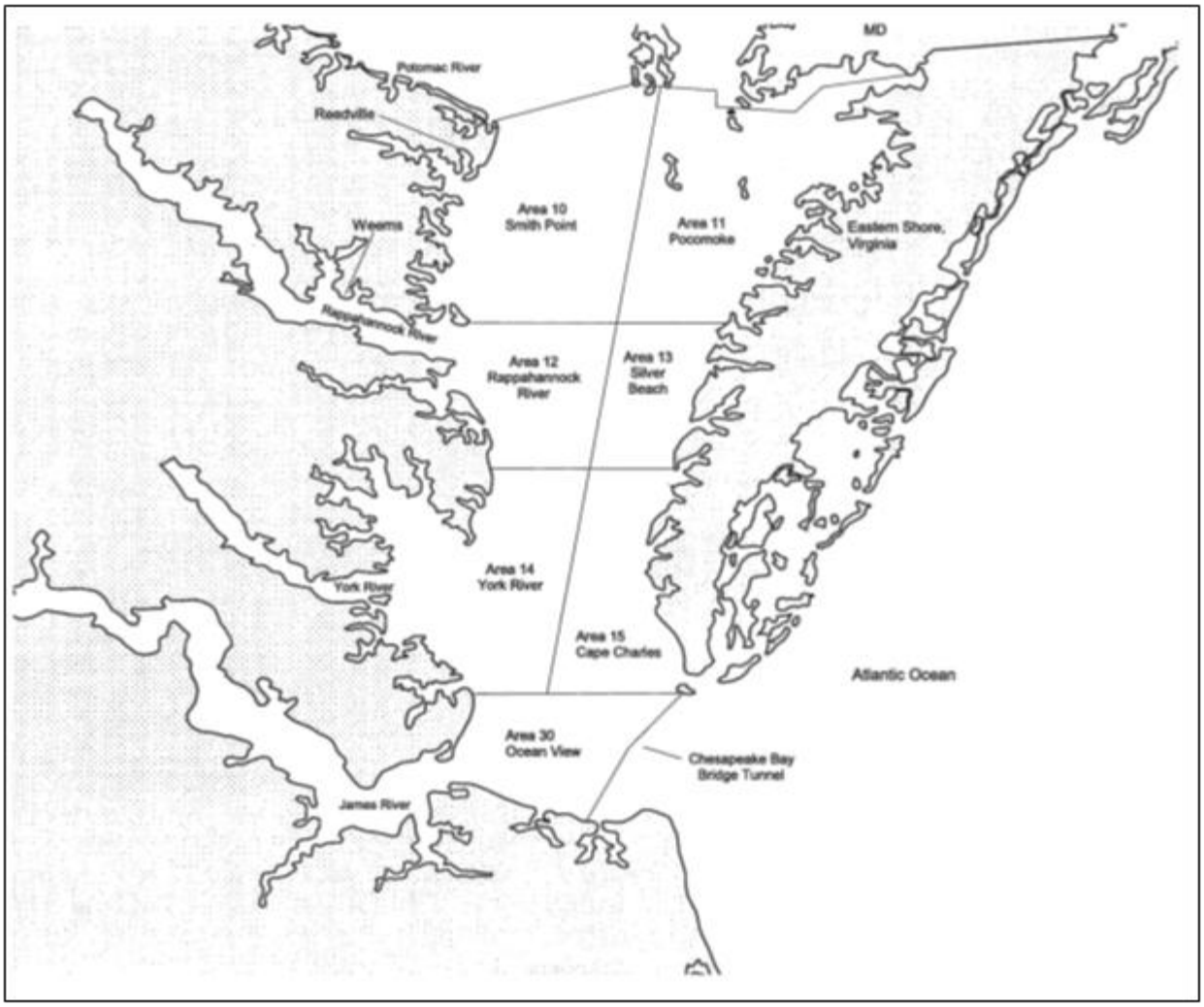


Figure 5. Cumulative percent of purse seine reduction harvest over the season for the most the past 25 years (2000 – 2024). Black dashed line is the 25-year average.



CDFR Program Virginia Reporting Areas

Chesapeake Bay					
	West		→	East	
North	Area	Name		Area	Name
↓	10	Smith Point		11	Pocomoke
	12	Rappahannock River		13	Silver Beach
	14	York River		15	Cape Charles
South	30			Ocean View	
Ocean					
↓	16			NMFS Water Code 625	
	17			NMFS Water Code 631	

Figure 6. NMFS menhaden reporting areas for the Bay and coastal water of Virginia. From: Smith, J.W. and W.B. O'Bier. 2010.

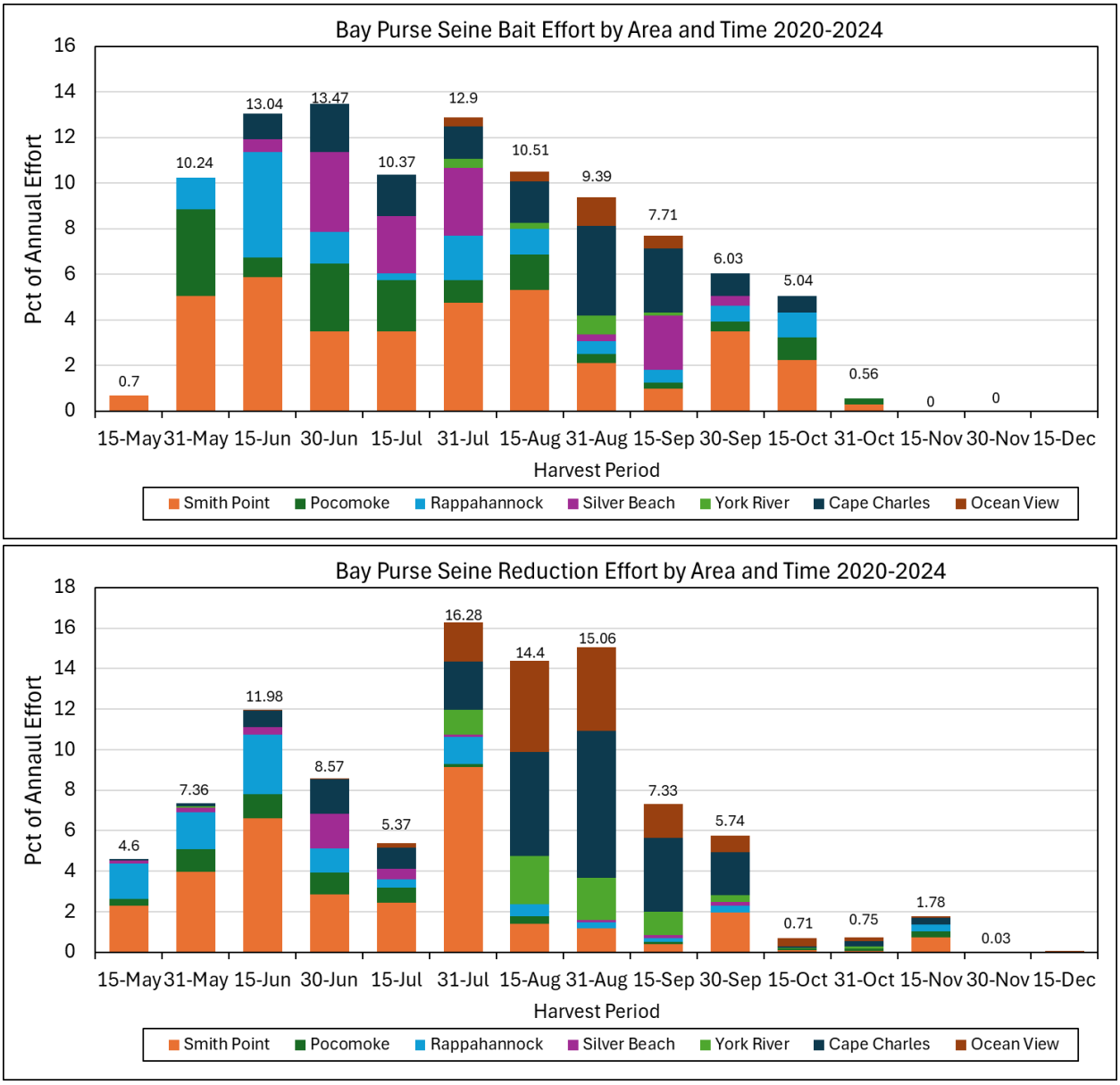


Figure 7. Menhaden purse seine reduction (top) and bait (bottom) effort by NMFS Chesapeake Bay reporting area and semi-monthly periods 2020 – 2024. Numbers above each bar present the percent of effort for that time period relative to the total effort.

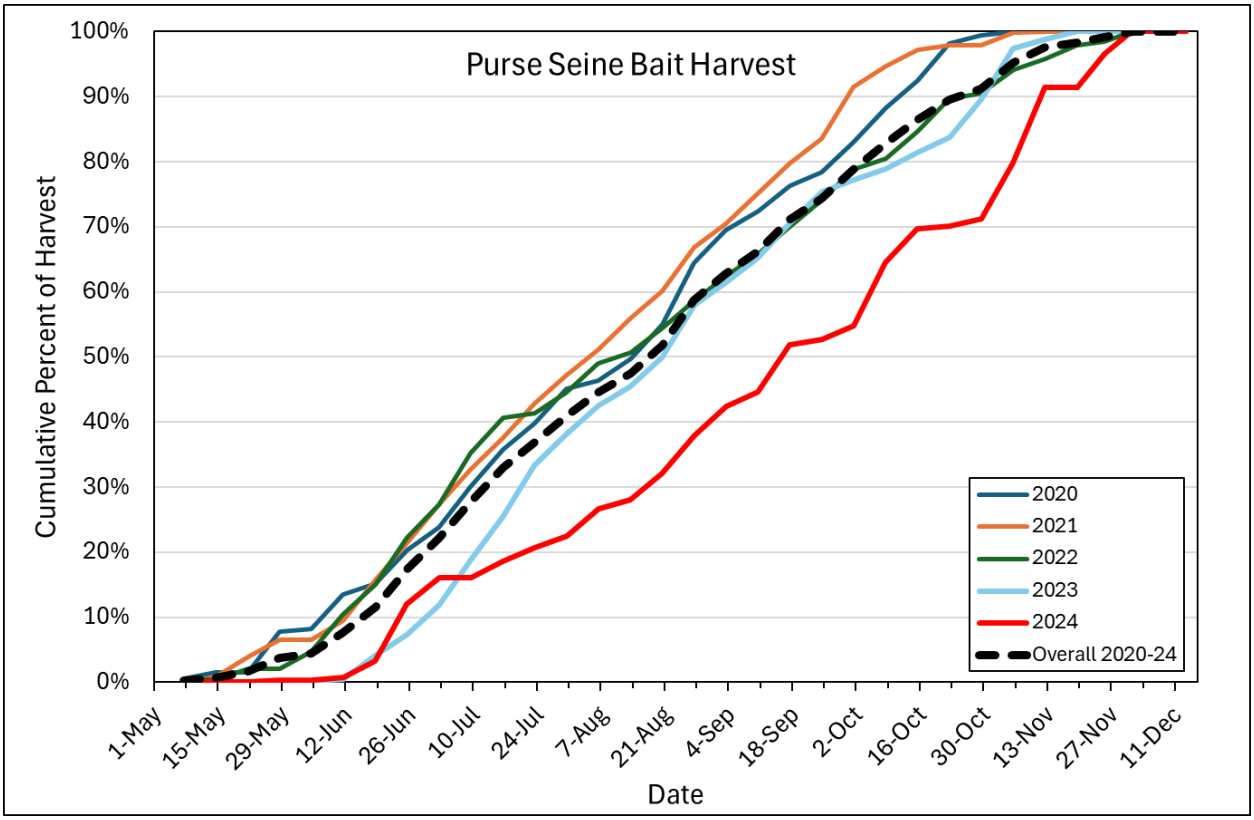


Figure 8. Cumulative purse seine bait weekly harvest reports compared to the 5-year average (2020-2024).

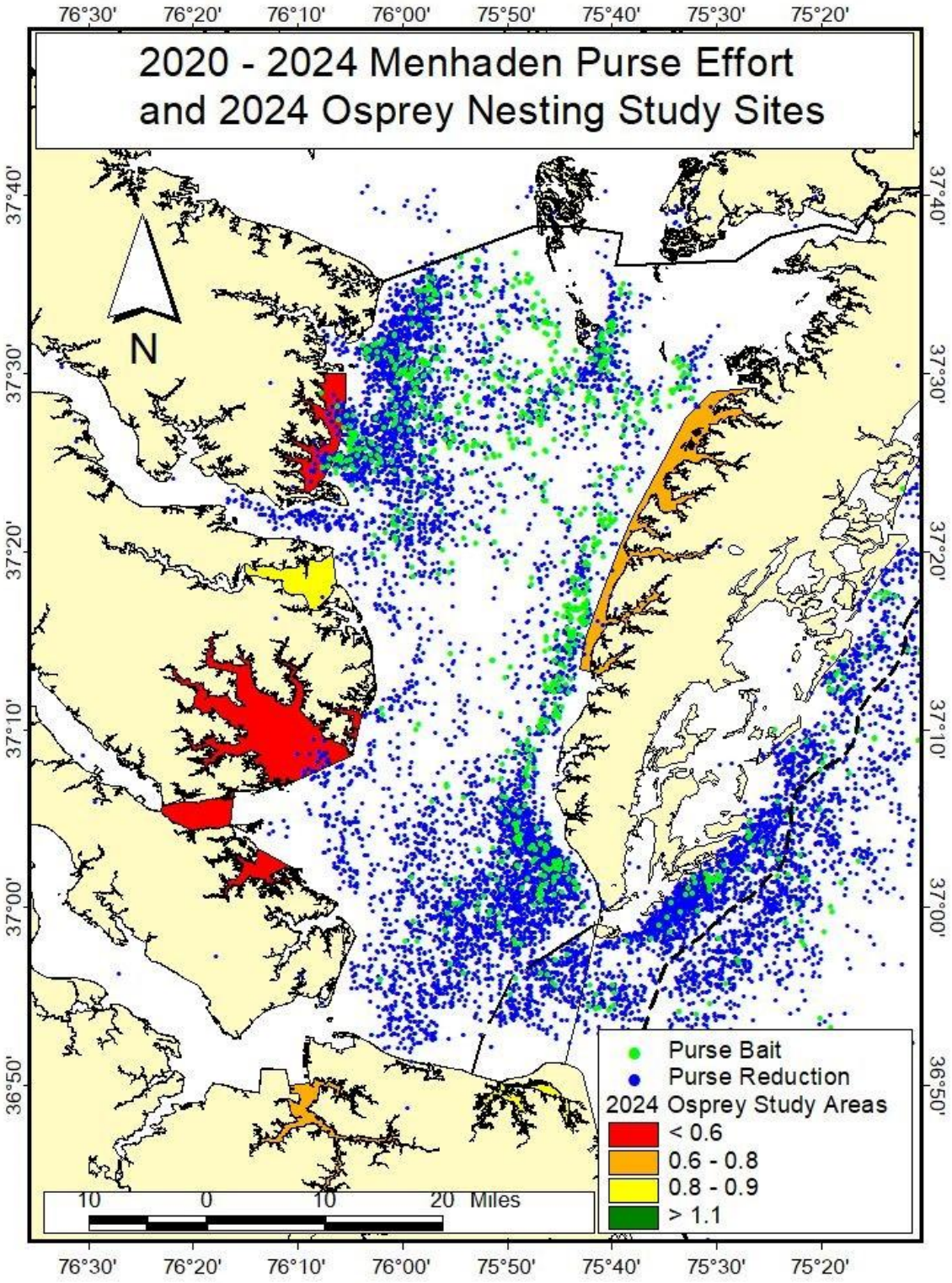


Figure 9. Menhaden purse seine fishing effort (2020-2024) relative to the Watts 2024 osprey reproductive success and nesting study areas.

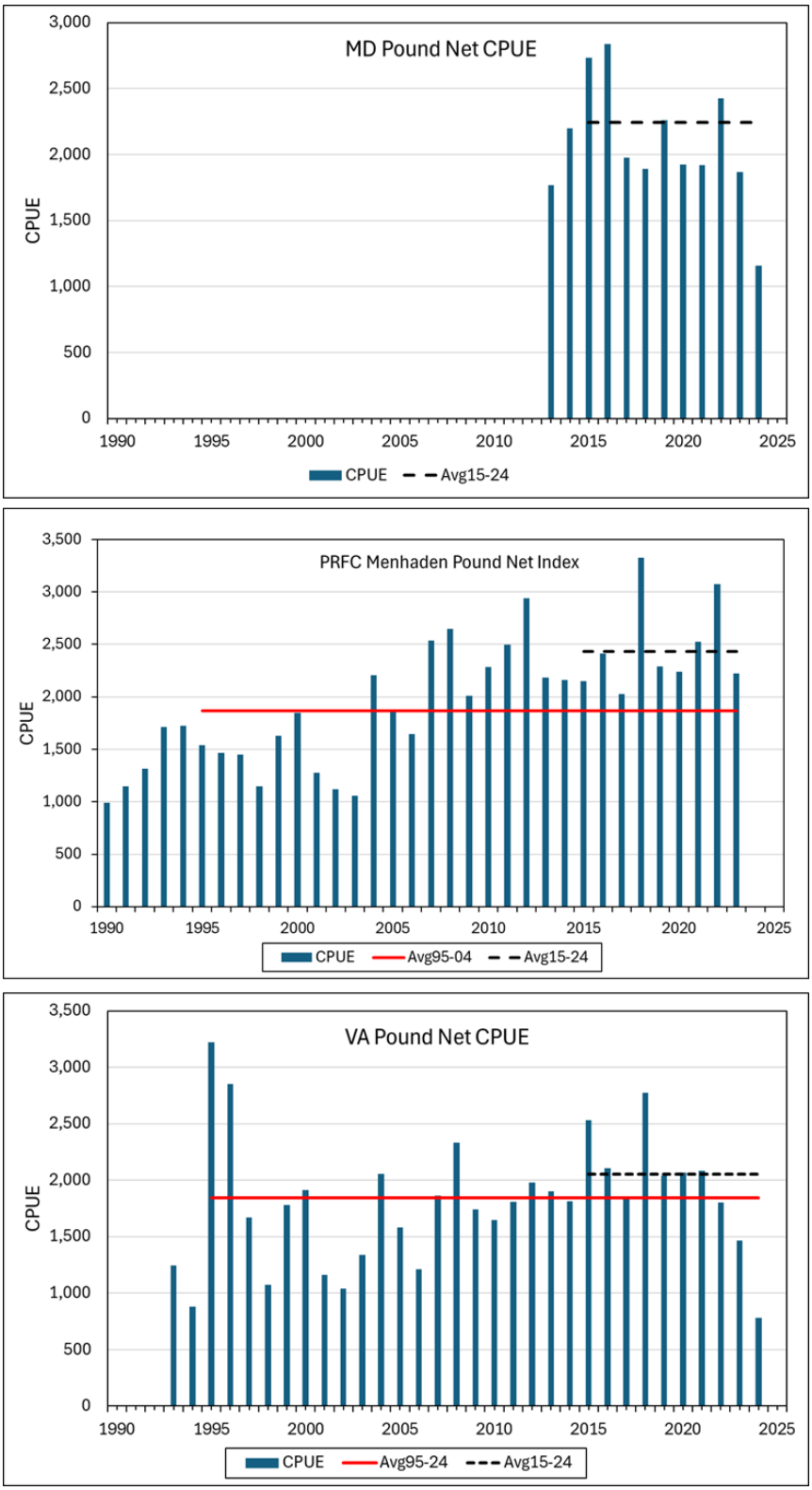


Figure 10. Annual menhaden Pound Net CPUE from Maryland, Potomac River, and Virginia. CPUE is in lbs per net day. Sources: MD DNR, PRFC, and VMRC.

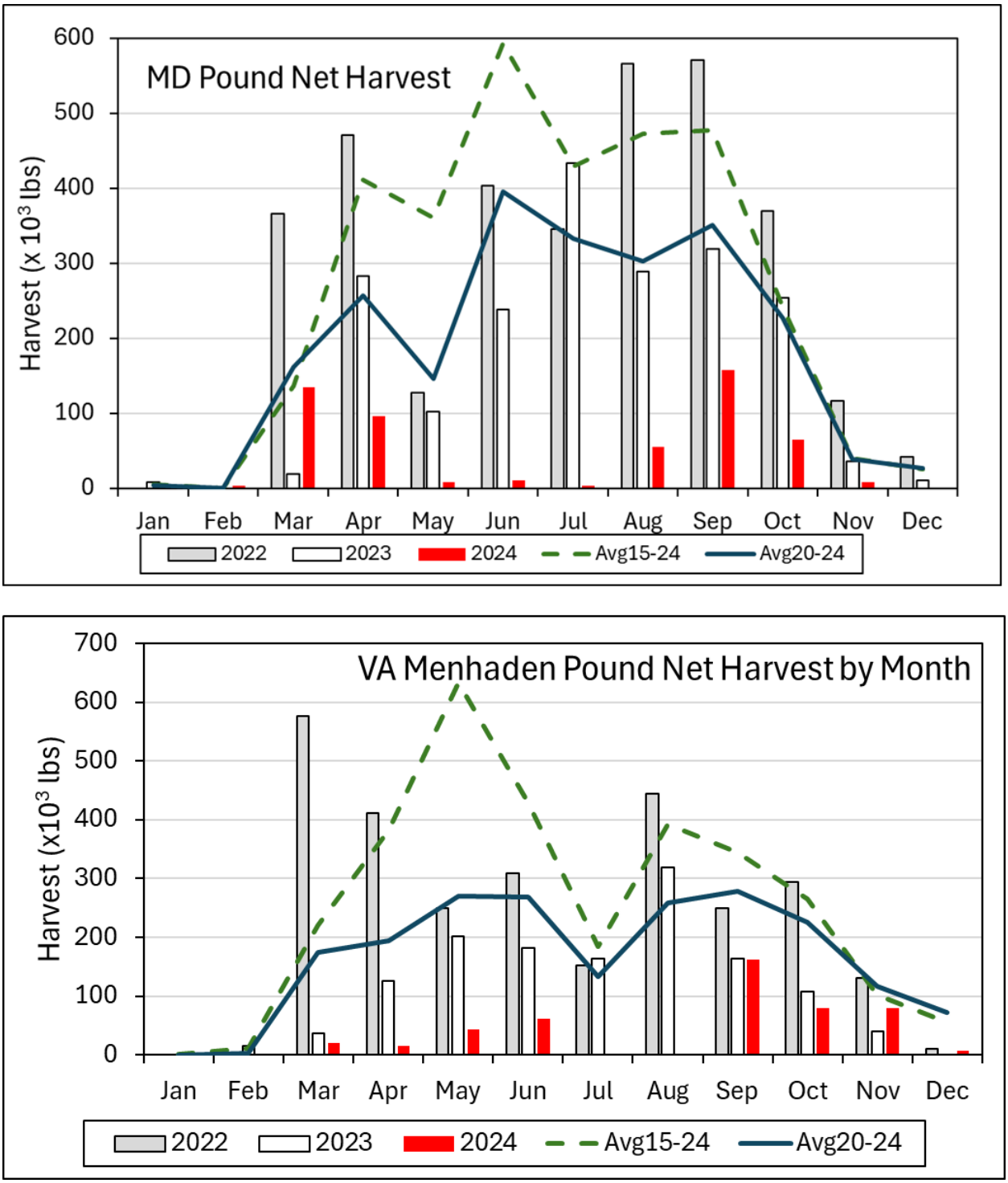


Figure 11. Menhaden monthly pound net harvest for Maryland (top) and Virginia (bottom) for the last three years relative the 10 and 5-year averages.

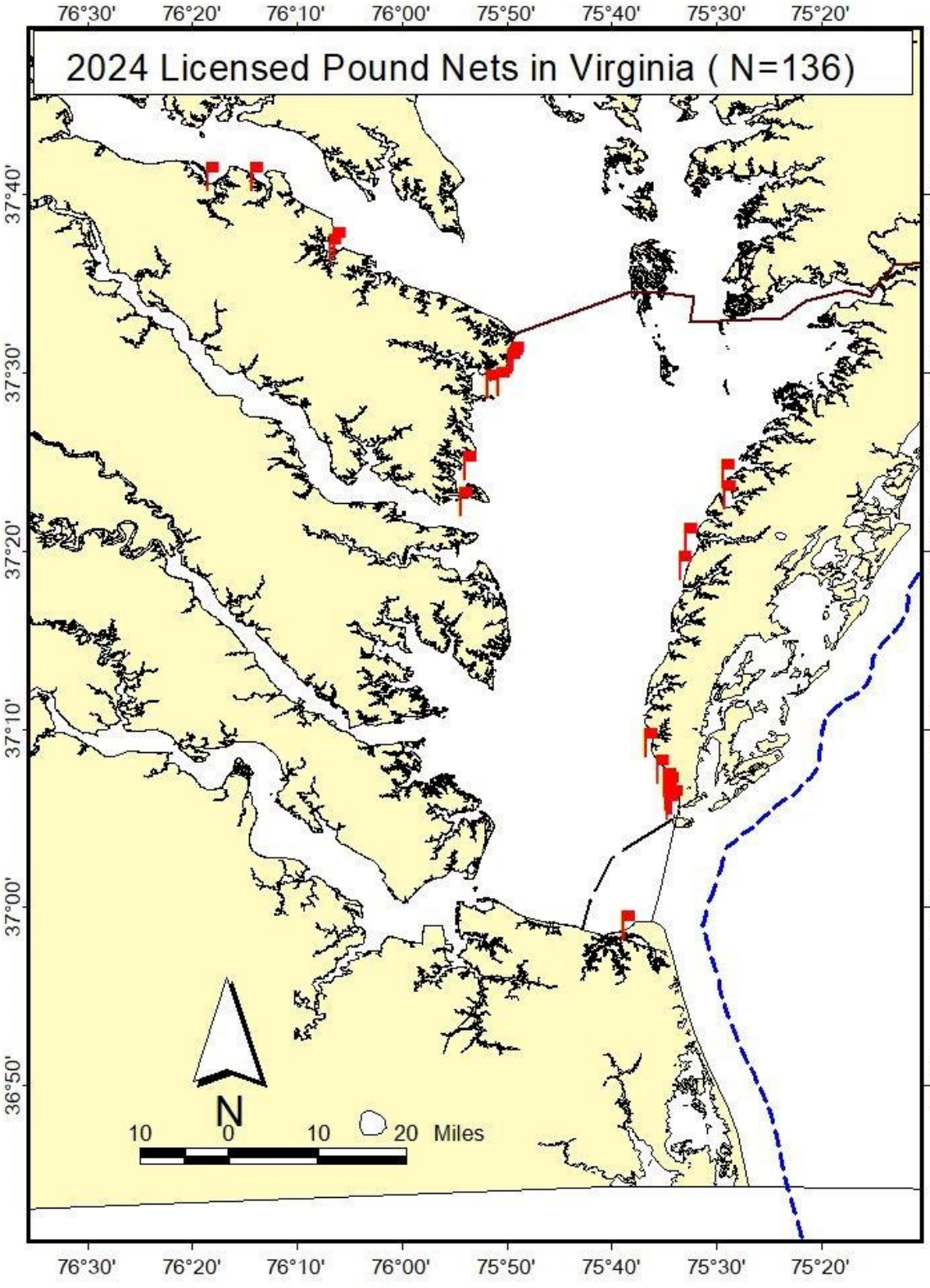
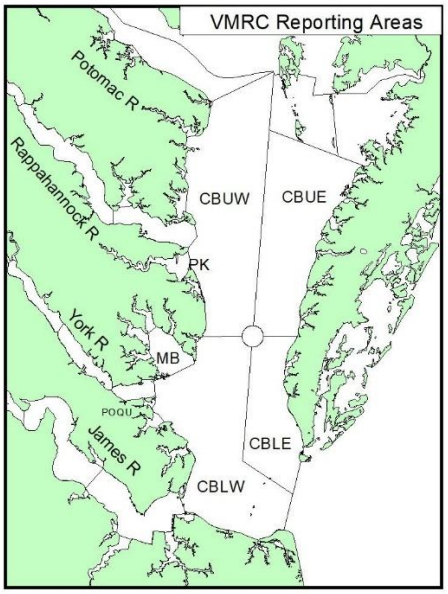


Figure 12. Location of 2024 licensed pound nets in Virginia.



VMRC Harvest Areas

Area	Description
CBLE	Ches Bay Lower East
CBLW	Ches Bay Lower West
CBUE	Ches Bay Upper East
CBUW	Ches Bay Upper West
JA	James River
POQR	Poquoson River
YK	York River
MB	Mobjack Bay
PK	Piankatank River
RA	Rappahannock River
PO	Potomac River

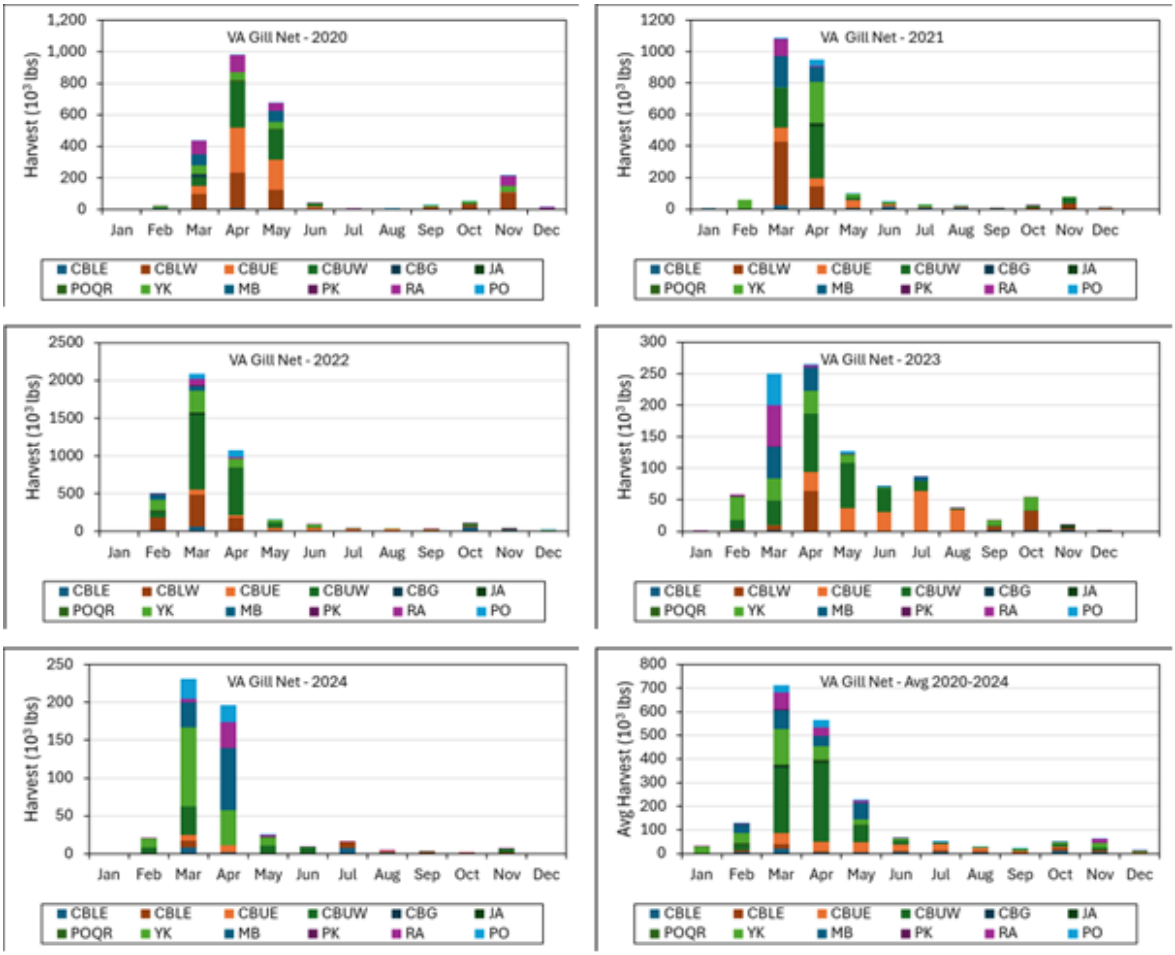
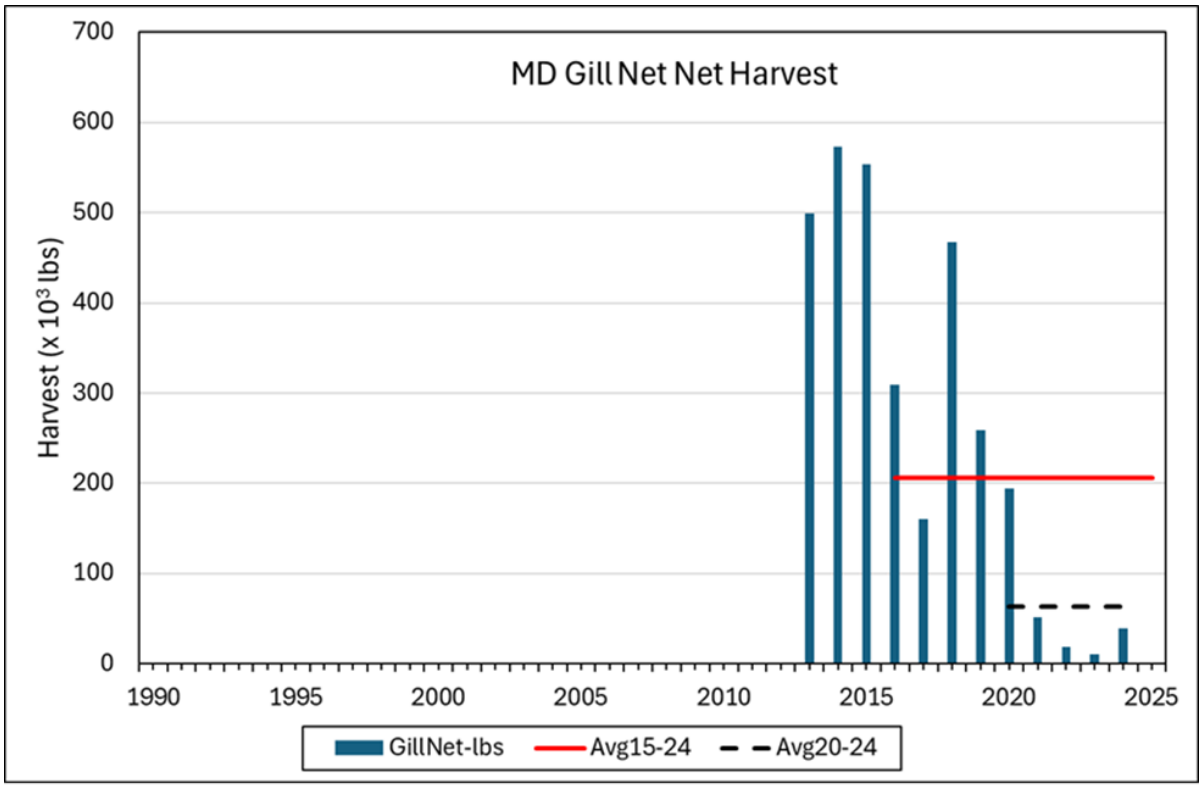


Figure 13. Virginia monthly pound net harvest by VMRC reporting area 2020-2024 Smaller water bodies were collapsed to reduce the number of reporting areas (see map).



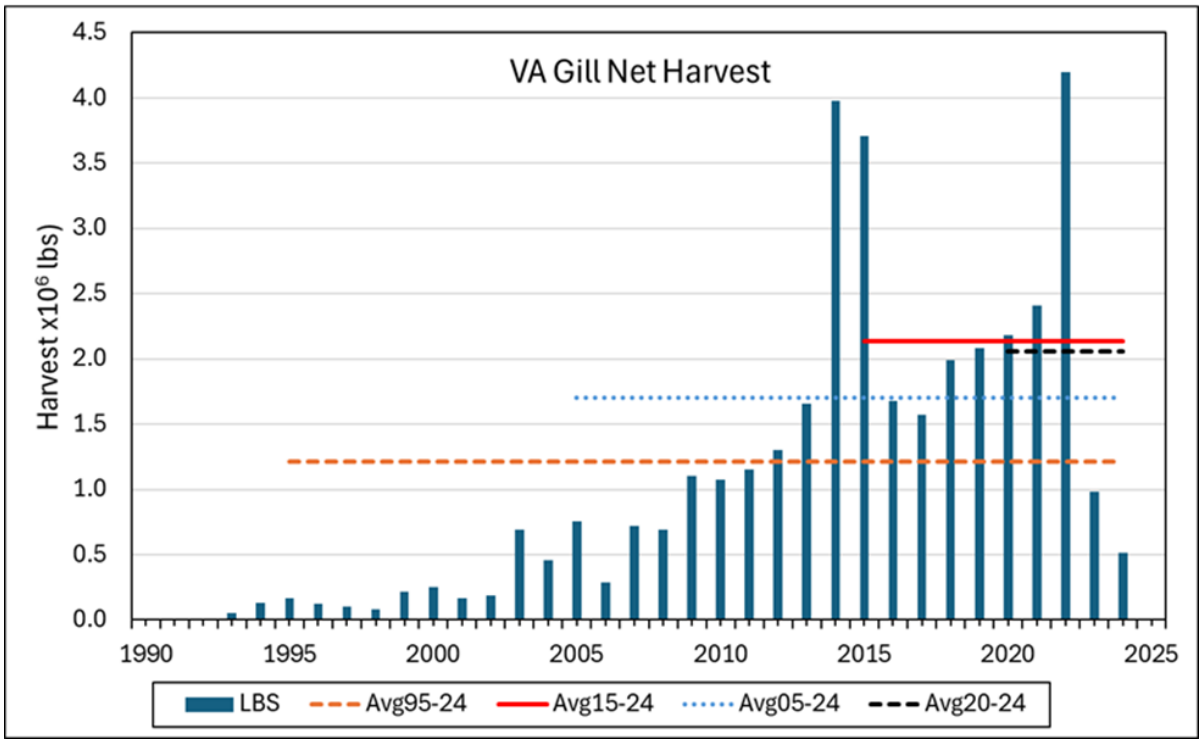


Figure 14. Menhaden gill net harvest for Maryland (top) and Virginia (bottom). Note that the scales on the y-axis are different: MD in thousands and VA in millions. Potomac River gill net data is not yet available. Sources: MD DNR and VMRC

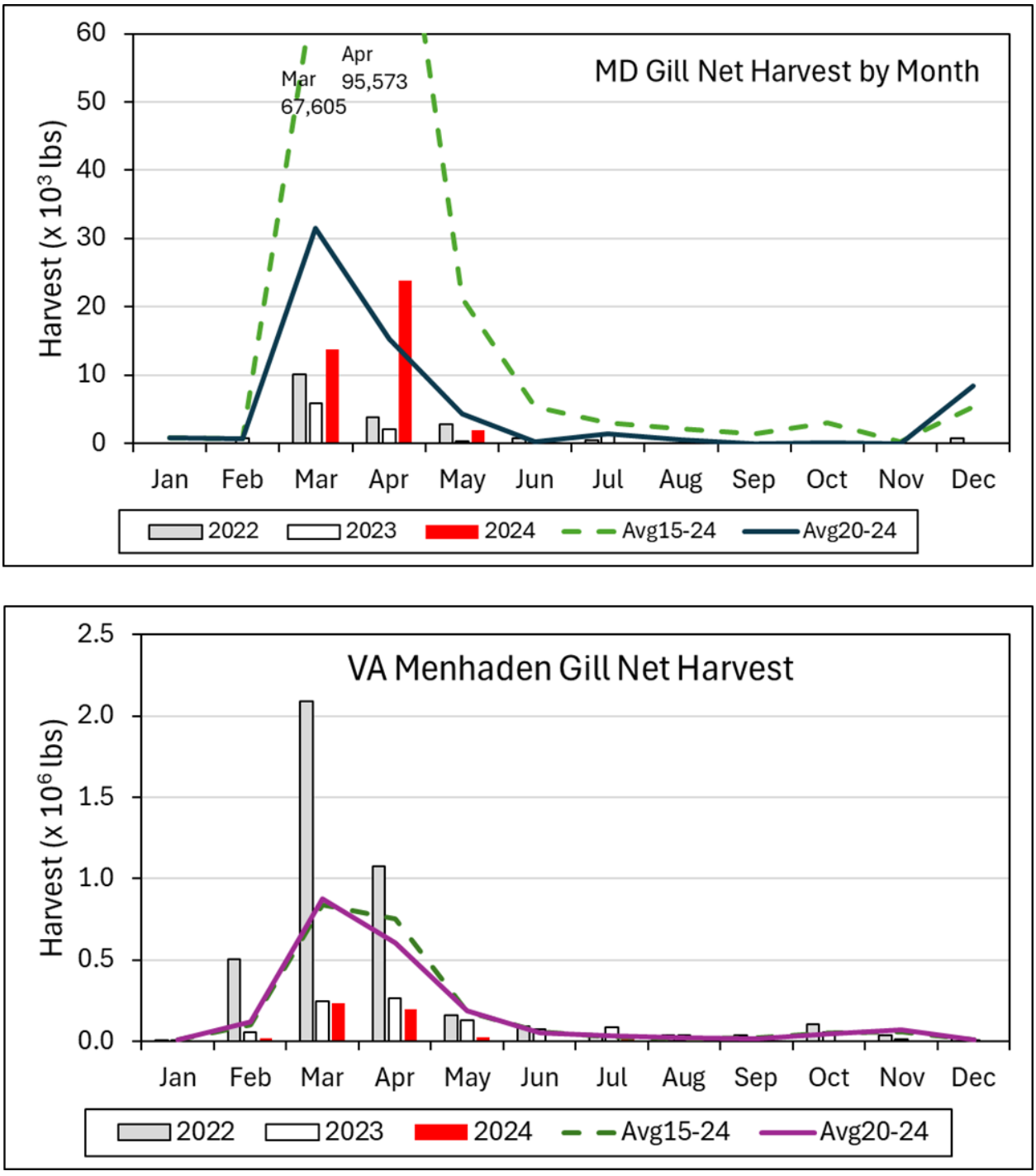
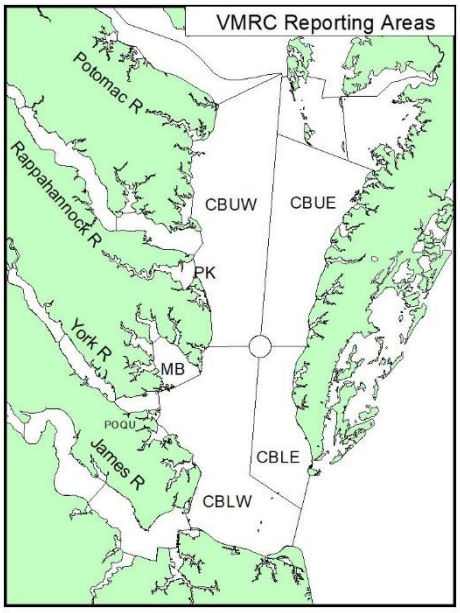


Figure 15. Menhaden monthly gill net harvest for Maryland (top) and Virginia (bottom) for the last three years relative the 10 and 5-year averages.



VMRC Harvest Areas

Area	Description
CBLE	Ches Bay Lower East
CBLW	Ches Bay Lower West
CBUE	Ches Bay Upper East
CBUW	Ches Bay Upper West
JA	James River
POQR	Poquoson River
YK	York River
MB	Mobjack Bay
PK	Piankatank River
RA	Rappahannock River
PO	Potomac River

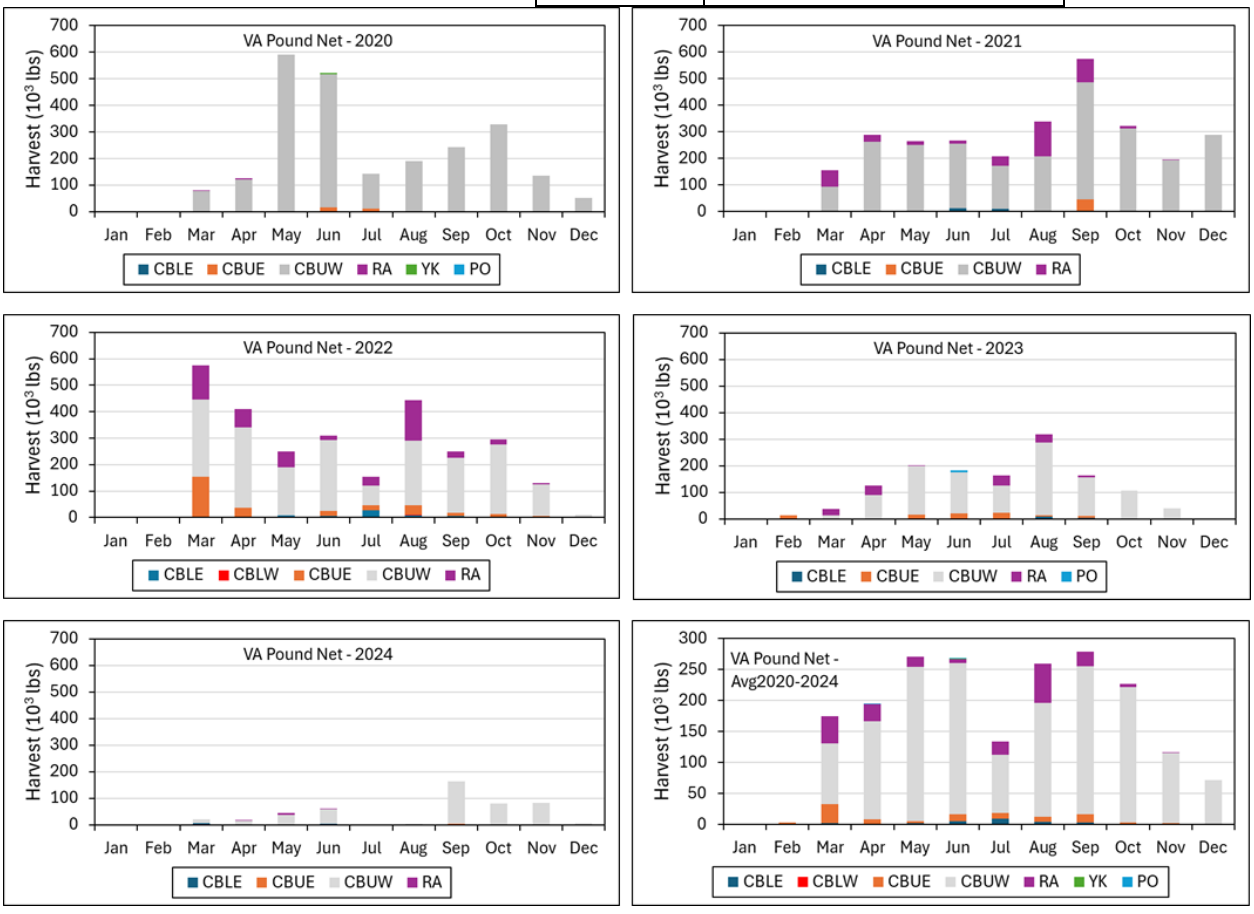


Figure 16. Virginia monthly pound net harvest by VMRC reporting area 2020-2024 Smaller water bodies were collapsed to reduce the number of reporting areas (see map).

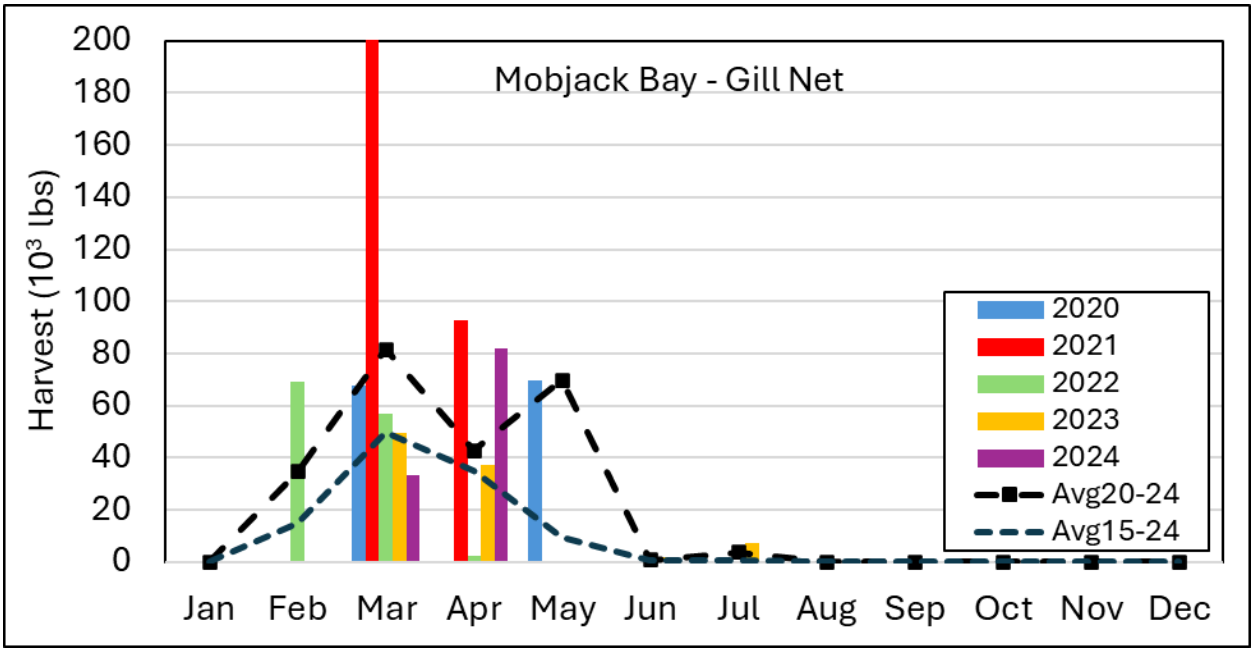


Figure 17. Mobjack Bay gill net menhaden harvest by year and month relative to the 5-year average (2020-2024) and ten-year average (2015-2024).

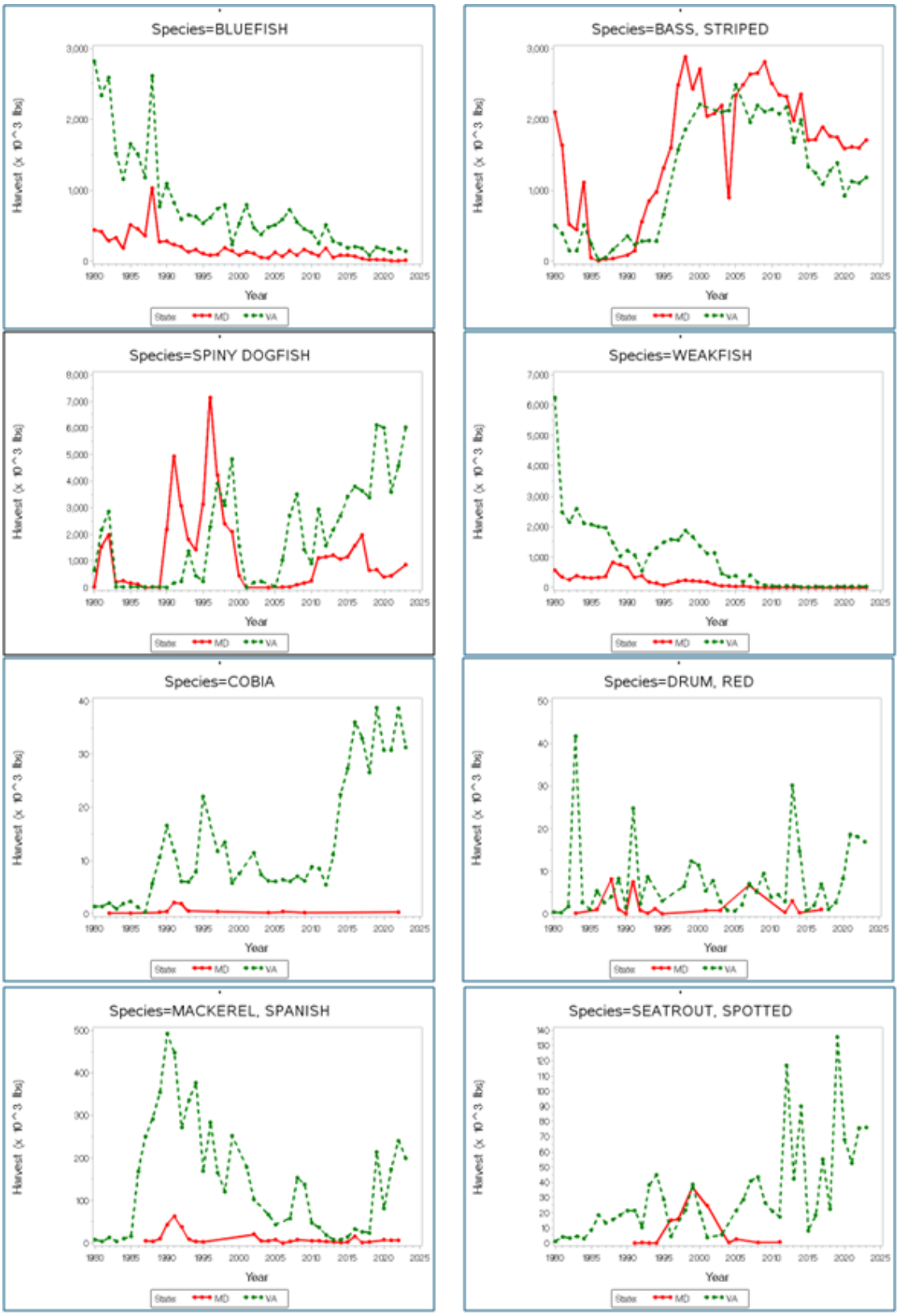


Figure 18. Commercial Harvest for Key Bay Predators. Source: ACCSP

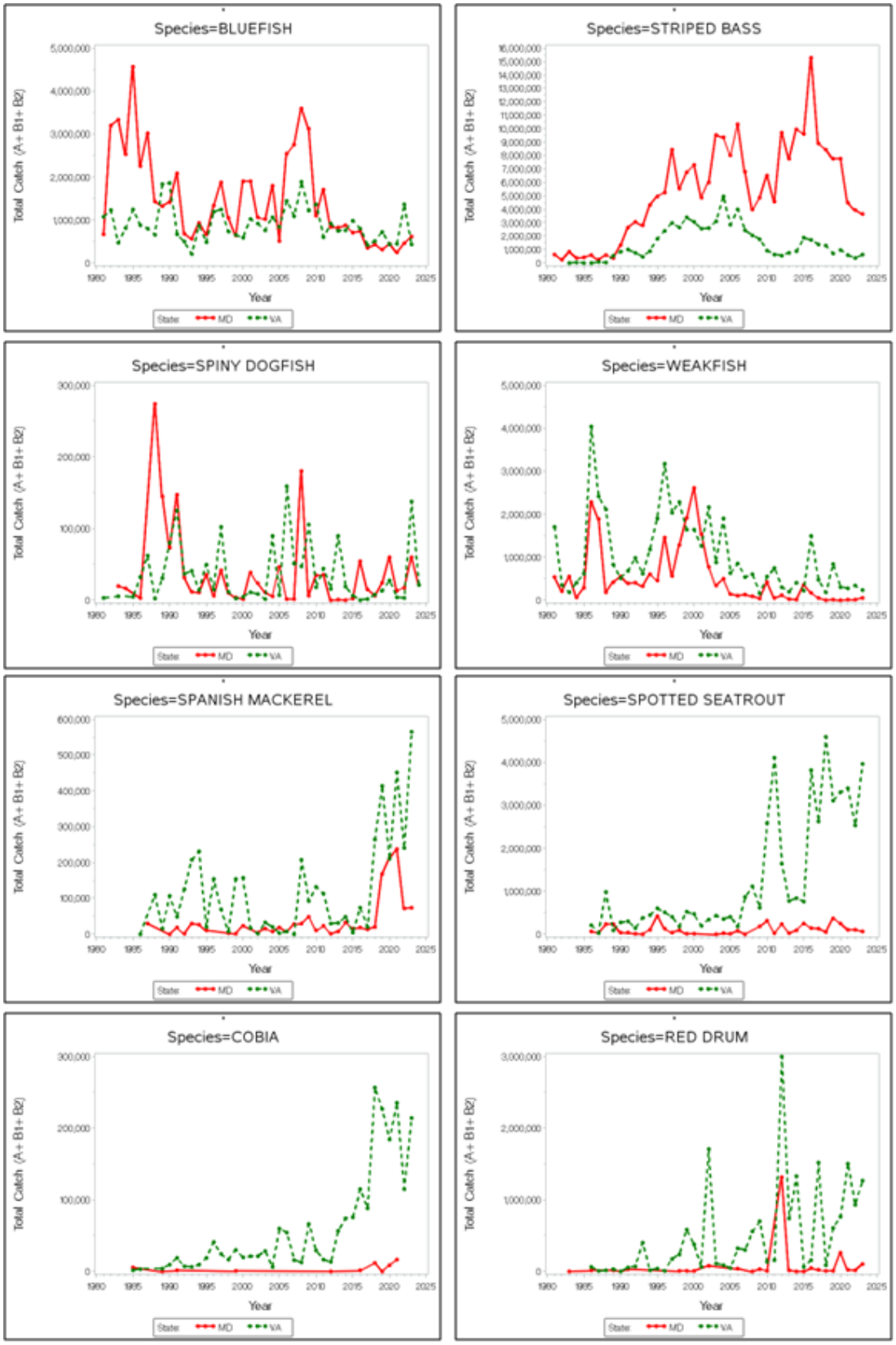


Figure 19. Recreational Catch of Key Bay Predators. Source: MRIP

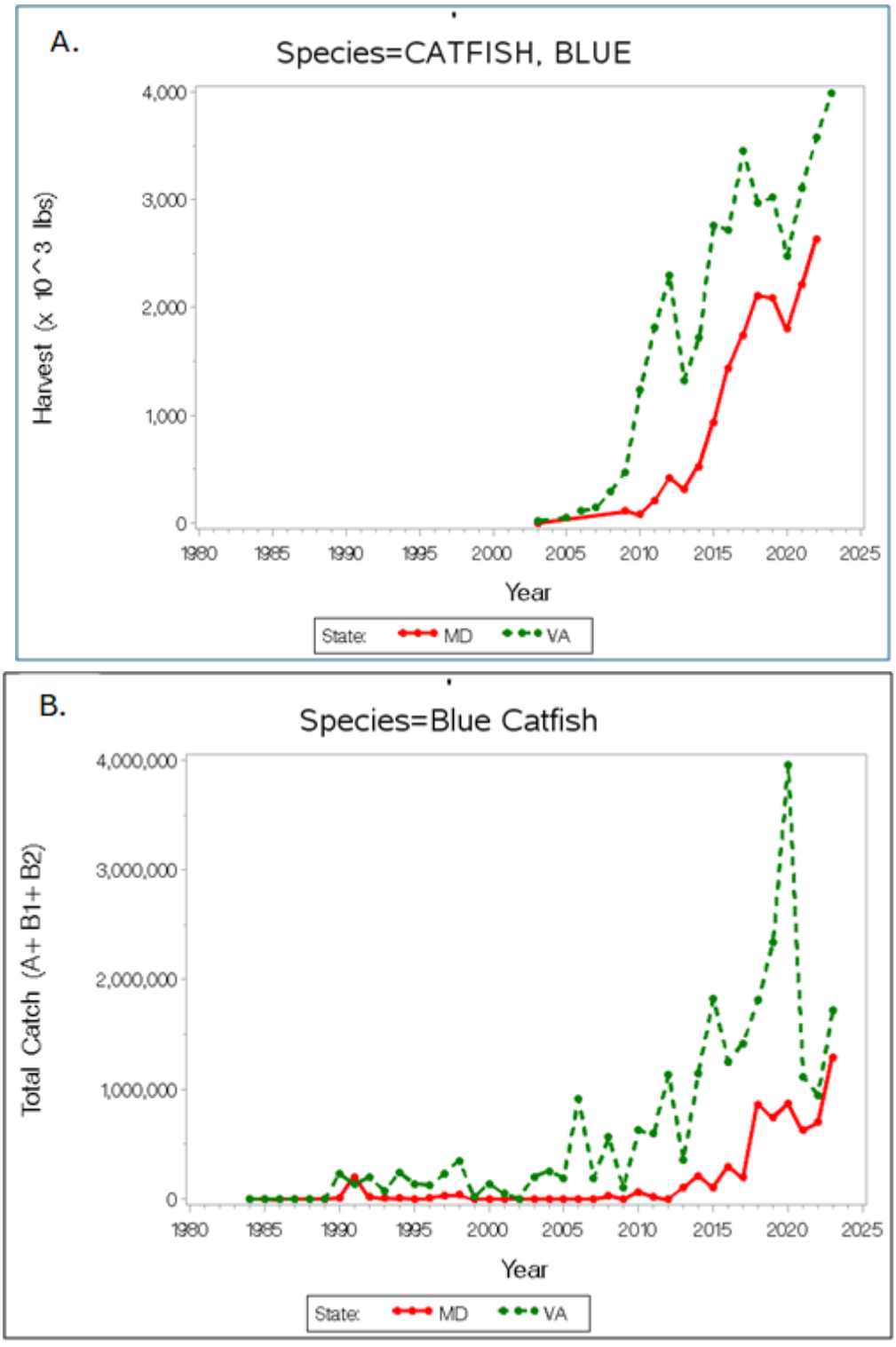
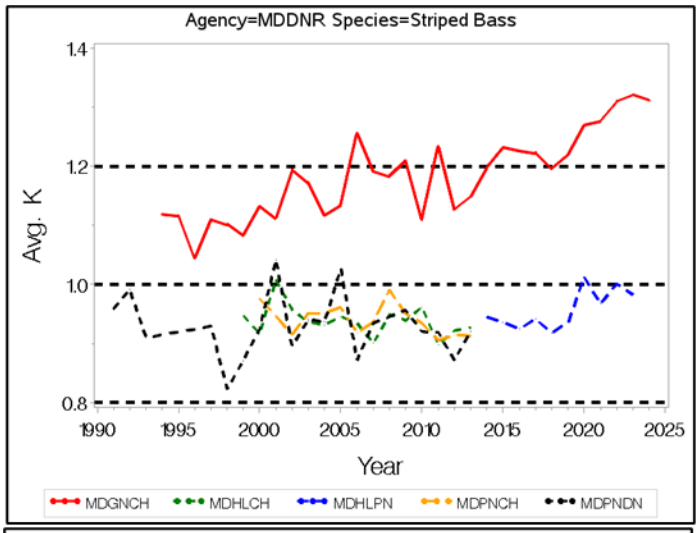
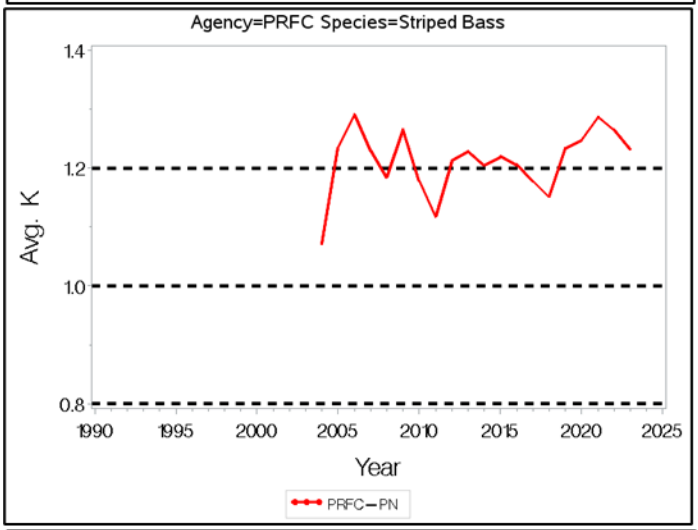


Figure 20. Blue Catfish Commercial (A) harvest and recreational catch (B) for Maryland and Virginia. Sources: ACCSP and MRIP





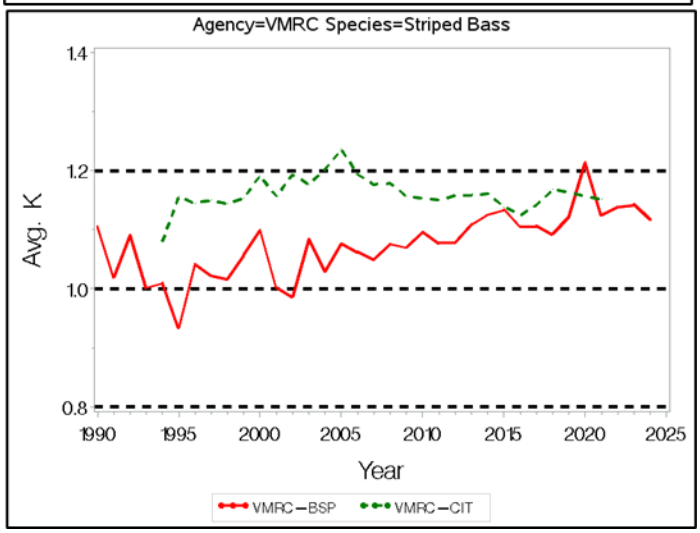


Figure 21. Striped Bass annual Fulton's Condition Factor by agency and project: 1 = normal, > 1.2 = very healthy, < 0.8 = stressed.

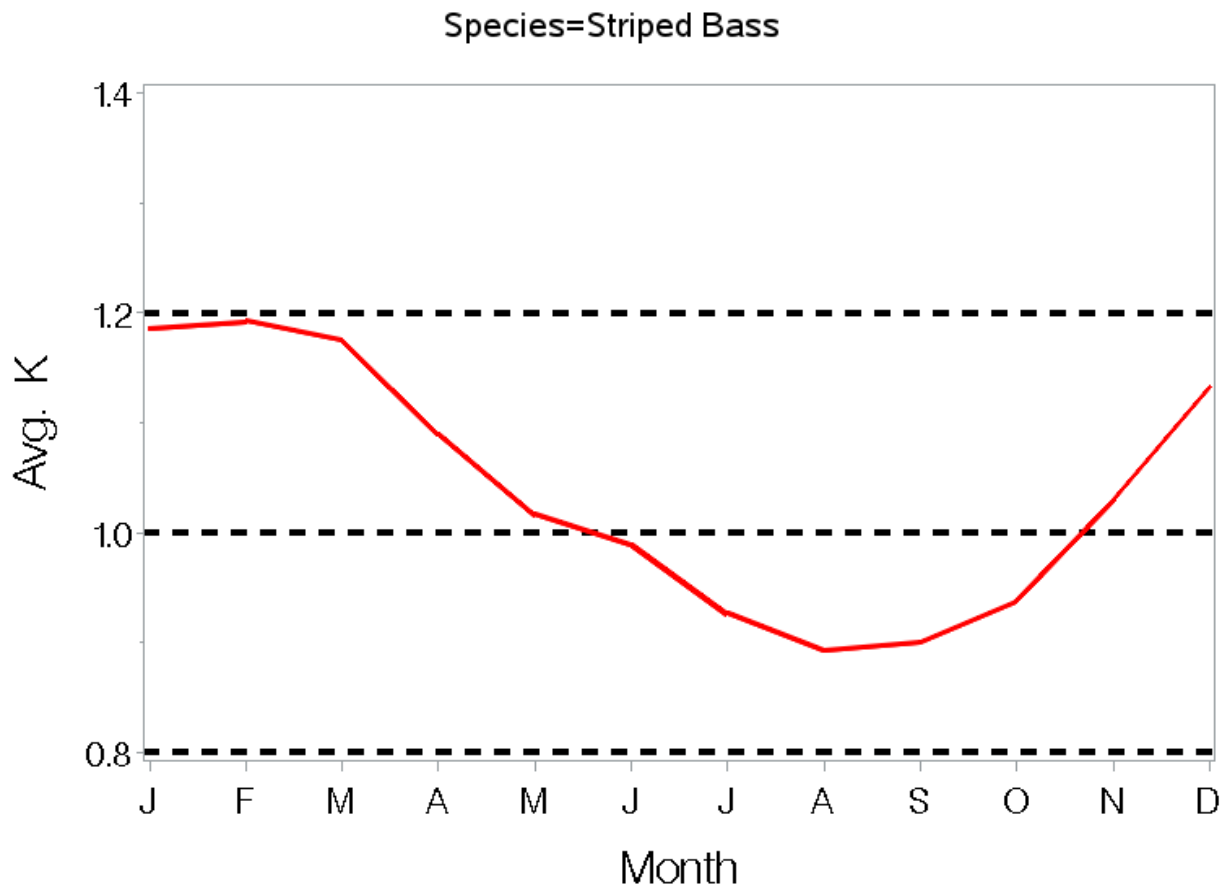


Figure 22. Striped Bass Fulton's Condition Factor by month for all agencies and projects combined.

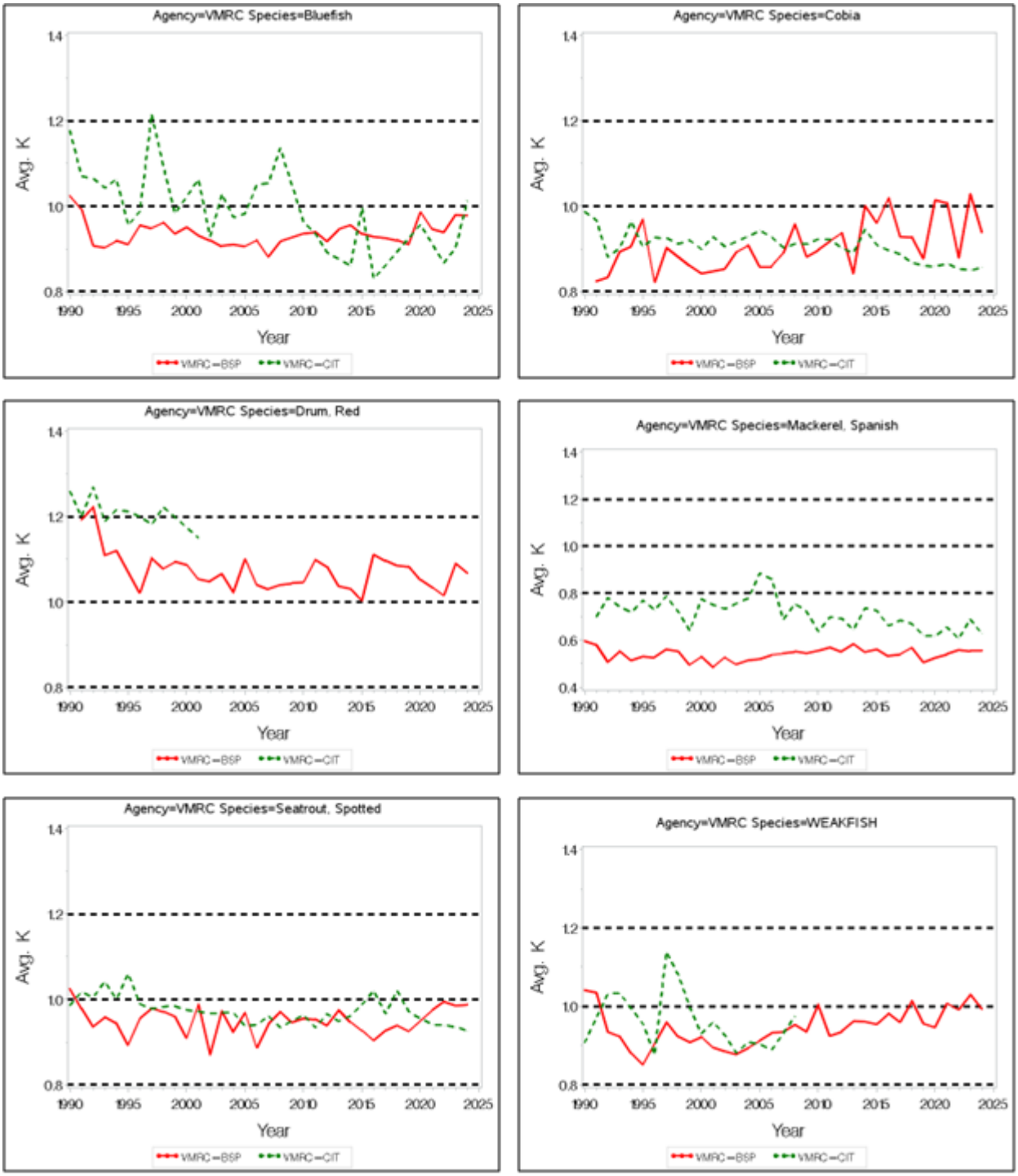


Figure 23. Fulton's Condition Factor for other bay predators for Virginia based projects only. Information for blue catfish and spiny dogfish is not available currently.

From: gerryjim
To: Info (ASMFC)
Subject: [External] [New] Menhaden and Ospreys
Date: Thursday, July 17, 2025 7:17:21 PM

It is time for you to better control the fishing of menhaden. Ospreys are in decline and there is evidence it's because they are not able to catch menhaden, due to overfishing. Their young are starving to death in the nest.

Gerald Orcholsk
Pasadena, CA

James Boyle

From: Adam Sabella <asabella4@optimum.net>
Sent: Thursday, July 17, 2025 11:05 AM
To: James Boyle
Cc: Tina Berger
Subject: Re: [External] Bunker

James

Your data doesn't match up with my on- the-water experience or that of the dozens of anglers in my network.

The last two years have seen significantly lower numbers.

Adam Sabella
(917) 689-2598

> On Jul 17, 2025, at 10:58 AM, James Boyle <JBoyle@asmfc.org> wrote:
>
> Hello Adam,
>
> Thanks for reaching out. Atlantic menhaden are evaluated using two assessments to determine (1) are they overfished? and (2) is overfishing actively occurring? The first assessment is a traditional single-species assessment and develops coastwide estimates of fishing mortality and fecundity for menhaden. The second is the Ecological Reference Points (ERP) assessment, which evaluates menhaden in an ecosystem context to account for menhaden's role as a forage fish. The ERP assessment creates target and threshold reference points of fishing mortality and fecundity to compare to the results of the single-species assessment to determine menhaden's stock status. Fishing mortality determines whether overfishing is occurring, and fecundity determines whether the stock is overfished. Using the ecological reference points, the latest single-species assessment update indicates the coastwide menhaden stock is neither overfished nor experiencing overfishing.
>
> Both assessments used fishery-dependent and -independent data as well as information about Atlantic menhaden biology and life history. Fishery-dependent data come from the commercial reduction and bait fisheries, while fishery-independent data are collected through scientific research and surveys. For the ERP models, fishery-dependent and -independent datasets were compiled for predator and prey species from the most recent stock assessments for each species. Diet data were also compiled from fishery-independent surveys to calculate the proportion of Atlantic menhaden and other species in predators' diet.
>
> Based on the stock status, the Board sets a coastwide Total Allowable Catch (TAC) to cap menhaden harvest corresponding to a certain risk level of exceeding the reference points. An analysis of the current TAC in 2022 when it was implemented determined that there was a 0% probability of exceeding the ERP mortality threshold from 2023-2025. The probability of exceeding the ERP target was 2% in 2023, 22% in 2024, and 28.5% in 2025.
>
> Below are links to the memo of the TAC analysis and both assessments. A new single-species update and ERP benchmark are currently in development and are scheduled to be presented to the Management Board in October. I hope this helps and feel free to reach out with any additional questions.
>
> Risk Projection Memo:
> https://asmfc.org/wp-content/uploads/2025/02/AtlMenhadenTAC_Risk_Proje

> ction_Dec2022.pdf
> 2022 single-species assessment update:
> https://asmfc.org/wp-content/uploads/2025/01/2022AtlanticMenhadenStock
> AssessmentUpdate_TOR_Report.pdf
> 2020 ERP benchmark assessment:
> https://asmfc.org/wp-content/uploads/2025/01/2019AtlMenhadenERPStockAs
> sessmentReport.pdf
>
> Best,
> James
>
> James Boyle (he/him) | FMP Coordinator Atlantic States Marine
> Fisheries Commission
> 1050 N. Highland Street, Suite 200 A-N Arlington, VA 22201
> Phone: 703.842.0715 | Fax: 703.842.0741 jboyle@asmfc.org |
> www.asmfc.org
>
>
> -----Original Message-----
> From: Adam Sabella <asabella4@optimum.net>
> Sent: Saturday, July 12, 2025 11:44 AM
> To: Info (ASMFC) <info@ASMFC.ORG>
> Subject: [External] Bunker
>
> Good Morning:
>
> I am writing to understand what efforts, if any, you have put in place to protect bunker from commercial over fishing?
>
> As someone who is out on the water several days a week from April to November in the New York metropolitan area, I am clearly seeing much smaller numbers of bunker, and it appears that those commercial vessels are really decimating the population. It strikes me as an emergency that needs to be dealt with immediately.
>
> Kindly advise,
>
> Adam Sabella
> (917) 689-2598
> CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

From: Bill Wilson
To: Info (ASMFC)
Subject: [External] [New] menhaden
Date: Thursday, July 17, 2025 3:30:27 PM

I am a regular reader of the Bay Journal. There is usually an article about the menhaden population in the Bay in each issue. I should start out by saying that I am opposed to the taking of menhaden by a company that I believe travels here from Texas and the catch is used to make fertilizer, of all things.

Now the story is that the beloved osprey population has gone down significantly. I live close to the Bay and have become used to their coming and going and spending their summer here. When I first started living in my current location we would have three returning pairs every year. Now I think we're down to one. Why? Lack of food for feeding their young. That food primarily: menhaden.

According to your website, they are not overfished. If that's true, why are the ospreys suffering? Maybe studying the ospreys is a better method for determining the health of the menhaden in the Bay than trying to count the number of fish.

Bill Wilson
5180 Park Avenue
ShadySide, MD 20764
443-822-9136

Mr. JP Williams
John Poole Middle School
17014 Tom Fox Ave.
Poolesville, MD 20837

June 5, 2025

Mr. James Boyle
1050 N. Highland St., Suite 200 A-N Arlington, VA 22201

Dear Mr. Boyle

Did you know that OMEGA Protiens harvests 51,000 metric tons of menhaden every year?OMEGA Protiens Quota for Atlantic Menhaden is destructive and harmful to the ecosystem and is causing other species of fish to suffer.Omega proteins current menhaden quota is 51,000 metric tons. This is causing other fish species like striped bass to become less plentiful and endangered. Striped bass sucessful spawning rates are down from 11.0 to 2.0. This is bad because the future generation of rockfish are not getting the chance of survival they naturally have, due to less food and more competition while they are still juvenile.OMEGA Protiens quota for Atlantic Menhaden needs to be drastically reduced.

Striped bass are not having successful spawns due to the lack of menhaden to feed on during this time.Striped Bass spawning rates have declined from 11.0 to 2.0 in recent years. This is in large part due to declining amounts of Menhaden, which is one of the main food sources for spawning striped bass. The absence of this fish means that pre-spawn Striped Bass are having to work much harder for food, and becoming malnourished, which hinders their ability to have a successful spawn. This evidence proves my reasoning because the connection between the menhaden population and striped bass population is clear. If the forage fish arent there, the striped bass don't eat. OMEGA Protiens is removing mass amounts of menhaden every year, limiting striped bass and other fish like bluefish, spanish mackeral, red drum, and speckled trout from having successful spawns and staying healthy and nourished to keep the population running. This is an issue not only because the fsih species are dying, but because these fish species are a food source and livelihood to many Chesapeake Bay residents, whether it be dinner once a week, a charter boat, crabbing operations, or a father taking his children on a fishing trip. All of these people are losing valuable ways of life in large part due to the overharvest of Atlantic Menhaden. Atlantic Menhaden are the backbone of the chesapeake bay. Almost every fish species feed on them, and they feed on Phytoplankton. This is crucial to the Chesapeake Bays ecosystem because some types of phytoplankton can be harmful to the environment, causing algae blooms, harm shellfish, and cause for dead zones. According to the Chesapeake bay foundation, "Menhaden, also called bunker or pogy, create a vital connection between the bottom, middle, and top of the food chain. They eat tiny plants and animals, called plankton, by filtering them from the water. In turn, menhaden are a rich food source for many predator fish—including rockfish (striped bass), bluefish, red drum, bluefin tuna, and

weakfish—as well as ospreys, bald eagles, dolphins, and whales." This evidence proves my reason and supports the overall argument because it shows how crucial menhaden are to the Chesapeake Bay and its species.

In conclusion, OMEGA Protiens quota needs to be drastically reduced because the menhaden are the backbone of the chesapeake bay, and removing them is harmful to the bay. Some actions that could be taken is reducing the quota by 50-75%, outlawing the harvest of menhaden in the chesapeake bay, or having a moratorium on commercial harvest on menhaden. I would like the recipetint of this letter to advocate for the reduction of menhaden quota in any way possible, or we may not have a chesapeake bay ecosystem in 10 years. I can be reached at jpwilliamsbaseball5@gmail.com, 214484@gmail.com, or 20104 Spurrier Avenue, Poolesville, Maryland, 20837.

Sincerely, JP Williams

Mr. JP Williams

From: info@asmfc.org
To: Info (ASMFC)
Subject: [External] [New] New website contact submission from Contact Us
Date: Thursday, June 26, 2025 10:30:41 AM

Name

Sean Renish

Email

renishsean38@gmail.com

Get in Touch

Your assessment that Menhaden aren't being overfished is clearly false. There's lots of folks on the water who can see Omega Protein specifcally sending commercial fishing boats up from Virginia where they have already decimated the Chesapeake population. If commercial boats need to leave their home bay and go to the next neighboring one to fish, there's clearly a problem and you are either incompetent in the matter or complicit in illegal corporate synergy with said company…….

James Boyle

From: Mina Y <minay7899@gmail.com>
Sent: Tuesday, June 24, 2025 1:32 PM
To: James Boyle; Matthew Gates; William Hyatt; Sen. Craig A. Miner; Robert Lafrance; Justin Davis; Rep. Joseph P Gresko; Jeff Kaelin; Joe Cimino; Adam S. Nowalsky; Sen. Vin Gopal; Emerson Hasbrouck; Marty Gary; Caitlin Craig; John Maniscalco; Roy Miller; John Clark; Rep. William J Carson; Carl Wilson; Stephen R. Train; Rep. Allison Hepler; Megan Ware; Cameron Reny; Lynn Fegley; Russell Dize; Peter Himchak; Paul Eidman; nmfs.gar.garfo@noaa.gov
Subject: [External] [New] A Crucial Plea: Protecting the Atlantic Menhaden

To Whom It May Concern,

I am writing to express my profound concern regarding the ongoing depletion of Atlantic Menhaden populations due to intensive net fishery practices, and to urge for an immediate re-evaluation of current management strategies. The continued large-scale harvesting of this vital species, particularly without comprehensive, up-to-date scientific studies, is a decision made in the dark, with potentially catastrophic consequences for our marine ecosystems.

The Atlantic Menhaden, often referred to as "the most important fish in the sea," plays an indispensable role in the health and stability of our coastal waters. They are a keystone species, acting as filter feeders that improve water quality and, crucially, serving as a primary forage fish for a vast array of predatory species, including striped bass, bluefish, tuna, whales, and seabirds. When menhaden populations dwindle, the ripple effect through the food web is devastating, impacting the health and abundance of economically significant game fish and endangered marine mammals alike.

Current net fishery operations are, in my view, unsustainable and are demonstrably pushing menhaden populations to a perilous brink.
Anecdotal evidence from anglers, charter captains, and environmental observers across the coast consistently points to a dramatic decline in menhaden schools, directly correlating with a noticeable decrease in their predators. This is not mere speculation; it is an alarm bell ringing across our marine communities.

Furthermore, it is deeply concerning that significant management decisions continue to be made without sufficient, contemporary scientific data. To allow such intensive fishing pressure to persist while studies are either outdated or insufficient to accurately assess the current stock status and the ecosystem's carrying capacity is, frankly, irresponsible. Without robust, independent scientific research that thoroughly evaluates menhaden biomass, recruitment rates, and their ecosystem-wide impact, any management decision is a blind decision. We are risking the long-term health of our oceans, and by extension, our coastal economies and way of life, on assumptions rather than facts.

I implore you to consider the broader ecological implications of ignoring this crisis. The short-term economic gains from unchecked menhaden harvests are a paltry sum compared to the irreversible damage that could be inflicted upon the entire marine ecosystem. We have a responsibility to act as stewards of our natural resources, not just exploiters.

Therefore, I respectfully request and strongly advocate for:

An immediate moratorium or significant reduction in industrial menhaden net fishery until comprehensive, independent scientific studies can definitively assess the current stock status and the ecological carrying capacity.

The allocation of resources for thorough and transparent scientific research into menhaden populations and their critical role in the ecosystem.

A management approach that prioritizes ecosystem health and the needs of all dependent species, rather than solely focusing on harvest quotas.

Let us not make blind decisions that could cripple our marine environment for generations to come. The time to act decisively and intelligently to protect the Atlantic Menhaden is now.

Sincerely,

Mina Youssef

James,

Please bring up during the next meeting.

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Sent from my iPhone

James Boyle

From: Mina Y <minay7899@gmail.com>
Sent: Friday, July 11, 2025 2:01 PM
To: James Boyle
Subject: [External] [New] Menhaden Bycatch Study Results

James - please present the following articles showing the menhaden bycatch amount.

Gov Article:
https://www.wlf.louisiana.gov/news/menhaden-bycatch-study-results-presented-by-lgl-ecological-research-associates

Report:
https://www.wlf.louisiana.gov/assets/Resources/Publications/Saltwater_Fish/Fate-of-Released-Bycatch-for-the-Menhaden-Purse-Seine-Fishery-Occurring-off-the-Coast-of-Louisiana.pdf

Presentation:
https://www.wlf.louisiana.gov/assets/Resources/Publications/Saltwater_Fish/CharacterizationOfBycatch_July_8_Presentation_LGL.pdf

Tina and James Will you please distribute this comment to the ERP assessment committee, the menhaden board for the August meeting, and the Chesapeake bay “protective options” work group and the staff. As usual please advise receipt. Have a nice day

Tom Lilly Whitehaven MD


10:17
5
Menhaden - Little Fish, Big Deal!
Mary Wenz · 16m ·
Like
Comment
Send
You and 2 others
Most relevant
Thomas Lilly Top contributor
Mary The Osprey tragedy , which includes the starvation of thousands of chicks each year is brought to you by the heartless, conflicted losers at the ASMFC menhaden board that allow one crappy little Canadian company located in Reedville Va to rape, the Chesapeake Bay of 51,000 tons of vital menhaden forage a year taking the food away from our starving wildlife. They must be stopped somehow.
Just now Like Reply
Steve Atkinson All-star contributor
Their primary food source, menhaden, are very scarce in the bay this year. Sad.
9m Like Reply
Members also joined
Chesapeake Rock Fishi...
17K members · 5 posts a day
Join
Chesapeake Bay and Mi...
5.5K members · 2 posts a...
Join
Write a comment...
GIF

James Boyle

From: Tom Lilly <foragematters@aol.com>
Sent: Wednesday, June 18, 2025 9:08 PM
To: James Boyle; Marty Gary; Raymond Kane; Robert Lafrance; Joe Cimino; Loren W. Lustig; Allison Colden; Patrick Geer; Spud Woodward; Lynn Fegley; Russel Dize; Bob Beal
Subject: [External] No menhaden in Maryland

James

I have a question or two and a few comments for you as menhaden coordinator. Please post this to the ERP assessment group and the menhaden board for the August meeting as well as any work group meetings before the summer meeting.

Regarding the work group. Last August a work group formed to recommend "protective options" for Chesapeake Bay menhaden. They were to report to the October and then the April board meetings but no specific recommendation were made at either. And then, they said they would report to the August 25 board meeting nearly a year later. Do I have that right?

From what I am hearing the tragic starvation of thousand of osprey chicks last year is being repeated right now. If the board had taken action last August to restrain the factory fishing, so the ospreys could have gotten some food , these beautiful courageous birds would not be experiencing the horror of having their babies starve one by one in the nest from a lack of food . The people throughout Chesapeake Bay, that care so deeply for these birds would have been spared the anguish each is experiencing right now while they watch the babies die one by one. This was entirely preventable by the menhaden board.

Am I correct that after a number of meetings and two or three failed deadlines this work group has not produced a single specific protective option for the board to consider?

The most obvious option, the one every state affected but Virginia has , is moving the factory fishing out into the US Atlantic zone where they will not be taking the forage directly from the food supply of Chesapeake Bay. Can you tell me if that is an option that is proposed by the work group and if it is not why not?

Possibly the second most obvious option is to delay the opening of the season by 30 to 45 days to either June 5 or June 20. This would allow, for the first time, all of the menhaden entering Chesapeake Bay in the spring season to reach the Maryland bay to feed our struggling fish and ospreys. Is this an option the work group is proposing and if not, why not?

The third obvious and critical option would be to stop the season by September 1 so for the first time the schools of menhaden migrating from the bay to their spawning grounds will not be caught, but can continue out into the ocean to produce next year's crop of forage. Is this an option that the work group is currently proposing and if not, why not?

I do not see where the work group is to report to the board according to the August agenda. Que Pasa ? There is an agenda item about the technical committee, but not a report on specific recommendations. Could you please explain what is going on here? No recommended options after a year "study"?

I presume that you and the board members and the work group members are aware that for the last two years, the factory fishing, in spite of intense effort, has landed practically no menhaden in Va. in the Spring? Are you aware of that fact or not ? I have repeatedly asked you and the work group members and the board members to pick up the phone and call Ray Mroch at Beaufort lab and make arrangements to see the last five years May and June weekly landing reports that are required to be filed by Beaufort and which are sent weekly to the commission. This data would confirm the reports by Bill Dunn, as to the lack of landings of fish in Virginia in May and June for the last five years . Have you obtained these records and shared them with the board or not and if you have not obtained them, why haven't you.

Has Lynn Fegley or Allison Colden or someone else advised the ERP assessment team, the work group or the menhaden board that as of now one of the primary wholesalers that purchases menhaden from Maryland fixed gear

menhaden fisherman is reporting that nothing, I repeat no menhaden has been caught this year in Maryland as of today?

This tells me and I hope it tells the work group and the board, that this spring the Maryland bay's menhaden forage base was nonexistent. There was no or virtually no menhaden in the Maryland bay to feed our struggling ospreys and striped bass spawning stock at the most critical time of the year. And as I said before, this is nothing new it has been gaining momentum for at least a decade, and all of that data was known in real time or should have been known by the (menhaden) board as it happens. Delegate Russell Diez told you the same thing last year.

If Bill Dunn's reports are correct and it is verified by the weekly landing figures you obtain then we have an ongoing crisis situation in Chesapeake Bay as to its most important food supply- menhaden. While I say it is a crisis, I do not mean to indicate that this is a recent crisis. This has been building for decades under the nose and eyes of the commission and nothing has been done , all of the negative consequences have happened to Chesapeake Bay, fish and wildlife and to the millions of people that would like to be using and enjoying Chesapeake Bay, but cannot due to the factory fishing killing off the food supply. All of the negative consequences the bay is suffering now are exactly what Dr. Jacques McGuire, told the menhaden board would happen if they did not pass seasonal and area restrictions on the factory fishing. That was 16 years ago in 2009 that Dr. Maguire warned the board about they coming negative consequences, but they did not listen and they are still not listening .

I realize I've asked a lot of questions here, but the answers to those questions and the solutions to the problems discussed are so important to the survival of Chesapeake Bay fish and wildlife and the enjoyment of the bay by millions of people and their children. Thank you for your cooperation, sincerely Tom Lilly 443-235-4465 Whitehaven Maryland

Sent from my iPhone

James Boyle

From: Tom Lilly <foragematters@aol.com>
Sent: Thursday, June 19, 2025 9:57 AM
To: James Boyle; Bob Beal; Marty Gary; Raymond Kane; Robert Lafrance; Joe Cimino; Allison Colden; Lynn Fegley; Russell Dize; Loren W. Lustig; Patrick Geer; Spud Woodward
Subject: [External] Addition to No Menhaden in MD mail

To the menhaden work group and board

This is a supplement to yesterday's mail with two new additions. I hope you will take a few minutes to read this.

The two osprey babies in the photo below are in a nest on our dock in Whitehaven, Maryland. We are closely observing this nest. There has not been any food delivery for days. Unless there is some human intervention here these babies will be starving as thousands did last year on the Bay.

The second attachment is Bill Dunn's report on the reduction fishing activity this morning. This is the same as about 50 reports since the season opened that there are virtually no menhaden in the Virginia Bay. On Tuesday, I spoke to a fish wholesale business in Cambridge MD where our fixed gear menhaden fisherman sell their catch. They told me that they have caught nothing this year, underline nothing.

Four years now Dr. Brian Watts has been reporting 1000s of osprey babies are dying on the main stem of the bay due to over harvesting of menhaden. Our. Striped bass spawning stock has been in reproductive failure for years now. Both species are your ERP indicators of over harvesting. Our blue crab situation in the bay is the worst in history as striped bass are foraging on baby crabs when they can't find other food. These three items are a trifecta of damage to our bay, and to the quality of life of millions of Marylanders and their children as well of as thousands of watermen and charter captains. The very culture of small communities such as Smith Island Maryland is being wiped out.

The disaster for bay fish and wildlife that a generation of Marylanders have suffered was predicted in 2009 when your consultant, Dr. Maguire, said that you should use seasonal and area restrictions on the factory fishing to avoid "negative consequences" as he put it. 16 years later, there has been no effective action and the negative consequences have all happened. Think for a minute about the hundreds of thousands of our senior citizens on the bay who looked forward to fishing and enjoying the bay with their grandchildren and friends when they retired but that dream has gone up in smoke. This is exactly what has happened to me and my friends.Frustration over this situation among those who care for our Bay has increased month by month as the work group has failed to recommend any specific protective options to change things.

How do you think caring Marylanders feel about this? Every state but Virginia has used a rule to protect itself and its environment from the factory fishing. That of course, is simply moving the factory fishing 3 miles offshore into the US Atlantic zone where there are said to be plentiful ,to prevent them from taking 51,000 tons of this critical forage directly from Chesapeake Bay food chain. Will that option be presented by the work group to the menhaden board at the August meeting or not?

Right now the industry is allowed to catch all of the very few schools migrating toward Maryland in the spring. Will they work group present an option to the board to delay the opening of the season until June 5 or 20th so that the little forage that is entering the bay can actually get to Maryland to feed our wildlife or not?

Right now the industry is allowed to catch all of the schools that begin to migrate out of the bay in the fall to go to their wintering spawning grounds of the Carolinas. Virtually all of these schools are being caught as they attempt to leave the bay in the fall. Will the work group recommend the closing the season as of September 1 to prevent this?

If you have read this, I want to thank you personally and possibly discuss what you think can be done at this point.. if you have 10 minutes to do that, I would appreciate your calling me at 443-235-4465 otherwise I would appreciate it if James or Bob would answer these questions directly so the Public can understand what's going on here. Tom Lilly

7:24

Menhaden - Little Fish, Big D

William Dunn · 17m ·

6/19/25 Thur 7 am:

Planes and ships quit yesterday arou
finding a few schools out from Reed
it was a lackluster day for Omega.

There are 6 Omega ships out this mo
planes have been looking since arou
far, they haven't found anything.

Sent from my iPhone

James Boyle

From: Tom Lilly <foragematters@aol.com>
Sent: Thursday, July 3, 2025 9:18 AM
To: John Clark
Cc: Marty Gary; Raymond Kane; Robert Lafrance; Joe Cimino; Loren W. Lustig; Allison Colden; Patrick Geer; Spud Woodward; James Boyle; Bob Beal
Subject: [External] Osprey starvation

Sent from my iPhone
John we are about to leave on vacation for South Bethany, DE. Many Marylanders are drawn to your state because the fishing is so terrible here .

There is great sadness in our family because the osprey babies in the two nests near our property on the eastern shore have died within the last few days. Right now the parents are back sitting on the nest but there are no babies there to take care of. They have died a very painful death with the parents watching them. As you know the parent faced with an inadequate food supply must select the chick to live and the one to die. Can you imagine the pain and suffering of the parent and of the chick selected to die as it watches it's sibling being fed and it dies a painful death. Is anything crueler than that?

I've been in contact with Dr. Watts and this is the worst nesting season in Virginia ever and believe me that is saying something. Thousands of osprey babies are starving on Chesapeake Bay again this year because the menhaden board allows one company in Virginia to destroy their food supply and is refusing again to take action on protective options . That's where the problem lies. You have not even scheduled this as an agenda item for action for the August meeting …..just more and more delays. By that meeting it will be one year since protective options became a goal of the menhaden board and right now achieving that goal and saving the ospreys seems as far away as the day it started.

Could you and the other board members please let me know when the cruelty inflicted on Chesapeake bay's ospreys will end, if ever? Sincerely Tom lilly

James Boyle

From: Tom Lilly <foragematters@aol.com>
Sent: Monday, July 14, 2025 12:51 PM
To: comments@asmfc.com; James Boyle; Tina Berger
Cc: Bob Beal; John Clark
Subject: [External] Fw: Schedule the protective options for action at the August meeting

Tina please post this to the menhaden and striped bass boards for the August meetings.

John, James and the menhaden board Please answer one question that is on the minds of the people that want to end the factory fishing from taking 51,000 tons of menhaden forage from the food supply of our Chesapeake bay wild life when every board member has in front of them that this is starving thousands of osprey babies and is a primary cause of the chronic reproductive failure of our striped bass spawning stock, that was described by Bob Beal as the Commissions "flagship species". Well the ship has sunk and the ospreys are dying like flies and still the menhaden board has not scheduled action on the "protective options" for their meeting August 7th that could begin to end this mess that has been created for the fish, wildlife, ecology and the people of Chesapeake bay. Why is the board delaying this again and again?

As of your August 7th meeting it will be one year since the board took on the responsibility to decide of protective options for bay menhaden and now sixteen years since your consultant Dr Maguire warned the board of the "negative consequences" if they didn't put area and seasonal controls on the factory fishing. The Work Group report contained all the science and data the board needed to act decisively last May.
Your Charter requires the board act on the best scientific information ***available*** *and not postpone* needed management action over and over again**.** That essential rule is being violated meeting after meeting.

So, once again, we ask you and the board to act this August 7th on the goal you set for yourselves last August of protecting Chesapeake bay menhaden and the species that rely on them for survival and stop the cruel and unnecessary pain and suffering you are causing to thousands of bay ospreys and the destruction of striped bass charter and recreational fishing in the bay. You can't do that by avoiding action on the proposed protective options. You can do this by placing "possible action on WG's protective options for Chesapeake bay menhaden" on the board agenda for August 7th...Will you do that ?

Tom Lilly Whitehaven Md

Please reschedule an agenda item of possible action on the WG protective options for the August 7th meeting. Please advise receipt of this. Tom Lilly

----- Forwarded Message -----
From: Tom Lilly <foragematters@aol.com>
To: John Clark <john.clark@delaware.gov>
Sent: Thursday, July 3, 2025 at 12:18:16 PM EDT
Subject: Re: Osprey starvation

John Thank you for replying, and this has given me some hope that something will be done at the August meeting to protect these courageous birds. Best Tom
Sent from my iPhone

> On Jul 3, 2025, at 11:35 AM, Clark, John (DNREC) <John.Clark@delaware.gov> wrote:
>
> Thank you for your email, Tom. I certainly understand your concern for the ospreys. While ospreys are not a specific agenda item, the Board will be continuing its discussion of Chesapeake menhaden management at the August Board Meeting and I am sure that ensuring there are enough menhaden for other species will be part of the discussion.
>
>
> John H. Clark
> Fisheries Section Administrator
> Delaware Division of Fish and Wildlife
> 89 Kings Highway
> Dover, DE 19901
> (302)739-9914 (Fisheries) or 9108 (Direct)
>
>
> -----Original Message-----
> From: Tom Lilly <foragematters@aol.com>
> Sent: Thursday, July 03, 2025 9:18 AM
> To: Clark, John (DNREC) <John.Clark@delaware.gov>
> Cc: L Gary Martin <martin.gary@dec.ny.gov>; Raymond Kane <ray@capecodfishermen.org>; ROBERT LAFRANCE <robert.lafrance@quinnipiac.edu>; JOE CIMINO <joseph.cimino@dep.nj.gov>; Loren Lustig <senseofwonder@Pa.net>; Allison Colden CBF <acolden@cbf.org>; Pat Geer <pat.geer@mrc.virginia.gov>; SPUD WOODWARD <swoodward1957@gmail.com>; James Boyle <jboyle@asmfc.org>; Bob Beal <rbeal@asmfc.org>
> Subject: Osprey starvation
>
>
> Sent from my iPhone
> John we are about to leave on vacation for South Bethany, DE. Many Marylanders are drawn to your state because the fishing is so terrible here .
> There is great sadness in our family because the osprey babies in the two nests near our property on the eastern shore have died within the last few days. Right now the parents are back sitting on the nest but there are no babies there to take care of. They have died a very painful death with the parents watching them. As you know the parent faced with an inadequate food supply must select the chick to live and the one to die. Can you imagine the pain and suffering of the parent and of the chick selected to die as it watches it's sibling being fed and it dies a painful death. Is anything crueler than that?
> I've been in contact with Dr. Watts and this is the worst nesting season in Virginia ever and believe me that is saying something. Thousands of osprey babies are starving on Chesapeake Bay again this year because the menhaden board allows one company in Virginia to destroy their food supply and is refusing again to take action on protective options . That's where the problem lies. You have not even scheduled this as an agenda item for action for

the August meeting …..just more and more delays. By that meeting it will be one year since protective options became a goal of the menhaden board and right now achieving that goal and saving the ospreys seems as far away as the day it started.
> Could you and the other board members please let me know when the cruelty inflicted on Chesapeake bay's ospreys will end, if ever? Sincerely Tom lilly
>