Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

October 19, 2021
1:15 – 5:15 p.m.
Webinar

Draft Agenda

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

1. Welcome/Call to Order (*S. Woodward*)	1:15 p.m.
2. Board Consent • Approval of Agenda • Approval of Proceedings from August 2021	1:15 p.m.
3. Public Comment	1:20 p.m.
4. Provide Guidance to the Technical Committee and Ecological Reference Points Work Group on Priorities for Completing Next Benchmark Stock Assessment (*M. Cieri*) **Possible Action**	1:30 p.m.
5. Break	2:30 p.m.
6. Progress Update on Development of Draft Addendum I to Amendment 3 (*K. Rootes-Murdy*) **Possible Action**	2:45 p.m.
7. Update on 2020-2021 Atlantic Menhaden Mortality Events (*J. Brust*)	4:30 p.m.
8. Other Business/Adjourn	5:15 p.m.

The meeting will be held via webinar, click here for details.

MEETING OVERVIEW

Atlantic Menhaden Management Board
Tuesday, October 19, 2021
1:15 – 5:15 p.m.
Webinar

Chair: Spud Woodward (GA) Assumed Chairmanship: 03/20	Technical Committee Chair: Josh Newhard (USFWS)	Law Enforcement Committee Representative: Robert Kersey (MD)
Vice Chair: Mel Bell (SC)	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: August 4, 2021
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 August 4, 2021

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

4. Provide Guidance to the Technical Committee and Ecological Reference Points Work Group on Priorities for Completing Next Benchmark Stock Assessment (1:30-2:30 p.m.) Possible Action

Background

- In February, the Board tasked the Technical Committee (TC) and Ecological Reference Points Work Group (ERP WG) with identifying data and modelling needs to develop a spatially-explicit model that could help inform management in the Chesapeake Bay.
- The TC and ERP WG met in March and discussed data needs and potential timelines depending on the management objectives the Board wants the next benchmark stock assessment to address. (**Briefing Materials**)
- The Board had a preliminary discussion in August on priorities and considerations for the completing the next benchmark stock assessment.

Presentations

- Decision Tree for Guiding next Benchmark Stock Assessment by M. Cieri

Board Actions for Consideration

- Provide Guidance to the TC & ERG WG on the next benchmark stock assessment.

5. Break

6. Progress Report on Development of Draft Addendum I to Amendment 3 (2:45-4:30 p.m.) Possible Action
Background • In August, the Board initiated a draft addendum to consider changes to commercial allocations, the episodic event set aside (EESA) program, and the incidental catch and small-scale fisheries provision. The action responds to the Board work group (WG) report on potential strategies to evaluating in changing provisions of the current management program. • The Menhaden Plan Development Team (PDT) met six times in September and October to develop a memo outlining draft statement of the problem, objectives, considerations, and management alternatives for each topic based on the Board WG Report **(Supplemental Materials)**. The memo is intended for the Board to review and provide guidance to the PDT in further developing the draft addendum.
Presentations • Progress Report on Draft Addendum I by K. Rootes-Murdy
Board Actions for Consideration • Provide Guidance to the PDT on further development of the draft addendum.

7. Update on 2020-2021 Atlantic Menhaden Mortality Events (4:30-5:15 p.m.)
Background • In August the Board received public comment on a number of menhaden mortality events that have occurred in multiple states this year. The Board requested staff work with U.S. Fish and Wildlife Service to provide a summary of these events at the Annual Meeting.
Presentations • 2020-2021 Atlantic Menhaden Mortality Events by J. Brust

8. 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

- TC, SAS, ERP WG – various taskings relating to management response to the 2019 benchmark stock assessments
- TC,SAS, ERP WG- begin work to complete 2022 stock assessment update
- TC – April 1st: Annual compliance reports due

TC Members: Josh Newhard (USFWS, Chair), Corrin Flora (NC), Joey Ballenger (SC), Jason McNamee (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ellen Cosby (PRFC), Micah Dean (MA), Kurt Gottschall (CT), Caitlin Craig (NY), Shanna Madsen (VMRC), Chris Swanson (FL), Ray Mroch (NMFS), Amy Schueller (NMFS), Alexei Sharov (MD), Jeff Tinsman (DE), Kristen Anstead (ASMFC), Kirby Rootes-Murdy (ASMFC)

SAS Members: Amy Schueller (NMFS, SAS Chair), Matt Cieri (ME), Micah Dean (MA), Robert Latour (VIMS), Chris Swanson (FL), Ray Mroch (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ) Kristen Anstead (ASMFC), Kirby Rootes-Murdy (ASMFC), Joey Ballenger (SC)

ERP WG Members: Jason Boucher (NOAA), Matt Cieri (ME,ERP Chair), Michael Celestino (NJ), David Chagaris (FL), Micah Dean (MA), Rob Latour (VIMS), Jason McNamee (RI), Amy Schueller (NFMS), Alexei Sharov (MD), Howard Townsend (NFMS), Jim Uphoff (MD), Kristen Anstead (ASMFC), Katie Drew (ASMFC), Sara Murray (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC MENHADEN MANAGEMENT BOARD

Webinar
August 4, 2021

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 CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Megan Ware, ME, proxy for Pat Keliher (AA)
Sen. David Miramant, ME (LA)
Cheri Patterson, NH (AA)
Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nichola Meserve, MA, proxy for Dan McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Conor McManus, RI, proxy for Jason McNamee (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Rep. Sosnowski (LA)
Justin Davis, CT (AA)
Rob LaFrance, CT, proxy for B. Hyatt (GA)
Maureen Davidson, NY, proxy for J. Gilmore (AA)
Emerson Hasbrouck, NY (GA)
John McMurray, NY, proxy for Sen. Kaminsky (LA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Adam Nowalsky, NJ, proxy for Asm. Houghtaling (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
G. Warren Elliott, PA (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, proxy for B. Anderson (AA)
Russell Dize, MD (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for S. Bowman (AA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Bill Gorham, NC proxy for Rep. Steinberg (LA)
Mel Bell, SC, proxy for P. Maier (AA)
Malcolm Rhodes, SC (GA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Marty Gary, PRFC
Max Appelman, NMFS
Mike Millard, USFWS

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

Ex-Officio Members

Joshua Newhard, Technical Committee Chair

Staff

Bob Beal
Toni Kerns
Laura Leach
Maya Drzewicki
Tina Berger
Pat Campfield
Lisa Carty
Kristen Anstead
Lindsey Aubart
Emilie Franke
Lisa Havel
Chris Jacobs
Jeff Kipp
Heather Konell
Kirby Rootes-Murdy
Sarah Murray
Joe Myers
Caitlin Starks
Deke Tompkins
Geoff White

Guests

Michael Academia, WMU
Fred Akers, Newtonville, NJ
Mike Armstrong, MD DMF
Pat Augustine, Coram, NY
Joe Ballenger, SC DNR
Robert Begin
John Bello, CCA VA
Colleen Bouffard, CT DEP
Karen Bradbury, Ofc. of Sen. Whitehouse, RI
Jeff Brust, NJ DEP
Mike Celestino, NJ DEP
Benson Chiles
Matt Cieri, EM DMR
Peter Clark, NJ DEP
Richard Cody, NOAA
Nicole Lengyel Costa, RI DEM
Heather Corbett, NJ DEP
Robert Crockett, Advantus Strategies
Jessica Daher, NJ DEP
Lorena de la Garza, NC DENR

Guests (continued)

Taylor Deihl, Omega Protein
Monty Deihl, Ocean Fleet Svcs.
Greg DiDomenico, Cape May NJ
James Fletcher, Wanchese Fish Co
Anthony Friedrich, SGA
David Frulla, Kelley Drye
Alexa Galvan, VMRC
Shaun Gehan, Gehan Law
Lewis Gillingham, VMRC
Jon Hare, NOAA
Hannah Hart, FL FWC
Gregg Hartley, HB Strategies
Helen Takade-Heumacher, EDF
Peter Himchak, Cooke Aqua
Jesse Hornstein, NYS DEC
Edward Houde, UMCES
Bill Hyatt, CT (GA)
Jeff Kaelin, Lund's Fisheries
Pat Keliher, ME (AA)
Adam Kenyon, VMRC
Tom Lilly
Tom Little, Ofc. Asm. Houghtaling
Carl LoBue, TNC
Mike Luisi, MD DNR
Chip Lynch, NOAA
Shanna Madsen, VMRC
Alyson Martin, CBF
Dan McKiernan, MA DMF
Steve Meyers, Williamsburg, VA
Chris Moore, CBF
Allison Murphy, NOAA
Brian Neilan, NJ DEP
Kennedy Neill
Gerry O'Neill, Cape Seafoods
Derek Orner, NOAA
Patrick Paquette, MA SBA
Michael Plaia
Janice Plante, NEFMC
Nick Popoff, FL FWS
Will Poston, SGA
Jill Ramsey, VMRC
Stephanie Rekemeyer, NYSDEC
Kathy Rawls, NC (AA)
Harry Rickabaugh, MD DNR
Tara Scott, NOAA
Olivia Siegal, VMRC
David Sikorski, CCA MD
Jared Silva, MA DMR
Lincoln Simmons
Ethan Simpson, VMRC
Tom Sminkey, NOAA
Joseph Smith
Art Smith
Somers Smott, VMRC
Rene St. Amand, CT DEEP
David Stormer, DE DFW
Kevin Sullivan, NH FGD
Jim Uphoff, MD DNR
Mike Waine, ASA
Lowell Whitney, US FWS
Kate Wilke, TNC
John Williams
Chris Wright, NOAA
Phil Zalesak, Timbers, MD
Erik Zlokovitz
Rene Zobel, NH FGD

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened via webinar; Wednesday, August 4, 2021, and was called to order at 1:50 p.m. by Chair Spud Woodward.

CALL TO ORDER

CHAIR SPUD WOODWARD: Good afternoon everyone; this is Spud Woodward, Governor's Appointee from Georgia. I am your Chair of the Atlantic Menhaden Management Board. I want to call our August 4th meeting to order.

APPROVAL OF AGENDA

CHAIR WOODWARD: Everyone has a draft agenda. I wanted to make a few brief comments about that agenda, before I ask for any suggested modifications and hear from staff.

We have one action item, which is at the end of our agenda. We've got two informational presentations; the first which will be to review the data needs for spatially explicit management of Atlantic menhaden in the Chesapeake Bay. That will be presented by Josh Newhard. I just want to emphasize that this is something we were scheduled to have received back in May at our meeting.

We did not have the time for it, so it was postponed and brought forward to this meeting. It is for informational purposes, and an opportunity for questions. We're not going to take any specific action on this agenda item at this meeting. Instead, I want folks to have an opportunity to think about it, and to come back at the annual meeting, hopefully in person in October, and make some specific recommendations on a path forward, for improving our ecosystem-based management of Atlantic menhaden.

Also, we'll receive a report from our Work Group, and I want to give a shout out to the folks that were on that Work Group, and Megan Ware, Nichola Meserve, Joe Cimino, Allison Colden, Pat Geer, Chris Batsavage and Rob LaFrance was our Chair. They've done some great work. I think everybody will be impressed with the results of their activities, and it certainly will help us focus our discussions for our next possible management action. Are there any recommended or requested changes to the agenda? Any hands, Toni?

MS. TONI KERNS: NO hands.

CHAIR WOODWARD: Is there any opposition to adopting the agenda as presented? If so, raise your hand.

MS. KERNS: I see no hands.

CHAIR WOODWARD: All right, then we will consider the agenda accepted by unanimous consent.

APPROVAL OF PROCEEDINGS

CHAIR WOODWARD: The next order of business is the approval of the proceedings from our May, 2021 meeting. Are there any edits, corrections, changes to the proceedings as presented in the briefing materials? If so, raise your hand.

MS. KERNS: I see no hands.

CHAIR WOODWARD: All right, is there any opposition to accepting the proceedings as presented?

MS. KERNS: I see no hands.

CHAIR WOODWARD: All right, we'll consider the proceedings again accepted by unanimous consent.

PUBLIC COMMENT

CHAIR WOODWARD: This is the time on our agenda for public comment. I know we have at least two folks, Kirby. What is our public comment head count?

MR. KIRBY ROOTES-MURDY: As of right now I believe we have Tom Lilly and Peter Himchak.

CHAIR WOODWARD: All right, just in recognition of the fact that we're starting late. We have a schedule to go until 5:15, but I'll just ask folks to be brief, and this is comments on items not on the agenda from this meeting. Please, if you will keep your comments to three minutes, and again just a reminder, this is for items not on the agenda. Mr. Lilly, I'll call on you first.

MS. KERNS: Just really quick, I just wanted to let you know that you have two additional hands that are raised, Phil and Michael Academia.

CHAIR WOODWARD: All right, we'll stick with the three minutes, but I would appreciate you keeping it within, or certainly under the three minutes. We've got a counter of minutes, to let you know how time is elapsing. Tom, if you'll go ahead.

MR. TOM LILLY: Fishing in Chesapeake Bay right now is the worst it has been in memory. This has been going on, steady decreases for the last 15 years, all the data shows that. This was the one thing that at least a million Marylanders did together, to get away from it all, just to go fishing. They aren't fishing very much anymore.

It isn't working anymore. As you know, the question really right now, is what is on your minds right now as you sit there, how to take care of Omega Protein? Will you take the necessary steps to get the benefits of menhaden to Maryland's six million people, especially the 50,000 people protecting Marylanders from COVID, and risking their lives to do so?

Four hundred thousand Maryland veterans, and a million of their family members, need and deserve a much-improved Bay experience. You can start that process right now, to bring Chesapeake Bay wildlife back from the brink. Each of you has been entrusted with a unique power to diminish or improve the lives of all Marylanders, and these deserving people. As you and only you control their food supply. The last day research was wrapped up when your consultant said that you don't need totals. You don't need more research. You can fairly allocate and protect the Bay, by using time and area controls. You have the mail from George, a New York angler, showing the spectacular improvements that have happened there when they outlawed purse seine in their waters.

Our seasons are closing, a moratorium on striped bass is being discussed, but they have spectacular striped bass fishing. In New York the ospreys are flourishing, ours are dying out, due to a lack of menhaden. The question here for every Board member. You can follow the same well-known path of New York, and every Atlantic state but Virginia has taken to protect its environment and its people, requiring the factory fishing be in the U.S. Atlantic Zone.

Maryland can't control what happens in Virginia. That is what you are here for, You delegates, that is what you're here for. You can start that process to protect Chesapeake Bay and Marylanders right now at this meeting, by starting to consider what Dr. Maguire said about the potential benefits of time and area closures. That is what you can do to protect Maryland, and the people that deserve that protection so much.

CHAIR WOODWARD: All right, thank you, Tom, appreciate that. Pete Himchak, you are up.

MR. PETE HIMCHAK: Okay, my name is Peter Himchak. I'm a fishery scientist for Omega Protein, and I would like to talk to the Board about the occurrence of menhaden fish kills in 2020 and 2021. Now I'm not just talking about peanut bunker that get trapped in the confined space by a predator, and die from asphyxiation. We are now seeing older fish dying in the spring and the fall in open marine waters, between New Jersey and Rhode Island.

New Jersey has identified a bacterium of the genus vibrio, that is known to cause whirling disease in hatcheries as the culprit for fish kills in Raritan Bay

and the Navesink and Shrewsbury River. Whirling disease can wipe out an entire hatchery raceway or pond, and it is that fish are characterized by swimming erratically in circles at the surface of the water.

This is unmistakable behavior for whirling disease. I am confounded how whirling disease exists in open marine waters. I know it is a horrible threat to hatcheries. I'm asking the Board to direct the Technical Committee to start compiling some of these fish kill events. Yes, we all experience peanut bunker kills, but it's these older fish that appear to be more worrisome to me.

The Technical Committee, I've been in contact with ASMFC staff and some Technical Committee members are documenting occurrences of this whirling disease phenomenon, and I think the Board needs to direct them to do a thorough investigation on why whirling disease is occurring in menhaden bigger fish out in the open ocean or in bays. Thank you very much.

CHAIR WOODWARD: Thank you, Pete. That is interesting and concerning all at the same time. I've made a note that time allowing, we can maybe discuss that under other business today, in terms of tasking the Technical Committee to do some data gathering and bring a report back.

MR. HIMCHAK: Thank you very much.

CHAIR WOODWARD: You're welcome. Next up is Mr. Zalesak. Go ahead.

MR. PHIL ZALESAK: Good afternoon, my name is Phil Zalesak; I'm from Southern Maryland. I just have one question. What is the mission of this Board, and how is it going? According to the latest fishery management plan, the goals and objectives are as follows. You are to manage the Atlantic menhaden fishery in a manner which equitably allocates ecological and economic benefits between user groups, and you basically have three user groups. You've got recreational fishermen and charter captains in one group, you've got the reduction fishing and the bait fishermen in another group, and then you have people whose livelihood just depends on the health of marine ecosystems. Based on this Board's and Virginia's allocation, Omega Protein, a Canadian owned reduction fishery, is allocated over 70 percent of the total allowable catch for the entire Atlantic coast.

Is this an equitable distribution of American ecological and economic benefit? Is this allocation based on the latest science and empirical data? According to the latest science, which was published January of 2020, predator fish such as striped bass, bluefish and weakfish, are highly dependent on Atlantic menhaden for their survival.

This Board lowered the total allowable catch for the entire Atlantic coast by 10 percent, to lower the mortality rate of these predator fish. However, this Board did nothing to reduce the reduction fishery cap in the Virginia portion of the Chesapeake Bay, and this cap represents 26 percent of the total allowable catch for the entire Atlantic coast.

Clearly, isn't this overharvesting Atlantic menhaden in the Chesapeake Bay? Does this make any sense at all? What does the empirical data say regarding the commercial harvest for striped bass, bluefish, and weakfish over the last 22 years in the Chesapeake Bay and Potomac? The commercial catch for striped bass is down 34 percent.

The commercial catch for bluefish is down 76 percent. The commercial catch for weakfish is down 98 percent. Are we starving these fish to death? What is the latest assessment of the technical group looking into how to measure the Atlantic menhaden biomass in the Chesapeake Bay? The group stated that it will take from five to ten years to determine if the proposed methodologies are valid.

They have also asked additional guidance from this Board. Given the poor state of striped bass coastwide, do we have five to ten years to find out if any one of these methodologies is valid? Finally,

given the science and the empirical data, how do you think this Board is doing in meeting its mission? I thank you for your time and consideration.

CHAIR WOODWARD: Thank you, Mr. Zalesak. Who was our fourth speaker Toni?

MS. KERNS: It was Michael.

CHAIR WOODWARD: Okay, go ahead, Mike.

MR. MICHAEL ACADEMIA: First of all, thank you, members of the Board, for listening. Ospreys, also known as fish hawks, are one of our most iconic and cherished birds of prey. However, they can no longer sustain themselves within the main stem of Chesapeake Bay. Like the proverbial canary in the coal mine, ospreys are warning us of dangerous levels of overfishing.

I'm a graduate student at William and Mary, and represent the Center for Conservation Biology. My Master thesis focuses on the osprey/menhaden relationship. Many birds, such as pelicans, bald eagles, heron, loons, and gannets, depend on menhaden. But out of all of the bird species, osprey stand alone, and are inextricably linked to menhaden.

Due to this dependency, ospreys represent one of the best and highly visible ecological reference points available to science. The Center for Conservation Biology has conducted field work on osprey throughout the Chesapeake Bay for 50 years, and evidence gathered demonstrates ongoing impacts.

Through four generations of Graduate Students, the Center has documented shifts in osprey diet, and reduction in productivity. For example, delivery rates of fish were three times higher in 1975, compared to 2006. Menhaden, once the dominant prey species in the diet, now represents less than 30 percent.

Most importantly, depletion of menhaden has caused osprey productivity to decline to the levels below the DDT era. No other fish species available provides the energy content of menhaden. They provide critical ecosystem services within Chesapeake Bay and beyond. We request that the needs of the broader ecosystem be considered when setting harvest policy, and menhaden populations be maintained at levels that support a healthy ecosystem in Chesapeake Bay. Thank you for your time and consideration.

CHAIR WOODWARD: Thank you very much, Michael. We appreciate that. All right, any other hands up for public comment, Toni?

MS. KERNS: No other hands.

CHAIR WOODWARD: All right, thank you very much.

REVIEW DATA NEEDS FOR SPATIALLY EXPLICIT MANAGEMENT OF ATLANTIC MENHADEN IN THE CHESAPEAKE BAY

CHAIR WOODWARD: We'll proceed with the agenda. Next up we've got Josh Newhard, and he's going to give us a presentation on the data needs for spatially explicit management of Atlantic menhaden in the Chesapeake Bay. You should have all received a written report on this subject. We'll let Josh go through his presentation, and then we'll have opportunity for questions at the end of it. Josh, go right ahead, and thank you for being here.

MR. JOSH NEWHARD: I will just briefly go over the memo that was sent to the Board back in May, and I'll start off with a little background. Back in the 2021 winter meeting, the Board asked some questions about what specifically a spatially explicit model may look like. Now that was a research recommendation for a number of iterations of the assessment, going back a number of years. Just some details into what that meant with that. The TC and the ERP Work Group met to discuss things such as data needs, how long different models may take, what they might look like, and then ultimately the Board also wanted to see if a spatial model could address or answer some Chesapeake Bay management questions, as it relates to the

coastwide population. The TC and the ERP Work Group met, and developed some preliminary approaches, had some discussions on what relatively simple approaches might look like. I use that term very literally, and all the way to fully realized fine scale spatial models.

These approaches vary, you know on their complexity, the data needs, how long they're going to stay, and they each provide some different level of information that may be questions of interest to management. Again, these, I'll say a lot probably, but the data needs, the timelines and the model considerations are very preliminary.

They are just based on our current understanding of feasibility, you know for example once if the TC and ERP Work Groups got into data, found out the data that are available that we know of aren't very good. That would obviously change the timeline for implementation for any of the model approaches.

The right approach will ultimately depend on the management goals, the desires of the Board, and then once the TC and ERP get that feedback, then of course it will depend on data and funding availability as well. Again, over the range of approaches from a coarse broad scale that may require some minimum additional data requirements, all the way to fully realized fine scale spatial single species, as well as multispecies models.

I won't go over the right column there, because we'll go over those more in detail as we move forward. If we start with the most basic approach that we came up would, would actually maintain a coastwide single species and multispecies model, so we would still keep the single species BAM and the NWACS-MICE for the multispecies model. We would still have coastwide ERPs, but we would supplement it with some Chesapeake Bay specific information. To do that we would be able to provide some level of insight to Chesapeake Bay related harvest, and how it relates to the coastwide TAC. That would require some supplemental Bay information, specifically menhaden abundance estimates in the Bay. One example of what that might look like is, you know five to seven years of an aerial survey. We could use some supplemental Bay multispecies indicators, using some existing datasets that are around.

That would only provide a qualitative context of the Bay Cap, not a quantitative one. Again, this kind of approach would take estimated, maybe five to seven years, given some targeted funding for surveys and personnel availability, if that was targeted for funding, could perhaps, potentially increase that timeline. Moving on. If we were to take a little bit more refined look, we could actually provide info on a broad spatial scale, so some sort of regional scale.

The example listed there, New York, Mid and South Atlantic. We could add a Chesapeake Bay Region. Note that that Chesapeake Bay Region would include coastal waters that harvest, and those Chesapeake Bay states would be lumped into that Chesapeake Bay Region. This kind of approach could be explored with some existing data. Some of the uncertainty that would surround that would be that we don't know differential migration rates by age. We would have to assume that all ages would migrate at the same rates and spatial scale as well. That could provide info for the Chesapeake Bay Cap, as well as potential regional allocations, if the Board desired to go in that direction. That timeline would also be within five to seven years, and again, that depends on the data, how good the data are that are out there, and finding the personnel availability. Stop me if you've heard that one before, you'll hear it again.

If we had a coarse spatial BAM, we could take it two different approaches. Where we have a coarse spatial single-species model combined with a coastwide multispecies model. That would still produce the coarse spatial dynamics for just

menhaden alone. Whereas, with the multispecies model we would still have coastwide ERPs.

We could do it the other way, where we have coarse spatial, both single species and multispecies models. If we had some more complex spatial approaches, again we would just be narrowing down those scales. We could perhaps have a Chesapeake Bay specific region that does not include coastal waters.

The ERPs could either be coastwide or spatially refined. This type of approach, as you might expect, would take quite some time for development, we're talking a decade or more perhaps. Again, if we have targeted funding for some of the survey data that may be missing, or some data mining funding personnel, these timelines can be adjusted.

But a refined spatial single species model, with the multispecies ERPs, we would need those fine scale migration rates at age between the regions of interest. Whatever those regions were determined by the Board. You know you're talking perhaps a new comprehensive tagging study, some pretty extensive data collection there.

We would also need some seasonal spatial distribution maps, some trends in abundance within whatever those regions are, as well as catch-specific data. This type of approach is not even feasible, until those movement data are even available. We have our most complex approach would be a really detailed spatial single species and multispecies model.

We have detailed spatial ERPs. This would be the whole shebang. It's a fully realized fine-scale model, and we don't even know potentially what that could look like. It could be the NWAC-MICE model for multispecies, it could be an entirely new modeling approach. This type of thing would be quite labor intensive, you're talking fine scale spatial resolution that have habitat gradients built in, jurisdictional boundaries.

The spatially temporal maps need to be developed on some sort of scale that is appropriate for management. We would also need a lot of multispecies interactions, data, different movement data, as well as diets as well. That would actually require some software development, which of course that is adding to that decade plus time scale.

Again, this isn't feasible until we have vetted that fine scale spatial data. Just to sum up, this is a table of going from, at the top is our least complex broad approach, all the way down to the bottom where we have a detailed single species and multispecies model. The timeline there is kind of what I suggested, and then you can see a process going from left to right. If it offers some single species Chesapeake Bay reference, some information. That is that first column, and you can see what kind of information each model type may provide. The single access there would just indicate that we're only looking at, like a qualitative information, not quantitative. Again, these time scales are really rough, depending on personnel funding, as well as data quality. Obviously, the most that you get would be the detailed.

You can get single species and multispecies Chesapeake Bay related information. You get information on regional allocation, and you get fine scale spatial models. If the goal of the Board is just to get single-species Chesapeake Bay information on menhaden alone that could be provided by the least complex approach.

Again, the funding needs. We had some talk about what type of things should be funded or could be funded to help speed things up. Again, that is going to depend on the approach, and the approach is going to depend on the desires of the Board. If we had some funding directed solely for model development, that could shorten those timelines that were just presented.

The Chesapeake Bay Menhaden Abundance Survey is something that has been brought to the TC

before, where it's been an aerial survey that has been approved. We would need the abundance survey information for coastwide ERPs, but with the Chesapeake Bay abundance approach, we would need that information on menhaden abundance.

That also could be beneficial for some of the other approaches as well though, so it wouldn't just be solely for that coastwide ERP single species approach. We would need some spatially and seasonally explicit diet data, as well as spatial temporal maps for the key predator and prey species that are in the multispecies model.

That would be useful for the coarse approach, but we could potentially use that coarse spatial model without the spatial and seasonal diet data. Lastly, we would need some fine scale migration rates between regions by age. Now that would be needed for any refined or detailed approaches for those most complex models that I mentioned.

Really what the TC and ERP groups would need from the Board is, what is the primary goal for this spatially explicit modeling? Is it solely to inform the Chesapeake Bay Cap, or how Chesapeake Bay related harvest influenced the coastwide population? Is it the Board want to move towards regional allocation and need some information on that?

Is it something else that we haven't thought of? We really need to get that, if we're going to move toward a spatial model. Then if there are any secondary goals of that, that would help inform the modeling approach that we would attempt as well. Then lastly, this is a big one too. What tradeoff is the willing to accept, given the desired goals, as well as the timeline for implementation?

You know if, for example, you wanted it done quickly, are you willing to put off the next benchmark stock assessment. Some of those tradeoffs really need to be considered, to help the TC and ERP Work Group move forward. I think that is the last slide, and I could take any questions. Oh, I've got one more. I might have kind of mentioned it, but yes. The ecosystem objectives, you know if they are Chesapeake Bay specific questions, are those exactly the same as coastwide ERPs? Maybe it's different predators, there are different, obviously, predator/prey dynamics with that occurring within the Chesapeake Bay separate from the coastwide population. You know with the Board, I mentioned that in some of these approaches the Chesapeake Bay Region would include coastal waters, and would that be acceptable by the Board, or would you want just the Chesapeake Bay specific region, and not include those coastal waters? With that one I could take any questions.

CHAIR WOODWARD: Thanks, Josh. Thanks a lot, to the TC and the Work Group for distilling this down to a clear, concise document for our purposes. I appreciate the fact that it is mentioned repeatedly that it is contingent on data, quality data, and personnel and funding. That is something that we all have to keep in consideration.

We moved into an era of ecosystem-based fisheries management, knowing that it relies on a tremendous amount of timely and quality inputs. You know it kind of reminds me that you don't run a top fuel dragster on stale lawnmower gas, you just can't do it. Those are things we're going to have to bear in mind. I would open up the floor for questions right now, so if you will raise your hand, and we will get everybody in the queue.

MS. KERNS: Mr. Chair, I'll give you three names for now; Allison Colden, Justin Davis, and Marty Gary.

CHAIR WOODWARD: Okay, all right go ahead, Allison.

MS. ALLISON COLDEN: I just have to say, I always appreciate and enjoy your metaphors, so thank you for that, and thank you, Josh, for the presentation and the work of the TC and the ERP Work Group on this. It really is a tremendous amount of

information, and putting forward a lot for the Board to consider.

One thing I'm sort of curious about, in terms of the goals in moving forward in a spatially explicit is, I would be curious if you could comment on what the Technical Committee's motivation might have been in including it in their research recommendation. Is what you presented to the Board what the Technical Committee was envisioning when including that research recommendation, fall under one of these options, or was it purely a recommendation based on model performance?

Was it a recommendation based on acknowledging that the spatial distribution is an important dynamic that is not currently captured in the model? I'm just sort of wondering what the Technical Committee's original motivations were, in putting it in the recommendations, and where that falls on the spectrum that was presented. Thanks.

MR. NEWHARD: I can try to answer it. I don't know if ASMFC staff is onboard, so I know it's been in there for some time. But you know ultimately, I think it was just to refine perhaps some of our estimates. You know what is presented to the Board is probably more refined than even at the species scale, which is dire. But it was useful in that it started the conversations now, instead of waiting years from now, of what that may look like. I know the recommendations have, at least the priorities have changed. I would offer that if ASFMC staff is onboard, if they want to chime in too.

DR. KATIE DREW: Yes, this is Katie. I can take a stab at that and just say, you know I agree with Josh's comments. I think the ERP Work Group and the TC kind of see incorporating spatial dynamics into the model as a logical next step for the development of this model, to kind of improve our estimates, and improve the model overall.

I think kind of the degree to which we pursue that, the degree to which we accelerate and dedicate time and funding to that, will determine the degree to which the final product resembles something on this list. I think we see it as a natural evolution of where we are with this ERP model, and that is why it's included as a research recommendation.

CHAIR WOODWARD: Do you need follow upon that, Allison?

MS. COLDEN: No, that was very helpful, thank you.

CHAIR WOODWARD: All right, Justin, you're up, and then Marty is on deck.

DR. JUSTIN DAVIS: I think this probably follows from Allison's question. When looking at that table that was presented towards the end of the presentation there, which sort of outlined, as you moved from the most basic approach down to the most complex, and sort of what you would get from that.

I just wanted to clarify my understanding of that. It seems like until you get to the break point, where you're making the multispecies model spatially explicit, you are not going to get essentially advice out of the modeling approach that is going to provide regional TACs or reginal sort of targets for the fishery.

But before that, in that sort of intermediate level, in which you're incorporating spatial dynamics into the BAM single species model, but you're still considering the multispecies model on a coastwide basis, and saying coastwide ERPs. The primary benefit there, as I understand it, would be the model might more accurately capture the dynamics of the population in the fishery, because you're taking into account differences spatially along the coast.

But that ultimately at the end of the day, we would still end up with a coastwide TAC that we measure performance against, and that sort of from the first row of the table on down, it is sort of baked in that we would be doing that Chesapeake Bay Aerial

Survey, or something similar, that gives us advice on abundance in Chesapeake Bay, so it would help us have better context for the Bay Cap. Is that all accurate?

MR. NEWHARD: I think most of it, yes. Yes, the first one of course, yes that would be just to provide some level of context for the Chesapeake Bay Cap. I think I might have misheard you, but it's not necessarily influencing how the Chesapeake Bay influences the coastwide, you know the fishery necessarily. If that is what you meant. You can correct me if I'm wrong. But you are right in that, you know not until we get more refined spatial scale, whether that is some sort of broad multispecies approach or not, will you begin to get that multispecies regional ERP. We would mostly maintain that that coastwide ERP, while taking a more regional look at the single species, with some level of Chesapeake Bay related information. I think the one thing too that it would ultimately depend on the goals.

I know it is not necessarily that we would have to always have some index of abundance for Chesapeake Bay abundance. If there are some existing datasets that I mentioned we could look at that may provide some insight, if the goal was not necessarily to inform the Chesapeake Bay Cap, does that make sense?

DR. DAVIS: It does.

MR. NEWHARD: I think each one does not necessarily need the same level of additional data. It's not like just because the first one says we need some abundance estimates in the Chesapeake Bay, it doesn't necessarily apply to other modeling approaches. It would help, but.

CHAIR WOODWARD: Do you need follow up, Justin? I guess not. Marty. Who is on the list, Toni?

MS. KERNS: After Marty, we will have Conor, and then Joe Cimino, and then Lynn Fegley.

CHAIR WOODWARD: Good, go ahead, Marty and Conor, you are on deck.

MR. MARTIN GARY: Thank you, Josh for your presentation, it's a lot of information to process. I feel like a goalie that just saw five shots go by him, and just trying to figure out what happened, but on the theme of spatial resolution more generally speaking. A question that I get asked quite a bit by our constituents.

In trying to better understand this species utilization of Potomac River habitat, which widely varies based on flows, salinity, temperature, and seasonal hypoxia which is a serious force in the river during the warmer months. Is there a level of spatial resolution, Josh, that will allow us to understand how this species utilizes the Potomac or portions of the Potomac to some degree?

Is that really kind of just a matter of default in the priority and we have the boundaries. Is that attainable, I guess? This, I guess is asked. This question is asked of me, because folks often link predator availability hand in hand with it, and I'm not sure if it's exactly the case all the time, but they certainly seem to observe predator species like Spanish mackerel showed up in the river two years ago.

We're 50 miles up the river, and nobody could remember the last time they saw something like that. They were linking that to a large group of menhaden that were in the river. Whether that is true or not, I don't know. But I guess ultimately my question is, what do you say if there is funding in time for the next, would you be able to spatially address some of those ??? Thank you.

MR. NEWHARD: I think, I didn't catch if you asked part of your timeframe. You kind of broke up there. But I got the gist of your question, and I think, you know ultimately, there is a modeling approach that would address the question. Now, you know I'll say it again. The modeling approach would totally be based on the goals of the Board. We would need to have, if the goal was to have some sort of regional allocations with seasonal, you know multispecies.

That is going to be one of those more refined models that is going to take some time to develop. But I think ultimately, we could answer your question, of seasonal availability of predators and prey. You know that would be a fully realized, detailed, fine-scale spatial model. But it could potentially be done. A timeframe of ten plus years is pretty broad. But given the data, it could be done.

MR. GARY: Thank you very much, Josh, I appreciate. It sounds like it's kind of codependent on some hard wiring with some of the Board's needs and desires, so thank you. Thank you, Mr. Chairman.

CHAIR WOODWARD: You're welcome. All right, Conor, you're up, and Joe Cimino, you are on deck.

MR. CONOR McMANUS: Thank you, Josh, for your presentation. Just thinking in the context of priorities and balance and competing needs, for research and work. I guess my first question was, trying to think through, you know depending on the goal, and looking at the approaches in Table 1.

Is there an opportunity for some of these to not be mutually exclusive, and build upon them sequentially? Perhaps one of the tools be this five-to-seven-year mark estimated. But in that time, you're also somewhat building towards the more refined spatial BAM or NWACS-MICE model for ERPs?

Then I guess my second question is, if one of these elements were chosen for a direction, would that still allow for reevaluating multispecies models for ERPs, which was a discussion when we first looked at the ERPs. That might be challenging, based on workload for the TC and the ERP Working Group. I just wanted to get a better sense of what allows us to keep evaluating and improving the multispecies model, while pursuing these additional spatial data needs.

MR. NEWHARD: The first part of your question, I mean definitely some of these could build upon one to the next. I mean clearly if we had some idea of menhaden day abundance that would help inform, you know other modeling approaches. You know the tricky side of that is, you know like you mentioned with time and staff availability.

There is no sense in necessarily moving towards a regional allocation model, if the Board is not going to manage the fishery as such, of course. You know these things, it's hard to separate any one approach and say, well that is the ideal approach, because it totally depends on the goals, of course. While some of them, yes, I think any of the data collected in one would likely inform the other. Again, if anybody wants, an ERP group or TC staff wants to chime in that's fine. I think that answers your question. The second part of your question is honestly, just quite difficult to answer. Like you said, if they could be given time and staff availability, all the timeframes for the next benchmark. That one is hard to answer without any real clear, definitive questions from the Board to answer.

CHAIR WOODWARD: Okay, Joe, and then Lynn, you're on deck.

MR. JOE CIMINO: I want to give my gratitude to the TC and the ERP group on this. I appreciate all the hard work. We talk a lot at ASMFC about how things have been changing, and in an allocation sense we're going to have those conversations. But I've had concern for some time that this Board seems to have tunnel vision on the importance of the Chesapeake Bay, when we continuously talk about how much things have changed.

My question to the groups would be, you know what are the dangers of ignoring or not paying attention to the very possible examples, that there are nursery areas that are of growing importance north of the Chesapeake Bay, and I agree with Katie, that you know a spatially explicit model is probably the next logical step. But if we're only tasking you to focus on the Bay, what are the dangers of ignoring other areas?

MR. NEWHARD: That one is hard to answer. I mean the simple answer would be, I mean if we're spending time looking at the Bay, we perhaps may not be spending time looking at other stuff. But that all depends on the approach as well. If it's just something relatively simple.

I mean that TC has looked at and approved aerial survey designs a number of years ago, for the Chesapeake Bay specific, and it didn't seem to detract away too much from coastwide issues. You know the quick answer is, I mean I don't really know. But there is opportunity there to do both, given again, that all goes back to staff and time availability though.

CHAIR WOODWARD: Lynn, you're up.

MS. LYNN FEGLEY: Thank you so much, Josh, for this presentation. I had a question, and then I wanted to make two points. My question really has to do with this idea of ERPs. No matter how much modeling or data we have, an ERP still has, you know it's a value judgment at the end of the day. You know this Board worked really hard to develop those coastal ERPs, we started with the beginnings of a management strategy evaluation, to develop goals that went to years of modeling.

We made a decision, a consensus decision on what we felt was the appropriate level of harvest to conserve enough fish for its role as forage. My question to you really is, I'm hoping that you can clarify a little bit for the Board that, no matter where we go with this Chesapeake Bay data, that we're still going to have that issue within Chesapeake Bay about deciding how much is ultimately enough, because we're going to have.

You know, we have people in the Bay who, rightly so, are extremely concerned about our ecosystem in the Bay. I think that their argument would be, you know what, we need to leave every single available fish in the water, to serve as forage. But then the other extreme would be, well maybe we only need to leave just enough to make sure that the striped bass population is ticking along at its biomass target. I'm hoping, and if you'll indulge me, Mr. Chair, with a follow up. My first question really is to Josh, just if you can help the Board just confirm or deny that there is this value judgment component to an ERP.

MR. NEWHARD: Well, I mean I guess to a degree, because it is up to the Board to ultimately decide on these model-adopted things. Obviously, some of it is left on the table with the, there is other predators and prey, you know that are included in the model. We're still working it under this to better refine those multispecies models, and the ERPs as well. You know that might be almost a better question to the Board, in terms of that. I'm not sure if I answered your question there or not, but happy to take the follow up.

MS. FEGLEY: No, I think that was a good try. I'm just thinking about the rainbow plot that we have, and I really just want to make sure we all understand that there may not be one firm right answer at the end of the day. I just wanted to follow that up by saying that given that, and I might be jumping the gun.

But from the state of Maryland's perspective, I think that we have zero desire to delay the benchmark. I think the ecosystem reference points that we put in place are one of the most important things we've done, to safeguard our ecosystem. I really would hate to see that delayed.

Then I just wanted to close by saying that I think if we're at the point where us as the Chesapeake Bay states need to figure out a way to rally some resources, and really understand how we can start producing Chesapeake Bay specific data on menhaden. This is our largest estuary in the United States.

It's an incredibly important body of water for many of the species that we manage. I would just sort of like to go on the record to say that, you know we're going to make a commitment, to see if we can figure out a way and rally some resources, to really

start getting some of this abundance in diet data for our Chesapeake that can represent our area. Thank you for that.

CHAIR WOODWARD: Any other hands, Toni?

MS. KERNS: Mr. Chair, you have Dennis Abbott, Max Appelman, and then Allison Colden, I think is looking for a second bite at the apple. I'm not 100 percent sure if Justin Davis had a follow up or not. His light went on, and I think we ended up talking over him. Then Pat Geer just put his hand up as well. Then you do have some members of the public, if you want to take public comment on this.

CHAIR WOODWARD: Well, I'm going to refrain from that for the time being. We need to judicially use our time. Dennis, go ahead, and Max you're on deck.

MR. DENNIS ABBOTT: I have some comments and a question. The question might be, if we were to embark on a study program that might take five-to-seven years in its simple form, or ten years in its complex form. Following the completion of that study, would it not be important to continue the study, as things are constantly changing? That is a question for the presenter, but the concern that I have is, as I was listening to the presentation, was that if we move ahead with this, which is probably a good idea. We would be looking at a period of time to authorize it, and then we would be conducting the study in five or seven years, maybe, which probably means it would take longer.

Then when we received the results, it would probably be another year or two before the Commission would take action, and then we would have an implementation period. This all adds up to 10 or 15 years down the road. I would venture to guess that 95 percent of the people listening to this conversation as Board members, won't be around. I know I won't be around, because I'm 80 years old, so I probably won't see the results of this. I'm also concerned about whether this study is going to take away from us dealing with the issue of the Chesapeake Bay problem today. Lynn Fegley made a lot of good points about, in Maryland they have people that may want to leave every menhaden in the water, and vice-versa.

But I'm up in New Hampshire, and I'm a long way from the Chesapeake Bay, but I'm very concerned that for the health of the striped bass that head this way every summer. I think that we have to deal today with a real or perceived problem of the Chesapeake Bay Cap. My telephone is ringing, so I'll stop there and say that in a parallel course we should be dealing with this study, but we should also be dealing with the Chesapeake Bay problem today. Thank you.

CHAIR WOODWARD: I think you had a question in the front of that. Do you still have that in your head, Josh?

MR. NEWHARD: A little bit. I got a little sidetracked. But I will say that I think some of this stuff, well again, we go back to funding and personnel availability, if you have some dedicated model development that kind of shortens some of the timeframes potentially. But additionally, you know some of this information would help inform, you know if they are able to go concurrently.

You know abundance estimates in the Chesapeake Bay would help inform the current modeling, as well as migration rate at ages would help inform ongoing modeling. You know, there could be some added benefit given staff and funding availability, that they could inform each other but, while model development you know more complex modeling is going on.

CHAIR WOODWARD: Okay, I have Max. I think you want to talk, so you can make sure that that blank check that NOAA Fisheries is going to send us for all this needed work gets to the right place, is that correct?

MR. MAX APPELMAN: Thank you, Mr. Chair. I guess I should start by managing expectations on our commitment for funding and personnel time, so I'll put that out there. But I wanted to add on to a line of thought that I think it was Allison, right at the beginning, about the TC and ERP Work Group, their initial rationale for having this sort of research recommendation in there. I appreciate the Chair's remarks at the start, to let this marinate a little bit before we start considering actions. With that in mind, I think it would be really helpful for me, and maybe for others, to elaborate a little bit more on, you know if this line of tasking wasn't going on right now, where would the TC and ERP Work Group be going with the spatial information, given the data that they know to be available now, and the modeling capabilities that are available now? You know, what would be the next step from your perspective, given the internal conversations that are happening amongst those committees?

MR. NEWHARD: Katie, that might be a better question for you, if you don't mind.

DR. DREW: Sure. Yes, that is a good question. I think on the ERP Work Group's list, I think for the next benchmark assessment, Number 1 would be resolving kind of the seasonal issue that we identified, as sort of some of the uncertainty, when we were initially setting these reference points. Kind of resolving the seasonal issue would be our first priority. I think we would be interested in looking at a coarser spatial scale than the coastwide level.

But I think it would be hard to say, you know what that would look like with the available data, and it's not really something that we could finish for the next benchmark assessment. I think that is something we could start looking at, as well as potentially, you know start looking at some alternative formulations for the ERPs, in addition to the existing NWCS-MICE Model, do we want to refine the multispecies catch-at-age model, or things like that, or continue to refine those models as we go forward.

I think there is the coarse spatial resolution, very coarse spatial resolution would probably be one of our next steps, for sure, to look at this, but not something that could be done for the next benchmark. Unless the Board identified that as a very high priority, and wanted to give us a little extras time to shift that benchmark back, and focus a lot more time and resources on that particular question, which is one of the options here. But I think it is kind of a longer-term goal of the Committee in the end.

CHAIR WOODWARD: Any follow up with that, Max?

MR. APPELMAN: No, I mean that was really helpful. Again, I appreciate that we're buying ourselves some time here, and letting all this information sink in. I'm just letting it marinate a little bit more. That was definitely helpful, thank you.

CHAIR WOODWARD: All right, Allison and then Justin. Sorry if I missed you earlier. I'll call on you after Allison.

MS. COLDEN: I appreciate the second round here. I just wanted to call the TCs attention, if they didn't already discuss it in the meetings. There is some existing work that was funded in the Chesapeake Bay Region, to develop specific forage indicators, as well as Chesapeake Bay specific menhaden abundance estimates.

I'm not sure what the protocols are. I know in the past there have been external studies that have been reviewed by the TC, and the ERP Work Group, to be pulled into the ASMFC process. But I just wanted to flag that there has been some funded work, I believe, by the NOAA Chesapeake Bay office, that could possibly have some management or technical implications here. But I do know one thing I want to flag, which is related to all of the caveats that Josh has been so diligently giving us about data availability and the feasibility is, it's my understanding that the funded study to develop a menhaden abundance estimate for Chesapeake Bay

was not actually able to move forward, because industry was unwilling to provide the data to the PIs who were funded to do that project.

I think that that is an absolute shame, and that we had an opportunity there to move something forward, and there was a lack of cooperation that caused that to stall out. I want to flag that we're going to need that type of cooperation, if these improvements to the model and to our management structure are going to move forward, and hopefully flag those studies for the TC, if they weren't already aware of them. Thanks.

MR. NEWHARD: Thanks Allison, yes, of course we would welcome any external data or studies that would improve the modeling.

CHAIR WOODWARD: Justin, you're up, and I guess Pat you're on deck.

DR. DAVIS: No need to apologize for before, that was operator error on my part with the mute button. I just had a comment quickly. I can certainly appreciate the advice from the Technical Committee that we would want to wait five-to-seven years before incorporating new information from an aerial survey in Chesapeake Bay about abundance.

I worry that those members of the public who might be listening to this meeting, and have real concerns about localized depletion in Chesapeake Bay, might sort of think that is completely unacceptable, that we are going to have to essentially wait the better part of a decade before possibly taking action to change the Bay Cap, or have better scientific advice on how to manage the Bay fishery.

You know I would just hope that this Board, out of a sense of precautionary management, if there is strong indication from ecological indicators, or possibly other sources of information, like Allison just mentioned. There is strong reason to believe there might be localized depletion going on in the Bay. I'm hoping this Board could take some precautionary action on a more urgent timeline.

I think about what we're doing with striped bass right now in Amendment 7, where we're contemplating changing fishery measures next year, to protect the 2015-year class. That is absent any information from a stock assessment model, that suggests that current measures are inadequate to protect the 2015-year class, or current fishing rates are too high on that year class. We're doing it out of a sense of being precautionary, so I would hope that we could apply that same spirit for menhaden management. Thanks.

CHAIR WOODWARD: All right, Pat, go ahead.

MR. GEER: I just wanted to agree with what Joe Cimino was saying, about yes, we need to look at the Chesapeake Bay, but we're seeing a large increase in harvest and abundance up in the New England states, and we need to be looking at that as well. I agree with Lynn, I do not want to see the stock assessment delayed. I think the general public wants to see that stock assessment done on schedule, and I think we need to stick with that. But I agree with Lynn also, that as a Chesapeake Bay state, we need to start looking at ways to get this information. We need to work together and try to do what we can, and that Chesapeake Bay program project that Allison mentioned, we worked very hard to try to get access to those data.

They didn't refuse access to it; they just didn't want to be the first species that they are doing. They are going to hopefully be doing this on one or two species every couple of years, and they just didn't want to be the so-called guinea pig for the first time around. Omega staff, I think Pete is going to be sitting on that group, reviewing the striped bass process, to see how it goes. They didn't refuse, they didn't want to be the guinea pig on that. I am hopeful that down the line, those datasets would be made available to help answer some of those questions.

CHAIR WOODWARD: Before I catch up with the hands, I'm going to use Chairman's discretion. I've got a question myself. For either you, Josh, or

Katie, and that is, can you just remind us of the relationship between the BAM model assessment of menhaden, and the timing of the predator species in the NWCS-MICE model assessments?

In terms of do they need to be synchronized, you know if they are not in synchrony, how does that effect the model inputs and the model outputs, because I think that might have some ultimate bearing on the decisions we make about when do we do our assessments, and the consequences thereof.

MR. NEWHARD: I don't have the timeline in front of me. I do know that the multispecies models are not in sync, and I believe that was a recommendation following the multispecies assessment. I'll let ASMFC staff chime in on that as well, they might have the timeline a little bit more in their heads.

DR. DREW: Yes, so we would get the best information out of the multispecies model, if we had the single species assessments for the predators and alternative prey species complete, all the way up through the same terminal year as the menhaden assessment. We would need a little bit of tweaking to the schedules to get them to all line up exactly right, to have the most up to date information available in that regards.

I mean I think it is something we can deal with if necessary. But it is kind of making sure they are aligned, and making sure we have the most up to date information for those other species, gives us the best information out of the NWCS-MICE model, or whatever other ERP model we're using.

CHAIR WOODWARD: All right, Toni, hands?

MS. KERNS: I think you have exhausted the hands of the Board. Pat Geer, is that a hand that stayed from before? Yes, it was. That is all the Board members.

CHAIR WOODWARD: All right, very good. Thank you all for the questions and the comments. At this point, what I would strongly urge the Board to do is to take the memo, and give particular attention to Page 6, where it says Management Input Needs, because that is what we're going to need to do when we convene again in October, is to look at that list, and think hard on that list, and think is there something on there that is missing, so that we can give clear guidance to the TC and the Work Group on how to move forward. I think that list needs to be looked at with the realities of consequences of delay, and the consequences if funding is not available to acquire the data we need. It's always difficult to lower one's expectations because of those realities. I think that is something we're going to have to be burdened with. At that point, are there any final comments or questions about this agenda item?

MS. SARAH MURRAY: Hi Spud, this is Sarah Murray. I just wanted to chime in, if that's okay, because I have the stock assessment schedule in front of me.

CHAIR WOODWARD: Please, do.

MS. MURRAY: I do want to note that while not perfectly aligned, given our current schedule, the ERP benchmark is reasonably well aligned with the other species that go into it, so that could not be the case if it got shifted. It might be that it happens to fall on another year, where it does align well, but currently it's in a reasonably good space with lining up with the other assessments.

CHAIR WOODWARD: Thank you, I appreciate that. Again, any last comments, questions? If not, I recommend that we take a short break, a biological break right here. Let's take five minutes for a biological break, and then we'll come back and get into our next agenda item, which is Review the Work Group Report on Commercial Quota Reallocation and Other Provisions of Amendment 3. You have a counter on the screen.

(Whereupon a biological break was taken.)

REVIEW WORK GROUP REPORT ON COMMERCIAL QUOTA REALLOCATION AND OTHER PROVISIONS OF AMENDMENT 3

CHAIR WOODWARD: Okay, it looks like our break time is up. Our next agenda item is Item Number 5. Are we queued up and ready for Rob's presentation?

MR. ROB LaFRANCE: I'm just waiting on our presentation, and I will move on from there. But while I'm waiting for that, I just wanted to thank you, Spud, for having the confidence in me, to allow me to Chair this Committee. It has been really, quite a learning experience for me, and I really appreciate the hard work of all the members. We'll get into a little bit more of what they did when we get the presentation up. I'll just hang for a second, and then we can get going.

CHAIR WOODWARD: Thank you, Rob, taking on the task of a work group is never easy, and you did a great job, as did all the members of the work group. I certainly very much appreciate it. I can't imagine this Board having to have wrestled with things to the degree of detail that you all did. It would have taken many hours, so thanks again.

MR. LaFRANCE: Okay, I see we've got the presentation up, and maybe we can jump into the next slide. We just put forward an outline. This is sort of the same outline that we put forward in the report, which everyone got in their supplemental materials. Effectively, we started from a Board motion from the last meeting. We will talk about that and lay that out in a little bit more detail. The Working Group was appointed by the Committee Chair, and included the states that you see above up there. What we did with the report itself, we set up the background about some of what the issues are, and then really got into what are really the main topics of the report. Allocation, which fortunately for me, I was very happy to have different members of the Working Group take lead roles on this, and on the allocation section, Megan Ware, of Maine, was the lead.

On the incidental catch and small-scale fisheries, I had Allison Colden taking the lead on that on the report. On the episodic event set aside, Nichola Meserve was the lead there, and then on additional strategies to address the amendment options, Amendment 3 provisions, we had Joe Cimino.

Kirby did a great job, and I just can't thank him enough for all of his additional information, providing everything he did to me, laid out some of the real issues surrounding quota transfers, which we'll get into in a little greater detail. Finally, I just want to make certain I recognize Pat Geer and Chris Batsavage from North Carolina, for their very helpful and informative information.

This is the Board motion that we had from the last meeting; move to create a work group to develop an allocation of options, to better align jurisdictions commercial quotas with current landings, and fishability, while providing a level of access to the fishery by all Atlantic Coast jurisdictions.

To review the incidental catch provisions, including gear type, eligibility, and reduce the need for quota transfers. As a Working Group, our job was to lay out a number of different options, so that is what we really tried to do. In each one of these categories that we saw before, we gave a little bit of history about what was happening in those particular areas, and then we offered up different options.

We're looking at Amendment Number 3, and the current provisions. Those provisions included jurisdictional allocation, so the allocations were basically set out for each jurisdiction as a percentage of the overall TAC. In addition to that we had this incidental catch and small-scale fisheries provision, which small scale fisheries is something we'll definitely have to delve into a little bit more detail.

The episodic event set aside program, and then sort of everybody needs to recognize that we're looking

at a total available catch, which has now been reduced from where we used to be, of about 216,000 metric tons. Now under the new ERPs, we're down to 194,400 metric tons. As we get into the allocation issues to see how that change impacted.

MR. ROOTES-MURDY: Hey Rob, we're having some issues hearing you. If you could speak into your microphone a little bit closer, that would be great.

MR. LaFRANCE: Thanks, Kirby, I appreciate that. Sort of reading off of this here as well. Anyways, the point is that the TAC, we're going to have to revisit the TAC going into the future, and some of the changing dynamics that we're seeing, particularly on allocation, is that there has been an increase in landings in the Gulf of Maine. Now the issue as to why that's happening, we could maybe talk about, but my sense of it is, is there has been more bait landings up there, really responsive to the lobster fishery and the need to capture bait for lobster, that used to be herring, and now is more and more relying on menhaden. I think this quote really came from Megan Ware. We have a mismatch right now between quota and fish availability, and in essence, we're going to take a look at the allocation provisions in just a second.

But the change in state fisheries and landings since 2009 and 2011, which is the time period that the allocations were based upon, has really sort of shifted, particularly in the northern states. The seasonality of fisheries presents the issue around quota transfers as well. As people fish the species under their existing allocations, if they run out of an allocation, they need to see quota transfers from other states.

In our report, we actually lay out some of the history of what has happened, and what states have transferred quota from certain states to other states. Certain states, and most of the states have gone from a variety of states up to the northernmost states. Then fixed minimum quotas has resulted in latent or unused quota.

I think that was something that we were all being asked to take a closer look at, as part of the Working Group. The fixed minimum, again the fixed minimum could vary in each year, depending upon the value of the TAC. That is another thing that folks needed to recognize. These are set out in percentages, the allocations are set out in percentages of the TAC, and so if you change the TAC, you're going to change the actual quota or the amount of landings that can happen in each state.

This is probably the most significant chart that we worked on through the Working Group. Effectively it shows what the allocations were. Those were that 2009 to 2011, you can see the allocation percentages in each one of those. Then in Amendment 3, every state got a minimum allocation of 0.5 percent.

The issue there really becomes, how much of that 0.5 percent is really not being utilized under the now-existing total allowable catch, which has been adjusted for ecological reference points. I know we heard a little bit more about how that may play out in the Chesapeake. I think those are issues that will be separated from this.

We were really trying to focus on the existing standards, and some of the mismatches that existed, particularly in northern states. When we took a look at the allocation, we're really focused on that chart above, and we started to figure out what kind of strategies could we put forward. In looking at those, the question that really came up was, how are those percentages developed? Could we look at changing them in a different way?

One of the approaches, and this is something that the PDT ultimately, I would imagine, would look at, was considering a 50/50 split between the current allocation and something in more recent years. The idea being, that the utilization of the fishery has changed from one place to another, and maybe we have to take a look at historic landings at one level, but also take a look at current landings, to find out

whether or not there is a shift there that makes more sense, given the current utilization of the resource. Another would just be to say, listen, we're not going to do the 50/50. We're not going to look historically and go forward in a different way. We just need to update the landings, and update the allocations based upon that. Another was to take a look at a longer timeframe, basically going and looking at a longer timeframe, and examining landings over a longer period of time.

These are all potential strategies to determine whether or not the current percentage allocations of the TAC could be shifted in some way, to more closely align themselves with what states are actually doing. The other thing was to try and figure out whether or not, so when you took a look at the allocations earlier, you saw that everybody got some fixed minimum amount.

The question was posed as a strategy is whether or not we should consider a tiered approach, to basically adjust some of the fixed minimums, depending perhaps on what those states are actually landing, depending upon, there could be a number of factors that you could look at to determine how you would move from say a half a percent to one percent, for those states that just are working off the fixed minimum, but something that a tiered approach would get you to take a closer look at.

Next would be to take a look at a jurisdiction's best year landings, in a time series as opposed to an average. Would a base allocation be based upon a particular jurisdiction's best year, and then allocated according to that? That is another option to take a look at. In terms of how frequently to review these allocations.

I think the Work Group agreed that we need to continue to review allocation regularly, because of shifts of what we see in the fishery. Fisheries are changing as a result of fish moving, some of the climate issues, but also fish needs changing. Bait fishery needs changing, potentially, reduction fishery needs changing, and also recreational uses as well.

Another idea here is to limit the percentage reduction in allocation for jurisdictions, so this was sort of a transitional issue, as to whether or not a particular jurisdiction, based upon some public comment that we got, that there is an interest in making certain that investments made that are actually part of the landings system, if you will, aren't overly burdened by a quick transfer of allocation.

We're going to go into the incidental catch in small fisheries. But when we go to questions at the end of this, I would ask that Megan Ware can maybe help me on some of the questions to this. She is most familiar with some of that, and put together a lot of the portions of that report. Incidental and catch in small scale fisheries, so this is kind of a very unique element of what happened in Amendment Number 3.

The incidental catch in Amendment 3, also included something called the small-scale fisheries. If you take a look at the report, at the very end of it, you'll see the whole amount of transfers that have moved from one state to the northern states. But in essence what you've seen, is there has been a lot of change, in terms of the small-scale fishery movement.

The incidental catch, small-scale fisheries in 2017, was averaging, I think 4.5 million pounds on average. But in 2020, it's up to 13.9 million pounds. You can see that there has been a big pressure on the small-scale fishery, in terms of pressure on the northern states. You can see that a lot of this is coming from small-scale fishery through purse seine, and then again, a lot has changed. I think there was a lot of discussion in the Working Group, and also included in the report, about the various types of gear used.

I'm not going to get into that in any greater detail, but there is a question about how the gear should really be taken a look at, and maybe we need to take a closer look at that. Then this other issue is

something that is important for folks to recognize, which is, this incidental catch and small-scale fisheries, it was included that the landings in that particular program were included in the assessment of ecological reference points.

But when we do the management of it, it is not being accounted for, in terms of being accounted for against the TAC. There is a possibility that the TAC could be exceeded, if the total landings continue to increase. Moving some landings to a directed fishery may improve accountability, and these landings are accounted for, like I said, assessment models, but not in the management as part of a TAC, or as a set-aside.

The potential strategies to take a look at underneath this small-scale and incidental catch fisheries was, should you separate them out? Should the small-scale fishery be taken and separated from the incidental catch fishery, sort of a directed and non-directed fisheries, and whether or not that is doable or not is a question.

But it was a question of whether or not, do you really want to have the two of those packaged together? Another issue was gear type, and the different gear types depending upon where you are, whether it's a passive kind of gear, or whether it's a more active gear, was something that was definitely discussed by the Working Group, and again, this is where I think we need to focus some of our attention, in looking at this particular program.

The other idea here is on some of these things the incidental and small-scale fisheries, there could be a limit, lowering trip limits that currently exist within the Amendment might be another way to help reduce the amount of fish that are taken and are outside, if you will, the existing allocation. Then finally, excuse me not finally, but the last one on this page.

Count all incidental catch and small-scale fishery landings towards the TAC using a set-aside as a TAC. That is how it works under the episodic event set-aside, or maybe under a management trigger. Develop a Cap. This is another way to look at small-scale fisheries. You might want to just say, we're going to cap small scale fisheries at a certain number, and make certain that that's a part of the TAC, and again, possibly utilizing a management trigger to move that forward.

Requiring all states to utilize their full directed allocation prior to entering the incidental catch, regardless of in-state allocation. That becomes maybe a state-by-state issue that needs to be resolved, perhaps amongst everybody on the whole Commission. Then finally, to just eliminate the small-scale fisheries provision, and revert to a bycatch allowance only.

I think folks can see here there is a very broad array of possible ways to deal with this specific issue. A lot of it having to do with sort of how expansive the interpretation of the small-scale fisheries has been, and the increase of landings underneath it. The Episodic Event Set-aside Program is basically a provision that allows states to, so what this does basically, it sets aside a percentage of the TAC that can then be used in a certain month, after folks have kind of exploited all of their existing allocation.

Then they can jump into this set-aside program, and in essence, they have to demonstrate because it's episodic, because the state who is going to take advantage of this has to demonstrate that there is fish availability, fish availability meaning menhaden, in their jurisdiction. If they can do that, then they can participate in this program.

One of the ideas here was to adjust the set-aside percentage, maybe increase it to be reviewed regularly. Is 1 percent enough? Could we use the episodic set-aside in a broader way, to maybe do more with it than is currently being done? Again, some of the issues here that may provide some additional challenges, in terms of making certain that we're doing the right administrative review of how often that fish is being taken, and again, how

does that work as between states who are involved in this program?

Then for any particular year, or to either require or allow states to transfer unused quota, or relinquish their quota, and put it into the EESA. In other words, the idea here was, if I have latent quota, and I'm a state who isn't really using it, maybe I could just donate that to the episodic event set-aside program.

Permanently reallocate the state's latent quota, or a portion thereof to the EESA. Again, roll back unused EESA sooner than October 31, and then additional restrictions on the use of the EESA. For example, putting limitations on weekly limits or daily landings, or some other form of a state cap, or allow the state EESA to access less than 100 percent of quota use.

Again, Nichola, I want to thank you for helping me on that, in terms of pulling that together, and Allison Colden for the earlier ones as well. Additionally, we had some additional strategies that we had Joe Cimino help pull together on this. The idea here was, and we talked a lot about this in the beginning, of whether or not we could create a quota bank.

In other words, a place where folks who have latent allocations could relinquish their commercial quota, and so that others could basically utilize it. Again, I think there was a number of technical and administrative concerns with moving this forward, but the idea was to basically allow states to put a donation into a sort of a larger group, that could then be utilized by folks who need it in the bait fishery.

Similarly, but slightly differently, would be to do a pooled quota, where landings are evaluated against a pool. In other words, it would be similar to like a coastwide cap, used for American eel management. I think there were some differences between the two of those. We included it in the report as something that might be looked at, but probably needs a little bit more analysis, before it moved forward.

The other thing about this, and this is something I had some good conversations with Kirby about, is quota transfers are an administrative burden. I mean, you're looking at trying to make certain that I, as a donating state, and another state who requires it. You have to check the number of boxes, and that basically brings it back to the Atlantic States Marine Fisheries staff, to make certain that the state who wants to get it, gets it, and the state who is giving it away, give it away. You're getting into a bunch of issues, in terms of trying to deal with those transfers.

You also have to figure out where the states are on all of these programs, in terms of what their actual landings are, have they utilized their quota. When should they utilize it and when shouldn't they? Not that they should utilize it, but when have they and when haven't they? There is just a bunch of tracking and administrative hassle about this, which I think is part of what our task was, to try and reduce some of that.

Basically, the Working Group promoting the idea to promote the use of quota transfers, if jurisdictions are not really fully utilizing their quota. I think that was one of the things that the Working Group was hoping that, if you're not using it, maybe you could allow it to go someplace else.

A challenging of compelling quota transfers, I mean all the states involved in this are effectively sovereign states, they have a quota. They get to decide what to do with it, and we as a Working Group were trying to offer up suggestions for figuring out a way to move, transfer, or somehow or other alter allocations, such that we were not left with latent quota.

Finally, adjust fishing seasons from the calendar year to be offset with peaks in fishing pressure. Again, this was one of the issues of how the timing of all of the quota transfer's work. That is it, I apologize for running through that pretty quickly. I think the report does a better job than I did, in terms of actually laying it all out, but hopefully my presentation, when combined with reading the

report, will get folks to where they need to go, so thank you.

CHAIR WOODWARD: Thank you very much, Rob, great report, lots of innovating thinking and good ideas, to deal with some difficult and challenging issues. At this point, I'll open up for questions for Rob, and some of his section leads. Toni, if you'll give me the raised hands.

MS. KERNS: Currently, I have Ritchie White.

CHAIR WOODWARD: Okay, go ahead, Ritchie.

MR. G. RITCHIE WHITE: Excellent job, a lot more detail than I was expecting. I think it will be helpful. Was there any thought given to kind of the next step, getting into numbers, to look at the last couple of years of landings and quota transfers, and come up with a total volume it looks like the New England states need to find, so kind of work it backwards? You know what is the total amount that the states are now utilizing and landing, and then that might help applying to which of these options would work. Thank you.

MR. LaFRANCE: That's a great question, Ritchie, and I'm going to answer what I think, but I'm also going to ask Megan Ware to jump in on this. I think in many ways what's happening in the Gulf of Maine, and up in that general direction, I think Megan has the best handle on. But I think what we were trying to do, was to offer up suggestions of different alternatives. I like what you're saying, in terms of the idea of actually working it backwards. I think that was in the minds of some of the folks we were working with, when we started to take a look at some of the data sheets. But I would say that I don't know that we actually did some projections, although there was some discussion of that in the Working Group. Megan, I don't know, are you available to maybe answer that? I said I might phone a friend on this, and I think I'm doing that right now.

MS. MEGAN WARE: Yes, I'm happy to chime in. I think you had a great answer. Yes, Ritchie, we never like specifically added up the landings from the New England states, and like came up with a percentage that some people may be looking to get to the New England states. But we did look at things like direction of transfers.

The percent of total landings that are coming from each state. I think we looked at the trends that would kind of support that type of analysis, but we didn't specifically say, you know as an example, the New England states collectively landed 8 percent, let's say, of landings last year. How do we get to 8 percent?

CHAIR WOODWARD: Yes, I think the issue here, Ritchie, is we asked the Work Group to develop these strategies, to address things like mismatch, and then it will really be up to the Board to decide how to move forward, and which strategies are best suited for addressing both the current situation, and possibly preventing future situations. You know, while recognizing that we're going to have a dynamic situation with these fish, like most fish. I mean we spent a lot of time on black sea bass distribution earlier today, so it's part of our lives. Toni, any other hands?

MS. KERNS: I don't have any other hands at this time.

CHAIR WOODWARD: Well, Rob, you did a great job, or just overwhelmed everybody with the menu. I think you've heard me mention that before.

MR. LaFRANCE: Thank you, Spud.

CHAIR WOODWARD: But it's a great menu, and we certainly appreciate the work that was put into it. There is no doubt there is a lot of thought put into this, and I think it is going to help us.

CONSIDER INITIATION OF ADDENDUM ON COMMERCIAL FISHERY MEASURES

CHAIR WOODWARD: If there are no questions or comments about Rob's presentation, we're going to

move into our next agenda item, and that is to Consider Initiation of Addendum on Commercial Fishery Measures. I'm going to turn it over to Kirby for some background information before we get into our deliberations.

MR. ROOTES-MURDY: Maya has a presentation for me that we'll get up on the screen in just a minute, and is, I assure you all, a very short presentation. Building off of the Working Group report, I thought it would be helpful for this Board to be aware of what items from Amendment 3 that can be adjusted through an Addendum.

For those of you who have Amendment 3 on your desktop right now, you can easily get to the Pages 49 and 50. I pulled out just some of the key ones, as I said, were specific to topics covered by the Work Group report. They include TAC specifications, the quota allocations, quota transfers, quota rollovers, episodic event set-aside programs, incidental catch, and small-scale fishery provisions, fishing year, and/or seasons, trip limits, gear restrictions, including mesh sizes and area closures. Again, these are just ones that are specific to the Work Group report. There are additional items in Amendment 3 that can be adjusted through an addendum it's a pretty exhaustive list.

With that as we had it set up today, the Board action for consideration is to initiate an addendum, to address really the issues that were outlined in that motion back in May. As staff, what we will be looking to the Board to do is hopefully make clear what the goals and objectives are, to guide what will be our Plan Development Team, which is yet to be formed, and developing an addendum if initiated. I can take any questions, if there are any at this point. Thanks.

CHAIR WOODWARD: Any questions for Kirby on procedure and process?

MS. KERNS: Justin Davis.

CHAIR WOODWARD: Go ahead, Justin.

DR. DAVIS: The question for Kirby, was there anything in the Work Group report, or anything that the Work Group deliberated on that could not be addressed through an addendum? Like one example that came to mind is, I think there was discussion about the idea of creating something like a quota bank.

Sort of like an episodic set-aside, but maybe a little different, as a place to park some quota, to help out jurisdictions, when they exceed their directed quota. I don't know if that would fall under sort of the Episodic Event Set-Aside Program as described in Amendment 3. But I guess my general question, is there anything that was contemplated by the Work Group that could not be done through an addendum?

MR. ROOTES-MURDY: Yes, it's a good question, Justin. You know, thinking through the report. There was nothing during those deliberations that really came out as being really out of bounds clearly. I think some of these things could be addressed through the broad idea of quota allocations, if that is what this Board wants to pursue.

Something that was discussed by the Work Group, and I can turn it back to them to chime in more on it, was generally speaking, the strategies when it came to allocation, they were talking about, were focused on jurisdictional allocations. But there wasn't really guidance so far. We had heard from the Board that more of a regional quota approach was something this Board wanted to pursue.

That being said, I think the Work Group report does highlight that one of the issues with the episodic event set-aside program, in some people's eyes, is that it has effectively become a secondary regional quota. Those are just some considerations. I'll leave it at that, and if other Work group members want to chime in specific to this question, feel free.

CHAIR WOODWARD: Rob, anybody in the Work Group want to opine on this?

MR. LaFRANCE: Justin, it's a good question. Remember, we weren't really, as the Working Group, supposed to deliberate. Our job was to recommend options. We did not say, well this option is something that could be done by an amendment, or this is something that can only be done by an addendum.

I think really, as the, like a PDT would take a closer look at it. They would only be able to do that which would be legitimate as an addendum. I don't know, if we were to move forward and have a PDT take a look at these recommendations, or these strategies really, they were strategies that they could consider. I think at that point in time the decision would have to be made, as to whether or not it was a big enough change to the existing amendment, to call for the need for a new amendment.

CHAIR WOODWARD: Absent any more questions for Kirby, what I'm looking for from the Board is a motion to initiate a management action, ostensibly an addendum. Hopefully, a motion that captures what the scope of that management action would be. I mean there are multiple topics that were addressed by the Work Group. It is certainly up to the Board to decide which or all of those topics they would like to be addressed in a management action. At this point I'll open the floor up to any possible motions.

MS. KERNS: You have Megan Ware.

CHAIR WOODWARD: All right, go ahead, Megan.

MS. WARE: I have sent a motion to staff, if they are able to put it up. I'll read it in the record, and if I get a second, I can provide some rationale. But the motion is, move to initiate an addendum to consider changes to commercial allocation, the episodic events set-aside, and the small-scale/incidental catch provision. The purpose of this action is to address the issues outlined in the Atlantic Menhaden Work Group memo, and the PDT should use the strategies provided in the work group memo as a starting point.

CHAIR WOODWARD: Thank you very much, Megan. Do I have a second?

MS. KERNS: You have a lot, but I'll go with the first name I saw, and that was Emerson Hasbrouck.

CHAIR WOODWARD: All right, thank you, Emerson. All right, Megan, I would like if you would just elaborate a little bit more on your motion, and provide a little more background.

MS. WARE: Great, thank you. I think it's pretty clear that we've seen some changes since 2009 to 2011, both in the menhaden distribution and the fishery. I now believe it's time to consider changes to our management, and I think some of the clearest pieces of evidence showing this change, particularly in New England, are the fact that Maine now receives 200 to 300 percent more quota via transfers, then what we are allocated, the consistent and rapid use of episodic events each year. I also think Maine's volume of landings under the incidental small-scale provision is a symptom of a management system that is not reflecting current conditions. I hope it's obvious that Maine does not set a goal of trying to land 10 million pounds under small scale. The challenge is that we're exhausting all of our available quota in July, when biomass is highest. I think the Work Group has teed this up well. I think it does a good job of showing how all of these challenges and solutions are interconnected, so I hope that is a good starting point for the Plan Development Team.

Then, in response to Kirby's comment. You know I know Kirby has encouraged us during the Board discussion to provide some goals for this action. Some of the things that I hope we can achieve, are to better align jurisdictional quotas with fish availability and landings, maintain access to the fishery for all Atlantic coast jurisdictions, reduce the state's dependence on quota transfers, and continue to minimize our regulatory discards.

Then I also think it may be important to maintain flexibilities in the FMPs for unanticipated shifts in menhaden abundance. You know the work group had some discussion that we don't have full knowledge of where menhaden will go next. They may further increase in New England. There may be a surge in the Mid-Atlantic, and having those types of provisions is important to the long-term viability of the FMP. Thank you.

CHAIR WOODWARD: Thank you, Megan, I appreciate that. Emerson, would you like to add anything as the seconder of the motion?

MR. EMERSON C. HASBROUCK: Thank you, Mr. Chairman, I don't think I need to add anything more. The Working Group report was fairly extensive, and Megan has outlined the need for this motion, so I don't have anything additional to add, thank you.

CHAIR WOODWARD: At this point, I'll accept comments, lobby some questions. What I would like the Board to particularly is, you've seen a pretty diverse range of strategies. The motion recommends that the PDT consider all of those, and I would like there to be some feedback.

Are there any of these strategies that are seen as problematic by Board members, and they may wish for them not to be considered by the PDT? Likewise, if there are some strategies that you think are particularly important, that need to be emphasized, I would welcome any comments along those lines as well, so Toni, do we have any hands?

MS. KERNS: A couple hands here, I'll give you three names first; Pat Geer, David Borden, and Joe Cimino, and then I'll give you more names.

CHAIR WOODWARD: Okay. Go ahead, Pat, and David, you're on deck.

MR. PAT GEER: I believe I know the answer to this, because you just said all options. Megan, I just want to be clear that changes to the commercial allocation, because you mentioned episodic events and the small-scale incidental catch provisions, but this would also include the quota bank and the full quota options as well, correct?

MS. WARE: Correct, yes. At this point I haven't weeded anything out of the document, so I think moving all of those strategies forward is appropriate at this time.

MR. GEER: Okay that's fine, thank you.

CHAIR WOODWARD: Sort of to that point, Pat, I think that by assigning that to the PDT, we can certainly, working with staff, they can determine whether or not this quota bank concept is compatible, you know with Amendment 3 or not, if it's out of balance or not. Go ahead, David Borden.

MR. DAVID BORDEN: I support the motion, particularly because of the last phrase in the motion as a starting point. I mean the Work Group has done a tremendous job, giving us a diversity of issues. One of the things I would be concerned about is that I think we need to winnow down some of those issues, so it doesn't become too much of a burden on the PDT. But I also think we need to be able to add or delete strategies at the next meeting, so this would be a work in progress, if I understand the intent of the motion.

CHAIR WOODWARD: Yes, and that's a good point, David, and certainly, if there are strategies that were not identified in this report, certainly it's the Board's prerogative to bring those up now, and to make sure that those are included in the tasking to the PDT. I certainly invite anyone who has an idea that is maybe not addressed in this report, please feel free to bring it forward, so it can be heard and discussed. All right, Joe Cimino, you're up next.

MR. CIMINO: Like David, I support this motion, and with the concept that this is a starting point, it was a pleasure to be a part of this Working Group. It was a great think tank, and a lot of work went into this. One thing in here that does kind of give me caution, since I had the chance to work through a

lot of the potential reallocation options, is the concept of a best-year scenario. It is one of the few things that I do have concern with moving forward.

I get that somehow, we would formulate a percentage, where we wouldn't be going over a TAC, and yet menhaden availability in each year, kind of we expect to be reflected in the landings. Every state having their best year, doesn't reflect annual availability, and somehow decouples, you know reality from that proposal. I know it can be worked out mathematically, to not exceed a TAC, by just showing what each state's total of the best percentage is, but I still have some serious concern about that, and I just wanted to put that on the record. Thanks.

CHAIR WOODWARD: Thank you, Joe, and I think that's what we need, as far as feedback. If there are other folks that have a similar concern. As David said, I mean we certainly, we can winnow this down some before tasking the PDT. That certainly lessens their workload. If anyone, or several anyone's who have similar concerns about it, that is one that we could possibly delete, or we could leave it in there for analysis, and deliberate on it in the future. All right, Toni, what is my list like?

MS. KERNS: Your next three names are Rob LaFrance, and Lynn, and Conor.

CHAIR WOODWARD: Okay. All right, go ahead, Rob.

MR. LaFRANCE: I just wanted to highlight what I think is one of the more significant findings of this, and something I want to make certain the PDT kind of keeps in mind, as they move forward with final recommendation, and that is the idea that all of these landings should be part of our management structure.

They should all be accounted for under the TAC. That is the one thing I think we just need to make certain that we do. As we start to look at what I heard the longer discussion today about, how we're managing the species, and looking at it through a number of different perspectives. When we start to set the TAC to include an ecological reference point, we can't be having certain provisions of it maybe sort of fall outside that TAC.

From my perspective, I think there are a lot of options for the small-scale fishery. I think we laid out a number of those. But I really, really think it's important that at the end of the day, all of those landings get incorporated into our management strategy, and our counts according to the TAC.

CHAIR WOODWARD: All right, Lynn.

MS. FEGLEY: I really just wanted to, first of all, extend thanks and appreciation to the Work Group. It was a little bit of a debacle getting that motion off the ground to form the Work Group, but I really think that they just went above and beyond, and really have provided a very strong starting point for us to work from, and the starting point is going to be key.

I think it's going to be really important for the Board, when we start to see options in writing. We can begin to whittle things down and adjust things so they work. With that, I just wanted to mention a couple things. The first one has to do with the timeframes. You know the issue with timeframes in a species like menhaden that has fluctuated in abundance between areas.

It's kind of done this shift from the Mid-Atlantic to the North and back again. I think that the trouble is that timeframes create very strong winners and losers. I wouldn't advocate removing timeframes, but I would advocate considering placing guardrails, that when you apply a timeframe, you also have a safety that a particular jurisdiction cannot lose more than F percent of its allocation, because it can get pretty extreme, and it can really do damage to a state.

I also wanted to just encourage the PDT to simplify menhaden allocation as it's extremely complicated with the episodic set-aside, the bycatch allowance,

the small-scale incidental. I would encourage them to look hard at this idea of a pooled quota for non-targeting gears, you know gears that are passive, that sit in the water and can't chase the fish, because those gears, I believe harvest a very low percentage of the annual quota.

It is those gears that also are subject to this shifting distribution. If you had a pooled quota for these gears that would be defined, it's possible that that quota would be absorbed more by one region, in a year when they are in the Mid-Atlantic, and more by another region when they are up north. I think some of that is outlined in the report, but I would definitely, I am kind of interested in that concept. The other piece I just wanted to talk about was accountability. I fully am supportive of accountability, but I just want to be clear that I don't believe that we've had a lack of accountability. I think we've got a situation where that bycatch allowance has not counted towards the quota, yet we've never exceeded the quota. That bycatch allowance has worked exactly as it should, to prevent regulatory discards. But there is accountability. What is caught is known.

There is no mystery catch that we know of, and all of that catch gets accounted for in the stock assessment. We need to make sure we're all on the same page in what we mean by accountability. With that rambling, I think I will stop, and thank you, Mr. Chair, for the opportunity.

CHAIR WOODWARD: All right, thank you, Lynn. Go ahead, Conor.

MR. McMANUS: I guess I first wanted to say that I support the motion that could take a closer look at this, both sharing some of the same sentiments as Megan, as well as David Borden had also suggested, and indicated at really looking at this as a starting point. Just a couple notes. You know I think that, again, tremendous gratitude to the Working Group members for putting this together.

I think it not only highlighted the complexity of issues, but how many of them are linked, and we'll also certainly have to keep that in mind as we look at considering an individual action, and how it may or may not end up best, being coupled with other tools. I guess I wanted to, one of interest particularly, just thinking about some of the allocation components is the idea of the tier approach for the minimum. I think it's a really interesting idea, it's intriguing.

I guess I would just like to stress for the PDT, as they're thinking about this one in particular, like really working towards creatively trying to find what that criterion is for states. I think looking at that criterion as a context, simply on recent or historical landings, almost could effectively duplicate a given measure or consideration, so I just wanted to stress for the PDT as they look at this one, to think of creative ways as to what would be the defining criteria for states at that minimum entry either against two or multiple difference criteria levels for that.

CHAIR WOODWARD: Thank you, Conor, all right Toni, how am I looking with raised hands?

MS. KERNS: I have three more names on the list. I have Ritchie White, Eric Reid, and Allison Colden.

CHAIR WOODWARD: All right, go ahead, Ritchie.

MR. WHITE: I strongly support this motion. I also support some of the points that Lynn brought up. I think that states need to maintain a limited amount of quota, regardless if they are harvesting or not. I would look at New Hampshire, having had 300 pounds of quota prior to getting our half a percent, and we're now harvesting between 4 and 5 million pounds a year, and we couldn't even have started that if we hadn't had a minimum amount.

Now we depend on states to provide us quota, which we're very appreciative of. Going back to my earlier comments. I think a good starting place for the PDT would be to have the landings and quota transfers from each of the New England states, and then also, to ask them what they feel their landings

will be in the next few years, given that menhaden are in the waters. At least those kinds of numbers are there for us to look at, and then to see how those numbers could fit into some of these different options. I think that would be helpful, to kind of get a feel for where this is.

I would certainly expect that if the stock leaves New England waters, that these quotas then would be available, if they are not being used, if all of a sudden, the Mid-Atlantic or other states are harvesting then these additional quotas, if that's what happens, is available to the states where the harvest is taking place. Thank you.

CHAIR WOODWARD: All right, Eric, go ahead.

MR. ERIC REED: I'm going to echo some of Lynn's comments and Mr. White's comments as well. I have no problem that this is a starting point. My real problem is the end point. Under A-2, Rhode Island has about 70,000 pounds of quota. At 70,000 pounds we lost infrastructure, incentive, and interest in the fishery. Episodic events, you know that was great, but it was no guarantee that when the fish came back in the fall that we would have any quota.

My concern is, what would be the terminal year of landings in the action? You know, we're at 2.2 million pounds under Amendment 3, and we're starting to get our infrastructure, our incentive and our interest back now. You know infrastructure doesn't come, even in the menhaden fishery, overnight. I'm just really concerned about what is the end point for any landings that might be considered in the future.

CHAIR WOODWARD: I think that's something that the PDT will have to grapple with, looking at various scenarios to bring back to the Board for their information and consideration. Allison, go ahead.

MS. COLDEN: A couple things that I, first of all I'll start out by saying that I support this motion, and I want to just confirm if I can first with the maker of the motion, that it also includes the quota transfers, in the line of Pat Geer's question from before, even though it's not stated here. Is that right, Megan?

MS. WARE: Yes, thanks for asking that. Yes, anything that's in the Work Group memo, I perceive it's within bounds of this motion.

MS. COLDEN: Thank you. Then, if I could just make a comment too. One of the things that stood out to me strongly, when I was reviewing the information in Amendment 3 on the small-scale and incidental catch fisheries, was this issue of gear eligibility, and the language that already exists in Amendment 3 that says if there is any significant increase in landings by a particular gear type, that the management board would revisit that.

Based on that guidance in Amendment 3, I think it's extremely important that gear eligibility under the small-scale fisheries provision be a part of the Addendum moving forward. Just because it is something that we struggled with, kind of as a work group, acknowledging that although that language exists in Amendment 3, there is no definition of a significant increase. In addition to sort of looking at what the gear eligibility should be for now, maybe the PDT could also consider putting some sort of quantitative bounds on what options could be for a significant increase, if that provision is to stay in, so that we have some sort of baseline in the future to evaluate different landings by different gear types in the future.

One other comment I wanted to make is I think that with respect to the small-scale fishery landings, and counting towards the TAC. I think there is a strong assumption being made that moving allocation, and working on some of these other parts of allocation that make up the entire framework, would maybe "fix" the problem, and fix our reliance on some of these provisions, but that is not really a guarantee.

If it's not born out, that changing directed allocations or jurisdictional allocations don't sort of slow the trends that we have seen in the small-scale fishery, for example. I do agree with Rob's

comment that we run the risk of exceeding the TAC, if the trend continues to increase, as it has over the past three to four years.

If it's not a direct action in this Addendum, I would at least encourage at a minimum, really, some sort of management trigger for the Board to revisit this provision, but also including some of the things, more direct actions that are already in the Work Group memo as well.

CHAIR WOODWARD: All right, Toni, how are we looking?

MS. KERNS: We just have one last hand up, it's Lynn.

CHAIR WOODWARD: All right, go ahead, Lynn.

MS. FEGLEY: Yes, I apologize for the second bite, thank you, Mr. Chair. It was just something that Allison said that reminded me. I just wanted to also put forward that there is a difference between having your every fish count toward the TAC, and managing to a hard state-specific quota. I just want to be clear that while I think it's very important that we adhere to the coastwide TAC.

I think there are creative ways that keep states like Maryland, and I know that I'm a broken record with our pound nets. What happens if we have to shut down a pound net fishery, and all of the dead fish we have floating around? I think there are creative ways that that can be dealt with. I just wanted to make that clear, that you know, accountability toward the quota can be viewed a couple different ways, thanks.

CHAIR WOODWARD: All right, I want to turn it over to Kirby, who has got a few comments for us.

MR. ROOTES-MURDY: I appreciate comments that Board members have offered up, you know from a Plan Development Team Chair standpoint, they are helpful, generally speaking to hear that some of these strategies are worth pursuing in greater detail, and heard at least one or two instances, where a Board member didn't want a strategy to be pursued further. I would follow up to what David, I think noted, and maybe a few others that I heard, Eric Reid and maybe some others, that we've got right now in this motion three main issue items, or topics, and that these are not siloed in some ways, that they are kind of interconnected. Just to manage expectations, you know with that in mind. The Plan Development Team, unless there is guidance that says we need to make sure that all things are continued, and then we develop them out, that we will try to whittle some things down.

But ultimately, I think the draft document that gets back to this Board, possibly at the annual meeting, that there will need to be some additional Board decisions on what to get possibly removed from the document, from a management document crafting standpoint, and trying to ensure it's clear and not complicated for both the Board to understand, and the public to provide comment on.

You know the fact that these things do affect each other, in terms of allocations, percentages set for, episodic set-aside, and management triggers for small-scale provisions. That there will need to be some further guidance, likely from the Board once those options are made clear, and those linkages are established. Just so that is clear for the Board to consider, thanks.

CHAIR WOODWARD: Yes, thank you, Kirby. It's always important for us to kind of remember, and set realistic expectations. We've got a pretty diverse menu of strategies that we're asking the PDT to investigate. They are going to do that; we're going to get some feedback from the PDT at our annual meeting in October. We may or may not delete from further consideration some of these strategies and options.

Doing so may mean, if you delay final approval of this Addendum, you know well into next calendar year, and not that we shouldn't take the time to do it right, I'm certainly going to ask for that. But I think it's just something we all need to keep in

mind, is that if we all agreed and everything was great at the annual meeting, then we could have something that goes out for public comment, something that could possibly be finalized in February of 2022. But it may be that that is not realistic, so it's just something to keep in mind. Toni, any other hands have been raised?

MS. KERNS: You have one hand, David Borden.

CHAIR WOODWARD: Go ahead, David.

MR. BORDEN: I just want to agree with you, Mr. Chairman. I think it's important for all of us to have the ability to look at the output from the PDT at the next meeting, and then be able to winnow down, or fine tune, or possibly even add options at that point. At least in my own case, I'm not prepared to totally commit to these, because they are a little bit amorphous at this point. Once we get a little bit more information on the details, I think individuals will have other comments to make, and preferences. Thank you.

CHAIR WOODWARD: As we all know so well, when it comes to allocation it's all about the details, and the decimal points, so that's something we all know very well. All right, any further discussion on this motion? Any other comments? Okay, nothing.
MS. KERNS: No hands.

CHAIR WOODWARD: All right, is there any opposition to this motion?

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

CHAIR WOODWARD: Absent any opposition, we'll consider the motion approved by unanimous consent, and that will start us on the pathway to a management action that we presume will be an Addendum, that's the goal. I appreciate everybody's involvement. Again, I appreciate the hard work of the Work Group. I think it made what we just did possible, and we did this is a fairly brief amount of time, which is pretty remarkable for something that is this complicated.

But the hard part will come in the future, so save up your energy.

OTHER BUSINESS
WHIRLING DISEASE IN ADULT MENHADEN

CHAIR WOODWARD: All right, we've got one item of other business, based on a comment that Pete Himchak made, and that is concern about the presence of whirling disease in ocean going adult menhaden populations. Kirby, what do we need to do to task the TC to look into this, and maybe bring some information back to the Board at a future meeting about this particular topic?

MS. KERNS: Spud, before Kirby jumps in on that, just a quick reminder to the Board that we will need to form a PDT for this Addendum, and Kirby will send out an e-mail for that. But I just want to note that it's likely that those PDT members will need to get confidential data access, so for those states that are approving confidential data access, please be on the lookout for those PDT members.

CHAIR WOODWARD: Thank you, Toni. Good information.

MR. ROOTES-MURDY: Yes, thanks for that, Toni, it's a good reminder for folks. I guess what would be helpful for this Board to know is, obviously when these fish kills have been occurring, especially this year, they don't happen in a vacuum, in terms of simply just one or two people seeing it, you know state agencies have been mobilized to try to respond.

Across the coast a number of Technical Committee members have been providing each other updates on if and when they have a fish kill. At this point, we generally just had informal e-mail exchange regarding fish kills when they come up, trying to get pathology reports, which is obviously one of the key things to better understand.

If one fish kill in a state is similar, or dealing with a different issue than a fish kill in another state. I

think the best way to couch this for the Board's consideration is, what would it be that the Board wants the Technical Committee to do, in looking at these fish kills? You know, I think we have obviously our tools, so to speak, within fisheries management that we're all very aware of.

But when it comes to some of these other questions that are maybe somewhat outside of traditional limits on either catch or area closures, moving into pathology. I think those are things for this Board to consider, if they want to task the TC with doing any work on this specific. Just something for the Board to think about, in trying to task the TC on this topic.

CHAIR WOODWARD: I'll certainly open it up to the Board for responses to that, but I was thinking of something more along sort of the informational lines of, you know for those of us who maybe aren't experiencing it, so the Board could be more fully aware of, you know where is this happening, when is it happening?

Is it increasing in frequency, or is it sort of up and down from year to year? Just as sort of a broad overview of it, not necessarily you know driving towards any action in response to it. But more just learning more about it, so that we can be fully aware. Certainly, Board members, I would welcome any input on this.

MS. KERNS: I have Roy Miller, Tom Fote, and Joe Cimino.

CHAIR WOODWARD: All right, go ahead, Roy.

MR. ROY W. MILLER: Thank you, Mr. Chair. Just a quick observation. Last fall and winter, we saw what I would classify as a low-level adult menhaden kill along the lower portion of the Delaware Bay, where there would be a menhaden every 25 yards, that kind of thing. I have no idea whether it's related to the same organism that Pete Himchak was referring to, or whether it was something else.

But if we were observing that, I suspect it was something similar on the New Jersey side of the Bay. But there is a bit of confusion. Using the term whirling disease, I think confuses the organism with the one that salmonid biologists are much more familiar with, which is a metazoan parasite, myxobolus cerebralis I looked up the name. Hopefully there is another name for this, so the public is not misled, that we're looking into this organism, which traditionally affects salmonids. Thank you.

CHAIR WOODWARD: Yes, good point, Roy, thank you. Go ahead, Tom.

MR. THOMAS P. FOTE: I've been involved with menhaden management since 1984, somewhere around that year I first got involved. Over the years in the Commission, I've listened to guys like Tony Vega from Massachusetts, Vito from Massachusetts, Ken Driscoll, and we talked about menhaden purse seine.

This year, I was up in the Raritan Bay quite a few times, and I saw menhaden floating out of the Navesink River on a high tide, and had never seen the bodies. You know I've watched oxygen depletion kills. I saw it up in Massachusetts when I used to fish up there once in a while. I've seen it in Long Island Sound, I've seen it in Raritan Bay. But this was different.

There were rotten bodies all over the place, all over Raritan Bay, where they went all the way up the Raritan River, or I went in different areas coming out of the Navesink. It concerned me dramatically, because I think it's something else that we basically should be really looking at, because I can see. I've heard it is the same in Connecticut, they see the same thing. You know, we depend so much on menhaden for all the other species. I've been sitting here. You know I listened to Dennis today, we were talking about, you know he might not be around, because he's 80 years old. Well, I'm 74, and I understand some of those feelings you think about, well I'm not going to be around when this finishes up. But I also don't want to see by the time 15 years are all elapsed.

We have enough problems with oxygen depletion, and we have that coming on seriously, because of the global warming, the warmer waters. We're going to see more kills for that. We don't need a disease kill. I think we need to get out in front of this. I think we need to find out what's going on. I've gotten calls from more people all over the state, and other states. I think it's becoming a serious problem, and I think we need to really address it.

CHAIR WOODWARD: Thanks, Tom. All right, Joe, go ahead.

CHAIR WOODWARD: Thanks, Spud, I wasn't quite prepared to speak to this, but since we were kind of a central hub for this, and we're very fortunate to have a pathologist on staff with our Division of Fish and Wildlife, who has been looking into this. I did want to provide some information.

First, although the majority of samples that we were seeing, we saw vibrio anguillarum which is not uncommon in the marine habitat, and in shellfish and finfish, and we thought that that was part of the reason for the early mortality events. Later on, as we collected samples, we did find a second bacterium, which is that, and forgive me for my Latin pronunciation, but yersinia ruckeri, which is that pathogen known to trout and salmon that causes whirling disease.

You know Pete Himchak's concern there is valid, and just to Roy's point there. All of this needs to be continued to look at. We've worked with New York State DEC. I really appreciate ASMFC staff's help on trying to coordinate, and just keep the information flowing. We've worked with Stonybrook, USGS, and USDA on this.

We're kind of doing this on the cuff, and maybe ASMFC is a good group to help us to continue to coordinate this. Samples do need to be fresh, so even though we do have a pathologist on staff here at NJDEP, we can't just say hey, send us your stuff and we'll look into it. There needs to be a better network of collecting samples up and down the coast.

I think one of the most interesting things about the kills around the Raritan was they were during the winter. One of the interesting things to me is that menhaden were sticking around in New York and New Jersey rivers during the winter, and that is why we saw kills earlier than we have in some years. It's not uncommon to see die offs in spring, they just started happening. Well, they were happening in December, and then we saw again in March and early April. I'll just leave it at that. Thank you.

CHAIR WOODWARD: Thanks, Joe, that is very informative, appreciate it, and I think that sort of speaks to the fact that I think it's worthwhile for our scientific advisors to delve into this to some degree, and at least keep us informed of what is going on, and what the consequences may mean for us. Kirby, does that help get what you need?

MS. KERNS: Spud, you have one more name on the list, John Clark.

CHAIR WOODWARD: Go ahead, John.

MR. JOHN CLARK: Yes, just briefly. Typically, any time these bacteria are ubiquitous in the environment out there, typically happen when the fish are stressed or very crowded. The conditions they were talking about sound like that was indeed happening, you know these winter kills like this.

I don't know that there is much we can do about it, other than work to clean up the water. But you know once again, we've seen all sorts of things kill menhaden down here from low DO to Kudoa, there was even a suspected Pfisteria kill years ago. There are just tons of things out there that will kill bunker.

MR. ROOTES-MURDY: Yes, Spud, this is Kirby. I'll follow up now. What I'm hearing is that really right now there is an interest in getting at the next Board meeting, a full report or at least a summary of what the fish kills that have occurred, I'm hearing in the last year, where they have occurred and what

information is available. You know I think it would be helpful, just kind of from a staff workload standpoint.

You know, where this kind of flies with some of the other things that this Board is considering with menhaden, right. We've got this assessment; we're looking for the Board to provide feedback on during the next Board meeting. Staff will be working with the PDT to draft up this Addendum, and where does these questions about wanting to get more information on the fish kills kind of rest with those two other items that have been talked about today?

CHAIR WOODWARD: Well, I certainly think that it's a much lesser priority than our other activities. If we can fit it in and not encroach on other things, and create hardships, let's just do it when we can, not necessarily has to be the next meeting. This can be something that we get next year, you know after there has been ample time for the work to be done. Unless someone disagrees with that, I think that is the best course of action. After all, I'm not sure, go ahead.

MS. KERNS: Sorry, I wasn't sure if Tom was disagreeing with you. He put his hand up.

CHAIR WOODWARD: Go ahead, Tom.

MR. FOTE: Well, one of the things if this starts being coastwide, the agency that should be looking into it is the U.S. Fish and Wildlife Service, since it's basically inland waters that it's basically affecting. I know U.S. Fish and Wildlife Service sits on the Menhaden Board. Do they have any ideas?

CHAIR WOODWARD: I don't know. I guess, is Mike Millard here?

MS. KERNS: Hold on Spud, I don't know if it's Mike or Lowell today. I forget.

MR. ROOTES-MURDY: We have Mike Millard on, or at least had him on at one point. We have him offline on one, and then I think maybe he just came back on.

CHAIR WOODWARD: Well, I'll give him an opportunity to comment if he chooses to. If he doesn't want to that's fine, but I think you made a good point, Tom, that it's something that needs to be looked at on an inter-agency standpoint, certainly.

MR. ROOTES-MURDY: Another consideration I think maybe to what Tom was saying. We have partners at USGS, and they may be another agency that would be able to provide some input as well, if need be, given they have some expertise in other parts of fish management.

CHAIR WOODWARD: Suffice it to say, we'll do our best to keep this on our radar screen, and keep the Board informed of what's going on, and what we know and what we don't know about these kills, and what the consequences may mean at the population levels. We're at the end of our agenda. Is there any other business to come before the Menhaden Board, anything else you need, Kirby or Toni?

MR. ROOTES-MURDY: It looked like you might have had a phantom hand raise from Mike Millard. I'm getting mixed signals from him. Oh, it looks like he's there now.

CHAIR WOODWARD: Okay, Mike, would you like to respond to what Tom said about Fish and Wildlife Service involvement?

MR. MIKE MILLARD: Yes, thanks, Mr. Chair, I was struggling with my technology. I don't know, I'm not sure of the exact workload, but the Service would, we would do everything we could to help out with that issue. Our fish health center is at Lamar, Pennsylvania, and I would be glad to talk to somebody more about what exactly we can do.

CHAIR WOODWARD: Well, thanks, Mike. Well since you all are our federal authority, maybe you all could get these menhaden to socially distance,

and that way we could reduce the problems. All right, any other business to come before the Menhaden Board?

MS. KERNS: Spud, you have one member of the public with their hand up.

CHAIR WOODWARD: Who is that?

MS. KERNS: Tony Friedrich.

CHAIR WOODWARD: All right, Mr. Friedrich, I'll allow you a couple of minutes for comment. I'm not hearing anything, Tony.

MS. KERNS: Tony Friedrich, you need to unmute yourself, and you had one other hand come up, Joe Smith.

CHAIR WOODWARD: Okay. Mr. Friedrich. All right, let's go to Joe Smith.

MR. JOE SMITH: Mr. Chairman, Joe Smith here sitting in on the meeting. I just heard fish kills, and it piqued my interest. I was at the Beaufort Lab for 30 years, worked for Doug Vaughn on the menhaden program. About 2002, the Technical Committee tasked me with keeping track of fish kills, and I've got about a one-inch file of fish kill reports on the Atlantic from 2002 or 3 to 2015, when I retired, if the Board is interested or the Technical Committee is interested.

Also, there was some mention of catastrophic fish kills. I believe Doug Vaughn and maybe Bill Shroff from our Beaufort Lab did a paper on the effects of simulated catastrophic fish kills on the Atlantic menhaden population. This followed, I think the Pfisteria hysteria of the '90s. There is that paper out there that you can draw some information from. Thank you.

CHAIR WOODWARD: Thank you, Joe. Yes, I appreciate anything you could do to help the TC with information. That would be great. All right, did we get Mr. Friedrich on the sound?

MS. KERNS: He put his hand down.

CHAIR WOODWARD: Okay. All right now, no other hands up, Toni.

MS. KERNS: No.

CHAIR WOODWARD: Okay, with no other business to come before the Menhaden Board, I want to thank everybody for your participation, it was a good productive meeting. I want to thank the Work Group again. I always thank our TC and our ERP Work Group for all the effort they put in, and glad things are moving along. I appreciate everybody.

ADJOURNMENT

CHAIR WOODWARD: Hopefully, our next meeting will actually be in person in October. Let's keep our fingers crossed that we can do that. With that we'll stand adjourned.

(Whereupon the meeting convened at 4:30 p.m. on Wednesday, August 4, 2021.)

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Atlantic Menhaden Management Board

FROM: Ecological Reference Point Work Group and Atlantic Menhaden Technical Committee

DATE: April 26, 2021

SUBJECT: Atlantic Menhaden Spatial Model Needs

At the 2021 Winter Meeting, the Atlantic Menhaden Management Board tasked the Ecological Reference Point Work Group (ERP WG) and Atlantic Menhaden Technical Committee (TC) to provide additional detail regarding the research recommendation in the 2019 benchmark stock assessment to "develop a spatially-explicit model." Specifically, the Board requested information on what data would be needed, a timeline for development and implementation, and if it would resolve questions regarding management of menhaden in the Chesapeake Bay.

The ERP WG and TC discussed potential approaches for developing a spatially-explicit model for Atlantic menhaden. These approaches cover a range of spatial complexity, data needs, and timelines, and provide different levels of information to support management. In this memo, the ERP WG and TC provide an initial outline of potential approaches, including the data and modeling development needs, timelines, and expected management information produced, and highlight areas where Board input is needed. The ERP WG and TC stress that the needs and timelines listed here are based on the group's current understanding of what is feasible and may change once model development and data analysis are underway. The approach the group chooses will depend on management goals, as well as data and funding availability.

Attributes	Approach
Coarse spatial scale, minimal additional data requirements	Coastwide Beaufort Assessment Model (BAM) + coastwide Northwest Atlantic Coastal Shelf Model of Intermediate Complexity for Ecosystems (NWACS-MICE) + supplemental Bay information
	Coarse spatial BAM + coastwide NWACS-MICE ERPs
Fine spatial scale, significant additional data requirements	Coarse spatial BAM + coarse spatial NWACS-MICE ERPs
	Detailed spatial BAM + detailed spatial ERPs (NWACS-MICE or alternative detailed spatial multispecies model)

1. Coastwide BAM and NWACS-MICE with supplemental Bay information

These approaches would use the existing BAM plus NWACS-MICE approach to develop coastwide ERPs for Atlantic menhaden to produce a Total Allowable Catch (TAC) that takes into account Atlantic menhaden's role as a forage fish on a coastwide basis, as is done now, but would also provide supplemental information on the Chesapeake Bay.

a. Supplemental Bay Atlantic menhaden abundance information

Approach*:* Supplemental information on absolute Atlantic menhaden abundance in the Chesapeake Bay, such as from an aerial survey, could be used to determine what proportion of the TAC could be taken from the Chesapeake Bay in order to keep exploitation in the Bay at an acceptable level. This simpler, escapement-based approach could be an efficient way to develop information to inform the Chesapeake Bay Cap; however, it would not provide broader spatial information and therefore would not provide advice for regional allocation discussions. In addition, the ERPs developed would be on the coastwide scale, and thus would not include consideration of predator-prey interactions or needs on a finer spatial scale. The ERP WG and TC also noted the uncertainty introduced by combining two different methods of abundance estimation (the BAM and the fishery-independent Bay method), and the lack of information on seasonal migration rates into and out of the Bay.

Data & development needs: This approach would not require additional model development, but would require a significant investment in a robust source of information on absolute abundance in the Chesapeake Bay, which is currently does not exist. It may be possible to use a shorter time series of abundance in this framework than the 10 years that the TC requires for indices of relative abundance within the BAM; however, this will depend on review of the data after collection. An absolute abundance survey would likely require 1-2 years of gear calibration and pilot studies, plus a minimum of 3 years data, in order to evaluate interannual variability and uncertainty in the abundance estimates from the survey, meaning this approach could potentially be taken to peer review within 5-7 years of initiating the survey. However, if interannual variability is high, more years of data would be needed before the approach is ready for management use. Although shorter time series might be sufficient for the initial analysis, the survey would need to be conducted on a regular basis in order to provide management advice in subsequent years.

b. Supplemental Bay multispecies indicators

Approach: Supplemental information such as the state of major predators (striped bass, blue fish, birds) abundance and body fat condition for the Bay could be used as ecosystem indicators to inform management control rules in parallel with the single species BAM and MICE models. Indicators would likely provide qualitative rather than quantitative advice on the Bay cap.

Data & development needs: Ecosystem indicators could be developed from existing datasets, but would require some work to synthesize different data sources and develop a meaningful control rule or traffic light approach to inform management.

2. Coarse spatial model approaches

These approaches would provide information on a coarse spatial scale, e.g., North, Mid, and South Atlantic plus a Chesapeake Bay region. However, it is important to note that, due to data limitations, the Chesapeake Bay region would include the coastal waters of Maryland and Virginia. Additional analysis of the tagging data would be required to determine the significance of including ocean waters and whether or not this information could be used to inform the Bay Cap. Both of these approaches would take approximately 5-7 year to complete, though this could change depending on funding and data availability.

a. Coarse spatial BAM with coastwide NWACS-MICE ERPs

Approach: This approach would refine the BAM to include spatial dynamics at a coarse scale and produce regional estimates of biomass, while the NWACS-MICE model would provide coastwide ERPs. The BAM plus NWACS-MICE would be used to develop a coastwide TAC, as is done now. An escapement-based approach could be used to determine what proportion of the TAC could be taken from each region. Regions would be defined to match management needs and the existing information on migration rates. Again, in the coarse approaches the Chesapeake Bay region would include Maryland and Virginia coastal waters due to its inclusion in the Bay region in the historical tagging study. The coastwide ERPs would not include the ecosystem considerations on a finer spatial scale. Currently, genetic and tagging data indicate Atlantic menhaden comprise a single stock on the Atlantic coast, and the BAM includes some consideration of spatial dynamics with the fleets-as-areas approach. Incorporating spatial structure could provide some improvements to our understanding of the stock, including differences in recruitment and life history characteristics.

Data & development needs: Catch-at-age data are already available on a coarse regional basis. Existing fishery-independent indices could be assigned to or developed at the regional level. The existing information on migration rates between large scale regions is not differentiated by age, and so the model would assume that all ages share the same migration patterns. This would introduce additional uncertainty in the spatial model. Information on the proportion of total recruitment that comes from each region could also be a limitation for this model. This approach could be attempted with the existing datasets, but would require investment of personnel time and effort. This approach would likely be ready for peer review in 5-7 years, but that frame could be longer if existing data are not adequate.

b. Coarse spatial BAM with coarse spatial NWACS-MICE ERPs

Approach: This approach would build on the coarse spatial BAM approach described above, but combine it with a coarse spatial NWACS-MICE. To develop ERPs that take into account spatial dynamics in predator-prey interactions, a spatially-explicit multispecies model is necessary. The most straightforward approach would be to combine a spatially-explicit version of the NWACS-MICE model with a spatially-explicit version of the BAM. Both models would have a similar coarse spatial scale determined by management needs and data availability. Again, note that the Chesapeake Bay region would include Maryland and Virginia coastal waters. This approach could be used to provide advice on both the Chesapeake Bay Cap and broader regional allocation discussions. For example, it would be possible to run scenarios with differing levels of

fishing in the Chesapeake Bay region to estimate specific impacts on predators that use the region.

Data & development needs: A spatially-explicit multispecies model is more data intensive than the spatially-explicit BAM. To develop a coarse NWACS-MICE spatial model, we would need estimates of dispersal rates for all modeled species, information on seasonal spawning, recruitment, and migration patterns, and also information on spatial fishing effort for all fishing fleets in the model. In absence of actual data, expert opinion and rules-of-thumb can be used to parameterize the spatial model. For calibration and validation of the spatial model, we would need reliable species distribution maps that are seasonally resolved, region-specific trends in abundance and catch, fishing effort maps, and region-specific food habit data. The scale of the existing diet data is a weakness in current data availability in developing ERPs that account for finer scale ecosystem dynamics, especially for non-finfish predators. Investment in enhanced diet data collection from new or existing fishery-independent sampling programs at the state or federal level for the species in the NWACS-MICE model would benefit these models. This approach could be attempted with the existing datasets, but would require investment of personnel time and effort. This approach would likely be ready for peer review in 5-7 years; however, that frame could be longer if existing data are not adequate or shorter if resources are made available and more time can be allocated to model development.

3. Complex Spatial Modeling Approaches

These approaches would further refine the spatial scale. If the data were available, these approaches could provide information on the Chesapeake Bay specifically (i.e., not including ocean waters) and other regions beyond the coarse spatial scale. Both of these approaches would likely take at least 10 years, though this could change depending on funding and data availability.

a. Refined spatial BAM with NWACS-MICE ERPs

Approach: This approach would develop a more refined spatial BAM, which would be able to provide information on the Chesapeake Bay specifically (separate from MD and VA ocean waters) and other regions beyond the coarse spatial scale described above. It could be used with a coastwide NWACS-MICE or a refined spatial NWACS-MICE, depending on data availability. Depending on which NWACS-MICE approach was used, this approach would provide information similar to the escapement-based approaches or the coarse NWACS-MICE approach, respectively, but on a more refined spatial scale.

Data & development needs: In order to provide information on a true Chesapeake Bay region, or other regions beyond the coarse spatial scale described above, the BAM would require more fine-scale information on migration rates at age between the regions of interest. This would require a new comprehensive tagging study to provide that information. If complementary data on seasonal spatial distribution maps and trends in abundance and catch were available for the NWACS-MICE model, ERPs could be developed on a similar scale to the BAM's regional structure. If not, coastwide ERPs could be used in conjunction with the more refined BAM model. The refined spatial ERPs require significant investment in movement studies as well as in

diet data and model development. This approach would not be feasible until the necessary movement data are available.

b. Detailed spatial BAM and detailed spatial ERPs

Detailed spatial BAM and detailed spatial ERPs

Approach: The most complex approach would be to develop a fully-realized fine-scale spatial multispecies or ecosystem model for Atlantic menhaden. This could be achieved with NWACS-MICE, or another model such as the multi-species statistical catch-at-age model developed for the 2019 ERP Benchmark Assessment. A fully realized NWACS-MICE or other spatial model would use a much finer spatial resolution (on the order of 10-minute squares) that represented habitat gradients and jurisdictional boundaries. The model could be driven by static and/or spatial-temporal habitat maps, for example from satellite data or oceanographic model. This approach could simulate a broader range of environmental and policy options, such as warming sea temperatures and species range expansion into the northern region. Higher spatial resolution in the model would allow for better representation of spatial fishing effort in and out of the Bay.

Data & development needs: The disadvantage of this approach is that it is far more computationally demanding and requires information on species-habitat interactions that may not be available for some species. Typically, the habitat preference functions are derived from survey data. Assembling habitat maps, combining survey datasets, and estimating species preference functions for the different habitat types adds considerable time to model development. For species/life stages that are not captured in any surveys, expert opinion and online data repositories such as AquaMaps can be used instead. Validating the high-resolution spatial MICE model could be done by comparing region-specific time series (similar to the coarse scale model), comparing predicted and observed species distribution maps, or on a point-by-point basis. Higher resolution movement and diet data would significantly enhance model development and result in more reliable ERP estimates. Spatially-explicit statistical catch-at-age models do exist (i.e., Stock Synthesis and others); however, they do not exist in a multispecies model construct at this point, so would require software development. This approach would not be feasible until the necessary spatial data are available.

Immediate Funding Needs

The ERP WG and the TC indicated that some form of a coarsely structured spatial model was possible to develop for the next benchmark assessment if the Board was willing to accept a longer time frame for the next benchmark (2027-2028 instead of 2025). The approach that the groups pursue will depend on management goals (see 'Management input needs' below), data availability, and development resources. Table 1 provides a comparison of the approaches based on advice provided, data needs, and timeline.

The major areas that would require or benefit from funding to address data or model limitations are summarized below. In addition, the ERP WG and TC noted that timeline for model development could be shortened somewhat with funding for dedicated modelers.

Approach	Major Funding Need
Coastwide model with supplemental Bay information	3-5+ years of reliable absolute abundance estimates for the Chesapeake Bay
Coarse spatial ERPs	Spatially and seasonally explicit diet data and spatial distributions for key predator and prey species; additional model development
Refined spatial ERPs	Spatially- and seasonally-explicit diet data for key predator and prey species; fine-scale information on migration rates between regions by age; additional model development

Management input needs

The TC and ERP WG need guidance from the Board on specific goals and priorities to determine a path forward. The ERP WG and TC pose the following questions to the Board:

- What is the primary goal for spatially-explicit modeling? (e.g., advice on Chesapeake Bay Cap, regional allocation advice, enhance accuracy of coastwide ERPs, something else)
- Are there secondary goals?
- Are the ecosystem management objectives for the Chesapeake Bay the same as those used to develop the coastwide ERPs?
- What tradeoffs is the Board willing to make between the spatial scale/detail of the modeling and the timeline for the next benchmark?
- Would the Board be satisfied with a regional approach that separates MD and VA from the rest of the coast if modeling the Chesapeake Bay separately is not feasible for the next benchmark?

For example, the primary goal could be to provide advice on the Chesapeake Bay Cap by the next benchmark assessment, and the secondary goal could be to provide information to inform regional allocations. In this case, if there were challenges with developing a model to provide regional allocation information in the next benchmark timeframe, the group could switch to an approach that would only provide advice on the Chesapeake Bay Cap. Alternatively, if the Board prioritized regional allocation in addition to the Bay Cap and indicated that they were willing to wait longer for results, the group could delay completion of the benchmark assessment in order to complete that approach.

The TC and ERP WG will need direction from the Board as soon as possible (no later than Annual Meeting) in order to pursue a spatially-explicit modeling as part of the next benchmark stock assessment and follow the current assessment schedule.

Table 1. Comparison of potential approaches for developing a spatially-explicit model for Atlantic menhaden.

Approach	Advice				Data Needs		Timeline***
	Single-spp. CB	Multi-spp. CB	Multi-spp. Regional Allocations	Fine-scale Spatial Dynamics	Possible w/ Existing Data	Addt'l data needs	
Coastwide BAM + NWACS-MICE + supplemental Bay abundance	✓					Absolute abundance estimates in C. Bay	5-7 years
Coastwide BAM + NWACS-MICE + Bay indicators	✓*	✓*			✓		5-7 years
Coarse spatial BAM + coastwide NWACS-MICE ERPs	✓**				✓		5-7 years
Coarse spatial BAM + coarse spatial NWACS-MICE ERPs	✓**	✓**	✓		✓	Better diet data for ERP species	5-7 years.
Refined spatial BAM + NWACS-MICE ERPs	✓	✓	✓			Migration at age data for desired regions, better diet data for ERP species	10+ years
Detailed spatial BAM + detailed spatial ERPs	✓	✓	✓	✓		Finer scale data (all types) for ERP species	10+ years

*: This approach would likely provide qualitative, not quantitative, information on Chesapeake Bay Cap

**: Existing data could provide information on MD and VA separately from the rest of the coast, but not Chesapeake Bay itself.

***: These timelines are preliminary estimates and could be revised once model development is underway.