

**PROCEEDINGS OF THE  
ATLANTIC STATES MARINE FISHERIES COMMISSION  
ATLANTIC MENHADEN MANAGEMENT BOARD**

**The Westin Crystal City  
Arlington, Virginia  
Hybrid Meeting**

**April 30, 2024**

**Approved August 6, 2024**

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1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 17, 2023** by consent (Page 1).
3. **Move to nominate John Clark as Vice-Chair of the Atlantic Menhaden Board** (Page 20). Motion by Jeff Kaelin; second by Steve Train. Motion approved by consent (Page 20).
4. **Move to adjourn** by consent (Page 21).

## ATTENDANCE

### Board Members

Megan Ware, ME, proxy for Pat Keliher (AA)	Loren Lustig, PA (GA)
Steve Train, ME (GA)	John Clark, DE (AA)
Rep. Allison Hepler, ME (LA)	Roy Miller, DE (GA)
Cheri Patterson, NH (AA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Doug Grout, NH (GA)	Lynn Fegley, MD, AA (Acting)
Sen. David Watters, NH (LA)	Russell Dize, MD (GA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)	Allison Colden, MD, proxy for Del. Stein (LA)
Raymond Kane, MA (GA)	Pat Geer, VA, proxy for J. Green (AA)
Sara Ferrara, MA, proxy for Rep. Peake (LA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Conor McManus, RI, proxy for J. McNamee (AA)	Chris McDonough, SC, proxy for M. Rhodes (GA)
David Borden, RI (GA)	Ben Dyar, SC, proxy for Sen. Cromer (LA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Doug Haymans, GA (AA)
Robert LaFrance, CT, proxy for B. Hyatt (GA)	Spud Woodward, GA (GA)
Marty Gary, NY (AA)	Jeff Renchen, FL, proxy for Jessica McCawley (AA)
Emerson Hasbrouck, NY (GA)	Gary Jennings, FL (GA)
Joe Cimino, NJ (AA)	Ron Owens, PRFC
Jeff Kaelin, NJ (GA)	Max Appelman, NMFS
Adam Nowalsky, NJ (LA)	Rick Jacobson, US FWS
Kris Kuhn, PA, proxy for T. Schaeffer (AA)	

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

### Ex-Officio Members

Caitlin Craig, Technical Committee Chair

### Staff

Bob Beal	Tracey Bauer	Katie Drew
Toni Kerns	James Boyle	Kristen Anstead
Tina Berger	Caitlin Starks	Jeff Kipp
Madeline Musante	Chelsea Tuohy	Jainita Patel
Lindsey Aubart	Emilie Franke	Trevor Scheffel

### Guests

Dennis Abbott	Joseph Beneventine	John Carmichael, SAMFC
Thad Altman	Greg Blackler, Maine Elver	Nicole Caudell, MD DNR
Mike Armstrong, MA DMF	Fishermans Assn.	Michael Celestino, NJ DEP
Steve Atkinson, Virginia	Colleen Bouffard, CT DEEP	Benson Chiles
Saltwater Sportfishing Assn.	Michael Bowen, Cornell Uni.	Matthew Cieri, ME DMR
Pat Augustine	Ingrid Braun-Ricks, PRFC	Haley Clinton, NC DEQ
Linda Barry, NJ DEP	Olivia Brocklebank	Brian Collins
Mel Bell	Delayne Brown, NH FGD	Margaret Conroy, DE DNREC
John Bello, Virginia Saltwater	Jeff Brunson, SC DNR	Matt Corbin, MN NRP
Sportfishing Assn	Jeffrey Brust, NJ DFW	Claire Crowley McIntyr, FL FWC

Scott Curatolo-Wagemann,

Caitlyn Czajkowski  
 Tanya Darden, SC DNR MRRI  
 Conor Davis, NJ DEP  
 Montgomery Deihl, Ocean Fleet Services  
 Taylor Deihl, Ocean Harvesters  
 Greg DiDomenico  
 Steve Doctor, MD DNR  
 C. Dollar, CCA National  
 Roman Dudus  
 Phil Edwards, RI DEM  
 Julie Evans, East Hampton Town Fisheries Advisory Cmte.  
 Steve Fagan, SMRFO  
 James Fletcher, Unites National Fisherman's Association  
 Anthony Friedrich, ASGA  
 David Frulla  
 Alexa Galvan, VMRC  
 Keilin Gamboa-Salazar, SC DNR  
 Matthew Gates  
 Shaun Gehan  
 Lewis Gillingham, VMRC  
 Angela Giuliano, MD DNR  
 Berlyna Heres, FL FWC  
 Jaclyn Higgins, TRCP  
 Peter Himchak, Omega Protein  
 Harry Hornick, MD DNR  
 Jesse Hornstein, NYS DEC  
 Derrek Hughes, NY DEC  
 Bill Hyatt, CT (GA)  
 Todd Janeski, VCU  
 Mike Jech, NEFSC  
 TJ Karbowski, Rock & Roll Charters  
 Amy Karlnoski, Office of NYS Assemblyman Fred W. Thiele, Jr.

Cornell Cooperative Extension of  
**Guests (continued)**

Carrie Kennedy, MD DNR  
 Aaren Kornblutit  
 Adrienne Kotula  
 R. Kramer, Wild Oceans  
 Robert LaCava, MD DNR  
 Ben Landry, Omega Protein  
 Laure Lee, US FWS  
 Nicole Lengyel Costa, RI DMF  
 Ben Levitan, Earthjustice  
 Brooke Lowman, VMRC  
 Michael Luisi, MD DNR  
 Shanna Madsen, VMRC  
 John Maniscalco, NYS DEC  
 Anthony Mastitski, Marine Stewardship Council  
 Joshua McGilly, VMRC  
 Daniel McKiernan, MA (AA)  
 Alexandre Meirhaeghe, NYS DEC  
 Steve Meyers  
 Chris Moore, Chesapeake Bay Foundation  
 Janelle Morano, Cornell Uni.  
 Molly Morgan-Ogren, RI DEM  
 Ray Mroch, NOAA  
 Dale Neal  
 Jean Nelson  
 Thomas Newman, North Carolina Fisheries Assn.  
 Jeff Nichols, MA DMR  
 Scott Olszewski, RI DEM  
 Marina Owens, FL FWC  
 Danielle Palmer, NOAA  
 Alexis Park, MD DNR  
 Michael Pirri  
 Brandon Price, VMRC Marine Police  
 Jill Ramsey, VMRC

Suffolk County

Davis Reed, Chesapeake Legal Alliance  
 Harry Rickabaugh, MD DNR  
 Bailey Robertory, Chesapeake Research Consortium  
 James Rogers  
 Kevin Rose  
 Amy Schueller, NOAA  
 Chris Scott, NYS DEC  
 Tara Scott, NOAA  
 Alexei Sharov, MD DNR  
 David Sikorski  
 Ethan Simpson, VMRC  
 Joseph Smith  
 Somers Smott, VMRC  
 Blaik St. Amand, CT DEEP  
 John Sweka, US FWS  
 Kristen Thiebault, MA DMF  
 Chad Thomas, NC Marine & Estuary Foundation  
 Jim Uphoff, MD DNR  
 Taylor Vavra, Stripers Forever  
 Tim Wheeler, Bay Journal  
 Ritchie White  
 Kelly Whitmore, MA DMR  
 Lowell Whitney, US FWS  
 Angel Willey, MD DNR  
 Travis Williams, NC DEQ  
 Steven Witthuhn, NY MRAC  
 Gregory Wojcik, CT DEEP  
 Rich Wong, DE DNREC  
 Chris Wright, NOAA  
 Phil Zalesak  
 Daniel Zapf, NC DEQ  
 Renee Zobel, NH FGD

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, April 30, 2024, and was called to order at 1:15 p.m. by Chair Conor McManus.

### **CALL TO ORDER**

CHAIR CONOR McMANUS: Good afternoon, everybody. For those of you who do not know me, my name is Conor McManus. I am the Chair for the Atlantic Menhaden Management Board. I would like to call the meeting to order.

### **APPROVAL OF AGENDA**

CHAIR McMANUS: With that being said; we'll move on to our first item, which is Approval of the Agenda. Is there anyone who has comments or revisions to the agenda as written? Seeing no comments or hands, I assume that we can approve with consent.

### **APPROVAL OF PROCEEDINGS**

CHAIR McMANUS: Which will then move us to approval of the meeting summary from October, 2023. Are there any revisions recommended by the Board? Seeing none; then we will consider that approved by consent.

### **PUBLIC COMMENT**

CHAIR McMANUS: Which then brings us to Public Comment. Just by a quick show of hands in person and online, how many folks do we have who are interested in providing public comment?

MS. TONI KERNS: Just to be clear, we see no hands raised right now online. If there is anyone online that wants to make public comment, please make sure you raise your hand now, three minutes.

CHAIR McMANUS: What we'll do now is we'll enter into public comment. I'll look to folks in the room first, and then we'll look to those online for three-minute public comment for items not on the agenda. Remember it's public comment, not a

dialogue with the Board, so hopefully looking to obtain your public comments and then the Board is listening. With that I think I'll look to the room first for public comment. Yes, feel free to step to the microphone.

MR. PHIL ZALESK: All right, Mr. Chairman. My name is Phil Zalesak; I am the spokesman for the Save Our Menhaden Coalition. Striped bass are dependent on menhaden for their survival. The higher the mortality rate of menhaden, the higher the mortality rate of striped bass will be. The current Virginia Atlantic menhaden reduction fishery allocation is 158,000 metric tons. That is three-quarters of a billion fish approved to be removed from the Chesapeake Bay and its entrance, during a period of time of little migration.

That is two-thirds of the total allowable catch for the entire Atlantic coast. This is the very definition of localized depletion. According to NOAA, the recreational harvest of striped bass has declined 72 percent in Maryland/Virginia from 2016 to 2022. During the same period of time, the reduction fishery exceeded its Chesapeake Bay quota by 15,000 metric tons in 2019, which created further foraging pressure on striped bass. Therefore, striped bass are most likely being starved to death, not overfished.

Further, the Maryland Department of Natural Resource's Stripe Bass 2023 Young of the Year Index, is 1.0, well below the long term 11.1. That is five straight years of poor performance. Mr. Chairman, the Coalition recommends that the Board task the Technical Committee to complete the following, no later than August of this year.

First, determine the ecological and economic benefit of ending reduction fishing in Virginia waters. Second, determine the ecological and economic benefits, realized by New Yorkers and ending reduction fishing in their waters. Oh, by the way, the Coalition is comprised of scientists like Dr. Noah Bressman of Salisbury University, thousands of recreational fishermen, the Sierra Club, the Audubon Society, and the International Osprey Foundation. I thank you for your time.

CHAIR McMANUS: Thank you for your public comment. Do I have a hand for someone next? Yes, feel free to step to the microphone.

MR. DAVID REED: Good afternoon, my name is David Reed. Fisheries managers for the Virginia Marine Resource Commission recently advised that Commission not to act on a petition for rulemaking. In one breath the fisheries manager positively stated that overfishing and localized depletion is not occurring, and that the petition intentionally misled the Commission to think otherwise.

But immediately following this, Ms. Madsen and others lamented that they simply don't have the data to determine whether localized depletion is occurring in the Bay, so which is it? The fact is, unbalanced the totality of evidence, including the data and modeling in the Atlantic, as well as back of the envelope modeling of local stocks, and also anecdotal data, shows that it is more likely than not that localized depletion is occurring in the Bay and the mouth of the Bay.

With the 2019 Liljestrand and Wilberg study showing minimal communication and disbursement between Atlantic regional populations, this strongly suggests that it is more likely than not that when regional and local populations are depleted, they are not quickly replenished. In this case over 200 million pounds in a single season from the Bay and the mouth of the Bay.

Both Virginia fisheries law and the Magnuson-Stevens Act require not only an ecosystem-based management approach, but a precautionary one. That is inaction until scientific certainty demands a response runs afoul of the legal requirements for fisheries managers and of science itself. Furthermore, a failure to properly acquire the data, the largest and most important estuary in the Atlantic coast is not a justification for inaction.

Lamenting the lack of that data is not a response. This Board should not follow the agenda of any particular stakeholder/staff member, but instead manage the regional fishery to protect the regional estuary, and not to ignore the obvious and

enormous difference between managing the Atlantic stock and the Bay stock. The Board made the right decision in 2017 to reduce the Bay cap. It should further reduce the cap unless and until the data is available to determinately show the Bay stock is healthy on an ecosystem basis. Finally, because we have three minutes and not two. Most scientists bristle at both letter conclusions and studies, and potentially skewed analyses interpretations for the purpose of both claims, I get that.

All that said, folks generally don't understand that most research merely shows a strong tendency. This is true of modeling and experimental designs. Statistical significance is not a smoking gun. We today have the opportunity to put all this in perspective. Don't wait for smoking gun science that we all know isn't coming, which virtually no field can produce, without which we simply cannot know anything.

Ecosystem pressures, species pressures could be climate, bacteria, dissolved oxygen and a litany of other drivers, but that is obfuscation with an agenda not to act. Menhaden removal from the system is a substantial and maybe even primary driver of both osprey and striped bass population stress. That we can't know with certainty which one it is, not precluded for consideration for menhaden.

CHAIR McMANUS: Thank you very much for your comments. Yes.

MR. BRIAN COLLINS: Thank you, my name is Brian Collins, I consider myself a concerned citizen and active participant in dialogue on the concerns you've heard about. I've put a few things together that are questions that our informed group has raised, and the answer that we currently have, for your consideration and the ability to clarify. I know this isn't an interactive session.

What does ASMFC and VMRC know about the availability and ecosystem demands from menhaden in the Chesapeake Bay, the largest and most important estuary in the United States?

Reportedly nothing. How does ASMFC set the quota of 112 million pounds, 51,000 metric tons of menhaden in the Bay? By using historical catch data.

How is the quota at the mouth of the Chesapeake Bay of 230 million more pounds related to the Bay quota? It's not. Industrial fishing can remove all menhaden coming and going from the mouth of the Bay, up to another 230 million pounds. How did menhaden quotas adjust for striped bass failure, since the Bay is the nursery for 60 to 80 percent, you know there is different percentages out there, of the east coast stock in the nursery of the Bay for nine years?

We need to feed those fish so that they can supply the east coast supplies. The striped bass regulations this year have no adjustments whatsoever for the quota, to address the striped bass concerns. All the blame was placed on recreational and commercial fishing. How can we get an ecosystem monitoring threshold for menhaden in the Chesapeake Bay, like Rhode Island has for Narragansett Bay? Answer, we need either ASMFC or VMRC to step to the plate and take care of that. Thank you very much for your time.

CHAIR McMANUS: Thank you very much for your comments, is there anybody else in the room, just confirming? Excellent, so now we will be moving to folks online. First online, look to Steve Atkinson, if you can unmute on your end, feel free.

MR. STEVE ATKINSON: Yes, Steve Atkinson, I'm with the Virginia Saltwater Sportfishing Association. I would like to point out that there is some science that is available right now for menhaden that in our view, strongly suggests that a precautionary approach is needed in the Chesapeake Bay, with a significant reduction in the Bay cap.

What I'm referring to is the fact that the industry, last year in particular, was not able to hit their Bay cap or was not able to hit their total allowable catch, in spite of adding an additional harvest shift. That in itself is data. During the first part of the summer, particularly May, June, July, many of the

local area bait shops reported having great difficulty finding menhaden for bait.

Their source of menhaden is usually pound netters, and the pound netters simply were not finding menhaden at that part of the season. The osprey research, you're certainly familiar with that. I won't dwell on that. More recently, of course you've heard, we had a promising bill in the General Assembly and from everything I can tell, the industry helped lobby against the bill for the second year in a row.

Once again, there are claims that there is no science to support our concerns, yet the industry apparently is lobbying against these very bills that would give us even more science. Again, therefore I think a precautionary approach is needed, until such time as science can show that it is not causing harm.

I think if we have that hook, we might find that suddenly the industry is much more interested in participating in science. Finally, I have to add, unfortunately the VMRC Board is not capable of doing anything here, and that is largely because the Board is stacked with friends of the menhaden industry. Thank you very much for your time.

CHAIR McMANUS: Thank you for your comments, and we have one last late individual interested in public comment, so we will ask you to unmute, and try to be brief as much as you can. Jim Fletcher.

MR. JAMES FLETCHER: The United National Fishermen's Association for years has said pharmaceutical pesticides and manmade chemicals are the problems for most fisheries. We now know that the PFAS and plastic micro and nano are more of a problem than we realized. Rather than going sport against recreational, why don't we try an enhancement program of spawning trillions of menhaden, and releasing them where the eggs and larvae can grow?

Why not try something different? The situation is, enhancement may be the solution, but the true problem lies with the wastewater that is coming



downstream, and that can be addressed by land applying all wastewater. Thank you for your time, and hope that somebody listens to the plastic problem and the wastewater problem. Thank you, James Fletcher, United National Fishermen's Association.

CHAIR McMANUS: Thank you for your comments, Jim. With that, that will close out our public comment period for this meeting.

**REVIEW REPORT ON ACOUSTIC SURVEY OF  
OVERWINTERING ATLANTIC MENHADEN  
OFFSHORE OF NEW JERSEY**

CHAIR McMANUS: With that we'll move on to Item 4 on the agenda, which will be Report on and Acoustic Survey of Overwintering Atlantic Menhaden Offshore of New Jersey, presented by Dr. Genny Nessler. With that, I will pass it to you, Genny.

DR. GENEVIEVE NESSLER: Thank you, Chair, and thank you all. Good afternoon; my name is Genny Nessler. I am now an Associate Research Professor at Chesapeake Biological Lab, and a former member of the Commission family, so it's good to be back and see you all this afternoon. Thank you for letting me have the opportunity to brief you today on a Cooperative Survey that we ran for Atlantic menhaden in the winter of 2022.

This project was highly collaborative, cooperative research done in collaboration between academic and private scientists, industry folks, as well as numerous federal and state partners. There was a large team of folks, including colleagues here at Chesapeake Biological Lab, as well as folks you know well from Virginia Institute of Marine Science, Normandeau working alongside the folks from Lund's Fisheries, our wonderful captain, Stef and Leif Axelsson from the vessel we used for the survey, the F/V Dyrsten.

We were very fortunate to have the feedback and the partnership of the Northeast and Southeast Fisheries Science Centers, as well as New Jersey DEP, all working together on this project. It was

such a huge thing to get it done. I just want to extend my thanks to the Commission for your support of this science, as well as the states of Delaware, North Carolina and South Carolina, for providing transfer quota to New Jersey in 2022, to make sure we were able to get this science done, so thank you.

When people hear the phrase menhaden survey, they get very excited. I'm glad they do. I get excited myself, but I just want to tell you a little bit about the very specific goals of this particular survey. This was a project funded by NOAA Fisheries through the Saltonstall-Kennedy Program, with the goal of providing science that promotes sustainable U.S. seafood production and harvesting.

In particular, we started working on this project in response to a need the industry had. There is a winter bait fishery out of New Jersey that operates mostly between January and March. It began in 2014, and they seemed to very easily hit their quota, and they claim that they were seeing a lot more fish out on the water, and were asking for more quota.

But of course, we don't know how many fish are out there. In fact, when I started at the Commission back in 2008, we didn't even think that menhaden were overwintering in that region of the coast. This is really an area where we know very little about their biology, what they're doing up there in the winter, and how many there might actually be off the coast of New Jersey for this particular fishery.

We set out to conduct a hydroacoustic survey of the overwintering menhaden population of offshore of New Jersey, to see basically what the biomass of menhaden might be in that region. Then of course, what is the age, the size, the sex structure, maturity of the fish that we encounter in that study area.

We were partnering with industry on this, and using an industry vessel, and the acoustics onboard, and so one of our other goals was to see how accurate those industry acoustics were, and whether there was potential for future use in additional cooperative research in the future. Then we also

sampled menhaden. The idea was that if we did encounter menhaden, we would age them in the lab and do a thorough aging evaluation study to see what the uncertainty is for these animals that we anticipated would be some of the older fish, given how menhaden tend to stratify by age along the coast. When we set off to start thinking even about this project, it was back in 2015/2016.

When we sat down to design this survey, we realized how difficult it was going to be, because menhaden don't like to play by normal fish rules. They tend to form, as you know, extremely large, very dense schools. But they are very patchily distributed across the seascape, such that if you run a normal acoustic survey, you might not encounter them.

That was a challenge, and in addition we were trying to survey in the winter. While in the summer, as you all know, large schools are near the surface, you can see them from a spotter pilot in the wheelhouse of a large vessel, and you can harvest them with purse seines pretty easily. That is not so in winter.

In winter the school's kind of go subsurface when the water temperature drops. Therefore, you can't use purse seines, you can't see them, how are we going to survey for them? What we did was we spent quite a bit of time with a project funded by the NSF Science Center for Marine Fisheries to design and simulation test a new acoustic survey that was tailored just for Atlantic menhaden, and to try and meet all those challenges I just mentioned.

We published that approach and the simulation study that we did to accompany that in 2020 in fisheries research, and in that same year we also, thanks to you all, had the Technical Committee review that in our implementation plan for the cruise, and they provided a lot of great feedback, which we incorporated into our final cruise plan.

That is all, and you can also reference the memo from August of 2020 for that. I'll just briefly touch on why this survey design is a little bit different. You've probably seen other acoustic surveys where

folks go out, the scientific crew goes out with a vessel, and they run, transect random lines along a study area.

They are looking with the echo sounder, the down sounder, down underneath the boat, for any biomass of fish that they might cruise over. The problem being of course if we did that, we might not see any menhaden, because they are very densely packed in these tight little schools across the landscape.

What we decided to do was use a combination of the down sounder, that you would normally use for an acoustic survey, along with the omnidirectional sonar that is also on this vessel, looking out in front of and beside the boat. That effectively allowed us to expand our search area out to about 1,600 meters each side of the boat, as opposed to just being underneath the vessel, maybe 30 or 50 meters wide.

If we encountered a fish school within that search area, 1,600 meters each side of the boat, then we included that in our analysis. If we saw schools outside of that range, we noted them. But they were not included in the final biomass estimates, just to maintain statistical rigor with this design. The actual survey area that I keep referencing, I'll show you a map here. Our basic operations were in Cape May, and we were surveying the area about 15 to 50 miles offshore from the southern end of Hudson Canyon down to the Delaware/Maryland, excuse me the New Jersey/Delaware border. You can see here that the area outlined in gray, and then the black lines are the actual transects that we ran.

They were straight line transects, perpendicular to shore. You can see the general area of highest concentration where the state fishery is operating, although they do move into offshore waters farther north and farther south, a lot of the fishing occurs in this region. We utilized the fishing vessel the Dyrsten, which many of you may be familiar with.

It's 160-foot midwater trawling vessel, it's quite large and powerful. We had two experienced

captains onboard, who provided a lot of the knowledge we needed to make the logistics actually work in the timeframe we had. We were very fortunate that our partners were the VIMS survey crew, which are usually onboard the NEAMAP and the CHESMAP surveys.

We had a very experienced scientific Chief Science Officer, as well as the sampling crew, that you would normally have for the other coastal surveys. The vessel is equipped with some of the most advanced industry-grade downsounder and omnidirectional sonar on the market, so we felt that this might be a possible substitute for the scientific-grade sonar that is typically used on science vessels.

But of course, we set off to test that, and I'll talk about that in a moment. One of the ways that we were able to test that is that this vessel was large enough to capture with the midwater trawl net, and then store individual schools of menhaden. What this gave us the ability to do was to collect echosounder sonar data on the schools that we encountered under the vessel as we passed over it, and then compare the biomass that we estimated from the sonar with the actual weigh-out at the dock at Lund's.

They individually pumped out each school from each of the individual tanks, and weighed them individually, so we could do a side-by-side and see how accurate our sonar estimates were. We were delayed one year in implementation because of COVID, but we did finally get on the water in winter of 2022, and we spent about three days actually calibrating the sonar.

When I say we, I should thank Dr. Mike Jech and the VIMS crew. Mike Jech is acoustic expert at the Northeast Fisheries Science Center, came down and spent his weekend helping us calibrate the sonar equipment onboard, so that we would have that for post processing. The actual design-based survey was conducted from Valentine's Day through about ten days after that.

We had two days that we weren't on the water, because of a severe storm that came in. But

otherwise, we were able to proceed pretty regularly. We actually finished a little bit early, and both the industry and academic folks were so excited about what they were doing, that they actually volunteered to go back out with the crew.

What we ended up doing was collecting fishery dependent data with the VIMS sampling crew onboard for an additional week from the end of February through the beginning of March. Then once the VIMS crew had to go back and actually work on their own surveys, we had Lund's Fisheries kindly continue to do additional port sampling, so that we were getting the most out of that particular year, sampling and collecting as much information as we could as part of this project. I am happy to report that we encountered a lot of menhaden. It was very exciting. A lot of this is new data that no one had ever seen before, so I'm happy to share this with you.

We ended up collecting sonar data on over 100 schools of menhaden. Five of them were sampled individually, stored in individual tanks and then weighed at port, so that we could do that comparison that I mentioned before. We also took advantage of the opportunity, while we were on the water, to collect as much hydrographic data as we could, so we would get a handle on what the ocean conditions were during the survey, both along the transects at regular locations, and also at the locations where we encountered menhaden schools.

The bottom left figure there, just gives you a few example sonograms of echograms of individual menhaden schools. You can see they are extremely large and extremely dense, if you are used to looking at these sorts of images. The red indicates very densely packed large school. The map on the right is our study area, outlined in black, and the dashed lines are the transects.

The black dots are the locations of the individual schools of menhaden that we encountered during the survey, and then the red triangles are schools that we encountered when the VIMS crew was

onboard with the fishing vessel, while they were doing normal fishing operations.

Now the one hiccup we had, and there is always a hiccup when you do real field research, is that about half way through our survey, we noticed that suddenly overnight, the menhaden changed their behavior, and they were no longer forming these incredibly big, dense schools near the middle or bottom of the water column.

They were suddenly dispersed as tiny schools near the surface. We could see them in the wheelhouse, but it was really difficult to get over them and actually collect sonar information on them. After much consternation and consultation with oceanographers later, when we got back to port, we discovered that a warm core eddy had moved into the region, and it pushed a big ball of warm saline water up into our study area, right in the middle of our survey, which changed the behavior of menhaden, which we had no idea actually occurred.

The fishermen had said, oh yes, we've seen that before. But they didn't know why they did it. It just suddenly happened. Well, now we know why, and we'll know in the future when we go to survey for them again, hopefully someday that we will monitor those warm eddy mass to make sure we go out in the water at the right time.

But what you can see on the bottom left is a graph of the water temperature, both in the bottom and the surface. The blue bars are the first two transects before that warm core eddy really hit the area, and the red is after. On the graph on the right, is salinity. You can see particularly on the bottom there was a big change, an increase in water temperature and an increase in salinity, about halfway through our survey.

In total though, we were able to catch up to and ensoufy and do biological collections on a number of schools, and with that we were able to collect lengths and weights on over 4,000 individual menhaden. Three hundred of those we subsampled, and collected a whole bunch of additional information, including length, weight, but

also sex, maturity stage, which was from visual inspection, and then we collected a patch of scales, as well as paired sagittal otoliths. Here we were able to do very extensive paired scale otolith comparison, and do an aging study on them.

I'll just briefly touch on the highlights of our results. The report I provided has all the details for you. But in the bottom left here you can see a plot of the fork length of the individuals that we sampled. The red bars are females and the blue are males, and where they overlap it is purple. You can see that these are much larger animals than we typically encounter in the port samples that make up the majority of the information that goes into the stock assessment.

Our average length of the fish that we encountered was about 270 millimeters, and the average in the reduction fishery is probably about 250 or so, so larger animals, you can see the red bars extend farther to the right. The females therefore tend to be larger than males, which is normal for a fish. But it was exciting to finally see that with menhaden.

On the right you'll see a plot of Beaufort Lab's estimates of the aging, based on scales. You can see there that most of the animals were between ages 3 and 5. We had VIMS and New Jersey DEP age them as well. There wasn't a great agreement among the three labs, but they all agreed that these were primarily ages 3 and 4 fish, which is very different than what we particularly encounter with most of the port samples for the stock assessment, that are mostly ages 1 and 2.

We were encountering large or older fish than we typically see in our sampling programs. A little over half of them were female, but the other big interesting piece of information we were able to gather was that most of these fish were mature, which isn't surprising given their age. But they were currently not spawning, at least most of them.

A small proportion were, but most of them were not spawning. One of the questions that had been raised, or concerns that the Technical Committee had raised earlier on was that, are you going to be

surveying and pestering spawning aggregations. We didn't think that was the case, because we don't in general think that menhaden have spawning aggregations.

The previous work that other folks, including myself has done, looking at ichthyoplankton data indicate that they seem to be spawning pretty continuously up and down the coast, that they don't form spawning aggregations. But this was at least one confirmation, a snapshot in time at least in one area that did not appear to be the case. That was promising.

Then our comparison of the trawl catches to the acoustic estimates of biomass for each school, turned out to be positive as well. Working with industry-grade sonar data is much more labor intensive. We had to do a lot of post processing, compared to scientific-grade sonar, but it's doable. If you look at the graph on the bottom left here, you can see the red bars are the trawl catch made out by Lund's at the dock.

The blue bars are our estimates of biomass for those same exact schools from the acoustic data. They are not exactly the same, you wouldn't expect them to be. But they are close enough that we felt that there is promise in using industry-grade acoustics potentially for future cooperative research. Then of course the big answer everyone wants to know is how many menhaden were out there when we were surveying. What we did was we took the biomass of menhaden encountered in each of those transects, and scaled them up to the entire survey area.

Our estimate ranged from a little less than 8,000 metric tons, which correlated to about 17 million in pounds of menhaden, on the low end, with up to as high as perhaps 11,000 metric tons, which equates to 24 million pounds. That's our estimate for 2022. Just a few notes on that. We think that low end estimate is pretty conservative, because it doesn't account for that effect of the warm core eddy that hit the survey.

Meaning that because we weren't able to actually get estimates of them and their behavior changed the detectability and the catchability, and the survey changed in the middle, and that was a challenge. But we didn't want to try and inflate that too much, so we're most confident in this low-end estimate.

The higher end estimate reflects the spatial modeling that we did to try and account for the effects of that warm core eddy, and the change in water temperature that ensued. It could be as high as that 11,000 metric ton estimate. That being said, that may be an underestimate as well, because we did assume 100 percent catchability in the trawl net, which is likely it's never 100 percent, and we also assume that the sonar was capturing the entire school.

The signal from the entire school, which probably isn't the case either. But we wanted to be conservative, and so these are our estimates, between a little less than 8,000 to 11,000 metric tons. To put that into perspective, the study area biomass that we estimated, is probably only about half of a percent of the Age 1 plus biomass that was estimated in 2022 from the stock assessment itself.

This is a tiny fraction of the coastwide stock. But if you are looking at local management, just for reference, the portion of New Jersey's quota that is allocated the winter trawl fishery is equivalent to about 6 to 9 percent of our estimated study area biomass for 2022. It's a small fraction of what is in New Jersey, but what's in New Jersey in winter is probably a small fraction of the total coastwide biomass.

Just to conclude, I'll wrap up with some of the high points, the takeaway messages from our study, and where we're going next with this. This study is, I think most impactful, in that we finally have fishery independent confirmation that Atlantic menhaden are partial migrants. Some of the stock is staying in the Mid-Atlantic and Southern New England region, based on what we see in the fishery as well.

While the majority may still be going down off of Hatteras, there is an overwintering population of menhaden, and so we are excited to have finally confirmed that with fishery independent data. Again, there is a small portion of the total population that is overwintering off of New Jersey. The estimated study area of biomass was a little less than 8,000 metric tons, and that is large through, compared to the current New Jersey winter trawl quota. But I think the take home message for future research for menhaden would be that we really need to think creatively, and use a nontraditional acoustic survey design, should we continue to do projects like this and surveys for menhaden, or other schooling pelagics like menhaden. If we had run a traditional acoustic design with the budget that we had, we would have said there was no menhaden out there, which we know is simply not true.

If we had used a traditional acoustic design and actually tried to do it at a frequency of number of transects at which we would actually encounter menhaden would be prohibitively expensive. Alternative designs that are simulation tested like ours may be really fruitful in the future, for the future of menhaden research.

Our next steps with this, we have our aging team on the project at Beaufort and VIMS and New Jersey DEP are working to develop best practices for aging these older menhaden that folks don't normally see in the port samples. They are going to try and come to some consensus on how best to handle these types of older fish, using both scales and otoliths for the future.

Then I'm happy to report that Dr. Amy Schueller, who is the lead assessment scientist on the stock assessment, and I, were recently funded, again by the Science Center for Marine Fisheries, to do a comprehensive study of all the available size-at-age information for Atlantic menhaden on the coast, to try and get a better estimate of time varying growth and both length at age and weight at age for potential future use in the stock assessment. With that, I would be happy to answer any questions you might have and the Chair is willing.

CHAIR McMANUS: Thank you, Genny, for a great presentation. I will look to see if the Board has any questions for Genny on her work. Yes.

MR. ROBERT LaFRANCE: There was a Figure 6, where you showed where there was red triangles and then black dots. Was that just a timing function? It seemed to me that the reds were all sort of in the same location. I was wondering if there was any rational basis for that.

DR. NESSLAGE: Absolutely, yes. The black dots were the schools that we encountered along the fishery independent survey, when it was actually the survey design, and we were following all of our protocols. We had a few extra sea days at the end, and that's where the VIMS crew went out with the fishermen while they were just fishing, and those are the red triangles.

You could see this is why we don't usually use fishery dependent data, but we go a lot of great bio samples from that, and we got several, basically echograms off of that, and that gave us a lot of good information on how to better move forward with analyzing those data. But they were not included in the biomass estimate.

MR. LaFRANCE: Thank you very much, that is really helpful.

CHAIR McMANUS: Any other questions? Yes, Allison.

MS. ALLISON COLDEN: Thank you so much for the presentation, Genny, really great work. Two quick questions for you. One, what was the size of the total area included in that polygon, if you know.

DR. NESSLAGE: Off the top of my head, I don't know, but I can get back to you. Sorry.

MS. HELPLER: Yes, that would be great, just to understand sort of the area that was being sampled. My second question you touched on a little bit at the end, but I was wondering if you could walk us through it and explain a little bit more. My question was going to be about whether or not the

transect overlapped, like the sonar coverage overlapped, and it's not how you chose the number of transects that you chose. I think you started to touch on it at the end, the approach that you took. Would you mind just sort of reiterating some points about how you decided that sample design?

DR. NESSLAGE: Sure, so in the 2020 work that we did, doing the simulation testing of alternative designs. That work indicated that based on, at least the data we had available, which were VTRs from the fishery, NEFOP locations of bycatch of menhaden, and the environmental data that is available in that region.

When we simulation tested alternative designs, it indicated that this was the amount of essentially mileage we would need to run the vessel, in order to encounter menhaden with that search area, that broadened search area. In fact, at the time, I can tell you that they had a less strong sonar, omnidirectional sonar on board, so when we did the simulation testing, actually the search area was shorter.

We've actually sampled a bit more than we had originally anticipated. Basically, the simulation study indicated that this would be adequate to get a decent estimate with I think the CD with maybe 25 percent with this number of kilometers of area surveyed. The locations were selected within a random start for the first transect, and then we tried to space them out evenly across the study area, so that they weren't overlapping.

This is the most basic design, and it's kind of the recommendation with initial pilot studies for acoustic surveys. Once you get an initial set of data, you can then do fancier designs, once you kind of know roughly what's out there. But this is kind of the first step in a new area you want to try and get that broad coverage, to figure out kind of what the variances of the school encounter rates are.

Then I think you asked if there was overlap. We don't expect, I can't remember off the top of my head. It was how many kilometers apart they were. But it should be enough that the menhaden school

shouldn't be moving between them in the timeframe, when we're going from one transect to another. That being said, we did have to be off the water for two days, due to a storm, so who knows what happened during those two days. But in general, they should be adequately spaced.

CHAIR McMANUS: I'll next go to Lynn and then I'll come to the Senator here.

MS. LYNN FEGLEY: Thank you, Dr. Nessler, this is really nice to see you and great work to you and the whole team. I just want to put a plug in. I'm a really big believer in the FK Mission, and I think this is such a really great example of how your industry and science is working together. This is really fascinating to me, and the two words that come to mind when I see this is cryptic biomass. I just wonder, and maybe you can't answer this, but I do wonder if you have any inclination that this may make impact the selectivity curves that are used in the stock assessment? It's just a thought, and I'm just curious.

DR. NESSLAGE: I don't think I can speak to whether this would impact the stock assessment. I don't think it would, per se, but my mind is traveling back to the pre, was it 2015 assessment, where we did change the selectivity curves, and we did that based on a very coarse assumption based on, I think it was the bycatch estimates of larger menhaden in the northern region of the stock assessment.

This really kind of was indicating at the end here. We finally have really good solid data that yes indeed there are bigger, older animals hanging out up in the northern part of the range. This won't actually impact the shape of a curve, per se, but at least it gives us some confirmation that we made the right decision, I think. Does that answer your question?

CHAIR McMANUS: Yes, Senator.

SENATOR: Is there data over time on any trendlines in the temperature, salinity or dissolved oxygen? I also wondered whether you had any data on pH for acidification.

DR. NESSLAGE: I'll answer the last pH first, no on pH. We only got temperature, DO and salinity. But you asked about time trends. We were only out there over about a month period, several weeks where we were collecting the hydrographic data. I have been scrambling to try and find people who have actual long time series or time series from that region offshore, and it is actually kind of difficult to find.

The Ecoman folks go into there every once in a while, but it is really not well monitored. Most of our understanding of what the ocean conditions are in that region are satellite driven, or from models. Does that get at your question? Yes, unfortunately, because I really wanted more information on that one core eddy coming in. I'm glad we took that information, otherwise we wouldn't have any idea what was going on when we were out there. But it was a snapshot in time, it's not a time series.

CHAIR McMANUS: Any other questions? Yes, Craig.

MR. CRAIG PUGH: I guess this is set to happen again? No, well that's a shame. I'm not impressed very easy, that is pretty impressive what you put up there today. That's good information. If you have a chance to do this, and you're looking for that upwelling again. As a fisherman, I would say cyclically within the moon phases of when your attention was paid.

If you repeat that again, you may find that upwelling again. With that you would begin to see a more consistent in what we find is in our catches. It can become more consistent, but that is really like a proprietary secret that most of those fishermen have. We don't offer up very much, but if you want your data collection to be accurate, you better be cyclically on the same deck. What I'm trying to say, if we took these surveys today on April 30th, that would not be the same as April 30th next year. But cyclically you can find that within the moon phase. You'll see that there is tidal influence will put those fish in a certain spot for you, and it will be much, much more consistent data. A lot of commercial fishermen are probably very sorry that I just said that. Thank you.

CHAIR McMANUS: Any other questions or comments for Genny from the Board? Thank you, Genny, very much for the presentation. I recommend public or Board if you have a follow up question for the doctor, say it now.

#### **UPDATES FROM STATE MANAGEMENT PROGRAMS**

CHAIR McMANUS: With that, that moves us on to our next agenda, which is Update from State Management Programs for Maryland and Virginia. I'll first look to Lynn Fegley.

#### **MARYLAND**

MS. FEGLEY: For this update, I don't have a whole lot to offer, other than what I offered at the last meeting, and that is to say that we are currently working on a communications tool around the balance of menhaden and striped bass in the Maryland portion of the Chesapeake Bay. It's a traffic light index analysis.

I think it's a really elegant piece of work that is not designed for management, but is designed to really present a synthesis of data that we've collected over the years, and will continue to collect, that just demonstrate how we are seeing the balance of these two animals, and our attention now is we are setting up to get it out for an independent desk review.

We want to make sure that we have independent scientists really ensuring that we are applying the data in a neutral, nonbiased way, and that our treatment of the data is fair. We're hoping that maybe we can launch this thing in the fall. I don't have a lot more to offer than that right now. I will say that the index includes information from striped bass, things like striped bass body condition, levels of relative F of menhaden.

One of the things that we've looked sort of high and low to find to include in this analysis, are data about osprey. We haven't really managed to find the right dataset to fit into that. I just bring that up now, because under other business I had a few more comments to make about that. That is really the only updates we have, Mr. Chair.



CHIR McMANUS: Thank you, Lynn, I'll look to Pat for an update from Virginia next.

### VIRGINIA

MR. PAT GEER: In your supplemental materials there is a letter that I provided to the Commission, with information from this year. Last year, if you remember, at the May 1st meeting, I gave a pretty comprehensive presentation of what we've done in the past. But as far as last year, what we did was in December '22, we had a Commission meeting where we were going to put forth some spatial and temporal restrictions on the purse seine fleet. Our Board did not approve that, but they approved the development of a Memorandum of Understanding.

That was approved last April 20th, between Virginia Marine Resources Commission, the bait and the reduction fleets., to provide some protection with the one nautical mile buffer around some of the beaches, some of the areas that are publicly used in the summertime, and some temporal restrictions of not fishing in the Bay on weekends and on holidays. The purpose of that was to try to prevent spills by having them fish in slightly deeper waters. Then also, if there is a spill, having it a little bit further from shore. That seemed to work. Ocean harvesters were also going to, they worked with us to improve their spill response. Ocean harvesters have purchased a skimmer boat that in case there was a spill they can respond immediately to get out there and try to collect those fish before they do come to shore. I'm very happy to say in 2023, we did not have any spills at all. We did not have any reported spills to us, and that is the first time since we started keeping good records on spills since 2016. Part of the 2023 General Assembly, there was a Senate bill.

Senate Bill 1388, which requested VIMS to create a plan on how to study menhaden, so to come up with a plan, a budget to involve the ecology, the fisheries impacts, and the economic impacts on menhaden. As a result of that, Bob Latour and some of my staff worked on a workshop that was held August 8 and 9 at William and Mary. It was attended by 21 scientists, resource managers,

recreational fishermen, different sectors of the fishery, and NGOs, to discuss the priority needs in the Chesapeake Bay in Virginia for menhaden.

The group came up with nine issues in three categories; ecology, fisheries impacts, and the economic importance. The total price tag for those nine projects was about 2.5 million dollars over three years. Moving forward to this General Assembly Session, we had a House Bill 19, which was put forth to fund those projects, at least fund some of them.

It went forward, it went into Committee. Unfortunately, the Rules Committee decided to table it until 2025. But at least now, if you look at the letter I wrote, there is a link to the research there. They did a really good job these nine priorities. We have a plan. We just have the chart one running forward.

There was another bill that was introduced, House Bill 928, which addressed interference with commercial fishermen. There were a number of alarming videos that surfaced of watercraft approaching commercial vessels, interfering with their nets, interfering with their vessels, and actually going over their nets.

You can hear the verbal attacks on the commercial fisheries, the vessels themselves, and the people onboard. This Bill raises the penalty for people found guilty of that to a Class 1 misdemeanor, which is a \$2,500.00 fine or up to one year in jail, and also revocation of all their fishing and hunting privileges in the state for one year.

It was passed by the General Assembly unanimously, and the Governor signed off on that. We've had a couple of petitions. Some of the commenters mentioned these. This is a relatively new process for us, it's in the Code of Virginia that allows the public to request changes or repeals to existing regulations. Somebody can make a request to a specific agency, and then it goes to the Register, you only have 12 days to upload the petition onto what is called the Virginia Town Hall website.

It is up there for 21 days. People can read the petition; they can provide whatever comments they want for 21 days on that petition. Then afterwards, the Agency in question has 90 days to issue a written decision on whether to grant or deny that petition, so it's a yes or no. A simple yes or no, if they say yes, then that agency moves forward with regulatory process. We had one on June 27, which was a petition to regulate menhaden purse seines and ensure they are fished in a proper manner and an appropriate depth. The petitioner said the nets are too deep to be fishing in the Chesapeake Bay, and that they don't leave enough room for non-target species to escape, and they are affecting the bottom habitats. That went before our Board in October 26, and VMRC denied the petition with a 5 to 1 vote. In December '21, we received a second petition, which is much more detailed.

It had five issues, one to enact a moratorium on the reduction purse seine in the Bay. Two, require at least 40 percent of the Virginia reduction harvest come from federal waters. Three, codify the one-nautical mile buffer in regulations, which is now listed in MOU. Four, to fund the implement of the population studies proposed by VIMS, and five, establish a proper industry oversight, increase harvesting of bycatch monitoring.

The 21-day comment period ended on February 5, and the Commission heard it just last Tuesday on April 21. There was a lively discussion about it, and the petition was denied 5 to 3. We're also seeing quite a few more public interactions. We've had 11 FOIA requests for menhaden in the last year. We're spending a fair amount of time.

You know these petitions take a lot of our time when they come forward, because we have to deal with those. We're seeing a lot more folks showing up at our Commission meetings, speaking during public comments that are not on the agenda as well. That is all I have at this point. We're hoping that somewhere along the line we can get funding for some of those projects that the folks on the workshop provide.

CHAIR McMANUS: Thank you both, Lynn and Pat. Based on some of the discussions we'll have in our next agenda item, what I would like to do is move into that presentation now. Then the Board can have discussion or comments on both for Lynn and Pat as necessary, or as needed. Then as well for Katie.

#### **PROGRESS UPDATE ON 2025 STOCK ASSESSMENTS**

CHAIR McMANUS: With that, I'll look to Katie to give us a Progress Updates on the 2025 Stock Assessment.

DR. KATIE DREW: As mentioned, I'm going to be providing an update on the current stock assessment progress, as well as talk a little bit about kind of the next steps after that assessment, where we think we'll end up, in terms of any spatial reference points or more spatial information to inform the Board, as well as some information on next steps that management should consider. Our current timeline is up on the screen right now.

We most recently had a Data and Methods Workshop in October of 2023, which I'll go into some of the discussion and results of that workshop in my next slide. But we are currently right now in the process of gathering data to support the single-species assessment update, as well as the multi-species assessment that are going to support the ERP model.

At the end of this timeline, you will see we are anticipating presenting this to the Board at the annual meeting in 2025. Following the peer review, which will be through the SEDAR process in the summer, August of 2025. Our next big workshop is going to be the Methods Workshop Part II, in October of 2024, which is going to include one day for the SAS to discuss the assessment update, and then the rest of the time will be the ERP Workgroup on the ERP assessment.

#### **ECOLOGICAL REFERENCE POINT BENCHMARK ASSESSMENT**

DR. KATIE DREW: The next thing I wanted to talk about a little bit is basically, what did we talk about

tat the Data and Methods Workshop, to give you an idea of where we're going with the ERP benchmark assessment. We met in October to review potential new data sources and discuss high priority models of relevant tasks. A more detailed meeting summary is available online, but I'm just going to go through a few highlights of what was brought to us going forward.

As you know, we encouraged and in fact put out a call for data for external collaborators, or external researchers to bring data to these assessments, for all of our assessments, so that it is not just what did we use before in the past, what do we know that the state and the feds have. We have an opportunity to bring in other data sources. I'll go over some of the important ones that were presented from external researchers.

The Nesslage et al Survey was not considered for inclusion in the assessment, due to the short time period. This is basically just a snapshot of a pilot study. It really wasn't suitable for the assessment as a whole. But some of the weight-at-age information from that study showed some discrepancies with the weight used in the single species assessment.

The ERP Workgroup recommended that the SAS explore this particular issue in more depth, using additional data sources as part of the assessment update. The ERP Workgroup remanded that to the SAS for further consideration. The next data source that was brought to us was from Dr. Ault, and so his colleagues presenting a reanalysis of the tagging data used to develop estimates of menhaden natural mortality.

That resulted in a lower natural mortality than when he was using a different subset of the data and different methods. This is compared to what is currently used in the single-species assessment. The ERP Workgroup remanded this to the SAS as well, kind of recommending that some additional work be done to understand the differences between the datasets in question, and conduct a sensitivity run with a lower natural mortality for consideration in the ERP model.

The next dataset was some information presented by Dr. Watts on the relationship between menhaden and osprey in the Chesapeake Bay, and other nearshore types of piscivorous birds that he's worked on. As well as the ERP Workgroup reviewed some additional literature on marine mammal diet. Overall, the ERP Workgroup found that the marine mammal and bird diet data and abundance data are still extremely limited coastwide.

We have some good very localized studies of individual aspects of this relationship. But overall, the data are very limited. The ERP recommended doing a comprehensive review of the existing data for birds and marine mammals, to update the NWACS-Full model, that is the full EWE model, as a complement to the NWACS-MICE model. But at this point, not including birds or marine mammals in the NWACS-MICE model.

Instead, we'll look to that sort of full comprehensive NWACS-Full model to support or provide context for the results from the NWACS-MICE model. Similarly, the ERP Workgroup reviewed new diet information on bluefin tuna and blue catfish, as potential additional predators within these models, and recommended exploring the inclusion of bluefin tuna further, as the data were insufficient, but not blue catfish for this assessment. The more comprehensive diet data studies for blue catfish, indicated that menhaden was actually a relatively small component of their overall diet, and the geographical overlap with menhaden was limited, basically to freshwater, less saline parts of the Chesapeake Bay. At this point, there is not a lot to be gained from including blue catfish in the NWACS-MICE model. We may come back to this decision for future assessments as the spatial skills of blue catfish extends, or as the spatial extent of the NWACS-MICE model changes. But at this point we did not feel that that warranted inclusion. Those were the source of new data sources we examined, or at least the important high-profile ones.

In terms of high priority modeling tasks, the ERP Workgroup identified the following as things we want to make sure we accomplish for this benchmark. Number one, incorporating seasonal

dynamics into the NWACS-MICE model to better capture predator and prey temporal overlaps. Right now, we're just using an annual time step.

The intent would be to go down to a monthly or seasonal time step, to better capture some of that interactive, some of those overlaps, especially in some of the things like the Atlantic herring and striped bass overlap, which is a very intense relationship during certain times of the years, but has less overlap during other parts of the year.

In addition, we would like to incorporate bottom-up feedback into the VADER multispecies statistical catch at age model as a complement to NWACS-MICE model, and to further develop that modeling framework, as recommended by the Peer Review Panel, as well as continue development and testing of a model that was not considered last time, but might be useful this time around.

The Wilberg et al age structured predator prey simulation model would provide some interesting simulation capacity to support the NWACS-MICE and data model. Additional high priority modeling tasks include the incorporation of spatial dynamics into the NWACS-MICE model during this benchmark.

D. Chagaris et al have been funded through an S-K Grant to do this work for us, which will give us a lot more dedicated time from that group, in order to advance this model. In addition, the ERP Workgroup is going to work on gathering additional data, and reworking existing multispecies data, to support a finer seasonal and spatial scale for model development. That covers sort of where we are with the multispecies, the ERP, benchmark assessment.

#### **ATLANTIC MENHADEN SINGLE-SPECIES ASSESSMENT UPDATE**

DR. DREW: I'm going to give a quick update on the single-species assessment update. At this point fishery independent data through 2023 have been submitted. Fishery dependent data are due, essentially this month, and we are trying to have

the base model runs completed in time for the October, 2024 Assessment or Methods Workshop. In terms of the tasks that the SAS got from the ERP Workgroup. The task requested all available weight and age data from the states, and ended up with a very limited data to evaluate the species for the 2025 update.

I think most of the work to resolve that question is probably going to have to come from the Nesslage and Schueller Project that was recently funded. In terms of natural mortality, the staff determined that changing M was not warranted at this time, as the current M is based on a peer reviewed study that also was reviewed and accepted by the Peer Review Panel at the last benchmark assessment. But number one, we'll conduct some alternate runs with a lower M estimate to support the ERP work, and we'll look further into the discrepancies between the data sources and other issues for the differences in the M estimates, to help resolve this issue going forward. I'm going to pivot a little bit now from sort of what has happened to what will happen, and what is going to happen going forward, to talk a little bit about the spatial ERP timeline.

This iteration of the NWACS-MICE model will incorporate more information on seasonal and spatial dynamics into the ERPs for this benchmark. However, the BAM single-species model will remain a coastwide model. There just is not time to develop a spatial model for the BAM. If you remember this timeline from the ERP Workgroup memo.

We presented this in April of 2021, I think when we were initially talking about this, that as we want to develop more spatial ERPs that can provide a quantitative estimate of what makes up what the Bay cap is, or more quantitative information on what's happening in the Bay. There is sort of different scales of approaches, ranging from sort of a more coarse spatial scale with minimal additional data requirements, down to a very fine spatial scale that will have significant additional data and modeling requirements.

The timeline for most of that was sort of between five years and ten years, ten plus years, depending on the options that we chose. The Board decision at the time was not to delay the 2025 assessment, in order to pursue any of those spatial options, but instead sort of go forward and stay to the 2025 timeline.

The option that we're sort of going forward with was not actually on that list, as you may have noticed. We're going with a more spatially explicit NWACS-MICE model to get more spatially informed CRPs, but we will still be using the coastwide BAM, or the coastwide single-species model. The ERPs will definitely be improved by this.

We'll have a more refined reference point that will better capture the spatial and seasonal dynamics of menhaden, and their key predators, and help us get to a reference point that is better scientifically. But it likely will not provide quantitative advice about the Bay cap. We'll still be working within sort of a coastwide reference point system. What we will get out at the end, sort of in a management framework, is going to at the 2025 annual meeting, you will receive.

I will give or my team will give a presentation of the ERP and the Single-Species Assessment. This will give the Board; the Board will actually have a chance to kind of reconsider the target and threshold reference point definition for ERPs at this meeting. This is a little different from many of our other single-species approaches, where we come to you and we say, here is your reference points, here is your F-40 percent and your SSB-40 percent, this is your target and your threshold.

That's it, it's been updated, it has new information, but sort of that definition is the same. If you recall, the tool that we provided through this process is really giving you ways to evaluate the tradeoffs between menhaden harvest and predator abundance, and the allowable predator fishing mortality rates. The current definition for our ERPs is that this is our target, the F rates that will allow striped bass to stay at their biomass target, when striped bass are fished at their F target, and all the

other species in the model are fished as sort of the status quo in 2017. That is one possible definition. That is the definition we went forward with. I think at this point, you know when we come back to you, we will again present this tool, and the Board will have the option of considering potential other definitions, in terms of what should the F rates on striped bass be? What should the F rates on other species in the model be, when we are defining what our menhaden reference points should be?

The Board is not obligated to change in any way. I think the definition that we have right now is still a viable definition on the table. But the Board will have the opportunity to reconsider some of those management tradeoffs and management objectives within this ecosystem framework, at that 2025 annual meeting.

Changes to the reference points can be made through the Board actions or through adaptive management. You also have to do specifications at this meeting, which may make trying to change that definition a little more complicated. We'll try to make the options on the table as easy as possible for you guys. But I think we just wanted to highlight that this is a complex system with a lot of moving parts.

We won't have quantitative advice, probably on the Bay cap at that point. Although there are always other qualitative approaches that this Board can take, and we'll be presenting a tool that is maybe a little more complicated than the traditional SPR based reference points that we have for our single species assessment. There are a lot of moving parts that are going to come together at this meeting, and a lot of things for the Board to think about.

I'm not saying you have to start this conversation now. We do still have a year and a half to figure out a lot of these issues. But just to kind of prepare this in everyone's mind for kind of what's coming down the road; where we are now, where we're going, and where you guys are going to have to make some decisions, in terms of management objectives in about a year and a half. With that I am happy to take any questions.

CHAIR McMANUS: Thank you, Dr. Drew. With that, are there any comments or questions for the Board for Katie, Lynn or Pat? Yes.

BOARD MEMBER: Related to the final questions about striped bass. How do you think this model will help us to be able to evaluate that relationship when we get the report in 2025?

DR. DREW: You mean the relationship between striped bass and menhaden fishing mortality? I mean I think the goal is the tool that we have now, and the goal is to have a more refined version of that tool that basically looked at, as you increase fishing mortality on menhaden, what happens to striped bass? As you increase fishing mortality on striped bass, what happens to striped bass, so that you can sort of find that balance.

It is a tradeoff, right. You can put more fishing pressure on menhaden and you have to feed back off of the fishing pressure on striped bass, in order to keep them at sort of the same level. That is all interconnected. It is not just a matter of turning one knob, there are multiple knobs within this system to turn. I think the goal of our tools is to help everybody understand these relationships between, you can adjust the fishing mortality on one of them, but you're not doing that in a vacuum. Right now, a single-species model sort of assumes we are doing it in a vacuum. With the ERPs you can turn multiple knobs at a time, and figure out what is sort of a balance between fishing pressure on menhaden and fishing pressure on striped bass that gets to where you want to be for striped bass. I don't know if that helps or not.

BOARD MEMBER: Let me just follow up. You think there is enough synchronicity between the menhaden and the striped bass assessments to make that useful?

DR. DREW: Yes. Right now, we will have an assessment update, as you know this year for striped bass, which means we'll have data through 2023 that aligns with, we're aiming to have a 2023 terminal year for menhaden as well, and we will have that for most of the other species, either 2022

or 2023 terminal year for our other key species in the NWACS-MICE Model. But that is definitely something we try to keep an eye on, is to make sure that we're not waiting on data from any one species in order to manage.

CHAIR McMANUS: Any other questions or comments? Yes, Al.

MS. COLDEN: Thanks to all of you for your updates. Katie, I do have a couple of follow up questions related to the mortality estimates that you were talking about natural mortality estimates, that there was some uncertainty here, or inconsistencies here based on the analysis method. Just, I'm sure it is from a functional perspective. What would a lower natural mortality rate tend to lead to, in terms of the outcomes of the assessment?

DR. DREW: Perhaps unintuitively, if you use a lower natural mortality rate in these models, in the single-species model, you're going to get a lower estimate of biomass or abundance of menhaden coming out. Right now, that we're using the higher estimate. When we implemented that higher estimate of M, we saw an increase overall in the scale of the population. That effect, the scale of the population and our perception of that population for the single-species model, and then feeding into the multi-species model.

How many menhaden are out there for those other predators to be influenced by, or to have available to them to consume? Using a lower natural mortality is going to make the population smaller and have less menhaden over the full time series available to those other predators. It's hard to say exactly what the effect will be, in terms of for the multi-species model, generally speaking on the single-species model, when you use a lower M, you usually get higher estimates of fishing mortality as well. Follow up.

MS. COLDEN: Based on the existing natural mortality estimate that is being used, and the one that was proposed in the Data Workshop. Do you have any kind of scale of the differences between those two, kind of what is the relative magnitude of

the different season estimates that you're considering, either directly from those or in the sensitivity runs.

DR. DREW: I don't have the exact proportion, and the other issue is of course the estimates that are in these studies are just a single estimate of natural mortality. In the assessment scale that is more to match the Lorenzen so you have higher natural mortality on the in the assessment scale that is more to match the Lorenzen. You have higher natural mortality on the younger fish, and lower natural mortality on the older fish, which hasn't really been carried through for these other studies. But it is a significantly higher estimate of M. This was pretty extensively addressed during the last peer review, so there is some report in the benchmark document showing some of those comparisons to what has been used in the past, and the current estimate of M used now.

CHAIR McMANUS: Yes, John Clark.

MR. JOHN CLARK: I hope I'm remembering this correctly but the current TRP, the NWACS-MICE, it doesn't directly produce a multispecies reference point, right? It's like advice as how we can change our fishing mortality on the menhaden, based on the other species. Now the other models you were talking about, the VADER and what was the other one? Are those more set up to directly estimate reference points, based on the entire predation on the menhaden? If so, is that the goal is to eventually get to that, or is it still just to use the NWACS-MICE?

DR. DREW: I would think, the NWACS-MICE does give us a reference point, but it sort of has to be translated back into the currency of the single-species model. The NWACS-MICE model is very good at capturing those predator/prey dynamics, and helps you understand, you know, as I was saying, does the increase have on the menhaden?

What does that do to the other species in the model? If you increase half on striped bass how does that best influence striped bass and the data? How does that all tie together, so that you can sort

of figure out in the long term, if you fish at a specific rate on menhaden and a specific rate on striped bass, where is that striped bass population going to stabilize?

You can adjust those knobs until in the long term the striped bass population will stabilize at its target. The issue is that the NWACS-MICE model, the EWE models are not good at capturing sort of really short-term dynamic changes in recruitment for or populations affect. They are better for long term.

Like all of our reference points models, they are better for sort of long-term stability and an end goal. We use the BAM, the single-species model that is really good at capturing sort of the short-term dynamics of menhaden, what's going on right now, what's going on in the next couple of years. What happened in the past based on that dynamic recruitment, and other things.

We use that to sort of, we take the information that we get out of the NWACS-MICE model about, you know what is our long-term F rate that we want to stay at, and use the BAM model to figure out what is the appropriate quota to keep you at that F rate. We're using sort of these two models in combination, because they give each other things that the other one is not good at. Predator/prey dynamics on the NWACS-MICE side, short-term recruitment is better dynamics of the scale on the BAM side.

The VADER model is a multispecies statistical catch at age model, and I think the long-term goal of that would be to develop a model that could do it all in one. The multi-species model is one potential approach that can do that. If it is capable of handling some of those short-term recruitment dynamics and things like that within its own framework. However, it right now is missing the bottom-up feedback that says, you know right now it is basically only looking at how much are these predators' affecting menhaden, and not looking at how menhaden is affecting the predators. That is a real hard challenge to build into that type of model, and so that is kind of I think the long-term goal

would be to try to get something where you could do it all in one comprehensive model.

Whether that is, can we get better recruitment dynamics in our EWE models or is it can we get predator/pretty dynamics in our multispecies statistical catch at age model? That is why we're continuing to develop both of them at the same time. I think it's kind of just a matter of, what will be done in time for management by the benchmark, in terms of what we actually bring to you as a final result.

CHAIR McMANUS: Yes, Rob LaFrance.

MR. LaFRANCE: Thank you, Katie, really interesting stuff that you are working on with these. One of the things you mentioned though is there will be some spatial data that is going to be created as a function of this. Is there any information we can glean from that? Even though I know it's recognized we're going to be looking at a coastwide, still a coastwide ecological reference point.

But is there any descriptive information we might be able to get, like looking at particular measures, in terms of maybe the south looks different than say the Mid-Atlantic versus the North Atlantic? Is there any information we might be coming out of that, and just ask those questions all at the same time? Have we looked at data or are we looking at any data coming in from offshore wind? Are they providing you any information on any of these species?

DR. DREW: I guess the short answer to the second one is an easy no. We don't have any information from that offshore wind development coming into these models. I think ideally, we would like to be able to look at maybe some of the dynamics of, yes spatially sort of in this with the reference point model in the long term of what is the effect of more intense fishing pressure in the Bay versus offshore more intense in the north versus in the south. If recruitment is increasing in the north and has been low in the Chesapeake Bay, can we pick up those dynamics?

I think the reference points will definitely be improved by incorporating some of these spatial dynamics, and our understanding of the system will be improved. But we may not have the ability to do that and to link that back to say, and therefore checked in the Bay, it may still end up being a coastwide quota, and we'll have to look to other methods if we want anything spatial on the Bay.

MR. LaFRANCE: Will we have any sort of sensitivity to that? Will there be some output from that or not really?

DR. DREW: I mean we can definitely look into that. I think there is also the question of we haven't done this full model development, and I think we also are a little bit unsure of sort of the quality of the data that will come in at that spatial scale. We can look into doing some of that sensitivity stuff. How informative it will be will depend on the quality of the data and the performance of the model. But hopefully we can improve our spatial understanding in some way.

MR. LaFRANCE: Great answer, thank you.

CHAIR McMANUS: Allison Colden.

MS. COLDEN: Thank you, Mr. Chair, I appreciate a second round here. I'm really excited about all of the work that has been presented here. I know that the spatial dynamics and the temporal dynamics have been a priority ever since we got the first round of the ERP model, so I'm happy to see that moving forward.

But coming from one of the Bay jurisdictions, Chesapeake Bay jurisdiction, I feel like I would be remiss if I didn't point out the number of times Katie, you had to specify that this will not get us any additional quantitative data on the Chesapeake Bay. I'm sort of searching here for a solution.

We have 5 to 7 years of work in front of us in order to get from core spatial data resolution, which we'll hopefully get coastwide in this model, to anything even close to coming in offshore and looking at specific nursery areas like the Chesapeake Bay and



other places. We also heard from Maryland and Virginia that the efforts that they are working on to try and either synthesize our understanding or provide guidance or get to the science are hitting bumps at every turn.

Virginia is on the study, Maryland has put together a great synthesis of data that we have, but it's not intended for management and is focused only on striped bass. We have significant concerns in the Bay region, particularly with species like osprey that are not included in the ERPs, and are not directly included in the NWACS-MICE model, and according to those updates won't be included in this next round of the NWACS-MICE model either.

I just want to flag that there are some of these significant concerns, including other datasets that we have found recently that have not been included in previous rounds of this. I want to just flag for the Board that I think that there is some serious consideration to be given for these ecosystem concerns in the Chesapeake Bay, and the fact that they won't be addressed through some of the assessment work that is going on now, and some of the work that the states are working on. I just want to keep that in front of mind for everyone.

CHAIR McMANUS: Thank you, Allison. Are there any other comments or questions from the Board? All right, seeing none.

#### **ELECT VICE-CHAIR**

CHAIR McMANUS: That moves us on to our next item for electing a Vice-Chair. Move to see from the Board if there are any nominations to put forth. Yes, Jeff Kaelin.

MR. JEFF KAELIN: **I move to nominate John Barnes as Vice-Chair for the Atlantic Menhaden Management Board.**

CHAIR McMANUS: Do I have a second? Move to nominate John Clark as Vice-Chair?

MR. KAELIN: **Did I say Barnes? I'm sorry.** That's an old, old name, an old menhaden name. **I'm sorry**

**about that, John Clark.** Wow, I don't know where that came from, senior moment. Sorry about that senior moment, John Barnes is long gone.

CHAIR McMANUS: Thank you, do I have a second? Yes, thank you, Steve Train. **Any opposition to the motion? All right, I will consider that approved by consent.** Thank you, Jeff and Steve Train.

#### **OTHER BUSINESS**

CHAIR McMANUS: With that, that brings us to Other Business. Is there any other business to bring forth? Yes, Lynn Fegley.

#### **USGS OSPREY DATA**

MS. FEGLEY: I'm going to try to be quick about this so we can move on to horseshoe crabs. I mentioned in our update that we've been working on this data synthesis. We have been looking for osprey data in the Maryland portion of Chesapeake Bay. We have been looking hard at the osprey data coming out of Virginia that is showing nesting success issues. I did have a conversation with USGS, and they have scientists who are planning to do some follow on with osprey research further up in the Maryland portion of the Bay.

Upon talking with them, it appears that they do have some data, which may be of interest. I say that, because it does seem to me that if we really are having a problem with ospreys in our area, and if there is something about the way that we are managing menhaden, that could be impacting the bird resource. I think we really need to know about it.

I think it's incumbent upon us to get as much information as we can. I have a request for staff, and I'm happy to gather offline if I can help, and that is to reach out to USGS to the Eastern Ecologic Science Center, and request for August, if they could present to us the information that they have on osprey in the Bay region.

That would specifically be data around the spatial and temporal distribution of osprey, anything they know about dietary demands of osprey, the timing

of the osprey fledge, and anything they know about nesting success. That was my other question, Mr. Chair, and I'll leave it there. If I need to make a motion, I will.

CHAIR McMANUS: Thank you, Lynn. I'll look to Katie really quick to provide comment on that, and then I can look to the Board for further discussion as necessary.

DR. DREW: Yes, I think we can definitely reach out to USGS and arrange for a presentation to the Board, if that is of interest, as well as ensuring that the USGS science is looped into the ERP framework, as necessary or where appropriate. You know I think we are aware of some of their data, probably not all of their data. I think it would be good to close the loop on that as part of the assessment process. As long as I think the ask, to like have them do the work of presenting this to you. I think that's feasible, and would not impact the ERP timeline in any way.

CHAIR McMANUS: Thank you, Katie, Craig Pugh.

MR. PUGH: I don't mean to convolute this. I know it's anecdotal, but in our area the osprey seems to be in direct competition with the increased population of bald eagles. The osprey is a much, much better fisherman than the bald eagle is. The bald eagle either attempts or does take food away from the osprey. We've witnessed this daily, repetitively, over and over and over. There is another bird here that is involved, at a pretty high level. We experience this every day. We can witness this; we can watch it. The bald eagle population in our area is probably ten times over what the osprey, and it's increasing.

CHAIR McMANUS: Thank you, Craig. Are there any other additional comments on this topic? Yes.

MR. LOREN W. LUSTIG: I just wanted to thank Lynn and Allison specifically for bringing up issues regarding the osprey. I've been trying to monitor that personally. I did come across some data recently from areas near Long Island and New York,

and apparently the breeding success is much higher there. It would be interesting to follow that up.

CHAIR McMANUS: Any other questions or comments from the Board? It sounds like there is a request to have staff be engaged in dialogue with USGS regarding osprey data, and it sounds like there is amenability to that on the Commission side. Anyone strongly opposed to doing such? I'm not seeing any hands, so I think we can consider that to move forward.

#### **ADJOURNMENT**

CHAIR McMANUS: Is there any other business beyond that topic that folks have? I'm not seeing any hands online or in person. Is there a motion to adjourn? Yes, John Clark and seconded by Cheri Patterson.

(Whereupon the meeting adjourned at 2:45 p.m. on Tuesday, April 30, 2024)