Atlantic States Marine Fisheries Commission

Shad and River Herring Management Board

August 1, 2023
9:00 – 10:00 a.m.
Hybrid Meeting

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 *(L. Fegley)*	9:00 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from February 2023	9:00 a.m.
3.	Public Comment	9:05 a.m.
4.	Consider Update to Potomac River Fisheries Commission American Shad Sustainable Fishery Management Plan *(W. Eakin)* **Final Action**	9:15 a.m.
5.	Update on US Geological Survey Alosine Genetic Repository and Expanding Collection Efforts *(W. Eakin)*	9:30 a.m.
6.	Progress Update on the 2024 River Herring Benchmark Stock Assessment *(K. Drew)*	9:50 a.m.
7.	Other Business/Adjourn	10:00 a.m.

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

Atlantic States Marine Fisheries Commission

MEETING OVERVIEW

Shad and River Herring Management Board
August 1, 2023
9:00 – 10:00 a.m.
Hybrid Meeting

Chair: Lynn Fegley (MD) Assumed Chairmanship: 2/23	Technical Committee Chair: Wes Eakin (NY)	Law Enforcement Committee Representative: Thomas Burrell (PA)
Vice Chair: Phil Edwards	Advisory Panel Chair: Pam Lyons Gromen	Previous Board Meeting: February 2, 2023
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 2, 2023

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. Consider Update to Potomac River Fisheries Commission American Shad Sustainable Fishery Management Plan (9:15-9:30 a.m.) Final Action

Background

- Amendments 2 and 3 to the Shad and River Herring FMP require all states and jurisdictions that have a commercial fishery to submit a sustainable fishing management plan (SFMP) for river herring and American shad, respectively. Plans are updated and reviewed by the Technical Committee (TC) every five years.
- Potomac River Fisheries Commission (PRFC) submitted an updated SFMP for TC review and Board consideration at the 2023 Summer Meeting **(Briefing Materials)**.
- The TC reviewed this SFMP update and recommendation the plan for Board approval **(Briefing Materials**).

Presentations

- American Shad Sustainable Fishery Management Plan Update for Board Consideration by W. Eakin

Board Actions for Consideration

- Consider approval of updated SFMP for PRFC

5. Update on US Geological Survey Alosine Genetic Repository and Expanding Collection Efforts (9:30-9:50 a.m.)

Background

- In response to a Board request, the Technical Committee reviewed a presentation from the U.S. Geological Service about the Alosine Genetic Repository Program to identify data gaps and help to improve future sample collection **(Briefing Materials)**.

Presentations

- Technical Committee Report by W. Eakin

6. Progress Update on the 2024 River Herring Benchmark Stock Assessment (9:50-10:00 a.m.)

Background

- The river herring benchmark stock assessment was initiated in April 2022. The assessment workshop is scheduled for August 2023.

Presentations

- Update on River Herring Stock Assessment Progress by K. Drew

7. Other Business/Adjourn

Shad and River Herring 2023 TC Tasks

Activity level: Medium

Committee Overlap Score: Medium (Multi-species committees for this Board)

Committee Task List
• 2024 River Herring Benchmark Stock Assessment • Updates to state Shad SFMPs • Annual state compliance reports due July 1
TC Members: Mike Brown (ME), Conor O'Donnell (NH), Brad Chase (MA), Patrick McGee (RI), Kevin Job (CT), Wes Eakin (Chair, NY), Brian Neilan (NJ), Brian Niewinski (PA), Johnny Moore (DE), Matthew Jargowsky (Vice-Chair, MD), Ingrid Braun (PRFC), Joseph Swann (DC), Patrick McGrath (VA), Holly White (NC), Jeremy McCargo (NC), Bill Post (SC), Jim Page (GA), Reid Hyle (FL), Ken Sprankle (MA), Ruth Hass-Castro (NOAA), John Ellis (USFWS). Ted Castro-Santos (USGS), C. Michael Bailey (USFWS)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SHAD AND RIVER HERRING MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

February 2, 2023

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

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Draft Proceedings of the Shad and River Herring Management Board Hybrid Meeting
February 2023

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ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Steve Train, ME (GA)
Rep. Allison Hepler, ME (LA)
Cheri Patterson, NH (AA)
Doug Grout, NH (GA)
Mike Armstrong, MA, proxy for D. McKiernan (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Phil Edwards, RI, proxy for J. McNamee (AA)
David Borden, RI (GA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
John Maniscalco, NY, proxy for B. Seggos (AA)
Emerson Hasbrouck, NY (GA)
Heather Corbett, NJ, proxy for J. Cimino (AA)
Peter Clarke, NJ, proxy for T. Fote (GA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD (AA, Acting)
Russell Dize, MD (GA)
Pat Geer, VA, proxy for J. Green (AA)
Shanna Madsen, VA, proxy for Sen. Mason (LA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Ross Self, SC, proxy for M. Bell (AA)
Malcolm Rhodes, SC (GA)
Chris McDonough, SC, proxy for Sen. Cromer (LA)
Spud Woodward, GA (GA)
Erika Burgess FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Marty Gary, PRFC
Dan Ryan, DC, proxy for R. Cloyd
Rick Jacobson, USFWS
Max Appelman, NOAA

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

Ex-Officio Members

Wes Eakin, Technical Committee Chair

Staff

Bob Beal
Toni Kerns
Madeline Musante
Tina Berger
Lindsey Aubart
Kurt Blanchard
James Boyle
Emilie Franke
Caitlin Starks
Gabe Thompson

Guests

Ashley Asci, NOAA
Pat Augustine, Coram, NY
Rob Beal, ME DMR
Emily Bodell, NEFMC
Jason Boucher, NOAA
Ingrid Braun, PEFC
Joe Cimino, NJ (AA)
Caitlin Craig, NYS DEC
Wes Eakin, NYS DEC
Sheila Eyler, US FWS
Emily Farr, Manomet
Jared Flowers, GA DNR
Steve Gephard, Deep River, CT
Ben German, NOAA
Lewis Gillingham, VMRC
Willy Goldsmith, Pelagic Strategies
Pam Gromen, WildOceans
Jay Hermsen, NOAA
Matthew Jargowsky, MD NDR
Jeff Kaelin, Lund's Fisheries
Jared Lamy, NH F&G
William McDavitt, NOAA
Patrick McGrath, VIMS
Steve Meyers
Mike Nardolilli, ICPRB
Brian Neilan, NJ DEP
Conor O'Donnell, NH F&G

Guests (continued)

Nicole Pitts, NOAA
Marisa Ponte, NC DENR
Will Poston, SGA
Eric Roach, Seabrook, NH
Jeff Sabo, PA F&B
Somers Smott, VMRC
Michael Stangl, DE DFW
ElizaBeth Streifeneder, NYS DEC
Kevin Sullivan, NH F&G
Jonathan Watson, NOAA
Holly White, NC DENR
Kate Wilke, TNC
Chris Wright, NOAA
Darrel Young, MEFA

The Shad and River Herring 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; Thursday, February 2, 2023, and was called to order at 8:30 a.m. by Chair Lynn Fegley.

CALL TO ORDER

CHAIR LYNN FEGLEY: Good morning, everybody. We're going to get ready to get started on the Shad and River Herring Board meeting. I want to say for the record that I'm terrified to chair this meeting after yesterday's parliamentary training. We'll see how it goes. We're going to go ahead and get started. Welcome everyone, we've got a pretty quick agenda.

We do have four action items, so please be ready for that. My name, if you don't know who I am, my name is Lynn Fegley, I represent the state of Maryland, and I'm happy to serve as your Chair today. I've got James Boyle and Katie Drew up here with me, and we're also going to hear from Brian Neilan, who I want to flag. This is his last meeting as our TC Chair, so I want to thank Brian for all the great work that he's done for these two important species.

APPROVAL OF AGENDA

CHAIR FEGLEY: With that, the first order of business is Approval of the Agenda. Are there any modifications, additions or changes to the agenda? Seeing none; we'll consider that approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR FEGLEY: Next, we're moving to the proceedings from November, 2022. Does anybody have any changes, additions, modifications to the proceedings?

Okay, seeing none, we will consider those approved by consent.

PUBLIC COMMENT

CHAIR FEGLEY: Next, we move to Public Comment. I do have, is Mr. Mike Nardolilli in the audience, and I apologize if I massacred your name, but welcome.

MR. MIKE NARDOLILLI: Thank you, Madam Chair. I'm Mike Nardolilli; I'm the Executive Director of the Interstate Commission on the Potomac River Basin, ICPRB. In 1940, Congress approved the compact between all of the basin states of the Potomac watershed; Virginia, West Virginia, Maryland, Pennsylvania and the District of Colombia.

I am here to just introduce myself and my Commission. Some of you may remember that we were very involved with the return of the shad to the Potomac River. This was an operation done by our aquatic biologist in the 1990s. Jim Cummings may be a name familiar to some of you. I'm just here to learn about how the shad are doing, and look forward to any further interactions with your Commission. Thank you very much.

CHAIR FEGLEY: Thank you very much for being here.

CONSIDER THE NORTH CAROLINA AMERICAN SHAD SUSTAINABLE FISHERY MANAGEMENT PLAN

CHAIR FEGLEY: Okay, so next we will move on to consideration of the North Carolina American Shad Sustainable Fishery Management Plan, this is an update. This will require a final action, so I'm looking for a motion at the end of the presentation by Brian Neilan. Brian, if you're online, take it away, please.

MR. BRIAN NEILAN: Thank you for those kind words, Madam Chair, and good morning to the Board. My name is Brian Neilan and I'm the current TC Chair, not for long, as Madam Chair just told you guys, and I'm also the TC Rep from New Jersey. Today I have a quick overview of an updated sustainable fishery management plan from North Carolina for your consideration, so we'll fall right into it.

I would like to include some quick background info, so Board members have some frame of reference for reviewing the plan presentations. Amendment 2 and 3 of the Shad and River Herring FMP requires states requesting a fishery to submit a sustainable fishery management plan. A fishery management plan defines sustainable as demonstrating a stock could support a commercial and/or recreational fishery that will not diminish the future of the stock reproduction and recruitment.

These plans are updated every five years to reassess stock status and sustainability. Last month the TC reviewed an update for shad from North Carolina that concludes this plan would be in place from 2023 through 2027. After reviewing the updates and changes to the plan, the TC recommended the approval of the SFMP as presented. North Carolina does not qualify for *de minimis* status, so it made a request for both commercial and recreational fisheries.

They do quite a bit of work in view of their river systems throughout the state, and they use the data, both fishery dependent and independent from those rivers to support their fishery management plan. The most recent stock assessment of American shad in North Carolina determined that the population in Albemarle Sound are sustainable and not overfished, whereas the determination of status could not definitely be assigned for the Tar-Pamlico, the Neuse and Cape Fear Rivers, due to limited information from the 2020 benchmark stock assessment.

While stock status for the Neuse and Cape Fear River Systems could not be determined, the SAS noted that adult mortality for the Neuse was considered sustainable, and there is an increasing trend in adult abundance in the Cape Fear River since 2005. This plan was an update, so the general framework of the plan remains relatively the same, with some changes to a few of the sustainability parameters, to better reflect the data currently being collected, and how that data is analyzed and applied to develop the various parameters.

This slide here just kind of summarizes some of the changes, and this plan updates North Carolina's sustainability parameters. Albemarle Sound index of juvenile abundance was added after it was developed through the 2020 benchmark stock assessment, and it's been incorporated to the plan as a new sustainability parameter, catch per unit effort.

Additionally, sink nets were removed from their independent gillnet survey. These nets were removed to reduce interactions with sturgeon. The removal of the sink gillnets from the data did not significantly impact the relative abundance estimates of shad, since most of their shad gillnet surveys are getting caught in their floating nets. Finally, for the Albemarle Sound, relative F is now calculated using the female CPUE index as a sustainability parameter and commercial harvest of those is now coming from all gear types, so that is how they are generating their relative F.

These modifications are necessary to capture changes in the commercial fishery due to management restrictions, as well as changes in sampling methodology. In their independent gillnet survey, the modifications to the relative F calculation are now more representative of American shad abundance than fishery independent and fishery dependent data.

For the Tar-Pamlico and Neuse, the relative F now incorporates recreational harvest into the calculation. This was due to a significant decrease in commercial harvest over the past 10 year of the previous plan. The Rec data will help round out the declining data typically available from the commercial fishery in the past.

For the Cape Fear River, the plan now incorporates recreational harvest data as well, for the same reason declining commercial harvest, as well as the electrofishing CPUE that they also use, as was adjusted due to some fish passage issues at one of

the survey sites that didn't artificially inflate abundance estimates.

Here is a slide of the Summary of Changes for the commercial and the recreational harvest restriction. For all the waterways highlighted here, commercial season dates have been changed from fixed-season dates to potential timeframes in which the fishery can occur. The dates listed on this slide should be considered the maximum potential duration of the fishery in a given year.

The actual dates of each year's fishery will be determined by North Carolina's Shad Working Group taking into account the previous seasons fishery harvest, independent data, whether or not sustainability parameters have been exceeded, and put some stakeholders and other applicable parameters.

For the Albemarle Sound/Roanoke River, the potential timeframe for the commercial fishery was extended from the previous plan. It is now January 1st, potentially January 1st through April 14th. The expansion of the potential season for this part of the state only was due to the Albemarle/Roanoke complex being assessed as not overfished and overfishing not occurring.

The rest of the rivers and inland waters retained the previous plan set dates. As I mentioned before, these are no longer set dates, they are now potential timeframes for the fishery to be executed. For the commercial fishery, the statewide bag limit was changed from a 10-fish aggregate to a 10-fish shad aggregate with only 1 of those fish are permitted to be an American shad.

That is a potential reduction in American shad harvest there. That was the general summary of North Carolina's updated plan, just changes to how the sustainability parameters are calculated, as well as changes to commercial and recreational regulations coming up. I could take any questions if anybody has any.

CHAIR FEGLEY: Thank you, Brian. Are there any questions for Brian on this? Anybody online, Toni? Okay, Malcom Rhodes.

DR. MALCOLM RHODES: If you're ready for a motion, Madam Chairman. I would move to approve the updated American Shad Sustainable Fishery Plan for North Carolina as presented today.

CHAIR FEGLEY: Is there a second? Russel Dize, okay. We have a motion on the board, and that is: Move to approve the updated Shad Sustainable Fishery Management Plan from North Carolina as presented today. Motion by Dr. Rhodes, second by Russell Dize, and I now give the motion to the body to discuss.

Is there any discussion on the motion? Okay, well is there any objection to the motion? Okay, we'll consider this one approved by consent. Thank you very much.

UPDATE ON THE 2023 RIVER HERRING BENCHMARK STOCK ASSESSMENT

CHAIR FEGLEY: Moving on, the next item is an Update on the 2023 River Herring Benchmark Stock Assessment. Dr. Drew, take it away.

DR. KATIE DREW: Work continues on the 2023 stock assessment for river herring. The Index and Life History Work Groups of the SAS have been hard at work standardizing and evaluating the indices, as well as developing life history parameters, including growth, maturity, natural mortality and total mortality.

We'll be having our Methods Workshop the week after next, to finalize those data decisions and move on to developing methods for reference points and potential stock status options, as well as dealing with the bycatch question, and maybe some potential modeling population approaches for that. The goal is to have a final assessment workshop sometime in early summer, and to do the peer review in late summer, so that we can present to you at the annual meeting this year.

However, depending on how work progresses over this time, we may end up bumping back to the February Board meeting to give ourselves a little more time this year. Complete it this year, but do the Peer Review at the end of the year. I think after the methods workshop, we'll have a better sense of whether this year is a completable timeline. That's where things are, and I'm happy to take any questions.

CHAIR FEGLEY: Questions? Any online, Toni? All right, well we'll look forward to the results of those analyses. Okay, moving on.

MS. TONI KERNS: There was one question if there was a date for the Methods Workshop, Katie.

DR. DREW: Yes, so the Methods Workshop will be held via webinar. The date and the link are on the ASMFC Calendar, but it's going to be February 13th and 14th, and then 16th and 17th, so there will be sort of a break in the webinar on that Wednesday, to give the SAS some work time. But it will be the 13th and the 14th, and the 16th and the 17th, and like I said, the dates and the link for that webinar are on the ASMFC calendar if you're interested.

CHAIR FEGLEY: Great, thank you very much.

MS. KERNS: There is one question from Jeff Kaelin. He put his hand down, I think we covered it. Perfect, thank you.

CONSIDER THE FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2021 FISHING YEAR

CHAIR FEGLEY: Okay, moving on. We're going to go to, Consider the Fishery Management Plan Review and State Compliance for the 2021 Fishing Year. James Boyle, take it away.

MR. JAMES BOYLE: We'll jump right in. Here is an outline for the presentation. I'm going to start with a short reminder of historical landings over time, and then move on to cover the 2021 fishing year specifically. Then I'll move on to some of the monitoring and the compliance reports, including fish passage, stocking efforts and certain bycatch interactions.

Finishing off with the *de minimis* requests and the recommendations from the Plan Review Team. We've got a quick reminder of the historical context, so this figure shows the trajectories of commercial landings for river herring and American shad since 1950. Starting in the 1970s, river herring landings fell drastically, and then steadily decreased over time.

For shad there has also been a steady decrease in landings over time, which of course is in part due to the moratoria implemented through Amendments 2 and 3. To zoom in on the end of that time series, make it a little bit easier to see. Since 1990 there is more variation for river herring, which ended up with landings increasing from 2016 to 2019, but for shad you generally see a downward trend in landings since the '90s.

For 2021 specifically, this table shows state landings and coastwide totals for commercial shad and river herring, excluding confidential data. The river herring coastwide commercial landings including bycatch, totaled just over 2.1 million pounds, which is a 12 percent increase from 2020. Bycatch values continue to plummet by 99.7 percent from 2020, which is as a reminder, after a 77 percent drop from 2019 to 2020.

Almost all of this is the result of lower bycatch reported from Massachusetts. Another quick reminder that I reported at the last FMP Review last year. Massachusetts eliminated their state portside sampling program, and so they report NOAA NEFOP data. In that compliance report, the NEFOP data they reported was 90,259 pounds, but I did not include that in this table, because it's a combined estimate of both shad and river herring, so it didn't really fit in the table.

That is also across several fisheries and regions. For reference, that same reporting counted 142,639 pounds in 2020. For American shad the total 2021

commercial landings, directed and bycatch included, reported in compliance reports were 195,642 pounds, which is a 39 percent decrease from 2020 landings.

However, bycatch landings of shad increased 96 percent and represent 17 percent of total landings. Hickory shad commercial landings amounted to 99,419 pounds, which is an 8 percent increase from 2020, although bycatch landings decreased by 89 percent, and are 2 percent of the total landings.

As part of the requirements in Amendments 2 and 3 for river herring and shad respectively. Passage counts are required on select rivers in the states on the slide, 4.44 million river herring were counted, which represents a 29 percent decrease compared to 2020, and 377,472 shad is a 47 percent decrease compared to 2020. There are a few caveats to note from the compliance reports. I'll give a couple examples. For instance, the American shad survey at the Stephen Dam in South Carolina was cut short, due to a gate mechanical failure, and two locations on the Susquehanna River were not in operation to prevent invasive species, although they did perform trap and transport operations, which transported 6,413 American shad upstream.

During 2021 half the American shad fry were stocked in the Pawcatuck, Nanticoke, Potomac and the Santee Rivers, totaling 16.24 million American shad, as a 10 percent increase from 2020. Maine also continues to participate in track and transfer stocking of adult pre-spawning alewife of wild origin on the Androscoggin River, although that is not included in the table in the document.

For sturgeon interactions in 2021, there were 40 reported with one fatality. However, as always, New Jersey gillnetters report the weight and not and not the number of individuals, so they reported 1,666 pounds. Of those 40 interactions, 33 were identified as Atlantic sturgeon, 5 were shortnose and 2 were unclassified.

Again, as always, Rhode Island reports NOAA NEFOP and At-Sea monitoring data, which lags by a year, because it comes out after the compliance report deadline. They reported 4 interactions from 2020, and we will see the 2021 interactions in this year's compliance report in July. For the upcoming fishing year, Maine, New Hampshire, Massachusetts, and Florida have requested continued *de minimis* status for their American shad fisheries, and New Hampshire, Georgia and Florida also requested continued *de minimis* status for river herring.

They all meet the requirements and qualify based on their commercial landings, which is less than 1 percent of the coastwide total. Moving on to the PRTs recommendations. In evaluating the state compliance reports, the PRT noted a few inconsistencies with the requirements in Amendments 2 and 3. Similarly to 2020, some monitoring could not be completed due to the COVID-19 pandemic, which is detailed in Table 6 of the document.

Just so you know, there are a few longstanding issues that are related to funding or staffing shortages, where a state either cannot complete a survey or take samples, cannot process them for example. In previous years we included those only Table 6, but the PRT just wanted to note them in the body of the document as a reminder, but they've been longstanding for many years and does not represent, the PRT doesn't feel they need to take any action on them.

Another issue of note. It's in the document the Edisto River was below CPUE sustainability benchmark for three consecutive years, but management action was not listed as triggered in the compliance report. However, since the drafting of the document, a management measure has been implemented for the 2023 fishing year, and that measure will be evaluated by the TC in a future meeting.

There are other small inconsistencies looking at compliance report template, such as not including a

copy of the state fishing regulations, or a section in hickory shad, which the PRT requests, even if that section just said not applicable for the ease of our review. With those minor issues and given the circumstances regarding the monitoring, the PRT recommended approval for the compliance reports for 2021 for all states. There is one further recommendation the PRT is making. The group noticed some inconsistencies in bycatch reporting with some states utilizing NEFOP reporting, some states using their own catch reporting, and some not specifying the sources for their data.

Therefore, in the compliance report template for this year, staff will add a section for states to detail the sources of their bycatch data, and the PRT is going to use that to better identify gaps in reporting and use them for future reviews. With that information, the action for the Board is to consider approval of the 2021 shad and river herring FMP review, the State Compliance Reports and *de minimis* status for Maine, New Hampshire, Massachusetts, Georgia, and Florida. With that I am happy to take any questions.

CHAIR FEGLEY: Great, thank you, James. Are there any questions on the presentation? John Clark.

MR. JOHN CLARK: Thanks for the presentation, James. Just curious. I noticed that the shad landings continue to drop, and the stocking though is going up. I know that the states all use marking on the fry they're stocking. Is there any effort to get all the results from the states that are stocking, if they can generate any type of estimate of the impact that the stocking is having, you know to look at in the catch? I know a lot of states are sampling the catch to look for the marking on their stocked shad.

MR. BOYLE: I am not aware of any current effort, at least not in the FMP Review Process, if there is something I can look into and get back to you, maybe it's something we can include.

CHAIR FEGLEY: Interesting question, Ross Self.

MR. ROSS SELF: I just wanted to speak briefly to the missed CPUE targets for the Edisto in South Carolina. Those, you know we're seeing a marked decline in the number of shad fishermen across the state, and particularly in the Edisto. You know we feel like that loss in effort from the fishermen contributed to that, as well as the impact of the social restrictions in '20 and '21 from the pandemic. But measures like was mentioned in the report. We do have some measures being implemented for '23 that should address that, even though we think that that is kind of an artifact of a lack of participation.

CHAIR FEGLEY: Thank you for that clarification, Russell Dize.

MR. RUSSELL DIZE: I was wondering. A few years back Connecticut was, we were at a meeting and they reported they had removed X amount of dams on the rivers. I was wondering if that was showing any progress in the amount of shad or river herring. Justin Davis.

DR. JUSTIN DAVIS: Thanks for the question, Russell. I'm going to have to say that I don't really know. I mean we have certainly got ongoing efforts within our state to do dam removals, fishway installations. That being said, I don't know right now off the top of my head, sort of how many miles of river we've restored in recent years. I don't really have a good answer for you. But I can certainly get some information for you and send it back to you.

MR. DIZE: Thank you. The reason I asked the question was, I don't see any chance for our shad and river herring in Maryland. This is when I was a young man that we had just boatload after boatload of herring caught and processed on Tilghman. But now we've got so many invasive species, with snakehead and the blue cat up around the Conowingo Dam, that I see no hope for them. But I was just wondering, you know I would like to see success somewhere.

CHAIR FEGLEY: Go ahead, Justin.

DR. DAVIS: Yes thanks, and thanks for the follow up. I guess one thing I should mention is that we were seeing some marginal success with alewives. You know some of our runs seemed to be recovering a little bit. Blueback herring had been in tough shape all along and then not been doing any better. Then this last year in 2022, we had pretty much the worst year of river herring returns that we've had, I mean really probably since we've really started counting them.

That wasn't just a Connecticut thing, it was also Rhode Island and Southern Massachusetts as well. I would love to say that we've got some really good signs of success with river herring restoration. We felt like we were kind of getting somewhere, maybe a little bit with alewives, and then this last year was really bad. We're hoping it's sort of a one-year speed bump, and we'll get back to normal next year. But we'll have to wait and see.

CHAIR FEGLEY: Yes, I appreciate the conversation. It's a daunting problem, and between climate change and invasive species, and then the money that we're investing, it would be nice to see some progress. Are there any other questions on the presentation? Anything online, Toni? Okay, so our next step would be to consider approval. John Maniscalco.

MR. JOHN MANISCALCO: I would be happy to make a motion. Move to approve the Fishery Management Plan Review, State Compliance Reports and d*e Minimis* requests for Maine, New Hampshire, Massachusetts and Florida for American shad, and New Hampshire, Georgia and Florida for River Herring for the 2021 fishing year.

CHAIR FEGLEY: Second by Erika Burgess. Okay, we have a motion on the board. Move to approve the Fishery Management Plan, review State Compliance Reports and d*e Minimis* requests for Maine, New Hampshire, Massachusetts, and Florida for American shad, and New Hampshire, Georgia and Florida for River Herring for the 2021 fishing year.
Is there any discussion on the motion? **Okay, seeing no discussion, is there any objection to this motion? Okay, good job, motion passes by consent.**

REVIEW AND POPULATE THE ADVISORY PANEL MEMBERSHIP

CHAIR FEGLEY: Moving on, we are going to go to our next agenda item, which is to review and populate the Advisory Panel membership. Tina Burger. Is Tina in the room?

MS. TINA L. BURGER: I'm here, give me one second, sorry about that.

CHAIR FEGLEY: It's all right, Hi, Tina.

MS. BURGER: Sorry, guys. I offer for your consideration and approval, two nominations to the Shad and River Herring Advisory Panel, Stephen Gephard, a recreational angler and retired Connecticut DEEP biologist, with over four decades of experience with diadromous species, and William Lucey, who focuses on dam removal and fish passage issues with Save the Sound, also from Connecticut. Your nominations were provided in the supplemental materials.

CHAIR FEGLEY: Thank you, Tina, are there any questions or discussion on these nominations? Okay, it looks like there is a motion on the board, Dr. Davis, would you care to state your motion for the record?

DR. DAVIS: I move to approve Stephen Gephard and William Lucey of Connecticut to the Shad and River Herring Advisory Panel.

CHAIR FEGLEY: Okay, we have a second by Roy Miller, and the motion on the board is to approve Stephen Gephard and William Lucey of Connecticut to the Shad and River Herring Advisory Panel. **Is there any discussion on this motion? Is there any objection to the motion? Okay, seeing none; the motion passes by consent.** Thank you, very much.

ELECT VICE-CHAIR

CHAIR FEGLEY: next is also going to be an action. We are going to move to, we are going to elect a Vice-Chair, so I will be looking for a motion to nominate some lucky person. Pat Keliher.

MR. PATRICK C. KELIHER: I would like to nominate Phil Edwards from Rhode Island. Sorry, Phil.

CHAIR FEGLEY: Second by Eric Reid. The motion on the board was to nominate Phil Edwards as Vice-Chair of the Shad and River Management Board. Is there any discussion on this motion? Eric Reid.

MR. ERIC REID: Yes, I missed the parliamentary procedure yesterday, but I was really considering making a motion to amend the language to expound on Mr. Edward's qualifications or it's a substitute with a couple of blanks in it, or something like that. I don't really know what happened yesterday.

CHAIR FEGLEY: You can fill in the blanks.

MR. REID: I could amend how you spelled Mr. Keliher's name, but that's fine, and my name as well. Congratulations and condolences, Mr. Edwards, but he's an excellent choice, so thank you.

CHAIR FEGLEY: **Any other discussion on the motion? Is there any objection to the motion? All right that carries by consent, congratulations, Phil.** Thank you for stepping up to do that.

OTHER BUSINESS

GENETIC WORK INVOLVING SHAD AND RIVER HERRING SPECIES

CHAIR FEGLEY: All right, this takes us to our last agenda item. This is Other Business. We do have an item here. I'm going to turn this one over to John Maniscalco to outline his Other Business.

MR. MANISCALCO: I'll make this quick. There is some really important genetic work being done on shad and river herring species, that we hope will inform stock ID efforts and sources of bycatch mortality. USGS among others is heavily involved, and I would ask that USGS update the TC on the status of current genetic sample collections, identifying data gaps and future needs. The idea is to work together to achieve comprehensive sampling, and identify where additional resources may be needed to accomplish that. Following that TC update, I would ask that the Board be updated next time we meet, on collections this far, and on any recommendation the TC may have, and if necessary, I'm happy to make a motion.

CHAIR FEGLEY: I don't think we need a motion for this, if the Board can sense that we can send this to the TC. Is there any discussion or thought about having the TC updated and getting more information on genetic sampling, and bringing that update forward to the Board. I think this is an excellent idea. Any comments, questions? Okay, with that thank you, John. We'll move that forward for the record.

ADJOURNMENT

CHAIR FEGLEY: The final item is, is there any objection to a motion to adjourn, made by the Chair. Okay, seeing none; we stand adjourned, thank you.

(Whereupon the meeting adjourned at 9:03 a.m. on Thursday, February 2, 2023)

Atlantic States Marine Fisheries Commission

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Shad & River Herring Technical Committee

Meeting Summary

May 31, 2023

Technical Committee Members: Wes Eakin (Chair, NY), Matthew Jargowsky (Vice-Chair, MD), Ingrid Braun (PRFC), Michael Brown (ME), Kevin Job (CT), Ken Sprankle (USFWS), Patrick McGee (RI), Ruth Haas-Castro (NOAA), Patrick McGrath (VA), Jim Page (GA), Conor O'Donnell (NH), Joe Swann (DC)

ASMFC Staff: James Boyle and Katie Drew

The TC met via conference call on May 31, 2023 to receive an update from USGS about the Alosine Genetic Stock Identification and Tissue Repository to identify current collection efforts and provide guidelines for future sample collections. Additionally, the TC met to review an update to the Potomac River Fisheries Commission (PRFC) Sustainable Fishery Management Plan (SFMP) for American shad and to review planned management actions in South Carolina for the Edisto River in response to recent low fishery-dependent sustainability metrics.

The next SFMP to be reviewed is from Connecticut (Shad).

1. **USGS Alosine Genetic Stock Identification and Tissue Repository**

Dave Kazyak, Miluska Olivera-Hyde, and Ryan Franckowiak presented the status of the project, including the differing temporal and spatial ranges of samples for American shad, alewife, and blueback herring. The discussion revealed a few main points where the TC can assist:

1. Collect more mixed-stock samples.
2. For river herring, help inform temporal stability by providing samples from missing years.
3. For river herring, fill in spatial gaps as samples are largely concentrated in southern New England and around the Bay of Fundy in Maine.

Several TC members offered to provide samples after receiving kits from the USGS team, especially to fill the spatial gaps in the southern end of the range. The TC also discussed the potential for shad samples to be collected as bycatch in the VA spiny dogfish fishery and concluded to work on that possibility.

2. **PRFC SFMP Update for American shad**

Ingrid Braun presented the PRFC SFMP for American shad, which proposed continuing their limited commercial bycatch allowance under the same sustainability metrics, which is based on the geometric mean of pound net catch per unit effort (CPUE) and has been above its restoration target since 2011. The TC discussed the finding of the 2020 American Shad Benchmark Stock Assessment that found mortality in the Potomac River to be slightly above the sustainability threshold and showed interest in PRFC developing an additional metric based around the Juvenile Abundance Index for the next update to the SFMP. **The TC recommended the updated plan for approval by consensus.**

3. **Edisto River Management Actions for American Shad**

Kyle Hoffman updated the TC on actions taken in response to the fishery-dependent CPUE falling below the target from 2020-2022 with no evidence that conditions would improve in 2023. As a preemptive management measure, South Carolina is reducing the permit allowance from two nets to one per licensee. They also noted that due to high attrition in the fishery, there is concern that the metric is unreliable and will propose changing the index to a fishery-independent survey in the future.

MARYLAND - VIRGINIA
"Potomac River Compact of 1958"

Potomac River Fisheries Commission
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Potomac River Fisheries Commission's

American Shad

Sustainable Fishery Management Plan

Submitted to the
Atlantic States Marine Fisheries Commission

Prepared by Ingrid Braun

May 17, 2023

1. Sustainable Fishery Plan

In accordance with the guidelines provided in Amendment 3 to the Interstate Fishery Management Plan (IFMP) for Shad and River Herring, the Potomac River Fisheries Commission's (PRFC) first American Shad Sustainable Fishery Plan (SFP) was accepted by the Atlantic States Marine Fisheries Commission (ASMFC) Shad and River Herring Management Board in 2012 (2012 SFP), and an updated plan was approved by the Board in 2017 (2017 SFP). The Potomac River Fisheries Commission submits the following updated plan for the next five-year term.

1a. Request for Fishery

The PRFC requests that the Shad and River Herring Management Board consider this request to continue a limited commercial by-catch allowance of American shad in the portion of the Potomac River under PRFC jurisdiction (Figure 1). Accordingly, the PRFC justifies this request based on the fact that the Board accepted the 2007 Shad Stock Assessment which established a benchmark goal for American shad recovery in the Potomac River and required the PRFC to continue monitoring the pound net fishery's by-catch allowance of American shad, including discards. The Stock Assessment stated "to continue stock rebuilding, there should be no new expansion of the fishery until the benchmark is reached". The benchmark goal identified in the 2007 Stock Assessment was approved as a restoration target and has been exceeded each year since 2011 (Figure 2).

1b. Definition of Sustainability

Amendment 3 to the IFMP for Shad and River Herring defines a sustainable fishery as one that will not diminish potential future stock reproduction and recruitment. The PRFC proposes to continue with the mandatory daily harvest reporting program with the fishermen on the Potomac River, in which they record daily harvest, effort and discard data. The continuation of this data collection enhances the long-term data set that the PRFC maintains, updates and utilizes to monitor the progress of the American shad stock rebuilding and recovery in the Potomac River. The long-term American shad juvenile abundance index (JAI) for the Potomac River is provided by Maryland Department of Natural Resources (MD DNR) and will continue on an annual basis (Figure 3).

1c. Summary of current stock status

The Potomac River has been closed to the commercial and recreational directed harvest of American shad since March 1, 1982. The only allowable commercial harvest since then has been via a pound net by-catch provision that allowed up to two percent by volume of the total catch in possession to be American shad. Starting in 1996, the pound net by-catch provision was further limited to two percent by volume, but could not exceed one bushel per day per licensee. In 2004, a one-bushel limit of American shad by-catch for the gill net fishery was approved by the ASMFC Shad and River Herring Technical Committee and Board, and established by the PRFC. In 2012, ASMFC approval was obtained to increase the by-catch limits from one bushel to two bushels per day per licensee for pound nets and gill nets. Currently in the Potomac River, all directed commercial, recreational and charter boat fisheries for American shad remain closed.

1d. Benchmark goals and objectives or restoration goals/targets

In the 2007 ASMFC Shad Stock Assessment (SSA), a benchmark for American shad in the Potomac River was defined as the geometric mean (GM) CPUE of pound net landings reported in Walburg and Sykes (1957) for the years 1944 to 1952, or 31.1 pounds per net-day. It was concluded in the assessment that among Chesapeake Bay stocks of American shad, the Potomac River population showed the most promising signs of recovery. The gill net index, the pound net index, and the JAI depicted strongly increasing trends in relative abundance. To continue stock rebuilding in the Potomac River, it was recommended that there should be no new expansion of the fishery until the benchmark goal is reached, and that this requires continued monitoring of the pound net fishery, including discards. However, the 2020 SSA identified a mortality benchmark for American shad stock as 1.07. In the most recent assessment, it was found that the Potomac River American shad stock was found to be experiencing unsustainable female mortality based on the three-year average in 2017 of 1.1. Additionally, the stock's juvenile mortality status and abundance staties is unknown. There have been no trends in the young-of-year (YOY) abundance or adult abundance since 2005.

The ASMFC Shad and River Herring Management Board accepted the 2007 Shad Stock Assessment Report, which included the Potomac River benchmark. This benchmark goal of 31.1 became the restoration target for the Potomac River and was approved by the ASMFC Shad and River Herring Technical Committee. The GM was calculated for CPUEs of total pound net data (catch + discards) and the GM exceeded the benchmark goal and restoration target in 2011 with a value of 32.0 pounds per net-day (Figure 2). The GM has increased every year since 2002, so achieving the target in 2011 was not unexpected; however, we have continued to exceed the restoration target each year. The PRFC has reported this information in their annual compliance report.

1e. Proposed time frame for achievement

The benchmark goal identified in the 2007 Stock Assessment and approved as a restoration target was first exceeded in 2011, and continues to be exceeded each following year.

1f. Discussion of management measure(s) to be taken if sustainable target is not achieved within indicated timeframe

The restoration target in the Potomac River was achieved in 2011, and continues to be exceeded during each of the following years. The PRFC will continue monitoring the total pound net CPUE data as well as the MD DNR survey data.

If the GM for CPUEs of the total pound net data (catch + discards) drops below the restoration target for three consecutive years, then the PRFC will consider potential restrictions including: reducing or eliminating the two bushel by-catch allowance for pound nets and gill nets; and limiting or restricting the take of broodstock/egg collections by other agencies for shad restoration projects.

2. Stock Monitoring Programs

2a. Fishery Independent

American shad have been taken from the Potomac River as brood stock for hatchery production by several agencies under special collection permits issued by the PRFC since 1995. The Interstate Commission on the Potomac River Basin (ICPRB) participated in the Potomac Restoration Stocking Program for American shad from 1995 – 2002, at which time recovery was considered sufficient for natural reproduction. In 2003, restoration stocking of the Rappahannock River started using Potomac River origin eggs through a partnership between ICPRB, the Virginia Department of Wildlife Resource (DWR), and the U. S. Fish & Wildlife Service (USFWS) Harrison Lake National Fish Hatchery. Stocking of the Potomac River continues, but now as "replacement stocking" to account for the Potomac shad sacrificed for another river system. Since 1995, the ICPRB has released over 22 million fry into the Potomac. ICPRB continues to collect some American shad each year from the Potomac River for their schools and educational components, and incorporates significant public involvement into this project with a "Schools-in-Schools" partnership. In 2022, volunteers helped over 550 students from 12 Washington metropolitan area schools hatch shad in their classrooms and stock them in the Potomac and Anacostia Rivers. The students' efforts to help replenish American shad populations are notable, but more important is the link between students, volunteers, the river, watermen, biologists and our shared fishery heritage.

Several agencies, such as the MD DNR (since 2001), DWR (2003 – 2009, and 2017), the USFWS (since 2004) and the District of Columbia's Fisheries and Wildlife Division of the Department of Energy and Environment (DOEE) (2005-2018) have all collected American shad for brood stock under special collection permits issued by this Commission. The PRFC's Scientific Collection Permits require data reports and scale/otolith samples of ten percent of the "kept" American shad for analysis, together with their length, weight and sex. In addition, ten to fifteen percent of all shad fry resulting from the use of this permit are to be restocked in the Potomac River as close to the capture site as is feasible.

The MD DNR began replacement stocking in 2007, and has released about 1.4 million fry into the Anacostia River, a tributary of the Potomac River in Washington D.C. and 3.3 million fry into the Potomac River (Table 4). The DOEE has released approximately 7.6 million fry and 50,000 eggs into the Anacostia River (Table 5). The DWR reported a total of 6.2 million fry stocked in the Potomac, and the USFWS reported 902,000 fry stocked in the Potomac River as mitigation for egg collections (Table 2). In addition, the USFWS released approximately 2.25 million viable eggs back into the Potomac River for mitigation (Table 2). The Potomac River has been the egg source for the majority of Maryland's shad restoration projects, Virginia's shad restoration program in the Rappahannock River, as well as the Susquehanna River (MD/PA) and some of Delaware's rivers since 2002.

i. Juvenile abundance indices

Maryland is required to provide an American shad juvenile index for the Potomac River and several other river systems throughout its portion of the Chesapeake Bay. The annual juvenile abundance survey has been conducted since 1954, with American shad data collected from 1959 to present. Fixed stations and some auxiliary stations are used each year for a beach haul seine survey in

which the juveniles of all species encountered are identified and recorded. The American shad juvenile index for the Potomac River is derived from the Maryland DNR state wide annual young of the year survey as geometric mean CPUEs (Figure 3). The 2022 value of 2.45 was significantly lower than the 2015 value of 19.81, which was a record high value (Figure 3).

ii. Adult stock monitoring

Durell and Weedon (2022) report that Maryland DNR has conducted a Striped Bass Spawning Stock Survey since 1985, using multi-panel drift gill nets in the Potomac River. Since 1996, adult American shad that were incidentally caught were processed to obtain length, sex and age (scale samples) and repeat spawning determination (Figure 4).

2b. Fishery Dependent

i. Commercial Fishery

The non-directed Potomac River pound net by-catch harvest in 2021 consisted of 11,331 pounds of American shad (Table 1). The PRFC's mandatory commercial daily harvest reporting system is the source of these data, collecting harvest as well as discards or released fish. The 2021 discards/released by-catch of American shad in excess of the daily landing limit from pound nets was 3,500 pounds. The 2021 pound net harvest data was combined with the 2021 pound net discard data to identify the total CPUE. There were 408 pounds of American shad reported as harvested by gill nets and no gill net discards in 2021.

Pound net effort is expressed as "pound net fishing day" which is one net fished one time. During 2021, one hundred pound nets were licensed in the Potomac River. The pound net fishery is a 'limited entry' fishery capped at 100 licenses (each net is licensed separately). Effort included 202 pound net fishing days for the American shad by-catch harvest.

Regulation effective January 1, 2011 – all pound nets in the Potomac River must have at least six PRFC approved fish cull panels properly installed in each pound net to help release undersize fish. This regulation will have a beneficial impact on the release of river herring, but will not be effective in the release of adult shad. These fish cull panels were being used for by-catch reduction by some pound netters on a voluntary basis prior to 2011; they are now mandatory.

ii. Recreational Fishery

The Potomac River, under PRFC jurisdiction, recreational and charter boat fisheries for American shad remained closed in 2023. The American shad fishery has been closed since 1982 in this portion of the Potomac River. We are unaware of any historical or current recreational activity within the PRFC's jurisdiction. A historical recreational fishery existed in the D.C. portion of the Potomac River, but that fishery is now closed.

Literature Cited

Durell, E. Q. and C. Weedon. 2022. Striped Bass Seine Survey Juvenile Index Web Page. http://dnr2.maryland.gov/fisheries/Pages/juvenile-index.aspx. Maryland Department of Natural Resources, Fisheries Service.

Walburg, C. H. and J. E. Sykes. 1957. Shad fishery of Chesapeake Bay with special emphasis on the fishery of Virginia. U.S. fish Wildlife Service, Research Report 48, 26 p.

Figure 1. Potomac River – PRFC jurisdiction is the main stem of the Potomac River downstream of Washington, DC.

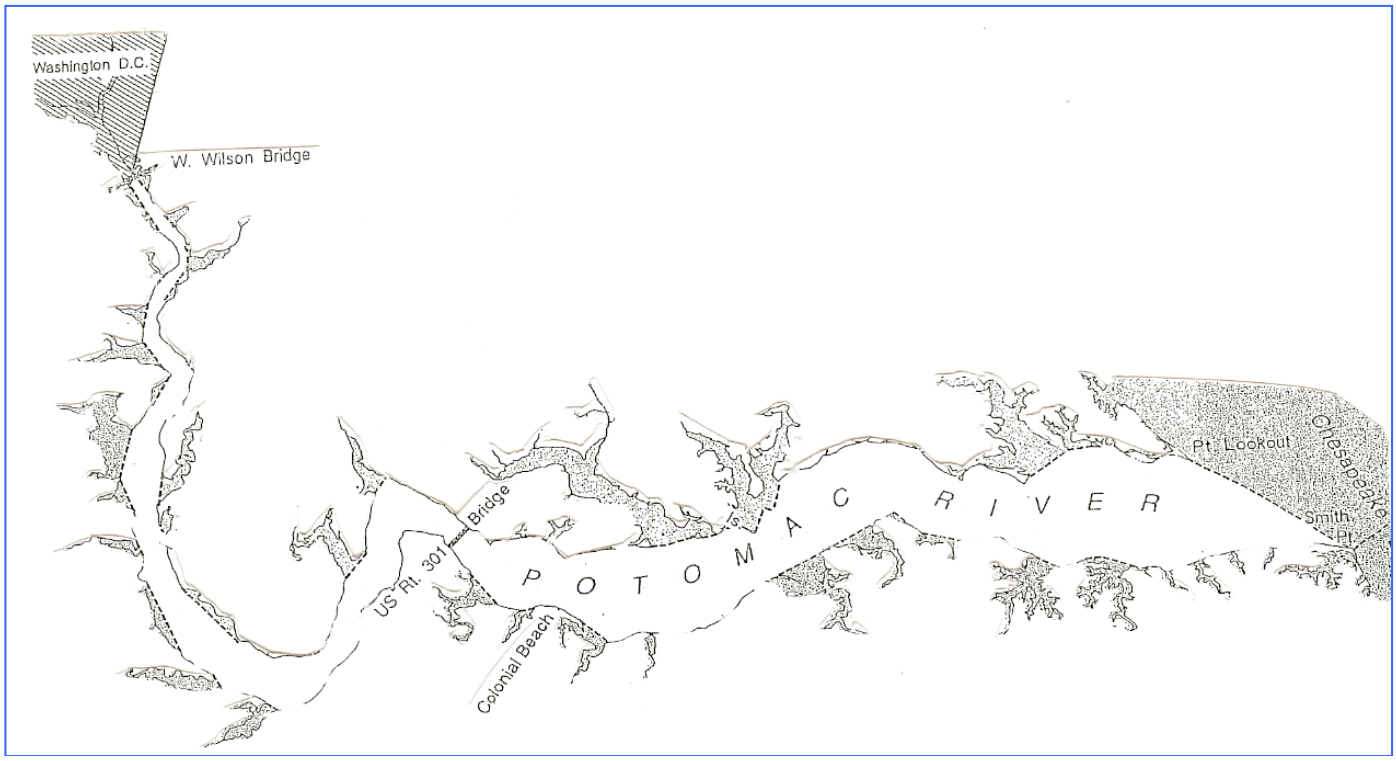
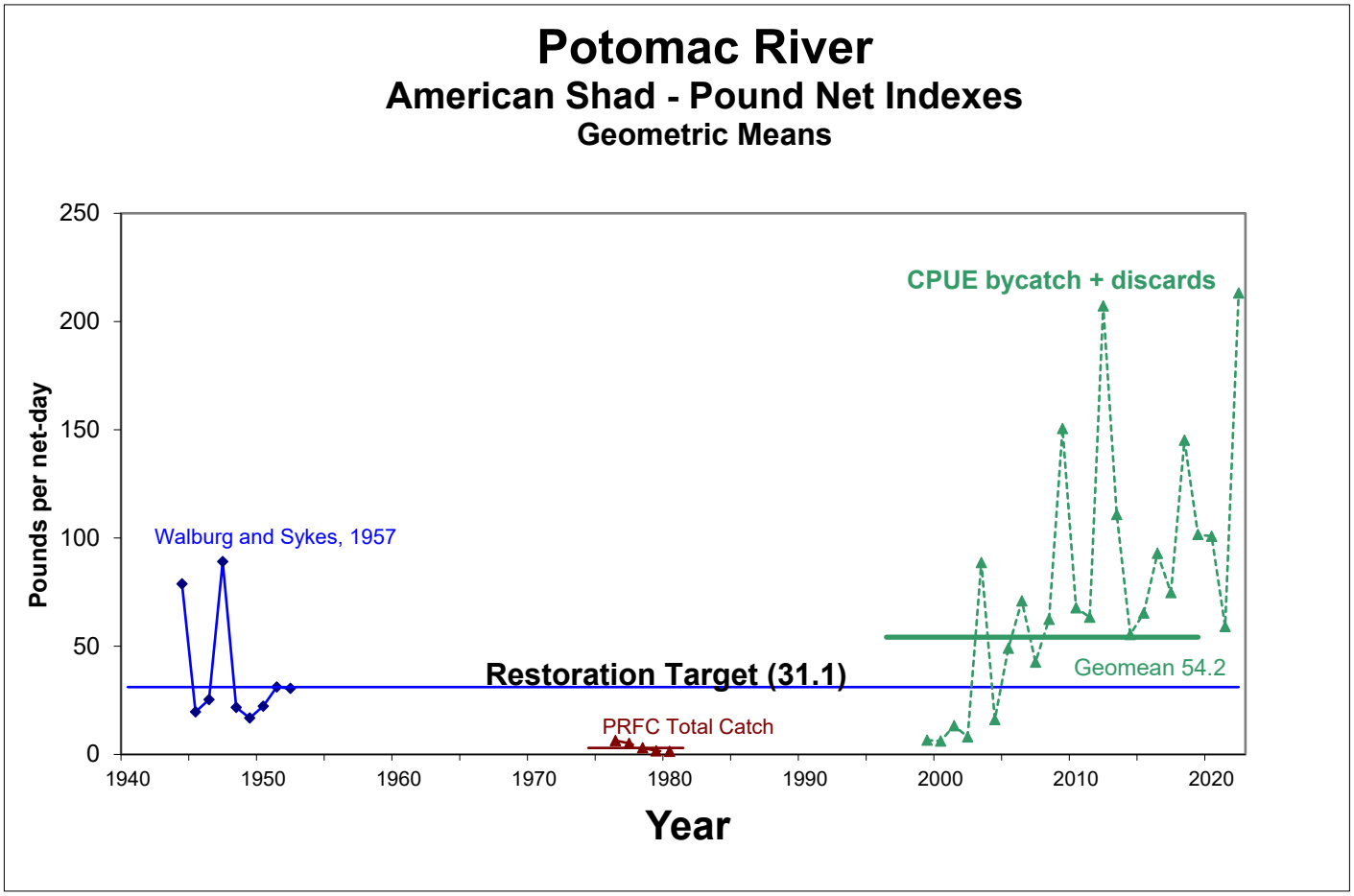


Figure 2. American shad pound net indexes using geometric means from reported bycatch and discards.

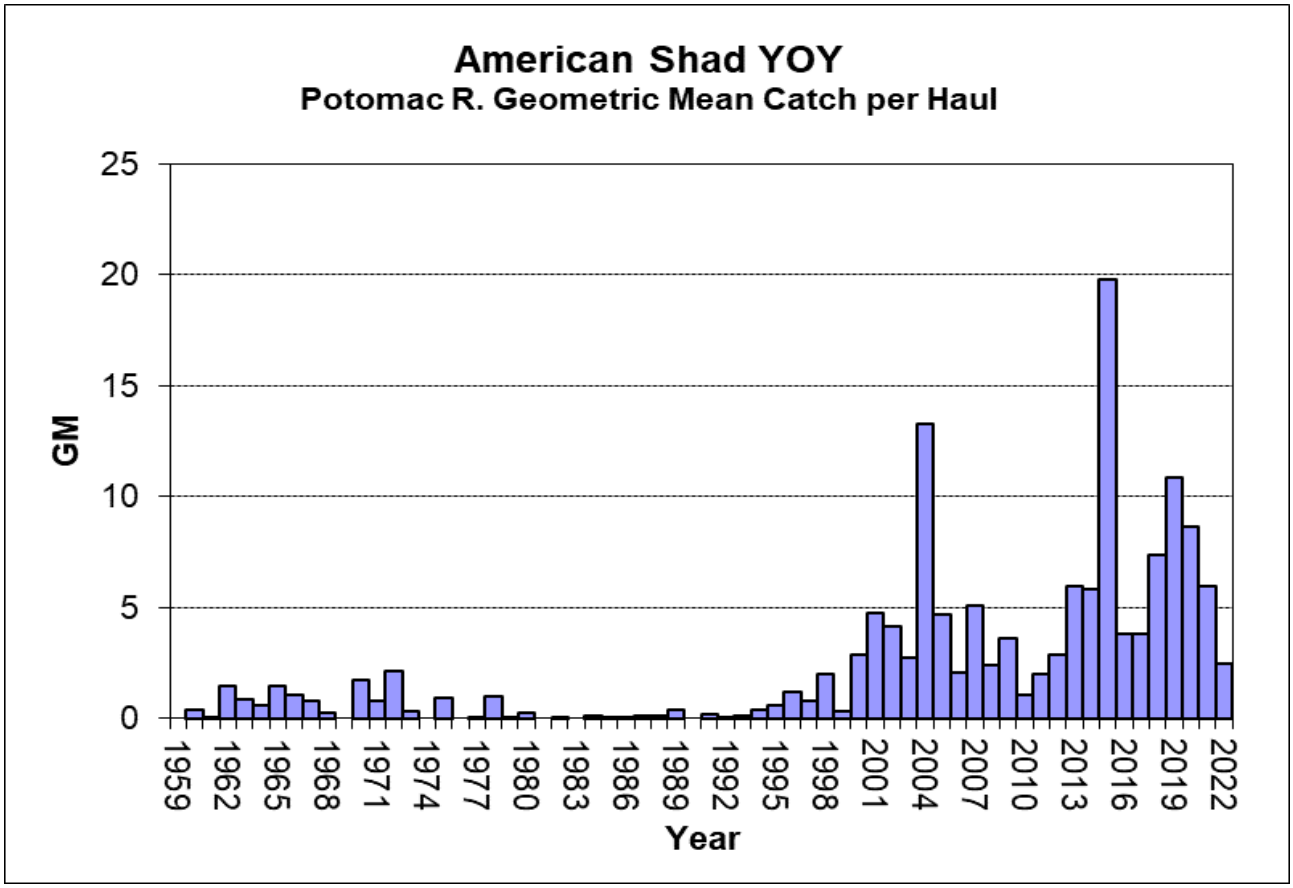


Source: PRFC

Geometric Mean (GM) of Pound Net CPUE Data												
Time Series	1944-1952	1976-1980	1999-2002	1999-2003	1999-2004	1999-2005	1999-2006	1999-2007	1999-2008	1999-2009	1999-2010	1999-2011
GM	**31.1**	3.0	8.1	13.1	13.6	16.3	19.6	21.3	23.8	28.1	30.2	32.0

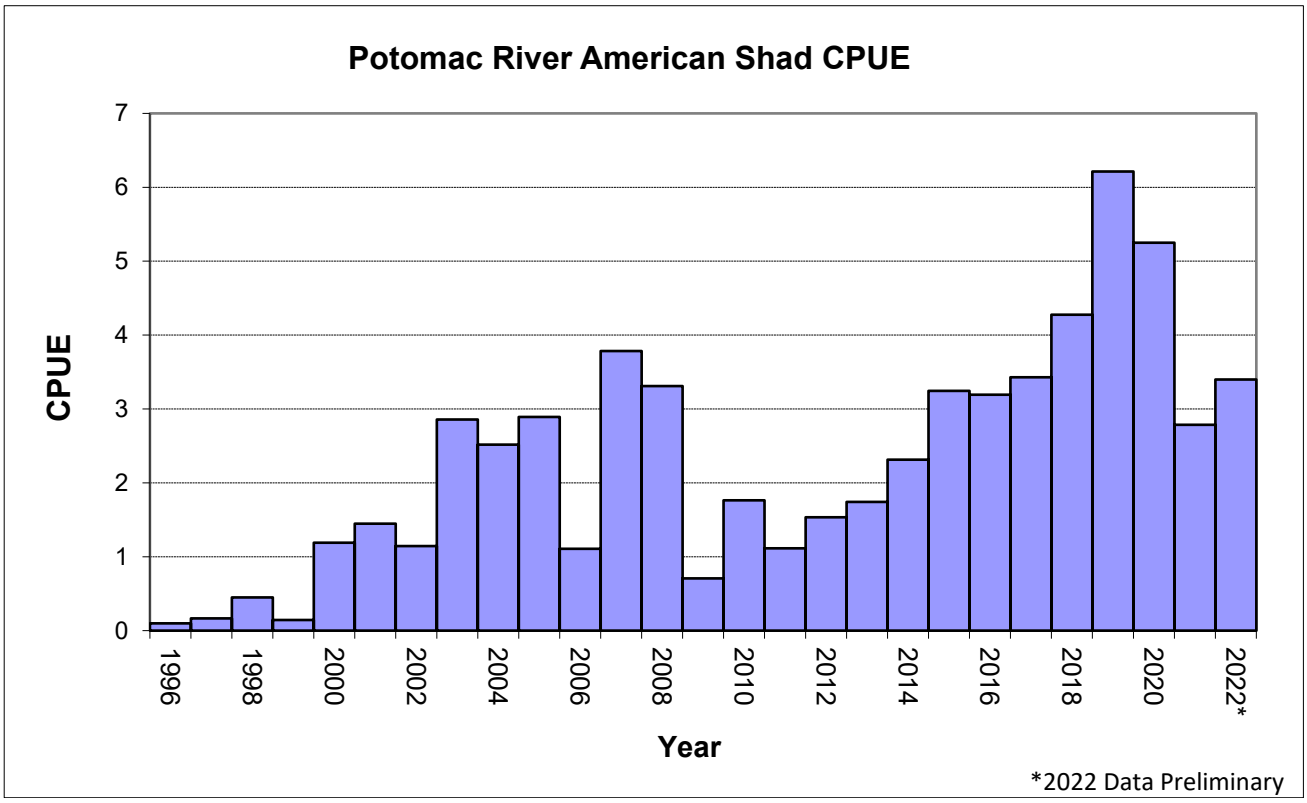
Geometric Mean (GM) of Pound Net CPUE Data												
Time Series	1999-2012	1999-2013	1999-2014	1999-2015	1999-2016	1999-2017	1999-2018	1999-2019	1999-2020	1999-2021	1999-2022	
GM	36.6	39.4	40.3	41.4	43.3	44.6	47.3	49.1	50.7	51.0	54.2	

Figure 3. American shad juvenile index for the Potomac River from Maryland Department of Natural Resources.



Source: https://dnr.maryland.gov/fisheries/pages/striped-bass/juvenile-index.aspx

Figure 4. Effort corrected catch of American shad on the Potomac River during the MD DNR striped bass spawning stock survey. CPUE is standardized as the number of fish caught per 1000 square yards of drift gill net per hour.



Source: MD DNR

Table 1. Potomac River Commercial Harvest (lbs) for American Shad by gear type

YEAR	HAUL SEINE	POUND NET	FYKE NET	GILL NET	MISC.	ROE SHAD	BUCK SHAD	LBS. LANDED IN MARYLAND	LBS. LANDED IN VIRGINIA	TOTAL
1995*	-	2,638	3	-	-	1,458	1,183	324	2,317	2,641
1996	-	2,292	-	-	-	1,357	935	99	2,193	2,292
1997	120	5,083	3	-	-	2,773	2,433	98	5,108	5,206
1998	121	2,251	-	-	-	1,680	692	623	1,749	2,372
1999	-	1,966	-	-	-	1,049	917	44	1,922	1,966
2000	-	1,508	-	-	-	897	611	124	1,384	1,508
2001	-	4,882	-	-	-	3,390	1,492	794	4,088	4,882
2002	-	2,762	-	-	-	1,727	1,035	-	2,762	2,762
2003	-	8,141	93	-	407	7,229	1,412	2,916	5,725	8,641
2004	-	5,051	-	293	-	4,701	643	1,656	3,688	5,344
2005	-	6,019	-	801	-	6,044	776	2,972	3,848	6,820
2006	-	4,256	-	413	-	4,245	424	1,146	3,523	4,669
2007	-	6,604	-	2310	-	7,929	985	4,532	4,382	8,914
2008	-	6,815	-	160	-	6,470	505	5,115	1,860	6,975
2009	-	5,005	-	209	-	4,601	613	5,210	4	5,214
2010	-	3,885	-	31	6	3,821	101	1,350	2,572	3,922
2011	-	2,419	-	-	-	2,167	252	969	1,450	2,419
2012	-	4,119	-	623	-	3,105	1,641	4,173	569	4,742
2013	-	3,796	-	3	-	2,946	853	3,796	3	3,799
2014	-	4,003	-	10	-	2,832	1,181	4,013	-	4,013
2015	-	1,877	-	12	-	1,135	754	1,877	12	1,889
2016	-	1,145	-	4	-	560	589	1,145	4	1,149
2017	-	10,273	-	-	-	7,904	2,369	2,493	7,780	10,273
2018	-	18,146	-	374	-	15,870	2,650	7,101	11,419	18,520
2019	-	17,546	-	341	-	13,625	4,262	8,730	9,157	17,887
2020	5	12,310	-	4704	-	15,964	1,055	7,599	9,420	17,019
2021	-	10,923	-	408	-	10,332	999	7,338	3,993	11,331
2022	-	7,041	-	85	-	5,002	2,124	2,739	4,387	7,126

* Moratorium adopted 1995 for all fisheries, except pound net by-catch provision
Source: PRFC

Table 2. Summary of American shad collected and eggs produced from the Potomac River by the USFWS and otolith age samples.

	2004	2005	2006*	2007*	2008*	2009*	2010*	2011*	2012*
# Females Caught			673	1,110	1,291	451	1,569	1,021	1,611
# Males Caught			117	272	284	510	1,196	404	475
Ripe Females	50			515	501	451	955	368	712
Ripe Males	39			271	284	510			
# Shad Released	125		395	596	790	787	614	652	899
Total Shad Kept	89		382	786	785	771	2,151	772	1,187
Total Shad Caught	214	296	777	1,382	1,575	1,558	2,765	1,425	2,086
Avg.CPUE (shad/hr/ft^2)			0.001	0.002					
Volume(L) of Eggs			99.3	183.9	194.4	132.2	375.0	137.4	258.0
# of Eggs			4,511,426	7,488,716	8,503,709	6,380,784	17,843,432	6,216,484	11,183,457
Viable Eggs			2,003,222	2,875,455	3,491,069	1,885,500	6,874,612	2,714,435	5,664,920
Viablility (%)			44%	42%	41%	30%	39%	44%	51%
# Fry stocked				259,119	188,739		365,000	90,000	
Viable Eggs stocked									670,292

	2013*	2014*	2015*	2016*	2017*	2018*	2019	2022*	**Totals**
# Females Caught	1,732	2,277	2,456	1,637	3,692	4,273	103	1,741	**25,637**
# Males Caught	266	758	284	331	1,000	641	1	272	**6,811**
Ripe Females	539	1090	793	702				673	**7,349**
Ripe Males									**1,104**
# Shad Released	1,193	1,187	1,663	935	2,280	2,517	64	1,105	**15,802**
Total Shad Kept	805	1,848	1,077	1,033	2,412	2,397	40	945	**17,480**
Total Shad Caught	1,998	3,035	2,740	1,968	4,692	4,914	104	2,013	**33,542**
Avg.CPUE (shad/hr/ft^2)									
Volume(L) of Eggs	118.1	316.7	170.5	165.6	330.9	342.3	31.8	197.1	**3,053**
# of Eggs	7,512,761	14,407,614	8,850,523	8,385,914	14,438,781	16,494,265	1,424,675	9,327,441	**142,969,982**
Viable Eggs	1,603,498	5,671,992	2,044,013	2,138,510	4,264,317	3,301,728	426,130	2,166,773	**47,126,174**
Viablility (%)	21%	39%	23%	25%	30%	20%	30%	23%	
# Fry stocked									**902,858**
Viable Eggs stocked	277,864	555,650	298,476	155,125	576,839	470,083	53,582	50,867	**3,108,778**

* Scales & otoliths taken on 5% of fish
No work was conducted in 2020 or 2021 due to the pandemic

Table 2 (continued). Summary of American shad collected and eggs produced from the Potomac River by the USFWS and otolith age samples.

American Shad Age, Length, and Weight Potomac River - 2022 (USFWS)

Year Class	2015	2016	2017	2018	Total
Age	**7**	**6**	**5**	**4**	
Males					
Number		1	2	2	5
% by year class		20%	40%	40%	
Av. TL (mm)		462	489	422	
Av. Wt. (kg)		0.93	0.96	0.79	
Females					
Number	14	9	31	11	65
% by year class	22%	14%	48%	17%	
Av. TL (mm)	505	487	480	460	
Av. Wt. (kg)	1.14	1.08	1.04	0.98	
Sexes Combined					
Number	14	10	33	13	70
% by year class	20%	14%	47%	19%	
Av. TL (mm)	505	485	480	454	
Av. Wt. (kg)	1.14	1.06	1.04	0.95	

American Shad Age, Length, and Weight Potomac River - 2018 (USFWS)

Year Class	2011	2012	2013	2014	Total
Age	**7**	**6**	**5**	**4**	
Males					
Number		5	4		9
% by year class		56%	44%		
Av. TL (mm)		478	462		
Av. Wt. (kg)		0.91	0.92		
Females					
Number	3	45	39	3	90
% by year class	3%	50%	43%	3%	
Av. TL (mm)	520	487	486	471	
Av. Wt. (kg)	1.27	1.16	1.1	1.17	
Sexes Combined					
Number	3	50	43	3	99
% by year class	3%	51%	43%	3%	
Av. TL (mm)	520	486	483	471	
Av. Wt. (kg)	1.27	1.14	1.09	1.17	

American Shad Age, Length, and Weight Potomac River - 2017 (USFWS)

Year Class	2010	2011	2012	2013	Total
Age	**7**	**6**	**5**	**4**	
Males					
Number		9	17	2	28
% by year class		32%	61%	7%	
Av. TL (mm)		482	457	432	
Av. Wt. (kg)		1.04	0.94	0.77	
Females					
Number	4	29	38	1	72
% by year class	6%	40%	53%	1%	
Av. TL (mm)	524	497	485	457	
Av. Wt. (kg)	1.36	1.23	1.23	1.02	
Sexes Combined					
Number	4	38	55	3	100
% by year class	4%	38%	55%	3%	
Av. TL (mm)	524	493	476	440	
Av. Wt. (kg)	1.36	1.18	1.14	0.85	

American Shad Age, Length, and Weight Potomac River - 2016 (USFWS)

Year Class	2008	2009	2010	2011	2012	Total
Age	**8**	**7**	**6**	**5**	**4**	
Males						
Number		1	1	2	1	5
% by year class		20%	20%	40%	20%	
Av. TL (mm)		514	479	462	382	
Av. Wt. (kg)		1.04	0.88	0.52	0.46	
Females						
Number	1	5	11	17	1	35
% by year class	3%	14%	31%	49%	3%	
Av. TL (mm)	540	532	507	451	470	
Av. Wt. (kg)	1.34	1.23	1.18	1.02	0.96	
Sexes Combined						
Number	1	6	12	19	2	40
% by year class	3%	15%	30%	48%	5%	
Av. TL (mm)	540	529	505	452	426	
Av. Wt. (kg)	1.34	1.2	1.15	0.97	0.71	

Table 3. MD DNR American Shad Mitigation Report – Potomac River

Year	Date	Stocking site	Number	Cultured By:	Stocked For:
2007	5/15/07	Anacostia	200,000	DC Fisheries	MD DNR mitigation
2008	4/24/08	Anacostia	170,000	DC Fisheries	MD DNR mitigation
2008	5/12/08	Anacostia	30,000	DC Fisheries	MD DNR mitigation
2009	5/6/09	Anacostia	200,000	DC Fisheries	MD DNR mitigation
2010	5/5/10	Marshall Hall	100,000	MD DNR	USFWS mitigation
2010	5/12/10	Marshall Hall	100,000	MD DNR	USFWS mitigation
2010	5/18/10	Marshall Hall	100,000	MD DNR	USFWS mitigation
2010	5/25/10	Marshall Hall	60,000	MD DNR	USFWS mitigation
2010	5/25/10	Marshall Hall	5,000	MD DNR	USFWS mitigation
2010	n/a	Anacostia	400,000	DC Fisheries	MD DNR mitigation
2011	4/25/11	Marshall Hall	30,000	MD DNR	USFWS mitigation
2011	5/25/11	Marshall Hall	60,000	MD DNR	USFWS mitigation
2011	n/a	Marshall Hall	263,000	MD DNR	MD DNR mitigation
2012	4/16/12	Marshall Hall	165,000	MD DNR	MD DNR mitigation
2012	4/5/12	Anacostia	200,000	DC Fisheries	MD DNR mitigation
2013	5/1/13	Anacostia	200,000	DC Fisheries	MD DNR mitigation
2013	4/29/13	Marshall Hall	3,000	MD DNR	MD DNR mitigation
2013	5/10/13	Marshall Hall	220,000	MD DNR	MD DNR mitigation
2013	5/21/13	Marshall Hall	57,400	MD DNR	MD DNR mitigation
2014	4/14/14	Marshall Hall	10,300	MD DNR	MD DNR mitigation
2014	4/16/14	Marshall Hall	20,700	MD DNR	MD DNR mitigation
2014	4/23/14	Marshall Hall	10,300	MD DNR	MD DNR mitigation
2014	5/8/14	Marshall Hall	31,000	MD DNR	MD DNR mitigation
2014	5/16/14	Marshall Hall	20,700	MD DNR	MD DNR mitigation
2014	4/29/14	Marshall Hall	166,000	DC Fisheries	MD DNR mitigation
2015	4/24/15	Marshall Hall	10,800	MD DNR	MD DNR mitigation
2015	5/7/15	Marshall Hall	172,700	MD DNR	MD DNR mitigation
2016	4/13/16	Marshall Hall	30,800	MD DNR	MD DNR mitigation
2016	4/26/16	Marshall Hall	30,800	MD DNR	MD DNR mitigation
2017	4/10/17	Marshall Hall	15,800	MD DNR	MD DNR mitigation
2017	4/16/17	Marshall Hall	55,300	MD DNR	MD DNR mitigation
2017	4/20/17	Marshall Hall	47,400	MD DNR	MD DNR mitigation
2017	4/24/17	Marshall Hall	79,000	MD DNR	MD DNR mitigation
2017	4/25/17	Marshall Hall	31,600	MD DNR	MD DNR mitigation
2017	4/26/17	Marshall Hall	94,800	MD DNR	MD DNR mitigation
2017	5/9/17	Marshall Hall	20,000	MD DNR	MD DNR mitigation
2018	4/24/18	Marshall Hall	240,000	MD DNR	MD DNR mitigation
2018	4/27/18	Marshall Hall	16,000	MD DNR	MD DNR mitigation
2018	5/2/18	Marshall Hall	16,000	MD DNR	MD DNR mitigation
2018	5/3/18	Marshall Hall	16,000	MD DNR	MD DNR mitigation

Table 3 (continued). MD DNR American Shad Mitigation Report – Potomac River

Year	Date	Stocking site	Number	Cultured By:	Stocked For:
2018	5/6/18	Marshall Hall	16,000	MD DNR	MD DNR mitigation
2018	5/7/18	Marshall Hall	16,000	MD DNR	MD DNR mitigation
2018	5/21/18	Marshall Hall	32,000	MD DNR	MD DNR mitigation
2019	4/17/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	4/22/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	4/23/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	4/24/19	Marshall Hall	77,500	MD DNR	MD DNR mitigation
2019	4/25/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	5/1/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	5/7/19	Marshall Hall	31,000	MD DNR	MD DNR mitigation
2019	5/8/19	Marshall Hall	15,500	MD DNR	MD DNR mitigation
2019	5/13/19	Marshall Hall	31,000	MD DNR	MD DNR mitigation
2019	5/17/19	Marshall Hall	77,500	MD DNR	MD DNR mitigation
2019	5/19/19	Marshall Hall	186,000	MD DNR	MD DNR mitigation
2021	5/3/21	Marshall Hall	41,600	MD DNR	MD DNR mitigation
2021	5/4/21	Marshall Hall	72,000	MD DNR	MD DNR mitigation
2021	5/17/21	Marshall Hall	145,000	MD DNR	MD DNR mitigation
2022	4/11/22	Marshall Hall	9,100	MD DNR	MD DNR mitigation
2022	4/13/22	Marshall Hall	36,500	MD DNR	MD DNR mitigation
2022	4/26/22	Marshall Hall	36,500	MD DNR	MD DNR mitigation
2022	4/28/22	Marshall Hall	82,100	MD DNR	MD DNR mitigation
2022	5/2/22	Marshall Hall	90,000	MD DNR	MD DNR mitigation

Table 4. Summary of American shad collected and eggs obtained from the Potomac River by MD DNR and scale age samples.

	2001	2002	2003	2004	2005	2006	2007	2008
# Ripe Females	298	568	458	231	561	472	567	401
# Green Females		205	351	276	446	314	438	405
# Spent Females		147	60	183	192	98	178	141
# Males	143	1083	490	286	385	223	213	476
Total Shad	441	2,003	1,359	976	1,584	1,107	1,396	1,423
Liters of Eggs	101.8	309.6	222.6	137.5	246	249	294.7	213.5
Total # of Eggs	3,906,375	11,501,975	8,337,225	5,742,950	9,514,400	9,350,900	10,222,090	7,918,150
Total Fertile Eggs	1,687,629	5,898,446	3,260,799	3,268,708	4,466,611	3,207,860	3,508,795	3,921,239
# Re-stocked Fry							200000	200000

	2009	2010	2011	2012	2013	2014*	2015*	2016*
# Ripe Females	425	599	304	1828	1168	579	569	947
# Green Females	277	288	355	1744	1199	1065	1482	907
# Spent Females	144	150	80	223	146	34	126	152
# Males	467	604	417	1250	354	1543	585	340
Total Shad	1,313	1,641	1,156	5,045	2,867	3,221	2,762	2,346
Liters of Eggs	205.5	299	168.5	619.5	441	180	174	372
Total # of Eggs	7,557,855	11,463,350	5,957,600	25,540,150	15,834,815	6,564,000	7,126,200	14,787,550
Total Fertile Eggs	4,554,483	7,882,600	3,964,097	11,294,187	8,306,826	3,346,406	3,199,264	6,502,012
# Re-stocked Fry	200000	400,000	263000	365000	480400	259000	183500	61600

	2017*	2018*	2019*	2021*	2022*	**Total**
# Ripe Females	1050	1164	1050	249	463	**13951**
# Green Females	2054	833	675	251	390	**13,955**
# Spent Females	378	282	69	61	15	**2859**
# Males	627	280	118	167	200	**10251**
Total Shad	4,109	2,559	1,912	728	1,068	**41,016**
Liters of Eggs	480	458	572	114	182	**6040.2**
Total # of Eggs	15,924,350	14,494,200	17,444,400	3,866,925	10,483,600	**223,539,060**
Total Fertile Eggs	7,546,119	7,829,522	7,254,283	2,556,016	6,547,051	**110,002,953**
# Re-stocked Fry	343900	352,000	496,000	258,000	254,200	**3,916,600**

* Scales taken for age samples
No work was conducted in 2020 due to the pandemic

Table 4 (continued). Summary of American shad collected and eggs obtained from the Potomac River by MD DNR and scale age samples.

American Shad Age, Length, and Weight Potomac River - 2022 (MD DNR)					
Year Class	**2015**	**2016**	**2017**	**2018**	**Total**
Age	**7**	**6**	**5**	**4**	
Males					
Number	8	4	5	1	18
% by year class	44%	22%	28%	6%	
Av. TL (mm)	483	466	441	409	
Females					
Number	9	33	36	3	81
% by year class	11%	41%	44%	4%	
Av. TL (mm)	500	486	470	470	
Sexes Combined					
Number	17	37	41	4	99
% by year class	17%	37%	41%	4%	
Av. TL (mm)	492	484	467	455	

American Shad Age, Length, and Weight Potomac River - 2021 (MD DNR)				
Year Class	**2016**	**2017**	**2018**	**Total**
Age	**7**	**6**	**5**	
Males				
Number	11	12	6	29
% by year class	38%	41%	21%	
Av. TL (mm)	480	460	441	
Females				
Number	5	9	7	21
% by year class	24%	43%	33%	
Av. TL (mm)	512	481	471	
Sexes Combined				
Number	16	21	13	50
% by year class	32%	42%	26%	
Av. TL (mm)	490	469	457	

American Shad Age, Length, and Weight Potomac River - 2019 (MD DNR)							
Year Class	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Age	**9**	**8**	**7**	**6**	**5**	**4**	
Males							
Number	1		17	26	13	1	58
% by year class	2%		29%	45%	22%	2%	
Av. TL (mm)	519		474	467	448	400	
Av. Wt. (kg)	1.05		0.89	0.83	0.77	0.56	
Females							
Number		2	7	57	24	1	91
% by year class		2%	8%	63%	26%	1%	
Av. TL (mm)		506	499	491	483	471	
Av. Wt. (kg)		1.24	1.06	1	1	1.03	
Sexes Combined							
Number	1	2	24	83	37	2	149
% by year class	1%	1%	16%	56%	25%	1%	
Av. TL (mm)	519	506	481	483	471	436	
Av. Wt. (kg)	1.05	1.24	0.94	0.95	0.92	0.8	

American Shad Age, Length, and Weight Potomac River - 2018 (MD DNR)					
Year Class	**2011**	**2012**	**2013**	**2014**	**Total**
Age	**7**	**6**	**5**	**4**	
Males					
Number		4	2	2	8
% by year class		50%	25%	25%	
Av. TL (mm)		462	430	420	
Av. Wt. (kg)		0.91	0.78	0.66	
Females					
Number	9	59	63	8	139
% by year class	6%	42%	45%	6%	
Av. TL (mm)	509	501	482	486	
Av. Wt. (kg)	1.2	1.1	1.05	0.85	
Sexes Combined					
Number	9	63	65	10	147
% by year class	6%	43%	44%	7%	
Av. TL (mm)	509	499	481	473	
Av. Wt. (kg)	1.2	1.08	1.03	0.76	

Table 5. Summary of American shad collected and eggs produced from the Potomac River by DOEE and otolith age samples.

	2006	2007	2008	2009	2010	2012	2013	2014
# Ripe Females	19	148	65	151	158	177	203	103
# Green Females	8	348	80	158	170	337	189	160
# Spent Females	4	55	28	56	30	21	44	34
# Males	1	43	18	115	128	185	85	218
Total Shad	32	594	191	480	486	720	521	515
Liters of Eggs	4.3	64.75	34.75	81	87.5	102.25	94.5	42.75
Liters of Viable Eggs	3.4	46.2	14.8	41.1	60.3	64.9	59.8	27.4
Viable Eggs/Female	3,831	9,355	8,550	12,334	15,058	13,252	7,143	10,003
# Stocked Fry in Anacostia River	114,920	763,600	261,710	922,650	1,672,411	1,912,947	1,216,443	796,787
# Stocked Eggs in Anacostia River								

	2015*	2016*	2017	2018*	**Totals**
# Ripe Females	71	244	0	75	**1414**
# Green Females	115	213	0	-	**1778**
# Spent Females	27	78	0	-	**377**
# Males	51	55	0	104	**1003**
Total Shad	213	590	0	179	**4521**
Liters of Eggs	0	33	0	40	**584.8**
Liters of Viable Eggs	0	0	0	-	**317.9**
Viable Eggs/Female	0	0	0	-	**79,526**
# Stocked Fry in Anacostia River	0	0	0	0	**7,661,468**
# Stocked Eggs in Anacostia River				50,000	**50,000**

* Scales & otoliths taken on 5% of fish

No work was conducted in 2015 or 2016 due to filtration system failure

Table 5 (continued). Summary of American shad collected and eggs produced from the Potomac River by DOEE and otolith age samples.

American Shad Age, Length, and Weight Potomac River - 2018 (DOEE)					
Year Class	**2012**	**2013**	**2014**	**2015**	**Total**
Age	**6**	**5**	**4**	**3**	
Males					
Number	1	9	19	5	34
% by year class	3%	26%	56%	15%	
Av. TL (mm)	491	480	473	464	
Av. Wt. (kg)	0.89	1.01	0.96	0.91	
Females					
Number		5	7	3	15
% by year class		33%	47%	20%	
Av. TL (mm)		500	499	468	
Av. Wt. (kg)		0.93	1.24	1.01	
Sexes Combined					
Number	14	26	8	8	56
% by year class	25%	46%	14%	14%	
Av. TL (mm)	491	487	480	465	
Av. Wt. (kg)	0.89	0.98	1.03	0.94	

American Shad Age, Length, and Weight Potomac River - 2016 (DOEE)						
Year Class	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Age	**7**	**6**	**5**	**4**	**3**	
Males						
Number		1	3	5	4	13
% by year class		8%	23%	38%	31%	
Av. TL (mm)		495	493	481	428	
Av. Wt. (kg)		1.00	0.96	0.89	0.70	
Females						
Number	2	11	15	15	4	47
% by year class	4%	23%	32%	32%	9%	
Av. TL (mm)	528	511	488	482	461	
Av. Wt. (kg)	1.27	1.18	1.1	0.95	0.96	
Sexes Combined						
Number	2	12	18	20	8	60
% by year class	3%	20%	30%	33%	13%	
Av. TL (mm)	528	510	489	482	444	
Av. Wt. (kg)	1.27	1.17	1.08	0.94	0.83	

American Shad Age, Length, and Weight Potomac River - 2015 (DOEE)						
Year Class	**2008**	**2009**	**2010**	**2011**	**2012**	**Total**
Age	**7**	**6**	**5**	**4**	**3**	
Males						
Number	1	7	4	3	1	16
% by year class	6%	44%	25%	19%	6%	
Av. TL (mm)	473	485	480	467	430	
Av. Wt. (kg)	1.05	1.09	1.05	1.03	1.03	
Females						
Number	1		11	6		18
% by year class	6%		61%	33%		
Av. TL (mm)	495		492	499		
Av. Wt. (kg)	1.42		1.33	1.29		
Sexes Combined						
Number	2	7	15	9	1	34
% by year class	6%	21%	44%	26%	3%	
Av. TL (mm)	484	485	489	488	430	
Av. Wt. (kg)	1.24	1.09	1.25	1.2	1.03	