Atlantic States Marine Fisheries Commission

Shad and River Herring Management Board

August 6, 2025
10:00 – 11:00 a.m.

Draft Agenda

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

1. Welcome/Call to Order (*P. Edwards*) — 10:00 a.m.

2. Board Consent — 10:00 a.m.
   - Approval of Agenda
   - Approval of Proceedings from October 2024

3. Public Comment — 10:05 a.m.

4. Advisory Panel Report *(P. Lyons Gromen)* — 10:15 a.m.
   - 2024 River Herring Benchmark Assessment

5. Consider Shad and River Herring Sustainable Fishery Management Plan (SFMP) and Alternative Management Plan (AMP) Updates *(M. Jargowsky)* **Action** — 10:35 a.m.
   - Massachusetts SFMP (River Herring)
   - Florida AMP (Shad & River Herring)
   - Georgia SFMP (American Shad) and AMP (River Herring)

6. Elect Vice-Chair **Action** — 10:55 a.m.

7. Other Business/Adjourn — 11:00 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

MEETING OVERVIEW

Shad and River Herring Management Board Meeting
August 6, 2025
10:00 – 11:00 a.m.

Chair: Phil Edwards (RI) Assumed Chairmanship: 8/25	Technical Committee Chair: Matthew Jargowsky (MD)	Law Enforcement Committee Representative: Lt. Col. Doug Daniels
Vice Chair: Vacant	Advisory Panel Chair: Pam Lyons Gromen	Previous Board Meeting: October 23, 2024
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 October 2024

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. Advisory Panel Report (10:15-10:35 a.m.)

Background

- The River Herring Benchmark Stock Assessment was approved for management use in August 2024.
- The AP met in October and December 2024 to review the assessment and develop recommendations to the Board **(Briefing Materials)**.

Presentations

- Presentation of AP Report by P. Lyons-Gromen

5. Consider Shad and River Herring Sustainable Fishery Management Plan (SFMP) and Alternative Management Plan (AMP) Updates (10:35-10:55 a.m.) 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 an SFMP for river herring and American shad, respectively. Plans are updated and reviewed by the Technical Committee (TC) every five years.
- Massachusetts (American shad) and Georgia (river herring) submitted updated SFMPs, and Georgia (shad and river herring) and Florida (river herring) submitted updated AMPs. The plans were recommended for approval by the TC (**Briefing Materials**).

Presentations • Shad and River Herring SFMP Updates for Board Consideration by M. Jargowsky
Board actions for consideration at this meeting • Consider approval of updated SFMPs for Massachusetts, Georgia, and Florida

6. Elect Vice-Chair Action

7. Other Business/Adjourn

Shad and River Herring 2025 TC Tasks

Activity level: Medium

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

Committee Task List
• Updates to state Shad and River Herring SFMPs • Annual state compliance reports due July 1
TC Members: Matthew Jargowsky (Vice-Chair, MD), Mike Brown (ME), Conor O'Donnell (NH), Brad Chase (MA), Patrick McGee (RI), Kevin Job (CT), Wes Eakin (NY), Brian Neilan (NJ), Brian Niewinski (PA), Johnny Moore (DE), Ingrid Braun-Ricks (PRFC), Joseph Swann (DC), Patrick McGrath (VA), Holly White (NC), Jeremy McCargo (NC), Kyle Hoffman (SC), Jim Page (GA), Reid Hyle (FL), Ken Sprankle (MA), Jim Hawkes (NOAA), John Ellis (USFWS). Ted Castro-Santos (USGS), Kurt Eversman (USFWS), James Boyle (ASMFC), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SHAD & RIVER HERRING MANAGEMENT BOARD

The Westin
Annapolis, Maryland
Hybrid Meeting

October 23, 2024

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ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Rep. Allison Hepler, ME (LA)
Steve Train, ME (GA)
Cheri Patterson, NH (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Doug Grout, NH (GA)
Dan McKiernan, MA (AA)
Rep. Jennifer Armini, MA (LA)
Phil Edwards, RI, proxy for Jason McNamee (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
David Borden, RI (GA)
Matt Gates, CT, proxy for Justin Davis (AA)
Bill Hyatt, CT (GA)
John Maniscalco, NY, proxy for Marty Gary (AA)
Jim Gilmore, NY, proxy for Assy. Thiele (LA)
Emerson Hasbrouck, NY (GA)
Heather Corbett, NJ, proxy for Joe Cimino (AA)
Adam Nowalsky, NJ, proxy for Sen. Gopal (LA)
Jeff Kaelin, NJ (GA)
Kris Kuhn, PA, proxy for Tim Schaeffer (AA)
Loren Lustig, PA (GA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Lynn Fegley, MD (AA)
Allison Colden, MD, proxy for Del. Stein (LA)
Russ Dize, MD (GA)
Pat Geer, VA, proxy for Jamie Green (AA)
James Minor, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Chad Thomas, NC, proxy for Rep. Wray (LA)
Jerry Mannen, NC (GA)
Ross Self, SC, proxy for Blaik Keppler (AA)
Mel Bell, SC, proxy for Sen. Cromer (LA)
Malcolm Rhodes, SC (GA)
Doug Haymans, GA (AA)
Spud Woodward, GA (GA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Gary Jennings, FL (GA)
Ron Owens, PRFC
Daniel Ryan, DC Fisheries
Max Appelman, NMFS
Rick Jacobson, USFWS

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

Ex-Officio Members

Wes Eakin, Technical Committee Chair
Pam Lyons Gromen, Technical Committee Chair
Jeff Sabo, Law Enforcement Committee Rep.

Staff

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

The Shad and River Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Capitol Ballroom via hybrid meeting, in-person and webinar; Wednesday, October 23, 2024, and was called to order at 11:29 a.m. by Chair Lynn Fegley.

CALL TO ORDER

CHAIR LYNN FEGLEY: We're going to get started one minute early. Welcome to the Shad and River Herring Management Board. My name is Lynn Fegley from the state of Maryland. I am happy to serve as your Chair today. To my right I have James Boyle, our Plan Coordinator, Wes Eakin, TC Chair and Dr. Katie Drew.

APPROVAL OF AGENDA

CHAIR FEGLEY: The first thing that I want to do is ask for an Approval of the Agenda. I will update it though, one small change that did appear in supplemental materials, we will not be having the Advisory Panel report today, so that goes off the agenda. Is there anybody who is opposed to the agenda as it stands? Okay, none, we'll move forward by consent.

APPROVAL OF PROCEEDINGS

CHAIR FEGLEY: Then we're going to look at Approval of Proceedings from August, 2024. Are there any changes or additions? Roy Miller.

MR. ROY W. MILLER: Madam Chair, I just happened to notice when looking through the minutes, there was a reference on your Page 8 Peer Review Panel Report it says Dr. Conway. That is Dr. Conroy. I would like to make that correction. Thanks.

MS. FEGLEY: Okay, thank you, I'm going to assume that staff has that noted. Are there any other edits or changes to the agenda? All right, any opposition to the agenda as it stands? Seeing none; we will move forward.

PUBLIC COMMENT

CHAIR FEGLEY: The next thing on our agenda is Public Comment. We received some comment in writing, which we appreciate. Is there anybody from the public online or in the room? Okay, no public comment.

CONSIDER UPDATES TO SHAD AND RIVER HERRING SUSTAINABLE FISHERY MANAGEMENT PLANS (SFMPS)

CHAIR FEGLEY: This is our action item, we've got several Shad and River Herring Sustainable Fishery Management Plans to consider today, we'll be looking for motions. We're going to go through a little bit step by step here, we're going to consider New Hampshire, then we're going to consider Maine, and then we're going to do Massachusetts and Connecticut together. With that I'll kick it over to Wes Eakin.

MR. WES EAKIN: Thanks, Madam Chair. We'll just jump right into it. Today I have four SFMP updates for Board consideration, two for river herring from New Hampshire and Maine, and two for American shad in Massachusetts and Connecticut. Then we also have a proposal to reopen New Hampshire's River Herring Fishery following a closure in 2021. Just a bit of background about SFMPs and what is required of them, as well as the sustainability definition in the FMP. The Amendments 2 and 3 of the Shad and River Herring FMP require states wishing to have a fishery submit a SFMP that would demonstrate the stock could support commercial and/or recreational fishery that will not diminish future stock reproduction and recruitment. These plans are updated and reviewed every five years.

NEW HAMPSIRE RIVER HERRING SFMP AND PROPOSAL TO REOPEN FISHERY

MR. EAKIN: We'll start with New Hampshire's SFMP update. New Hampshire manages their river herring fishery on a statewide basis, in lieu of river specific or species specific. Data from six rivers within the Great Bay estuary are combined to develop the Great Bay indicator stock and that is used to develop their sustainability metrics. Harvest and answers primarily for personal use as

bait in the striped bass fishery, as well as bait in the lobster fishery.

Between 2010 and 2020, the statewide landings ranged from just over 5,000 fish to just under 22,000 fish, and 95 to 100 percent of that harvest occurs in the estuary. The new additions to the SFMP include updated mortality rates, standard error calculations for the original time count estimates, updated information from the 2024 River Herring Benchmark Stock Assessment, and an updated escapement target.

New Hampshire has developed two sustainability targets, one for fisheries dependent, which is an exploitation rate of less than 20 percent on the Great Bay indicator stock, and one for fisheries independent, which is an escapement target of 94,589 fish. New Hampshire will review both of these sustainability targets on an annual basis, to determine if there is a management action necessary.

Those management actions are if the fishery dependent target is not met, no additional days or areas are prohibited to harvest the river herring. Implement will lower daily harvest limits for state permitted harvesters, and/or implement a daily catch limit for recreational anglers. If the fisheries independent target is not met, the fishery will close in all state waters.

This plan was recommended for approval by the TC. Moving into New Hampshire's proposal to reopen the river herring fishery. As I mentioned, the fishery was closed in 2021, due to low spawning run counts in 2019 and 2020, leading to a failure to meet your fisheries independent target. If approved today, New Hampshire is proposing to reopen their fishery for 2025.

New passage estimates in Exeter River have been above the fishery's independent escapement target level for the past four years. New Hampshire has also given some reasons for the low run counts in 2019 and 2020. They attribute that to low water temperatures and decreased flows during the early part of the spawning season.

In the Cocheco River they had equipment failure and fishery modifications in 2016 that led to a loss of ladder efficiency and decreased river herring passage. In the Exeter River, the Great Dam and Fishway was removed in 2016. The next dam up in Pickpocket Fishway or the Pickpocket Dam and Fishway, which is over 15 kilometers upstream, did not have good returns, despite observing thousands of fish passing the former dam location.

New Hampshire took some corrective actions. In the Cocheco River they converted the fishway back to how it operated prior to 2016, offered more consistent water flows, and the Exeter, it was determined that the river herring reaching the Pickpocket Fishway was not providing accurate population estimate of those fish migrating past the former dam location, therefore they developed a new counting methodology using visual time counts at the former Great Dam location, beginning in 2021.

These two figures here are the current sustainability targets. The figure on the left is the fisheries independent target that shows that exploitation has remained at or below 20 percent. The figure on the right is a fisheries independent target, that shows that they have had escapement above their escapement target for the past four years.

In summary, New Hampshire has made the following as a case for reopening their fishery. They have exceeded the fisheries independent target for the past four consecutive years. The majority of the harvest comes from the Exeter River, which is already very restrictive, where there is only 2 days of fishing allowed per week, with one tote of fish per day.

The Cocheco River will remain closed while improvements to the fishway and fish passage continue. Harvest on the Cocheco is minimal, and the river's closure likely won't increase fishing

pressure on other systems in New Hampshire. The remaining rivers, the Great Bay Indicator Stock can support harvest opportunities while continuing to meet New Hampshire's sustainability targets.

Last month the TC reviewed New Hampshire's request to reopen, and during that review the TC referenced the TC Guidance Document that recommends a five-year consecutive year above the targets occur before reopening. The TC was hesitant to go against the previously established guidance.

But they also acknowledged that it is unclear whether the decrease in spawning run counts in 2019 and 2020 were true reflection of abundance or due to methodology. The TC was unable to reach a consensus of wanting to recommend for or against New Hampshire reopening the fishery a year earlier than recommended. With that I would be glad to take any questions.

CHAIR FEGLEY: Any questions from the Board about this presentation? Okay, no questions. What I would like to do, because we're going to need an action on both approving a plan and the proposal to reopen the fishery. I wanted to, Cheri Patterson, I wanted to turn to you to see if you had any additional thoughts or comments for the Board before we make that decision.

MS. CHERI PATTERSON: Thank you, Madam Chair. It is a recommendation from the TC to keep a fishery closed for five years. It's not something that is definitely a mandate and such. We have very good reasons for wanting to open it a year ahead of that, you know a four-year closure as opposed to a five-year closure.

When we did the dam removal in downtown Exeter, fish were obviously going up through, they just dropped out and spawned before they hit the next fishway, which was as indicated 13 kilometers above where the former dam was in downtown Exeter. We were anticipating to have fish counts occur at that fish ladder, thinking they were going to go right up through. They did not. They dropped out and they spawned in the lower section. We did notice the difference in species. We noticed that there was a lot more bluebacks, which want the riverine habitat as opposed to the impoundment habitat, that were noted in our sampling, as well as we still have a very good range of ages, so we did not note any discrepancy or any missing ages at all, since we have been sampling in that river since the dam was removed.

As for the Cocheco River, we are still very cautious there. We did pull out internal modifications that we had put in to increase the efficiency of the fish ladder. Obviously, that worked this year. We had a count of 77,000 fish that went through the Cocheco fish ladder. But this was the first year that we had any, what I would call respectable returns to the Cocheco.

We are going to keep the Cocheco closed until we get a few more years of decent returns back to that system. We had very little harvest activity in the past in the Cocheco River. It's not going to produce in the ordinant pressure and in the other river system that we would want to open up, so if you have any questions feel free to ask. Thank you.

CHAIR FEGLEY: Thank you very much, Cheri, for that. Any further questions? Does anybody have any questions on this issue before we go to a motion? Okay, seeing none, does anybody have a motion for the Board? Cheri Patterson.

MS. PATTERSON: Thank you, I'll wait until it gets up, oh, there we go. I **move to approve the updated River Herring Sustainable Fishery Management Plan and proposal to reopen the fishery from New Hampshire, as presented today.**

CHAIR FEGLEY: We have a motion on the board from Cheri Patterson, and a second from Dan McKiernan. Is there any discussion on the motion? Pat Keliher.

MR. PATRICK C. KELIHER: I should have asked this before the motion, Cheri, but is the plan to have some limited harvest or a regular harvest, or are you still going to wait a year, a proving and waiting year before the harvest?

MS. PATTERSON: No, we're hoping to open up harvest under the same rules that we had prior, with the exception of closing the Cocheco. We have other rivers closed, we have the Oyster closed, we have the Taylor closed and the Exeter River we have just two days of harvest allowed, two days.

CHAIR FEGLEY: Okay, any other questions? Just to be clear, the proposal, it's a year early to open with the reasons given. Any other discussion? Allison Colden.

MS. ALLISON COLDEN: Obviously very great information presented and lots of supporting rationale for the action on reopening in New Hampshire. Obviously, as Cheri pointed out, the technical guidance is not a requirement, it's not a mandate. My only hesitation, slight hesitation here is that as much as technical guidance is for the states to understand what the Technical Committees are comfortable with.

I also think it gives states and stakeholders important expectations on the types of data that are required to bring a technical committee to a place of comfort in evaluating these types of decisions. I'm not necessarily adamantly opposed, but I do have a little bit of hesitation moving forward against the technical guidance that currently exists, and kind of what we all understand to be the needs for the Technical Committee to help us make these types of decisions.

CHAIR FEGLEY: Steve Train.

MR. STEPHEN R. TRAIN: I can support this motion, but I have a question more about the procedure. Maybe I need some more clarity. Cheri told us what they plan to do, but the motion says that we're opening up their fishery. Are we going to be able to do motions like this from now on for every state, and not have specifics in it? Do we have a copy of as the plan presented somehow its voted? I mean I want their fishermen to fish, but the motion seems broader than what we're actually voting on.

CHAIR FEGLEY: Yes, Toni.

MS. TONI KERNS: I think I'm correct on this, and James, let me know if I'm wrong. But the SFMP lays out what rivers they plan on opening and what rivers they plan on keeping closed, so that is the updated river herring SFMP that is listed in that motion there.

CHAIR FEGLEY: Right, so the proposal is very detailed. Rick Jacobson.

MR. RICK JACOBSON: I'm a little confused with the rationale for reopening a year early. As I heard it there were four different potential drivers of the low counts that were observed that led to the closure in the first place. One of those were technical difficulties with the ability to count at the established counting point, the fishway.

Another was that dam removals, and that some number of the individuals that would have otherwise been counted further downstream had dropped out, because they are spawning in the intervening place. If either of those were the driver, well those are just technical anomalies that led to an aberrant low count, and I would be inclined to say after four years of consistently high counts to approve the proposal.

But on the flip side there was also something in the original presentation that suggested the low count might have been a product of environmental factors, water temperature and low water. If in fact they were driven in that initial closure by environmental factors, that seems a very different issue. I was wondering if there can be any clarity. Was this truly an aberrant low count because of technical issues, or was it potentially a low count because there truly were fewer fish?

CHAIR FEGLEY: Thank you for that question, James, do you want to try to field that, or Cheri Patterson, why don't you address that.

MS. PATTERSON: Thank you for the question. Those two years that reflected low counts actually had environmental issues that are consistent amongst any year, right, whether you have good runs or not. We have other fish ladders, or other rivers that would have higher counts normally, or high counts, so that we wouldn't necessarily have had to close down the fishery, based on the two river systems that I talked about, the Exeter and the Cocheco. But because of those environmental conditions, those rivers were also low. Let's go back to the Exeter. We always have those environmental conditions; every fish passage system does. Sometimes you have high flows that prevent fish passage systems from being efficient. Sometimes you've got the cold temperatures that would prevent the early run of alewives to make it up through, but your bluebacks make it up through.

It's just the environmental conditions can change year to year, but this was kind of an anomaly, where we had two big river systems that had, I don't want to say big river systems, but river systems that had good runs. Dam removal prevented us from effectively counting one of those systems, and a modification to the Cocheco failed to produce what we were hoping it to do.

They were hoping that we didn't have to clean up the ladder three times a day, you know do it by hand, we were hoping to have these modifications that U.S. Fish and Wildlife Service actually designed for us. We were hoping that that would just be allowing the fish to do a complete swim through. For two years that didn't happen.

We ended up tearing out those modifications, in order to revert the fish ladder back to the way it was originally designed, and we started seeing the decent returns at that point in time. At the Exeter, what we changed for counting the fish was doing time counts down by the former dam that was removed, as opposed to relying on the next fish passage system for those counts.

We were thinking about coming to this Board last year, but the TC indicated that they wanted to see more daily time counts, in order to increase the statistical validity of what we were seeing in time counts, so we did that this year. We had prior to this year an average of three time counts a day. This year we had an average of six time counts a day.

Some days we had nine-time counts. We're still seeing over a hundred thousand passing through, where the former dam was, essentially. We had the fish there in the Exeter, it's just that we didn't have counts as to when the fish were there at the particular location. Did that help or do you need other clarity?

MR. JACOBSON: I believe it helped. I believe that it reinforces my notion that in fact the low counts were an aberration affiliated with technical issues, as opposed to truly environmental issues, so thank you.

CHAIR FEGLEY: Thank you, Cheri, and I have Dennis Abbott.

MR. DENNIS ABBOTT: I live on the Lamprey River, the river we're talking about, and where the fishery would be prosecuted is right in the middle of town. I guess methods of fishing could be with some gillnets, if possible, but there has been one existing old fashioned stick net with a box that protrudes out in the back of the Community Church in the middle of our town.

It's not being operated now, but it is owned by one gentleman who is 75 years old, and I don't picture him making much of a dent in the fishery if it's reopened, that tends it with a rowboat when he does fish. Some of the locals say he's not a good fisherman and he doesn't really know how to set the poles, et cetera and et cetera, but he does catch, and he's been, I won't say probably a thorn in

the side of Cheri and myself through the years. Since it's been open, he has an attorney friend that likes to call us and wants to see this open. For Jerry Collins, I wouldn't mind seeing this open at this time. I also have pictures here in my iPad what pictures were taken 10 years ago of the weir and whatever, but I don't think anybody needs to see that. It won't harm the fishery if Jerry Collins is able to operate his little fishing weir.

CHAIR FEGLEY: Thank you, Dennis, really appreciate that context. Is there any other discussion around this motion? Okay, so I'm going to try it. Is there any opposition to this motion? Fantastic, so this **motion is considered approved by consent**, and you know what, I'm going to go ahead and read it into the record.

The motion is, **move to approve the updated River Herring Sustainable Fishery Management Plan and Proposal to reopen the fishery from New Hampshire as presented today.** Thank you for that, and Maine, you are up next. Wes Eakin, take it away.

MAINE RIVER HERRING SFMP

MR. EAKIN: Moving on to Maine's SFMP Update. Maine has 36 municipalities that maintain exclusive river herring harvest rates. Currently 22 of those municipalities are in the existing SFMP, and in 2024, 19 commercial river herring fisheries were executed by those 22 municipalities. Fourteen municipalities do not fish, because they are not covered under the SFMP, and Maine has approximately 230 waters that support river herring population.

River herring harvest is strictly controlled by municipalities that are granted exclusive harvest rates by the state. There is one fishing location and one harvester per watershed. The season starts when the first fish arrive, June 5, with an option to extend until June 15th approved. Currently there is a 3-consecutive day lift period that allow fish upstream to spawn, and there is no fishing in the watershed above a municipality that has exclusive harvest rights.

New additions to Maine's SFMP include five additional commercial fisheries, updated fisheries independent surveys, recalculated 25th percentile metric, updated Z estimates from the most recent river herring benchmark stock assessment, and a new age requirement. For fisheries to be added to the fisheries management plan, Maine has defined sustainability as follows.

It must demonstrate a repeat spawning ratio of greater than 20 percent, Z estimates of less than or equal to 1 before a commercial fishery begins, and annual release of 235 spawning fish per surface acre, and an age structure that demonstrates the presence of older fish. For management triggers, if a run demonstrates a declining trend in the three-year average in run counts, the fishery will close for the following year.

If the Z estimates exceed 1.67 from the previous year, the number of fishing days will be reduced until those Z estimates fall below 1.67. If the repeat spawning of 20 percent is not achieved, fishing days again will be reduced until that rate exceeds 20 percent. Finally, if river herring populations that don't demonstrate the presence of fish ranging from Age 3 to 7 for more than 3 consecutive years, that will result in a reduction of fishing days. This plan was recommended for approval by the TC, and I can take any questions.

CHAIR FEGLEY: Okay, any questions on the Maine SFMP? Okay, seeing no questions, this one also requires action. Is there a motion from the Board? Pat Keliher.

MR. KELIHER: If you have a prepared motion, Madam Chair. I would **move to approve the updated River Herring Sustainable Fisheries Management Plan for Maine as presented today.**

CHAIR FEGLEY: Excellent, and I got a second from Eric Reid. Is there any discussion on the motion? John Clark.

MR. JOHN CLARK: I should have asked sooner, I'm just curious. The highlights in the table of contents, is that about confidential data from Maine, and plus Maine misspelled New Hampshire in that table of contents as Hew Hampshire.

CHAIR FEGLEY: Is that about confidential data, do you know?

MR. JAMES BOYLE IV: I haven't checked the table of contents exactly, but there are two versions of the SFMP, one with confidential data and one without. They were ready for the TC to review the confidential data if necessary, and so that might just be a leftover on the table of contents in the non-confidential version.

CHAIR FEGLEY: Any other discussion around this motion? Is there any opposition to the motion? Great, it **passes by consent and we have passed the motion to approve the updated River Herring Sustainable Fishery Management Plan for Maine, as presented today,** and now we are going to move on to Massachusetts and Connecticut. Take it away, Wes.

MASSACHUSETTS AMERICAN SHAD SFMP

MR. EAKIN: The last two we have updates for Massachusetts and Connecticut for American shad. Currently Massachusetts is proposing a continued recreational harvest of American shad in the Merrimack and Connecticut Rivers, all of their state waters are catch and release, and have been so since 2012.

Their sustainability targets for the Merrimack are the fish count list, the 25th percentile at the Essex Dam Fish Lift over the time series. They will also use a Z estimate of 0.98 as a warning threshold. In the Connecticut they will use the 25th percentile of the Holyoke Dam Fish Lift over the time series, which is 140,000 shad.

They will also use sustainability metrics for the Connecticut, as defined in the Connecticut SFMP, which I'll go over next. It's a management action, for the management action threshold there are three consecutive years below the benchmark will trigger Mass Wildlife and DMF and Connecticut, if it's in the Connecticut River, to review, our ploy would be to consider reducing harvest. This plan was recommended for approval by the TC.

CONNECTICUT AMERICAN SHAD SFMP

MR. EAKIN: For Connecticut, Connecticut is proposing to continue the commercial and recreational harvest on the Connecticut River. Their sustainability targets are the passage at Holyoke, which is 140,000 fish. Recruitment is 25th percentile of the time series, and escapement of 90 percent. Connecticut uses a stoplight approach for the management action threshold. Green is when all three indicators are positive, yellow is two out of three, orange one out of three, and red if all indicators are negative. Their management response will vary, depending on which indicators are positive. It's important to note that all metrics for this plan since the last update have consistently been above the threshold or trigger values indicating a green stock status and a low level of management concern. This plan was also recommended for approval by the TC.

CHAIR FEGLEY: Any questions? Anybody have a motion? Cheri Patterson or Dan McKiernan.

MR. DANIEL McKIERNAN: Thank you, I'll make that **motion to approve the updated Shad Sustainable Fisheries Management Plan from Connecticut and Massachusetts, as presented today.**

CHAIR FEGLEY: Awesome, we have a motion from Dan McKiernan and a second from Cheri Patterson. Any discussion on the motion? Is there any opposition to the motion? Excellent, **approved by consent**, and that is a **motion to approve the updated Shad Sustainable Fishery Management Plan from Connecticut and Massachusetts as presented today.**

ADJOURNMENT

That takes us to the last item on our agenda, which is Other Business. Is there any Other Business to come before the Board? Excellent, thank you for the discussion and do we have a motion to adjourn? Any opposition to adjourning? We're adjourned, thank you.

(Whereupon the meeting adjourned at 12:01 p.m. on October 23, 2024)

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Shad and River Herring Management Board**

FROM: **Shad and River Herring Advisory Panel**

DATE: **October 15, 2024**

SUBJECT: **Advisory Panel Review of 2024 River Herring Benchmark Assessment**

The Shad and River Herring Advisory Panel (AP) met via conference call and webinar on Monday, October 7th, 2024 to review the results of the 2024 River Herring Benchmark Assessment.

AP Members in attendance*:* Pam Lyons Gromen (Chair), Byron Young (NY), Edward Hale (DE), Bill Lucey (CT), Deb Wilson (ME), Jerry Audet (MA), Mike Thalhauser (ME), Ray Brown (NC), Steve Gephard (CT), Thomas Rowe (SC)

ASMFC Staff: James Boyle, Katie Drew

Other: Margaret Conroy (SAS Chair), Matthew Jargowsky, Kevin Job, Jason Boucher, Emily Bodell, Jamie Cournane, Roger Fleming, Jaclyn Higgins

Margaret Conroy presented an overview of the 2024 River Herring Benchmark Stock Assessment, including a description of methods and results for each system. The presentation highlighted the newly incorporated regional stock structures and habitat model.

AP Discussion

Overall, AP members were concerned that river herring populations are not recovering despite the actions taken through Amendment 2 that resulted in the closure of most state fisheries. Individual AP members provided several comments related to the assessment. First, Ray Brown expressed concern with the idea of increasing harvest for either species given the results of the assessment.

Steve Gephard wanted it noted for management and the public that the 2009 reference year represents a greatly depleted stock and comparisons to 2009 do not fully convey the losses that the stock has had over the full time series. Additionally, expressed concern that recent bycatch values are artificially low due to the lack of observer coverage and that the assessment does not adequately incorporate the Area 1a Atlantic herring spawning closures into its evaluation of the relatively positive trends seen in northern New England. He would recommend that the Commission draft a comment letter in support of time/area closures in Atlantic Herring Amendment 10 by the New England Fishery Management Council.

Jerry Audet noted that the lack of a significant positive trend coastwide since the moratorium in 2009 represents an emergency. Furthermore, he sought direction from the assessment data on the most critical areas of immediate concern to direct management efforts. It is unclear whether in-river or at-sea issues represent the most immediate threat to restoration.

Bill Lucey, through comments during and after the meeting, indicated support for exploring catch caps that are more responsive to existing river herring stock conditions by genetic sub-regions as defined by Reid et al. (2018), while also formulating time area closures based on bycatch probability such as those developed by Roberts et al. (2023). Furthermore, he advocated for the time-area closures to be more clearly defined than the rolling hotspot method but could incorporate information from that previous management effort. Finally, he emphasized that there should be a rapidly growing focus on funding in-river monitoring efforts along with any other herring specific surveys (e.g. acoustics, tagging) to look at population level responses to reduced Atlantic herring and mackerel effort and evaluate fishing mortality through at-sea interception, or lack thereof due to reduced fishing effort.

Mike Thalhauser expressed concern that the assessment is not able to evaluate the stocks at small enough scales for suitable management and wishes for managers to adapt to considering individual river stocks and fisheries rather than coastwide trends.

Ed Hale emphasized the need for increased observer coverage to evaluate at-sea bycatch and for states to utilize a consistent method for ageing samples. Additionally, he spoke in support for recreational personal use harvest in state Sustainable Fishery Management Plans (SFMPs).

Paul Perra (MA) was unable to attend the meeting but sent comments in ahead of time to call for coastal buffer zones in the Atlantic herring and mackerel fisheries to reduce river herring bycatch and to express support for the research recommendations in the assessment to improve restoration efforts.

In addition to discussing the assessment, several AP members expressed disappointment with the frequency of AP meetings and requested that the AP meet more regularly to be more involved and effective as an advisory body. The last AP meeting was held after the most recent American shad assessment in January 2021.

Finally, the AP requested to convene for another meeting to further discuss recommendations and draft consensus statements for management in response to the assessment.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Shad and River Herring Management Board**

FROM: **Shad and River Herring Advisory Panel**

DATE: **February 19, 2025**

SUBJECT: **Continued Advisory Panel Review of 2024 River Herring Benchmark Assessment**

The Shad and River Herring Advisory Panel (AP) met via conference call and webinar on Monday, December 2nd, 2024, to continue discussing the results of the 2024 River Herring Benchmark Assessment and receive an update on the progress of the New England Fishery Management Council's (NEFMC) Atlantic Herring Amendment 10. The AP will meet in 2025 to review the management alternatives in Draft Amendment 10 when they are available.

AP Members in attendance*:* Pam Lyons Gromen (Chair), Edward Hale (DE), Bill Lucey (CT), Deb Wilson (ME), Mike Thalhauser (ME), Paul Perra (MA), Steve Gephard (CT)

ASMFC Staff: James Boyle, Katie Drew

Other: Matthew Jargowsky, Kevin Job, Emily Bodell, Jamie Cournane, Jaclyn Higgins, Allison Colden, Alan Bianchi, Bailey Bowden

2024 River Herring Benchmark Assessment

- The AP discussed the contrast in the assessment results between Northern New England and Southern New England, particularly considering that the report notes both regions have significant restoration programs. One member believes it is an oversight for the report not to have mentioned the possible effects of Atlantic herring spawning closures in Area 1A on reducing bycatch of river herring from rivers in the Gulf of Maine. Furthermore, the AP strongly felt that there should be a greater emphasis on identifying the key features of management programs in systems that have shown increasing trends when compared to systems that have not. **The AP recommends the Board task the Technical Committee (TC) to document the numbers of commercial fisheries by state over time and use those trends to identify and evaluate attributes of effective management programs, including assessing the impact of the Atlantic Herring Area 1A seasonal closures on the relative success of Maine river herring runs.**
- Of the high-priority research recommendations in the stock assessment, **the AP recommends prioritizing genetic sampling of river herring at-sea bycatch, particularly with portside sampling programs, as well as the development of a uniform ageing protocol between states to reduce uncertainty in the assessment results.** There was general agreement that there needs to be greater monitoring of offshore fisheries and that more of the burden of sustainability should be placed on offshore fisheries that

have a high incidence of river herring bycatch rather than in-river fisheries. Portside sampling was seen as the most efficient method to acquire the data necessary to evaluate the possibility of disproportionate effects of bycatch on different systems.
- One member of the AP expressed concern that the assessment process does not involve the AP before the assessment is approved for management use.
- One member of the AP that was unable to attend the meeting submitted written comment expressing the need for rapid action in response to the lack of improvement in many systems despite their harvest closures and restoration efforts.

NEFMC Atlantic Herring Amendment 10

James Boyle provided an update on the timeline of Amendment 10 and the guidance provided to the PDT by the Council. The AP will plan to meet again to review the management alternatives and provide recommendations on their preferred options.

- **The AP recommends the Commission support the development of management alternatives to consider time/area closures, incidental catch caps, and improvements to incidental catch monitoring accuracy and precision in Atlantic Herring Amendment 10.**

General

- **The AP recommends the Board identify mechanisms for improving public access and transparency of data between stock assessments.** The group specifically referenced the Manomet River Herring Portal as an example to follow to provide coastwide run count and fishery-independent sampling information across years and in a more comprehensive and timely manner than the annual FMP Review. Additionally, the AP would recommend the TC develop a consistent reporting method that would enable a theoretical data portal to be easily filtered by different run count and sampling methodologies.
- **The AP recommends the Board investigate the use of external collaborators for data collection.**

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Shad & River Herring Technical Committee
Meeting Summary

July 14, 2025

Technical Committee Members: Matthew Jargowsky (Chair, MD), Wes Eakin (NY), Ken Sprankle (USFWS), Patrick McGee (RI), Patrick McGrath (VA), Conor O'Donnell (NH), Reid Hyle (FL), Brian Neilan (NJ), Holly White (NC), Brad Chase (MA), Jeremy McCargo (NC), Kyle Hoffman (SC), Kurt Eversman (USFWS), Jim Hawkes (NOAA), Jim Page (GA), Johnny Moore (DE), Ted Castro-Santos (USGS)

ASMFC Staff: James Boyle and Katie Drew

The TC met via webinar on July 14, 2025, to review updates to the Sustainable Fishery Management Plans (SFMPs) for Massachusetts (river herring), Georgia (American shad), and Florida (American shad), as well as updates to the Alternative Management Plans (AMPs) for Georgia (river herring) and Florida (shad and river herring).

1. Massachusetts River Herring SFMP Update

Brad Chase presented a new SFMP update that proposed opening harvest in Herring Brook in the Town of Pembroke. The proposed fishery would be capped at 10% of the time series mean (since 2012) of the annual spawning run count, recalculated every three years. If the 10% cap is exceeded in any year, Massachusetts DMF will meet with the Pembroke Herring Fisheries Commission to review harvest records and management practices in a joint memorandum. Additionally, if the Herring Brook run count is below the 25th percentile for two consecutive years, the sustainability target will be reduced to 5% of the time series mean for the following year. Three consecutive years with the run count below the 25th percentile of the time series will trigger a minimum 3-year closure the following year. In order to reopen the harvest, an opening threshold of three consecutive years above the time series mean would have to occur. If approved, harvest is expected to begin in 2026.

The TC requested that 2025 run count data be included now that it has become available, as well as language to encourage delaying the start of the fishing season until after the first wave of fish have returned to allow for those larger, repeat spawners to pass first. **The TC recommended the updated plan for approval by consensus.**

2. **Florida SFMP and AMP Update**

Reid Hyle presented updates to Florida's SFMP for American shad in the St. John's River and AMP for shad and river herring in other state waters. Regarding the SFMP, there were no significant changes to the previous version. However, the TC discussed the possibility of adding a new sustainability metric of "relative exploitation" by monitoring the ratio of fishery-dependent information (e.g. effort, catch, harvest) to fishery-independent abundance indices, as well as adding more explicit language to their management triggers. **Following the TC recommendation, Florida will re-submit the SFMP with revised sustainability metrics for review at a future meeting.**

There were no proposed changes to the AMP, which maintains the trigger to re-evaluate the sustainability of a system if any source detects a non-zero harvest of blueback herring or American shad outside of the St. John's River. **The TC recommended the updated plan for approval by consensus.**

1. **Georgia SFMP and AMP Update**

Jim Page presented an update to the Georgia SFMP for American shad and AMP for river herring. There were no significant changes to management from the previous SFMP except to update the benchmarks for management triggers to include data through 2023. Additionally, due to funding, the Ogeechee River creel survey will be suspended. While the TC expressed concern about the loss of the creel survey, they noted that abundance data will still be collected and the management trigger is still maintained by the electrofishing survey. **The updated plan was recommended for approval by consensus.**

There were no changes proposed to the AMP for river herring. The plan maintains a trigger to develop an SFMP or pursue regulatory change if any creel surveys indicate positive harvest of ricer herring for three consecutive years. T**he TC recommended the plan for approval by consensus.**

Sustainable Fishery Management Plan for River Herring

Herring Brook, Pembroke, Massachusetts

Developed Cooperatively by the Massachusetts Division of Marine Fisheries and the Pembroke Herring Fisheries Commission

July 2025 - ASMFC Board Submittal

INTRODUCTION

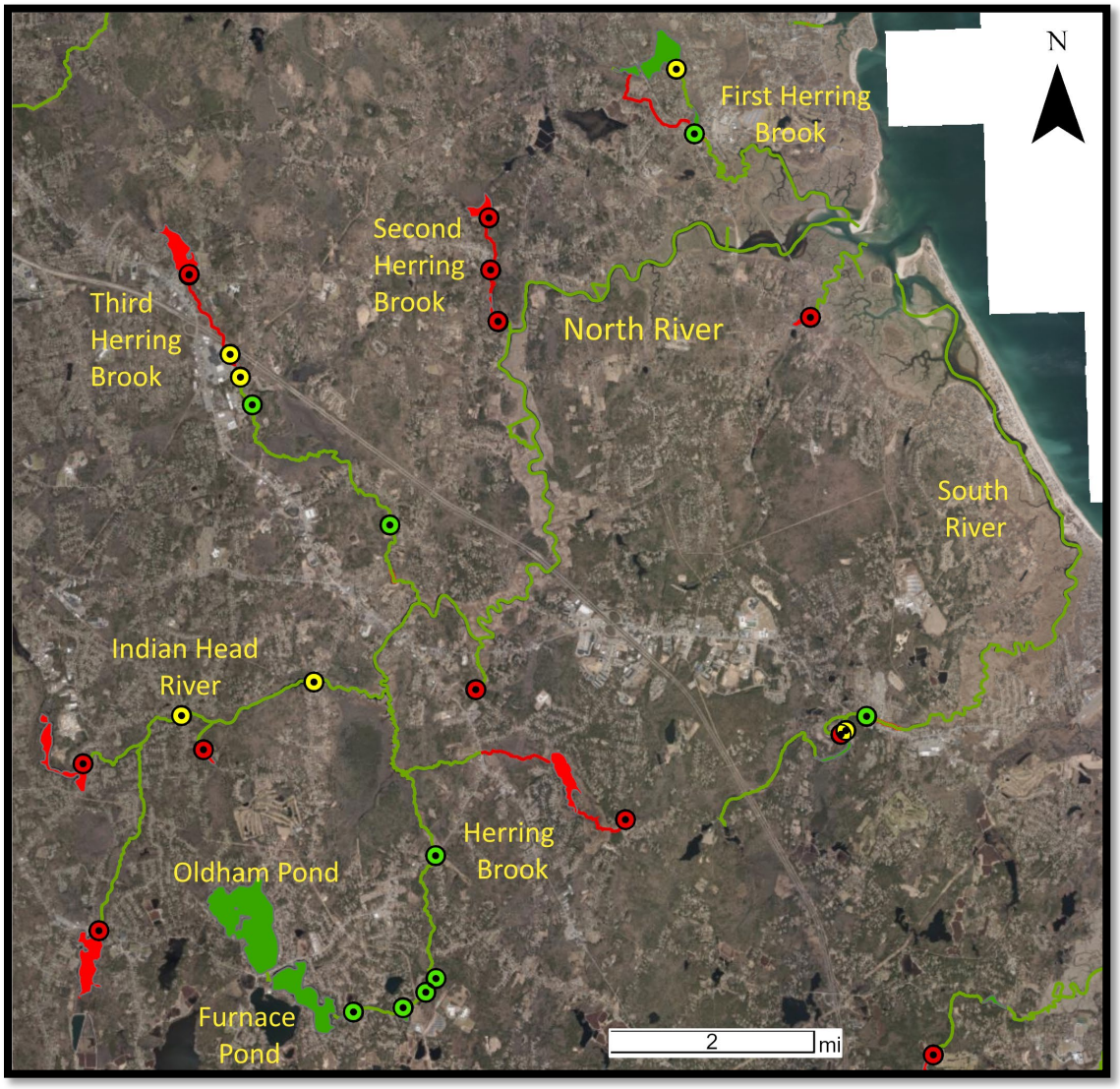
The Herring Brook in Pembroke has historically been one of the largest river herring runs on the South shore of Massachusetts. Herring Brook is a tributary to the North River watershed that contains one of the largest fresh and saltwater wetlands in Massachusetts. The Herring Brook herring run has a long history of dedicated local management by the Pembroke Herring Fisheries Commission and prior Town entities. The Pembroke Fish Fry was held at the scenic Herring Brook Park for over 40 years to celebrate the herring run before being postponed during the 2020 pandemic. River herring harvest has been prohibited in Massachusetts since 2006 due to concerns over declining stocks. The objective of this sustainable fishery management plan (SFMP) is to allow a reopening of the traditional recreational river herring fishery in Herring Brook. The river herring run in the Herring Brook is primarily composed of alewife (*Alosa pseudoharengus*) with minor known occurrence of blueback herring (*Alosa aestivalis*). The river herring run begins in late-March and is typically over by the end of May.

WATERSHED

The North and South River watershed basin includes 114 mi^2 within eight towns in the South Shore Coastal Drainage Area. The watershed supports the municipal water supply for eight towns with a large dependency on groundwater (USDA 1982). The tidal North River meanders through extensive wetland that included 1,540 acres of salt marsh in the 1960s (Fiske et al. 1966). Tidal action strongly influences North River currents with a mean 8.8 ft tidal amplitude at the entrance and nearly 4 ft of tidal influence extending to the Indian Head River. Large fluctuations in salinity occur with each tide change. During summer high tides, salinity has been recorded over 11 miles upstream of the North River entrance (Fiske et al. 1966). Freshwater contributions are mainly provided by the following six tributaries: the South River, Herring Brook (also called Barker's River), Indian Head River, First Herring Brook, Second Herring Brook, and Third Herring Brook (Figure 1). Herring Brook has the headwaters of Oldham and Furnace Ponds and flows for approximately 4.5 miles in the Town of Pembroke to reach the North River. The drainage area of Herring Brook is 30.3 mi^2 with a 7-day/2-year flow of 1.0 cfs (USDA 1982). There is no USGS stream flow gauge station on Herring Brook.

Figure 1. North River Watershed. Waterways colored green are accessible to river herring and those

colored red are impassable (MA DMF Diadromous GIS Data Layer).



The harvest of diadromous fish resources was important in the North River watershed for native Americans and colonial settlers. The abundance of sea-run fish declined in the 1700s with the advent of hydropower dams to support mill industries. The north-side tributaries of First, Second and Third Herring brooks all supported herring fisheries in the 1700s, although were reported to have few fish returning by 1831. Fiske et al. (1966) reported that river herring were nearly absent at the three north- side tributaries to the North River at the time of DMF's North River marine resource study. During Belding's survey of alewife fisheries in Massachusetts (1921) the watershed was heavily manipulated for hydropower and polluted by tack and rubber mills. Belding further reported that only Barker's River (Herring Brook) maintained a viable herring fishery at the time with three days open to public harvest per week during the run. This fishery was established as a public fishery to benefit the residents of Pembroke in 1790. Belding reported that 250 barrels (241,000 fish at 965 fish/barrel) of herring were harvested from the North River in 1912; of which the source was likely Barker's River.

Herring fisheries in Herring Brook and Indian Head River persisted after the herring runs in the other tributaries of the North River faded. By the 1960s, only Herring Brook maintained a viable fishery through

the diligent efforts of the Pembroke Herring Superintendent (Fiske et al. 1966). However, the Herring Brook herring run was reported to be declining in the 1960s, despite passage improvements and steady local stewardship, due to the introduction of beavers into the watershed in 1956, cranberry bog interactions with juvenile herring, and the construction of water supply pipeline in 1965 that diverted water (and juvenile river herring) from the Herring Brook watershed to the separate Silver Lake watershed (Reback and DiCarlo 1972). Reback and DiCarlo's (1972) anadromous fish survey portrayed a dire status for river herring at all North River tributaries, including the above concerns for Herring Brook. Their survey highlighted the need for stream channel maintenance and documented a robust American shad run in the Indian Head River and South River, as two of the few remaining shad fisheries in coastal Massachusetts.

The industrial-era mills that polluted the North River and tributaries are long gone. Although undocumented, it is likely that water quality in the watershed is better now than a hundred years ago. The present status of North River herring runs may be similar to the prior DMF reports with low numbers of herring in most tributaries (Chase 2006), and larger runs in Herring and Indian Head Brook. The third DMF/DFG survey of anadromous fish resources in 2000-2001 (Reback et al. 2005) reported that the Herring Brook herring fishery continued to underperform its potential due to degraded or inefficient fish passage at five fishways on the brook, and juvenile herring impacts from water supply operations and cranberry bog water management. Starting in 2011, much effort has gone into cooperative DMF and Pembroke Herring Fisheries Commission projects to restore the traditional herring run in Herring Brook.

FISHWAYS

The following three fishways are present in the Herring Brook watershed: Herring Brook Park off Barker Street; Third Mill Pond off Hobomock Street, and at the Gorman Mill Pond Dam. Two mill pond dams between Barker Street and Hobomock Street previously had wood fishways last build by the DMF Fishway Crew around 2000. The dams blew out during flood flows in 2005, eliminating the ponds and reducing the elevation changes to the point fishways were not needed. With no additional effort these stream channels have naturalized and readily pass migratory fish. The water diversion next to Gorham Mill Pond is also reported in this section; although not a fishway, the site has had potential to cause fish passage impacts.

Third Mill Pond Dam. A flume at the outlet of Third Mill Pond (also called Glover Mill Pond) used for cranberry farming was known to have a wood fish ladder for decades. The wood fish ladder was last rebuilt by the DMF Fishway Crew about 20 years ago. This fish ladder also blew out in the flood flows of 2005. The dam and fishway were reconstructed in 2011 under a project funded and managed by DMF with substantial engineering support from the MA Public Access Board. The scoping design was prepared by Dick Quinn of the USFWS. Engineering plans and permitting were provided by Tibbetts Engineering (Taunton, MA), and the construction was done by C. Naughton Corp. (Weymouth, MA). Design and permitting costs were approximately $19,000 and the construction costs were approximately $160,000 excluding the three 10 ft-sections of Alaskan Steeppass fish ladder contributed from DMF project stock. The new dam spillway has an elevation rise of 7 ft with a fishway length of 30 ft. and slope of 23.5%. A working draft Fishway Operation & Maintenance (O&M) plan was prepared for this site by DMF in 2011.

Herring Brook Park. The scenic and historic Herring Brook Park contains two channels that served former mill hydropower. The river-right channel has a gradual slope with no formal fishway needed but with a stone weir at the end of the channel that needs periodic adjustments. At the river-left channel remnants of mill works (Barker's Dam) at a culvert crossing that required both concrete stop-log slot weirs and rock weirs to raise water levels to allow fish passage through the culvert. This channel at the former mill works had long been a cause of fish mortality as fish struggled in the craggy channel and suffered from abrasion and stranding. The Town of Pembroke constructed a water wheel at the mill works in 2019. As part of this permitting, the DMF Fishway Crew conducted extensive rehabilitation of fish passage at this site with

repairs to granite channel walls, repairs to the culvert walls and floor, and the installation of new concrete and granite block weirs to step up water elevations through the mill works. The Fishway Crew returned in 2020 to add another concrete weir and raise the channel walls at some locations. A working draft Fishway O&M plan was prepared for this site by DMF in 2020.

Gorham Mill Pond. The Gorham Mill Pond Dam is a former mill complex owned by the City of Brockton and used for water supply purposes to backwater the Furnace Brook Diversion pipeline located at the other end of an earthen dam. The concrete dam at Gorham Mill Pond has a spillway width of 35.1 ft and height of 4.3 ft. A concrete sleave in the dam has housed wood fishways for decades. The DMF Fishway Crew removed a steel gate at the fishway exit in 2017 that had long caused physical damage to herring exiting the fishway and added an aluminum exit chute to allow safer passage and better fishway flow management. DMF last rebuilt the fishway in 2000 with a 20-baffle wood ladder (23 ft length and 1.6 ft width) The wood fishway degraded over time and required recent repairs by the Fisheries Commission and DMF. Following DMF's emergency repairs in March 2023, the fishway remarkably passed over a half million herring that season. In the summer of 2023, DMF replaced the wood ladder with a two-section, aluminum Alaskan steeppass section during a cooperative project with the Fisheries Commission.

Furnace Pond Diversion. The Furnace Brook diversion is owned and maintained by the City of Brockton to supplement their water supply at Silver Lake with diverted flow from Furnace Pond. The diversion intake is operated by gravity and raised concerns for decades that juvenile herring could be entrained through the trash rack (1" spacing) and diverted out of the Herring Brook watershed to Silver Lake. An agreement was made between DMF and the City of Brockton to design and install a new secondary screen at the diversion intake to prevent entry of juvenile river herring. A custom aluminum secondary screening system was funded and installed at the diversion by the City of Brockton in 2018. There have been no reports of river herring juveniles diverted from Furnace Pond to Silver Lake since 2018.

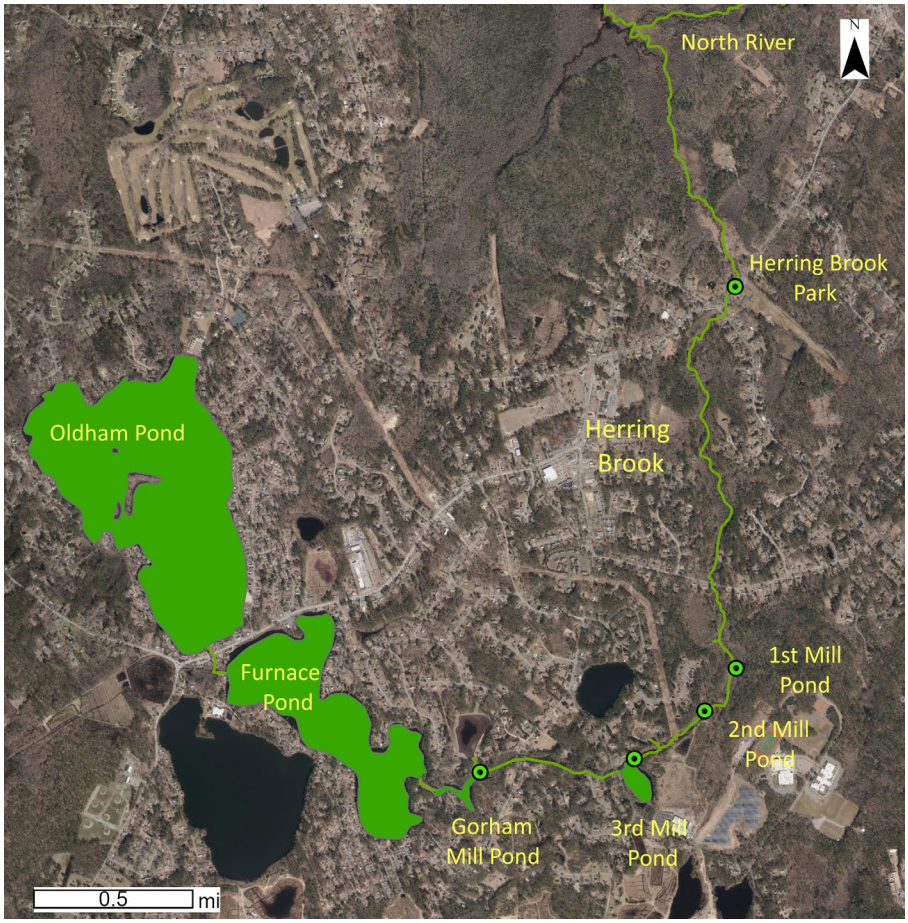
SPAWNING HABITAT

The primary spawning and nursery habitat for river herring in the Herring Brook watershed are Furnace and Oldham Ponds. A stream channel connects the 235-acre Oldham Pond to the 115-acre Furnace Pond. Outflow from Furnace Pond leads to the 2-acre Gorham Mill Pond. Herring Brook next flows to the 4-acre Third Mill Pond (Figure 2). All of these ponds are shallow and prone to excessive aquatic plant growth in summer. An aquatic plant harvester was deployed by the Town of Pembroke in 2020 to open the channel at the inlet of Third Mill Pond. Herbicide and alum treatments have been conducted by the Town of Pembroke to reduce the excessive growth of invasive plants in Furnace and Oldham ponds during the past 10 years. Belding (1921) reported that the herring run was also connected to Great Sandy Pond and Little Sandy Pond. Presently, river herring cannot access those ponds for spawning.

TOWN MANAGEMENT

There is a long history of active management of the Herring Brook herring run by the Town of Pembroke extending back to the 18th century. Belding (1921) describes this history in these words, "The alewife fishery on Barker's River is the traditional and sacred possession of the Town of Pembroke". Unlike many towns in coastal Massachusetts where mill works came to take precedence over the need for passage for migratory fish, from an early time, Pembroke required that mills allow for the spring migrations. In 1717, the Town of Pembroke authorized citizens to "go with neighboring Indians and clear the Herring Brook and to prosecute the author of any obstruction" – an early reference to fish passage and stream maintenance activities to ensure passage for sea-run fish[1]. In 1742, the Town ordered mills on Herring Brook to keep sluice gates for fish passage from April 1st until May 14th.

Figure 2. Primary river herring spawning and nursery habitat in Herring Brook, Pembroke.



Harvest in Herring Brook appears to have been mainly managed to allow spring spawning run netting for local sustenance. Commercial leases appear to have been limited to seining licenses in the main stem North River where each bordering town was granted a low number of leases. The seine fishery is reported by Belding (1921) to have largely been abandoned by 1898. Belding (1921) has no specific harvest numbers for the Herring Brook run other than to say that the run size was at 40% of its former potential and the North River total catch was 250 barrels of herring of which Herring Brooks was the most active site at the time. Town-managed harvest in the last 50 years was conducted under "local control" provisions of M.G.L. Chapter 130 §94 under which DMF authority to manage the river herring harvest was transferred to the Pembroke Board of Selectman under an approved plan in 1973.

Stream channel maintenance has long been an essential activity to ensure river herring can reach spawning ponds in Herring Brook. Concurrently with the reconstruction of the Third Mill Pond fishway in 2011-2012 a large cooperative effort began between DMF and the Pembroke Herring Fisheries Commission to investigate the entire brook channel from Furnace Pond to the North River confluence. Numerous significant blockages were found due to tree falls, debris jams and wetland plant encroachment. A stream maintenance plan was drafted by DMF in 2016 to guide responsible stream maintenance practices in Herring Brook. The reconstruction of the fishway at the impassible Third Mill Pond Dam in 2011 was certainly a main driver in the sharply increasing numbers of returning river herring in Herring Brook. The collective efforts of DMF and the Fisheries Commission to diligently conduct stream maintenance and repair fishways at the Herring Brook Park and Gorham Mill Pond Dam since 2011 are important contributions to this regional success story in river herring population restoration.

POPULATION AND HARVEST ESTIMATES

Historical information on the Herring Brook herring run is limited to the Belding (1921) survey and fragments from historical summaries. DMF installed a Smith-Root electronic fish counter at the Third Mill Pond fishway in 2015. The electronic count series at the Third Mill Pond Brook provides 11 years of spawning run count data from 2015 to 2025. A volunteer visual count at this same location has 13 years of counts during 2012-2025 following the methods of Nelson (2006). Using both count series, there are 14 years of spawning run counts since the fishway reconstruction, that can be used to develop sustainability metrics for the SFMP (Table 1). The spawning run counts of 2019, and 2023-2025 are among the highest reported, even considering anecdotal historical records. With over 350 acres of spawning and nursery habitat available in the watershed, these counts equate to approximately 1,000 fish per spawning acre. Relative to other river herring spawning runs with counts in Massachusetts this proxy for productivity is higher than average (DMF, unpublished data), and impressive contemporary run counts given the long-distance fish must travel from the tidal North River and the type and number of relatively small capacity fishways that must be passed.

The very low counts of 2021 and 2022 were unexpected, and a decline not seen with neighboring herring runs. These low counts caused DMF and the Town of Pembroke to pause plans in 2022 to develop a SFMP for herring harvest. The reasons for the sharp decline are not known; however, stream blockages were discovered during this period that may have limited Herring Brook access. Large spawning events of river herring were observed by DMF staff in the 1990s in the upper reaches of the main stem North River (Chase 2006). Given the rebound seen in 2023 and absence of other runs in Massachusetts showing this pattern, it is not expected that these low numbers represent recruitment failure. It is possible that an unknown proportion of the herring migrating to Herring Brook were compelled to spawn at other tributaries in the watershed or the main stem North River for those years.

The volunteer visual count produced a run count estimate for 13 of the 14 years during 2012-2025. Ten of the visual counts came concurrently with the electronic count, allowing a comparison of the two methods. The average ratio of the visual count to the electronic count is 0.34, with a range of 0.07 to 0.55. The ratios for the two low count years of 2021 and 2022 were noticeably lower than other years. Without those two years, the ratios are fairly consistent and average 0.40. The SFMP metric in Table 1 uses the average comparison ratio of 0.34 to allow the inclusion of 2012-2014 in time series. This adjustment includes the first few years after the Third Mill Pond fishway reconstruction. We expect that this approach and the inclusion of the dubious low count years of 2021 and 2022 are conservative influences on the time series mean.

Electronic Counting Station. DMF installed an eight-tube, Smith-Root 1601 electronic counter at the Third Mill Pond fishway in 2015. The counting station is managed by DMF staff and the Herring Commission with daily coverage throughout the spawning run. The counter accuracy is derived from daily, five-minute visual comparison counts. The ratio of fish observed, and fish counted are a proxy for counter accuracy. The DMF accuracy target is at least 90% for both average of all seasonal comparison counts, and the seasonal ratio of all counts summed. This accuracy target was met for the Pembroke station in 2023 and 2024 since adopting these quality assurance protocols for DMF electronic counters (Chase et al. *In Press*).

Table 1. River herring spawning run count data at Herring Brook, Pembroke. Volunteer visual counts began in 2012 at the Third Mill Pond Dam. Electronic counts began at the same location in 2015, with ten years of direct comparison.

Year	Visual Count (No.)	Electronic Count (No.)	Comparison Ratio (%)	Adjusted Count (No.)
2012	99,035			291,279
2013	81,902			240,888
2014	38,663			113,715
2015		125,010		125,010
2016	130,619	238,410	0.55	238,410
2017	114,350	307,832	0.37	307,832
2018	119,662	348,634	0.34	348,634
2019	180,414	476,609	0.38	476,609
2020	75,150	187,776	0.40	187,776
2021	2,519	38,117	0.07	38,117
2022	5,808	48,057	0.12	48,057
2023	190,177	568,877	0.33	568,877
2024	201,331	444,075	0.45	444,075
2025	200,679	470,380	0.43	470,380
Mean	110,793	295,798	0.34	278,547
Median				266,084
25th Percentile				140,702
10% of Mean				27,855

SUSTAINABLE HARVEST PLAN

ASMFC. The Atlantic States Marine Fisheries Commission's (ASMFC) Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring gives states guidance for developing Sustainable Fishery Management Plans (SFMP) for river herring (ASMFC 2009). These plans are to be developed and approved by State jurisdictions then reviewed by the ASMFC Technical Committee (TC) and if suitable forwarded to the ASMFC Shad and River Herring Management Board (Board) for approval. The premise is that SFMPs should allow harvest while not diminishing the potential future reproduction and recruitment of herring stocks. The SFMPs are based on Sustainability Targets that relate management responses to population action and warning levels. SFMPs can be river-specific, regional or state-wide.

> ***ASMFC Sustainability Targets.*** *The recommended sustainability targets in Amendment 2 included: spawning stock biomass, fish passage counts, mortality rates, repeat spawning ratio, and juvenile abundance indices. From these measures, thresholds or targets shall be set to prompt action level (mgt. action such as fishery closure or regulation change) or warning level responses (documentation and management planning).*
>
> *The first ASMFC review of SFMPs occurred during 2011-2012 when state plans from ME, NH, NY, NC and SC were approved. The sustainability targets from these SFMPs were mainly based on exploitation rates and escapement targets related to fishery dependent harvest or independent herring spawning run counts. A recruitment failure definition and a juvenile index were applied in one case each as sustainability targets. Several states indicated their intention to investigate*

the future use of population metrics (mortality, length, Catch-per-Unit-Effort, and repeat spawning ratio) as sustainability "measures" or warning limits.

ASMFC Update. During the 2017-2018 review of new SFMPs and renewals from 2011-2012, the TC identified several inconsistencies between state SFMPs and the requirements of Amendments 2 and 3. As a result, the Board tasked TC with developing proposed improvements to Amendments 2 and 3 with regard to the five items below. The Board reviewed the TC recommendations in February 2021 and subsequently directed TC to develop a technical guidance document to ensure that implementation of Amendment 2 and 3 requirements related to the issues outlined below is consistent with the TC recommendations. The guidelines were presented to the Board in April 2021 (ASMFC 2021).

1.) Management and monitoring of rivers with low abundance and harvest of shad and river herring.
2.) Standardization of SFMP requirements: content, metrics, and management responses to triggers.
3.) Incorporation of stock assessment information into SFMPs and discussion on the timeline for renewing plans.
4.) Clarification of de minimis requirements as they pertain to SFMPs.
5.) Review of the number of years of data are required before developing a SFMP.

The Herring Brook SFMP was prepared with consideration for the pertinent guideline updates with provisions adopted where applicable for items #2, 3 and 5:

Standardization of SFMPs. The 2021 TC guidelines recommend that standardized management responses are provided in SFMPs. For example, if a stock falls below the sustainability target or threshold identified in the SFMP, the state must notify the Board in the next annual compliance report and pursue implementation of the specified management response for the following calendar year. This approach is adopted in the Herring Brook SFMP and described below under "Management Actions".

Stock Assessment Information. The TC supported the inclusion of stock assessment information such as size, age and mortality data in SFMPs; however, the TC did not recommend that new requirements should be made at this time. Each jurisdiction should develop sustainability metrics for their SFMPs and review all available population data with each 5-year plan renewal to see if stock assessment updates or other data can be utilized as metrics in SFMPs. The Herring Brook SFMP discusses the collection of biological data for this population below under Potential Future Metrics.

Time Series Duration. The guidelines standardized the acceptable time-series duration for data supporting a sustainability metric to be 10 consecutive years for river herring, with allowance of a shorter duration of 7-9 years if the TC accepts additional information related to the proposed exploitation rate, stock size, or other relevant factors. The Herring Brook SFMP is based on 11 years of electronic spawning run count data with three additional years of visual count data.

Town of Pembroke Objectives. The Pembroke Herring Fisheries Commission sent a request to DMF in December 2020 to begin an evaluation of opening harvest of river herring in Herring Brook. The Herring Brook herring harvest was closed in 2006 with the coast-wide harvest moratorium. The Town cites improvements in spawning run counts since cooperative fish passage restoration began in the watershed in 2011 as justification to open the traditional recreational harvest. A draft SFMP was prepared in April 2022; however, the very low spawning counts of 2021 and 2022 prompted DMF and the Town to postpone

submittal of the SFMP to ASMFC. The improved counts of 2023 and 2024 caused the Town to request revisiting the draft SFMP.

State Role. The DMF supports this request and has proceeded to evaluate the existing spawning run count data from Herring Brook. From this review, the following framework is presented for a Herring Brook SFMP for river herring. The proposed SFMP would commence in 2026. The harvest ban would at that time have been in place for 20 years (2006–2025) and the count time series duration will be 14 years in total; with 11 years for the electronic count and 3 additional years for the volunteer visual count.

Herring Brook SFMP

Management Unit. The SFMP has a river-specific management unit of the Herring Brook herring run in the Town of Pembroke.

Sustainability Measures. The ongoing spawning run count will serve as the primary measure to monitor the Herring Brook run status.

Sustainability Target. One fishery-independent sustainability target will be used. Harvest will be capped at 10% of the time series mean (TSM). This value will be recalculated every three years. Table 1 provides the run count statistics that formed the basis of the recommended sustainability target.

Primary Action Threshold. The 25th percentile of the Herring Brook run count time series will serve as the primary action threshold to trigger a management response to declining run size.

Secondary Threshold. An annual exploitation rate of 10% of the run size will serve as a secondary threshold or warning limit. Annual exploitation rates will be tracked each year with a threshold of 10% assigned as a warning limit. Following a single, annual exceedance of this threshold, DMF will meet with the Pembroke Herring Fisheries Commission to review harvest records and management practices and document the review and cause of increase in exploitation rate in a joint memorandum.

Management Actions. With two consecutive years that the Herring Brook run count is below the 25th percentile, the sustainability target will be reduced to 5% of the TSM for the following year. Three consecutive years with the run count below the 25th percentile of the time series will trigger a minimum 3-year closure the following year. In order to reopen the harvest, an opening threshold of three consecutive years above the TSM would have to occur.

Biological Samples. DMF does not presently sample adult river herring in Herring Brook. DMF will work with the Herring Commission to record river herring length subsamples from harvested fish in 2026 as described below:

Potential Future Metrics. With the SFMP implementation, there may be opportunity to record biological data from harvested fish. The DMF Diadromous Fish Project may not have the resources to add the full biological sampling with age processing for another counting station at this time. However, it may be possible to collect robust samples of length by sex that can be used to prepare secondary sustainability metrics on mean length. Further, escapement targets could be calculated based on the relation of the spawning run count to spawning and nursery habitat area.

Mean Length. Mean length data provides similar evidence of demographic status as age data with reduced diagnostic capability due to interannual growth changes and the influence of cohort dynamics to shape mean data. However, these data are accessible and with growing duration of the time series, could become a useful index of population change. With the implementation of the SFMP, the Herring Commission will endeavor to measure samples of harvested river herring on open harvest days in cooperation with DMF staff. Permit holders will be asked if they are willing to have their weekly catch limit measured. The Herring Commission will target subsamples of 50 herring to record species, sex, and total length on each open harvest day.

Escapement Targets. Future SFMPs for Herring Brook could alternatively consider to annually open harvest following the meeting of a suitable escapement target of incoming spawners was met. The escapement target would depend on real-time reporting from the electronic counting station and relate counts to a spawning habitat productivity metric. For example, the Maine Department of Marine Resources uses a calculation based on spawners per surface acre of spawning and nursery habitat (Havey 1961 and 1973) to set escapement targets. This would guarantee a certain number of spawners entering the spawning habitat and guard against unexpected low returns.

HARVEST MANAGEMENT

Reopening harvest in a few individual rivers after 20 years of a coast-wide harvest ban creates management and enforcement challenges given that Massachusetts has about 100 rivers within 48 coastal towns that contain river herring runs. Presently, only the Nemasket River and Herring River, Harwich have approved SFMPs for river herring harvest in Massachusetts. However, these Towns have not elected to allow a harvest after receiving ASMFC approval. Ideally, a regional approach would be established to allow several runs to open at the same time. This would reduce concerns over harvest compliance and enforcement while providing a larger opportunity for Commonwealth citizens who are not town residents to purchase harvest permits. This has been a goal of DMF since the harvest ban; however, relatively few other herring runs presently have the full complement of favorable stock status, a suitable data series, and the infrastructure and dedication found with the local management in Middleborough-Lakeville, Pembroke and Harwich. The preparation of the Pembroke SFMP was done to be consistent with the two approved SFMPs. The intention is to develop an integrated and consistent approach to reopen river herring harvest in Massachusetts, with multiple sites for citizens to access fish.

Proposed Harvest Management. The numbers of permits, weekly catch limits and harvest days will be managed to avoid exceeding the harvest target of 27,855 (10% of TSM). The Town of Pembroke will have the prerogative to adjust the following harvest scenarios if they wish to target a harvest total lower than the SFMP maximum harvest amount. Because river herring are a natural resource under the jurisdiction of the Commonwealth of Massachusetts, all Massachusetts citizens should have potential access to the river herring harvest managed by the Town of Pembroke. Town residents can have preferred access with a lower cost permit. The permitting process for several Massachusetts Towns prior to the harvest ban was to set a ratio of permits for residents and non-residents, cap the total number of permits, and if needed, set a lottery system for non-residents.

A ratio of 4:1 for residents to non-residents is recommended for permits; with a maximum permit number of 300. Recommended costs for permits are $25 for residents with possible consideration for different costs for seniors and non-residents. In order to limit harvest to 10% of TSM sustainability metric, a truncated season would have to be closely managed. A cap of 225 resident and 75 non-resident licenses would be enacted with a weekly catch limit of 15 fish allowed over a five-week season with three open

days per week. The potential maximum catch under this scenario would be 22,500 fish. Assuming that half the permit holders catch their maximum allowance, and the other half only realize half of their maximum harvest, the harvest would be estimated to be 16,875 fish. This assumption is not based on past harvest records but the expectation that some permit holders will remain inactive or minimally active each year. These recommended permit/catch limits numbers may be modified by the Town of Pembroke as they manage annual harvest within the requirement of not exceeding the annual harvest limit.

Harvest Monitoring. The potential for harvest to exceed the sustainability target exists under all possible options if a high proportion of permit holders takes the full weekly harvest each week. This outcome is hard to predict but can be tracked once harvest is open. The SFMP will diligently monitor harvest performance by permit and week in order to make annual adjustments to relate the harvest target to the numbers of permits issued. Harvest will only be allowed at Herring Brook Park during three open days per week. Set times for harvest will be posted on the open days and Town Herring Wardens will be present to supervise harvest and issue daily catch cards. The Town may allow permit holders to catch their own fish or have the wardens net fish for people. The Town of Pembroke is investigating whether Herring Wardens can be authorized to issue citations for harvest violations at the harvest location and other locations in Pembroke. No harvest will be allowed at other locations in Pembroke.

Harvest will be monitored through the issuance of daily catch cards to each permit holder that harvests herring. The card would indicate the date, permit number, number of fish and will expire in 30 days. State regulations will be changed by DMF to require that any possession of river herring in Massachusetts be accompanied by the Herring Brook harvest permit and the daily harvest card. Herring frozen in bags must have the original daily harvest card placed in the bag. The permits and daily catch cards will be professionally printed on waterproof paper.

The usage of harvested river herring trended sharply towards striped bass bait in the decade leading up the state-wide harvest ban. Prior to that trend, cases of excessive herring harvest for lobster bait were reported to DMF. DMF recognizes that a component of the concern that led to the state-wide ban on river herring harvest was excessive bait harvest and related declining conservation ethics. Recreational bait use will be allowed; however, the SFMP seeks to promote and encourage traditional uses of consumption of river herring as grilled, pickled, and smoked fish and fried roe. There will be public outreach associated with the implementation of the SFMP that encourages responsible use of herring for bait and traditional use as food. The Pembroke Herring Fisheries Commission will also consider accommodating requests for food as able. For example, requests for only females for roe harvest might be allowed when manageable on-site during the three open days per week. In these cases, the Commission should record the female only harvests and compensate daily as needed by providing males for bait use.

Harvest Timing. Older repeat spawners are known to occur at a higher proportion at the onset of river herring spawning runs than later in the run (DMF, unpublished data). The Herring Commission will coordinate with DMF's daily monitoring of the electronic spawning run count to set the start date of the harvest two weeks after the run onset. This timing can be adjusted as experience is gained with harvest management.

Native American Harvest. The Commonwealth of Massachusetts recognizes the aboriginal practice of the Federally recognized tribes (Wampanoag and Aquinnah) to harvest river herring at ancestral river herring runs in Massachusetts. In prior years, a Memorandum of Agreement was signed between DMF and the Wampanoag tribe with the agreement that harvest was an aboriginal right for sustenance purposes only and that harvest would be reported by river to DMF. There does not appear to be much tribal harvest activity at Herring Brook. As needed, DMF will coordinate with Federally recognized tribes on harvest at Herring Brook to encourage responsible harvest and record keeping.

STATEWIDE REGULATIONS AND ENFORCEMENT

For this harvest opening to be successful and enforceable, the process will need a tightly managed accounting system for daily harvest, well-planned coordination with the Massachusetts Environmental Police (MEP), and participation from Town law enforcement. A coordination meeting will be held with MEP, DMF, Town Police, and the Pembroke Herring Fisheries Commission each year prior to the season start. DMF recently enact changes to the existing state regulations that ban state-wide harvest to allow harvest and possession of river herring in accordance with approved SFMPs.

The MEP recommends that the Pembroke Herring Fisheries Commission provide information on permit records and seasonal harvest records to improve the enforcement of harvest regulations. The ideal approach would be to have an online source of permit records and the names and schedules of herring wardens available at the start of each season with weekly updates in harvest provided online by the Town of Pembroke. This approach is recommended by the SFMP. The Town of Pembroke will endeavor to create this process during the initial SFMP 5-year period; recognizing that experiences of the first open season will instruct how to structure and manage this accounting.

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FOOTNOTES

[1]Ancient Landmarks of Pembroke

ASMFC Alternative Management Plan for Shad and River Herring in Florida

Prepared by

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Submitted to ASMFC TC for Review

June 20, 2025

On Behalf of

Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Research Institute and Division of Marine Fisheries Management

This alternative management plan for American Shad and Blueback Herring in Florida addresses American Shad management outside of the St. Johns River System and Blueback Herring in all state waters.

System Descriptions

The St. Johns River in Florida drains 22,900 km^2 along east central Florida from Vero Beach to Jacksonville. The primary spawning runs of American Shad (*Alosa sapidissima)* and Blueback Herring (*Alosa aestivalis)* in Florida historically were and currently are in the St. Johns River. Spawning of *Alosa spp*. occurs from late December to early May in most years, with peak activity from mid-January to mid-March for American Shad and Blueback Herring (Walburg 1960, Williams and Bruger 1972, Williams et al. 1975, McBride and Holder 2008, McBride et al. 2010). The spawning grounds of American Shad have been documented from rkm 230 to rkm 433 near the headwaters (Williams and Bruger 1972, Williams et al. 1975). Of that distance 160km can be classified as river and 43 km as lake. Primary spawning grounds of American Shad were in river habitats between rkm 275 and rkm 360 (Williams and Bruger 1972). Contemporary egg collection (Miller et al. 2012b) and telemetry (Dutterer et al. 2011) confirm that American Shad spawning grounds still exist between rkm 230 and a weir at rkm 415. Blueback Herring spawning area overlap American Shad and may extend further downstream, but the specific habitats have not been identified (Williams et al. 1975). The mainstem run of the St. Johns River supported significant commercial fisheries of shad and river herring in the 19th and 20th centuries and continues to support a small recreational fishery for American Shad but not Blueback Herring.

Other Atlantic Coast Systems North of Cape Canaveral

The Nassau River is a small river restricted to the coastal plain between the St. Marys River and the St. Johns River. It has a drainage area of ~1,000 square miles (ACOE 1999). There is a passing reference to "a few fish" being taken from the Nassau River in Walburg and Nichols 1967 and no contemporary records of shads being taken in the Nassau River. Most of the stream is under tidal influence. There are no contemporary records of *Alosa spp.* in the Nassau River.

Pelicer Creek and the Tomoka River are small coastal streams with drainages areas of 412 and 385 km^2 respectively and stream lengths of <16 km. They are considered part of the "Northern Coastal Basin" that drain into a shared lagoon (SJRWMD 2003, Brown and Orel 1995). Neither received mention of having *Alosa* fisheries in the mid-20th century federal studies e.g. Walburg and Nichols 1967 and Williams and Grey 1975. Rulifson et al. 1982 extended the probable range of *Alosa* as far south as the Tomoka River. That finding was based on asking then Florida Game and Freshwater Fish Commission biologists and verbal records mentioned in Williams and Grey 1975. No specimens were recorded or vouchered and no quantity of fish or confirmation of spawning of *Alosa* in these small systems south of the St. Johns River have been documented. A faunal survey in the 1990s that recorded 59 species of fish in the Tomoka River did not record any *Alosa* species.

American Shad and Blueback Herring appear to be functionally absent from the Nassau River, Pelicer Creek, and the Tomoka river. Pelicer Creek and Tomoka River are likely outside the natural range of American Shad and Blueback Herring.

Florida Blueback Herring Fisheries

There has not been a fishery for Blueback Herring (*Alosa aestevalis)* in Florida for more than 30 years. Blueback Herring were likely an important commercial fishery in Florida in the 19th and early 20th centuries but catch data from that time period are unreliable. Landings of 'alewife' were reported up to a peak of around 1 million pounds in the early 20th Century. However, 'alewife' were often the combined landings of Blueback Herring, Hickory Shad (*Alosa mediocris*), and Menhaden (*Brevoortia* spp.). It is unclear what proportion of the landings was herring, though herring were harvested and salted for market at the time. By the mid-20th Century, herring harvest was limited to bycatch in other fisheries and was sold as crab and catfish bait (Williams et al., 1975). Those bycatch fisheries eventually ended following various gear restrictions in Florida. Blueback Herring in Florida are not harvested by either commercial or recreational anglers and no harvest has been recorded since the 1960s. Almost all landings that did occur historically were in the St. Johns River. If a Blueback Herring Fishery were to develop it would be restricted to hook and line gear by existing regulations.

Florida American Shad Fisheries

American Shad (*Alosa sapidissima)* fishery and management history is described in the American Shad Sustainable Fishing Plan for the St. Johns River System, Florida. Commercial and recreational fishing for American Shad in Florida almost exclusively occurred in the St. Johns River for several decades. There has not been any commercial landing of American Shad reported from anywhere in Florida since 2000.

Recreational Fisheries American Shad Outside of the St. Johns River

No directed recreational fishing for American Shad or incidental catch of American Shad has been documented in Florida waters other than in the middle/upper St. Johns River and adjacent Econlockhatchee River (Walburg and Nichols 1967, Walburg, 1960, and Williams and Bruger 1972). MRIP surveys have not recorded American Shad fishing or catch to occur in the coastal systems (Nassau, Pelicer, Tomoka). FWC has regular contact with recreational fishing clubs (e.g. First Coast Fly Fishing Club, Mosquito Lagoon Fly Fishing Club, Orlando Kayak Fishing Community) from Jacksonville to Orlando, and none report fishing for or catching American Shad outside the St. Johns River system.

Regulations

There are no bag or size limits for Blueback Herring, but take is restricted to hook and line gear.

As of January 1, 1997 hook-and-line gear was the only permissible gear for shad (American, Hickory, and Alabama) and river herring (blueback herring) in Florida (46-52.001(2), FAC and later updated to 68B-52.006, FAC). There was also a 10-fish aggregate bag limit implemented for shad (American, Hickory, and Alabama) at that time (46-52.001(3), FAC and later updated to 68B-52.004, FAC).

Fishery Dependent Monitoring

A creel survey is conducted annually on the St. Johns River. The survey is focused on American Shad but occurs in an area that overlaps Blueback Herring spawning grounds. There is also a creel survey from January through April that rotates between Lakes George, Monroe, and Crescent. These lakes are natural wide spots in the lower St. Johns River. No river herring catch, harvest, or directed effort has been recorded in angler surveys outside the American Shad fishery on the Middle and Upper St. Johns River. There is one recent instance of Blueback Herring being reported in a creel survey from a few anglers fly fishing for American Shad in 2018. However, these anglers reported them as 'baby shad' and promptly released their catch. The year of this reported sighting of blueback herring coincidently coincided with a year of high abundance recorded in the electrofishing surveys (Figure 1). There is no Fishery Dependent Monitoring by FWC on the St. Marys River or the other coastal systems; Nassau River, Pellicer Creek, and Tomoka River. MRIP surveys have not recorded any Blueback Herring fishing or catch in the small coastal systems, St. Marys, or St. Johns River. The FWC creels in the St. Johns and MRIP should continue indefinitely.

Fishery Independent Monitoring

FWC conducts spawning stock and juvenile sampling for American Shad in the St. Johns River. Both of these surveys encounter Blueback Herring. These surveys could produce a CPUE based abundance index for both life stages. The spawning stock survey is a standardized electrofishing survey from January through March and the time series is 2003 through the present (Figure 1). The juvenile survey is a standard pushed trawl that runs bi-weekly from March through July. These data are reported in the annual compliance report to ASMFC (Figure 2). The pushnet is effective at capturing YOY Blueback Herring (Figure 2). Georgia DNR conducts a standardized electrofishing survey on the St. Marys River that has not to date encountered Blueback Herring. There are no credible records of Blueback Herring runs in the Nassau River, Pellicer Creek, or Tomoka River so directed fishery independent sampling there is not planned.

Management Alternative

Florida seeks to leave the current regulations for shad and river herring in the Florida Administrative Code unchanged until either 1) there is evidence that harvest of Blueback Herring is occurring anywhere in the state; or 2) there is evidence that harvest of American Shad outside the monitored St. Johns River system is occurring.

No commercial gears that could result in incidental catch of shad or river herring, such as pound nets, gill nets, or haul seines, are operating in Florida waters. No recreational fisheries are known to be

catching or harvesting Blueback Herring anywhere in Florida or American Shad outside of the monitored St. Johns River.

Blueback Herring and American Shad are absent or functionally absent from all drainages in Florida except the St. Johns River system. Therefore, it is not possible to develop useful metric of sustainability in systems outside the St. Johns. Monitoring in the St. Johns River could yield index-based benchmarks for Blueback Herring similar to those for American Shad if needed. However, the absence of any harvest, directed catch, or significant incidental catch preclude there being any conservation benefit to changing regulations to prohibit the harvest of Blueback Herring or American Shad beyond the existing gear and bag restrictions.

FWC proposes to continue its existing fishery dependent and fishery independent monitoring that focus on the St. Johns River where there are known populations of American Shad and Blueback Herring and where there is a monitored recreational fishery for American Shad and any incidental capture of other *Alosa* species. FWC will rely on the American Shad creel survey and other angler creel surveys to monitor for the existence of Blueback Herring catch or harvest in the St. Johns River. FWC will rely on MRIP and contact with recreational fishing organizations to detect *Alosa spp.* recreational catch in waters outside of the St. Johns River Basin. FWC will keep informed of GADNR monitoring of the St. Marys River for information about Blueback Herring or American Shad harvest and coordinate a response with Georgia DNR if data warrant. FWC will add reporting of data collected in accordance with this alternative management plan to its annual Shad and River Herring FMP compliance report.

Triggered Action

If any source detects non-zero Blueback Herring harvest anywhere in Florida for three consecutive years or there is recorded American Shad harvest outside the St. Johns River basin for three consecutive years, then Florida FWC will initiate a process to demonstrate sustainability for the affected population through monitoring compliant with Amendment 3 and begin the process to implement appropriate management actions. Since the American Shad bag limit already applies throughout Florida, one potential action could be to incorporating Blueback Herring into the 10 fish aggregate bag limit if there are indications of harvest for three consecutive years.

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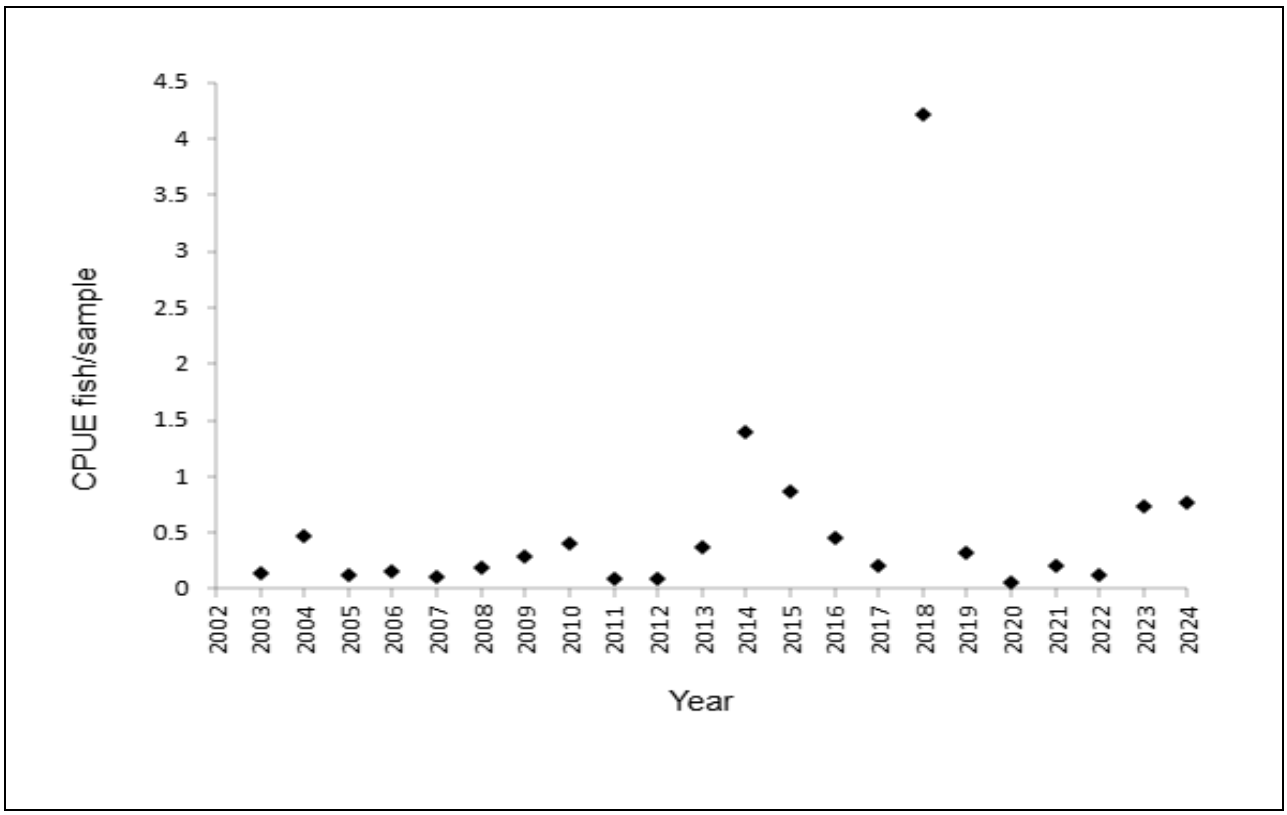

Figure 1. Annual geometric mean electrofishing catch per transect of Blueback Herring from the St. Johns River, Florida *Alosa* spawning stock survey. Each transect consisted of 10 minutes of electrofishing effort within a randomly selected 1km portion of the river.

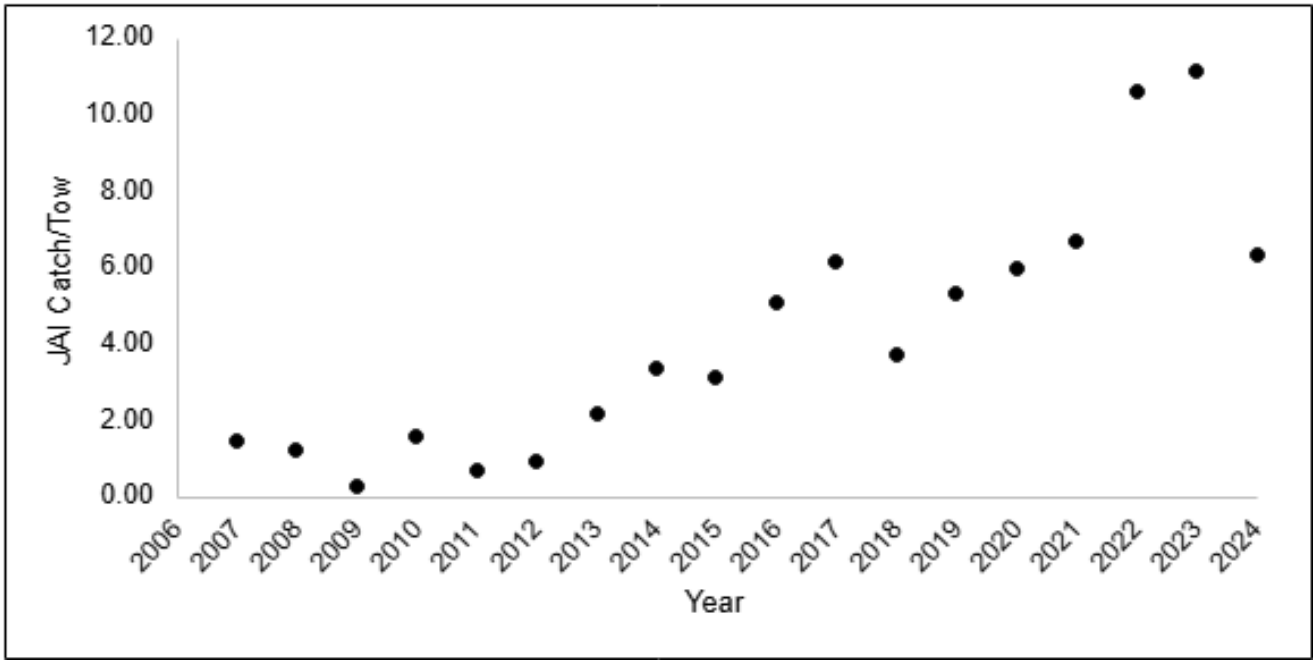

Figure 2. Geometric mean Blueback Herring catch per unit effort from the annual Alosa pushnet survey in the lower St. Johns River, Florida.

ASMFC American Shad Sustainable Fishing Plan for Georgia

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Introduction:

The purpose of Georgia's sustainable fisheries management plan (SFMP) for American shad is to allow the continuation of existing American shad fisheries in Georgia rivers where it has been determined continuation of fishing will not adversely impact the Atlantic Coast American shad stock. The plan fulfills requirements of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management). Georgia's current shad SFMP was initially accepted in October 2017 and updated in July 2020.

Management of American shad in Georgia is shared between the Georgia Department of Natural Resources' (GADNR) Wildlife Resources Division (WRD) and GADNR's Coastal Resources Division (CRD). The river complex utilized by fish stocks defines Georgia's management units. Historically, all of Georgia's Atlantic-slope rivers (Savannah, Ogeechee, Altamaha, Satilla, St. Mary's) supported a commercial fishery for American shad (Fig. 1). However, commercial fishing for shad is currently only allowed in two (Altamaha and Savannah) of these five rivers. Recreationally, shad may be targeted throughout the state, though the only known recreational shad fisheries exist at the New Savannah Bluff lock and dam (NSBLD) on the Savannah River; the Ogeechee River; and the Ocmulgee River.

Management Actions:

In 2010, the Georgia Board of Natural Resources (Board) adopted new commercial shad fishing rules based on a recommendation from WRD staff. These changes modified the temporal and spatial components of the commercial shad fishing efforts along Georgia's Atlantic-slope rivers, both to provide the basis for American shad sustainability plans and to address shortnose sturgeon bycatch issues. Changes adopted included: 1) Closure of all waters upstream of US Hwy 1 on the Altamaha River (including the entire Ocmulgee and Oconee rivers) to commercial shad fishing; and 2) Closure of the St. Mary's and Satilla rivers to commercial shad fishing. Additional management actions taken in 2010 included the addition of various monitoring surveys, including electrofishing surveys targeting adult shad

on the Savannah and Ogeechee rivers and seine surveys targeting juvenile shad in the Savannah, Ogeechee, and Altamaha rivers.

In 2013, additional measures were adopted by the Board, including closing the Ogeechee River commercial shad fishery prior to the 2014 commercial shad season and initiating a temporary stocking program for shad in the Ogeechee. Closure of the Ogeechee River to commercial shad fishing was done due to lack of participation during the 2012 and 2013 seasons and to reduce concerns of potential sturgeon bycatch issues. A five-year temporary stocking program, which ceased in 2019, was initiated as an additional measure to promote the conservation of the American shad stock. Shad were stocked annually above migration barriers in an attempt to re-establish them in the Oconee and Ocmulgee rivers.

Georgia's Commercial American Shad Fisheries

The commercial shad (American and hickory) season is open each year from January 1 to March 31. Drift and set gill nets with mesh sizes of at least 4-½ inches (stretch mesh) are legal gear for commercial use. Effective April 2018, Georgia requires shad fishermen to purchase a shad endorsement stamp, which enhances our knowledge of who is participating in Georgia's commercial shad fishery.

The Altamaha River, formed by the confluence of the Ocmulgee and Oconee rivers, supports the state's largest commercial shad fishery and is Georgia's largest watershed, draining 37,192 km2. Despite having dams on the Oconee and Ocmulgee rivers, the main-stem Altamaha flows unimpeded (i.e. no dams) for approximately 220 kilometers to the Atlantic Ocean. Historically, the entire river and lower portions of the Oconee and Ocmulgee River were open to commercial fishing. However, currently only that portion of the Altamaha River from the U.S. Hwy 1 Bridge (rkm 183) downstream to the Atlantic Ocean is open to commercial fishing (Fig. 1). Including the waters of its major tributaries, this is an area approximately 347 rkm, or 65% smaller, than previously open to commercial shad fishing. The Altamaha River is open Monday through Friday below Seaboard Railroad bridge (SBR) and Tuesday through Saturday above SBR crossing (Fig. 1). Drift and set gill nets are the gear types used to commercially fish for shad throughout the river. Most full-time commercial fishermen focus their efforts in the lower 60 kilometers of the river. Drift nets are the most prevalent gear type in the lower river, whereas set nets are the more prevalent gear type in the upper river (upstream of Jesup, GA).

The Savannah River drains a watershed of approximately 17,022 km2 and forms the boundary between Georgia and South Carolina. It is open to commercial shad fishing from the U.S. Hwy 301 Bridge (rkm 192) downstream to the Atlantic Ocean, an area approximately 103 rkm or 35% smaller than previously open to commercial shad fishing (Fig. 1). The Savannah River is open from Tuesday through Friday east of the I-95 Bridge and Wednesday through Saturday west of the I-95 Bridge (Fig. 1). Commercial fishing gear consists of drift

and set gillnets, with most effort occurring in the lower portion of the river. The first barrier to upstream migration on the Savannah River is the NSBLD located at river km 301, just south of Augusta, GA and approximately 109 rkm above commercial fishing waters. American shad once passed through this dam via lockage, but in 2014 the U.S. Army Corps of Engineers (USACE) declared the facility unsafe to operate and ceased operating it, so fish are not being passed through the lock at this time. The dam is now a true migration barrier and is the uppermost reach of the American shad migration in the Savannah River. The USACE is currently overseeing the Savannah Harbor Expansion Project, which has mitigation plans to install a migratory fish passage at the dam that, once in place, will allow American shad to access further upriver habitats above the dam. Three additional dams (located from river km 333 – river km 355) are above the NSBL&D.

Georgia's Recreational American Shad Fisheries

Recreationally, Georgia has a statewide 8 shad (American and/or hickory) daily creel limit. Small-scale recreational fisheries for American shad are known to still exist in the Savannah, Ogeechee, and Ocmulgee rivers. Recreational creel surveys have been a popular tool used on several Georgia rivers to collect data from anglers. On the Savannah River, creel surveys were conducted in the late 1990s by both the GADNR (1997) and South Carolina Department of Natural Resources (1998, 1999). Estimates of catch from these surveys varied from year to year, largely due to dramatically different flow conditions. The 2014 closure of the dam by the USACE due to safety concerns prohibited further public access and essentially eliminated the bank fishery for American shad on the Georgia side of the river, which was by far the largest portion of the recreational fishery. Consequently, this once prevalent recreational fishery on the Savannah has virtually ceased existing.

Since 1986, GADNR staff have periodically utilized creel surveys to estimate harvest and catch-per-unit-effort (CPUE) of shad on the Ogeechee River. These surveys have confirmed the presence of a small, dedicated recreational fishery for American shad on the Ogeechee River. Sufficient budgets provided the opportunity to repeat these surveys in 2015 and again in 2021. Collectively, information gleaned from these surveys has been helpful in better identifying recreational effort in the river and estimating CPUE, while also allowing an opportunity to see how flow conditions impact angler catch rates in the fishery. While such creel surveys have historically been useful to some degree, they do not contribute to any management triggers and no funding has been dedicated towards the continuation of these surveys. Consequently, they have been suspended.

Anecdotal information from fishermen suggests some recreational fishing may occur on the Ocmulgee River, but no creel surveys are being conducted on this river. The accounts of fishermen capturing shad on this river have not been substantiated, and it is the belief of

GADNR that any significant effort on this river would be known through anecdotal or various media outlets.

Historically, numerous recreational creel surveys have been conducted on the Altamaha and Satilla rivers and American shad have never been observed in angler harvest. While GADNR does not conduct creel surveys on the Oconee or St. Mary's rivers, there is no information to suggest any evidence or reports of anglers capturing American shad.

Commercial Landings

Reported commercial landings of American shad are available from the National Marine Fisheries Service and the State of Georgia through CRD, which has recorded river-specific landings since 1962. In 2001, Georgia instituted a mandatory reporting system that requires an individual record (trip-ticket) to be completed at the time of sale for each catch sold to a seafood dealer. Data collected includes the river of capture, type of gear, total net soak time, etc. Similar to the number of commercial fishermen engaging in harvesting shad, the numbers of wholesale dealers processing shad have declined over time. Since 2010, there have been several instances of less than 3 dealers who purchased shad from commercial fishermen. As such, these low number of dealers and corresponding confidentiality agreements prevent the public release of some commercial landings data in GADNR reports (Fig. 2).

Fishery Dependent Indices

Reported American shad landings from the Altamaha River reached a high of 471,700 lbs in 1968 and then declined for several years. Landings averaged approximately 299,000 lbs during 1962-1969 and approximately 130,000 lbs during 1970-1979. During 1980-2000, total reported shad landings averaged 89,739 lbs. From 2000-2014, total reported American shad landings averaged around 35,000 lbs. Over the last 10 years (2015-2024), this average (21,000 lbs) has continued to decline, with landings significantly lower in the most recent years. Savannah River landings data that are not confidential will be reported in the South Carolina sustainability plan.

Since 2000, commercial shad fishing effort has been quantified based on total number of reported commercial trips. The highest recorded statewide effort was 860 commercial fishing trips for the Altamaha River in 2000 (Fig. 3). During 2000-2005, commercial fishermen averaged approximately 420 trips/yr in the Altamaha River, while during the 2006-2020 period commercial fishermen averaged approximately 255 trips/yr.

Fishery Independent Indices

From 1982 – 2023, GADNR utilized gill net surveys to generate population size and exploitation rate estimates, along with CPUE, for American shad through mark and recapture efforts in the Altamaha River. Though tagging efforts and subsequent population size/exploitation rate estimates ceased after the 2023 season, CPUE estimates have continued and are used as a management trigger in the SFMP.

Adult shad electrofishing surveys on the Ogeechee (Fig. 4) and Savannah (Fig. 5) rivers were initiated in 2010 as part of the monitoring requirements of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (Shad and River Herring ISFMP). As river levels allow, GADNR staff conducts these surveys monthly for at least three months during the spawning immigration. From 2010-2023, the Ogeechee River adult shad electrofishing surveys have averaged around 14 shad per hour, and the Savannah River adult shad electrofishing surveys have averaged around 220 shad per hour. It is important to note that these vastly larger catch rates in the Savannah River are not indicative of a higher population but rather are the effect of electrofishing samples on the Savannah River being performed immediately below the dam where fish are concentrated due to a physical barrier. The Ogeechee River is undammed and electrofishing samples are capturing fish without such migration barriers, thus efforts are much less effective.

GADNR estimated juvenile American shad abundance from trawl surveys on the Altamaha River during 1982-1991 and the Ogeechee River during 1982-1985. Analysis of this data confirmed juvenile catch rates could not be correlated to estimated spawning populations nor future adult spawning return rates, thus juvenile sampling ceased after 1991. However, in 2010 GADNR reinstated a juvenile sampling program as part of multiple management actions taken at that time. Utilizing a 50-ft seine at fixed sites in the Altamaha, Ogeechee, and Savannah rivers, staff re-instituted sampling of juvenile shad in 2010 pursuant to requirements of Amendment 3 to the Shad and River Herring ISFMP. Sampling has continued in the Altamaha and Ogeechee rivers since 2010 but was ceased in the Savannah River in 2021 due to duplicative juvenile sampling efforts already being done by SCDNR in the river. Seine samples are conducted monthly (July – Sept) as river levels allow at 3-6 sites in each river. While seining can be very effective at sampling juvenile shad under the right conditions, the variability of water levels from month to month and year to year create significant sampling challenges that lead to subsequent gaps in data availability and quality (Fig. 6).

RIVER SPECIFIC MANAGEMENT PLANS:

Altamaha River

Management of shad in the Altamaha River is done through analyzing data from fishery-independent monitoring. From 1982 – 2023, GADNR monitored CPUE rates and produced annual Lincoln-Peterson population estimates and exploitation rates from a study whereby gill nets were used by commercial fishermen to capture adult shad and subsequently tag them. After multiple stock assessments failed to utilize data from the population estimates and exploitation rates, GADNR staff opted to cease tagging fish and only continue collecting CPUE data. In previous SFMPs, GADNR has used a benchmark value of the 25th percentile of the mean for 3 consecutive years as the management trigger. Originally utilizing CPUE data from 1982-2011, this benchmark CPUE was determined to be 1.11 shad/ft-hr. This benchmark has continued to be used annually since that time. Interestingly, incorporation of additional data from 2012 – 2023 results in the 25th percentile benchmark slightly increasing to 1.14 shad/ft-hr. Consequently, a CPUE benchmark of 1.14 shad/ft-hr using the entire data series (1982-2023) is proposed as a sustainability measure for both the commercial and recreational fisheries going forward (Table 1). If gill netting CPUEs drop below 1.14 shad/ft-hr for 3 consecutive years, GADNR will evaluate commercial fishing regulations and harvest data and consider modifications to the Altamaha fishery to ensure the fishery remains sustainable.

Juvenile sampling on the Altamaha River was initiated in 2010 and has continued annually as water levels permit. Since 2011, GADNR has utilized a 50ft bag seine with ¼-inch mesh to sample juvenile shad. Annual geometric means continue to fluctuate, though such fluctuations are not only the result of biological influences but intermittent high-water events occurring during the sampling season which can significantly hinder and even prevent access to sampling sites. Nonetheless, sampling of juvenile shad is projected to continue as required.

Despite conducting a creel survey on the Altamaha River for over 20 years, no recreational fishing is known to occur in the river. Since the river is open to commercial fishing, GADNR has and proposes to continue utilizing the same sustainability benchmark that is used for the commercial fishery (Gill-net CPUE below 1.14 shad/ft-hr for 3 consecutive years), as the management trigger for the recreational fishery. Furthermore, we propose applying the same recreational management strategies and actions (e.g. closures; creel changes; etc.) implemented on the Altamaha to also apply to the Ocmulgee and Oconee Rivers since they are interconnected with the Altamaha River.

Collectively, it is our opinion that these combined efforts and subsequent data analysis suggest the Altamaha River management strategies are sufficient. The ASMFC American Shad Stock Assessment Sub-committee (SASC) utilized CPUE data through 2005 from the GADNR Gill-net survey on the Altamaha River as an indicator that the Altamaha stock was in

decline when the 2007 stock assessment was completed. During 2006-2023, CPUE data from GADNR's Gill-net survey averaged 2.39 shad/ft-hr, which is 107% higher than the average of 1.15 shad/ft-hr observed from 2000-2005 (Fig. 7). Based on this fact, the current fishery appears to be sustainable. Furthermore, the attrition of commercial fishermen over the years has also lessened effort and exploitation on American shad in the Altamaha River and even more so on the Savannah River. For example, in each of the last 5 years there are typically less than 20 active commercial shad fishermen on the Altamaha and less than 3 active commercial shad fishermen on the Savannah River. Barring some unforeseen change in product demand or shift in fishery practices, such attrition is expected to continue.

Savannah River

Management of shad on the Savannah River has historically been done using commercial landings data. Specifically, GADNR and SCDNR worked collaboratively to establish a joint sustainability benchmark for the Savannah River using data from roe shad landed in Georgia associated with the commercial drift-net fishery. The agreed upon sustainability benchmark was a commercial roe drift gillnet CPUE of 9.03 kg shad/trip for 3 consecutive years. However, participation in the commercial drift net fishery declined dramatically in the late 2010's, with zero (0) landings being reported from this sector of the fishery in 2019 and 2020. As a result, other data sources from fishery-independent work on the Savannah River had to be considered. Since 2010, GADNR staff have conducted electrofishing surveys for adult American shad each year at the NSBLD on the Savannah River. As a result of ongoing concerns with changing commercial fishery dynamics in the Savannah River (e.g. declining participation by commercial drift-netters) as seen in both GA and SC, GADNR was approved in 2020 to use 61.56 fish/hr (25^{th} percentile) for 3 consecutive years as a sustainability benchmark for the Savannah River (both commercial and recreational fisheries). Incorporating all data collected through 2023 increases the 25^{th} percentile to 115.4 fish/hr, which shall serve as the new benchmark. If the adult shad CPUE falls below 115.4 fish/hr for 3 consecutive years, GADNR will take the same approach it does for other managed rivers and evaluate and identify the causes thereof and initiate appropriate actions (Table 1).

Additional fishery-independent surveys conducted on the Savannah River include a juvenile electrofishing survey done by SCDNR. This juvenile survey is done in late summer and has proven to be a valuable dataset as well. Effective 2021, this survey replaced the shad seine survey on the Savannah River and fulfills the annual YOY sampling requirements for the river. GADNR remains in contact with SCDNR to examine annual results of these surveys and respond as necessary to any observed declines.

Ogeechee River

In 2014, the Ogeechee River was officially closed to commercial fishing due to lack of participation and potential sturgeon interactions. There are no plans to re-open the

commercial fishery in the river. A temporary 5-year American shad stocking program was conducted from 2014-2019 as an additional measure to promote the conservation of this stock. Adult American shad are monitored via electrofishing and juveniles are sampled with a 50' bag seine.

The Ogeechee River is one of the rivers in Georgia known to have a recreational shad fishery. The GADNR initiated an electrofishing survey in 2010 for adult American shad, using this data as the management tool for the Ogeechee recreational fishery. Using data collected from 2010-2023, the sustainability benchmark for the recreational fishery using the 25th percentile is 11.3 fish/hr (Table 1). Consequently, if the adult shad CPUE falls below 11.3 fish/hr for 3 consecutive years, GADNR will take the same approach it does for other managed rivers and evaluate and identify the causes thereof and initiate appropriate actions (Table 1).

Satilla and St. Mary's Rivers

The Satilla and St. Mary's rivers are currently closed to commercial shad fishing and there are no plans to re-open these rivers. Technically, the Satilla and St Mary's river are open to recreational harvest of shad. However, several recreational creel surveys have been conducted on the Satilla River (2006-2014) and American shad have never been observed in angler harvest. While the GADNR does not have any recreation creel survey data for the St. Mary's River, there has never been any evidence or reports of anglers incidentally capturing American shad. Additionally, annual spring electrofishing surveys targeting sportfish populations indicate that American shad abundance is extremely low in both rivers. Consequently, angler harvest is predicted to be low due to low shad abundance in these rivers.

Because it will be impossible to develop a SFMP with any credible metrics for two river systems where American shad are currently at such low abundance as to be functionally absent, GADNR recommends applying management strategies triggered and implemented on the Altamaha River to also apply to recreational fisheries on the Satilla and St. Mary's rivers. Geographically, the Altamaha River is the closest system with adequate monitoring and a sustainability metric. Consequently, the application of any triggered management responses conducted on the Altamaha River onto the Satilla and St. Mary's will prevent GADNR from having to seek a modification of Georgia state law to prohibit the harvest of American shad in these two rivers, which we believe will result in no demonstrable conservation benefit.

Summary of Georgia's Sustainable Fisheries Management Plan

GADNR will continue to monitor and manage the commercial and recreational shad fisheries through fishery-dependent and -independent sampling on the Altamaha, Ogeechee, and Savannah rivers. Data from the Savannah River will be shared with SCDNR, and the agencies will work cooperatively towards the management of this population. The management benchmarks identified in Table 1 will be used as triggers for management decisions for each river system.

If three (3) consecutive years of data show that CPUE of adults is decreasing, GADNR would evaluate and identify the causes thereof and initiate appropriate actions. Potential actions may include reducing the number of fishing days; modifying season dates; or regulatory change. In the event such actions are not successful in reversing negative trends, GADNR would then consider closing the fishery in that river system.

Table 1. Management Benchmarks and Triggers

River System	Index	Years Included in Index	Benchmark Value	Benchmark Level	Management Trigger
Altamaha (commercial & recreational)	Gillnet CPUE Index	1983-2023	1.14 shad/ft-hr	25th percentile	3 consecutive years below the benchmark
Savannah (commercial & recreational)	NSBLD Electrofishing CPUE Index	2010-2023	115.4 shad/hr	25th percentile	3 consecutive years below the benchmark
Ogeechee (recreational)	Electrofishing CPUE Index	2010-2023	11.3 shad/hr	25th percentile	3 consecutive years below the benchmark

Future Considerations

Georgia will continue to actively pursue effective management strategies that will allow the continued sustainability of our shad fishery. In recent years, fishery managers in Georgia have seen positive trends in our shad populations, particularly in the Altamaha River, which supports our largest shad population and fishery. Based on Gill-net study results, GADNR's relative abundance data in the Altamaha River has increased in recent years (2011-2023 avg: 2.57 fish/net ft-hr) as compared to the previous decade (2000-2010 avg: 1.50 fish/net ft-hr). This increase, combined with decreased commercial harvest and fishing effort due to attrition in the fishery, points to a healthy and sustainable stock. In an effort to pursue effective shad management beyond

traditional data collection efforts (e.g. Gill-net CPUE surveys), fishery managers will continue conducting various monitoring programs conducted annually since 2010, including YOY sampling and adult electrofishing surveys in the Savannah and Ogeechee rivers. Data from these collective efforts, which may include length, age, or other biological metrics, will aid fishery managers in decision making efforts. Additionally, future considerations may include additional assessments of the impacts of a new fish passage structure at the NSBLD, should such a structure be developed. Finally, considerations may be given in the future for collecting genetic samples for analysis of shad stocks in Georgia to better identify and understand stock compilation.

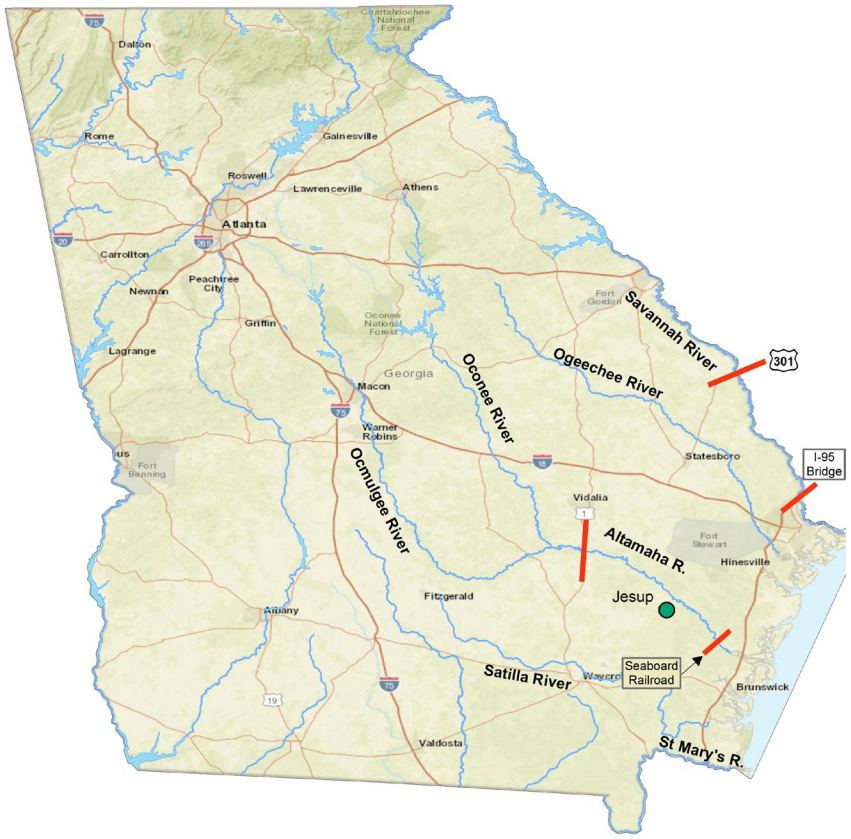

Figure 1. Georgia Atlantic-Slope Rivers. The larger lines are the upper boundaries to the commercial American shad fishery and the smaller lines are the boundary lines for different open days of the fishery.

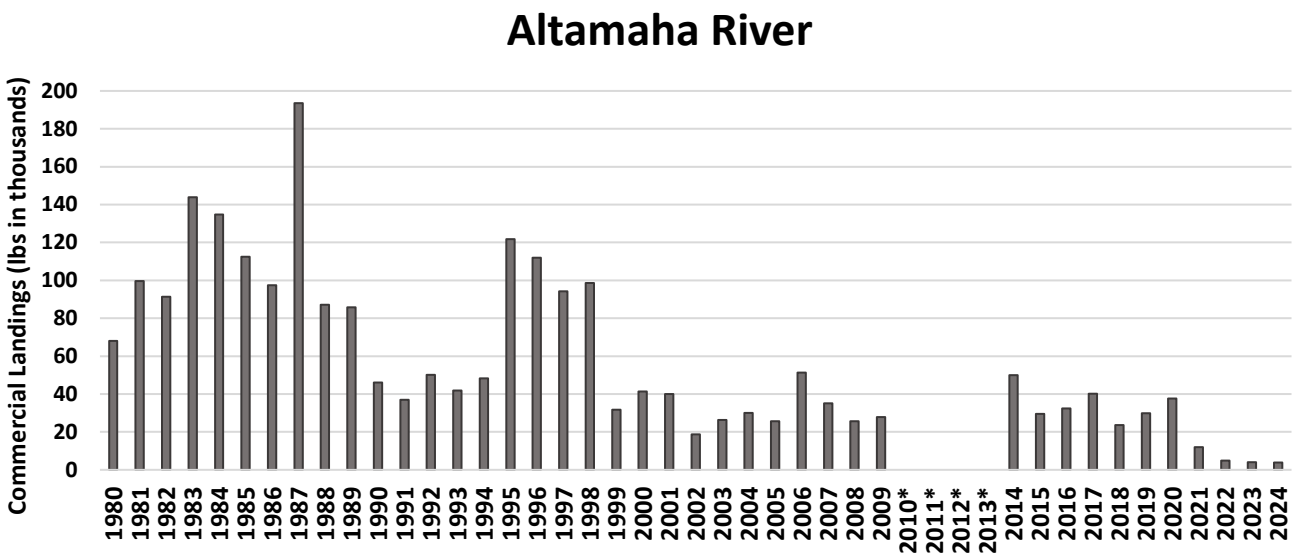

Figure 2. Reported commercial landings, reported by pounds in thousands, of American shad from the Altamaha River, Georgia. Due to confidentiality agreements, data from 2010*-2013* have been excluded.

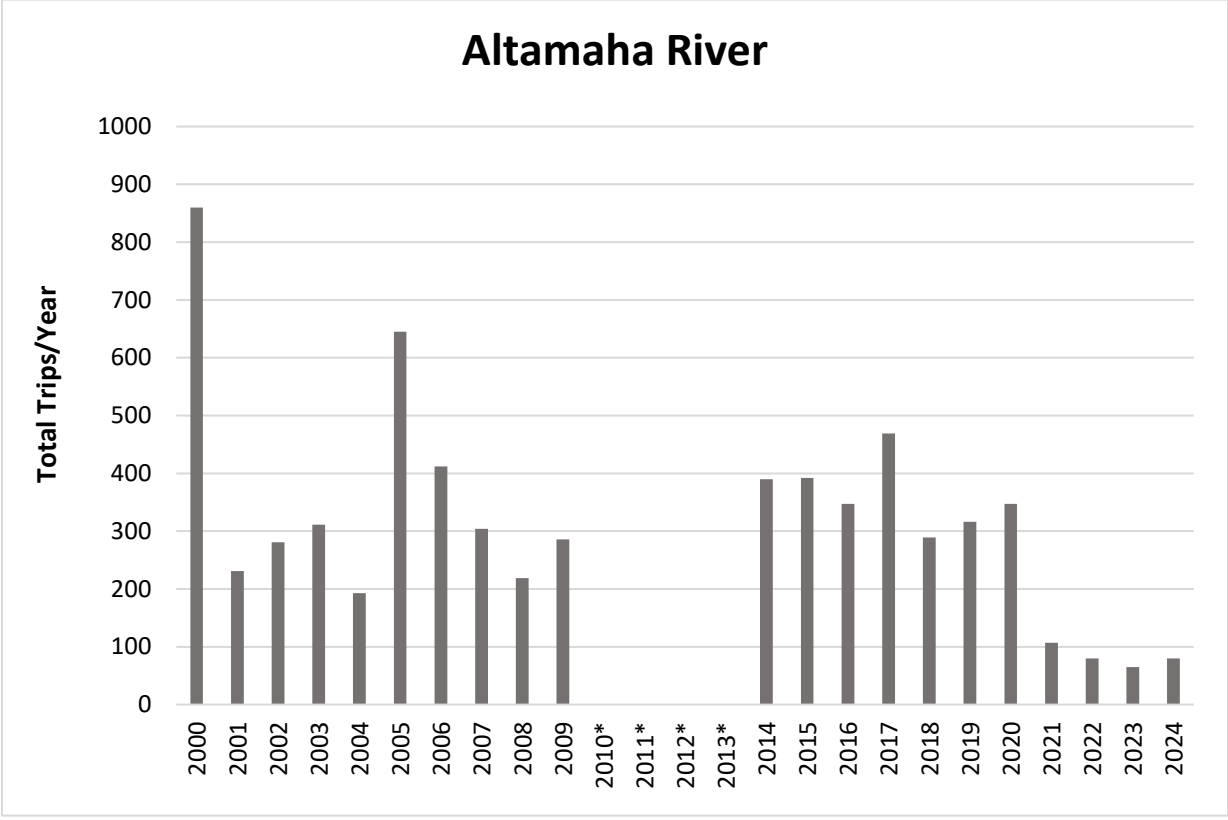

Figure 3. Total commercial fishing effort for American shad in the Altamaha River. Due to confidentiality agreements, data from 2010*-2013* have been excluded.

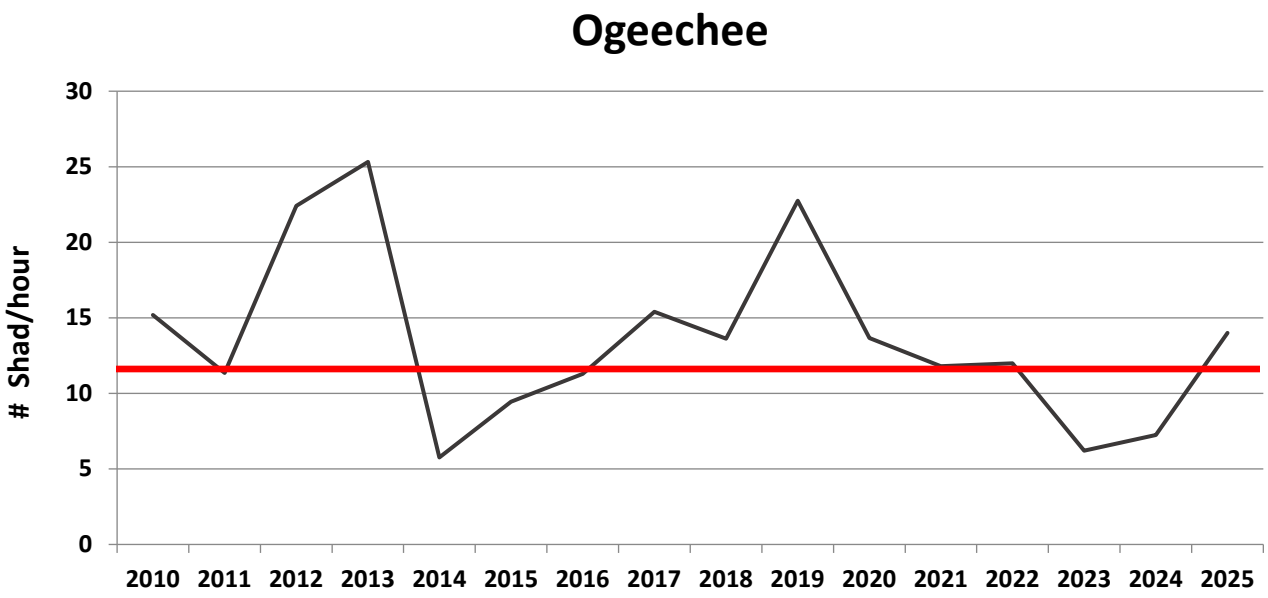

Figure 4. Ogeechee River adult American shad electrofishing CPUE's and the 11.3 shad/hr sustainability benchmark developed by GADNR.

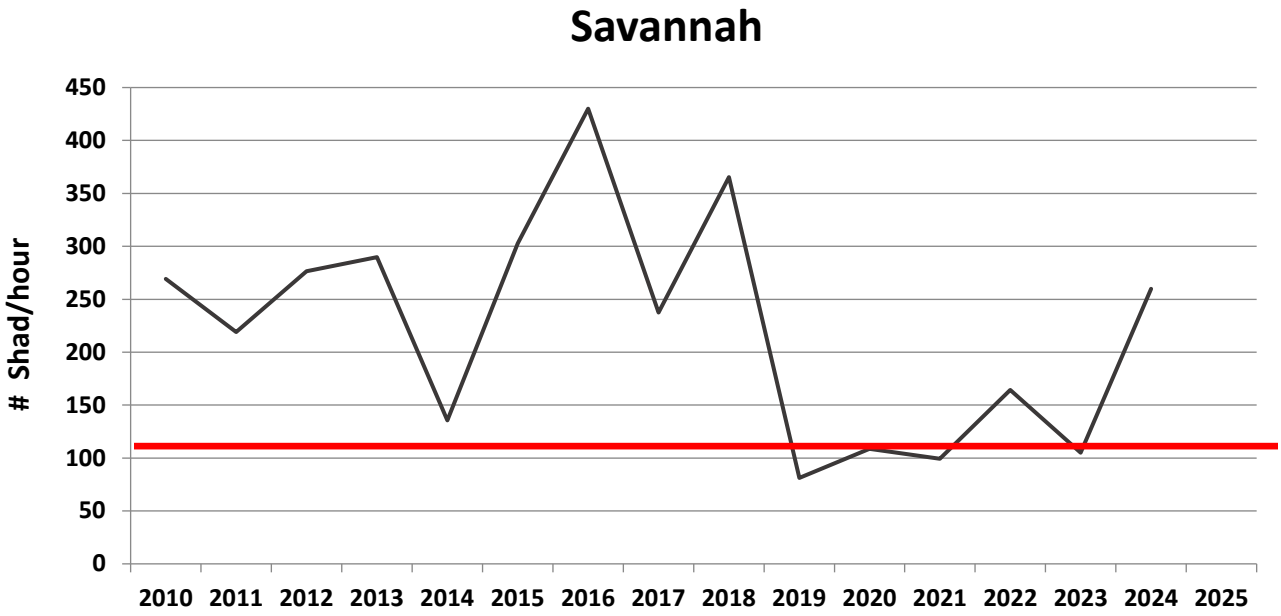

Figure 5. Savannah River adult American shad electrofishing CPUE's collected below the New Savannah Bluff Lock and Dam and the 115.4 shad/hr sustainability benchmark developed by the GADNR.

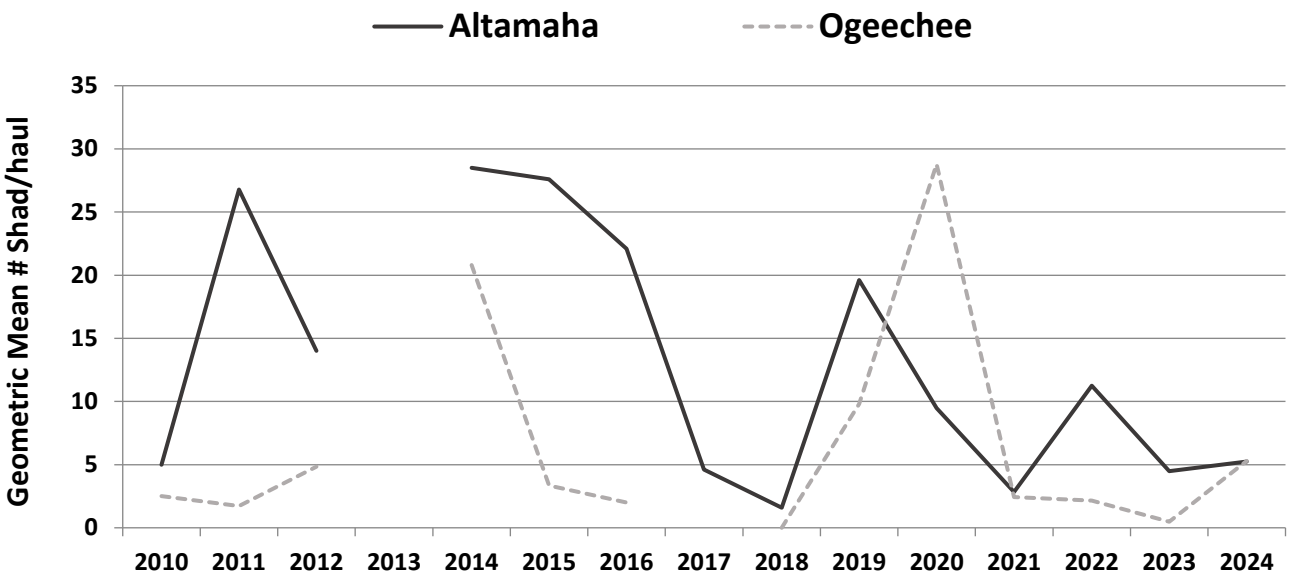

Figure 6. Juvenile American shad sampling program, initiated in 2010, utilizing a 50-ft bag seine on the Altamaha and Ogeechee rivers for monitoring under the sustainability plans to be submitted pursuant to requirements of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management).

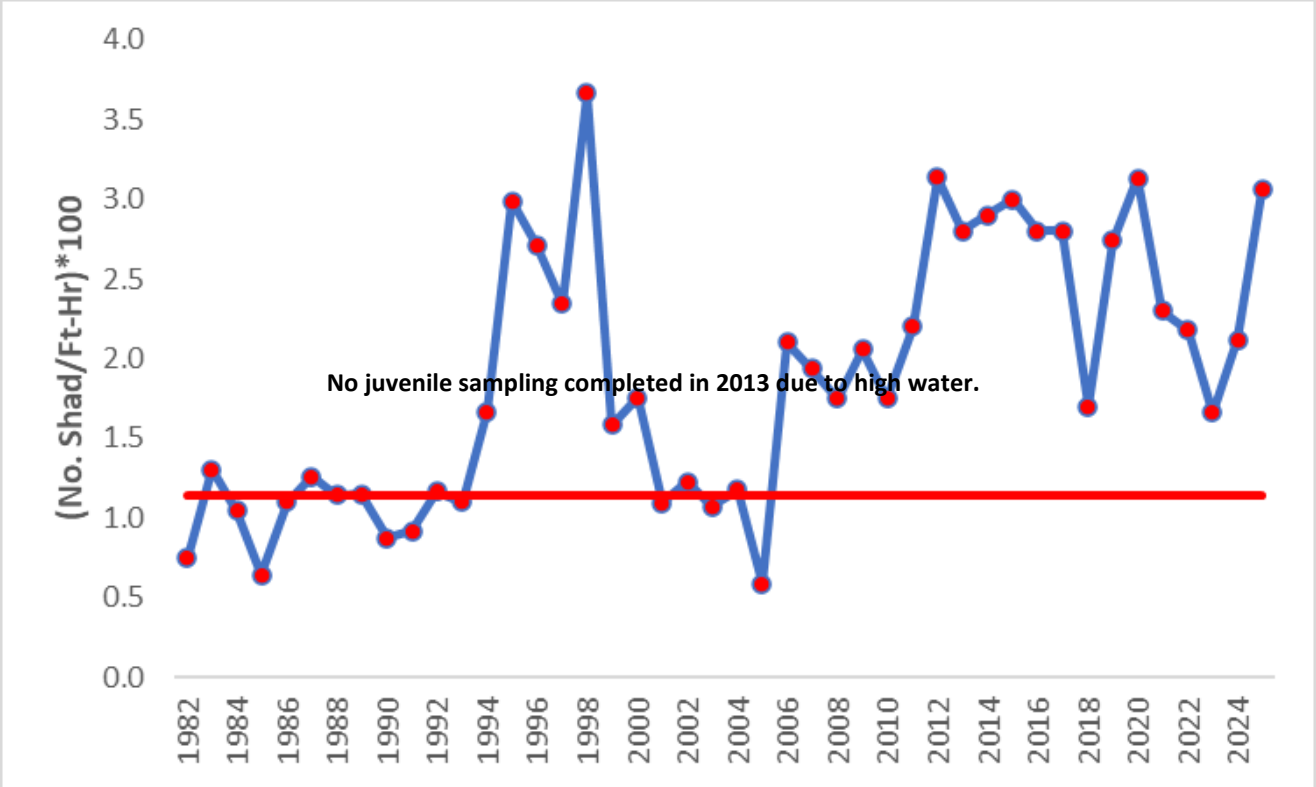

Figure 7. Altamaha River fishery-independent catch-per-unit-effort (CPUE-number caught per foot-hour) of American shad and the 1.14 shad/ft-hr benchmark developed from GADNR gill-net data.

ASMFC Alternative Management Plan for River Herring for Georgia

Submitted by

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Introduction:

Historical fisheries for river herring (e.g. blueback herring, etc.) in the open waters of Georgia are negligible. Scientific sampling throughout multiple waterbodies in the state have shown the river herring populations to be absent or at least functionally absent. The subsequent lack of data prevents a normal sustainable fisheries management plan (SFMP) from being developed, thus an alternative management strategy is needed. The purpose of Georgia's Alternative Management Plan (AMP) for river herring is to allow waters to remain open for recreational harvest. This plan is submitted to fulfill requirements of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (River Herring Management). Georgia's current river herring AMP was initially accepted in August 2020.

Management of river herring in Georgia is shared between the Georgia Department of Natural Resources' (GADNR) Wildlife Resources Division (WRD) and GADNR's Coastal Resources Division (CRD). The major rivers in Georgia utilized by fish stocks include the Savannah, Ogeechee, Altamaha (formed by the Oconee and Ocmulgee rivers), Satilla, and St. Mary's rivers. Commercial fishing for river herring in these rivers is not allowed, and no historical landings exist. Recreationally, river herring are unregulated in Georgia, and GADNR is unaware of any recreational effort for river herring.

Georgia's Commercial River Herring Fishery and Landings

There are no recorded landings of river herring from Georgia. Under this Alternative Management Plan, commercial fishing for river herring in Georgia will remain closed.

Georgia's Recreational River Herring Fishery

Though the GADNR is unaware of any directed recreational fishing for river herring, their harvest is unregulated. Numerous recreational creel surveys funded by the NMFS (e.g. MRIP) or GADNR (e.g. Altamaha, Ogeechee, and Satilla River creel surveys) show no harvest or directed effort for river herring. A creel survey specific to river herring was conducted by GADNR staff from Jan – March 2022 in the Altamaha River (Fig. 1) and was done solely for the purpose of identifying anglers who may be targeting river herring. During this survey,

zero (0) anglers were found to be targeting blueback herring, thus confirming our suspicions regarding the lack of recreational interest in the species. No recreational creel survey data exist for the St. Mary's river, but anecdotal creel information from anglers on the river indicates no evidence or reports of anglers incidentally catching river herring.

Fishery-Dependent Monitoring

The absence of a commercial fishery for river herring in Georgia prevents the establishment of commercial fishery-dependent indices for the species. Recreationally, fishery-dependent data collection is done through creel surveys. However, despite numerous surveys (MRIP, GADNR) over the years, there has been zero recreational harvest recorded of river herring. It is anticipated that, as funding opportunities allow, various current creel surveys (MRIP, GADNR) will occur to some extent into the foreseeable future.

Fishery-Independent Monitoring

GADNR conducts multiple fishery-independent monitoring efforts that may land river herring. These efforts involve two gear types. In the Savannah River, a fishery-independent effort utilizing electrofishing gear near the New Savannah Bluff Lock and Dam has been done annually since 2010 to assess American shad (Fig. 2). This survey is performed February through June. In the fifteen years that this survey has been conducted, only 10 river herring have been observed during electrofishing efforts, further supporting the notion that river herring abundance in the river is extremely low. Similarly, an electrofishing survey targeting American shad in the Ogeechee River (conducted between February and June) has yielded no river herring. Additional electrofishing efforts conducted annually by the GADNR include those targeting multiple species of scale fish in the Altamaha, Satilla, and St. Mary's rivers. These standardized surveys entail 1-hour fishing efforts conducted at 10-12 sites within each river (Fig. 3 - 5). Again, no river herring have been observed in any of these efforts thus far.

A second gear type used in fishery-independent surveys are seines. As part of the American shad FMP for Georgia, GADNR estimates juvenile American shad abundance annually utilizing a 50-ft seine on the Altamaha and Ogeechee rivers. Seine mesh size ($^1/_4$ inch) and site locations are standardized. GADNR staff annually sample 3-6 sites/river monthly from July through September as river levels allow. Incidental captures of river herring (e.g. blueback herring) do occur and are recorded. From 2011 - 2024, over 18,000 juvenile American shad have been captured in 600+ seine hauls, with only 391 juvenile blueback herring being captured in these same hauls. Annual geomean calculations for blueback herring continually remain well below one fish/haul. Consequently, creating a sustainability benchmark based on such low abundance would be ineffective and difficult at best. This difficulty is further exacerbated by the fact that seine gear is affected by river levels, and the

potential for data to not be collected during high-water periods would further inhibit the use of this data for management benchmarks and triggers.

Management Recommendation

In the absence of a sustainable fishery management plan for river herring, the GADNR has considered two options: A) establishing a catch-and-release only fishery; or B) using an Alternative Management Plan for the species. Indications are that populations of river herring in Georgia have historically been low, and no fisheries for the species (commercial or recreational) have been identified. Furthermore, in Table 15 of Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring, it is stated that "there are currently no known river herring populations in Georgia. Should populations be established, the Management Board has the authority to require a fisheries independent monitoring program be implemented" (ASMFC website). Because river herring are considered functionally absent in Georgia rivers, it would be impossible to develop a sustainable fishing plan with any credible metrics. A modification of Georgia state law to prohibit the harvest of river herring will result in no demonstrable conservation benefit, thus we do not consider a catch-and-release only fishery desirable.

In an effort to examine herring abundance in our state waters, the GADNR will continue fishery-independent *Alosid* monitoring via electrofishing on the Savannah and Ogeechee rivers, along with standardized sampling efforts via electrofishing on the Altamaha, Satilla, and St. Mary's rivers. As funding allows, GADNR will conduct creel surveys in an effort to monitor any directed recreational harvest of river herring in Georgia. These include fishery-dependent creel samplings conducted by MRIP coastwide and potential GADNR river-specific efforts.

GADNR plans to continue fishery-dependent and -independent monitoring for the foreseeable future. If a creel survey encounters a positive event of a harvest in a single year we will examine the specifics of that harvest and consider if additional data collection efforts are warranted. If any creel surveys indicate positive harvest of river herring for 3 consecutive years, GADNR will take the necessary steps to ensure sustainability for that river system. These steps will include the pursuit of establishing a formal SFMP or pursuit of a regulatory change (e.g. catch and release; river closure; etc.) if deemed necessary.

Annual Reporting

In an effort to further identify the current status of river herring in Georgia, we propose to present the results of all annual fishery-independent and fishery-dependent data in the annual Shad and River Herring Compliance Report. Such results may be presented in

written, tabular, or graphical form. The reporting of this data should provide additional insight into the status of river herring abundance in Georgia.

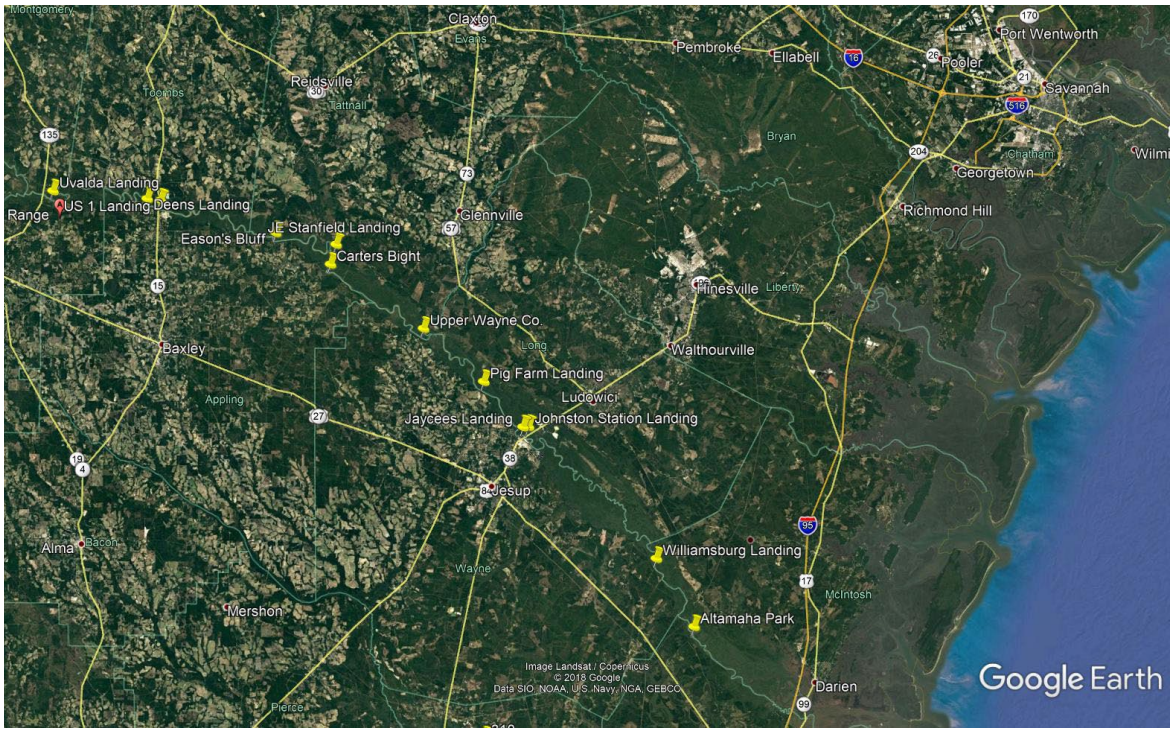

Figure 1. GADNR creel sites on the Altamaha River

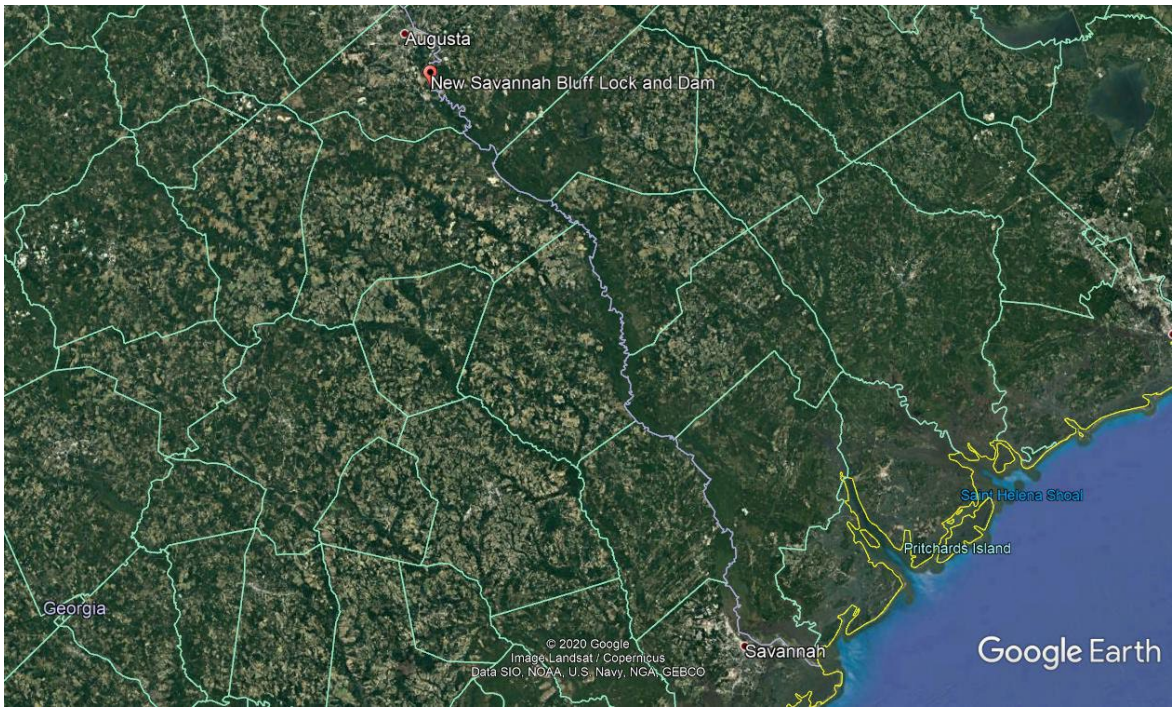

Figure 2. GADNR *Alosid* electrofishing site on the Savannah River

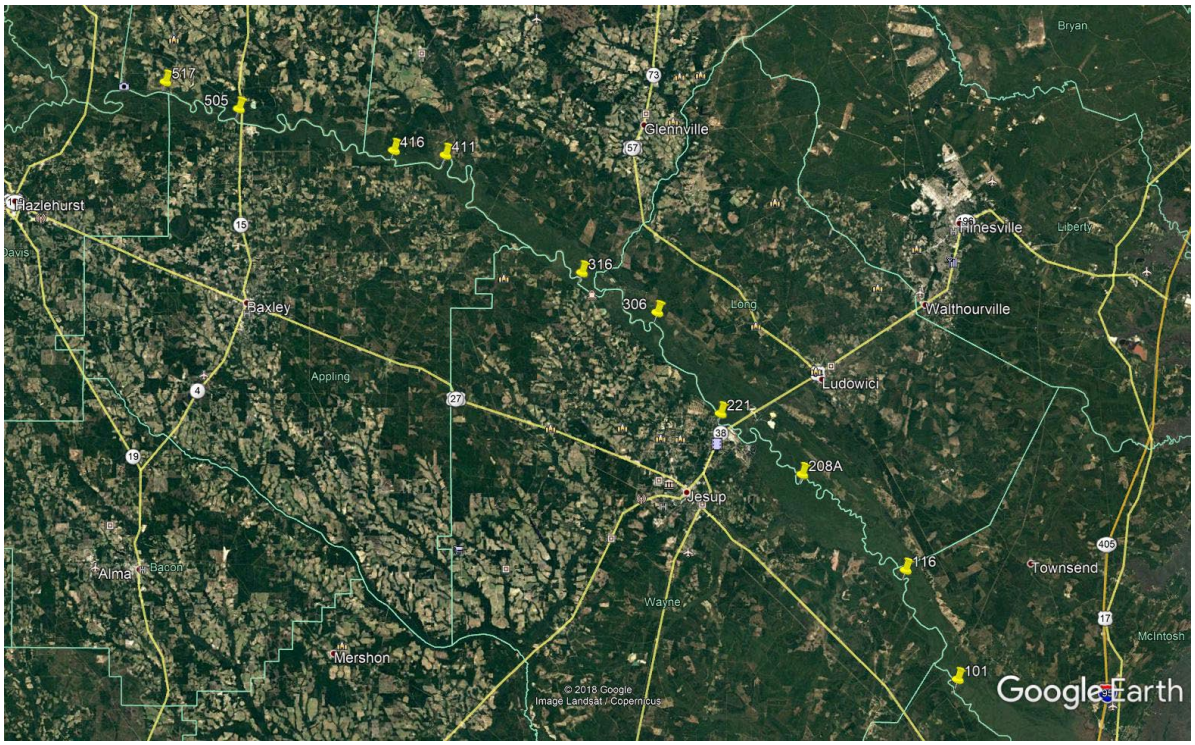

Figure 3. Standardized sampling sites on the Altamaha River

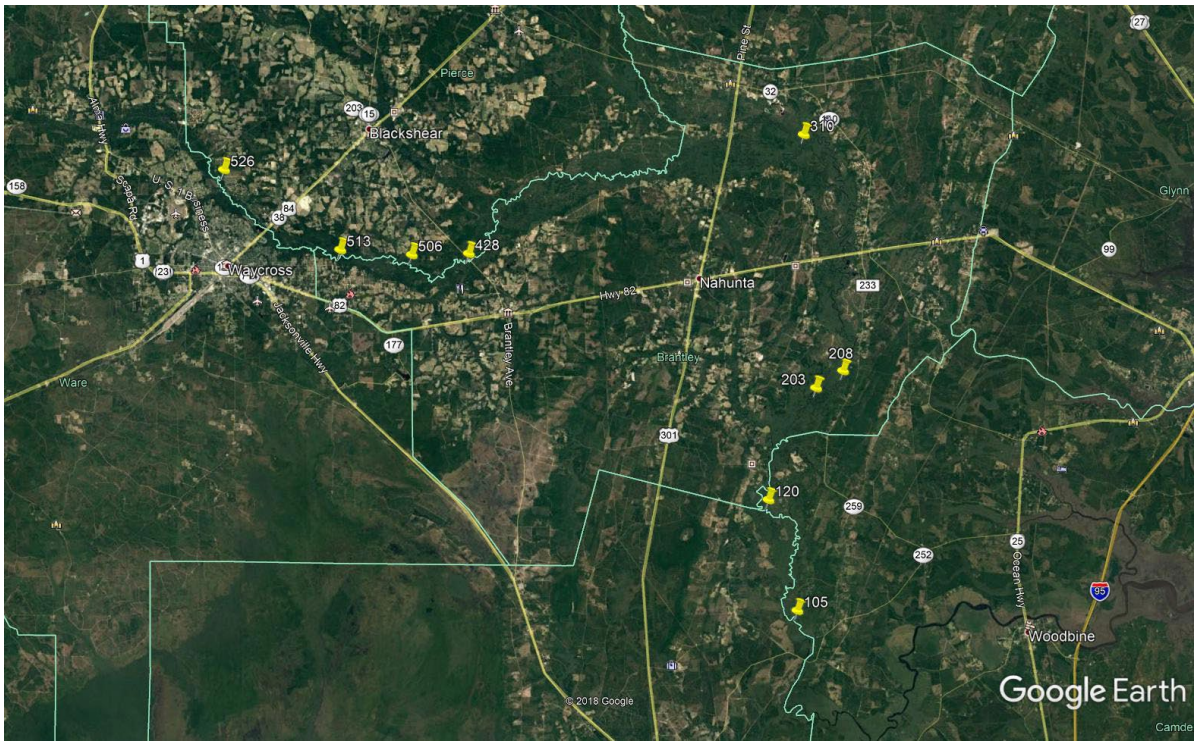

Figure 4. Standardized sampling sites on the Satilla River

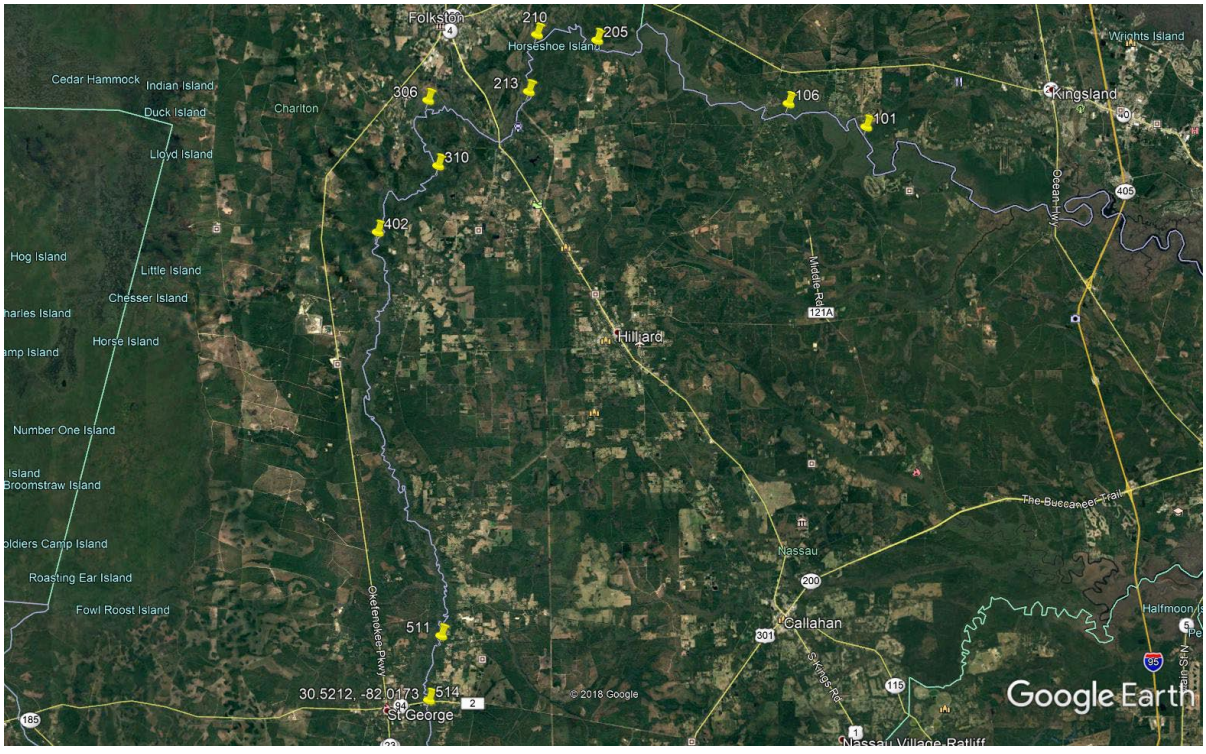

Figure 5. Standardized sampling sites on the St. Mary's River