Atlantic States Marine Fisheries Commission

Shad and River Herring Management Board

October 30, 2019
10:15 - 11:45 a.m.
New Castle, New Hampshire

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 *(M. Armstrong)*	10:15 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from February 2019	10:15 a.m.
3.	Public Comment	10:15 a.m.
4.	Review Technical Committee Recommendations on Management and Monitoring Inconsistencies with Amendments 2 and 3 *(K. Sprankle)* **Possible Action**	10:25 a.m.
5.	Consider Approval of Revisions to the Maine River Herring Sustainable Fishery Management Plan *(K. Sprankle)* **Action**	10:50 a.m.
6.	Discuss Updates to Shad Habitat Plans *(C. Starks)*	11:10 a.m.
7.	Progress Update on Shad Benchmark Stock Assessment *(J. Kipp)*	11:25 a.m.
8.	Review and Consider Approval of 2019 Fishery Management Plan Review and State Compliance *(C. Starks)* **Action**	11:30 a.m.
9.	Review and Populate Advisory Panel Membership (*T. Berger*) **Action**	11:40 a.m.
10.	Other Business/Adjourn	11:45 a.m.

The meeting will be held at Wentworth by the Sea, 588 Wentworth Road, New Castle, NH; 603.422.7322

MEETING OVERVIEW

Shad and River Herring Management Board Meeting
October 30, 2019
10:15 – 11:45 a.m.
New Castle, New Hampshire

Chair: Mike Armstrong (MA) Assumed Chairmanship: 10/19	Technical Committee Chair: Ken Sprankle (FWS)	Law Enforcement Committee Representative: Furlong (PA)
Vice Chair: VACANT	Advisory Panel Chair: Pam Lyons Gromen	Previous Board Meeting: February 6, 2019
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 2019

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. Review Technical Committee Recommendations on Management and Monitoring Inconsistencies with Amendments 2 and 3 (10:25-10:50 a.m.) Possible Action

Background

- In October 2017 the TC identified several inconsistencies between state SFMPs and the requirements of Amendments 2 and 3. Subsequently, the Board tasked the TC to develop proposed improvements to the Amendments with regard to several items: 1) Management and monitoring of rivers with low abundance and harvest of shad and river herring; 2) Standardization of Sustainable Fishery Management Plan (SFMP) requirements; 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; and 5) Review of the number of years of data are required before developing a SFMP.
- The TC formed a Task Group, and met several times to develop this task. The Task Group and TC developed a report on inconsistencies with Amendments 2 and 3, which describes in detail the inconsistency and provides case-by-case recommendations to resolve the issue. Three general inconsistency types were identified: 1) tributaries of river systems with SFMPs and monitoring that are not explicitly addressed in the SFMP; 2) rivers with harvest addressed by a SFMP, but with no or insufficient monitoring to support sustainability metrics; and 3) rivers legally open to harvest without a SFMP and/or monitoring. (**Briefing Materials**)

Presentations

- Technical Committee Recommendations on Management and Monitoring Inconsistencies with Amendments 2 and 3 by K. Sprankle

Board actions for consideration at this meeting

- Provide direction to the states for consistency with the FMP

5. Consider Approval of Revisions to the Maine River Herring Sustainable Fishery Management Plan (11:50-11:10 a.m.) Action

Background

- Maine submitted a proposal to modify the state's SFMP for river herring by allowing limited harvest in several municipalities with exclusive river herring harvest rights with limited data time series. (**Briefing Materials**)
- The TC evaluated the proposal and recommended several changes including removing three municipalities with short data time series from the proposal, imposing more conservative harvest rates, and modifying the mortality rate criterion to be more consistent with the stock assessment results. The TC recommended Board approval of Maine's revised proposal. (**Briefing Materials**)

Presentations

- Proposed Revisions to Modify Maine River Herring Sustainable Fishery Management Plan by K. Sprankle

Board actions for consideration at this meeting

- Approval of proposed revisions to the Maine Sustainable Fishery Management Plan

6. Discuss Updates to Shad Habitat Plans (11:10-11:25 a.m.)

Background

- Amendment 3 to the Shad and River Herring FMP requires all states and jurisdictions to submit a habitat plan for American shad. The habitat plans outline current and historical spawning and nursery habitat, threats to those habitats, and habitat restoration programs in each of the river systems at the river system level.
- A majority of the habitat plans were approved by the Board in February 2014, and it was anticipated that they would be updated every five years.

Presentations

- Updates to Shad Habitat Plans by C. Starks

Board actions for consideration at this meeting

- Direct states to review and update shad habitat plans as needed

7. Progress Update on Shad Benchmark Stock Assessment (11:25-11:30 a.m.)

Background

- The American shad benchmark stock assessment was initiated in October 2017. Due to delays in the proposed timeline, the scheduled completion date was moved to August 2020.
- In March 2018 the Stock Assessment Subcommittee (SAS) and TC met for the Data Workshop, and in November 2018 the SAS met for the Methods Workshop.
- The Assessment Workshop is scheduled for November 18-22 in Charleston, SC.

Presentations

- Update on Shad Stock Assessment Progress by J. Kipp

8. Review and Consider Approval of 2019 Fishery Management Plan Review and State Compliance (11:30-11:40 a.m.) Action

Background

- State Compliance Reports were due on July 1, 2019
- The Plan Review Team reviewed each state report and compiled the annual FMP Review **(Briefing Materials)**

Presentations

- Overview of the FMP Review Report by C. Starks

Board actions for consideration at this meeting

- Approve 2019 FMP Review, 2018 state compliance reports, and *de minimis* requests

9. Review and Populate Advisory Panel Membership (11:40-11:45 a.m.) Action

Background

- The following three individuals have been nominated to the Shad & River Herring Advisory Panel: Mike Thalhauser with the Maine Center for Coastal Fisheries and Alewives Harvesters of Maine; Mark Amorello, a recreational fisherman from Massachusetts; and Chuckie Green, a recreational angler and Tribal Nation representative from Massachusetts. **(Briefing Materials)**

Presentation

- Nominations by T. Berger

Board actions for consideration at this meeting

- Approve Shad and River Herring Advisory Panel nominations

10. Other Business/Adjourn

Shad and River Herring 2019-2020 TC Tasks

Activity level: High

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

Committee Task List

• October 2019 - October 2020: TC Task to recommend improvements to Amendments 2 and 3 related to the following items:
  • Management and monitoring of rivers with low abundance and harvest of shad and river herring
  • Standardization of Sustainable Fishery Management Plan (SFMP) requirements: content, metrics, and management responses to triggers
  • Incorporation of stock assessment information into SFMPs and discussion on the timeline for renewing plans
  • Clarification of *de minimis* requirements as they pertain to SFMPs
  • Review of the number of years of data are required before developing a SFMP
• Updates to state Shad Habitat Plans
• 2020 Shad Benchmark Stock Assessment
  • November 2019: Assessment Workshop
  • SAS assessment work ongoing throughout 2019 until August 2020

TC Members: Ken Sprankle (Chair, USFWS), Mike Brown (ME), Mike Dionne (NH), Brad Chase (MA), Patrick McGee (RI), Jacque Benway Roberts (CT), Robert Adams (NY), Brian Neilan (NJ), Josh Tryninewski (PA), Johnny Moore (DE), Rob Bourdon (MD), Ellen Cosby (PRFC), Joseph Swann (DC), Eric Hilton (VA), Holly White (NC), Jeremy McCargo (NC), Bill Post (SC), Jim Page (GA), Reid Hyle (FL), Ruth Hass-Castro (NOAA)
Shad SAS: Michael Bailey (Chair, USFWS), Ken Sprankle (TC Chair, USFWS-CT), Joey Ballenger (SC), Mike Bednarski (VA), Wes Eakin (NY), Kevin Sullivan (NH), Joe Zydlewski (USGS), Jacque Benway-Roberts (CT), Kiersten Curti (NOAA-Fisheries), Angela Giuliano (MD), Jason Boucher (DE)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SHAD AND RIVER HERRING MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
February 6, 2019

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ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Steve Train, ME (GA)
Cheri Patterson, NH, proxy for D. Grout (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Ritchie White, NH (GA)
Mike Armstrong, MA, proxy for D. Pierce (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
David Borden, RI (GA)
Phil Edwards, RI, proxy for J. McNamee (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Sen. Craig Miner, CT (LA)
Bill Hyatt, CT (GA)
John McMurray, NY, proxy for Sen. Kaminsky (LA)
Maureen Davidson, NY, proxy for J. Gilmore (AA)
Emerson Hasbrouck, NY (GA)
Heather Corbett, NJ, proxy for L. Herrighty (AA)
Russ Allen, NJ, proxy for T. Fote (GA)
Adam Nowalsky, NJ, proxy for Sen. Andrzejczak (LA)
Tim Schaeffer, PA (AA)
Andy Shiels, PA, Administrative proxy
Loren Lustig, PA (GA)
John Clark, DE, proxy for D. Saveikis (AA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Roy Miller, DE (GA)
Lynn Fegley, MD, proxy for D. Blazer (AA)
Russell Dize, MD (GA)
Allison Colden, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for Steve Bowman (AA)
Chris Batsavage, NC, proxy for S. Murphey (AA)
Mike Blanton, NC, proxy for Sen. Steinburg (LA)
Malcolm Rhodes, SC (GA)
Robert Boyles, SC (AA)
Doug Haymans, GA (GA)
Spud Woodward, GA (AA)
Jim Estes, FL, proxy for J. McCawley (AA)
Martin Gary, PRFC
Bryan King, DC
Derek Orner, NMFS
Mike Millard, USFWS

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

Ex-Officio Members

Ken Sprankle, Technical Committee Chair

Staff

Bob Beal
Toni Kerns
Jeff Kipp
Caitlin Starks
Jessica Kuesel

Guests

Arnold Leo, E. Hampton, NY
Mike Thalhauser, MCCH

The Shad and River Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia; Wednesday, February 6, 2019, and was called to order at 1:15 o'clock p.m. by Chairman John Clark.

CALL TO ORDER

CHAIRMAN JOHN CLARK: We will get started right now. This is the Shad and River Herring Management Board; John Clark, I will be Chairing the meeting today, and let's get right into the agenda.

APPROVAL OF AGENDA

CHAIRMAN CLARK: On the approval of the agenda, some of you may have seen the original agenda had an update on the ESA status of shad and river herring; that has been removed from the final agenda. But other than that, are there any additions to the agenda?

APPROVAL OF PROCEEDINGS

CHAIRMAN CLARK: And are there any questions about the proceedings from the October, 2017 meeting? Pat.

MR. PATRICK C. KELIHER: Just I've got one item of new business regarding a White Paper Maine is developing. I would like to give the Board a heads up.

PUBLIC COMMENT

CHAIRMAN CLARK: Is there anything else? Seeing none; we will move on to Agenda Item 3, which is Public Comments for items not on the agenda. We have one person that has signed up; Mike Thalhauser from the Marine Center for Coastal Fisheries.

MR. MIKE THALHAUSER: Thank you, Mr. Chair, members of the Board. My name is Mike Thalhauser; I'm a fisheries biologist with the Maine Center for Coastal Fisheries in Stonington, Maine. I'm guessing this is probably the first time Stonington, Maine has been brought up somewhere other than an argument about lobster.

I have the pleasure of working with communities in Eastern Maine from Penobscot Bay to the Canadian Border. Several of these communities are active in restoration and monitoring efforts of river herring runs; leading to lakes and ponds within their municipalities. These communities are participating for a variety of reasons.

In some cases people are motivated by childhood memories of streams running black with alewives. For others it's the conviction that local ecosystems benefit greatly from river herrings role in the food web. Marine fishermen see alewives as one of two things; either one, a supplemental lobster bait that could reduce impact of reduced Atlantic herring quotas, or two, bringing back collapsed groundfish fisheries by restoring an important forage fishery.

In all cases, towns are incentivized to be able to prosecute fisheries that support their communities; with food, with bait, and with money. Maine is unique in that river herring are one of two species in our state that are co-managed by municipalities and the Maine Department of Marine Resources. This means if a town can show that they have a fishery that can sustainably be harvested; through years of monitoring, escapement, and collecting biological samples analyzed by the state that they can work with the state to create a fisheries management plan to prosecute that fishery. It sounds pretty good.

The only problem is that current policies put these goals so far into the future that stakeholders are becoming disenfranchised, burned out, and are considering giving up. I think it's important to point out that unlike many other scientists working with

communities and citizen scientists, I didn't come to them with a research agenda and a need for more data, they came to me with a management agenda, and capacity to collect data and provide local knowledge of their own.

They also came frustrated by the fact that they are putting in countless hours; and spending large amounts of money, but what they aren't seeing are the potential benefits of investing this time and money. Here is just one example of the resources that these stakeholders represent. One of the towns that I work with is the town of Penobscot.

Penobscot is monitoring two alewife runs within their municipality; collecting the escapement biological data I referred to earlier. Both of these runs have had habitat issues with century old dams effecting fish passage. They activated local land trusts; and through their own town funds, donations and grant money, raised half a million dollars to remove these dams to provide adequate fish passage for river herring, eels, Atlantic salmon, and other diadromous species.

This small town is working with universities and researchers from the University of Maine, New Hampshire, and California Santa Cruz; to begin to answer questions, and fill data gaps that the River Herring Technical Committee has pointed out as being needed for this Council, to responsibly manage river herring.

Just this last year the town received funding from Maine Sea Grant; to purchase a small purse seine to estimate juvenile abundance, and pair those data with the adult escapement numbers to look at production variability between ponds and lakes. This crucial data is data that state and federal researchers need, and don't have the capacity to collect.

The only other thing I would point out is this town isn't alone. Maine is lucky that river herring that leave our ponds and lakes have favorable migratory patterns; and ocean conditions that are supporting returns of over a million fish in some cases, to lakes and ponds where they were stocked at a rate of just one to six fish per acre for just several years.

Certainly this has context within the discussion that this Council has had and will continue to have; with regards to declines in Atlantic herring fisheries. Stakeholders are seeing these remarkable returns; and the potential that river herring bring, and they're doing the work and collecting the data that we need.

They will continue to do so if the return on their investment happens within a reasonable time. Currently Maine river-herring harvest proposed to the ASMFC, are evaluated by the TC based on one model, with an assumption of very high harvest levels. To show that a fishery is sustainable at these kinds of levels, there is a high bar of ten years of data where escapement thresholds must be met, as well as other metrics. This ten year commitment of work before any benefit is seen is unrealistic, and leaves towns frustrated, as I mentioned before, and the fact that critical river herring spawning and nursery habitat is located in inland ponds and lakes, and unfortunately the fact that the only century old dams in Maine and throughout New England aren't just located in Penobscot.

This requires boots on the ground; local and coastwide stakeholder input and support. I'm proud to say river herring in Maine have this stakeholder input and support in spades. I and others are working with Commissioner Keliher and his department staff to try to find a way to incentivize the support. We believe that this incentive should be in the form of incremental harvest that starts far earlier than ten years; starting out very conservative and building to a full harvest, as fisheries meet data needs to responsibly do so.

If we can find this sweet spot, we can keep these stakeholders involved, add the datasets,

fill data gaps, provide fishing opportunity for our constituents, restore river herring at a coastwide scale, and reap the benefits that restoration would provide. I ask this Council recognize this huge resource that Maine and other states stakeholders represent; and to support innovative ideas that provides benefits to them and capitalizes on their efforts. Thank you.

PROGRESS UPDATE ON SHAD BENCHMARK STOCK ASSESSMENT

MR. JEFF KIPP: The Shad and River Herring Stock Assessment Subcommittee met in Providence, Rhode Island back in November for our methods workshop. A little different approach there for this assessment; given that it's been so long since the species has been assessed.

We had this Methods Workshop and the objectives of that were to review some of the data inputs that were being worked on to support the assessment approaches we were considering, make final decisions on our stock structure that we were assessing, and then discuss the actual assessment approaches that we wanted to apply to each of those stock units.

During review of some of the data inputs, it became clear that there were still some data delay issues and data cleaning issues with the data that we had. But we did sit down and define our stock structure into 31 different stock units during that workshop. We did discuss some of the different assessment approaches for each of those stock units; given the input data we had to work with.

But during that workshop it became clear to the Stock Assessment Subcommittee that the timeframe that we were working under wasn't going to work with some of the issues that we encountered. They are suggesting that we modify that timeline from the original intention to present the stock assessment results at the 2019 annual meeting in October; to the 2020 August meeting. With that in mind, we just wanted to run that past this Board; and if there are any questions on the stock assessment or that modified timeline, I can take those now.

CHAIRMAN CLARK: Thanks, Jeff. That's quite a change in the timeline; any questions for Jeff? Toni.

MS. TONI KERNS: This isn't a question for Jeff; but just to give everybody a heads up that that change in that timeline will impact other assessments, which will come up again tomorrow at the Policy Board. This is your first hit at this; but we'll get one more discussion on it.

CHAIRMAN CLARK: Cheri.

MS. CHERI PATTERSON: I'm sure I know the answer to this question; but any NOAA shutdown, will that affect this timeline also?

MR. KIPP: We do have one NOAA member on the Stock Assessment Subcommittee that is quite involved in the stock assessment itself; so yes, any anticipated shutdowns could potentially affect that timeline as well.

CONSIDER APPROVAL OF THE MASSACHUSETTS SHAD SUSTAINABLE FISHERY MANAGEMENT PLAN

CHAIRMAN CLARK: Any other questions? Seeing none; we'll move on to the next agenda item, which is to Consider Approval of the Massachusetts Shad Sustainable Fishery Management Plan. Ken Sprankle is here to review the SFMP and the Technical Committee Memo.

REVIEW SFMP AND TECHNICAL COMMITTEE MEMO

MR. KENNETH I. SPRANKLE: I'm going to run through a presentation of the American Shad

Sustainable Fishery Management Plan that was presented to the Technical Committee by Brad Chase in November of 2018. When Brad presented that there were some minor comments for possible consideration that Brad did incorporate into a revision of that plan that got back out to us in November.

The TC had a consensus recommendation for approval of this plan with the revisions. The proposed plan maintains the same fishery regulations for harvest. I just want to start with that; and also maintains those same regulations in the same rivers, so there aren't any changes there. There are some changes that I'll go through with this presentation; relative to benchmarks that were modified, improvements essentially that we can discuss.

Going back pre 2012 and the requirement for SFMPs, in 1987 the Commonwealth of Mass instituted a commercial harvest net ban. It's recreational harvest only by hook and line; again this is back pre 2012, and a recreational limit of 6 shad per day. Following the development of the first sustainable fish management plan, the state was closed to the recreational harvest of shad; with the exception of the Merrimack and Connecticut Rivers.

That's inclusive of those two system's tributaries. They also reduced the bag limit from 6 to 3 fish. They have several small rivers that are managed for catch and release only; and I'm going to describe those in a moment. That initial plan also included the use of a 25th percentile for using fish lift data. The 25th percentile for various metrics has been commonly used in a lot of the river herring and shad SFMPs.

We'll talk some more about that. That 25th percentile becomes important when the threshold falls under that for a period of three consecutive years. If anyone has any questions please raise your hand and I'll address it. This slide shows the shad-runs in the Commonwealth of Massachusetts. You can see the Connecticut River of course is the largest river basin in New England. That is a mean annual discharge in the far column; the Merrimack River is also quite large, it is the fifth largest basin in New England. Then we have the smaller coastal river systems in the Commonwealth, Neponset, Charles just gives you a sense for the relative size of these systems. The Connecticut River, as I said it's the largest river in New England as folks know.

We've been working cooperatively to restore anadromous fish in the Connecticut River since 1967. That was with the state and federal agencies, the four basin states, U.S. Fish and Wildlife Service and National Marine Fisheries Service. Beginning in 1983 that was more formally recognized by Congress; with the creation of the Connecticut River Atlantic Salmon Commission, and so that's the group that works cooperatively on restoration and management activities in a coordinated way.

This figure shows four main stem dams. You see Holyoke Dam is located at river kilometer 138; followed by a series of dams. We've got a lot of dams in this river. We've been working of course on upstream and downstream fish passage. We have FERC relicensing going on at the time. Holyoke Dam actually had the first fish lift in operation.

That started in 1955. A second lift was added to that facility in 1976. The CRASC that I had mentioned, we just recently developed and updated American shad management plan that was approved by the CRASC Commissioners in 2017, it's a habitat-based plan. In the Connecticut River we have several sources of fishery independent data; the fish lifts of course, Holyoke Fish Lift is an important source of information. I'm going to show you some data on that.

The state of Connecticut, the Connecticut DEEP, the Department of Environmental Energy and

Environmental Protection since 1978 has conducted a juvenile abundance index using seven index sites, all located downstream of Holyoke. In addition to that Connecticut has a longstanding data time series for biological data that is included both sub-sampling from the commercial fisheries, as well as weekly samples that have been collected at Holyoke Fish Lift to represent the temporal span of the population in the course of a single run year.

This figure shows the annual count passage totals at Holyoke Fish Lift. This is one of the changes I had mentioned with this proposed plan. The Commonwealth of Massachusetts shifted the benchmark; which had been going back for the entire data time series to restrict it to the period 1976 to the current, because that's when a second fish lift was added.

It's really a dramatic change at that facility; and so the 25th percentile we see here shown in the figures the blue line, and that is representing 194,000 fish. You can see we've had some nice increases in the number of fish that have been passed there in the past couple years. It doesn't show 2018.

In 2018, we had about a 50 percent reduction of what we observed in 2017; 2017 was the second highest run-count in a data time series. We had, again looking at the figure you can see for the period 2012 through 2017; all those values are above the 75th percentile. I'm going to switch over to the Merrimack River portion of the plan if there are no questions on the Connecticut.

CHAIRMAN CLARK: Any questions on the Connecticut? Seeing none; please continue, Ken.

MR. SPRANKLE: In the Merrimack River shad are also cooperatively managed by state and federal agencies. As you can see in the figure it includes obviously Massachusetts and New Hampshire, as well as the federal agencies, the U.S. Fish and Wildlife Service and NOAA. That basin going back in time to 1987 was angling only. It is a 3 fish bag limit under the current plan.

The first barrier on the Merrimack River is known as Essex Dam; it is at river kilometer 48, which is shown on the figure. It would be the second upstream red dot. Yes, Haverhill for some reason is identified on there. Lawrence is where the Essex Dam is located, and that has a fish lift facility to pass fish.

Here we have annual count data for the Essex Dam; that's the first barrier in Lawrence. This is another figure that shows a change from the previous plan; in terms of the benchmarks. The change made here is the use of a shad per lift day metric. In the original plan it was simply based upon the number of fish passed over the data time series.

They've incorporated the number of lifts that occurred relative to the fish that are passed. As many of you I think are aware, fish passage facilities are greatly influenced by whether or not there is spill, other environmental conditions, temperature, and of course the facility operations themselves.

Oftentimes all these things are very dynamic, they change within year of course and they are different from year to year. The value we see here in terms of a benchmark, the blue line. That is again a 25th percentile, and that blue line is 210 fish shad per lift day. That value again, I had mentioned how at Holyoke we've seen that nice increase in the number of shad passed.

You see that somewhat similarly reflected here for the period 2013 to 2017. With this inclusion of the additional years that metric has actually been shifted upwards. I'll also point out to you that this figure again goes to 2017. For 2018, like Holyoke there is about a 50 percent reduction in the number of shad that were

counted passing. In 2018 that value was down around 28,000.

There is also fishery independent data that's gathered for the Merrimack River out of the Essex Fish Lift; fish that are sampled there. There is biological data that are obtained; shad size, age, these are all similar things that are collected at Holyoke as well. By using scales Mass DMF is able to determine the repeat spawning history component of the fish; that information has been available since 2004.

They've also in this plan provide information on those data as well as mortality rate estimates, and those are based on using the repeat spawner data in conjunction with the age data. Age data for Mass DMF is obtained by the use of otoliths.

There are different datasets on that; the repeat spawner data, again if you refer back to the plan, the scale data that goes back to 1991. Mortality rates are reported in the plan. They are proposed to be used only as a warning threshold metric by Mass DMF, so it's not going to be an official benchmark.

I was remiss in mentioning that for the Connecticut River that is part of this plan update as well, we had suggested better incorporating the state of Connecticut's plan, and so the state of Connecticut benchmark metrics are all adopted in this plan and are being proposed to be used as a warning threshold. The state of Connecticut, we're not discussing the state of Connecticut's plan; but it's mentioned in here to trigger warning thresholds, include thresholds based upon recruitment through their Juvenile Abundance Index that's been conducted over the past many decades, as well as spawner escapement.

The spawner escapement metric is based upon the number of fish that are removed, based upon their monitoring of commercial fisheries and estimated recreational harvest, relative to the number of fish that are passed at Holyoke. If it falls below 90 percent, it's a very high bar that would trigger consultation.

Lastly, the state of Connecticut has set a 25th percentile, actually it's not 25th percentile it is simply a benchmark of 140,000 fish being passed at Holyoke. The Massachusetts Plan proposes to include those Connecticut measures as a warning threshold. This slide shows some of the comparisons between the timeframes 1983 to 2011 versus the full time series since the previous sustainable plan through 2017.

You can see just based upon total counts the median values on the Merrimack River at Essex Dam. You see that's increased from 16,000 to 20,000. Then you see the complimentary increase there in the 25th percentile value. Using lift days again that is the new proposed metric at Merrimack for the period only up through 2011, that value would be 174.

We've seen those increased passage rates in the most recent years; and so that value has been increased to 2010. I'll also point out that these benchmarks are being proposed to be maintained for the duration of the SFMP plan; so they won't be adjusted from year to year, they're proposed to be set.

On the Connecticut River, as we talked about, we've seen increases as well, so you can look at the median values there and how they've increased. To summarize, the SFMP the primary targets for both open harvest rivers is the fish lift count data distribution. On the Merrimack River we have that shift to shad per lift day value.

We also have on the Connecticut River simply the annual count metric. We also have warning thresholds as I discussed for the Merrimack River; based upon repeat spawners. When I say warning metrics, if you look in the Plan, the

concern there is the sample sizes. You know they're sampling between 100-200 fish, say.

What you can actually determine from scales viable data, those sample sizes go down. In order to run the analytical programs using a Chapman-Robson, the sample size would become very small. There is a lot of uncertainty. There was less confidence in using that information, other than for a warning.

As I mentioned on the Connecticut River, the Connecticut DEP benchmarks will all be used as warning thresholds. In conclusion, the SFMP just states that we've seen increasing passage counts in the most recent time period since the last 2012 to 2017. They're well above the benchmarks, and the 25th percentile benchmarks have been increased as well for both river systems. This illustrates some more of the actual detail values; comparisons between the two rivers. You see the benchmarks, warning there is a lot of text on there, but it's just illustrating the fact that there are both the benchmark count metrics as well as the warning metrics. That's my final slide. I would be happy to take any questions.

CHAIRMAN CLARK: Thank you Ken that was a very thorough presentation of the Massachusetts SFMP for shad. Are there any questions for Ken? Justin.

MR. JUSTIN DAVIS: Thanks for that presentation, Ken. You know I noticed that essentially what is missing is estimates of recreational harvest from the two river systems in Massachusetts that are currently open for harvest. I know in the Connecticut portion of the Connecticut River our agency used to do creel surveys.

Then it got to the point where essentially the fishery dwindled to a level where it was difficult to even find people fishing for shad, and that was why we discontinued the surveys. Is it your understanding that for the Massachusetts portion of the Connecticut River and the Merrimack it's sort of the same situation; the fisheries have become so low level that surveying them isn't really efficient or possible anymore?

MR. SPRANKLE: I work closely with the Mass Division of Fisheries and Wildlife, the inland counterpart to our Division of Marine Fisheries folks from the Commonwealth. They are unable to propose doing any monitoring on that. It's difficult to say. Because I work on the river I know that there are areas that receive attention; below the dams obviously are popular. It's something that we've recognized in the CRASC shad management plan; and we know it's a challenge, as we've talked about the costs for monitoring. They have no plans. It's hard for me to say what's going on, because I don't have a basis just anecdotal.

CHAIRMAN CLARK: We have a question from Eric.

MR. ERIC REID: It's just a curiosity to me. What if anything competes with the shad for lift space?

MR. SPRANKLE: That's a good question, because in other river systems there are issues. In the Susquehanna River there is a real issue with gizzard shad. On the Connecticut River, interestingly the gizzard shad showed up in the '80s, and those numbers never climbed to a crowding issue.

To answer your question, we've seen a terrible decline in blueback herring. People are familiar with that where there was a time where we were passing over half a million blueback herring at that facility. We just broke a thousand this year. Over 15 years it's been under a thousand fish. Shad are the most abundant fish utilizing that facility.

Then we see, again under a thousand blueback herring. There are usually a couple hundred

small striped bass that will utilize the facility. I'm going to get a little off tangent here; but there were significant modifications made that I'm quite proud of with a lot of other people, to pass shortnosed sturgeon. In the past three years we've been averaging about 85 shortnosed sturgeons being passed upstream to access spawning habitat. That facility is the only facility we're aware of that is designed to pass shortnose sturgeon.

CHAIRMAN CLARK: Any further questions for Ken? Mike.

MR. MICHAEL ARMSTRONG: Mr. Chairman, I would like to make a motion if I could.

CHAIRMAN CLARK: Please do.

MR. ARMSTRONG: I move to approve the Massachusetts Shad Sustainable Fisheries Management Plan Update.

CHAIRMAN CLARK: Second by Justin Davis. Is there any discussion of this motion? Seeing none; I'll read it into the record. Move to approve the Massachusetts Shad SFMP Update; motion by Mr. Armstrong, second by Mr. Davis. **Do we have any objection to the motion? Seeing none; the motion is passed by unanimous consent.**

UPDATE ON THE TECHNICAL COMMITTEE REVIEW OF INCONSISTENCIES WITH HARVEST AND MONITORING REQUIREMENTS OF AMENDMENTS 2 AND 3

CHAIRMAN CLARK: Thanks, and Ken you're up for the next agenda item; the Update on the Technical Committee Review of Inconsistencies with Harvest and Monitoring Requirements of Amendments 2 and 3**.**

MR. SPRANKLE: Okay so we have an update we've developed; again on inconsistencies with harvest and monitoring requirements. The Board's last meeting was in October, 2017. It tasked the Technical Committee with developing proposed improvements to both Amendment 2 and 3; with regard to five items that I'll read through here.

The first is management and monitoring of rivers with low abundance in harvest of shad and river herring. Second, standardization of sustainable fishery management plan requirements: the contents, metrics, management responses to triggers. Third is incorporation of stock assessment information into SFMPs and discussion on timelines for renewing plans.

Four, clarification of de minimis requirements as they pertain to SFMPs; and lastly Number 5, review the number of years of data that are required before developing an SFMP. We just heard the gentleman from Maine speak on his concern with that; as well as the types of data. These are all; I think they're good questions.

The Technical Committee is aware that these are our charges. We are at the current time focused on Number 1; that's why it's highlighted in green. There are a number of these other items; specifically Number 2, 3, and 5, we believe will be best handled once the shad benchmark stock assessment is completed. That information will really be of value and importance to properly address those items.

Now Item Number 4, the clarification of de minimis; we believe that is something that we might be able to tackle. We'll have to see how we proceed on that. In terms of background again, in October of 2017, the TC had been working on reviewing a lot of SFMP plans, and we identified inconsistencies between the SFMPs and the requirements of Amendments 2 and 3. Amendments 2 and 3, to remind you, require all states and jurisdictions to submit sustainable fish management plans for all systems that remain open to river herring or shad harvest, and that the SFMPs must

demonstrate fisheries are sustainable, with quantifiable sustainability targets and annual monitoring. This fall, beginning in September we've had conference calls, the Technical Committee, and we began work on trying to address the Number 1 item. We started developing a database. Caitlin has been tremendously helpful in this effort.

The inconsistencies with the amendments include; and we'll get into some permutations on this, but that there are tributaries of river systems that do have SFMPs and monitoring, but the tributaries are not explicitly addressed in the SFMP. We have rivers that are legally open to harvest without an SFMP or monitoring; but where no harvest of shad or herring is suspected. We have rivers with harvest addressed by an SFMP; but without monitoring to support sustainability, so those are some examples there of some of the inconsistencies.

That work to begin to gather that information again; that began in September. We had a second TC call in November; where people volunteered to form a task group, so we've got six people. Caitlin as I said has really been instrumental and helpful on this. We began work on developing a harvest and monitoring database; to begin to assemble the information that is available in a single place, where we can begin to look at it.

As we began to do that we came to realize that there should be additional information as well included; not just what is based out of the SMFP, but more nuance questions, questions that will help us better frame and address, provide some context to what we're trying to do here. This is an example taken from the database that is in development.

The first column is missing. That would be the state or jurisdiction. We didn't want to include that just for this presentation. You see the next data field is System. Systems are obviously that can be very inclusive of a number of river systems. The next data field over, you see rivers or tributaries. We begin to get a little more specific.

Whether or not the regulations allow any shad harvest, yes or no, it just goes right across the field here. Any shad harvest confirmed, suspected, or no; to describe any suspected shad harvest. You can see we're trying to get some context for this. Then the last data field on this slide, I'll have another one after this, what are harvest regulations for shad? You can see that information now.

You can see the first red cell there; it's the Delaware System in Green Creek, so that would be a small tributary in the Delaware System. We'll just go across. You can see that in fact the regulations do allow shad harvesting to occur. Then when we dug in a little further with TC members, is there any shad harvest confirmed or suspected, no, and so on. Again this is continuing right across a row here. You see the system, river tributary, so next thing whether or not monitoring is occurring, yes or no. We wanted again context.

What type of monitoring is occurring? Is there a shad SFMP in place? Again, if we would go down to the Green Creek, you can see that monitoring is not occurring; it's not specifically noted in the shad SFMP. Whether or not there has been confirmed shad spawning in this case, no. This is where we get into the TC members specific knowledge; and whether or not there is a known commercial fishery past or present, the same for recreational fishery. These are just a few examples here. Utilizing that database as it stands at this time; this table helps to provide some summary information that we thought we would share with you, based upon inconsistency type. You can see again, these get into some of the permutations. The first row you see no SFMP, no monitoring, no SFMP in the second row, no monitoring, or not a spawning river and so on.

We developed that again for both river herring and shad. As currently shown for river herring; the highest frequency occurrence is harvest allowed with no SFMP and no monitoring. You can see that is 12 out of 30. For American shad the highest frequency occurrence is harvest allowed without and SFMP, no monitoring, but noted as possibly could be included in an existing SMFP.

This gets down to what you folks had brought up at your last Board meeting; it's the definition of systems. That's an obvious recognition here. That is 31 out of 46. One thing we wanted to make an important point on this that these numbers are for counting rows; it's just the way the database is set up.

Each row is at that river tributary level, so that's why we've got many, many rows, and that's why these numbers seem to be quite large. These counts may be considered part of a larger river or a system; so that's just something to bear in mind when you look at those values. Are there any questions to this point?

CHAIRMAN CLARK: Thank you, Ken. That was a lot of inconsistencies. Lynn.

MS. LYNN FEGLEY: Yes, wow. Could you go back to that final summary table slide? Just because out of curiosity, what is the total N on these areas? This is a subset of areas with inconsistencies; but how many areas are in the total universe of possibility for SFMPs?

MR. SPRANKLE: That's a good question. Actually, I can't off the top of my head give you, Caitlin can you?

MS. CAITLIN STARKS: It's between 70 and 90; depending on shad or river herring. This is looking at pretty small scale. That is one of the issues we've been encountering is that it's such a huge breadth for the species; so it's been very hard to track down this information for these smaller tributaries that might not be mentioned anywhere in the SFMPs.

CHAIRMAN CLARK: We actually hadn't gotten to the end of the presentation; so let me let Ken finish the presentation, and then we'll take more questions. Thank you.

MR. SPRANKLE: Sorry, we were covering a lot of information, so I thought I would give an opportunity to have a question. I'll go on to the final slide. I apologize for that. We will continue to work on the database again. We're working with the full Technical Committee, again the smaller task group, to fill in additional data fields to get better context for many of the identified fields and rows.

That is in process. We've also started initial consideration; some discussions to develop potential options for resolving conflicts. That is in a very early stage. We want obviously; we'll be working through the full TC. We're going to present all the conflicts and potential solutions to the full TC; and we'll have discussions certainly on that in the coming months, and possibly look towards this coming summer to be able to provide a report again to the Board.

CHAIRMAN CLARK: The TC has a lot going on there. Thanks. Do we have any further questions for Ken on this topic? Okay seeing none.

OTHER BUSINESS

CHAIRMAN CLARK: We move on to our next agenda item; which is Other Business, and Pat Keliher, you had something from Maine?

MR. KELIHER: Yes I'll be brief; thank you, Mr. Chairman. Mike's comments at the beginning of the meeting really are the key to what we're looking at within Maine. We have had tremendous success with our river herring restorations within the state; but we are reaching a point when we have very passionate groups of both NGOs and just groups of folks

from the municipalities, trying to engage in restoration.

They are running up against this ten-year-time-limit wall; and start to lose interest very fast. This is a request for a conversation at the next meeting to discuss a White Paper that Maine is developing; and the possibility of the creation of some sort of a pilot project, where we could take some very select runs and work with communities and NGOs to see if we can use social engagement as a potential metric to actually speed up some of the recovery work that's being done in particular watersheds.

CHAIRMAN CLARK: Are there any questions for Pat on this effort up in Maine? Seeing none; oh sorry there's Toni.

MS. KERNS: Pat is it a White Paper, or is the state going to ask for a change in their sustainable fishery management plan to do something a little different for some of these rivers?

MR. KELIHER: My thinking is what we should do is to use it as a pilot project. Instead of moving forward with an addendum to change the sustainable fisheries management plan process, really focus it down into a pilot project to see if this type of system might work.

MS. KERNS: We'll have to read through the plan to see if we can do a pilot project; because I believe the Plan says you cannot have any harvest unless there is a sustainable fishery management plan. Therefore, we'll have to double check to see if that's something that's even viable in the Plan.

CHAIRMAN CLARK: Yes, Pat.

MR. KELIHER: Yes that is fine. We can work with staff between now and the next meeting; and figure out what the right approach is.

ADJOURNMENT

CHAIRMAN CLARK: Thanks, any further questions? Is there any other business to come before the Board? Seeing none; we are adjourned.

(Whereupon the meeting adjourned at 2:00 o'clock p.m. on February 6, 2019)

Shad and River Herring Technical Committee Task:
Technical Committee Report on Inconsistencies with Amendments 2 and 3

October 11, 2019

Introduction

In the fall of 2017, the Shad and River Herring Technical Committee (TC) identified several inconsistencies between state SFMPs and the requirements of Amendments 2 and 3. The Amendments require all states and jurisdictions to submit Sustainable Fishery Management Plans (SFMPs) for all systems that remain open to river herring and shad harvest. SFMPs must quantitatively demonstrate that fisheries will not have a negative impact on the stock. Additionally, the Amendments specify required fisheries dependent and independent monitoring for a number of rivers. However, in several states there are cases where rivers are legally open to recreational harvest of shad or river herring, but the management and/or monitoring of these rivers is not consistent with the requirements of the FMP.

The Board tasked the TC with developing proposed improvements to Amendments 2 and 3 with regard to this issue. The TC has taken the first step in this process by identifying and documenting each case of regulatory inconsistency. Section 1 of this document provides a description of each case identified by the TC, including information on the regulations and monitoring in place for a particular area that conflict with the Amendments' requirements. The TC's recommendations for resolving these inconsistencies are also provided on a case by case basis, and summarized in Table 1. Proposed changes to state SFMPs and Alternative Management Plans would be evaluated by the TC. Section 2 of the document includes some potential changes to Amendments 2 and 3 discussed by the TC that could address some areas of inconsistency and/or provide clearer guidance to the states on SFMP and monitoring requirements, as well as *de minimis* criteria and exemptions.

Section 1. Case Descriptions

River Herring Cases

Maine

- **Statewide: SFMP; 25 fish recreational creel limit.**
  Current state law allows recreational anglers to take 25 fish per day for personal use statewide, though few locations in Maine permit recreational anglers to regularly catch 25 fish per day. Gear restrictions limit anglers to hook and line and dip net only. These gear types are permitted only in areas outside of a municipally-managed watershed and downstream of the municipal harvest location where exclusive rights are granted by the State. The recreational fisheries do not affect escapement of spawning fish passed at commercial fishing operations.
  - → **TC recommends that Maine address cases where recreational harvest occurs in rivers not currently monitored under the river herring SFMP with a relevant monitoring threshold from other watersheds that relates to a defined management response. For the Salmon Falls River (shared waterbody with NH), ME currently prohibits recreational harvest.**

New Hampshire

- **Salmon Falls River: Irregular monitoring.**
  This river is included in the approved NH SFMP. Harvest is allowed, as there are currently no regulations establishing a length limit or daily bag limit for recreational anglers on either alewives or blueback herring within any water body of the state. Additionally, there are no closed seasons to the taking of river herring by recreational anglers, except that they are prohibited from harvesting river herring on Wednesdays. However, monitoring for this river is irregular, with fishery independent monitoring only occurring every 3-5 years. Fishery dependent reporting captures only about 20 herring per year. Salmon Falls River does not flow directly into another monitored waterbody, so downstream monitoring would not directly capture river herring in this river. The Maine side of the river has a park at the head of tide dam and a fishing wharf. Harvest of river herring is much more likely there.
  - → **TC recommends no changes to monitoring, and making the NH SFMP clear as to how monitoring in the Great Bay system is sufficient to inform sustainability and management of Salmon Falls.**
  - → Rationale: The Atlantic States Marine Fisheries Commission Shad and River Herring FMP states that "Definitions of sustainable fisheries and restoration goals can be index-based or model-based" and that "Member states or jurisdictions could potentially develop different sustainability target(s) for river herring based on the unique ecosystem interactions and…Targets can be applied state-wide or can be river and species specific." (Amendment 2, pg. 92). Therefore New Hampshire will use the stocks of river herring returning to the Great Bay Estuary system as an indicator of statewide river herring abundance and refer to them as the 'Great Bay Indicator Stock'. Using an estuary-wide versus river-specific approach is the best suitable method due to the physical/geographical characteristics of the Great Bay Estuary.

    Great Bay Estuary's unique geographical characteristics lend itself to monitoring the systems resource as a whole rather than on a river-specific basis. The estuary includes seven small to moderate size rivers with most flowing into a large embayment (Great Bay and Little Bay) before draining into a narrow, 15 km long opening to the sea via the Piscataqua River.

    If the fishery-dependent and independent targets for river herring are not met, the New Hampshire Fish and Game Department will implement a prohibition on harvest of river herring to all fisheries operating within state waters.

South Carolina

- **Little River: No SFMP; No monitoring.**
  This river is not included in the SC SFMP. In SC, statewide regulations allow recreational harvest of river herring: 1 bushel (22.7 kg) fish aggregate daily creel limit for blueback herring in all rivers. Reporting is required for recreational harvest using gill nets, but not for cast nets or hook and line gears. Fishery independent (FI) monitoring does not occur for this river. SC has a regulations package written up to address some of the inconsistencies in managing diadromous species, although it has not passed through legislature. As part of this package, the river herring

recreational fishery (cast nets) will have the same restrictions in locations, timing, and reporting as the respective commercial fisheries.

- → **TC recommends that Little River management relate to Great Pee Dee River sustainability metrics and management response, as it falls within the Great Pee Dee system.**
- → Rationale: the Little River does not have enough monitoring to support an individual sustainability metric, however, this intercoastal waterway ultimately connects with the Great Pee Dee River System through the Waccamaw River and is not known to have a separate spawning stock.

- **Winyah Bay system (Waccamaw, Little Pee Dee, Lynches, Black, Sampit, Bull Creek): tributaries not in SFMP; some monitoring.**
  Only the Great Pee Dee River is included in the SFMP. A commercial fishery occurs in the Great Pee Dee River with required monthly catch reports for legal commercial and recreational fishers using nets. SCDNR conducts biological sampling of river herring in the Great Pee Dee River. Under the statewide regulations, recreational harvest is allowed in all of the additional rivers that feed into Winyah Bay, however monitoring does not occur on those rivers. River herring may be reported as bycatch in mandatory landings reports for commercial shad fishery, but reports of river herring bycatch are infrequent.
  - → **TC recommends SC revise their river herring SFMP to apply sustainability metrics and management response for the Winyah Bay system to all tributaries in the system (Waccamaw, Little Pee Dee, Lynches, Black, Sampit, Bull Creek).**
  - → Rationale: The Great Pee Dee River is the only portion of the Winyah Bay system with a known spawning run, and has adequate monitoring and data to apply to the whole system.
- **Santee-Cooper system (Wateree, Congaree, Broad): tributaries not in SFMP.**
  The Wateree, Congaree, Broad are tributaries of the Santee and Cooper Rivers. They are not explicitly included in the SC SFMP. There is not monitoring occurring specifically within these tributaries, however, downstream monitoring in the Santee and Cooper Rivers would be representative of the tributaries. The Santee-Cooper is included in the SC SFMP.
  - → **TC recommends SC revise the SFMP to include these tributaries in the Santee-Cooper system and apply sustainability metrics and management response for the Santee-Cooper to all unmonitored portions of the system.**
  - → Rationale: Monitoring in Santee-Cooper system is representative of all tributaries.
- **Wando and Ashely Rivers: No SFMP; no monitoring.**
  These rivers are not included in the SC SFMP. Under the statewide regulations, recreational harvest is allowed. Harvest is not suspected to occur in these rivers. However, monitoring does not occur on these rivers. These are not tributaries of another river, and are treated as separate stocks.
  - → **TC recommends implementing one of the following:**
    - o **Catch and release only regulations**
    - o **An Alternative Management Regime (described under Section 5 of Amendment 2) with appropriate mechanisms for monitoring and responding to changes in fishery impacts to the river herring stock**

    - **Relate management of unmonitored rivers statewide to the sustainability targets and management response for the Santee-Cooper river system.**
  - → Rationale: These smaller rivers in the southern part of the state do not have data to support individual sustainability metrics, nor another "surrogate" system from which it would be appropriate to apply sustainability metrics.
- **ACE Basin system (Ashepoo, Combahee, Edisto, Salkehatchie): No SFMP; no monitoring.**
  These four tributaries are considered to be part of the ACE Basin system. The Salkehatchie is a tributary of the Combahee. There is no SFMP for the system nor for any of the tributaries, though recreational harvest is allowed in all of them under the statewide regulations. Harvest is not suspected to occur in these tributaries, however monitoring does not occur in any of them.
  - → **TC recommends implementing one of the following:**
    - **Catch and release only regulations**
    - **An Alternative Management Regime (under Section 5 of Amendment 2) with appropriate mechanisms for monitoring and responding to changes in fishery impacts to the river herring stock**
    - **Relate management of unmonitored rivers statewide to the sustainability targets and management response for the Santee-Cooper river system.**
  - → Rationale: The ACE Basin and smaller rivers in the southern part of the state do not have data to support individual sustainability metrics, nor another "surrogate" system from which it would be appropriate to apply sustainability metrics.
- **Coosawhatchie River: No SFMP; no monitoring.**
  Similar to the Wando and Ashely, this is not a tributary of another river, and is treated as a separate stock. It is not included in the SC SFMP. Under the statewide regulations, recreational harvest is allowed. Harvest is not suspected to occur in this river. However, monitoring does not occur here.
  - → **TC recommends implementing one of the following:**
    - **Catch and release only regulations**
    - **An Alternative Management Regime (under Section 5 of Amendment 2) with appropriate mechanisms for monitoring and responding to changes in fishery impacts to the river herring stock**
    - **Relate management of unmonitored rivers statewide to the sustainability targets and management response for the Santee-Cooper river system.**
  - → Rationale: This river is not part of a larger system and does not have data to support individual sustainability metrics, nor a "surrogate" system from which it would be appropriate to apply sustainability metrics.
- **Savannah: No SFMP; no monitoring.**
  There is no SFMP for this river (SC or GA). SCDNR used to conduct creel surveys for the hook and line fishery at NSBLD before it was deemed an unsafe fishing area, and collected biological samples. SC also samples YOY shad with an electrofishing boat, which could potentially capture some river herring (likely not enough to produce reliable indices for river herring). GA conducts monthly shad electrofishing below NSBLD from February to June, which has not caught any herring in recent years. There are a few sporadic intercepts of blueback herring in the striped bass electrofishing survey. These surveys likely occur further upstream where river herring are less likely to be encountered. Both SC and GA allow recreational harvest in the Savannah. GA has

no regulations to prohibit it, and SC has a 1 bushel fish aggregate daily creel for blueback herring in all rivers.

→ **TC recommends implementing one of the following:**
  - **Catch and release only regulations**
  - **An Alternative Management Plan (under Section 5 of Amendment 2) with appropriate mechanisms for monitoring and responding to changes in fishery impacts to the river herring stock**
  - **Relate management of unmonitored rivers statewide to the sustainability targets and management response for the Santee-Cooper river system.**

→ Rationale: SC and GA do not have data to support a sustainability metric for river herring, nor a "surrogate" system from which it would be appropriate to apply sustainability metrics. Existing data sources contain very low capture rates for river herring, so benchmarks developed from them would be close to zero. However, there is some seasonal monitoring that should capture changes in the fishery, so SC and GA may be able to use an alternative management plan to justify maintaining their current regulations.

Georgia

- **Savannah: see SC above.**
- **Altamaha system (Altamaha, Oconee, Ocmulgee): No SFMP.**
  Georgia does not have an SFMP for river herring. The state does not have any regulations in place to prohibit the recreational harvest of river herring. No harvest is suspected in the Altamaha and its two main tributaries, which are all considered one system. Creel surveys occur on the mainstem of the Altamaha annually, on a monthly basis from April to November. This may capture river herring in the upstream tributaries if present, however the survey dates may be later than river herring remain in-river. River herring harvest has not been recorded in the creel surveys.

  → **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying the absence of statewide harvest regulations by showing no significant river herring harvest is occurring under these regulations, and describing the metrics/monitoring the state would use to observe any increases in the fishery, and the management response that would be implemented if river herring abundance and/or harvest were to increase.**

  → Rationale: GA does not have sufficient data to support a sustainability metric for river herring. Existing data sources contain very low capture rates for river herring, so benchmarks developed from them would be close to zero. However, there is some seasonal monitoring that should capture changes in the fishery, so GA may be able to use an alternative management plan to justify maintaining their unregulated (harvest may occur) regulations.
- **Ogeechee River: No SFMP; irregular monitoring.**
  Georgia does not have an SFMP for river herring. The state does not have any regulations in place to prohibit the recreational harvest of river herring. No harvest is suspected in the

Ogeechee. Creel surveys are conducted at access points every 5 years, and have not recorded river herring harvest.

→ **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying the absence of statewide harvest regulations. See Altamaha system for additional details.**

- **Satilla River: No SFMP; no monitoring.**
  Georgia does not have an SFMP for river herring. The state does not have any regulations in place to prohibit the recreational harvest of river herring. No harvest is suspected in the Satilla. There was a creel survey until 2014 but no RH were captured. Monitoring no longer occurs.
  → **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying the absence of statewide harvest regulations. See Altamaha system for additional details.**
- **St. Marys River: No SFMP; no monitoring.**
  Neither Georgia nor Florida has an SFMP for river herring. Georgia does not have any regulations in place to prohibit the recreational harvest of river herring. In Florida, recreational river herring harvest is regulated under the statewide 10 fish possession limit for aggregated shad species. Neither state performs monitoring for this river.
  → **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying the absence of statewide harvest regulations. See Altamaha system for additional details.**

Florida

- **St. Marys River: see GA above.**
  → **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying harvest regulations. Florida should take management consistency with Georgia into account.**
  → Rationale: FL does not have sufficient data to support a sustainability metric for river herring. Existing data sources contain very low capture rates for river herring, so benchmarks developed from them would be close to zero.
- **St. Johns system (St. Johns, Econlockhatchee, Wevika, Oklawaha): No SFMP; some monitoring.**
  Florida does not have an SFMP for river herring. Statewide regulations allow harvest of river herring, which fall under the 10 fish possession limit for aggregated shad species. The St. Johns River system includes the three tributaries listed above. On the St. Johns and Econlockhatchee, there are American shad creel surveys that would also capture river herring catch/harvest. These creel surveys, as well as the FI spawning stock monitoring would not be representative of the Wevika and Oklawaha because they occur upstream of the tributaries. JAI sampling occurs downstream of all significant tributaries, and does encounter herring.
  → **TC recommends either 1) implement catch and release only regulations for river herring statewide, or 2) develop an alternative management plan justifying the statewide harvest regulations by showing no significant river herring harvest is occurring under these regulations, and describing the metrics/monitoring the state would use to observe any increases in the fishery, and the management response that would be implemented if river herring abundance and/or harvest were to increase.**

→ Rationale: There are some available data that could be used to monitor changes in river herring abundance or harvest, though existing data sources contain very low capture rates for river herring. FL may be able to use an alternative management plan to justify maintaining their harvest regulations by monitoring changes in the available data and implementing a statewide management response if there are changes in harvest or abundance.

- **Pellicer, Tomoka, and Nassau Rivers: No SFMP; no monitoring; no record of river herring presence**
  Florida does not have an SFMP for river herring. Statewide regulations allow harvest of river herring, which fall under the 10 fish possession limit for aggregated shad species. No monitoring occurs on any of these rivers, which are separate systems. There is no record of river herring presence in these three rivers, but there is a small amount of suitable habitat located in the Pellicer and Tomoka, south of the southern-most confirmed runs. The Nassau River is a small watershed with a big tidal range, so it is unlikely to contain any suitable spawning habitat.
  → **TC recommends either 1) implement catch and release only regulations, or 2) describe in SFMP/or Alternative Management Plan that these systems are not part of the alosa range.**
  → Rationale: If second option is chosen, the state will provide evidence to demonstrate that these areas are not part of the species range.

Shad Cases

Maine

- **All rivers: No SFMP; some monitoring.**
  Maine does not have a shad SFMP. Shad recreational harvest is allowed in all rivers in the state with a recreational possession limit of 2 fish per day; the only legal gear is hook and line. The commercial fishery is closed. Recreational harvest monitoring occurs through the Marine Recreational Information Program (MRIP), but only on the Saco River. There are also fishway counts on the Androscoggin, Saco, Kennebec, and Sebasticook Rivers, and some bycatch records from non-directed commercial fisheries. A juvenile alosine survey is carried out annually in the Kennebec/Androscoggin estuary.
  → **TC recommends Maine attempt to develop potential sustainability metrics using the JAIs and fishway counts from monitored systems to create a SFMP or Alternative Management Plan with a management response to a trigger (possibly a percentile approach) applied to unmonitored rivers. The TC would then evaluate the SFMP and make a recommendation to the Board.**
  → Rationale: Dependent on the data provided by MEDMR and the extent to which the proposed metrics, triggers, and responses are supportive of a statewide approach and a two fish limit. This case and some of the other examples may be best handled through an Alternative Management Approach, as TC may find the proposed management regime strays too far away from SFMP format/approach as described in Amendment 3.

New Jersey

- **Tributaries of the Delaware River: tidal stretches of tributaries not in SFMP.**

New Jersey portions of the Delaware River are managed under the Delaware River Basin Coop SFMP for American shad. There are 11 tributaries of the Delaware River that are not explicitly included in the SFMP, but on which harvest is allowed in the tidal stretches under New Jersey regulations. New Jersey allows recreational shad harvest with a 6 fish possession limit for shad species, and no more than 3 American shad. Harvest is only allowed in the mainstem of the Delaware River, the Delaware Bay, and the tidal portions of the lower tributaries. Though monitoring is not occurring in these smaller tributaries, monitoring occurs in the mainstem of the Delaware downstream from these smaller tributaries and would be representative of shad upstream.

→ **TC recommends including tidal stretches of all tributaries in the DE COOP SFMP**

→ Rationale**:** Monitoring programs in place for the Delaware River system are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.

Delaware

- **Delaware River Basin System (Brandywine and Broadkill): tributaries not in SFMP.**
  The Brandywine and Broadkill Rivers are explicitly included in the Delaware Basin Coop SFMP, but monitoring does not occur directly in these tributaries. The Brandywine River enters the Delaware River near Wilmington, so fishery independent monitoring in the upper bay should be representative of this tributary. The Broadkill River enters the lower Delaware Bay near Lewes, thus monitoring upstream may not be representative of this tributary; commercial harvest monitoring in the lower bay should capture shad entering the Broadkill. Delaware imposes a recreational 10 fish aggregate limit combined American Shad and Hickory Shad possession per angler, with no closed season or minimum size within their jurisdictional waters. Harvest is suspected for both rivers but the quantity is unknown. Adult shad would be recorded in commercial harvest reports.
  → **TC recommends including all tributaries in the DE COOP SFMP**
  → Rationale: Monitoring programs in place for the Delaware River system are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.
- **Back Creek (C&D Canal): no SFMP; no monitoring.**
  Back Creek is a waterway connecting the upper Elk River in Maryland to the Delaware River in Delaware. It is not included in an SFMP. Delaware allows harvest in their jurisdictional waters, Maryland does not. Delaware Bay commercial fishery sampling should be representative of this area, but independent sampling would not.
  → **TC recommends addressing in the DE COOP SFMP as a Delaware River tributary**
  → Rationale: Monitoring programs in place for the Delaware River system are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.
- **Chester River: no SFMP; no monitoring.**
  The Chester River is a tributary of the upper Chesapeake Bay. There is no shad SFMP for this river, nor monitoring. Delaware's regulations allow harvest of up to 10 fish daily for combined shad species per angler, with no closed season or minimum size. Harvest is suspected but unquantified. It is unclear if any monitoring programs would be representative of this river.

→ **TC recommends implementing catch and release only regulations**

→ Rationale: The portion of this watershed in MD is managed under catch and release only regulations. DE has no monitoring of the population or fishery, and DE currently allows recreational harvest in areas upstream of MD's jurisdiction. Therefore, consistent regulations with MD are recommended for Delaware.

- **Choptank River: no SFMP; some monitoring.**
  The upper reaches of the Choptank River barely stretch into Delaware. Delaware's regulations allow harvest of up to 10 fish daily for combined shad species per angler. Maryland performs a YOY seine survey in the Choptank, and a restoration group stocks larval shad, and monitors survival, hatchery vs. wild production, and spawning stock. No shad have been reported in the portion of the river that flows into Delaware or collected at the base of Mudmill Pond spill pool.
  → **TC task group recommends implementing catch and release only regulations**
  → Rationale: The portion of this watershed in MD is managed under catch and release only regulations. DE has no monitoring of the population or fishery, and DE currently allows recreational harvest in areas upstream of MD's jurisdiction. Therefore, consistent regulations with MD are recommended for Delaware.

North Carolina

- **Albemarle Sound system (Meherrin, Cashie): tributaries not in SFMP.**
  The Meherrin River is a tributary of the Chowan River, which feeds into Albemarle Sound. The Cashie River feeds directly into the Albemarle Sound at its upper end. The NC SFMP for shad includes the Chowan River, Roanoke River and the Albemarle Sound itself. The recreational bag limit for American and Hickory Shad in the Albemarle Sound, the Roanoke River basin and the Neuse River basin is a 10-fish aggregate (Hickory and American combined) per person, per day, of which only one American Shad can be taken. Monitoring is primarily carried out in the Sound; a juvenile seine survey is used to develop juvenile abundance indices and the FI gill net survey gathers size, age, and sex data. These surveys are downstream and representative of the two tributaries listed above.
  → **TC recommends include all tributaries of the Albemarle Sound system in the SFMP**
  → Rationale: Monitoring in the Albemarle Sound are representative of both the Meherrin and Cashie Rivers.
- **Currituck Sound (Northwest River, North Landing River): SFMP*; some monitoring.**
  The NC SFMP considers Currituck Sound and its tributaries to be part of the greater Albemarle Sound system. NC allows harvest of no more than 10 fish per day aggregate bag limit (only 1 American shad) in the Albemarle Sound (there is a 10 American and/or Hickory Shad aggregate possession limit per person, per day in the Tar-Pamlico River, Pungo River, Pamlico Sound, and all other inland, coastal and joint waters). Currituck Sound connects to the Albemarle Sound near the coast. Monitoring is performed throughout the Albermarle Sound, including Currituck Sound (e.g. trawls and seine surveys, juvenile surveys) but the stations used to inform management in the SFMP are not those in Currituck Sound. The SFMP uses information from other areas further upstream in the Albemarle Sound. Department of Game and Inland fisheries does not have any shad data for the Northwest and North Landing Rivers. There is no targeted effort for shad in these two rivers.

→ **TC recommends including Currituck Sound as part of the Albemarle Sound system in the SFMP, and adding language to specify how monitoring and sustainability metrics inform management of all tributaries.**

→ Rationale: North Carolina expects that surveys performed in the Albemarle Sound are representative of Currituck Sound.

- **Cape Fear system (Black River): tributary not included in SFMP.**
  The Black River is a tributary of the Cape Fear River, which is included in the NC SFMP for shad. Monitoring is performed in the Cape Fear River, including annual electrofishing for adults, an annual independent gill net survey, commercial harvest monitoring, and a recreational creel survey. Shad are not suspected to be present in the Black River. Cape Fear monitoring does not cover fish entering the Black River because it occurs upstream from where the tributary connects.
  → **TC recommends including all tributaries of the Cape Fear River in the SFMP, and adding an explanation of shad abundance in the Black River.**
  → Rationale: Shad in the Black River are assumed to be from the same spawning stock as those in the Cape Fear mainstem.
- **Little River: no SFMP; no monitoring.**
  The Little River is a small coastal river that connects to the Intracoastal Waterway in both NC and SC. Shad may travel to the Waccamaw River in SC through this system. Both NC and SC allow recreational harvest in this river with a 10 fish aggregate daily creel limit for both states. There is no monitoring that captures shad data for this river.
  → **TC recommends addressing Little River in SFMP by applying management response to sustainability metrics from the Winyah Bay System**. **Management response should be consistent between North Carolina and South Carolina.**
  → Rationale: The TC determined that the available data for the Winyah Bay system are more robust than those for the Cape Fear system.

South Carolina

- **Little River: See NC above.**
  → **TC recommends addressing Little River in SFMP by applying management response to sustainability metrics from the Winyah Bay System. Management response should be consistent between North Carolina and South Carolina.**
  → Rationale: The TC determined that the available data for the Winyah Bay system are more robust than those for the Cape Fear system.
- **Winyah Bay system (Little Pee Dee, Lynches, Black, Sampit, Bull Creek): tributaries not included in SFMP.**
  South Carolina's SFMP for shad allows for harvest the Winyah Bay system. Specifically, commercial and recreational fisheries exist in the Waccamaw River, Great Pee Dee River, and the Bay itself, while all other waters of the state are open for shad recreational harvest under an aggregate creel limit of 10 combined American and hickory shad per person. Where commercial fisheries occur, there is required monthly catch reporting for legal commercial and recreational fishers using nets. SC also collects FD biological samples in the Great Pee Dee River. Sampling in the Pee Dee system would be representative of the five tributaries listed above.

→ **TC recommends including all Winyah Bay tributaries in SFMP**

→ Rationale: Monitoring programs in place for the Bay are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.

- **Santee-Cooper system (Wateree, Congaree, Broad): tributaries not included in SFMP.**
  The Wateree, Congaree, Broad are tributaries of the Santee and Cooper Rivers. They are not explicitly included in the SC SFMP. There is not monitoring occurring specifically within these tributaries, however, downstream monitoring in the Santee and Cooper Rivers would be representative of the tributaries. The Santee-Cooper is included in the SC SFMP.
  → **TC recommends including all tributaries in the Santee-Cooper SFMP**
  → Rationale: Monitoring programs in place for the Santee and Cooper rivers are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.
- **Wando, Ashely and Coosawhatchie Rivers: No SFMP; no monitoring.**
  These rivers are not included in the SC SFMP for shad. Under the statewide regulations, recreational harvest is allowed. Harvest is not suspected to occur in these rivers. However, monitoring does not occur on these rivers. These are not tributaries of another river, and are treated as separate stocks. Similar to the Wando and Ashely, the Coosawhatchie is not a tributary of another river, and is treated as a separate stock. It is not included in the SC SFMP. Under the statewide regulations, recreational harvest is allowed. Harvest is not suspected to occur in this river. However, monitoring does not occur here.
  → **TC recommends modifying SFMP to include these systems, and apply metrics from the Santee-Cooper system to the Wando and Ashely, and apply metrics from the Savannah River to the Coosawhatchie. If necessary, add additional detail about the management responses tied to triggers.**
  → Rationale: The Santee-Cooper system and the Savannah River could serve as "surrogate" systems for these smaller rivers. Changes to the SFMP would be evaluated by the TC.
- **ACE Basin system (Ashepoo, Salkehatchie): tributaries not included in SFMP.**
  These two tributaries are considered to be part of the ACE Basin system. The Salkehatchie is a tributary of the Combahee. The SC shad SFMP addresses commercial and recreational harvest in the Combahee and Edisto Rivers, but recreational harvest is also allowed in the other tributaries under the statewide regulations. Harvest is not suspected to occur in these tributaries, however there is no monitoring occurring for either of them. For the Combahee and Edisto Rivers, monthly catch reports for legal commercial and recreational fishers using nets are required. This would be representative of the Salkehatchie but not the Ashepoo.
  → **TC recommends including Ashepoo and Salkehatchie with the Combahee in the SFMP.**
  → Rationale: The sustainability metric, triggers and management response from the Edisto River can be applied to the entire ACE basin system.

Georgia

- **Altamaha system (Oconee, Ocmulgee): tributaries not included in SFMP.**
  Georgia has an SFMP for shad, which includes the Altamaha River but is not clear whether it extends to these two tributaries. Commercial and recreational shad fisheries occur on the mainstem of the Altamaha. No harvest is suspected in these two main tributaries, but state

regulations allow recreational harvest of shad, with an 8 fish per day possession limit for aggregate shad species. Creel surveys occur in the mainstem of the Altamaha and would capture shad in the tributaries which are upstream.

- → **TC recommends including tributaries of the Altamaha system in the SFMP**
- → Rationale: Monitoring programs in place for the Altamaha River are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.

- **Satilla River: No SFMP; some monitoring**
  Georgia's SFMP for shad does not include the Satilla River. The state regulations allow recreational harvest of shad with an 8 fish per day possession limit for aggregate shad species. No harvest is suspected. Creel surveys have been conducted in the past (last one in 2014), and no evidence in recent years suggests any shad harvest is occurring in the Satilla. Electrofishing for standardized surveys occurs in the Satilla every year from March-April at 11 stations but has only picked up 1 or 2 shad in recent years.
  - → **TC recommends including the Satilla in the GA shad SFMP for recreational harvest, and applying the same metrics and management response in place for the Altamaha River to this river**
  - → Rationale: The Altamaha is the nearest river with a known spawning run, adequate monitoring and a sustainability metric.
- **St. Marys River: no SFMP; no monitoring.**
  Neither Georgia nor Florida's SFMP for shad include the St. Marys River. Georgia and Florida both allow recreational harvest of shad in this river, with 8 and 10 fish daily possession limits for aggregate shad species, respectively. Neither state suspects harvest occurs here, but neither performs shad monitoring for this river. Electrofishing for standardized surveys occurs in the St. Marys.
  - → **TC recommends including the St. Marys in the GA shad SFMP for recreational harvest, and applying the same metrics and management response in place for the Altamaha River to this river**
  - → Rationale: The Altamaha is the nearest river with a known spawning run, adequate monitoring and a sustainability metric.

Florida

- **St. Johns system (Econlockhatchee, Wevika, Oklawaha); tributaries not included in SFMP; some monitoring.**
  Florida has a shad SFMP for the St. Johns River. The St. Johns River system includes the three tributaries listed above, but they are not addressed in the SFMP. Statewide regulations allow harvest of shad under the 10 fish possession limit for aggregated shad species. The Wevika is a minor tributary with little suitable shad habitat, but some American shad have been recorded there. The Oklawaha appears to have some suitable American Shad habitat, though there is no record of a spawning run or fishery there prior to the Rodman dam. JAI sampling of the St. Johns occurs downstream of all significant tributaries. On the St. Johns and Econlockhatchee, there are American shad creel surveys. However, these creel surveys, as well as FI spawning stock

monitoring would not be representative of the Wevika and Oklawaha because they occur upstream of the tributaries.

→ **TC recommends that FL revise the shad SFMP to include all tributaries, and add language for how metrics from monitored sections will apply across the system tributaries**

→ Rationale: Monitoring programs in place for the St. Johns main stem are considered adequate, should metric benchmarks be triggered, management responses will be applied to these tributaries as well.

- **Pellicer, Tomoka, and Nassau Rivers: No SFMP; no monitoring; no record of shad presence** These rivers are not included in Florida's shad SFMP. Statewide regulations allow shad harvest with a 10 fish possession limit for aggregated shad species. No monitoring occurs on any of these rivers, which are separate systems. There is no record of shad presence in these three rivers, but there is a small amount of suitable habitat located in the Pellicer and Tomoka, south of the southern-most confirmed runs. The Nassau River is a small watershed with a big tidal range, so it is unlikely to contain any suitable spawning habitat.

  → **TC recommends either 1) implement catch and release only regulations, or 2) describe in SFMP/or Alternative Management Plan that these systems are not part of the alosa range.**

  → Rationale: If second option is chosen, the state will provide evidence to demonstrate that these areas are not part of the species range.

Section 2. Recommendations for Improvements to Shad and River Herring FMP

The TC Task Group and full TC discussed some possible changes to the FMP that could potentially improve clarity on what is required of the states with regard to SFMPs and monitoring, and/or reduce or resolve state conflicts with the current FMP requirements. The TC's discussions are described below. However, the TC has not made any consensus recommendations on modifications to the FMP.

The TC task group discussed the clarification of the *de minimis* language in Amendments 2 and 3. Based on the language in the FMP and a review of the Board's February 2010 discussion related to *de minimis* criteria and status, it is clear that *de minimis* status may only be granted on the basis of commercial harvest landings. Additionally, *de minimis* status does not exempt a state from the requirement to implement an approved SFMP for any system in which recreational or commercial harvest is allowed. The TC did not propose any changes to the current *de minimis* language.

The suggestion was made to modify the tables in Amendments 2 and 3 that specify required monitoring for river herring and shad. In particular the group noted that the tables could be improved by using more consistent and definitive language (e.g. define language such as "where appropriate").

Several ideas were discussed regarding adding more detail and guidance to the FMPs on SFMPs. Specifically, the TC Task Group thought it would be helpful to provide a standard format for reporting management metrics, thresholds and responses in the SFMPs. In addition, it was suggested that SMFPs should be more definitive with regard to the management responses (changes in regulations) that would be implemented if a management threshold or trigger were met. The group recognized there is still a need to maintain flexibility for the states/jurisdictions to tailor management responses to their systems

and fisheries. Lastly, the group noted the need for additional guidance on inter-jurisdictional management of shared waterbodies.

During the development of recommendations for resolving the inconsistencies described in the previous section, the TC discussed the use of Alternative Management Regimes, described in Section 5 of Amendment 2. The TC generally commented that there is a lack of clarity on when it is appropriate for a state/jurisdiction to use an Alternative Management Regime versus and SFMP, as well as what information is to be provided in such a proposal. More detailed guidance should be added to the FMP, especially given several states may consider implementing Alternative Management Regimes for data limited systems.

Lastly, the TC Task Group discussed the concept of modifying the FMP to allow states to maintain a low bag limit in unmonitored systems as an alternative to requiring catch and release only for unmonitored systems, provided a management response related to sustainability metrics from another or other monitored systems were in place. Several concerns with this concept were discussed. First, there were concerns that there could be negative impacts to the stock, but it would be difficult to assess considering the lack of monitoring. Second, the policy could be viewed as favoring the recreational fishery over commercial fisheries given that commercial fisheries are required to close completely unless an SFMP and appropriate monitoring are in place. The TC acknowledged that additional information and analysis would be necessary to evaluate the impacts of this concept. The TC intends to continue discussions on this and the ideas above at future meetings.

Table 1. Summary of TC Recommendations by State and Species

State	Species	Areas of Inconsistency	Recommendations
ME	River Herring	Statewide 25 fish bag limit, limited monitoring.	Address cases where recreational harvest occurs in rivers not currently monitored under the river herring SFMP with a relevant monitoring threshold from other watersheds that relates to a defined management response.
	Shad	All rivers: No SFMP, some monitoring	Develop potential sustainability metrics using the JAIs and fishway counts from monitored systems to create a SFMP or Alternative Management Plan with a management response to a trigger for all unmonitored rivers.
NH	River Herring	Salmon Falls River: Irregular monitoring	No changes to monitoring; make NH SFMP clear as to how monitoring in the Great Bay system is sufficient to inform sustainability and management of Salmon Falls.
NJ	Shad	Tributaries of the Delaware River not in SFMP	Include all tributaries in the DE COOP SFMP.
DE	Shad	Brandywine and Broadkill: tributaries not in Delaware River SFMP	Include all tributaries in the DE COOP SFMP.
	Shad	Back Creek, Chester River, Choptank River: No SFMP, no monitoring	Incorporate Back Creek into the DE COOP SFMP and implement catch and release only regulations on the Chester and Choptank
NC	Shad	Meherrin, Cashie, Northwest River, North Landing River: tributaries not in Albemarle Sound SFMP	Include all tributaries of the Albemarle Sound system in the SFMP, including Currituck Sound tributaries, and add language to specify how monitoring and sustainability metrics inform management of all tributaries.
	Shad	Black River: tributary not in SFMP	Include all tributaries of the Cape Fear River in the SFMP and add explanation of shad abundance in the Black River.
	Shad	Little River: no SFMP, no monitoring	Address Little River in SFMP by applying management response to sustainability metrics from the Winyah Bay system in SC; NC should include an equal management response in their SFMP to SC.
SC	River Herring	Little River: No SFMP, no monitoring	The Little River should respond to Great Pee Dee River (Winyah Bay) sustainability metrics, as it connects with the Great Pee Dee system.
	Shad & River Herring	Winyah Bay System tributaries (Waccamaw, Little Pee Dee, Lynches, Black, Sampit, Bull Creek): not in SFMPs	Revise shad and river herring SFMPs to apply sustainability metrics and management response for the Winyah Bay system to all tributaries in the system
	Shad & River herring	Tributaries of the Santee-Cooper System (Wateree, Congaree, Broad): not in the SFMPs	Revise shad and river herring SFMPs to apply sustainability metrics and management response for the Santee-Cooper system to all tributaries in the system

	River Herring	Wando and Ashely Rivers, ACE Basin system, Coosawhatchie River, Savannah River: No SFMP, no monitoring	1) Implement catch and release regulations for all unmonitored systems, 2) Implement Alternative Management Regime; or 3) apply statewide metrics to unmonitored rivers with defined management response
	Shad	Wando and Ashely Rivers, Coosawhatchie River: No SFMP, no monitoring	Apply metrics from the Santee-Cooper system to the Wando and Ashely, and apply metrics from the Savannah River to the Coosawhatchie. If necessary, add additional detail about management responses.
	Shad	Little River: No SFMP, no monitoring	Address Little River in SFMP by applying management response to sustainability metrics from the Winyah Bay system
	Shad	ACE Basin (Ashepoo**,** Salkehatchie): tributaries not in SFMP.	Include Ashepoo and Salkehatchie with Combahee in the SFMP; Sustainability metric, triggers and management response from the Edisto river can be applied to the entire ACE basin system.
GA	River Herring	All rivers: No SFMP; only monitoring in Savannah and Altamaha regularly, in Ogeechee every 5 years	1) Implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying the absence of statewide harvest regulations.
	Shad	Altamaha tributaries not in SFMP	Including all Altamaha tributaries in SFMP.
	Shad	Satilla, St. Marys: No SFMP, some monitoring in Satilla only.	Include Satilla and St. Marys in shad SFMP for recreational harvest, and apply the Altamaha sustainability metric, triggers and management response to those systems.
FL	River Herring	St. Marys: No SFMP, no monitoring	1) Implement catch and release only regulations for river herring statewide, or 2) develop an Alternative Management Regime justifying harvest regulations. Take management consistency with Georgia into account.
	River Herring	St. Johns system: no SFMP, some monitoring	1) Implement catch and release only regulations for river herring statewide, or 2) develop an alternative management plan justifying the statewide harvest regulations.
	Shad	St. Johns system: monitoring not representative of all tributaries	Revise the shad SFMP to include all tributaries, and add language for how metrics from monitored sections will apply across the system tributaries.
	Shad & River Herring	Pellicer, Tomoka, and Nassau Rivers: No SFMP; no monitoring; no shad or river herring	1) Implement catch and release only regulations, or 2) describe in SFMP/or Alternative Management Plan that these systems are not part of the alosa range.

Atlantic States Marine Fisheries Commission

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Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Shad and River Herring Technical Committee Webinar and Conference Call
Call Summary

Thursday, September 12, 2019
9:00 am – 12:00 pm

TC Attendance: Ken Sprankle (Chair, USFWS), Mike Brown (ME), Mike Dionne (NH), Brad Chase (MA), Patrick McGee (RI), Robert Adams (Vice Chair, NY), Brian Neilan (NJ), Josh Tryninewski (PA), Ellen Cosby (PRFC), Eric Hilton (VA), Holly White (NC), Jeremy McCargo (NC), Bill Post (SC), Jim Page (GA), Ruth Haas-Castro (NOAA)

ASMFC Staff: Jeff Kipp, Caitlin Starks

Additional Attendees: Sean Ledwin (ME DMR), Megan Ware (Maine DMR)

The Shad and River Herring Technical Committee (TC) met via conference call and webinar to address two items:

1) Review and provide a recommendation on Maine's proposal to modify their river herring Sustainable Fishery Management Plan (SFMP); and
2) Concerning the October 2017 Board task regarding improvements to Amendments 2 and 3, review the TC task group's recommendations for resolving identified harvest and monitoring inconsistencies with the Fishery Management Plan (FMP), and discuss next steps for completing the task.

Summaries and recommendations for each discussion topic are included below.

Review of Maine Proposal for Modifications to River Herring SFMP

Mike Brown of Maine DMR presented a proposed addendum to the state's SFMP for river herring. Maine proposes to allow limited harvest in six municipalities with exclusive river herring harvest rights with limited data time series (3-12 years), in addition to those currently allowed in their SFMP. In each municipality, a single harvester would be allowed modest harvest during a preliminary five year period while the data time series is expanded. In all open fisheries, three consecutive closed harvest days per week would be maintained to allow for escapement, and harvest would not occur until after May 18 to allow escapement of older spawning adults. Harvest would also be capped at 25% of the time series mean (TSM) run size, recreational fisheries above the point of commercial harvest would be closed.

To ensure sustainability, the plan would establish an annual escapement threshold of a minimum of 235 fish per surface area acre. The proposal also specifies sustainability criteria of a 20-percent repeat spawning ratio, mortality (Z) estimates of < 1.0, and an age structure that demonstrates the presence of older aged fish.

Maine's proposal to open these additional limited fisheries is based on improvements in returns given recent restoration efforts and based on Maine's unique potential for sustaining these efforts statewide. The state also believes it will provide incentive to local communities to implement and to continue restoration actions for river herring.

The TC discussed the proposal and highlighted a few concerns. First, the TC highlighted that one of the proposed

runs, Meddybemps Lake, did not achieve the sustainable production target of 235 fish/acre in any of the four years of available data. Maine explained this run was included in the proposal because there are plans underway to remove a significant passage obstruction, after which the state believes the run size will increase to reach the target. The TC came to consensus that the Meddybemps Lake run should not be opened for harvest until after it has met the sustainability target for more than one year, and it should be removed from the proposal at this time.

Multiple TC members expressed concern about the length of the time series of available data for several of the proposed fisheries. In past evaluations of SFMPs, the TC had generally accepted 10 years as the minimum time series needed to demonstrate stock sustainability. Several members agreed a single generation of fish (less than seven years of data) is not enough to provide a good understanding of stock health, and were uncomfortable with the proposal to open harvest on the runs with shorter time series. The TC agreed that the three runs with time series under seven years should be removed from the proposal until more data is available. In addition, the group agreed to have an in depth discussion on the appropriate number of years of data that should be available before opening harvest in a system, but did not agree on a number at this time.

A number of TC members shared the concern that the proposed harvest limit of 25% of the TSM was too liberal for some of the smaller runs, especially with limited data. One TC member suggested that rather than base the harvest level off run size over the entire time series, it could be based on run size after passage improvement or restoration projects have been implemented. The TC agreed it would be appropriate to use a starting harvest rate of 15% of the run size (following restoration events in systems where they have been implemented) and a higher harvest rate could be considered once a run meets its established production goal for three consecutive years.

Based on mortality estimates for existing fisheries that are doing well, the TC agreed the proposed sustainability criterion of Z-estimates < 1.0 may be unachievable. In the river herring stock assessment, Z-estimates between 2 and 3 were indicative of stock decline, so the TC recommended Maine use a Z-value more consistent with the stock assessment results.

Taking into consideration the concerns addressed above, as well as the strict measures Maine proposed for managing and monitoring these fisheries, the TC recommended Maine revise their proposal to remove Meddybemps Lake, Chemo Pond, and Pushaw Pond, and incorporate the recommended changes for the remaining three runs. They also asked for the proposal to include more detail on the criteria for meeting sustainability targets (on average or for several consecutive years) and the types of management responses that would be taken if sustainability targets are not met. Maine agreed to send the revised proposal back to the TC with these changes. **The TC recommends Board approval of Maine's proposal with the specified revisions.**

Review of Task Group Recommendations regarding October 2017 TC Task

Background:
In October 2017, after the TC and the PRT identified several cases of state management and monitoring programs inconsistencies with the requirements of Amendments 2 and 3 to the FMP, the Board tasked the TC to develop proposed improvements to Amendments 2 and 3 with regard to the following items:

1. Management and monitoring of rivers with low abundance and harvest of shad and river herring
2. Standardization of Sustainable Fishery Management Plan (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 required before developing a SFMP

In November 2018, a TC Task Group was established to compile information from the states on management and monitoring, develop draft recommendations for resolving each case of inconsistency with Amendments 2 and 3, and discuss potential improvements to the FMP related to the issues identified. The Task Group developed a database of management and monitoring programs by river system, and a document detailing each area of concern as well as potential options for resolving each inconsistency. Generally, the Task Group identified three types of inconsistency and provided consistent recommendations for those categories as follows:

1. Tributaries of river systems that do have SFMPs and monitoring, but the tributaries are not explicitly addressed in the SFMP
   Recommendation: Include tributaries of larger systems under the SFMP for the mainstem, and apply management metrics and responses to those tributaries
2. Rivers with harvest addressed by a SFMP, but with no or insufficient monitoring to support sustainability metrics
   Recommendations: Apply management metrics and response from other appropriate monitored system(s), or implement catch and release only regulations
3. Rivers legally open to harvest without a SFMP and/or monitoring, but where no harvest of shad or river herring is suspected
   Recommendations: Consider development of an alternative management regime, or implement catch and release only regulations

The TC Task Group also noted in Florida there are several rivers (Pellicer, Tomoka and Nassau) that the state does not consider to be part of the shad or river herring ranges. The state does not have any data available on alosine presence in these rivers. The TC recommended the FMP be modified to redefine the shad and river herring ranges, such that rivers excluded from the alosine range would be exempt from the FMP requirements.

The TC reviewed the work of the Task Group and agreed with all of the draft recommendations put forward to the states to resolve regulatory inconsistencies. Detailed descriptions of each case and the associated TC recommendations can be found in the *Technical Committee Report on Inconsistencies with Amendments 2 and 3.* The TC acknowledged that the states would need to submit any changes to their SFMPs, new SFMPs, or new Alternative Management Regime proposals to the TC for evaluation. The TC requested each state inform the TC Chair and ASMFC staff of their expected changes and timeframe for submitting their proposals.

The TC also considered the Task Group's suggestions for improvements to Amendments 2 and 3. First, the Task Group discussed the idea of allowing states to maintain a low recreational bag limit in areas with limited monitoring as an alternative to requiring catch and release only regulations. The group also proposed modifying the required monitoring tables in each of the amendments to provide more clarity and consistency in the requirements. Another suggestion was to require more definitive management responses to sustainability metrics in SFMPs. Lastly, the group proposed adding language to the Alternative Management Regime section of the FMP to provide more detailed guidance for when and how this option can be applied. Due to time limitations the TC was unable to come to any consensus recommendations on these ideas, and plans to have a dedicated discussion on potential FMP changes at a future meeting.

Addendum to the State of Maine Sustainable River Herring Fisheries Management Plan

SUMMARY

Maine Department of Marine Resources recommends that ASMFC consider a limited fishery at three locations based on improvements in returns given recent restoration efforts and based on Maine's unique potential for sustaining these efforts statewide. This document describes criteria that can be utilized to demonstrate limited harvest opportunities for some runs currently under restoration. The goal of this addendum is to provide incentive to local communities to implement and to continue restoration actions for river herring. Costly and lengthy monitoring requirements are an impediment to future restoration and data collection efforts where the decision to invest in fishways or their monitoring makes the best of the economic and cultural opportunities that a timely harvest provides. The benefits of a small harvest are continued community support for restoration efforts statewide, data collection, educational programs and stewardship of river herring populations that the DMR is unable to accomplish on a regular basis. Benefits of continued community involvement will ultimately determine the amount of data available to the DMR and ASMFC to track and monitor river herring populations coastwide and the eventual success of these restoration programs.

INTRODUCTION

River herring (*Alosa pseudoharengus* and *Alosa aestivalis*) are native to all coastal waters of Maine. Anadromous fisheries resources are a historic part of Maine fishing communities and coastal towns. The unique management and harvest of alewives and blueback herring in Maine, and the northeast in general, promotes a close connection between these species and the coastal communities where they are harvested. Restoration and stewardship of this important fishery resource continues to be one of the top priorities for Maine's coastal towns. Providing the most suitable upstream and downstream passage is critically important to towns that maintain their historical harvest rights to this resource and for those towns that hope to harvest fish in the future under Amendment 2.

Stewardship of Maine's river herring resources has occurred for the past two centuries. Citizens relying on anadromous fish for food, income and industrial products demanded fish passage over an ever-increasing number of dams that were being constructed on the migratory pathways. Whether these dams facilitated log drives, powered mills or produced power to run factory machinery, they all blocked fish passage and required fishways. Unfortunately, there were times when fishway laws were not enforced and the fishways that were built were ineffective or environmental conditions had become so degraded that the fish could not survive to use any fishways that were provided.

During the 1970's there was a revival of restoration interest and effort that continues today in Maine. In addition to the ongoing management of municipal runs that the towns harvested, Maine's larger rivers also benefitted from upstream and downstream passage for species of anadromous fish impacted by hydropower development and modernization. Today upstream and downstream passage exists on Maine's ten largest rivers and many of their tributaries. Providing for or improving passage has increased river herring returns statewide. The spawning population of river herring that returned to Maine in 2018 was estimated to be 25 million fish, most of which was the result of recent work by the

State of Maine, federal agencies, municipalities, NGO's, and local partners. Maine's history, economy, communities and natural environment now provide this state with unique opportunities to further sustain even more successful restoration efforts if more communities can be incentivized to participate.

CURRENT MANAGEMENT

River herring resources are managed on a watershed or sub watershed basis depending on location and size of the run. All river herring harvested are distinct and separate populations native to the watershed where harvest occurs. There are 36 municipalities in Maine that hold exclusive harvest rights. Twenty-two of these municipalities are eligible to harvest under our current sustainable fisheries management plan. The State of Maine permits each municipality, based on its possessing exclusive harvest rights, to harvest fish at a specific location utilizing one harvester per system. For each of these existing eighteen fisheries there is one licensed fisherman and associated crew that has sole access to the harvest. Commercial harvest is limited to one location and no additional harvest is permitted upstream of the harvest site for either commercial or recreational use. Most often harvest sites are located at the head of tide or at an existing fish passage facility. By limiting the number of harvesters, harvest locations and fish populations targeted for harvest, the population responses to management actions are easier to quantify.

River herring populations respond positively to restoration and management actions where habitat, passage and harvest practices support population growth. Stocking small numbers of pre-spawn fish often produce large returns of fish back to the system within four to six years. Several restoration projects started after 2000 now produce one million to five million fish annually. Several harvested runs average more than one million fish each year and provide income to coastal communities and fishermen. The DMR is confident that current restoration efforts will continue to grow if properly managed and supported by the communities.

SIGNIFICANT COMMUNITY RESTORATON EFFORTS

Maine is fortunate to have an active and successful statewide anadromous fish passage and habitat restoration program. The DMR estimates that 25 million river herring returned to Maine's inland waters to spawn in 2018. The population is expected to continue to grow as additional habitat projects are completed and new fishways are installed across the state. There are presently six active fish passage projects scheduled for 2019, plus a FERC order to reopen an existing fishway that has been blocked to fish passage until this year. These fish passage and restoration projects will add 53.7 square miles of river herring spawning habitat in Maine.

There are more than 50 additional waters that are under consideration for assessment and restoration programs. These historical habitats are spread along Maine's 3,476 miles of coastline and inland by as many as 150 miles. The geographic distance and limited number of sea-run fisheries staff requires that the department work closely with local communities to conduct many of the biological data collection and restoration activities associated with realizing river herring population growth in Maine. These communities also assume the roles associated with fund raising, grant writing and construction oversight through local non-profit organizations or through there own town administration and public works

crews. This model has worked very well and will be the model that Maine will continue to use for its restoration efforts. Community support and partnership are the key to achieving the resiliency needed to achieve Amendment 2 goals in the state of Maine.

Restoration projects vary based on size and complexity. Construction costs range from $100,000 to several million dollars per project. Data collection, run monitoring, debris removal requires additional funding and staff time after the initial fishway construction. The five existing DMR staff are unable to conduct monitoring at these locations without local assistance. The data collection associated with development of a sustainable harvest plan for each site, along with annual sampling poses another layer of complexity to achieving restoration in all existing historical river herring habitat with in Maine. Without community involvement to support these efforts Maine will not be able to continue to expand its existing river herring populations.

State and federal resource agencies and national and local nonprofit organizations provide most of the funding to restore fish passage. Local town governments and volunteers cover the expenses of sampling and operating fish passage after construction. Several small towns and coastal communities continue to support and lead on the ground restoration efforts along the coast with the goal of harvesting river herring. Volunteer efforts are critical for fishway construction, collecting biological samples, clearing beaver dams to provide passage and conducting annual fishway counts. Volunteer efforts have continued to dramatically increase the impact of the overall restoration of Maine's river herring populations within small coastal watersheds.

The coastal towns of Arrowsic, Penobscot and Phippsburg and many others have active river herring restoration and monitoring programs. In addition to providing funds for fishway construction, these communities continue to make annual financial commitments through town government and/or volunteer efforts. Many of the monitoring efforts have been ongoing for several decades. Examples of such collaborative work of the aforementioned towns are as follows:

The coastal town of Arrowsic has a population of 446 residents. More than 50 of the residents are currently active or have been active in the restoration and monitoring of the Sewall Pond river herring population. In 2014 the Maine Department of Transportation removed the last obstacle to fish passage by replacing an old culvert with a suitable fishway. The Conservation Committee has collected biological data from Sewall Pond for the DMR for 12-years.

The town of Penobscot, population 1,263 residents, in conjunction with state, federal, NGO's and local partners removed the dam at Wight's Pond and replaced it with a rock ramp, that is more natural. The total project cost to provide this unobstructed passage was $346,250. The town continues to budget funds for the alewife committee to use for the benefit of its river herring resource and to provide count and biological samples to DMR. Funds are allocated at the annual town meeting and are subject to the approval of the town voters. The allocation of these funds from the budget passes with unanimous approval each year. This demonstrates the continued commitment to support the river herring populations within this town. The town has actively managed this population and facilitated passage because of its importance to the town and those that utilized the resource. Many towns, including the town of Penobscot, have extensive local knowledge of these resources and how they were managed to utilize and conserve these populations.

Several volunteers remain committed to assist with monitoring the annual run at Wight's Pond and Pierce Pond, both in the town of Penobscot. In addition to mandatory monitoring of alewife runs associated with management requirements, Penobscot received funding for purse and beach seine sampling gear that is being used to study juvenile and sub-adult alewife life stages in the ponds and the Bagaduce Estuary. Working with local NGOs and multiple university professors, the waters within the town of Penobscot are part of a scientific study to determine the relative productivity between ponds and how that information can be best used to determine future harvest levels. This work has implications at the local level to direct future harvests and at a species wide level to answer questions that scientists and managers have identified as important data gaps. This effort demonstrates the capacity of local resources that, because of socio-economic ties that this addendum leverages, are committed to restoring this species for sustainable harvest and other natural resource benefits.

Center Pond in the town of Phippsburg is typical of a small coastal pond with a growing river herring resource. With a population of 2,216 residents, it has maintained an active alewife committee since the late 1970s'. Located near the mouth of the Kennebec River, a major challenge facing this small coastal pond is that river herring access is subject to the tidal stage of the Kennebec River which makes it accessible for only 48% of the tide. The town has provided or pledged more than $124,521 in town and private funds toward a new $300,000 fishway to improve passage into and out of Center Pond. Additionally, the town budgets annual funds to the alewife committee for the counting and tagging of fish. The volunteer alewife committee continues to collect data to better manage the river herring population and to meet the sustainability goals of the Maine SFMP. With an alewife run dating back to the 1800's and hard return data since 2012, Center Pond continues to be a critical study site because of its unique location very near the mouth of the Kennebec River and its three consecutive years of fish tagging data.

Within the past decade dozens of restoration projects targeting river herring, American shad and Atlantic salmon have started to witness a dramatic return of spawning river herring. Restoration projects like those described above vary in size and impact, from removing head tide dams that produces millions of fish, to small stream improvements of coastal lakes and ponds that produce thousands of fish. All of these restoration projects are significant, both in terms of the fish produced and in the significant amount of community support they provide for future restoration projects. Numerous other restoration efforts are currently underway, either in planning stages or actively under construction, with runs anticipated to grow by several million fish within the next five years.

DATA NEEDS

During the 2012 River Herring Assessment, river herring were determined to be data deficient, complicating the ability to fully assess these species coastwide. There is a need to continue to collect fisheries independent data for river herring populations that are not currently commercially harvested. Many unharvested river herring populations are under restoration and benefit from monitoring during the spring spawning run and fall migration of juveniles downstream. The towns and volunteers that monitor these populations deploy and operate counting stations, collect biological data (scales, species, sex, length, weight) and bycatch information that can be used to meet ASMFC data needs.

Biological samples and harvest data are collected annually from all commercially harvested river herring populations. Data collection and landing reports are mandatory requirements for any municipality that

commercially harvests under its exclusive harvest rights. For populations that do not have a dedicated harvest, data collection becomes the responsibility of the State of Maine DMR. Because of state budget constraints, Maine's expansive 3,478-mile coastline and demands for current data collection, the responsibility of biological and run count data collection rests with those towns focused on obtaining/utilizing their exclusive harvest rights. It is the volunteers, NGO's and others that are willing to partner to collect biological data that are doing the work. Without the continued assistance from local towns and volunteers most of Maine's river herring populations would not be monitored at current levels.

The data collected by volunteers and NGO's provide basic information to assess and track river herring populations. The DMR analyzes scales and additional data collected to calculate and track population metrics including species, age structure, sex ratio, repeat spawning, length at age and mortality estimates. Without assistance from those outside of state government most noncommercial runs would not be monitored on an annual basis.

FUNDING CONTINUED RESTORATION EFFORTS

The Atlantic States Marine Fisheries Commission manages river herring coastwide. Under Amendment 2 individual states may develop alternative state management strategies to restore river herring populations. Alternative state management approaches are beneficial because they allow flexibility for state fisheries managers to achieve monitoring, research and population recovery goals outlined in Amendment 2. The State of Maine proposes an addendum to the existing SFMP to furthers encourage continued local municipal restoration and sustainable management of river herring resources as a goal for increasing restoration success in Maine.

Maine will benefit from a state management program that builds upon restoration success experienced by the towns and the investment that municipalities continue to put into restoring river herring runs. A limited commercial river herring fishery at these locations will: incentivize volunteers and engage fishermen in restoration and sustainable harvest practices; provide educational programs for children and adults; allow a limited harvest which will provide resources to the state or town through the DMR Migratory Fish Fund; demonstrate to taxpayers the tangible rewards of such restoration projects; provide a limited additional source of lobster bait for that industry which is facing severe bait shortages because of recently curtailed herring catch limits.

Many towns that monitor river herring resources within their municipality have an established alewife committee or town conservation commission that oversees and coordinates the town's interaction with the local river herring resource. Participants are typically volunteers or current town employees. Funding programs as complicated as run counts and biological data collection can be problematic. Many towns lack the equipment necessary for expanding data collection, recording environmental conditions and counting river herring runs. The Migratory Fish Fund could be used to continue restoration efforts statewide by providing equipment, staff and standardized training necessary for data collection.

In cases where harvest rights are being established or restored, a municipality can exercise its commercial harvesting rights only after approval by the ASMFC Management Board. The provisional addendum of these three waters to the existing Maine Sustainable Fisheries Management Plan will

provide a modest incentive for community members to continue restoration efforts without risking significant impact to the resource.

MUNICIPAL GOALS

The collective goal of the municipalities is to continue building public support for river herring restoration, education, management and monitoring. With the mandatory closures required by Amendment 2, several municipalities have lost the volunteer support and ability to monitor and harvest these resources. Collectively, these three municipalities strongly support the opportunity to harvest a small number of fish to be sold with revenue going to fund educational programs, collect additional data and maintain the existing migratory corridors and fishways. A limited harvest will support fisheries dependent data collection, supply a limited source of bait and income for commercial fishermen, food for a small number of town residents and a very modest revenue return for some of the communities' tremendous time and money invested in the restoration, which can add up to thousands volunteer hours and dollars respectively. Furthermore, it will promote and sustain a network of restoration proponents, advocates and volunteers and could become a model for other states.

The Maine DMR supports this approach and is prepared to oversee funding, data collection efforts, educational training programs and provide any other assistance that it may be able to offer. The collective benefits to the municipalities are support toward meeting their goals of funding educational programs, collecting additional data, increasing the existing river herring populations and providing a limited amount of bait for commercial fishermen. DMR and ASMFC will benefit from data provided by the municipalities to enable tracking of recovery progress through standardized fisheries dependent and fisheries independent data collection. Some municipalities have been collecting data for several years and these data will provide valuable population trend information for the next full ASMFC river herring assessment in 2022.

IMPLEMENTATION OF AMENDMENT 2

Implementation of Amendment 2 requires a significant amount of data to demonstrate that individual populations of river herring are sustainable. Historical data collected for most river herring populations prior to Amendment 2 consisted of harvest weights and numbers along with limited amounts of scientific work conducted over the past 40 years. In many cases the limited fisheries dependent data available were insufficient for developing comprehensive management plans or for use in a coastwide assessment.

In 2008 the nonprofit association Alewife Harvesters of Maine began collecting biological samples and count data, at their own expense, in cooperation with the Maine Department of Marine Resources, to meet the anticipated requirements of Amendment 2. These data were used to develop the framework for the first sustainable fisheries management plan for river herring. Municipalities that are currently harvesting river herring are required to collect data to improve the management of this fishery. Municipalities that currently possess exclusive harvest rights and cannot harvest, or those towns that hope to gain access to newly restored runs, are also collecting data to develop sustainable management plans as their restoration programs continue. Biological data and count information obtained from these populations will originate from these towns and volunteer groups willing to collect data. Within some communities the data collection requirements necessary to meet the exiting data standards applied by

ASMFC are considered overly burdensome in years required and counterproductive to restoration progress and community support.

ASMFC MANAGEMENT PROGRAM IMPLEMENTATION

In Amendment 2 the ASMFC Management Board approved the following commercial and recreational fisheries management measures defining sustainability and providing guidelines for data collection.

"Systems with a sustainable fishery are defined as those that demonstrate their alewife or blueback herring stock could support a commercial and/or recreational fishery that will not diminish potential future stock reproduction and recruitment."

This addendum to the current SFMP proposes to assess the merits of a provisional process to allow limited harvest of river herring while continuing restoration efforts on rivers and streams that do not meet the current SFMP criteria or do not meet minimum time series data requirements for meaningful assessment. Within a five-year period, the three municipal waters selected for inclusion in this program must meet the following sustainable criteria for their runs to be added to the existing SFMP. These criteria are: 1) escapement of at least 235 fish per acre, 2) 20-percent repeat spawning ratio, 3) Z-estimates of < 2.0 for repeat spawning fish, 4) an age structure that demonstrates the presence of older aged fish (ages 3-7).

All the river herring populations in this proposed addendum to the SFMP have experienced varying levels of restoration success. While none of the proposed fisheries achieve all the sustainable fisheries standards currently established in the Maine River Herring SFMP or those developed after the Technical Committee review in 2017, the proposed harvest rates in this addendum are capped at 15% of the time series mean and should not permanently affect the overall restoration of these runs. The ASMFC Technical Committee will review the progress of these three runs toward meeting Maine SMFP standards. The Technical Committee may propose additional management measures or propose to close these fisheries during the 2022 SFMP review period.

Proposed Harvest @ 15% of Time Series Mean				
		Sewall Pond	**Center Pond**	**Wight's Pond**
Years of Data		12	7	8
Lake/Pond Surface Area		43	75	135
Average Run Size		19,013	27,702	45,503
@.15 TSM	Number	2,852	4,155	6,825
	Bushel	24	35	57

Restoration projects will continue at all three locations where fish are harvested from the existing population under this proposed addendum. The small commercial harvests proposed are not anticipated to minimize effects of restoration progress where population growth, age structure and fishing mortality are limiting factors of meeting restoration goals. While the limited commercial harvests will likely not prevent the subsequent success of these restoration programs it will delay restoration progress. Stricter biological controls and monitoring will track each population and DMR or the ASMFC Technical

Committee may reduce harvests below 15% prior to the end of the five-year period. Fisheries targeting river herring stocks that do not meet each of the sustainability targets needed for inclusion in the Maine SFMP at the end of the five-year period will close.

The benefits of the proposed small harvests are: continued community support for restoration efforts statewide, data collection, educational programs and stewardship of river herring populations that the DMR is unable to accomplish by itself or monitor on a regular basis. These continued benefits of community involvement will ultimately determine the amount of data available for DMR's and ASMFC's tracking and monitoring of river herring populations coastwide and the eventual success of these restoration programs. Furthermore, the positive effects of this proposed addendum are the continued volunteerism and local support of these fish populations.

1. Sustainability Threshold

Sustainability Definition – For the fisheries within this addendum sustainability will be defined as follows: annual release of at least 235 fish spawning fish per surface acre to provide an alewife population capable of increasing annual river herring run size; the run must demonstrate a repeat spawning ratio of 20 percent; Z-estimates of < 2.0 calculated for repeat spawning fish; an age structure that demonstrates the presence of older age fish (ages 3-7).

Monitoring to be Conducted to Support Target(s)
DMR fisheries staff will use annual escapement counts conducted by the municipality, volunteers or NGO and scale sample data (sex, age, mortality, repeat spawning, and species) to track relative health of these three river specific stocks. Additional data may come from the Bagaduce JAI survey conducted in the Bagaduce Estuary and DMR data collection and counts at these locations as time permits. Monitoring efforts will continue for all current commercial fisheries and for all directed commercial fisheries that propose to open in the future.

2. Proposed Rule-Making to Support Target(s)
Fisheries within the addendum that choose to participate in this limited fishery and do not achieve sustainability levels for spawning escapement, mortality estimates, repeat spawning ratio, age structure and run counts within 5 years will be closed. All recreational river herring fisheries will close to prevent additional harvest of spawning fish within the watershed. An assessment of each of the three fisheries in the addendum will occur prior to commencing the limited fishery the following year and once again after the conclusion of the harvest. The ASMFC Technical Committee will review restoration progress in 2022 as part of Maine's SMFP review.

3. Adaptive Management

a. Evaluation schedule

The Maine Department of Marine Resources conducts an annual review of all municipal fisheries plans. Many plans carry over year to year because they provide adequate protection for the river herring resource. However, this proposal requests an exemption from Amendment 2 sustainability requirements necessitating the need for more frequent review. Plan reviews will incorporate count data, escapement counts, spawning escapement, effort controls and results from analysis of biological data collected by the

municipality and analyzed by DMR. Plans will be reviewed at least twice each year for those municipalities in this addendum that choose this limited harvest. The first review will occur during the early summer to review data collected from the current harvest year. A second review will occur to assess downstream migration and develop harvest plans for the proceeding harvest season.

Once these fisheries meet the existing criteria in the current SFMP Addendum they will be forwarded to the Shad and River Herring Technical Committee for approval and addition to the formal SFMP. Additional runs will be proposed for a limited harvest if there is an active restoration program and the existing population can demonstrate continued growth and progress toward meeting sustainability metrics. The decision to add more waters for the Technical Committees review will be determined only after this program demonstrates that a limited harvest can occur during the restoration progress by providing three consecutive run counts greater than 235 spawning fish per acre.

b. Consequences or control rules

While the management objective within this addendum continues to recognize these populations are in recovery and any removal of spawning fish will impact production and future returns, it also at the same time recognizes tangible incentives for municipalities to continue their voluntary river herring recovery efforts. Under this addendum no harvest shall exceed 15% of the TSM measured in bushels. The TSM will be recalculated annually to incorporate changes in populations size during the five-year period. The assessment criteria used to evaluate population growth will be the same criteria used to evaluate existing commercially harvested populations. The Maine Department of Marine Resources will close those runs that do not meet the sustainability thresholds in this addendum during the five-year review period. The Maine Department of Marine Resources will reduce harvest from the allowed 15% TSM based on the following criteria used to measure progress toward achieving sustainability targets. The management responses to be taken if these sustainability standards are not met are outlined below:

1) Harvest will occur after May 18 to allow a proportion of the river herring run escape the fishery. All harvested fish must be accompanied by a receipt from the town indicating names of the seller/buyer, date, quantity and time of sale which is to be attached to the Annual Harvest Report at the end of the fishing season.

2) Towns that allow a recreational fishery must enumerate and subtract the recreational river herring harvest from their commercial catch allowance for the season. If there is a significant documented loss that occurs from poaching the commercial fishery will be closed.

3) Management changes will occur based on the following;

    A) Decreasing trends in running three-year averages of annual run counts.
    If the run demonstrates a declining trend in the running three-year average of annual run counts the fishery will close for the following year.

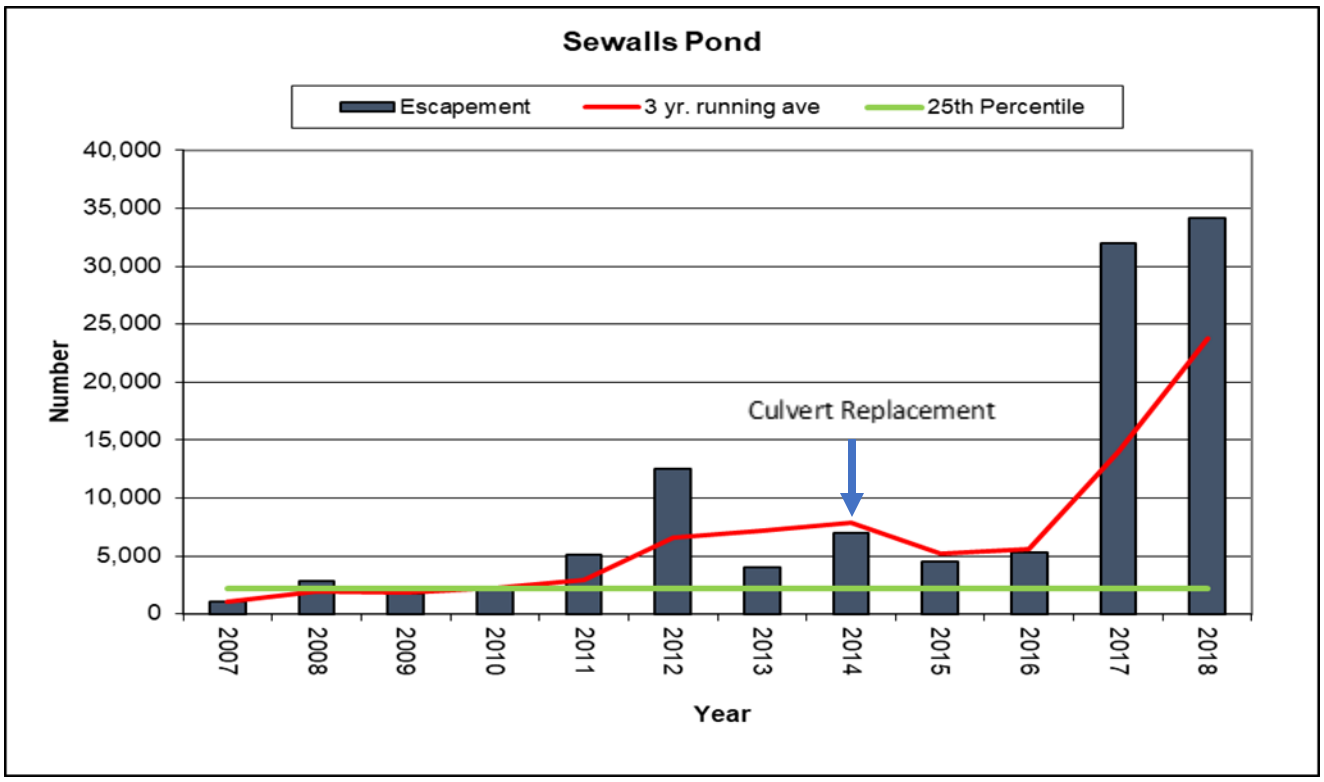
B) Increasing time series trends in total instantaneous mortality (Z) for repeat spawning fish. If the fishery does not achieve a Z-estimate of 2.0 or less for repeat spawners for the current year the fishery will be reduced by five percent of the TSM for the remainder of the five-year harvest period or until the Z-estimate falls below 2.0.

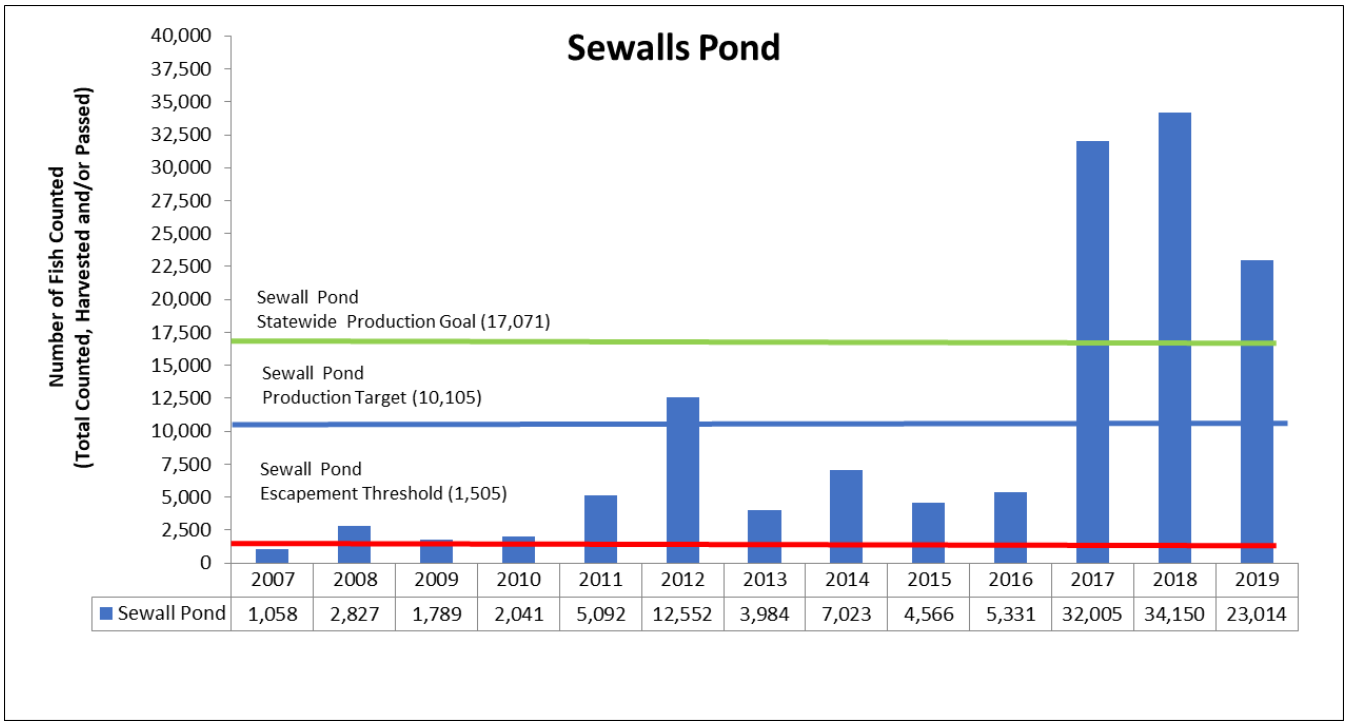
C) Decreasing time series trends in repeat spawning rates.
If the average number of repeat spawning fish for the TSM and sample year do not achieve 20 percent the fishery will be reduced by five percent for the remainder of the five-year harvest period or until either the annual repeat spawning rate or the mean for the time series exceeds 20 percent.

D) Decreasing time series trends in age structure.
River herring populations that that do not demonstrate the presence of fish ranging in age from three to seven years will be reduced by ten-percent at the end of the 2022 addendum review period.

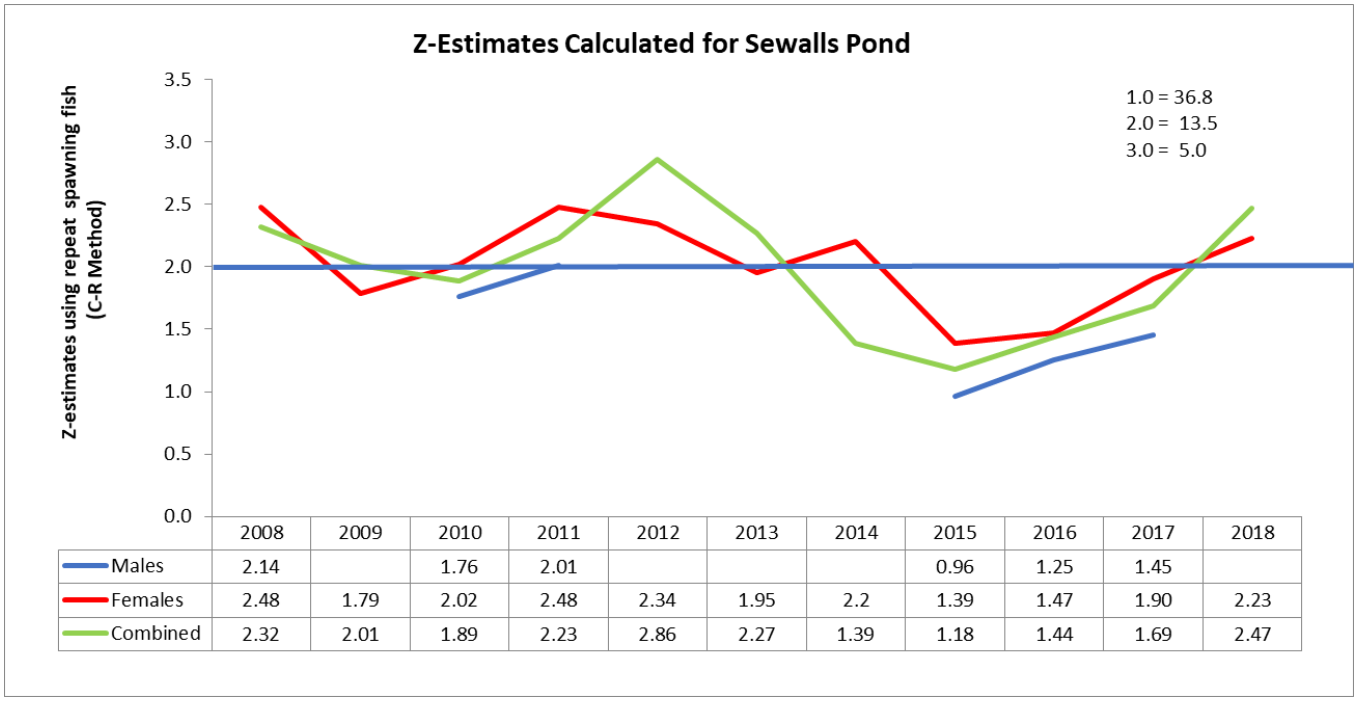
4) The release of a minimum spawning stock threshold of 235 fish/acre must be achieved annually. A commercial fishery that does not meet the minimum spawning stock escapement established for that system will be required to close the following season until fishery achieves the escapement goal for that year.

5) DMR and ASMFC Technical Committee fisheries staff will review age data, mortality rates, and repeat spawning rates and annual escapement derived from annual data collection to assess the need to suspend any fishery short of the five-year period.

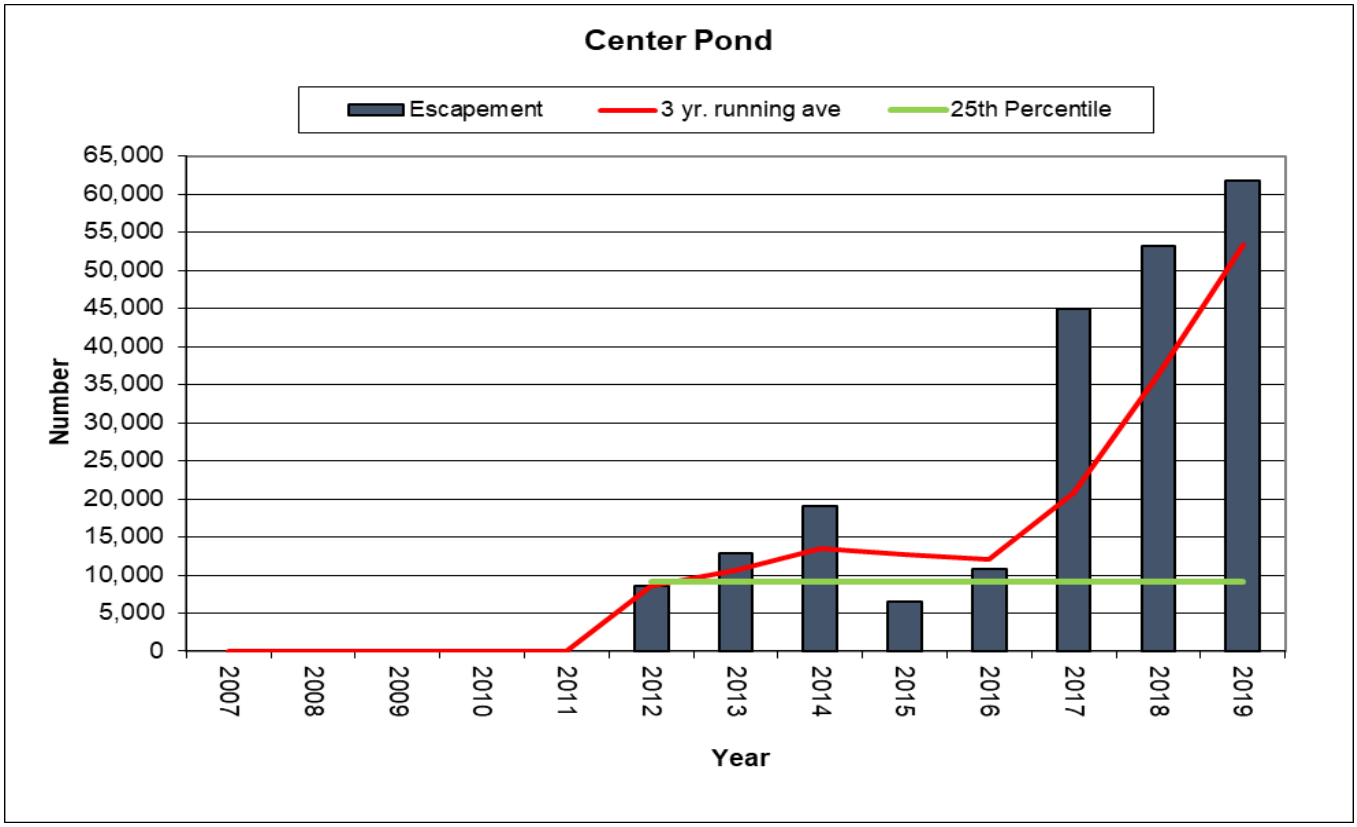


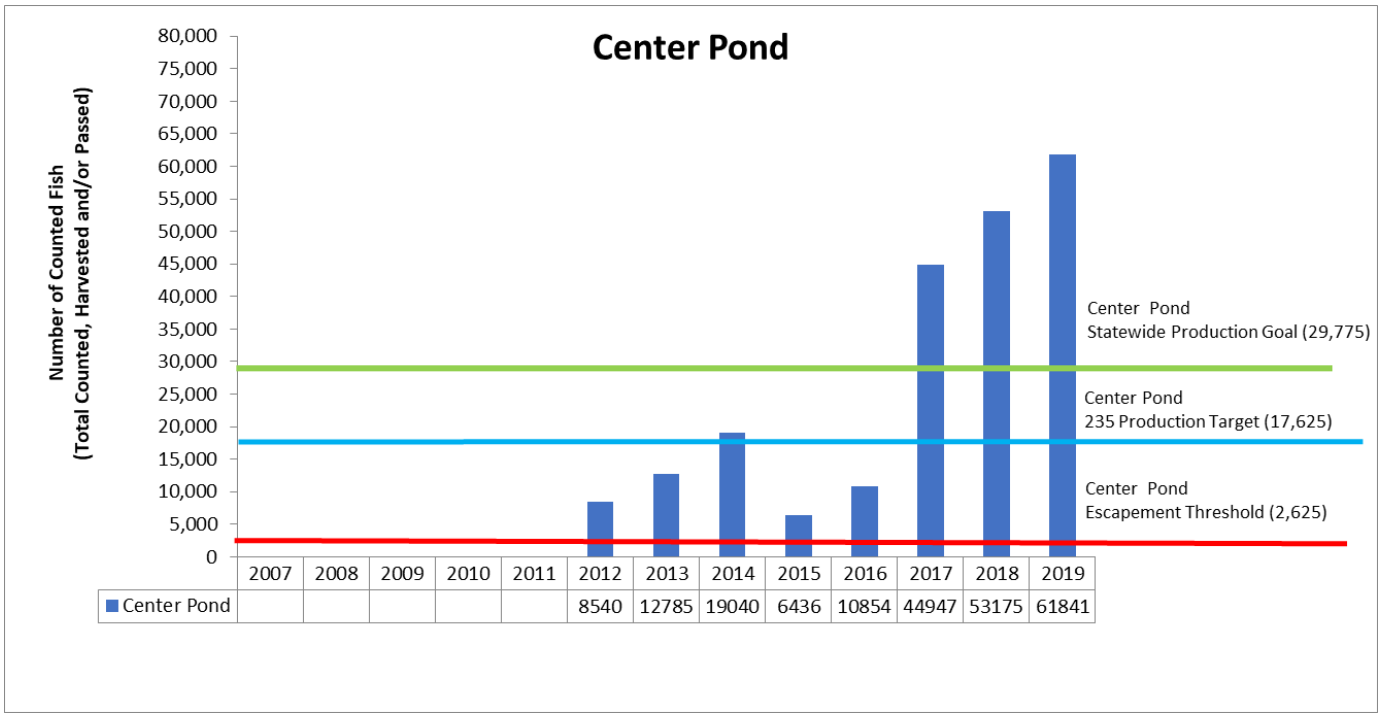


	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sewall Pond	1,058	2,827	1,789	2,041	5,092	12,552	3,984	7,023	4,566	5,331	32,005	34,150	23,014

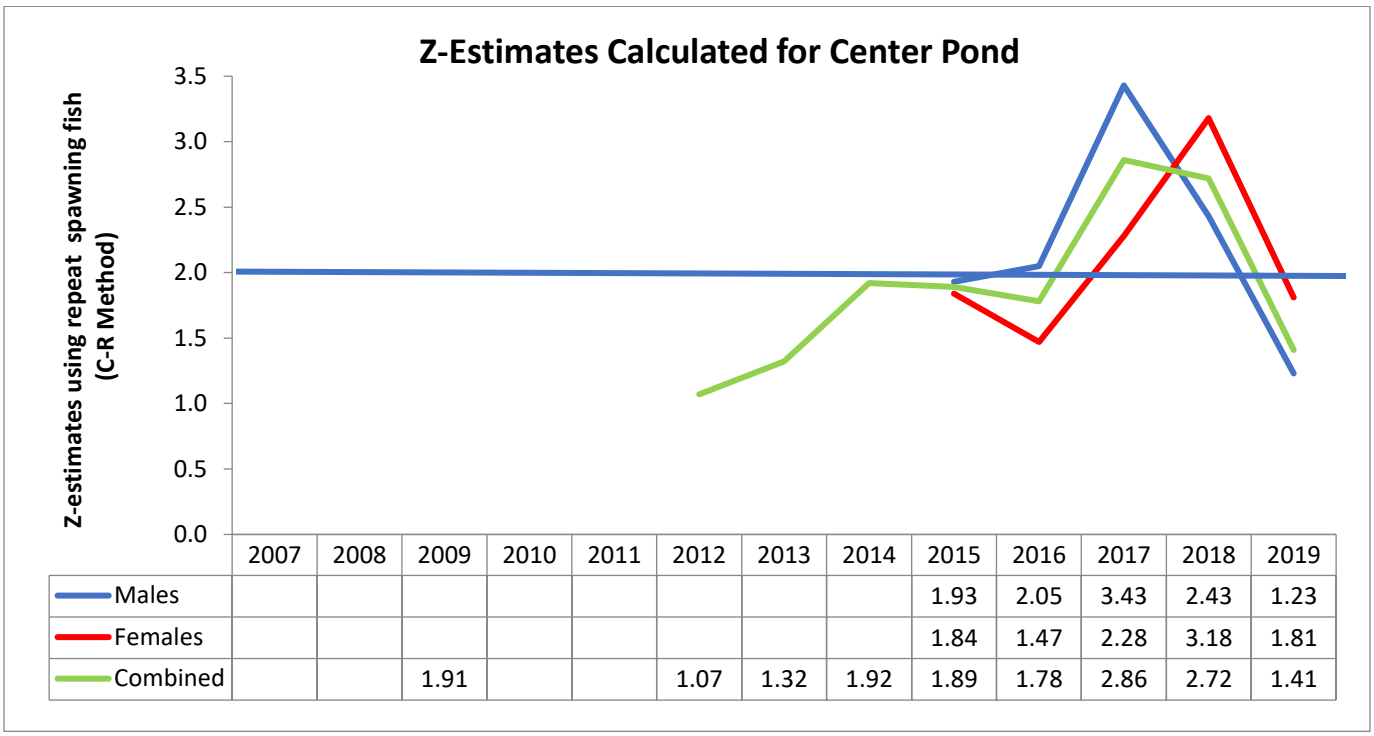


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Males	2.14		1.76	2.01				0.96	1.25	1.45	
Females	2.48	1.79	2.02	2.48	2.34	1.95	2.2	1.39	1.47	1.90	2.23
Combined	2.32	2.01	1.89	2.23	2.86	2.27	1.39	1.18	1.44	1.69	2.47

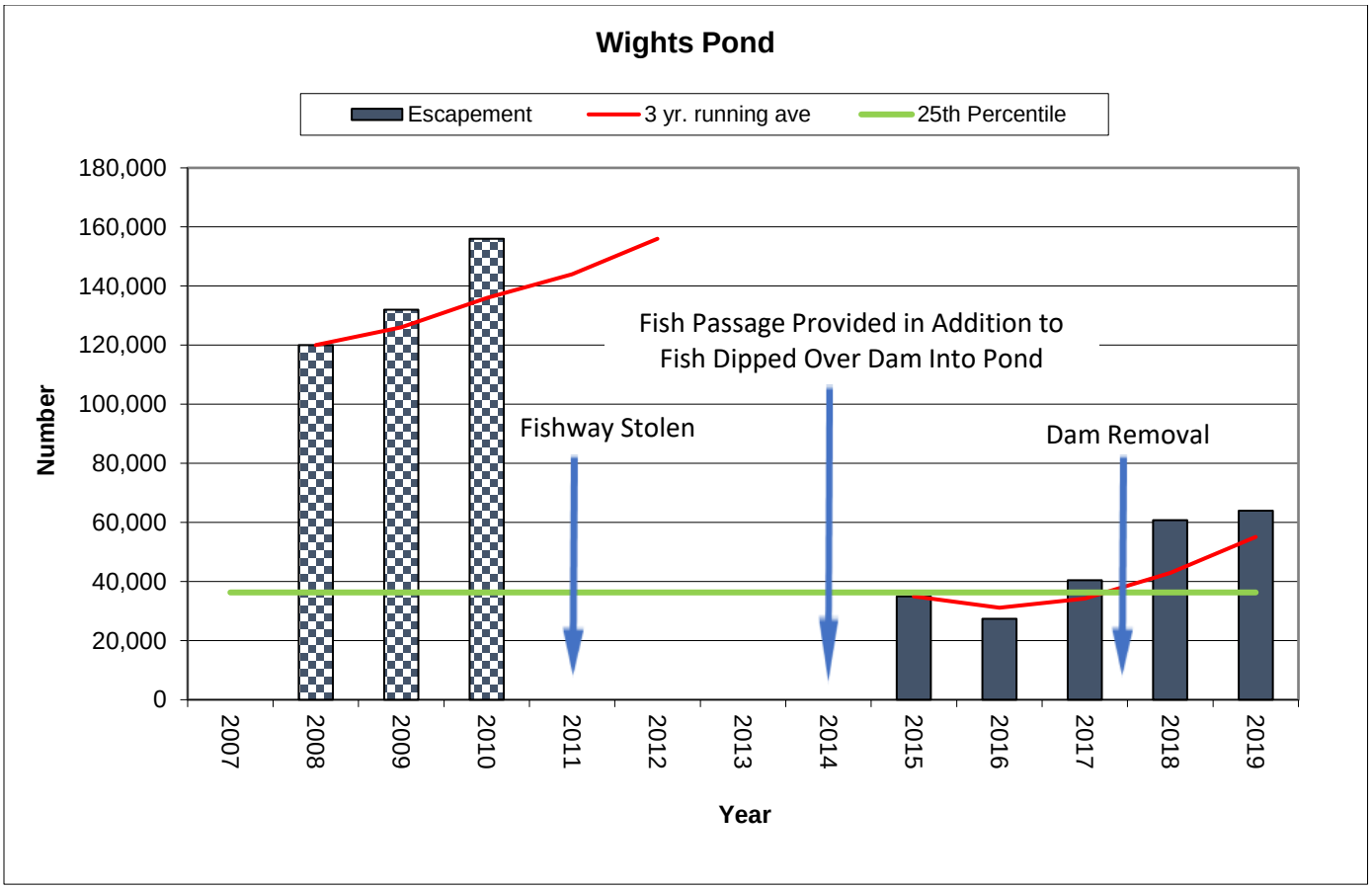


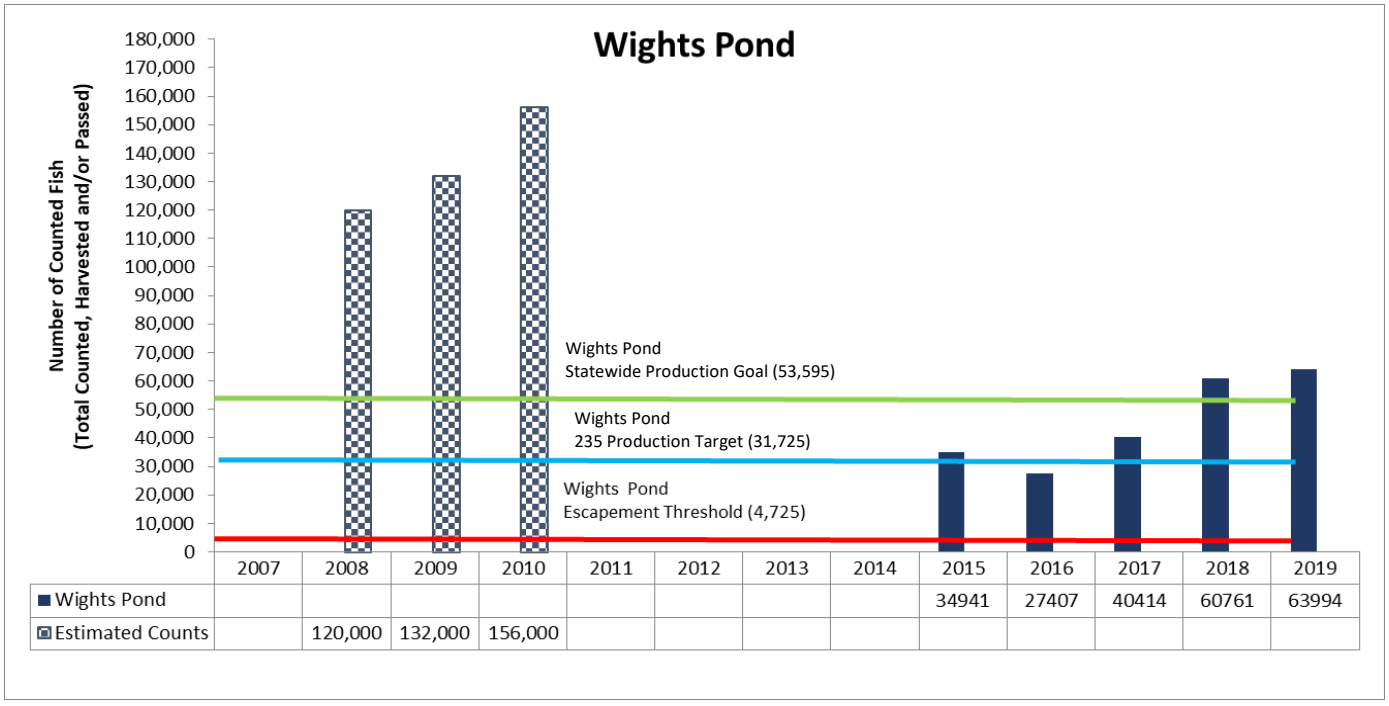


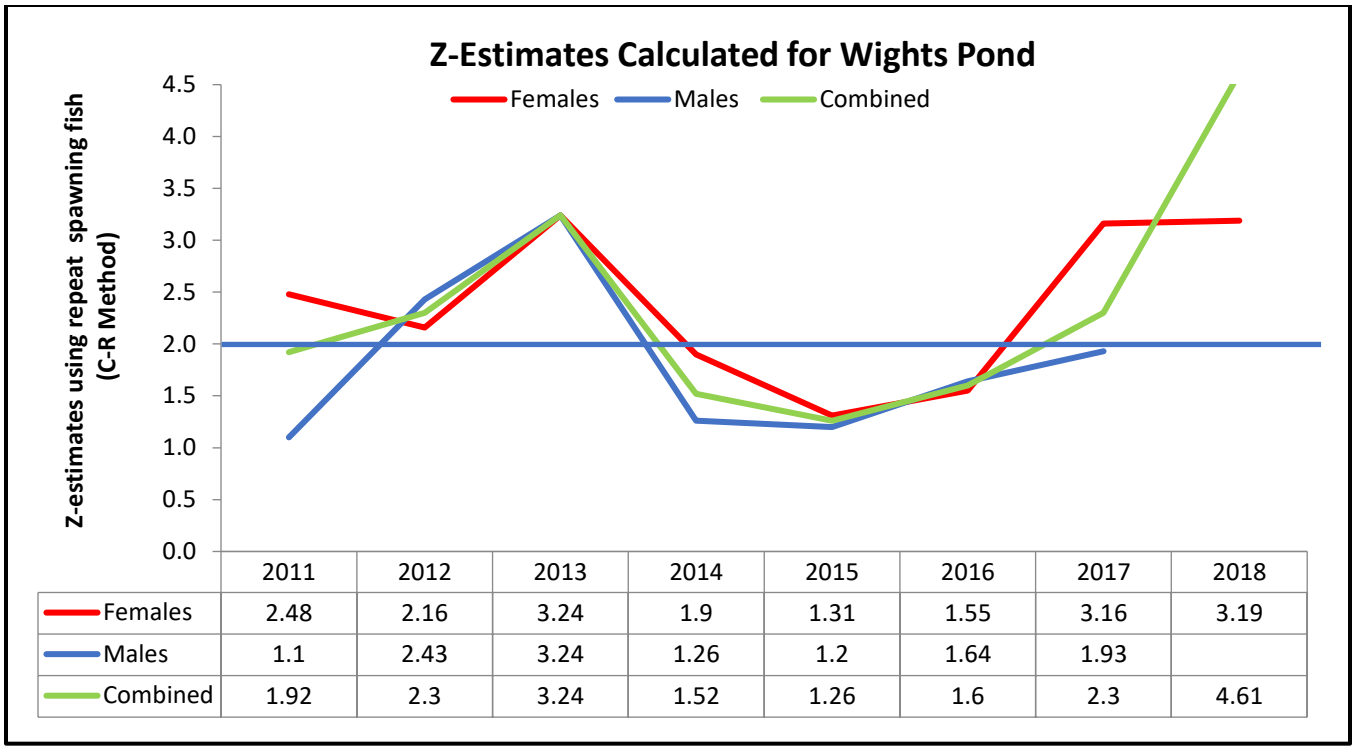
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Center Pond						8540	12785	19040	6436	10854	44947	53175	61841



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Males									1.93	2.05	3.43	2.43	1.23
Females									1.84	1.47	2.28	3.18	1.81
Combined			1.91			1.07	1.32	1.92	1.89	1.78	2.86	2.72	1.41


Wights Pond
Escapement
3 yr. running ave
25th Percentile
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Number
Fish Passage Provided in Addition to
Fish Dipped Over Dam Into Pond
Fishway Stolen
Dam Removal
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Year


Wights Pond
Number of Counted Fish
(Total Counted, Harvested and/or Passed)
180,000
170,000
160,000
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Wights Pond
Statewide Production Goal (53,595)
Wights Pond
235 Production Target (31,725)
Wights Pond
Escapement Threshold (4,725)
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Wights Pond 34941 27407 40414 60761 63994
Estimated Counts 120,000 132,000 156,000



	2011	2012	2013	2014	2015	2016	2017	2018
Females	2.48	2.16	3.24	1.9	1.31	1.55	3.16	3.19
Males	1.1	2.43	3.24	1.26	1.2	1.64	1.93	
Combined	1.92	2.3	3.24	1.52	1.26	1.6	2.3	4.61

Draft for Board Review

REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR SHAD AND RIVER HERRING *(Alosa spp.)* FOR THE 2018 FISHING YEAR

Shad & River Herring Plan Review Team
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October 2019

REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR SHAD AND RIVER HERRING *(Alosa spp.)*

I. Status of the Fishery Management Plan

Date of FMP Approval:	October 1985
Amendments:	Amendment 1 (April 1999) Amendment 2 (August 2009) Amendment 3 (February 2010)
Addenda:	Technical Addendum #1 (February 2000) Addendum I (August 2002)
Management Unit:	Migratory stocks of American shad, hickory shad, alewife, and blueback herring from Maine through Florida
States With Declared Interest:	Maine through Florida, including the Potomac River Fisheries Commission (PRFC) and the District of Columbia
Active Boards/Committees:	Shad & River Herring Management Board, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, Plan Development Team

The 1985 Fishery Management Plan (FMP) for Shad and River Herring was one of the first FMPs developed by the ASMFC. Amendment 1 was initiated in 1994 to require and recommend specific monitoring programs to inform future stock assessments—it was implemented in October 1998. A Technical Addendum to Amendment 1 was approved in 1999 to correct technical errors.

The Shad and River Herring Management Board (Board) initiated Addendum I in February 2002 to change the conditions for marking hatchery-reared alosines; clarify the definition and intent of *de minimis* status for the American shad fishery; and modify and clarify the fishery-independent and dependent monitoring requirements. These measures went into effect on January 1, 2003.

In May 2009, the Board approved Amendment 2 to restrict the harvest of river herring (blueback herring and alewife) due to observed declines in abundance. The Amendment prohibited commercial and recreational river herring harvest in state waters beginning January 1, 2012, unless a state or jurisdiction has a sustainable fishery management plan (SFMP) reviewed by the Technical Committee and approved by the Board. The Amendment defines a sustainable fishery as "a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment." Catch and release only fisheries may be maintained in any river system without an SFMP. SFMPs have been approved by the Management Board for Maine, New Hampshire, Massachusetts, New York, and South Carolina (Table 1). Amendment 2 also required states to implement fishery-dependent and independent

monitoring programs.

In February 2010, the Board approved Amendment 3 in response to the 2007 American shad stock assessment, which found most American shad stocks at all-time lows. The Amendment requires similar management and monitoring for shad as developed in Amendment 2 (for river herring). Specifically, Amendment 3 prohibits shad commercial and recreational harvest in state waters beginning January 1, 2013, unless a state or jurisdiction has a SFMP reviewed by the Technical Committee and approved by the Board. The Amendment defines a sustainable fishery as "a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment." Catch and release only fisheries may be maintained in any river system without an SFMP. SFMPs have been approved by the Board for Massachusetts, Connecticut, the Delaware River Basin Fish Cooperative (on behalf of New York, Delaware, New Jersey, and Pennsylvania), PRFC, North Carolina, South Carolina, Georgia, and Florida (Table 1). All states and jurisdictions are also required to identify local significant threats to American shad critical habitat and develop a plan for mitigation and restoration. All states and jurisdictions habitat plans have been accepted and approved.

Table 1. States with approved sustainable fishery management plans (SFMPs) for river herring or shad. Includes year of Board approval and year the Board approved the updated[1] SFMP.

State	River Herring SFMP	Shad SFMP
Maine	Approved (2010, 2017)	
New Hampshire	Approved (2011, 2015)	
Massachusetts	Approved (2016)	Approved (2012, 2019)
Connecticut		Approved (2012, 2017)
Rhode Island		
Pennsylvania		Approved* (2012, 2017)
New York	Approved (2011, 2017)	Approved* (2012, 2017)
New Jersey		Approved* (2012, 2017)
Delaware		Approved* (2012, 2017)
PRFC		Approved (2012, 2017)
Maryland		
Virginia		
North Carolina		Approved (2012, 2017)
South Carolina	Approved (2010, 2017)	Approved (2011, 2017)
Georgia		Approved (2012, 2017)
Florida		Approved (2011, 2017)

*Delaware River Basin Fish and Wildlife Management Co-op has a Shad SFMP, though Delaware and New Jersey are only states that have commercial fisheries. All states have recreational measures, with limited to no catch in the upper Delaware River (New York & Pennsylvania).

[1] SFMPs must be updated and re-approved by the Board every five years.

II. Status of the Stocks

While the FMP addresses four species: two river herrings (blueback herring and alewife) and two shads (American shad and hickory shad)—these are collectively referred to as shad and river herring, or SRH.

The most recent *American Shad Stock Assessment Report* (ASMFC 2007) identified that American shad stocks are highly depressed from historical levels. Of the 24 river-specific stocks of American shad for which sufficient information was available, 11 were depleted relative to historic levels, 2 were increasing, and 11 were stable (but still below historic levels). The status of 8 additional stocks could not be determined because the time-series of data was too short or analyses indicated conflicting trends.

Taken in total, American shad stocks do not appear to be recovering. The assessment concluded that current restoration actions need to be reviewed and new efforts need to be identified and applied. These include controlling fishing rates, improving dam passage, stocking, and habitat restoration. There are no coastwide reference points for American shad. There is no stock assessment available for hickory shad. A benchmark stock assessment was initiated in 2017 to analyze American shad stock status, with expected completion in 2020.

The most recent *River Herring Benchmark Assessment Report* (ASMFC 2012) indicated of the 24 river herring stocks for which sufficient data were available to make a conclusion, 23 were depleted relative to historic levels and one was increasing. The status of 28 additional stocks could not be determined because the time-series of available data was too short.

Estimates of coastwide abundance and fishing mortality could not be developed because of the lack of adequate data. The “depleted” determination was used instead of “overfished” because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but likely also habitat issues (including dam passage, water quality, and water quantity), predation, and climate change. There are no coastwide reference points.

The river herring stock assessment was updated in 2017 (ASMFC 2017) with additional data from 2011-2015, and concluded that river herring remain depleted at near historic lows on a coastwide basis. Total mortality estimates over the final three years of the data time series (2013-2015) were generally high and exceed region-specific reference points for some rivers. However, some river systems showed positive signs of improvement. Total mortality estimates for 2 rivers fell below region-specific reference points during the final three years of the data time series. No total mortality estimates were below reference points at the end of the 2012 stock assessment data time series. Of the 54 stocks with available data, 16 experienced increasing abundance trends, 2 experienced decreasing abundance trends, 8 experienced stable abundance and 10 experienced no discernable trend in abundance over the final 10 years of the time series (2006-2015).

III. Status of the Fisheries

Shad and river herring formerly supported the largest and most important commercial and recreational fisheries throughout their range. Historically fishing took place in rivers (both freshwater and saltwater), estuaries, tributaries, and the ocean. Although recreational harvest data are scarce, today most harvest is believed to come from the commercial industry. Commercial landings for these species have declined dramatically from historic highs. Details on each fishery are provided below:

AMERICAN SHAD:

Total combined river and ocean commercial landings decreased from a high of 2.36 million pounds in 1985 to a low of 1.4 million pounds in 1999, but increased in 2000 to 1.8 million pounds. The 2005 closure of the ocean-intercept fishery (phase out began in 2000) has substantially lowered the total coastwide landings of American shad. The total commercial landings reported in compliance reports from individual states and jurisdictions in 2018 were 304,043 pounds, a 24% decrease from landings in 2017 (398,278 pounds) (Table 2). Bycatch landings accounted for approximately 22% of the total commercial landings of American shad in 2018.

In 2018, landings from North Carolina and South Carolina accounted for 18% and 35% of the coastwide commercial fishery removals, respectively. The remainder of the directed landings came from Connecticut, New Jersey, Delaware, and Georgia. Maryland commercial fishermen are permitted a bycatch allowance of two fish per day of dead American shad for personal use, provided that shad are captured by gear legally deployed for the capture of other fish species; no sale is permitted. Landings from Virginia and PRFC are attributed to limited bycatch allowances for American Shad.

Substantial recreational shad fisheries occur on the Connecticut (CT and MA), Delaware (NY, PA NJ, and DE), Susquehanna (MD), Santee and Cooper (SC), and St. Johns (FL) Rivers. Shad recreational fisheries are also pursued on several other rivers in Massachusetts, District of Columbia, Virginia, North Carolina, South Carolina, and Georgia. Though shad are recreationally targeted in these locations, many fisheries are catch and release only. Hook and line shad catch may be thousands of fish per year, but actual harvest and/or effort is only estimated by a few states through annual creel surveys (e.g. Maryland, North Carolina, Georgia, and Florida). Harvest may only amount to a small portion of total catch (landings and discards), but hooking mortality could increase total recreational fishery removals substantially.

Since 2009, recreational harvest data from the Marine Recreational Information Program (MRIP) are generally not provided for American shad due to high proportional standard errors (PSEs). This is a result of the MRIP survey design, which focuses on active fishing sites along coastal and estuarine areas and is unsuitable for capturing inland harvest. However, Maine, North Carolina, South Carolina and Florida reported American shad recreational harvest estimates for 2018 (Table 3).

HICKORY SHAD:

In 2018, North Carolina, South Carolina, and Georgia reported directed commercial hickory shad landings; Rhode Island, Connecticut, New York, New Jersey and Virginia reported bycatch landings. North Carolina accounts for a vast majority of directed landings, contributing 91% of the total. Coastwide commercial and bycatch landings in 2018 totaled 96,968 pounds, representing a 27% increase from 2017 landings (76,643 pounds) (Table 2). Only North Carolina reported recreational harvest: 18,207 fish totaling 23,925 pounds.

RIVER HERRING (BLUEBACK HERRING/ALEWIFE COMBINED):

Commercial landings of river herring declined 95% from over 13 million pounds in 1985 to about 733 thousand pounds in 2005. Recent commercial landings continue to increase, despite the closure of the ocean-intercept fishery in 2005 and North Carolina implementing a no-harvest provision for commercial and recreational fisheries of river herring in coastal waters of the state in 2007. In 2018, directed commercial river herring landings were reported from Maine, New York, and South Carolina. Landings including bycatch in 2018 totaled 2.45 million pounds, only 1.8% more than the 2017 landings of 2.40 million pounds (Table 2). New Hampshire reported 4,113 pounds of river herring recreationally harvested for personal use by permitted coastal harvesters in 2018.

Table 2. Shad and river herring total commercial fishery removals (directed landings and bycatch[1], in pounds) provided by states, jurisdictions and NOAA Fisheries for 2018.

	River Herring	American Shad	Hickory Shad
Maine	*	*	*
New Hampshire	*	0	0
Massachusetts	173,971	*	0
Rhode Island	0	0	11,529
Connecticut	0	20,530	*
New York	*	*	*
New Jersey	0	16,960	*
Pennsylvania	0	0	0
Delaware	0	9,638	0
Maryland	0	0	0
D.C.	0	0	0
PRFC	3,372	37,820	0
Virginia	0	4,310	2,700
North Carolina	0	53,878	75,481
South Carolina	289,978	107,829	*
Georgia	0	27,484	6,010
Florida	0	0	0
Total Directed	2,257,693	236,319	82,485
Total Bycatch	187,845	49,204	14,799
Total	**2,445,538**	**285,523**	**97,284**

*Values not shown due to confidential data

[1] Available information on shad and river herring bycatch varies widely by state. Estimates may not capture all bycatch removals occurring in state waters.

Table 3. Recreational harvest estimates for American shad in 2018 (in numbers of fish) provided by states and MRIP.

State	American Shad Harvest	Source of Estimates
Maine	4,108	MRIP*
North Carolina	6,163	Recreational creel surveys on the Roanoke, Tar, Neuse, and Cape Fear rivers
South Carolina	870	Creel surveys and mandatory reporting for recreational gill netters
Florida	47	Access point creel survey on St. Johns River
Total	**11,188**	

*MRIP estimate considered highly uncertain, with a PSE of 90.8. Spatial coverage of MRIP sampling may not align with recreational harvest areas for shad. In Maine, only 3 shad were sampled in 2018 and fewer than 56 shad have been sampled since 1996.

IV. Status of Research and Monitoring

Amendment 2 (2009) and Amendment 3 (2010), required fishery-independent and fishery-dependent monitoring programs for select rivers. Juvenile abundance index (JAI) surveys, annual spawning stock surveys (Table 4), and hatchery evaluations are required for specified states and jurisdictions. States are required to calculate mortality and/or survival estimates, and monitor and report data relative to landings, catch, effort, and bycatch. States must submit annual reports including all monitoring and management program requirements on or before July 1 of each year.

In addition to the mandatory monitoring requirements stipulated under Amendments 2 and 3, some states and jurisdictions continue important voluntary research initiatives for these species. For example, Massachusetts, Pennsylvania, Delaware, Maryland, District of Columbia, North Carolina, South Carolina, and the United States Fish and Wildlife Service (USFWS) are actively involved in shad restoration using hatchery-cultured fry and fingerlings. All hatchery fish are marked with oxytetracycline marks on otoliths to allow future distinction from wild fish. During 2018, several jurisdictions reared American shad, stocking a total of 22,754,925 American shad, a decrease of 15% from the 26,647,458 shad stocked in 2017 (Table 5).

V. Status of Management Measures

All state programs must implement commercial and recreational management measures or an alternative program approved by the Management Board (Table 1). The current status of each state's compliance with these measures is provided in the Shad and River Herring Plan Review Team Report (enclosed).

Amendment 2 (2009) prohibits river herring commercial and recreational harvest in state waters beginning January 1, 2012, unless a state or jurisdiction submits a sustainable fishery management plan and receives approval from the Board. Amendment 3 (2010) also requires the development of a SFMP for any jurisdiction maintaining a shad commercial or recreational fishery after January 1, 2013 (with the exception of catch and release recreational fisheries).

States are required to update SFMPs every five years. In 2017, states reviewed their SFMPs and made changes based on fishery performance or observations (e.g., revised sustainability targets) where necessary. At a minimum, states updated data for their commercial and/or recreational fisheries and recommended the current sustainability measures be carried forward in the next plan. To date the Board has reviewed and approved updated SFMPs for all states, with the updated Massachusetts SFMP for shad being approved in February 2019.

Table 4. American shad and river herring passage counts at select rivers along the Atlantic coast in 2018. This table includes only fish passage counts required by Amendments 2 and 3.

State/River	Shad	River Herring
Maine		
Androscoggin	32	170,040
Saco	4,107	92,836
Kennebec	437	307,035
Sebasticook	26	5,579,903*
Penobscot	3,958	2,174,745
St. Croix		270,659
New Hampshire		
Cocheco	0	24,743
Exeter	0	32
Oyster	0	5,716
Lamprey	0	50,884
Taylor		**
Winnicut		0
Massachusetts		
Merrimack	29,069	449,356
Rhode Island		
Gilbert Stuart		88,080
Nonquit		32,653
Buckeye Brook		16,048
Connecticut River		
Holyoke Dam	275,232	1,061
Pennsylvania		
Schuylkill (Fairmont Dam)	624	
Pennsylvania/Maryland/Delaware		
Susquehanna (Conowingo)	6,992	60
Susquehanna (Holtwood)	1,458	0
Susquehanna (Safe Harbor)	661	0
Susquehanna (York Haven)	**	0
South Carolina		
St. Stephen Dam	320,092	140,169
Total 2018	642,688	9,404,020
Total 2017	761,386	5,876,375
Total 2016	540,917	5,514,890
Total 2015	611,368	3,825,435
Total 2014	426,073	3,031,753

*Passage after harvest removals.

**Fishway operated but not monitored. Monitoring for the Taylor River has not been required since 2015 and will not be reported in future reports.

Note: Passage numbers on Susquehanna River are cumulative and listed in ascending order of passage mile with Conowingo being nearest the river's mouth.

Table 5. Stocking of Hatchery-Cultured Alosines in State Waters, 2018.

State	American Shad	Alewife*
New Hampshire		
Lamprey River	2,442,094	
Massachusetts		
Merrimack River	288,000	
Charles River	300,000	
Rhode Island		
Pawcatuck River	2,979,802	
Pawtuxet River	1,184,673	
Pennsylvania		
Susquehanna River	2,740,679	
Lehigh River	304,362	
Schuykill River	74,174	
Delaware		
Nanticoke River	346,000	
Maryland		
Choptank River	2,010,000	
District of Columbia/PRFC		
Potomac River**	369,683	
Virginia		
James River***	0	
North Carolina		
Neuse River	669,902	
Roanoke River	2,304,279	
South Carolina		
Edisto River	38,660	
Wateree River	1,362,961	
Broad River	3,864,496	
Georgia		
Altamaha River		
Oconee River	473,775	
Ocmulgee River	388,646	
Ogeechee	612,739	
Total	**22,754,925**	**0**

*In Maine only river herring of wild origin are stocked as adult pre-spawning individuals on the Androscoggin, Kennebec and Union Rivers

**Numbers of fry stocked from combined efforts of PRFC, DC, and MD.

***In 2018, stocking efforts on the James River ceased operation.

VI. Prioritized Research Needs

Fishery-Dependent Priorities

High

- Expand observer and port sampling coverage to quantify additional sources of mortality for alosine species, including bait fisheries, as well as rates of bycatch in other fisheries to reduce uncertainty.[2]

Moderate

- Identify directed harvest and bycatch losses of American shad in ocean and bay waters of Atlantic Maritime Canada.

Low

- Identify additional sources of historical catch data of the US small pelagic fisheries to better represent earlier harvest of river herring and improve model formulation.

Fishery-Independent Priorities

Moderate

- Develop demersal and pelagic trawl CPUE indices of offshore river herring biomass.

Modeling / Quantitative Priorities

High

- Conduct population assessments on river herring, particularly in the south.[3]
- Analyze the consequences of interactions between the offshore bycatch fisheries and population trends in the rivers.
- Quantify fishing mortality for major river stocks after ocean closure of directed fisheries (river, ocean bycatch, bait fisheries).
- Improve methods to develop biological benchmarks used in assessment modeling (fecundity-at-age, sex specific mean weight-at-age, partial recruitment vector/maturity schedules) for river herring and American shad of both semelparous and iteroparous stocks.
- Improve methods for calculating M.

Moderate

- Consider standardization of indices with a GLM to improve trend estimates and uncertainty characterization.
- Explore peer-reviewed stock assessment models for use in additional river systems as more data become available.

Low

- Develop models to predict the potential impacts of climate change on river herring distribution and stock persistence.

Life History, Biological, and Habitat Priorities

[2] A prior statistical study of observer allocation and coverage should be conducted (see Hanke et al. 2012).

[3] A peer reviewed river herring stock assessment was completed in 2012 by the ASMFC.

High

- Conduct studies to quantify and improve fish passage efficiency and support the implementation of standard practices.
- Assess the efficiency of using hydroacoustics to repel alosines or pheromones to attract alosines to fish passage structures. Test commercially available acoustic equipment at existing fish passage facilities. Develop methods to isolate/manufacture pheromones or other alosine attractants.
- Investigate the relationship between juvenile river herring/American shad and subsequent year class strength, with emphasis on the validity of juvenile abundance indices, rates and sources of immature mortality, migratory behavior of juveniles, and life history requirements.
- Develop an integrated coastal remote telemetry system or network that would allow tagged fish to be tracked throughout their coastal migration and into the estuarine and riverine environments. UPDATE: currently available for American shad but not in use due to tagging mortality
- Continue studies to determine river herring population stock structure along the coast and enable determination of river origin of catch in mixed stock fisheries and incidental catch in non-targeted ocean fisheries. Spatially delineate mixed stock and Delaware stock areas within the Delaware system. Methods to be considered could include otolith microchemistry, oxytetracycline otolith marking, genetic analysis, and/or tagging.[4]
- Validate the different values of M for river herring and American shad stocks through shad ageing techniques and repeat spawning information.
- Continue to assess current ageing techniques for river herring and American shad, using known-age fish, scales, otoliths, and spawning marks. Conduct biannual ageing workshops to maintain consistency and accuracy of ageing fish sampled in state programs.[5]
- Summarize existing information on predation by striped bass and other species. Quantify consumption through modeling (e.g., MSVPA), diet, and bioenergetics studies.
- Refine techniques for tank spawning of American shad. Secure adequate eggs for culture programs using native broodstock.

Moderate

- Determine the effects of passage barriers on all life history stages of American shad and river herring. Conduct studies on turbine mortality, migration delay, downstream passage, and sub-lethal effects. UPDATE: Recent studies have been conducted by T. Castro-Santos of UMass.
- Evaluate and ultimately validate large-scale hydroacoustic methods to quantify river herring and American shad escapement in major river systems.
- Conduct studies of egg and larval survival and development.
- Conduct studies on energetics of feeding and spawning migrations of American shad on the Atlantic coast.
- Resource management agencies in each state shall evaluate their respective state water quality standards and criteria and identify hard limits to ensure that those standards,

[4] Genetic research currently underway in combination with otolith chemistry.

[5] River herring ageing workshop occurred in 2013.

criteria, and limits account for the special needs of alosines. Primary emphasis should be on locations where sensitive egg and larval stages are found.
- Encourage university research on hickory shad.
- Develop better fish culture techniques, marking techniques, and supplemental stocking strategies for river herring.

Low
- Characterize tributary habitat quality and quantity for Alosine reintroductions and fish passage development.
- States should identify and quantify potential shad and river herring spawning and nursery habitat not presently utilized, including a list of areas that would support such habitat if water quality and access were improved or created, and analyze the cost of recovery within those areas. States may wish to identify areas targeted for restoration as essential habitat.[11]
- Investigate contribution of landlocked versus anadromous produced river herring.

VII. Status of Implementation of FMP Requirements

In accordance with the Shad and River Herring Fishery Management Plan, the states are required to submit an annual compliance report by July 1st of each year. The Plan Review Team (PRT) reviewed all state reports for compliance with the mandatory measures in Amendments 2 (River Herring) and 3 (American shad). Table 6 provides important information on each state's fisheries, monitoring programs, and compliance issues pertaining to the 2018 fishing year. Table 7 summarizes state reports of protected species interactions.

De Minimis Status
A state can request *de minimis* status if commercial landings of river herring or shad are less than 1% of the coastwide commercial total. *De minimis* status exempts the state from the sub-sampling requirements for commercial and recreational catch for biological data. The following states have met the requirements and requested continued *de minimis* status in 2018:
- Maine (American shad)
- New Hampshire (American shad and river herring)
- Massachusetts (American shad)
- Florida (American shad and river herring)

State Compliance
All states with a declared interest in shad and river herring management have submitted annual compliance reports. Virginia has also submitted a separate bycatch report in accordance with the provisions of their limited bycatch program.

Most states have regulations in place that meet the intent of the requirements of the Interstate Fisheries Management Plan for Shad and River Herring. The PRT notes the following compliance issues encountered in their review of the state reports:

1. Several states continue to allow recreational harvest for shad and/or river herring in absence of an approved SFMP, though Amendments 2 and 3 require all states and

jurisdictions to submit SFMPs for systems that remain open to commercial and recreational harvest. Those states are:

- Maine: no SFMP for shad, statewide recreational creel limit of 2 fish per day
- Georgia: no SFMP for river herring, no regulations to prohibit recreational harvest of river herring
- Florida: no SFMP for river herring, statewide recreational creel limit of 10 fish for aggregated alosine species

The PRT acknowledges that the Board is aware of additional inconsistencies between state management programs and the FMP requirements. In October 2017 the Technical Committee (TC) was tasked with developing recommendations and proposed improvements to the FMP to resolve these issues.

2. Several states did not report on all monitoring requirements listed under Amendments 2 and 3 (see Table 6). A few states have consistently omitted the same information from compliance reports for the past few years (CT, NY, NC, GA). These states should take note of the required monitoring programs that were not reported and make a concerted effort to report all monitoring programs in future compliance reports. The most common omissions were: characterization of other losses, variance, characterization of recreational harvest, length and age frequency, and degree of repeat spawning.

3. Most states did not submit their monitoring data in a separate Excel file along with the compliance report, as is required by Amendment 3. If data from required monitoring is provided in a separate file, the compliance report should also indicate what data were provided.

4. In each of their compliance reports, states and jurisdictions that share monitoring should indicate which jurisdiction is responsible for the required monitoring, rather than omitting the information. In addition, separate reports could be sent for each state or jurisdiction.

5. All sections of the compliance report should be addressed, even if no changes occurred from the previous year. The PRT found it difficult to evaluate compliance when sections only included a statement of “no changes from the previous report.”

Table 6. Summary of PRT Review of 2017 State Compliance Reports.

STATE	2018 FISHERY AND MONITORING HIGHLIGHTS	UNREPORTED INFORMATION AND COMPLIANCE ISSUES
ME	In 2018, river herring passage counts were above average on the Androscoggin, Sebasticook, Kennebec, Saco, and St. Croix rivers. The JAI for alewives showed 4 of 7 river segments had above average CPUEs. MRIP estimated 45,146 American shad were caught in 2018 recreationally in Maine, with 4,108 harvested. Spawning stock analysis showed shad mortalities (1.3%) in 2018 were similar to recent years.	Maintained recreational shad fishery with bag limit of 2 fish per day, but does not have an approved SFMP for shad. There were 2 law enforcement violations in 2018.
NH	No commercial landings of river herring in 2018. Recreational creel data indicated 11,150 alewives and 0 RH were harvested in 2018. For fishery-independent river herring data, the JAI was higher in 2018 than 2017, and spawning stock assessment found an increase in the number of returning fish in 2018 as compared to 2017. For fishery-independent shad data, no JAI could be done due to 0 shad caught in seines in 2018, and spawning stock assessment found there were 0 American shad returns to NH coastal rivers in 2018. Multiple fish passage projects occurred in 2018, including the removal of the Lower Sawyer Mill Dam.	NA
MA	A record 449,356 river herring passed upstream of the Essex Dam lift. Census counting stations were established at 3 new stations. A new volunteer visual count for river herring was established at Horn Pond. Recreational creel data indicated 226 American shad trips were taken. American shad counts on the Merrimack and Connecticut rivers were below 2017 levels.	MA did not implement juvenile abundance survey in Merrimack or Connecticut rivers. In 2018, three civil violations were reported by the Massachusetts Environmental Police with two violations involving illegal possession of river herring and one violation involving illegal possession of river herring for the purpose of sale.
RI	Results of river herring counts showed increased numbers in 2018 from 2017 in the Gilbert Stuart, Nonquit, and Buckeye Brook locations. Pawtucket River JAI results for river herring indicated similar catches in 2018 (0.51) as compared to 2017 (0.6). The JAI for shad in 2018 (0.45) is similar to 2017 (0.49). Spawning stock assessments for shad in 2018 (103) were below 2017 levels (331).	Did not include harvest and losses table; no indication of other losses related to research, passage, etc. Did not report on progress in implementing habitat recommendations.

Table 6. Summary of PRT Review of 2017 State Compliance Reports.

STATE	2018 FISHERY AND MONITORING HIGHLIGHTS	UNREPORTED INFORMATION AND COMPLIANCE ISSUES
CT	Adult blueback herring collection efforts were not conducted by CT DEEP in 2018 due to funding and staffing shortages; only JAI was completed in 2018. The USFWS Connecticut River Fish and Wildlife Conservation Office (CTRFWCO) conducted a river herring electrofishing survey in 2018 to collect biological information on river herring, but data is not yet available. The river herring JAI increased this year to highest level since 2015. CT is looking to improve upstream and downstream passage at 3 main stem dams and some tributary dams of CT river. The American shad JAI was the highest among years reported (2014-2018).	For fishery-dependent monitoring, no commercial effort, size, or age composition was provided. Sex composition was provided but there was no description of how it was attained. No recreational landings, catch, or effort reported. Did not include copy of commercial and recreational regulations that were in effect.
NY	1) Hudson commercial age structure estimated using length age-key derived from 2018 fishery independent sampling. CPUE from adult FI survey is calculated, but due to variability in number of sites and river reaches sampled, staff do not feel that it is suitable as an index of relative abundance. Absolute abundance is determined via electronic count on Black creek, a tributary of Hudson. 2) There is a high percentage of males in adult FI haul seine samples. Some comparable studies demonstrate more even sex ratios for the Hudson. Staff hypothesize that females may congregate further from shore and are not as accessible to their gear; they will be looking into this further. 3) Hudson River adult spawning stock for shad is sampled by both haul seine and electrofishing boat. Data is combined for all bio-characteristic analyses, but gear bias has been investigated and will continue to be monitored. 4) From 1990-present, mortality estimates of the Hudson stock have been above the Z30 reference point. 5) The 2018 YOY index for American shad was 4.88, making this the fourth consecutive year below the recruitment failure limit.	A river herring recreational creel survey was not conducted in 2018 due to funding constraints. Did not report on progress in implementing habitat recommendations.
NJ	Both the Blueback and Alewife index obtained through the Ocean Trawl Survey were below the 30-year time series mean. For shad, the geometric CPUE index (0.66) for the Ocean Trawl Survey was below the time series average (0.78) and ranked 17th for the 30-year time series, but up from 2017 CPUE values of 0.18.	Did not include summary of regulatory or monitoring changes for the following year. Did not report on progress in implementing habitat recommendations.

Table 6. Summary of PRT Review of 2017 State Compliance Reports.

STATE	2018 FISHERY AND MONITORING HIGHLIGHTS	UNREPORTED INFORMATION AND COMPLIANCE ISSUES
PA	*River Herring*: 1) Only two blueback herring and 58 alewife herring passed Conowingo dam east fish lift. 2) 21 blueback herring and 6 alewife herring were capture in the Conowingo west fish lift. These were sacrificed for biological sampling. Sample size was too small for mortality estimates 3) Fish passage at Conowingo focused on American shad. Passage operations start too late for early stages of alewife migration. Overall passage conditions are likely not conducive to capture of river herring. 4) As us the case with almost all previous years, no river herring were captured in juvenile abundance index survey. Too few river herring pass Conowingo for successful spawning. 5) Juvenile index sampling at only one site in 2018 due to budget constraints. *Shad*: 1) 6,992 American shad passed Conowingo dam in 2018. This is less than half of the number passed in 2017. 2) Only 21% of fish passing Conowingo passed the next Susquehanna barrier, Holtwood dam. 3) 2018 shad scales from Conowingo sampling had not been read at time of reporting. 4) 38.9% of fish analyzed from Conowingo collections were hatchery origin. 5) Juvenile index effort lower this year due to funding constraints and high flow events. No juveniles were captured by this survey, continuing a trend since the early 2000s. 6) Conowingo FERC relicensing process is ongoing. Once passed, it should include inmproved standards for fish passage. 7) Final design of the York Haven nature-like fishway is still being modified.	Did not include copy of commercial and recreational regulations that were in effect.
DELAWARE BASIN COOP	Delaware River and upper bay YOY Alewife index from the Trawl Survey increased compared to 2017 index values. 2018 commercial landings of American shad attributed to NJ were up 80% over 2017 landings but still well below the 50,000 pound average captured since 2000 when the limited entry fishery went into effect. Delaware commercial shad harvest increased by 4,049 pounds but was still lower than the average 5-year and 10-year period.	Did not include summary of monitoring changes for the following year. Did not report on progress in implementing habitat recommendations.
DE	For the Nanticoke river, both the Alewife and Blueback Herring Haul Seine Survey indices were down in 2018; they were the third and tenth lowest values respectively of the 20-year time series. Juvenile shad Seine Haul (JAI) was down compared to 2017 and the adult shad electrofishing survey was the sixth lowest in the 17 year time series.	Did not include copy of commercial and recreational regulations that were in effect. Did not report on progress in implementing habitat recommendations.
MD	The alewife and blueback herring juvenile abundance index values for 2018 showed an increase over the 2017 values for all areas sampled (Upper Bay, Potomac River, Nanticoke River). The geometric mean CPUE of adult alewife and blueback herring rom Nanticoke fyke nets continues to show decline in catches. The American shad juvenile abundance index values for 2018 showed an increase over the 2017 values for all areas sampled (Upper Bay, Potomac River, Nanticoke River). Mortality rates were not calculated for Amirian shad in the Nanticoke River as a result of small sample size (n=5) and the Nanticoke River GM CPUE could not be calculated in 2018 because the Mill Creek pound net was not deployed by commercial fishermen in 2018.	NA

Table 6. Summary of PRT Review of 2017 State Compliance Reports.

STATE	2018 FISHERY AND MONITORING HIGHLIGHTS	UNREPORTED INFORMATION AND COMPLIANCE ISSUES
DC	No juvenile shad were stocked in 2018. Progress was made restoring habitat in Rock Creek through dam removal and installation of a fish ladder at the Pierce Mill Dam on Rock Creek. The geometric mean of the Seining Survey Push-Net Survey for Alosines and the Alewife CPUE for the Spawning Stock Survey both increased.	No ages calculated to conduct mortality or survival estimates.
PRFC	The 2018 young of year index values for alewife and blueback increased in comparison to the 2017 values. The Potomac River American Shad Restoration Target (31.1) was exceeded in 2018 (47.2) for the eighth year in a row. The 2018 YOY index value (7.36) saw a significant increase over 2017 (3.79). There has been a marked increase in American shad bycatch landings from the Potomac River pound net fishery in 2017 and 2018 with these two years having an average bycatch landing of 14,396 pounds. The previous 19 years (1998-2016) had an average bycatch landing of 4,306 pounds.	NA
VA	In 2018, 4,310 pounds of shad were landed as part of the small bycatch fishery. The American shad juvenile abundance index values for 2018 showed an increase over the 2017 values for all rivers sampled, excluding the Chickahominy which yielded no juvenile shad for the third year in a row.	Did not include summary of regulatory or monitoring changes for the following year. Did not report on progress in implementing habitat recommendations.
NC	North Carolina fishermen landed 53,878 pounds of shad in the 2018 directed fishery, representing a near 40,000 decrease from 2017 (92,769).	Due to budgetary constraints, Recreational Commercial Gear License harvest data for shad has not been collected since 2008. Did not include summary of regulatory changes for the following year.
SC	No management actions were triggered due to any benchmark exceedances during the 2018 fishing year. The sustainability benchmark of 0.050 for blueback herring in the Santee Cooper was not exceeded in 2018 (u=0.037). The 3 year running average harvest blueback herring on the Pee Dee River (382 kg) did not exceed the benchmark (1,000 kg). Observed sex ratios for American shad for the Santee River was 2.3 females per male and 4.9 females per male for the Waccamaw. The female-skewed sample ratios are most likely due to the marketability of females vs. males.	Did not include summary of regulatory or monitoring changes for the following year. Did not report on progress in implementing habitat recommendations. For shad and river herring, state regulations allow recreational harvest statewide, though not all systems are included in the SFMP.

Table 6. Summary of PRT Review of 2017 State Compliance Reports.

STATE	2018 FISHERY AND MONITORING HIGHLIGHTS	UNREPORTED INFORMATION AND COMPLIANCE ISSUES
GA	The 2018 population estimate of American shad in the Altamaha River in 2018 was 300,576, a 27% increase from 2017. The male:female sex ratio of American shad harvested was 1:16 from the Altamaha River; 1:334 for the Savannah River. The 5 year running average CPUE for the Savannah River in 2018 (35.51) was above the sustainability benchmark (25.5). The Savannah River American shad electrofishing catch rate increased 54% from 2017 rate.	Age data were not provided to meet the fishery-dependent monitoring requirements for the Savannah River. For river herring, state regulations allow recreational harvest though there is no approved SFMP.
FL	No commercial fishery exists for shad or river herring. Total estimated American recreational shad catch in Mullet Creel area and Puzzle Lake Creel area increased from 1,468 fish in 2017 to 5,543 fish in 2018. The total shad harvest at both sites combined was 47 fish. 350 American shad and 552 blueback herring were caught during 80 electrofishing transects on the St. Johns River. These numbers represent an increase from 2017. The season average geometric mean CPUE of blueback herring ranked 1st and 3rd in the time series for the 2 reaches of St. Johns River sampled.	For river herring, state regulations allow recreational harvest though there is no approved SFMP. For shad, state regulations allow recreational harvest statewide, though not all systems are included in the SFMP.

Table 7. Reported protected species interactions (sturgeon species) in shad or river herring fisheries. Only states listed below reported interactions.

Jurisdiction	Atlantic sturgeon		Shortnose sturgeon		Unclassified		Total by State	
	Catch	Mortalities	Catch	Mortalities	Catch	Mortalities	Catch	Mortalities
RI	*	*	*	*	*	*	*	*
CT					32	0	32	0
NJ	39	7					39	7
PRFC	1	0					1	0
VA	11	0					11	0
NC	52	4					52	4
SC	138	0	9	0			147	0
GA	19	0	42	0			61	0
Total by Species	260	11	51	0	32	0	**343**	**11**

*Rhode Island reported 2 sturgeon mortalities for 2017. Reporting lags behind by one year due to data availability from the Northeast Fisheries Observer Program.

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

September 16, 2019

To: **Shad & River Herring Management Board**

From: **Tina Berger, Director of Communications**

RE: **Advisory Panel Nominations**

Please find attached three nominations to the Shad & River Herring Advisory Panel – Mike Thalhauser with the Maine Center for Coastal Fisheries and Alewives Harvesters of Maine; Mark Amorello, a recreational fisherman from Massachusetts; and Chuckie Green, a recreational angler and Tribal Nation representative from Massachusetts. Please review these nominations for action at the next Board meeting.

If you have any questions, please feel free to contact me at 703.842.0749 or tberger@asmfc.org.

Enc.

cc: Caitlin Starks

Maine
River Herring:
Dennis L. Smith (rec. with background in alewife restoration)
P.O. Box 802
Northeast Harbor, ME 04662
Phone: (207) 288-5457
Email: rexphisn@adelphia.net
Appt. Confirmed 5/5/08
No response to March 2019 inquiry regarding continuing interest in serving on AP

Mike Thalhauser (NGO/comm)
Alewife Harvesters of Maine
13 Atlantic Avenue
Stonington, ME 04681
207.367.2708
mthalhauser@coastalfisheries.org

Shad:
Vacancy - shad rec

New Hampshire
Shad & River Herring:
Vacancy

Massachusetts
Shad & River Herring:
Mark Amorello (rec)
P.O. Box 235
Pembroke, MA 02359
Phone: 781.831.2123
markamorello@yahoo.com
Appointment pending

River Herring:
George "Chuckie" Green (rec/Mashpee Wampanoag Tribe)
483 Great Neck Road South
Mashpee, MA 02649
Phone (day): 508.477.0208, ext 138
Phone (eve): 774. 392.4979
Chuckie.Green@mtribe-nsn.gov
Appointment pending

Connecticut
Shad & River Herring:
2 vacancies

New York
Shad & River Herring:
Byron Young
53 Highview Lane
Ridge, NY 11961
Phone: (631) 821-9623
Cell: (631) 294-9612
Fax: (631) 821-9623
Email: youngb53@optimum.net
Appt. Confirmed 5/5/08
Chair from 1/09- 1/11
Confirmed interest in March 2019

New Jersey
Shad:
Vacancy – recreational

Shad & River Herring:
Jeff Kaelin (comm. trawl and purse seine)
Lund's Fisheries, Inc.
P.O. Box 440
Winterport, ME 04496-0440
Phone: (207) 266-0440
jkaelin@lundsfish.com
Appt Confirmed 8/20/09
Confirmed interest in March 2019

Pennsylvania
Vacancy

Delaware
Shad & River Herring:
2 vacancies

Maryland
Shad & River Herring:
Vacancy - recreational

Virginia
Shad & River Herring:
Vacancy
Shad:
Vacancy

North Carolina
River Herring:
Louis Ray Brown, Jr. (rec)
212 Walnut Creek Drive

Goldsboro, NC 27534
Phone (day): (919) 778-9404
Phone (eve): (919) 778-9792
FAX: (919) 778-1197
Email: lrbrown@nc.rr.com
Appt. Confirmed 5/5/08; 8/18
Confirmed interest in March 2019

Vacancy – commercial

South Carolina
Shad:
Thomas M. Rowe, Jr. (rec)
4625 Flounder Lake Drive
Meggett, SC 29449
Phone: 843-908-0247
FAX: 843-549-7575
Email: thomasmrowe@hotmail.com
Appt Confirmed 8/3/10
Confirmed interest in Sept 2017

Vacancy – commercial net

Georgia
River Herring:
Fulton Love (dealer)
6817 Basin Road
Savannah, GA 31419
Phone: (912)925-3616
FAX: (912)925-1900
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/8/99
Appt. Reconfirmed 3/19/08
No response to Sept 2017 or March 2019 inquiry regarding continuing interest in serving on AP

Florida
Shad & River Herring:
2 vacancies

Potomac River Fisheries Commission
River Herring:
Kevin L. Gladhill (rec)
21370 Mount Lena Road
Boonsboro, MD 21713
Phone (day): (301)988-6697
Phone (eve): (301)714-1074
Email: KLGladhill@myactv.net
Appt. Confirmed 5/5/08
No response to Sept 2017 or March 2019 inquiry regarding continuing interest in serving on AP

Vacancy – commercial pound net

District of Columbia
Shad:
Joe Fletcher (rec)
1445 Pathfinder Lane
McLean, VA 22101
Phone (day): (202)244-0461
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/15/99
Appt. Reconfirmed 4/21/08
No response to Sept 2017 inquiry regarding continuing interest in serving on AP

Nontraditional Stakeholders
Chair, Pam Lyons Gromen (fisheries conservation) (1/11)
Executive Director
Wild Oceans
1793 Sandy Court
Springboro, Ohio 45066
Phone: 240.405.6931
Email: plgromen@wildoceans.org
Appt. Confirmed 5/5/08
Confirmed interest in March 2019

Alison A. Bowden
Freshwater Program Director
The Nature Conservancy
205 Portland St, Suite 400
Boston, MA 02114
Phone (day): (617) 227-7017 x351
Phone (eve): (617)678-6135
FAX: (617) 227-7688
Email: abowden@tnc.org
Appt. Confirmed 5/5/08
Confirmed interest in March 2019

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Patrick Keliher (your name) State: Maine

Name of Nominee: Mike Thalhauser

Address: 13 Atlantic Ave

City, State, Zip: Stonington, ME 04681

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): (207) 367-2708 Phone (evening): _____

FAX: _____ Email: mthalhauser@coastalfisheries.org

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Shad and River Herring
   2. _____
   3. _____
   4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   yes _____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

   yes X no _____

   If "yes," please list them below by name.

Alewives Harvesters of Ma

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?
Rec Shellfish

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?
Rec fishing license

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? _____ years
2. Is the nominee employed only in commercial fishing? yes_____ no X
3. What is the predominant gear type used by the nominee?_____
4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)?_____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years
2. Is the nominee employed only in the charter/headboat industry? yes _____ no X

If "no," please list other type(s)of business(es) and/occupation(s):_____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? _____ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes _____ no X

   If "yes," please explain.

_____

_____

_____

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____years

2. Is the nominee employed only in the business of seafood processing/dealing?

   yes _____ no X If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

_____

3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

_____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? 13 years

2. Is the nominee employed in the fishing business or the field of fisheries management?
   yes ✓ no _____

   If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

_____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

I have worked in fisheries management at the stakeholder level (NGO's) and at the state management level for 13 years in Alaska and Maine.

Over the past three years, I have been working at the Maine Center for Coastal Fisheries working with three communities in their monitoring/management efforts in local river herring fisheries. I facilitate their cooperative work in these efforts and on answering research questions that they have specific to their fisheries, but that also have coast wide management/research implications. Based on this work in with communities, stakeholders, and fishermen, I have supported a dialogue around policy and management issues between this broad group and with research and management entities. My work in this role will also build on those relationships that I have made, and my understanding of river herring issues at these levels.

Nominee Signature: _____ Date: 6/12/2019

Name: Mike Thalhauser
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

_____
State Director

_____
State Legislator

_____
Governor's Appointee

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by David Pierce (your name) State: MA

Name of Nominee: Mark Amorello

Address: P.O. Box 235

City, State, Zip: PEMBROKE MA 02359

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 781-831-2123 Phone (evening): 781-831-2123

FAX: 781-293-4798 Email: markamorello@yahoo.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.

   1. shad & river herring
   2. _____
   3. _____
   4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

□yes ☒no

3. Is the nominee a member of any fishermen's organizations or clubs?

☒yes □no

If "yes," please list them below by name.

Fort Pierce Fishing Club, Florida

IGFA

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Red Fish, Trout

Striped Bass

Tuna

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

Same As Above

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business?

2. Is the nominee employed only in commercial fishing? □yes □no

3. What is the predominant gear type used by the nominee? _____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____

2. Is the nominee employed only in the charter/headboat industry? □yes □no

If "no," please list other type(s) of business(es) and/occupation(s):

_____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

_____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 50+ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? ☒yes □no

If "yes," please explain.

CURRENTLY PEMBROKE HERRING COMMISSION, SUPERINTENDENT ICCAT, MA. MARINE FISHERY COMMISSION,

_____

FOR SEAFOOD PROCESSORS & DEALERS:

- How long has the nominee been employed in the business of seafood processing/ dealing? _____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

□yes □no

If "no," please list other type(s) of business(es) and/or occupation(s):

_____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

_____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

- Is the nominee employed in the fishing business or the field of fisheries management? □yes □no

If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Nominee Signature: _____ Date: 7/27/2018

Name: MARK AMORELLO
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

_____ _____

State Director

State Legislator

Governor's Appointee

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by David Pierce State: MA
(your name)

Name of Nominee: George "Chuckie" Green

Address: 483 Great Neck Road South

City, State, Zip: Mashpee Ma. 02649

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): (508) 477-0208 EXT138 Phone (evening): (774)392-4979

FAX: (508) 477-1218 Email: Chuckie.Green@mwtribe-nsn.gov

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. river herring & shad
   2. _____
   3. _____
   4. _____
2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   ☐yes ☒no
3. Is the nominee a member of any fishermen's organizations or clubs?

   ☐yes ☒no

If "yes," please list them below by name.

_____ _____

_____ _____

_____ _____

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

_Herring (blue backs and alewives) ____ _Striped Bass, Blue fish, Scup and trout

_Large and Small-Mouth Bass_____ Oysters, Scallops, Mussels _____

Summer and winter Flounder,White Perch__ _Quahog, soft shell clams__

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

____see above_____ _____

_____ _____

_____ _____

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business?
2. Is the nominee employed only in commercial fishing? ☐Yes ☐no
3. What is the predominant gear type used by the nominee? _Shellfish Aquiculture gear _

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____
2. Is the nominee employed only in the charter/headboat industry? ☐yes ☐no

   If "no," please list other type(s) of business(es) and/occupation(s): _____
3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

   _____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? _60_ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? ☒yes ☐no

   If "yes," please explain.
   __See page 4_____

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

   ☐yes ☐no
   If "no," please list other type(s) of business(es) and/or occupation(s):

   _____

3. How many years has the nominee lived in the home port community? _63____ years

   If less than five years, please indicate the nominee's previous home port community.

   _____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _60_ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
   ☒yes ☐no

   If "no," please list other type(s) of business(es) and/or occupation(s):

   _____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

My name is George "Chuckie" Green I am the Director of Natural Resources for the Mashpee Wampanoag Tribe a hunting, fishing gathering culture. I am also a Conservation District Supervisor for the Cape Cod Conservation District. I am the Massachusetts Representative to Regional Tribal Conservation Advisory Committee to NRCS. I have just completed 8 Years on the Regional Planning Body for the Oceans under the National Ocean Council
River Herring are a staple of the Wampanoag people's diet and culture so it is my duty to support the development of plan to maintain populations and restore habitat.

Nominee Signature: _____ Date: 8/10/18

Name: George F Green Jr
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

_____
State Director

_____
State Legislator

_____
Governor's Appointee