

**PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
SHAD AND RIVER HERRING MANAGEMENT BOARD**

**The Westin Alexandria
Alexandria, Virginia
August 2, 2017**

Approved October 17, 2017

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1. **Approval of Agenda** by Consent (Page 1).
2. **Approval of Proceedings of February, 2017** by Consent (Page 1).
3. **Move to approve the South Carolina Sustainable Fishery Management Plan (SFMP) for river herring and the Florida SFMP for shad inclusive of the Technical Committee recommendations** (Page 12). Motion by Jim Estes; second by Malcolm Rhodes. Motion passes unanimously (Page 12).
4. **Move to approve the 2016 FMP Review of the 2015 fishing year and approve *de minimis* requests for Maine, New Hampshire, Massachusetts, and Florida for shad; and *de minimis* requests for New Hampshire and Florida for river herring** (Page 14). Motion by Michael Armstrong; second by Cheri Patterson. Motion passes unanimously (Page 14).
5. **Move to adjourn** by Consent (Page 14).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Cheri Patterson, NH, proxy for D. Grout (AA)	Roy Miller, DE (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Lynn Fegley, MD, proxy for D. Blazer (AA)
Ritchie White, NH (GA)	Rachel Dean, MD (GA)
Mike Armstrong, MA, proxy for D. Pierce (AA)	Allison Colden, MD, proxy for Del. Stein (LA)
Raymond Kane, MA (GA)	Kyle Schick, VA, proxy for Sen. Stuart (LA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Cathy Davenport, VA (GA)
Mark Gibson, RI, proxy for J. Coit (AA)	Rob O'Reilly, VA, proxy for J. Bull (AA)
David Borden, RI (GA)	Michelle Duval, NC, proxy for B. Davis (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	David Bush, NC, proxy for Rep. Steinburg (LA)
Justin Davis, CT, proxy for M. Alexander (AA)	Sen. Ronnie Cromer, SC (LA)
Sen. Craig Miner, Ct (LA)	Malcolm Rhodes, SC (GA)
John McMurray, NY, proxy for Sen. Boyle (LA)	Ross Self, SC, proxy for R. Boyles (AA)
Jim Gilmore, NY (AA)	Pat Geer, GA, proxy for Rep. Nimmer (LA)
Emerson Hasbrouck, NY (GA)	Rep. Thad Altman, FL (LA)
Heather Corbett, NJ, proxy for L. Herrighty (AA)	Spud Woodward, GA (AA)
Tom Fote, NJ (GA)	Jim Estes, FL, proxy for J. McCawley (AA)
Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA)	Martin Gary, PRFC
Andy Shiels, PA, proxy for J. Arway (AA)	Sherry White, USFWS
Loren Lustig, PA (GA)	Derek Orner, NMFS
John Clark, DE, proxy for D. Saveikis (AA)	

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

Ex-Officio Members

Brad Chase, Technical Committee Chair

Staff

Bob Beal	Jeff Kipp
Toni Kerns	Katie Drew
Kirby Rootes-Murdy	

Guests

Arnold Leo, E. Hampton, NY

The Shad and River Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Edison Ballroom of the Westin Hotel, Alexandria, Virginia, August 2, 2017, and was called to order at 8:00 o'clock a.m. by Chairman John Clark.

CALL TO ORDER

CHAIRMAN JOHN CLARK: This is the first part of our diadromous double header here. We're going to start with Shad and River Herring; and welcome to the meeting. I'll just give everybody a second to settle in here.

APPROVAL OF AGENDA

CHAIRMAN CLARK: Do we have any changes to the agenda? Seeing none; the agenda is approved.

APPROVAL OF PROCEEDINGS

CHAIRMAN CLARK: Do we have any changes or questions about the minutes from the previous meeting? Seeing none; the minutes are approved.

PUBLIC COMMENT

CHAIRMAN CLARK: We're on to Item 3, which is Public Comment, and we have been asked by Jeff Pierce to give a comment here; so Jeff, do you want to go up to the public microphone?

MR. JEFFREY PIERCE: Good morning, Chairman Clark, distinguished members of the Shad and River Herring Board. My name is Jeff Pierce. I'm the founder and Executive Director of the Alewife Harvesters of Maine. My comments today are just a few for consideration for both this Board and the Technical Committee. Maine over the last decade has opened up thousands of acres of rivers and stream habitat through the removal of several large dams.

There are many river restoration projects going on in different communities to restore fish passage. Citizen scientists, conservation

committees, local select boards and universities are working with like associations, Maine's Department of Marine Resources and other stakeholders to get many alewife and blueback herring collectively known as river herring, back into their native spawning ground.

Maine Department of Transportation has also been working diligently on stream passage, with a culvert replacement program; which recently gained approval for additional funding from the Maine State Legislature. These are just a few examples of the positive conservation restoration efforts going on in Maine and Massachusetts.

There are similar restoration efforts going on with citizen scientists and the other local community efforts. Many of us hope that the Technical Committee will take into consideration the social and economic effects of the community effort on river herring restoration; when they bring proposals to harvest river herring, and consider all the benefits and the aspects of this culturally important fishery, including basing their decisions on hard scientific data.

Allowing small scale commercial and education harvest builds good will when it comes time for municipal leaders to allocate funding for critical restoration work in their communities. Thank you for this opportunity to make public comment; and I would be happy to answer any questions you may have at this time.

CHAIRMAN CLARK: Thank you, Jeff. I'm sure Commissioners can talk to you after the meeting here; and get up with you on that. Thanks.

REVIEW OF RIVER HERRING STOCK ASSESSMENT UPDATE

CHAIRMAN CLARK: Okay, we're going to move on to Agenda Item 4; which is to Review the River Herring Stock Assessment Update, and for

that I'll turn it over to Technical Committee Chair, Brad Chase.

MR. BRAD CHASE: Good morning. I'm going to run through the river herring stock assessment update. I would like to start by thanking the Stock Assessment Subcommittee for all their good work to put this together. It was really a challenging endeavor; given all the different data sources they had to look at, and also a difficult time of the year.

I want to thank the staffers as well, for helping out; Jeff Kip, Kirby, and Ashton Harp for all the work they did to shepherd us through the SAS, as well as the TC review. I'll go through the background. It presents some of the data results, focusing on the abundance data, the biological metrics, and total mortality estimates; and then will finish up with a conclusion.

The SAS had recommended that trend analysis were updated after five years beyond the stock assessment in 2012, and that a newer benchmark assessment would be conducted in ten years from now in 2022. The feeling was that a full assessment really wasn't warranted at this point in time, because the variability in the indices from the previous assessment, and also there has been a number of changes that have occurred.

A number of states have put in harvest bans. There has been a fair amount of restoration activity to restore access to historic spawning grounds, and we've had a number of sustainable fishery management plans that have been enacted; so it was felt that it would be too soon to conduct the assessment after just five years with all this activity; and given the life history of river herring.

River herring management should really ideally be conducted on a river specific basis. This is difficult because there are so many individual systems, and also these stocks do mix in the

marine environment; so you have a diadromous life history, which is complicated to produce a coastwide stock assessment.

You also have challenges in that you have different data quality among the river systems; and some systems have no data at all. Then again, you have limited information coming from the mixed stock ocean bycatch; where it is difficult to relate what happens at sea to back to the river specific stocks.

Instead of a coastwide model approach, it is more of a trend analysis. The most common trend analysis used is Mann-Kendall. The benchmark also produced reference points of total mortality; and this was repeated. There were several catch-at-age-population models conducted, one for Monument River in Massachusetts, and the Chowan River in North Carolina; and these were updated, but they did not factor heavily into the update.

They will be continued, and there was also a depletion-based stock reduction analysis that was conducted for the benchmark; but this was not endorsed by the Peer Review Panel, so it was not updated. So 57 river systems were evaluated on the east coast, of these 26 percent had complete or useable data. The SAS looked at nine categories of fishery independent and fishery dependent data by species; both blueback and alewife, harvest data, age, length, weight, repeat spawner ratios, and then adult juvenile and catch-per-unit effort fishery independent and dependent indices. A large majority of these did occur in New England states.

I'll run through like I guess the next slide, sorry about that. The benchmark was updated through 2015, so the update period was 2011 to 2015; and datasets that were reviewed for the benchmark that were found to be too brief, but had reached ten years by 2015, were included this time around. But in effect that was just the addition of one data series.

Overall the update lost data series as several datasets were discontinued, due to management actions, unreliability in the data sources, or lack of returning fish. To briefly mention commercial landings. Coastwide landings have been stable since the benchmark. The upper graph shows historical landings going back to about 1880.

I think we're all familiar with that large peak that occurred in the '50s, '60s, and '70s as domestic fleets went offshore fishing for sea herring and mackerel, and caught river herring as bycatch; and also foreign fleets came in as well, and led to really high landings in that period. Those landings declined sharply in the 1980s and you can see that red circle in the far right; that is where we are today.

Fairly stable landings since 2006, at about 1.4 million pounds, and the SAS felt that this information might have reduced utility, because we've had a number of harvest moratoria in place since then. Either way it does show stability in the benchmark period. Most of those commercial landings are occurring in Maine spawning run fisheries, or bycatch in offshore fisheries.

The incidental ocean bycatch has been stable, well I wouldn't say stable, but has been reduced since the benchmark. For the most recent period it's been 227 metric tons has been the average; which is about half of what it was in 2005 to 2010, where it was near 500 metric tons. Again, the impact of this catch on stock status is largely unknown; because we can't relate the mixing at sea very well back to river specific stocks.

I think it is good news to see that graph declining. A lot of folks have worked hard to try to gain more information on ocean bycatch; and we are seeing that reduction in recent years. Following a framework that was established during the benchmark, which was a consensus-

base-expert-opinion framework to evaluate trends.

Trends were updated for abundance and total mortality. The terminal five-year trends that were determined during the benchmark were updated, and evaluated for the final ten years of the data series; which is 2006 to 2015. We'll go through those trends now. These trends are also summarized in Table 1 of the assessment update report.

I'll start with commercial catch-per-unit effort data. This shows the series that are presently active in dark lettering. The ones that have been discontinued are crossed out in red. For commercial CPUE there are just three series that are present. There were ten series before, and these have been discontinued for various reasons. What I'll do is show the trends; and you can see the arrow here. The SAS assigned trends of increasing, decreasing, stable, no trend due to high variability, or unknown. The symbols next to the trends, symbol RH means both alewife and blueback combined. A for alewife, B for blueback, and so these are the three commercial series, and you can see the Hudson River is increasing and the other two are stable. For run size data, quite a few states have counts on spawning run counts.

You can see that four series have been discontinued since the benchmark. You can also see there are very few south of New England. Here are the trends. It's a fairly mixed bag; but what you can see is there are none of these that are declining in this period of 2006 to 2015. For blueback, one is increasing, four have no trends. For alewife, six are increasing, eight have no trends.

Then combined series four increasing, two are stable. For this ten year period we have a general increasing trend with spawning run counts. Young of the year fishery independent survey data, nine states have these data surveys. Here are the trends. Again, it's mixed.

For blueback two are increasing, six have no trend.

For alewife, one is decreasing and six have no trend; and for combined species there is one with no trend. Fishery independent trawl survey data, there are five states that have these trawl surveys; then you have the New England Fisheries Science Center Bottom Trawl Survey that covers that large area in blue.

These are showing a fairly stable picture. A few of these are increasing. Three alewife are increasing, three with no trend for alewife. Blueback has one decreasing, one increasing, and four with no trend; fishery independent and fishery dependent length data, so we have quite a few series here. In this case mean length has either declined or is showing no significant trends for all rivers examined.

None of these mean length series are increasing. You have significant declines for alewife by sex in four of the nine river systems and the trawl survey, and significant declines for the blueback by sex in six of the nine systems examined. These results are fairly consistent with the benchmark period, and somewhat lower in some cases than historic data. A similar pattern is seen for max length data as well.

The fishery independent and fishery dependent age data, we have fewer data series. There are six states that have this information, with one series dropping out since the benchmark. If you combine these data there is 112 river specific age and species combinations; and 26 of these have reversed their significance from the benchmark analysis.

But the pattern is similar to mean length. In most cases mean length at age is declining; and each river has at least one age where there is decline in a mean length at age. Although there is this modest declining pattern; the coastwide pattern shows little change since the

benchmark. Fishery independent and fishery dependent repeat spawner data, six states have these. Two of these have dropped out since the benchmark.

Repeat spawner data is very similar to mean length. These have all declined or showed no significant trend in all rivers examined. Significant declines have occurred for alewives by sex in four of the ten rivers examined for blueback; it is significant declines in two of the five rivers, and again the results are similar to the benchmark and it's a declining trend relative to historic data in some of these systems. These biological indicators that reflect on total mortality are showing a general decline; whereas the empirical estimates for total mortality have a little different story. These states either age otolith or scales for river herring. One of these series has dropped out since the benchmark. Here we have a fairly stable picture with three of these series declining in this period. Three have no trend, alewife has three decreasing, and seven have no trend.

Again, a slight decline in some of the series for the empirical total mortality estimates; whereas it is the opposite view for some of the biological indicators for total mortality. The SAS also produced Z benchmarks, and they used the spawning potential ratio; which looks at the total mortality rate that would reduce a spawning stock biomass to a specified percent of a virgin or unfished spawning stock biomass.

The SAS for the benchmark assessment picked a Z of 20 percent SPR, and a Z of 40 percent SPR to develop these reference points. The Peer Review looked at this and they recommended using the natural mortality rate of 0.7, and the preferred the Z at SPR 40 percent. This was repeated for the update. For the update Z continued to be high for most of the stocks.

They looked at the three-year-terminal average for observed Z values, and they looked at the 40

percent SPR value. For 12 of the 14 stocks that had available data, they were above that benchmark. During the benchmark assessment with the three-year average, there were 18 stocks that had available data; and all these were above the Z at 40 percent benchmark.

Recent Z values are not available for three stocks; due to lack of returning fish or aging errors. There are fewer series to look at. The picture improves slightly, but overall the mortality estimates were well above the reference point in most cases. To conclude, most data evaluated reflected conditions that were similar to the benchmark stock assessment.

Most of the fishery independent indices indicate inter-annual variation below stock size, and that more time is needed to reflect large scale changes in abundance. There were some positive trends; particularly in the spawning run counts in trends of abundance, particularly in the northeast. It's also interesting to point to trends in total mortality estimates and biological indicators of mortality were often in conflict.

Given the conflicting results for mortality estimates, conclusions about mortality remain uncertain. However, in comparison to reference points, some rivers have total mortality in recent years that may be unsustainable. Overall there were 16 of the 54 stocks that were reviewed for 2006 to 2015 that had increasing abundance trends.

Two were decreasing, 8 were stable, 10 experienced no discernible trend due to high variability, and 18 did not have enough data to assess recent trends. The coastwide status was determined to be depleted. There were positive signs that were apparent, but the information indicates the status of the river herring meta-complex population being depleted to near historic low remains

unchanged since the benchmark stock assessment.

The depleted status indicates that there was evidence for declines in abundance due to numbers of factors such as predation, river mortality, fishing; but the relative importance of these factors in reducing river herring stocks could not be determined. I just wanted to mention that we have now in the river herring management there are five states that have approved sustainable fishery management plans. Maine has the largest number at 20. New Hampshire has several rivers in Great Bay. Massachusetts and New York have one each; and South Carolina has two, which we'll review shortly today. I would be happy to take any questions.

CHAIRMAN CLARK: Thank you, Brad. Do we have any questions for Brad about this presentation; first up, Emerson then Jim?

MR. EMERSON C. HASBROUCK: Thank you, Brad, for your presentation. I have two questions, Mr. Chairman. Can I ask them both? I have two questions, is that okay?

CHAIRMAN CLARK: Yes, sure.

MR. HASBROUCK: One is, and you went by it pretty quickly. It was towards the end of your presentation. Did you say that some rivers have total mortality? Did you say that some river systems have total mortality?

MR. CHASE: Yes, do you want to go back to that slide? There are several rivers that have estimates of total mortality.

MR. HASBROUCK: There have got to be some fish that return though, right?

MR. CHASE: No, the total mortality estimate is based on age structure of scales, otoliths that produce an estimate of the total mortality for that population, for that river specific

population. It's an estimate of the percent that would survive or die for that population.

MR. HASBROUCK: That's interesting. My other question is I noticed in the trawl surveys you didn't mention the NEMAP Survey. Do they not encounter any river herring?

MR. CHASE: I can't speak for if they do or they don't; but all data series that were available for the east coast were evaluated by the SAS, and they selected ones that were suitable for the update. I can't comment on that particular survey.

CHAIRMAN CLARK: Next up, Jim.

MR. JAMES J. GILMORE, JR.: Brad that was a great presentation. What happened in the Mid-Atlantic when we lost all those surveys is kind of interesting. I'm just wondering if there are other surveys, particularly like in New York we have I know at least three other surveys that are going on, on Long Island; the Peconics, we've gotten after Hurricane Sandy there was a breach.

Now the Clemons River is being monitored, and there have been fish ladders put into all that place, so there is like a whole new set of data; and I would be assuming up and down the coast. It doesn't look like that got incorporated; but is there may be a plan to get that in the future; because that seems to be a broader dataset that maybe we're not tapping at this point.

MR. CHASE: Yes, I think that is the intention of the SAS. There are many rivers on the east coast that are monitored presently; and the SAS looked at all the data available. The rule of thumb they're using is they want to see ten years of data. When a data series reaches that point, it will be considered. I think that as these data collection efforts mature, we'll see a number of series come to use; which will benefit the assessment.

CHAIRMAN CLARK: Next question is Roy Miller.

MR. ROY W. MILLER: Brad, you stated that the estimates of Z, total mortality, exceeded the benchmark in a number of cases. Do you have any feeling for how much of that Z is caused by offshore fisheries as opposed to inshore environmental factors and/or inshore harvest?

MR. CHASE: It's an excellent question, and it is a source of a lot of uncertainty with the assessment. You really can't separate those sources of mortality from those estimates. We just don't have that information. I think it's a good reference point to look at and to monitor going forward; and I think there are studies that are underway to try to get at that question of how to separate mortality sources. But presently it is not possible.

CHAIRMAN CLARK: Do we have any further questions for Brad? Seeing none; thank you very much for the excellent presentation, Brad.

TIMELINE FOR THE SHAD STOCK ASSESSMENT UPDATE

CHAIRMAN CLARK: Our next agenda item is the Timeline for the Shad Stock Assessment Update; which will be given by Jeff Kipp.

MR. JEFF KIPP: I just have a brief update on the next assessment for American shad, which was determined to be an update for 2018. The TC met, and they initially recommended an update of the most recent benchmark stock assessment, which was conducted in 2007. The reason cited for remaining with an update versus a benchmark stock assessment.

The primary reasons were, the short time series of new monitoring efforts that have come online since Amendment 3 was implemented are probably still too short to be used in a benchmark; similar to what we just discussed for river herring at this time. Also another primary reason was the need to develop robust

stock specific ocean bycatch estimates of these mixed stocks out in the ocean interacting with other fisheries.

The proposed timeline is the completion of the assessment for the 2018 August meeting. We just wanted to communicate some challenges experienced while going through the river herring assessment update. There was some committee turnover on the River Herring Stock Assessment Subcommittee; and we expect much more significant committee turnover, pretty much a complete turnover since the shad benchmark assessment.

There is some institutional knowledge lost during that benchmark assessment process. This type of assessment was a lot of consensus building, a lot of expert opinion. Some of that information is lost, and that is what we're trying to update for 2018. Also, there is some change in recommendations on the datasets to be used; based on the change in committee membership. That is another thing that we experienced during the river herring assessment update.

As we went over for river herring, there were several datasets that have been discontinued due to various reasons. We expect to experience that same thing with American shad. Another challenge that we anticipate that is unique to American shad are there are several publications that have come out since the benchmark stock assessment that have questioned the reliability of aging techniques that are used, and have been used historically to age shad with scales. The next steps are that we would like to, now that we've experienced these issues going through the river herring assessment update, and have discussed more internally these issues that we expect to come up with American shad being aging. We feel the need to go back to the Technical Committee and Stock Assessment Subcommittee, and discuss these challenges, and identify how we anticipate to approach this assessment update.

If there are any recommendations for a change to this assessment process, or suggestions of what this assessment update will look like, we plan to bring those forward at the annual meeting and update this Board on those recommendations. That's all I have, and if there are any questions on that.

CHAIRMAN CLARK: Thanks, Jeff. Do we have any questions for Jeff on the shad stock? We have one over there, Rob O'Reilly.

MR. ROB O'REILLY: I've got two questions. The first is the initial slide. You showed the ocean bycatch, so I'm wondering what that's all about. The second question has to do with the peer review of the previous benchmark; and I don't recall how either glowing or what that review was. But I'm wondering about an update, if there were any problems with the peer review from the last benchmark.

MR. KIPP: The ocean bycatch, it's similar to the issue with river herring. There is ocean bycatch of shad and river herring, and those are mixed stocks; these river specific stocks that go out and mix, and are captured by these fisheries. I think we're getting better information on the magnitude of what that ocean bycatch is in more recent years.

But there is also the need to partition that bycatch amongst the river specific stocks. There is recent information and work on doing that for river herring, and partitioning that out by the genetic analyses. But that is a major hurdle to moving to more complex techniques for assessing both shad and river herring.

That's a major hurdle to moving on to a benchmark of American shad; and one of the reasons we decided to stick with an update of the previous assessment. The previous assessment was approved by peer review, and subsequently by this Board. There were probably some recommendations coming out of that by the peer review.

But given that this would be an update assessment, the Stock Assessment Subcommittee would pretty much follow the techniques and use the datasets that were used during that benchmark assessment process; given the process of an assessment update. The opportunity to improve on some of those recommendations from the peer review of the 2007 assessment would likely be implemented in a future benchmark assessment.

CHAIRMAN CLARK: Yes, Rob.

MR. O'REILLY: Just to follow up on the intercept fishery. Do the previous studies assist at all with this delineation of river specific stocks? I realize the study by Bonnie Brown, back maybe around 1990, was a mitochondrial DNA study. There was also a tagging study by Jess Ian from Maryland, and several others back around '91, '92. Is that too far back, or is that any use at all, given that most of the genetic work is now just not mitochondrial DNA alone, but is supplemented by nuclear DNA? How does that all work?

MR. KIPP: I'm not as familiar with those studies, so I would just speak to the primary issue; being we do have some snapshot information on what that ocean bycatch looks like. I think the challenge is developing a time series of that ocean bycatch, partitioned out amongst the stocks and how that changes by year. I think that is one of the bigger challenges for using that information in a more standard or traditional stock assessment model.

CHAIRMAN CLARK: Are there any other questions for Jeff? Loren.

MR. LOREN W. LUSTIG: I appreciate that sir, thank you for your report. My question relates to the hickory shad that runs up the rivers just before the American shad. I have personal experience at the Conowingo Dam at the mouth of the Susquehanna River; and it seems to me their run is at a peak around April 20, the white

shad or American shad around April 30. My question is can we extrapolate any trends for the hickory shad based upon the American shad numbers?

MR. KIPP: I don't believe that is something the SAS looked at in depth during the benchmark assessment back in 2007. That would be kind of a new endeavor. I just don't know at this point whether that is something that could be considered to provide information on the American shad trends.

CONSIDER APPROVAL OF SHAD AND RIVER HERRING SUSTAINABLE FISHERY MANAGEMENT PLANS

CHAIRMAN CLARK: Any further questions? Seeing none; thank you, Jeff and we'll move on to our next agenda item, which is Consider Approval of Shad and River Herring Sustainable Fishery Management Plans. This is a final action. We'll start with Brad Chase reviewing the SFMPs and Technical Committee Memo for the South Carolina and the Florida Plans.

UPDATE ON SOUTH CAROLINA SFMP

MR. CHASE: I'll start with the blueback herring sustainable fishery plan update for South Carolina; prepared by Bill Post and Chad Holbrook, and reviewed by the TC in March. This plan was first approved in 2011, and it really focused on the commercial fishery in the Santee-Cooper River Complex, as well as small commercial fishery in the Pee Dee River.

The plan 2011 also closed all of the fisheries, and it developed sustainability targets for those two fisheries to remain open; and this was implemented in the 2012 season. It is basically a five-year update. Here is a view of the Rediversion Canal in the Santee-Cooper Complex. Most of the fishing occurs with cast nets. There is a ten bushel daily limit per boat. It occurs in March and April.

It's a fairly focused, traditional fishery that has been going on here for a long time. Here are graphs that show the catch-per-unit effort, and the lower graph shows the man days as well as the landings over time. You can see there have been a few peaks, but a fair amount of fluctuation in recent years.

The sustainability benchmarks are really focused on an exploitation rate that was developed between 1986 and 1990, during a mark and recapture study that looked at total harvest in the mark and recapture estimates for the total numbers of fish in the river. They applied a scaled exploitation rate of 0.05 to present management.

They are proposing to do the same for this update, use that exploitation rate of 0.05. It's a three-year-running average. The graph shows the relative exploitation rate over time, and you can see the metric; and all these years they have been below that. They are proposing to have no change to this benchmark. For the Pee Dee River it is a small commercial fishery with gillnets. It's executed by a small number of permit holders. They have catch limits of 500 kilograms, and they also have a benchmark with a three-year-running average. They are proposing no change to their metrics for this plan update.

I should say in recent years landings have not exceeded a thousand kilograms, so it's a very small fishery. Here is the Pee Dee River harvest in the three-year-running average. You can see there have been a couple years they have exceeded that; again by a small margin, with slightly increasing landings in recent years.

They are collecting fishery dependent biological data as well. They have fork length as well as repeat spawning marks from 2011 to the present. The plans, there is very little change. The catch limits remain the same. They are both using the three-year-running average as

their metrics; and they are requesting to have this approved with the same plan as before.

The TC reviewed this and they had a couple comments that I'll share with you. Again, the relative exploitation rate of 0.052 was derived from this 1986 to 1990 mark and recapture estimate. They picked four years and used the lower confidence interval estimates for the total population estimate, and divided that by the harvest; and that produced the relative exploitation rate.

The TC had questions about the data quality using the older data, prior to the present day, and asked if there were conditions that might have changed the applicability of this scalar metric to the present day. The response was that it was really the best available proxy for exploitation rates, and that it was selected to be the lower confidence intervals; so therefore it was quite low and conservative.

Secondly, the TC expressed concerns over the absence of biological metrics; as well as the absence of a secondary sustainability benchmark. They asked for more detail on management responses if they did in fact exceed one of the benchmarks. This was discussed; and the recommendation was that these things would be developed and included in the next update. The TC did approve this plan to move on to the Boards consideration and approval; with the inclusions of the recommendations number too.

CHAIRMAN CLARK: Maybe it would be better to take questions after each review of these plans. Are there any questions about the South Carolina SFMP? Mike Armstrong.

MR. MIKE ARMSTRONG: I guess my only question is based on the TC recommendation, how would we physically approve it and include a mandated recommendation? I don't know how that's done or if we can.

MR. CHASE: Well, in discussion with South Carolina, they were willing to explore adding those features. It really is a question of just having the data developed. I think they have all they need to develop biological metrics; and so I think this can be done. One of the themes that the TC discussed was some of these plans that were approved in that first round, 2010, 2011, was they had management responses listed if a benchmark was exceeded. But they didn't have very much detail to what that response was. That was something the TC was interested in seeing a little more detail in that; maybe some standardization to how these actions occur. Instead of just stating there will be a management response, explicitly outlining what that would be.

CHAIRMAN CLARK: Do we have another question? Andy Shiels.

MR. ANDREW L. SHIELS: I think it was the first graph that showed the catch-per-unit effort was stable but landings were increasing. Is that because there are more people entered the fishery?

MR. CHASE: That is a good question. I would have to defer from somebody from South Carolina who might have that information. I don't know the answer to that.

CHAIRMAN CLARK: Ross, do you have that information?

MR. ROSS SELF: Could you repeat the question?

MR. SHIELS: Sure. I think it was the very first graphic. It showed that catch-per-unit effort was stable, but then landings were increasing. I was just wondering why.

MR. SELF: That's a good question. We've seen some response to environmental conditions. We went through a period of drought. These recent years our runs have increased. I guess

we feel like there may be more fish available to that same amount of effort that's being applied.

CHAIRMAN CLARK: Any further questions? Dr. Rhodes.

DR. MALCOLM RHODES: Yes, I can just speak anecdotally. When we've had meetings with the shad river herring fishermen in the area, and they will be the first to admit, when we've had these areas or times of drought there has been very low fish recruitment. Then when we've had years of good-river flow; and you know this is going again anecdotally from the fishermen.

But they will talk for these 20, 30 years; most of these are elderly fishermen. They say when the flows up the fish are in. I think that's where we're getting some of this variation. I bet it correlates very closely, as Ross said with the river flow conditions and times of drought or high water.

MR. SELF: Our folks back home are monitoring our discussion, and they agreed with what I said, by the way that with increased flows we are seeing more fish in the rivers; which is providing more opportunity for that same number of anglers to harvest more fish.

CHAIRMAN CLARK: Given some of the comments we've heard, would the Board prefer to hear both plans and then take motions on approval or do each of these separately? It sounded like there might be some interest in putting some conditions in the motion. Okay, it doesn't look like anybody has got a strong opinion on this.

UPDATE ON FLORIDA SFMP

CHAIRMAN CLARK: Why don't we get the update on the Florida SFMP and then we'll take motions on both.

MR. CHASE: I did just read up on the notes from the last TC meeting that reviewed this.

There was discussion on how flow diversions in that canal can affect catchability; so it does seem to be a factor. Let me run through the American shad sustainable fishery plan with the Florida Fish and Wildlife Conservation Commission for the St. John River. This plan was also first approved by the Board in 2011, and so this is the five-year update. This is strictly for recreational fishing in the St. John River. The 2011 plan used both recreational angler catch-per-unit effort information of 1993 to 2005, it also had a spawning-stock-biomass-abundance estimate they used, and thirdly they had a juvenile abundance index that was used in that fishery management plan.

They proposed in the update to include those data series with a few changes. The present fishery has no commercial harvest, strictly recreational. Pound nets and haul seines were prohibited in the St. John River, and gillnet were prohibited in all state waters in 1995. It is a hook and line recreational fishery only.

Anglers must possess a saltwater fishing license. There is a bag limit of ten *Alosa* species per person per day, and voluntary catch and release really is the common activity in this fishery. For stock monitoring they have the juvenile abundance index; it's a bow mounted push net. It's been conducted since 2007.

They sample biweekly, April through July between river kilometer 210 and 250, and in tidal and freshwater stretches between river kilometer 125 and 165, so there are two separate sections that they sample for juveniles. Then secondly they have a spawning stock relative index of abundance, its electrofishing survey. It has been conducted since 2003, and it provides a catch-per-unit-effort index, as well as biological samples of length, sex ratio, and age.

Here is the St. John River Complex. You can see there are two highlighted sections in dark blue, above and below this large lake where the

sampling occurs for juveniles. Here is where the electrofishing occurs in three river stretches. These are highlighted in blue, and they are separated by quite a large distance.

The creel survey was conducted from 1993 to 2005; it was a roving creel survey in a specific stretch from river kilometer 285 to 298. It was redone in 2011, and I do not believe it is ongoing presently. The two benchmarks are based on the juvenile index as well as the adult index. What they have is a benchmark value; it is based on the 25th percentile, and the management triggers if there are three consecutive years below this benchmark there will be a management response.

Here is a graph showing the juvenile abundance index with that benchmark as the hash line moving across. You can see most of these data points are above that. In recent years several data points are well above that mark, and this is an ongoing series that it will be one of the two benchmarks in the present update. The spawning stock CPUE benchmark, here is a graph depicting the same concept.

The benchmark is shown running across the graph. The data points for the most part are above that. There was discussion on high water impacts of this data series change in catchability; and there was discussion at the TC level of having Florida use a GLM to try to tease out some of these influences of flow, as well as catchability changes along the different locations where they're sampling.

These photos portray what they can find in the St. John River. They have years of extremely low water, where sampling is confined to a very relatively narrow river channel; and then other years at very high water they can have a very wide channel at which they could sample. It certainly can affect catchability in these surveys. The recreational fishery, here is the creel survey results. I think I was mistaken. You can see that it does continue after 2011, so there was a gap

after 2005 to 2010, and it has been resumed, and Florida does seem to want to commit to keeping this series going.

This was reviewed also in March, and the TC again discussed the possibility of looking at it using a GLM to try to gain more information to standardize the data, and to see if we can get at some of these questions on flow influences on catchability in the data series. Florida was interested in exploring that for the next update.

The similar theme came up about having benchmark responses, but without detail as to what those management responses would be. The TC was interested in seeing greater detail and specificity to what would happen if the benchmarks were exceeded. The TC went on to recommend that the Board approve the sustainable fishery management plan with consideration for the improvements discussed in Items 1 and 2 on this slide.

CHAIRMAN CLARK: Any questions about the Florida SFMP? Seeing none; oh, I'm sorry, Rob O'Reilly.

MR. O'REILLY: I guess I was just curious about the push net sampling; because that occurred in some Virginia rivers. Is that a nighttime sampling?

MR. CHASE: It typically is. In this case I don't think I have that information if it is or not, so I would have to ask Florida if it is in fact nighttime sampling.

MR. CLARK: Jim, do you want to answer that?

MR. JIM ESTES: Yes, it typically is.

MR. CLARK: Any further questions? Seeing none; would somebody like to put forth a motion to approve these plans? Mr. Estes.

MR. ESTES: I move to approve South Carolina's sustainable fishery management

plan for river herring and the Florida sustainable fishery management plan for shad; inclusive of TC recommendations.

MR. CLARK: We have a second by Dr. Rhodes. Let's wait until we have the modified motion up there. The motion is to move to approve the South Carolina sustainable fishery management plan for river herring, and the Florida sustainable fishery management plan for shad; inclusive of the Technical Committee recommendations. Do we have any discussion on this motion? Rob O'Reilly.

MR. O'REILLY: Given Mike Armstrong's comments earlier. Can we see what the second item was for South Carolina that was coming from the Technical Committee, and make sure it's a recommendation?

CHAIRMAN CLARK: Can we get that back up? Do you want to amend the motion, Rob?

MR. O'REILLY: No that's fine; I just needed to see that again. Thank you.

CHAIRMAN CLARK: Any further discussion of the motion? Seeing none; are there any objections to the motion? Seeing none; the motion is approved by unanimous consent and that concludes Item Number 6.

REVIEW OF THE FMP REVIEW AND STATE COMPLIANCE REPORTS FOR 2017

CHAIRMAN CLARK: And we move on to Item 7, and Kirby will be giving us a review of the FMP review and state compliance reports for 2017. This is also an action item.

MR. KIRBY ROOTES-MURDY: I'm subbing back in on shad and river herring and trying to get up to speed as much as possible; so please bear with me as I go through the fishery management plan review. We have landings information here. As you all are aware there has been a steady increase in landings over

time; in part due to the moratoria implemented through Amendments 2 and 3.

States with shad commercial landings are New Jersey, Virginia, North Carolina, South Carolina and Georgia and states with river herring commercial landings are Maine, New Hampshire, New York, Maryland, North Carolina and South Carolina. In 2015 a total of 478,688 pounds of American shad were landed; which was about a 38 percent decrease from 2014 levels.

In 2015 about two million pounds of river herring were landed, which is a 9 percent increase from 2014 levels, and 153,000 pounds of hickory shad were landed, which is an approximate 29 percent increase from 2014 levels. States with the largest shares of shad landing are North Carolina and South Carolina, and the state with the largest share of river herring landings is Maine.

Moving on to river herring passage counts, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, Pennsylvania, Maryland and South Carolina all have projects in place. Coastwide 3.82 million river herring passed through and were counted this year. Coastwide total of 611,000 American shad were counted as having passed through.

In terms of how these fare relative to 2014 numbers, it is about a 26 percent increase for river herring, and it's about a 43 percent increase for shad. There are also coastwide stocking projects occurring in Maine, Massachusetts, Rhode Island, Pennsylvania, Maryland, the District of Columbia, Virginia, North Carolina and South Carolina.

In total 21 million hatchery Alosines were reintroduced in 2015. River herring is stocked in lakes and river basins in Maine, but they are wild caught, so they are not hatchery raised; and that's why we don't have any specific information included in the FMP review on that.

Brad went through earlier the sustainable fishery management plans that this board has reviewed at the beginning of the year.

I wanted to give you all just kind of an outline of what to expect for the annual meeting. Today this Board approved the South Carolina river herring and the Florida shad SFMPs. There will be a number of SFMPs that the Technical Committee is going to need to review over the next month or so.

I know that Ashton had sent out before a request for states to submit that information by August 30, and I would request that you try to do that sooner if possible, because as you can see we have five that the TC is going to need to review and provide recommendations to the Board on at the ASMFC annual meeting. Another component of the FMP review is reporting out sturgeon interactions. In 2015, 196 interactions were reported, 176 of those were Atlantic sturgeon, and 20 were short-nosed sturgeon. These took place in Rhode Island, Connecticut, New Jersey, Virginia, North Carolina, South Carolina and Georgia.

All were released alive with the exception of 15 fatalities that took place in North Carolina. Last, there were de minimis requests from the states of Maine, New Hampshire, Massachusetts, and Florida for American shad and for New Hampshire and Florida regarding river herring; and all these states meet the requirements for de minimis. With that I will take any questions.

CHAIRMAN CLARK: Thanks, Kirby. Do we have any questions for Kirby? Lynn Fegley.

MS. LYNN FEGLEY: Just a couple things for the record. I just wanted to correct that the state of Maryland is closed for the commercial harvest of river herring. I think that might have been PRFC, and also I do not believe that we're doing any run counts in the state of Maryland; so just for the record.

CHAIRMAN CLARK: Thanks, Lynn, also Delaware does have a shad stocking program. Are there any other questions or comments on the FMP review? Seeing none; do we have a motion, or do we need a motion for this? Okay, we have a motion, Mike Armstrong.

MR. ARMSTRONG: Move to approve the 2016 FMP Review of the 2015 fishing year, and approve de minimis requests from Maine, New Hampshire, Massachusetts, and Florida for shad, and de minimis requests for New Hampshire and Florida for river herring.

CHAIRMAN CLARK: Do we have a second? Cheri Patterson. Okay, do we have any discussion of this motion? Seeing none; do we have any objection to the motion? Seeing none; let me read it into the record. It is move to approve the 2016 RMP Review of the 2015 fishing year, and approve de minimis requests for Maine, New Hampshire, Massachusetts, and Florida for shad, and de minimis requests for New Hampshire and Florida for river herring.

Motion by Mr. Armstrong, second by Ms. Patterson, and seeing no objections the motion is passed by unanimous consent.

ADJOURNMENT

CHAIRMAN CLARK: Okay that brings us up to Item Number 8, Other Business. Is there any other business to come before this Board? Seeing none; we are adjourned, and we finished an hour early, so Eel will be starting before ten o'clock, so don't go too far. Thank you.

(Whereupon the meeting was adjourned at 9:00 o'clock a.m. on August 2, 2017.)
