Atlantic States Marine Fisheries Commission

Atlantic Sturgeon Management Board

August 8, 2018
10:45 a.m. – 12:15 p.m.
Arlington, Virginia

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 (*A. Nowalsky*)	10:45 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from October 2017	10:45 a.m.
3.	Public Comment	10:50 a.m.
4.	Update on 5-Year Status Review of the Endangered Species Act Listing and Recovery Plan (*J. Crocker*)	11:00 a.m.
5.	Review Technical Committee Report Regarding Highest Priority Data Sources for Stock Assessments (*K. Drew*) **Possible Action**	11:15 a.m.
6.	Consider Approval of 2018 Fishery Management Plan Review and State Compliance Reports (*M. Appelman*) **Action**	11:45 a.m.
7.	Review Recommendation to Disband the Advisory Panel *(T. Berger*) **Action**	12:10 p.m.
8.	Other Business/Adjourn	12:15 p.m.

The meeting will be held at the Westin Crystal City, 1800 S. Eads Street, Arlington, Virginia; 703.486.1111

MEETING OVERVIEW

Atlantic Sturgeon Management Board Meeting
August 8, 2018
10:45 a.m. – 12:15 p.m.
Norfolk, Virginia

Chair: Adam Nowalsky Assumed Chairmanship: 10/17	Technical Committee Chair: Ian Park (DE)	Law Enforcement Committee Rep: Lt. Thomas Gadomski (NY)
Vice Chair: Ross Self	Advisory Panel Chair:	Previous Board Meeting: October 18, 2017
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, VA, NC, SC, GA, FL, D.C., PRFC, USFWS, NMFS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 2017

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. Update on 5-Year Status Review of the Endangered Species Act Listing and Recovery Plan (11:00 – 11:15 a.m.)

Background

- In 2012, five distinct population segments (DPS) of Atlantic sturgeon were listed as either threatened or endangered under the Endangered Species Act (ESA or Act).
- In August 2017, NOAA Fisheries published two final rules designating critical habitat for each DPS of Atlantic sturgeon as required by Section 4(b) of the ESA.
- In March 2018, NOAA Fisheries announced its intent to conduct a 5-year review for each DPS of Atlantic sturgeon as required by Section 4(c) of the ESA (**briefing materials**).
- NOAA Fisheries also released its Atlantic Sturgeon Recovery Outline (**briefing materials**) which commences the recovery planning process as required by Section 4(f) of the ESA.

Presentations

- J. Crocker, Endangered Fish Branch Chief, GARFO Protected Resources Division

5. Review Technical Committee Report Regarding Highest Priority Data Sources for Stock Assessments (11:15 – 11:45 a.m.) Possible Action

Background

- At its October 2017 meeting, the Board reviewed the results of the benchmark assessment which indicated, in part, that efforts to assess the status of Atlantic sturgeon

are hampered by a lack of data, and that more work is needed to establish reliable indices of abundance for spawning populations and juveniles prior the next assessment • In response, the Board tasked the Technical Committee (TC) to identify the data sets most important to Atlantic sturgeon stock assessment, and develop recommendations regarding where to focus state resources (**briefing materials**).
Presentations • K. Drew will review the TC Report on its behalf
Board Actions for Consideration • Consider changes to fisheries dependent and independent monitoring requirements

6. Consider Approval of 2018 Fishery Management Plan Review and State Compliance (11:45 a.m.-12:10 p.m.) Action
Background • State compliance reports are due October 1 • The Plan Review Team reviewed each state report and drafted the annual FMP Review (**briefing materials**).
Presentations • M. Appelman will review the 2018 FMP Review report
Board Actions for Consideration • Consider approving the 2018 FMP Review

7. Review Recommendation to Disband the Advisory Panel (12:10-12:15 p.m.) Action
Background • Staff recommends the Board disband the Atlantic Sturgeon Advisory Panel (AP) considering it has not formally met since providing input on Amendment 1 nearly 20 years ago, and because it is unlikely that there will be any management activity for the foreseeable future (**briefing materials**). • If, down the road, the Board determines that it would benefit from the input of an AP, staff will work with the states to re-establish an AP at that time
Presentations • T. Berger
Board Actions for Consideration • Consider disbanding the Atlantic Sturgeon AP

8. Other Business/Adjourn

Atlantic Sturgeon

Activity level: Low

Committee Overlap Score: Medium (SAS overlaps with BERP, Atlantic striped bass)

Committee Task List
• TC – October 1st: Annual compliance reports

TC Members: Ian Park (DE, TC Chair), Lisa Bonacci (NY), Heather Corbett (NJ), Ellen Cosby (PRFC), Dewayne Fox (DSU), Greg Garman (VCU), Jeanne-Marie Havrylkoff (FL), Amanda Higgs (NY), Eric Hilton (VIMS), Chris Kalinowsky (GA), Wilson Laney (USFWS), Christine Lipsky (NMFS), Michael Loeffler (NC), Luke Lyon (DCMF), Elizabeth Miller (SC), Steve Minkkinen (USFWS), Marta Nammack (NMFS), Bill Post (SC), Ray Rhodes (College of Charleston), Brian Richardson (MD), Tom Savoy (CT), Eric Schneider (RI), David Secor (UMCES), Chuck Stence (MD), Gail Wippelhauser (ME), Kristen Anstead (ASMFC), Max Appelman (ASMFC), Katie Drew (ASMFC)

SAS Members: Laura Lee (NC, SAS Chair), Michael Celestino (NJ), Kiersten Curti (NEFSC), Jared Flowers (NC), Dewayne Fox (DSU), Edward Hale (DE), Amanda Higgs (NY), David Kazyak (USGS), Michael Loeffler (NC), Bill Post (SC), Eric Schneider (RI), David Secor (UMCES), Kristen Anstead (ASMFC), Max Appelman (ASMFC), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STURGEON MANAGEMENT BOARD

The Marriott Norfolk Waterside
Norfolk, Virginia
October 18, 2017

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

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Patrick Keliher, ME (AA)
Douglas Grout, NH (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Ritchie White, NH (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
David Pierce, MA (AA)
Mike Armstrong, MA, Administrative proxy
Raymond Kane, MA (GA)
Bob Ballou, RI, proxy for J. Coit (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
David Borden, RI (GA)
Sen. Craig Miner, CT (LA)
Mark Alexander, CT (AA)
Colleen Giannini, CT, Administrative proxy
Sen. Phil Boyle, NY (LA)
John McMurray, NY, Legislative proxy
Jim Gilmore, NY (AA)
John Maniscalco, NY, Administrative proxy
Heather Corbett, NJ, proxy for L. Herrighty (AA)
Emerson Hasbrouck, NY (GA)
Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA)
Tom Fote, NJ (GA)
Andrew Shiels, PA, proxy for J. Arway (AA)
Loren Lustig, PA (GA)
Roy Miller, DE (GA)
John Clark, DE, proxy for D. Saveikis (AA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, proxy for D. Blazer (AA)
Ed O'Brien, MD, proxy for Del. Stein (LA)
Rachel Dean, MD (GA)
Rob O'Reilly, VA, proxy for J. Bull (AA)
David Bush, NC, proxy for Rep. Steinburg (LA)
Chris Batsavage, NC, proxy for B. Davis (AA)
Robert Boyles, SC (AA)
Malcolm Rhodes, SC (GA)
Patrick Geer, GA, proxy for Rep. Nimmer (LA)
Spud Woodward, GA (AA)
Nancy Addison, GA (GA)
Jim Estes, FL, proxy for J. McCawley (AA)
Sherry White, USFWS
Derek Orner, NMFS

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

Ex-Officio Members

Staff

Robert Beal
Toni Kerns
Katie Drew
Max Appelman
Kristen Anstead

Guests

Russ Allen, NJ DFW
Joey Ballenger, SC DNR
Mike Bednarski, Richmond, VA
Joe Cimino, VMRC
Allison Colden, CBF
Christopher Davis, VMRC
Michelle Duval, NC DNR
Lewis Gillingham, VMRC
Aaron Kornbluth, PEW Trusts
Lynn Lankshear, NOAA
Arnold Leo, E. Hampton, NY
Mike Luisi, MD DNR
Chip Lynch, NOAA
Dan McKiernan, MA DMF
Nichola Meserve, MA DMF
Chris Moore, CBF
Kathy Moser, NYS DEC
Brandon Muffley, MAFMC
Cheri Patterson, NH F & G
Kelly Place, Williamsburg, VA
Tim Sartwell, NOAA
Chris Wright, NMFS

The Atlantic Sturgeon Management Board of the Atlantic States Marine Fisheries Commission convened in the Hampton Roads Ballroom V of the Marriott Waterside Hotel, Norfolk, Virginia, October 18, 2017, and was called to order at 10:15 o'clock a.m. by Chairman Adam Nowalsky

CALL TO ORDER

CHAIRMAN ADAM NOWALSKY: Good morning. My name is Adam Nowalsky; this is my first Board as Atlantic Sturgeon Chair, first meeting. Before we begin the sturgeon portion of the meeting, I just want to extend a word of gratitude for the dinner last night to our host; and I'll just simply say everyone involved with the dinner last night, very well done and much appreciated.

APPROVAL OF AGENDA

CHAIRMAN NOWALSKY: We've got our Atlantic Sturgeon Board meeting here today. We'll first go ahead and begin with the approval of the agenda. I'll extend a word of gratitude again for those individuals who heeded our request at the last Board meeting for any items to put on the agenda. We were able to get a couple following our stock assessment report.

Are there any modifications to the agenda as presented here today? Seeing none; the agenda stands approved as provided.

APPROVAL OF PROCEEDINGS

CHAIRMAN NOWALSKY: The next order of business is to approve our proceedings from our August, 2016 Board meeting. Are there any modifications to those proceedings as provided? Seeing none; those proceedings stand approved.

PUBLIC COMMENT

CHAIRMAN NOWALSKY: The next order of business is Public Comment for any items that are not on the agenda. Max, did we have anyone signed up? No one signed up. I'll look to the audience. If anyone would like to make public comment for an item not on the agenda, please raise your hand. Seeing no hands raised; we'll continue.

2017 BENCHMARK STOCK ASSESSMENT REPORT

CHAIRMAN NOWALSKY: Our first order of business then to come before us will be the 2017 Benchmark Stock Assessment Report. That will then be followed by a Peer Review Panel report, and then we'll have to first decide whether to accept that for management use, and make a determination if there are any actions we want here today. We will have a presentation from Katie Drew on the Benchmark Assessment Report. We'll stop briefly for any questions about that before we move on to the Peer Review Panel Report that will follow. With that we'll turn to Katie.

PRESENTATION OF BENCHMARK ASSESSMENT REPORT

DR. KATIE DREW: Before I jump into the actual content, I just wanted to take a minute to acknowledge all of the people who worked on this assessment. This is a list of the Stock Assessment Subcommittee members and the Technical Committee members. If you want to look, their names are in much larger print on the actual assessment report. But I just wanted to point out this took a lot of time and effort on a number of different people's parts from federal and state agencies, and from academic institutions. We really appreciate all of the work and all of the data that went into this assessment.

I'm just going to go over some background information on sturgeon; and on the history of the fishery, the data and the models used, the results, stock status, and then some conclusions and research

recommendations. There is a lot to get through, so I'm just going to jump right in.

Obviously as we all know, sturgeon are anadromous; meaning they return to their natal rivers to spawn, preferring hardbottom and tidal fresh water. They spend the first few years of their life in their natal rivers and then in the estuaries; and then eventually moving off to nearshore coastal marine waters.

Fish tagged in the Mid-Atlantic have been detected from Cape Canaveral in Florida, all the way up to the Gulf of St. Lawrence; so they move extensively along the Atlantic Coast. They are long lived, and they are slow to mature. The maximum recorded age is 60 years. They are believed to be mature around Age 10, but it can be all the way up to Age 32 for females in the north.

Maximum length was 14 to 18 feet historically, but nowadays you mostly see them at 10 to 12 feet. They once supported one of the largest fisheries by weight on the Atlantic Coast; in the late 1800s and early 1900s. But landings have declined steadily since the beginning of the time series. This graph goes back to the 1880s, so you can see a peak there of about 3,000 metric tons.

There was a bit of an increase again in the 1950s through the 1990s; but you can see that the peak here on this inset graph only goes up to about 120 metric tons, so nowhere close to the 3,000 metric tons we were seeing back in the 1800s. Declines in this peak, this little tiny peak, are eventually what led to the 1998 moratorium on the Atlantic Coast, implemented by ASMFC.

In 2012, NOAA listed Atlantic sturgeon under the Endangered Species Act. On the basis of genetics they identified five distinct population segments. They identified the Gulf of Maine as threatened, and the New York Bight, Chesapeake Bay, Carolina and South Atlantic DPSs as endangered. You can see the range of rivers included in each DPS in this figure.

The last benchmark assessment for sturgeon was conducted by ASMFC in 1998. NOAA undertook two status reviews after that. The 1998 one was linked to the 1998 benchmark assessment, and found no listing was warranted. The one in 2007 was the basis of the 2012 listing determination; which brings us to today, and the 2017 ASMFC benchmark stock assessment.

This was done at both the coastwide and the DPS-level. We're still a data poor species here; so a lot of the issues that hindered the assessment in 1998, and in 2007, are still here for this species. But we were able to conduct some more quantitative analyses than the previous assessments. This assessment was peer reviewed through the ASMFC external process in August; and following my report we'll be receiving a report from the Review Panel Chair, on how they felt about all this.

In terms of data used, we tried to pull data from a number of different sources, including biological and life history data, landings data, bycatch observer data, fishery independent surveys, and acoustic tagging data. We also explored a number of different analyses and models; trend analysis, data poor models, genetic methods, a tagging model, egg-per-recruit analyses, and so forth. Stock status determination was eventually based primarily on the ARIMA trend analysis, the tagging model, and the egg-per-recruit model. This is what I'm going to focus on in my talk today. The rest of this information is available in the stock assessment report; if you really want to get into it.

One of our TORs was to develop estimates of bycatch. I'm going to talk about the bycatch data that we have now; and what we were able to come up with, with that.

Obviously, the moratorium stopped the directed harvest; but you still have bycatch in other fisheries. The information unfortunately is limited. We looked at two observer programs to develop these estimates; the NOAA Observer Program on federally permitted boats, which occurs from Maine to North Carolina in ocean waters, and North Carolina Estuarine Gillnet Observer coverage.

They were ranged from 2000 to 2004 all the way up to the present. This is kind of a modification of the methods that were used during the status review in the listing process; which is basically using a GLM to predict the number of sturgeon, based on things like species composition, year, and other factors. We did separate models for the otter trawls and for gillnets, and for the North Carolina and for the NOAA data.

This is kind of where the samples were occurring. The North Carolina is the colored figure up on the left; and that is the North Carolina estuaries, where the gillnet observers were in state waters. Then we used the coastal statistical areas for the federal program; which is shown in the grey with the red boxes. I think the important thing here is they are not really overlapping at all. We have the coastal water estimates and we have inshore estuarine waters from a state.

If we look at the gillnet data, the observers actually record whether that fish comes up alive or whether it comes up dead. We calculated the total number of sturgeon that would have been caught by these fisheries over the course of a year; and then we applied the observed proportion dead to estimate how many of those were dead when they were caught. This obviously doesn't include any post release mortality; but it's kind of a way to estimate the differences between what was actually caught and what was killed.

For the federal gillnet bycatch estimates, we're looking at about 1,100 fish per year on average were caught; with an average of about 295 fish or 25 percent being brought up dead in the observer program. This is the otter trawl bycatch data. You can see there is actually a much lower proportion of fish that were observed dead in this program; partly due to the lower sample size or the lower encounter rate in the otter trawl.

But in some years they did not observe any dead sturgeon, only live sturgeon. As a result, you get about the same number caught, 1,100 fish per year on average, but only about 41 were dead. In the North Carolina estuarine sturgeon bycatch, in their gillnet observer program, they are averaging about 4,000 fish per year were caught. Although that has dropped off to about 2,000 in recent years. But they only observed about 5 percent dead, so the average was about 200 fish per year; which means that estimates of total bycatch were higher from the North Carolina program, but the estimates of the dead bycatch were similar in magnitude because of the differences in the way the fisheries were prosecuted; you had a much lower mortality rate in the North Carolina program than you did in the federal program.

The other difference was that North Carolina and NMFS, the fisheries that they're observing are operating on two different components of the population. North Carolina is primarily capturing smaller fish in the 50 to 75 centimeter range, which is juveniles, and the federal program is observing mostly larger individuals from 100 to 200 centimeters, the adults; which makes sense because again they're operating in different locations and they're operating on different components of the population, where the juveniles are inshore and the adults are the ones that are in the near coastal waters.

We did want to note that observer coverage on the Atlantic Coast is not really sufficient to fully characterize sturgeon bycatch. There is no coverage south of North Carolina. There is no estuarine coverage outside of North Carolina; and overall a low percentage of trips are covered across the coast, even in the programs that do exist. This is a source of uncertainty, and a source that we need more data on for this species.

Obviously this is important, because the bycatch in these ocean intercept fisheries are intercepting fish from all different DPSs. This is a figure of the DPS proportion in each different fishery. We actually were for this assessment able to reanalyze some samples that had been collected from the directed fishery in the 1990s with current genetic markers; so that we could have a comparison to the modern DPS concept, which is that first bar.

What you can see is that pretty much even in the '90s, it was dominated by the New York Bight; but you are getting fish from the Gulf of Maine, Canada, the Carolina, and the South Atlantic DPS. This proportion has changed over time; so that the middle bar is the data from samples collected during modern times from the observer program.

Again, you can see that the New York Bight dominates, but we have fish from all DPSs, including now the Carolina DPS as well as more of a proportion from the Chesapeake Bay and the South Atlantic. The last bar is fishery independent samples from that same region. This has made it very difficult for us to separate total coastwide harvest down to the DPS level; because we know we have these intercept fisheries in the New York Bight area, and then we also knew they happened off of Carolina as well.

Because these proportions change over time, and because they're harvesting different components of the population, we can't really separate that total harvest back down into DPS level; which hindered some of our ability to apply data poor models. I'm going to switch gears from the fishery dependent stuff to the fishery independent stuff now; where we are still data poor.

Atlantic sturgeon is rarely encountered in the usual multispecies surveys that we use to assess our species. We looked at 50 surveys from state, federal, and academic research partners; and ended up eliminating 41 of them, mostly because they did not encounter sturgeon frequently enough. There would be one or two sturgeon in the entire time series. In addition, other surveys had inconsistent methods or gear changes, or incomplete time series that made them inappropriate for developing indices of relative abundance. This is the final set of indices that we ended up looking at for this assessment that we felt were acceptable and reliable enough.

I think what I wanted to really point out with this figure is that there is very few survey points below North Carolina. We don't have a lot of information on the South Atlantic DPS from fishery independent sources. The surveys caught primarily juveniles and small adults. Most of the fish that we were looking at were 500 to 1,500 millimeters total length.

Even the ones we accepted had low rates of encounters with Atlantic sturgeon. Only about 1 to 3 percent of the tows had Atlantic sturgeon in them. As a result the Panel recommended that indices with low numbers of Atlantic sturgeon should use sort of presence/absence instead of CPUE as the index; so looking at how the proportion of tows with sturgeon in them changes over time. That is what I'm going to show you for the rest of this presentation.

Again, we looked at a number of different trend analyses for these indices; but what we decided on eventually as the most reliable was the ARIMA, which is the Auto Regressive Integrated Moving Average approach, which you guys saw yesterday for eel, and it has also been used for river herring in our assessment framework.

It's basically a statistical technique that smoothes out the effects of auto correlation, and observation error and noise in a time series. That also lets us calculate the probability that an index is above or below a reference value in the time series; given the amount of noise that we see in the time series.

We looked at two reference values; the 25th percentile of the index, and the index value in 1998, the start of the moratorium, and asked the question "is the index in 2015, or the last year of the time series, higher than the 25th percentile of the entire time series, and is it higher than it was in 1998?"

What I am going to be showing you now are the smooth ARIMA indices for the different surveys that we looked at. For example, this is the Maine/New Hampshire trawl survey, which takes place in the Gulf of Maine DPS, and you can see that decline and some bouncing around over time. In the last year of the dataset, this index had a 51 percent chance of being above the 1998 value, and a 61 percent chance of being above the 25th percentile.

Similarly, this is the Connecticut spring and fall. The spring had a low chance of being above the first year, and the fall had a higher chance of being above the first year, and both were above the 25th percentile. This is the New York Juvenile Atlantic Sturgeon Monitoring Program, which is one of our few dedicated sturgeon surveys.

You can see the strong, significant, increasing trend in that; and it was basically above both the first year of the index and above the 25th percentile. Similarly, the New Jersey ocean trawl on the bottom had a very high chance of being above both the 1998 value, and above the 25th percentile. The Chesapeake Bay DPS was represented by the VIMS Seine Survey in the James River; which had sort of an up and down pattern here, and as a result it had a low chance of being above the '98 value of the index, but a high chance of being above the 25th percentile at least. In the Carolina DPS we looked at the Program 135, and split that down into a spring and a fall index, and a young of year and a juvenile index. The young-of-year index had high chances of being above both '98 and above the 25th percentile. The juvenile index again, was one of the few with a significant increasing trend, and had a 100 percent chance of being above both '98 and the 25th percentile.

The Program 135 had a lower chance of being above the '98 value; but was slightly likely to be above the 25th percentile, and the fall juvenile is another one that had a statistically significant increasing trend, and had a high chance of being above both the '98 value and the 25th percentile.

The U.S. Fish and Wildlife Cooperative Tagging Cruise actually ended in 2010; due to gear and method changes. It had a lower chance of being above the '98 value, but a slightly higher chance of being above the 25th percentile. The South Atlantic DPS was represented by the Edisto River Survey, and it had a low chance of being above the first year in the index.

It only goes back to 2004. It doesn't go back to '98, and a 51 percent chance of being above the 25th percentile. However, the TC members from South Carolina had some concerns about this index; and we felt it needs more work. It's not enough to throw it out, but it needs more work before we consider this a reliable index of what's happening in the South Atlantic.

For the coastwide index, we used a method called the Conn Method to combine all of the indices that we had into a single index. It basically tries to look and find a single underlying trend for all of these indices; and produces this index for the entire sort of coastwide metapopulation of sturgeon, which had a 95 percent chance of being above the '98 value, and a 95 percent chance of being above the 25th percentile.

What you can see is kind of actually something we've seen in a lot of our indices; which is decline through the '80s into the early '90s, and then beginning a slow uptick after the moratorium. In general what we were seeing with these indices is that the majority of the indices were above the 25th percentile that we looked at. All of them except NEAMAP were above the 25th percentile, which is good that it means we're better than we have been at some point in the past.

When we're asking the question of are we better than we were in 1998, that is have we improved since we started that moratorium? The results were a little more mixed, and some of them were above and some of them were not likely to be above that index value.

To switch from talking about abundance to talking about total mortality, I'm going to talk about the acoustic tagging data now. We were able to get data from 12 different researchers from academic and state agencies that tagged a total of 1,300 Atlantic sturgeons with acoustic tags. Acoustic tags of course are the ones that are implanted inside the fish; and send out a little signal that is picked up by receivers in arrays throughout the coastal waters of the Atlantic, which means that we don't have to wait for this fish to be caught to know where it went and whether it's still alive.

We were able to assign the fish that were tagged back to the DPS of origin; based on genetics for the most part, and we had fish from all five DPSs. Although the New York Bight was represented much better than some of the DPSs like the Carolina DPS, which only had 99 fish. That did influence some of the results that we saw. We used a Bayesian model to estimate the survival rate of tagged fish at both the coastwide level, where we pooled all the fish together, and at the DPS specific level, where we only looked at fish from a single DPS.

The larger sample size from the coast did result in less uncertainty at the coastwide level than at the DPS specific level, and DPSs with higher sample size had more precise estimates of survival coming out of the model. These estimates of survival were translated into estimates of total mortality; compared to Z benchmarks from the egg-per-recruit analysis to determine if total mortality rates were too high.

The tagging model can't separate natural mortality and fishing mortality or anthropogenic mortality; and it's just a measure of how many fish are surviving from year to year, and therefore how many fish are dying from year to year, without trying to attribute that to natural or manmade causes. That egg-per-recruit analysis was used to estimate essentially the level of total mortality, natural and anthropogenic that produces 50 percent of the egg production of a virgin population. This gives us a total mortality benchmark or threshold of the Z 50 percent EPR. This is similar to the river herring benchmarks and the shad benchmarks that were based on SPR or spawning stock biomass per recruit; but again using that concept of a total mortality rather than a fishing mortality benchmark. It's also similar to the menhaden fecundity reference points; which are in terms of F, but are in terms of egg production rather than SSB.

Because the inputs to the egg-per-recruit model are so uncertain, that is we don't have great estimates of size at age, or

maturity at age, or natural mortality, the Review Panel recommended that we draw these values from a distribution. What you can see on the left there is that distribution of size at age, of length at age, with the median value and then some uncertainty around it. That goes into then creating a distribution of the Z EPR value instead of a single point estimate, and so that histogram on the right is the 50 percent egg-per-recruit distribution, rather than a single estimate. The median estimate was about 0.12, with confidence intervals of 0.1 to 0.15. Basically the takeaway from this is that Atlantic sturgeon cannot sustain high levels of additional mortality. Even the uncertainty we have about the selectivity curves, about the life-history parameters involved, you're still not looking at a very large range of sustainable mortality for this species.

What I'm going to show you now are the comparison of the estimates of total mortality from the tagging model in gray. That's basically the distribution of the estimates of total mortality that came out of the tagging model; compared to the Z threshold, this red line here on the graph. What you can see for the coast is that the majority of that gray is below the Z threshold. That is good. It means there is only about a 6.5 percent chance that Z is greater than the Z threshold.

In this case it's essentially saying that total mortality is sustainable at the coastwide level. Whereas, if you start looking down at the DPSs, what you can see for the Gulf of Maine is that we have a lot more uncertainty in that distribution. It's a much wider distribution, and that probably has to do with in part the sample size that we have fewer tagged fish in the Gulf of Maine than we do across the entire coast. In addition, the median Z in the Gulf of Maine was higher, so it had an estimate of 0.3, and that resulted in a 74 percent chance that Z is above the Z threshold. You can see a lot more of that distribution is above the Z threshold.

The New York Bight had a median Z of 0.09, and only a 31 percent chance that Z is greater than the Z threshold. You can see the majority of that estimate, the peak of that estimate is below the threshold. The Chesapeake Bay had a median Z of 0.13, and a 30 percent chance that Z is greater than the Z threshold. The Carolina DPS had a median Z of 0.25, and a 75 percent chance that Z is greater than the Z threshold. The South Atlantic DPS had a median Z of 0.15, and a 40 percent chance that Z is greater than the Z threshold.

To combine sort of all of this into a stock status, we were looking at essentially two reference points here. For abundance we weren't able to develop estimates of abundance at the DPS level or at the coastwide level; because of the lack of data. We used sort of the index value in 1998 as a reference point; in order to be able to say, are we doing better or worse than we have been doing since the moratorium?

For mortality we used the 80th percentile of that Z egg-per-recruit distribution. The Review Panel recommended for both of these that status be presented as the probability of being greater than the reference point. Instead of just saying okay we're above or below a reference point, as we have in the past; we're going to say, what is the probability that we're above or below that reference point in order to better capture the uncertainty in the data here, which gives you this table.

I did apply some color coding to kind of help you read this a little bit; at the coastwide level, what you're looking at here is the coastwide level, the probability of being above your Z threshold is low, and the probability that your index is greater than the 98 value is high. That is good. That's what you want to see.

The flip side being something like the Gulf of Maine, where the probability that you're above your Z threshold is high; and you have a 50/50 chance, essentially of being above where you were in '98, or in this case 2000, because the Gulf of Maine survey didn't start until 2000. You can see that there is not a consistent picture across our DPSs; that some have low probabilities of being above the Z threshold, which is good, and high probabilities of being above the '98 value, which is good. But others have lower probabilities or higher probabilities for different scenarios.

But what we also wanted to point out is that we still do believe the stock is depleted relative to historical levels. We're doing better than we were in '98, for the most part, but we are still depleted relative to historical levels, and we don't want to let the shorter time series of the indices hide some of that.

Of course the South Atlantic we felt there were no suitable indices, so the biomass or abundance status is unknown in that region. But there is only a 40 percent chance of being above your Z threshold.

Overall, at the coastwide level, the population appears to be recovering slowly; at least relative to where it was in 1998. Overall at the coastwide level, mortality is below that Z benchmark. There is more uncertainty at the DPS level, and not all DPSs show the same trends for biomass or for mortality. One good sign is that the juvenile indices were actually where we saw the strongest positive trends; so that the species is as we discussed, long lived, slow to mature, it's probably in the juvenile indices is where you're going to see that recovery first.

This is still a data poor species. We have few dedicated Atlantic sturgeon surveys, and none of them for spawning stock biomass at the DPS level. They are rarely encountered in existing multispecies surveys, which may be a problem with the design of the survey. But it may also be a problem with that they're just at low levels, and we may see them more and more as the stock recovers.

In addition, we have very limited biological data at the DPS level, and not a lot of that is being collected on an annual basis. We don't have a lot of good information on growth and maturity, and mortality at the DPS level, or even at the coast level. The tagging data provide important information for this assessment on survival and on mortality.

That time series should be maintained and sample size should be increased, to better understand the DPS level dynamics, in terms of mortality. Because of that the TC recommends an update to this assessment in five years, and a benchmark assessment again in ten years, if improvements in the data have been made. With that I will take questions.

CHAIRMAN NOWALSKY: Thank you very much for that report, Katie. We'll turn to the Board for questions; before we go on to the Peer Review Panel report. The first hand I see is Loren Lustig. Let me go through, and while Loren's speaking if you would keep your hands up, I'll jot you down and nod to you that I've got you here. Go ahead, Loren.

MR. LOREN W. LUSTIG: I actually have two questions, so I would request a follow up. My first question is the more important one. I thank you for that excellent report. I was concerned about the bycatch mortality, 5 percent. Now I understand that it's complicated, because many trips there are not observed. That is a problem likewise. Did the Technical Committee offer any suggestions about how this small, but still important, mortality could be alleviated or lessened in any way?

DR. DREW: I think probably the most important thing would be to increase observer coverage; and to get a better handle on what's going on. I think there has been some work in terms of looking at factors that led to the mortality. We reported it sort of essentially as it is 5 percent across the board in the North Carolina gillnet fishery.

But there have been studies that looked at things like is it tied down or is it a free-floating gillnet? Is it the depth that you're fishing at? Is it temperature or things like that? More work can definitely be done on that to help you avoid setting your nets and gear in a way that's going to interact negatively with sturgeon. I think more work can also be done with the tagging data; to identify sort of hot spots or hot times of year when these sturgeons are vulnerable to the gears, to help provide information on how not to catch sturgeon.

MR. LUSTIG: My follow up question is can you give us any indication of what the disposition of these fish is; that being the fish that have died in the bycatch and mortality consideration?

DR. DREW: My understanding is that when the observers are on board that all goes back, and everything has to go back into the water now. There is no retention of sturgeon for any purposes. Whether or not that's happening when somebody is not onboard is of course hard to say. But right now it all goes back into the water, whether it came up alive or whether it came up dead.

CHAIRMAN NOWALSKY: Right, so let me run through the list of people that I have down so far. I've got Dave Borden, Mike Armstrong, John Maniscalco, Dave Bush, and Rob O'Reilly. Is there anyone else that I missed from there? We do have a hard stop later this morning for a luncheon; so we'll try to keep ourselves on schedule here. Dave Borden.

MR. DAVID V. BORDEN: Excellent report, Katie. In terms of the Gulf of Maine as I understand it, it's pretty much bycatch. What are the fisheries? What are the target fisheries that have the bycatch in the Gulf of Maine?

DR. DREW: In the Gulf of Maine I don't know specifically by the DPS. I think the other issue for the Gulf of Maine of course is the connectivity with Canada, where there is still an open fishery. Some of that mortality may not be fishing actually in the Gulf of Maine. It may be in Canada, where it is still open.

But in general I think we were seeing, with the gillnets in particular, it was a lot of monkfish and spiny dogfish. I would have to go back and look. We did it based on sort of species composition, so we do have the relationships between what was most likely to be caught in that fishery with sturgeon, so we could go back and look at that as well.

CHAIRMAN NOWALSKY: Mike Armstrong.

MR. MICHAEL ARMSTRONG: Katie, I'm trying to be clear. An EPR of 50 percent is a Z of 0.12. Then you apply 80 percent of that so really the reference point is 0.096?

DR. DREW: It's a little higher. It's the 80th percentile of that distribution; the slightly higher end of that distribution yes.

MR. ARMSTRONG: Okay so we're getting Z out of the acoustic tagging. Most of the acoustic tagging is on juvenile fish, so you expect Z to be higher? My question is, are we biasing Z a little high, unless there is a selectivity curve you use in the EPR calculation and all that?

DR. DREW: If we go back and look at the distribution of the tagged fish. It is actually a pretty good split between juveniles and adults. We basically sort of eyeballed this and said the 1,300 millimeters, so 130 centimeters is an adult. Below that it's a

juvenile. We had a basically almost 50/50 split between fish above and below a certain size. The other thing we did, I didn't mention this in the presentation, but that Z estimate is, so the egg-per-recruit estimate is an age-structured model.

Because we're using age-specific natural mortality in that model, we actually reported a N weighted average of that mortality over the sort of the range of ages that we thought we were seeing in the tagged fish, so that we know that mortality on the juveniles probably is higher than it is on the adults, because of that combination of natural mortality and then vulnerability to those estuarine inshore fisheries. We tried to balance that out when we were to present a Z that is directly comparable to what we think the Z that the tagging model is actually measuring in there is.

MR. ARMSTRONG: Okay, well I'm glad I asked. That's good. I wanted to be clear on that. We're being pretty conservative. I see a lot of good news in this report. When I see the big red boxes, I don't think it's quite as bad as all that. I mean we're heading in the right direction here for sure.

DR. DREW: Right, and the red boxes were dangerous, and that's probably why the Review Panel recommended just the percentages. The important part of that I think is that in some systems we are seeing higher estimates of mortality; and that may be a function of the sample size that we have. The Carolina and the Gulf of Maine were our two lowest sample sizes, and that's where we see more uncertainty, and therefore a higher probability of being above that. But there may also be DPS level sort of specific factors that could be affecting mortality as well.

CHAIRMAN NOWALSKY: Next I have John Maniscalco.

MR. JOHN MANISCALCO: Katie thanks for the presentation. I was just wondering if the Assessment Committee looked at how sensitive the coastwide Z was to different DPSs, because of the, we'll say overrepresentation of the New York Bight tagging data?

DR. DREW: We did discuss whether we would want to consider coming up with DPS specific estimates of the reference point; versus doing this kind of coastwide approach. I think initially when we were just reporting the point value, we were sort of looking at, and we did provide estimates for a southern region and a northern region. Part of the issue is of course we don't have really good biological data at the DPS level; so we know there are differences in the life history in the south versus the life history in the north. But there is not a lot of good data to help hammer that down. There was a little bit of a difference. I think when we were looking at the point estimates it was like 0.09 compared to 0.13 for the south. There were some differences, but we ended up just sort of folding that into this larger uncertainty about the overall coastwide Z estimate, because we don't have a good handle on DPS specific life history parameters. The data just aren't good enough.

CHAIRMAN NOWALSKY: David Bush.

MR. DAVID E. BUSH, JR.: Some of my questions were sort of answered. But I guess that leads me to a new question. It relates back to the mortality. I understand that during this you really didn't try to attribute it to any one particular source of mortality; just lack of information. But that still brings me back to the original point in here, and some of the stuff that I was reading.

Bycatch and ship strikes are usually the primary or assumed to be the primary sources of mortality. But then in another area it is suggesting that there is a

substantial unaccounted for source of mortality somewhere. Are there any thoughts or suggestions what that could be or might be? What tree do we start barking up?

DR. DREW: I think the bycatch and the ship strikes are certainly probably the two primary, easy-to-identify sources of mortality. I think there is also, you know there is the concern about maybe how much of the Gulf of Maine is moving into Canada, where this is a directed fishery. There is also the concern I think about some of the power plant impingement type stuff. Dredging, construction, all of these types of projects that interfere with slow moving coastal fish, as well as the potential for if not direct mortality then a loss of productivity due to the loss of spawning habitat, and the degradation of environmental quality. I think it's a lot of things that we've seen with eel, with shad and river herring, as well as for sturgeon. They're all vulnerable to some of the same issues.

CHAIRMAN NOWALSKY: David, do you have a follow up?

MR. BUSH: Yes just very briefly. The proportion changes that you've seen over time that is associated to this mortality. Is it possible that some of these proportion changes are just simply based on the fact that we have more or better data; versus what we originally had? Do you think there are other substantial changes that are in fact changes as well?

DR. DREW: I think that is one of the things that hindered the assessment; is that it is hard to tell the difference between are we seeing more sturgeon now, either more deaths, or are we seeing more sturgeon in the rivers or more in our surveys because we're looking for them, because we're paying attention, because the data are better, or is this a genuine sign of either increased ship strikes or increased mortality or increased sturgeon abundance? I think that is hard to say, and it's probably a combination of both.

CHAIRMAN NOWALSKY: Right, so I've got additional speakers, Rob O'Reilly, Pat Keliher, John Clark, and Roy Miller. Once those four speakers have had a chance, we're going to move on to the Peer Review Panel report and we'll have an opportunity for additional questions after that. Rob O'Reilly.

MR. ROB O'REILLY: Thank you, Dr. Drew. Mortality seems to be talked about quite a bit. My question relates to using total mortality. At this point I can see that that is a valuable way to look at this. But the questions about the bycatch mortality or non-harvest mortality, once there are more incidental-take plans put in place through the National Marine Fisheries Service; it's bound to generate more monitoring efforts. I know in Virginia we're on the threshold of having our ITP approved, and we're looking at our gillnet fishery, and so we've got about a year of monitoring so far.

I guess when you talk about the five year and the ten-year approach, with the ten year being another benchmark, and the need for additional data, I would guess that more states having the incidental-take plans approved will propel us towards that more data. Then I wonder once we do achieve more ITP in essence, does that mean that total mortality will be important to split a little bit, and look more closely at the bycatch mortality, or do you think that as we go forward in time, whether it's five years or ten years that just looking at total mortality will suffice?

DR. DREW: I think looking at the total mortality is important from fishery independent surveys like the tagging program; because that's an actual measure of how is that bycatch impacting the population? I think it is going to be important to monitor the levels of bycatch that we're seeing, and then seeing how that translates into total mortality, to get a

better handle on how important is bycatch to the total mortality compared to things like ship strikes, or things that we're not adequately monitoring?

How much of it is sort of an unseen source? I think definitely having the better data through the ITP permits is going to be critical. But I think we also need this metric of sort of this fishery independent source of measuring how that's actually impacting the population.

CHAIRMAN NOWALSKY: We will have more ITP discussion shortly. Pat Keliher.

MR. PATRICK C. KELIHER: Katie that's a great presentation with a lot of positives. I want to get back to a direction you went with David Borden. The Endangered Species Act, if I'm not mistaken, has within its laws political boundaries, in this case the boundary between Canada and the U.S. Your answer to David included information related to Canada, and bycatch in Canada. Why are we taking that into account, when we're looking at a DPS that should not include the country of Canada?

DR. DREW: We're really not taking it into account. But I think we're talking about it in terms of, it's a question that the Gulf of Maine is genetically distinct from Canada, so it is its own population. But we know those fish are moving back and forth with Canada; and in fact in the report there is a figure showing the breakdown of harvest in the Bay of Fundy directed fishery on a genetic basis, and it was about half Canada but still had a significant component of Gulf of Maine fish.

We know those Gulf of Maine fish are moving up into Canada, where they are vulnerable to other sources of mortality. It's something to consider and keep in mind that when we're trying to recover this population, it may not be solely a Gulf of Maine problem. It may also have implications for interactions with Canada.

CHAIRMAN NOWALSKY: John Clark. Thank you, Roy Miller.

MR. ROY W. MILLER: I just wanted to clarify something I thought I heard and that regards the disposition of animals killed as a result of bycatch. I think I heard that they're thrown back overboard. Did I hear that correctly? Katie is shaking her head yes.

DR. DREW: That is my understanding, yes.

MR. MILLER: Isn't there some better way to handle these animals? It seems to me if we have observer coverage, couldn't that observer be given a permit to retain a sturgeon killed as bycatch, so that we could get biological data? The reason I suggest that is that when sturgeon wash ashore in our state, either from ship strikes or fisheries interactions. That becomes a big deal.

The public gets involved, a biologist gets dispatched to collect the animal and gather data from it, if it's not too decomposed. Here we have access to animals that are dead; but not decomposed. They otherwise should be in reasonable condition for a post examination. Can't we make better use of that data?

DR. DREW: That's definitely one of the research recommendations from the Stock Assessment Subcommittee and the Review Panel; is to try and make that happen. It's a combination I think, of permitting issues that you need now that it is an endangered species, you need specific permission to be able to do anything with it, even if it's dead.

But there is also, you know the observer program is on a working vessel and that the sturgeon is not the target of the observer program. I think it has been in the past easier for them; they take a length and a weight, and then just throw that thing back

overboard, and move on to the commercially important species they're trying to observe. I think we certainly recommend that that is what happens and that the observer program consider giving more priority to sturgeon, and taking that kind of samples from sturgeon that they encounter in the process.

PRESENTATION OF THE PEER REVIEW PANEL REPORT

CHAIRMAN NOWALSKY: Okay, we'll now turn to Dr. Ballenger for a presentation of the Peer Review Panel report.

DR. JOSEPH BALLENGER: All right thanks for having me today. Thanks, Mr. Chairman. For those of you guys who don't know me, I'm Dr. Joseph Ballenger. I'm from the South Carolina Department of Natural Resources. I was the Chair of the recent Review Panel; Independent Review Panel for the Atlantic Sturgeon benchmark stock assessment.

As Katie just said, we all are intimately aware there was a benchmark stock assessment conducted on Atlantic sturgeon. Where we came in, a Review Panel was convened, including myself and three additional technical reviewers, with expertise in sturgeon biology, statistics and population dynamics in stock assessment modeling, with the express goal of doing a scientific review focusing on the data inputs to the assessment, the model results and sensitivity regards to major model assumptions, and the just general overall assessment quality; with the ultimate products being both the stock assessment report and an accompanying Review Panel report that will be shortly I believe, posted to the ASMFC website.

In addition to myself, I was also joined on the Review Panel by Dr. Rod Bradford from the Population Ecology Division out of Canada Department of Fisheries and Ocean, Dr. Selina Heppell from Oregon State University's Department of Fisheries and Wildlife, and Dr. Rob Ahrens from the University of Florida Fisheries and Aquatic Sciences Program.

We convened, as Katie mentioned, in August, 2017, to review the assessment. I'm just going to go over very briefly our major findings. We did find that the suite of assessment analysis provided by the Stock Assessment Subcommittee and the Technical Committee provides the best available science at this point in time for Atlantic sturgeon. However, as Katie mentioned several times, the paucity or lack of data precluded the application of more traditional stock assessment techniques; except at perhaps the coastwide level.

There really is a genuine lack of data. We need some more information here. But the bottom line if for a stock-status determination, the Review Panel felt comfortable saying that the stock was depleted relative to historical levels, based off of results from the effective population size and stock reduction analyses. I'm not going to talk about those in depth here.

We also felt though on a good note is that total mortality in recent years seems to be generally below the threshold levels, as being proposed, and it seems from the relative abundance indices trend that it would have a stable to increasing relative abundance overall, generally speaking.

The Review Panel was actually tasked with going through the terms of reference and making specific comments regarding each TOR, the first of which was to evaluate the appropriateness of population structures defined in the assessment.

The Review Panel made some conclusions regarding this saying that there seems to be a body of evidence that suggests that complex metapopulation structure along the Atlantic Coast for this population was

sort of this network of small, semi-discreet, subpopulations, being connected through some type of migrational movements.

Generally speaking it seems like the genetic designations of the distinct population segments are sound; although it is likely there is going to need to be some refinements to the genetic baseline in the coming years, to better understand spawning tributary membership within the DPS units, particularly between the Carolina and South Atlantic DPS units.

That said there are a lot of challenges to actually conducting or running an assessment on Atlantic sturgeon actually at the DPS or river level. This is because we have, as I mentioned earlier, insufficient life history information, particularly within individual DPSs. Most of the life history information we do have derives mainly from the New York Bight area.

We've also seen an identification of new or more widespread spawning behaviors than we might have thought previously existed; including potentially higher incidents of straying between natal rivers, and also this identification of false spawning runs in some systems. We also feel that the lack of coordination between the U.S. and Canadian Atlantic sturgeon assessment research could be possibly hampering our understanding; particularly of what's going on in that Gulf of Maine DPS.

Finally, we have difficulties partitioning current sources of anthropogenic mortality, whether that's coming from bycatch, ship strikes, or other means to individual DPSs. Given that we recommended for the assessment that the Assessment Team focus on assessing trends and mortality, total mortality at the coastwide level for the assessment.

Then to support research that would advance our ability to assess the population of finer spatial resolutions into the future. Further, we would need to refine the DPS construct to better define spawning tributary membership; particularly as I mentioned earlier in the Carolinas and South Atlantic units.

For Term of Reference 2, we were asked to evaluate the adequacy, appropriateness, and application of data used, and the justification for inclusion or elimination of data sources. Overall, the Assessment Team and the Stock Assessment Subcommittee should be commended for a thorough collection and evaluation of the available data. That said, coming out of Katie's presentation, the data that ultimately was deemed suitable for use in the assessment emphasizes the data poor situation of Atlantic sturgeon; relative to many other U.S. managed marine and riverine resources. Particularly evident was a lack of data available from the South Atlantic DPS. There was also not enough adult fish were not adequately represented in most of the datasets. Very few adults were showing up in the datasets. We have no information on the age structure, or the age structure is not sufficiently documented for any DPS to really do an age-based analysis.

In regards to specific data streams, [the review panel] made some comments regarding specific data streams, and I'll start first with fishery removals. The Review Panel had some concerns there are several potential sources of bias in the historic landings dataset. As chief amongst those being that we have really an incomplete catch history, as we know that Atlantic sturgeon harvest began prior to the 1880s, but we just don't have any information about how much was landed prior to this point in time. We also understand that particularly in the earliest part of that historical landings stream that annual landings estimates are probably being influenced by under or over reporting, depending on what portion of the coast they decided to sample in a given year.

Then there is also just a general lack of information on sizes harvested; and if the sizes of harvested fish changed dramatically over time. We concurred with the Assessment Committee with regards to the removals time series that it is hampered by the inability to separate those removals to individual DPS units, with some acknowledgement that seems the center of the fishery is shifting over time, so the relative impact on the harvest on different DPSs is likely changing through time.

In regards to the indices of relative abundance, I hope it is abundantly clear by now that there is very few surveys that are specifically designed to catch Atlantic sturgeon. Given the surveys that we did end up using an assessment model, some surveys appear to be DPS specific, giving survey location and age which encountered.

But for those ocean or estuarine surveys, it's unclear what proportions of the DPSs are actually encountered in those surveys. We need to address this with concurrent genetic sampling of any Atlantic sturgeon sampled in those surveys in the future. Here is just once again that same map that Katie showed earlier, showing that we have basically three riverine surveys, and then the rest of the nine surveys are mainly coastal or estuarine in nature. They are probably mixed stocks [surveys].

The Panel also expressed some concern regarding the suitability of the Conn method to develop a coastwide index. Although this method has been used and advocated as a means to combine geographically separated indices in other studies, and on average it appears to provide unbiased results. It's not very clear in what situations it does produce biased results. That said, the Review Panel didn't have any other viable option, or couldn't come up with another viable option to come up with a coastwide index, so at this point in time we did feel that it represented the best available abundance trend for the coastwide [population].

The Review Panel also made some specific recommendations. We recommend, although the Assessment Team originally recommended excluding these indices, we recommended including the New York Juvenile Atlantic Sturgeon Survey, the NEAMAP Survey, and the South Carolina Edisto Surveys and Trend Analyses.

They were originally for the most part, my understanding, eliminated because of the relatively short time series for these surveys. But because these are primarily small juvenile relative abundance trends, we thought there was some value in including these in the assessment. We also made some specific recommendations about how to actually standardize the different relative abundance indices, recommending use of a binomial error structure for surveys that have low encounter rates and small catches of sturgeon, when they actually were positive.

We did this for six of the nine surveys; and we recommend using these in subsequent trend analyses in development of the coastwide index. I believe that is the results that Katie presented on earlier were those recommended changes.

Term of Reference 3, we were asked to evaluate the methods used to develop Atlantic sturgeon bycatch estimates. Panel conclusions; the bycatch series posited should not be used as a time series of relative abundance, and the Assessment Team also recommended this as well. This is because it's plagued by a lot of the same issues; we have a lot of other fishery dependent data sources including inconsistencies in sampling, not to a full understanding of the responses of industry to regulatory changes and how that could affect catchability or selectivity, and some uncertainty about DPS compositions or catches.

Further, DPS composition of the bycatch is needed if assessment/management at the DPS level is to be pursued into the future. The Panel also felt that bycatch mortality was likely underestimated overall. The bycatch estimates that we do have were derived from a subset of fisheries that are interacting with Atlantic sturgeon; and those fisheries had generally limited observer coverage in oceanic fisheries, with no information from many inshore, estuarine, and riverine fisheries.

There was also difficulty in defining effective effort on unobserved trips. The current bycatch estimates do not account for the possibility of delayed mortality of Atlantic sturgeon, once they are replaced back in the environment. They are affected by underreporting or inappropriate survey methods, and we know that the time series of bycatch estimates are incomplete, because the earliest bycatch estimates we have are from 2000. Recommendation from the Panel is to take measures to try to include additional fisheries, in order to increase a geographic scope of our understanding of bycatch, particularly in the Gulf of Maine and in estuarine/riverine areas.

For Term of Reference 4, we were asked to evaluate the methods and models used to estimate population parameters and biological reference points. Overall, as I said earlier, the suite of models available to the Assessment Team was somewhat limited, due to the inability to conduct age-based analyses. Simply put, the age data were just insufficient to do age-based analyses. Given these limitations, the Review Panel did agree with the decision to evaluate total mortality estimates from the acoustic tagging model relative to egg-per-recruit reference points as a means to sort of assess sustainability of recent mortality rates.

We also agreed with the use of the ARIMA models to evaluate recent trends in abundance, or endorse those approaches. One of the main things that are hampering this assessment is that the representativeness of life history parameter estimates at a coastwide, or individual DPS level is a significant source of uncertainty in the current assessment. We must get some better information regarding life histories from other areas, and more recently. A primary recommendation coming out of the Review Panel was to collect contemporary life history information from all segments of the population.

In regards to the acoustic tagging model specifically, the Review Panel felt fairly strongly that the uncertainty in those total mortality estimates are likely to improve in the short term from these models. As the length of the time series increases and as more Atlantic sturgeon are tagged. Those uncertainty estimates improve both at the coastwide and at the individual DPS level, and it will improve for estimates for juveniles and adults. We did recommend using the median Z estimates from the tagging model as point estimate for current Z instead of the more normal measure of central tendency of mean, simply because we saw those skewed distributions that Katie was showing earlier.

Here are just a couple of examples, the same thing from her plots showing the skewed nature of those distributions. These are actually from the two DPSs with the highest number of tagged fish. It gets a little bit more skewed for some of the other DPSs.

For the ARIMA model or the trends analysis, the use of the ARIMA model is the most suitable for the trends analysis, because from the Review Panel's perspective it did allow you to account for a potential autocorrelation in the indices values from year to year, as well as it provides a built-in mechanism for a probabilistic determination of likelihood of population increase relative to some predefined reference point.

Katie and I talked on this, but the Assessment Team also did a power analysis. The Review Panel felt this was very useful to actually investigate the potential utility of the surveys we are including in the model for the general result, suggesting that due to levels of uncertainty the ability to detect trends from those surveys may be relatively limited in the short term. Then finally the Mann-Kendall Test just allows us to once again address some probabilistic assessments of increase.

The Review Panel did have some concern regarding the robustness of the egg-per-recruit analyses, and reliance of management on the single point estimate of Z 50 percent as Katie alluded to in her presentation, due to two primary sources of uncertainty, namely the uncertainty of life history inputs and uncertainty in the bycatch and ship strike selectivity at size and age.

During the Review, we asked the Assessment Team to evaluate some different assumptions about age at maturity and/or bycatch selectivity; which ultimately suggested some substantial or moderate uncertainty in the Z 50 percent level. This is the same graph that Katie showed earlier, suggesting there is some uncertainty in that estimate, and hence we recommend taking that probabilistic approach.

The Review Panel also felt there needed to be some justification for the choice of the Z 50 percent as a threshold or target egg-per-recruit level. We should both explore how sensitive the reference point level is to different assumed threshold and target egg-per-recruit levels, and the choice of the most appropriate threshold or target will likely require additional research.

We also recommend using that probabilistic approach to define egg-per-recruit percent levels; whatever percentage you want to manage to.

For Term of Reference 5, we were asked to evaluate the methods used to characterize uncertainty in the stock assessment in regards to the mortality status. We felt that with the tagging model, as presented, appropriately incorporates uncertainty into recent total mortality estimates given that it's a framework. We did recommend including those visual or summaries of the posterior distribution of Z to give a better representation of the uncertainty. Then I've said this several times, but basically those total mortality estimates, coming from the posterior and recommend uncertainty incorporation of egg per recruit, allows the analysis for total mortality determination to be assessed probabilistically, as far as the biomass and abundance status.

The ARIMA analysis has a built-in framework that allows, once a risk tolerance is specified, to monitor population trends relative to an accepted reference point, so we felt this was good. The Review Panel thought that monitoring total mortality using acoustic tagging models in the short term will provide a better measure of anthropogenic mortality impacts on recovery than trying to directly monitor sources or individual sources of anthropogenic mortality, meaning directly monitoring losses due to bycatch, ship strikes, et cetera.

This is because it's going to take a lot of resources and a lot of extra expended effort to get those datasets into a situation to where they can be really used in a more traditional stock assessment approach. As I mentioned earlier, we also think in the short term the utility of those tagging model estimates are expected to increase as uncertainty in those total mortality estimates are reduced.

We also think that by addressing the previous concerns regarding the egg-per-recruit analysis, basically building on some of those life history and selectivity

uncertainties, it could be useful for actually informing potential recovery targets into the future.

There is still some uncertainty as to what the most appropriate index-based reference point to use as a measure of current stock status. As Katie alluded to, they used either the start of the moratorium, or the closest year they had to the start a moratorium, or whether it was above the 25th percentile of the overall index. The Panel didn't have any specific recommendations on other reference points to use. That is something that could be considered in the future though.

We also agreed that we should not use the results of the stock reduction analyses, which you can find in the report as a measure of biomass or abundance status. These results were suggesting a more rapid increase in abundance of the Atlantic sturgeon population coastwide in recent years than what we were seeing in any of our indices or any of our other analyses, which most likely suggests that there are unaccounted for sources of mortality that we're not accounting for in those models.

We also said that for the acoustic tagging models, although in the short term they are our favorite approach to assess total mortality, for them to be viable in the long term, there must be maintained and sustained effort to tag additional fish coastwide. We also should expand resources to do as much as we can, to maintain or expand current acoustic receiver arrays coastwide.

The Review Panel also felt the specification of a risk tolerance by managers would inform choice of the ultimate reference point from the egg-per-recruit analysis, and mortality status determination. Finally, the ultimate choice of the biological reference points should be informed by management goals and target recoveries.

Overall, regarding status determination, the Review Panel concurred with the assessment that the abundance of evidence suggests the abundances are likely increasing slowly coastwide. However, Atlantic sturgeon remains depleted relative to historical levels. The Review Panel was cognizant and recognized the difficulties posed by just the limited information the Assessment Team had, and lack of DPS specific recovery targets. We did recommend that additional research be conducted to identify appropriate reference points for future status determinations and recovery targets, and to develop metrics used in status determination to be presented as probabilities, as Katie showed you earlier.

I've mentioned several times and Katie has mentioned several times, but as far as research, data collection, assessment methodology recommendations, the primary thing is that there is still a severe data limitation that currently are restricting the type, scope, and usefulness of assessment methodologies that can be applied to Atlantic sturgeon.

There is an incomplete accounting of temporal and spatial variability and life history parameters. There is an imperfect understanding of temporal or spatial organization of the metapopulation structure. There seems to be major uncertainties in the scope for direct harm arising from interaction with ongoing human activities; whether that be through bycatch, ship strikes, et cetera.

Just to highlight that the Review Panel went through a little bit of a data gaps analysis, they put a table together in the Review Panel report to quickly try to highlight some of the primary data gaps we have for Atlantic sturgeon. With regards to life history, we basically don't have very much life history data at all. The vast majority of it

is coming from the New York Bight area, and even that data is fairly dated at this point in time. We need more contemporary studies of life history. In regards to surveys or monitoring work, we are lacking surveys on juveniles and adults in some specific DPSs; and we are lacking any survey of spawning adults throughout the entire coastwide range of Atlantic sturgeon. This should be a high priority moving into the future to improve our understanding of Atlantic sturgeon.

We also, as we talked about earlier, only have limited bycatch information. We have no local bycatch monitoring in the Gulf of Maine, New York Bight, or Chesapeake DPSs. Further, the number of acoustic tags used in our mortality estimation varies, depending on DPS and the number of genetic samples used in the definition of that genetic baseline varies from DPS, and likely sample size needs to be increased. Overall, once again just reiterating the suite of assessment analyses provides the best available science.

The overall conclusion is the stock is depleted relative to historic levels. The current total mortality is below threshold levels and coastwide Atlantic sturgeon populations seem to be exhibiting stable to increasing relative abundance since the moratoria. We concurred that the general timeframe should be to conduct an assessment update in five years, and a benchmark assessment in ten years; assuming that some of these data improvements are made over this time period. With that I would be happy to answer any questions.

CHAIRMAN NOWALSKY: Okay, so thank you very much, Dr. Ballenger, before we get to questions I will just highlight that there was a Atlantic sturgeon Stock Assessment Subcommittee and Technical Committee did meet and provided a supplemental report that is in the meeting materials for some of the items that the Peer Review had highlighted. A number of those were touched on in Katie's report, I believe as she went through that. But just did want to highlight that for everyone. Again, I want to highlight that we do have a hard stop this morning. I do have a couple of additional agenda items. I'll allow a couple minutes at this point for any questions for Dr. Ballenger about the Peer Review Report. I would ask that they be geared specifically towards informing the Board about the decision point we'll have, about whether or not to accept this for management use and request that. With that do I have any hands for questions for Dr. Ballenger at this point?

CONSIDER ACCEPTANCE OF THE BENCHMARK ASSESSMENT REPORT FOR MANAGEMENT USE

CHAIRMAN NOWALSKY: Okay, seeing none; we'll next turn to the Board for consideration of acceptance of the Benchmark Assessment Report for management use. Chris Batsavage.

MR. CHRIS BATSAVAGE: Yes I would like to make that motion that should be coming up on the board here shortly. I guess before it does, I would like to just express my appreciation to the Technical Committee and the Stock Assessment Subcommittee and everyone else who worked pretty hard on this assessment over the last few years.

As you saw one of the earlier slides, it was literally a cast of dozens, at least a couple dozen. Without me adlibbing, hopefully there is, here we go**. I move to approve the 2017 Benchmark Assessment for Atlantic sturgeon and Peer Review for management use.**

CHAIRMAN NOWALSKY: Thank you, Chris; do I have a second to that motion? Seconded by Doug Grout, discussion on the motion, okay before we take action on that I'll simply turn to the public momentarily. Are there any comments from the public on

this matter? Seeing none; back to the Board. **Is there any objection to the motion? Okay seeing no objections; the motion stands approved.**

CONSIDER MANAGEMENT RESPONSE TO THE STOCK ASSESSMENT REPORT AND PEER REVIEW REPORT

CHAIRMAN NOWALSKY: At this point we would entertain Board discussion about Management Responses to the Stock Assessment Report and Peer Review Report. Bob Ballou.

MR. ROBERT BALLOU: I'm not so sure if this is so much of a management response, but it's a curiosity that occurs to me as both Dr. Ballenger and Dr. Drew spoke about the lack of data from the South Atlantic. Associated with that the rejection of SEAMAP as a survey, based on the rare occurrence of sturgeon, yet NEAMAP was accepted; obviously because there must have been more of an occurrence of sturgeon in the survey results.

What are we to make of that? Are SEAMAP and NEAMAP surveying in the same way, and SEAMAP is just simply not encountering any sturgeon, or is there something about the SEAMAP methodology that differs from NEAMAP that might help explain the lack of data resulting from that survey, and therefore it's non-availability for use in the assessment?

DR. DREW: Sure, good question. We did look at SEAMAP, and they had very rare occurrences of sturgeon; so I think they caught maybe one or two over that entire 30 year time series of SEAMAP, whereas NEAMAP actually was getting semi-reasonable numbers for that. I think it does have to do with they are using different vessels, and they're surveying in different areas.

I think it may be a combination of the differences in the techniques that the SEAMAP is using that kind of shrimp trawl vessel, and it's just not able to interact with those larger fish the way that NEAMAP, which is using a larger vessel, is able to, and a different set of strata. I think it's just the SEAMAP is not good enough to capture sturgeon in ocean waters, whereas NEAMAP is a little more successful at it.

CHAIRMAN NOWALSKY: Okay so I've got three hands right now. I've got Mike Armstrong, Lynn Fegley and John Maniscalco. I would request again comments geared towards management response by this Board. Mike.

MR. ARMSTRONG: It's clear somewhere direction needs to come to improve the data. I've seen time and time again with species, where we get reports like this and there is no correlated effort to move things forward. I would suggest, I don't know how we move forward with it, but the TC can give us guidance of where is the biggest bang for the buck? Is it more acoustic tagging? I would suspect that's the easiest to pull off.

Is it going to improve the estimate? Life history looks like it is desperately needed; that will be a tough nut to crack. But anyway, I just wanted to throw that out there. If we want better data, if we don't want all this uncertainty, we need to move forward. Of course it will cost money, and I don't know where that comes from.

CHAIRMAN NOWALSKY: With that comment, let me turn to staff with the question of would there be any benefit to specific TC tasking on any items here today; or discussion at a future Board meeting? Is there any TC tasks in the hopper that will help inform a lot of these research questions moving forward?

MR. MAX APPELMAN: I think the task that Mike is bringing up is certainly valid; and just having that general agreement as part of this discussion on the record, to have the TC look into where to focus data collection

efforts is certainly something that can be done before the next meeting of this Board.

CHAIRMAN NOWALSKY: Is there any objection from the Board to having Max work with the TC on that moving forward; an objection?

MR. BATSAVAGE: No, Mr. Chairman, not an objection. But I think to that point, with sturgeon being listed as endangered and threatened, I think we need to keep in mind that in addition to money needed to conduct this research, we also need permits through the Endangered Species Act.

As we'll hear in just a few minutes that is not easy task. I think that is something the TC should probably highlight as well, as far as research needs. I guess maybe just kind of manage our expectations, as far as how we can get some of this stuff done, just due to the constraints under the ESA.

CHAIRMAN NOWALSKY: Next up I have Lynn Fegley.

MS. LYNN FEGLEY: Just to follow up on Mike's point about tasking the TC. There was a note in Dr. Ballenger's presentation about the necessity to maintain and potentially expand the acoustic array. I just wonder if there is a way for the Board to understand the status of that array; how it's faring. Are there budgetary constraints, and if there are some levers that can be pulled somewhere to help make sure that array stays in place?

CHAIRMAN NOWALSKY: I'll look to anybody up here at the table, or around the rest of the room to comment on the acoustic array. Katie.

DR. DREW: Part of the issue is of course that it's not a single, like there is no single entity maintaining this array. It's actually a patchwork of different arrays held together by different researchers. But I think as part of the TC task, we could also look at as part of the sourcing this data, we definitely reached out and tried to get in touch with as many people as possible.

We could definitely follow up with some of that and see how are things going, where are arrays now, where do people expect to lose funding or gain funding in the future? That could help sort of give a status report on the array as it exists.

CHAIRMAN NOWALSKY: John Maniscalco.

MR. MANISCALCO: I was just wondering what the Board could do to improve information sharing with Canadian fisheries that seem to be an issue for the Gulf of Maine.

CHAIRAMN NOWALSKY: Is that something the TC could look into and respond? Okay well thank you very much for that discussion. I think we've got something we could move forward with. Do we expect that we would hear back and schedule a Sturgeon Board meeting for the winter, or not until the spring?

EXECUTIVE DIRECTOR ROBERT E. BEAL: It seems we're coming up with a pretty extensive list for February already. If the Tech Committee can get their work done and it fits into the February meeting, we'll put it on there. Since it's a long term research project, it may not be as urgent as some of the other things that have to be tackled in February. You may have to push it to the May meeting, but we'll see what we can do.

CHAIRMAN NOWALSKY: Okay, so we're going to move on to the next agenda item then. With the consent of the Board I would like to flip flop Items 5 and 6. We do have the Atlantic sturgeon Coordinator here from GARFOs Protected Resources, unless there is any objection from the Board, I would like to give her the opportunity to do

her presentation on the update of the progress on the ESA five-year-status review and development of recovery targets. We'll turn to Lynn. Thank you.

UPDATE OF THE PROGRESS ON THE ESA FIVE-YEAR STATUS REVIEW AND DEVELOPMENT OF RECOVERY TARGETS

MS. LYNN LANKSHEAR: Thank you very much. I also wanted to recognize our counterparts, my colleagues in the Southeast Regional Office, with whom we share Atlantic sturgeon management under the Endangered Species Act. Once a species, subspecies or a distinct population segment of a species or subspecies is listed under the endangered species act, we, NOAA Fisheries, must undertake a review at least once every five years to consider new information since the listing, and then make a determination as to whether that listed entity should be reclassified under the ESA, or delisted. Since of course we were at that five-year mark for the Atlantic sturgeon DPSs, We are beginning that process of five-year review.

Any five-year review, one of our first steps is to publish notice in the Federal Register that we're undertaking the review, and to ask any members of the public to submit relevant information. The public notice will also give specifics on how and what information should be submitted, just in terms of providing biological information or any other information that needs to be considered. This is not a public comment period; so it's not an opportunity to comment on any past actions or any that the public may anticipate that we would be taking in the future. It is specifically to solicit information for the five-year review. There will be a deadline in that notice for when we would like the information. Again, that's just to help make the review process as expeditious as possible. However, it is important to remember that we will accept new information at any time.

We don't want folks to read that notice and then have something new come out, and withhold it, thinking that we can't consider it for the review. Again, any information that is available can be submitted to us at any time; both during this five-year review process or any time outside of a review process.

For species without recovery plans, this of course is where we're at right now with our Atlantic sturgeon DPSs, we analyze the available information relative to the definitions of endangered and threatened in the Endangered Species Act, and to those same five listing factors that we considered when they were originally listed.

It is very important to remember – we want this message to go out to as many people as possible – that the five-year review does not make any change to the listing. While the language in the ESA specifically says that the five-year review process ends with a determination about whether the species should be reclassified or delisted; we make that determination in the five-year review document, but it has no immediacy of affect. What that would mean, if it does determine that some change is needed, is that we would have to then do a proposed rulemaking with opportunity for public comment, and then considering all such comments and going out with a final determination.

Again, for our Atlantic sturgeon distinct population segments, our plan of course will be to review the information; and then draft the five-year review internally with NOAA staff, to use the stock assessment as one of our primary sources of new information, to request the Sturgeon Technical Committee to peer review the draft five-year review.

Again, five-year reviews do not necessarily need to be peer reviewed; but our

expectation at this point is that we will have it peer reviewed, and request that through the Sturgeon Technical Committee.

Then what may be subject to change, but at this point we're looking at completing one review document for all five DPSs. Again, that may change if we find that there is an abundance of information available for one DPS versus the others, and just as a matter of timeliness we may complete some before another one that needs further consideration. I just put this in so we would have something to reference to, but once the results are available they will be posted on our Office of Protected Resources website, as well as the regional websites.

Just for your information, for five-year reviews there is additional information there about templates that we follow and the guidance that's available. Our other step, which I alluded to at the beginning is recovery planning. We have not yet begun recovery planning for the Atlantic sturgeon DPSs. Recovery planning is also required, and the purpose of that is to put plans into place that guide our consideration of how the species will be recovered, and when we would consider those recovered to warrant delisting from the Endangered Species Act. Again, we're in the beginning stages of that. Part of that is to consider whether to do separate plans, one for each DPS, or some combination of the DPSs together. Part of that consideration in large part is that we are looking to involve a variety of subject experts in these plans. We want to make sure that we use their time in the best way possible. We don't want to call a group of experts in for one plan, and then have to subsequently call them in again for another. Some combination of plans together might be the best use of their time. Again, combinations may work, just in terms of when we put the information out to the public to enable the public to see things altogether, rather than in five or three or four separate places.

Once a Draft Recovery Plan is prepared, we make that available for public comment. Anyone not involved directly in the recovery planning process has the opportunity to comment on that. Again, we take those comments; consider those before making any final recovery plan. Just for your information, more information is there on our website about recovery planning.

I just want to finish up by updating folks on critical habitat; to make you aware that our last piece of information to go up on our websites occurred just this past week. Those are the final documents that include the GIS data for all the areas that we have designated as critical habitat. Again, folks can reference that for information to help determine whether if there is any ongoing activity, whether that activity may occur within the designated critical habitat.

Again, just a reminder of folks you can contact for more information; myself, my counterpart Andy Herndon in the Southeast Regional Office, and my Supervisor, Julie Crocker. We're always available. Please feel free to call us with any questions, or send e-mails at any time. We're happy to help. Thank you.

CHAIRMAN NOWALSKY: Thank you very much, Lynn. Did you have a timeline for when that request would come to our TC for them to review the five-year review?

MS. LANKSHEAR: I don't have a timeline at this point. But I think what we can do is we can provide a timeline of the whole process, and provide that ahead of time so they can also get it on their schedule.

CHAIRMAN NOWALSKY: That would be appreciated, I'm sure; questions for Lynn? Chris Batsavage.

MR. BATSAVAGE: If I understand correctly, because we have two things going on here

at the same time, the five-year review and development of the recovery plan, is it possible that the results of the five-year review could determine that sturgeon could be delisted or downlisted and then rule making can occur after that without the recovery plan, or does the recovery plan need to be put in place in order to see where we need to be, in terms of recovering this stock? I'm trying to figure out the order of things, in terms of moving forward, as far as any chances of delisting or downlisting the species.

MS. LANKSHEAR: The recovery plan would be specific to a listed species. The five-year review would be the document to really look at whether or not any one or all the DPSs may possibly warrant delisting. We would consider that first, and then obviously a recovery plan for something that may possibly warrant delisting; we wouldn't necessarily start that then.

CHAIRMAN NOWALSKY: John Clark.

MR. JOHN CLARK: I was just curious, the recovery targets you have up there. Is that going to be a specific population of sturgeon, since it doesn't seem like we know what the population is? We didn't know what it was when it was listed. How do you set a recovery target for a species like this?

MS. LANKSHEAR: The ESA isn't specific that we have to have a number as a recovery target. In fact, because we have so many data-poor species, recovery planning can involve any target that is a reasonable assessment that the species can warrant delisting. It does not have to be specifically population numbers.

CHAIRMAN NOWALSKY: I did see a hand in the audience as we were about to begin the presentation. Arnold Leo, did you have any comment specific to the five-year review and the recovery targets; if so, you can come up to a microphone and make your comments, please? Thank you.

MR. ARNOLD LEO: Arnold Leo; I represent the fishing industry of the town of East Hampton, New York. The point I wanted to make for your consideration; I think it's clear that the progress made with the sturgeon stock is really because of the moratorium, which has been in place for many years and really has nothing to do with the stock having been listed as endangered.

I think with the review of the benchmark assessment that we got today, it's clear that the moratorium is working satisfactorily, and that it could certainly warrant downlisting the species from endangered to threatened. This is a tremendous significance to the commercial industry; because the recovery plan, which has not yet been revealed to us, can certainly with an endangered species, curtail the activities of many commercial activities for example, gillnetting for monkfish in our region.

I think that rather than impose such curtailments through the recovery plan on the commercial industry, it would be wiser and serve the best information available to simply downlist to threatened. I would request that the Board petition for that downlisting to threatened. Thank you.

CHAIRMAN NOWALSKY: Thank you, Arnold, for highlighting the differences that may have been had on the impact, either between the moratorium and the ESA listing, and again that ESA listing impact on states for other species harvest has certainly been discussed quite a bit, and I'm sure will be continued to be discussed here at the Board.

What I'm going to do, I'm going to move on from this agenda item. I thank Lynn for coming today. She's got her information up here, anyone with additional items can contact here. We'll move on to the next agenda item very briefly. Max has a very

short presentation on ITPs, and he's got an item to go ahead and bring to your attention.

We are going to be limited in the amount of time we'll have to discuss it, but hopefully this information will at least be out there to all the individual states. They can further follow up with Max or follow up with individual states jointly. I'll turn to Max to go through his presentation, and we'll have just a couple moments for some brief discussion here.

REVIEW STATUS OF THE INCIDENTAL TAKE PERMITS FOR ATLANTIC STURGEON

MR. APPELMAN: In the interest of time, I'm not going to put up a presentation for this. I'm just going to list off a couple things I wanted to say about this exercise. There is a memo in your meeting materials about the status of incidental take permits, or ITPs for Atlantic sturgeon. That was the product of a survey.

Some of you guys around the table probably remember an e-mail I sent out earlier this summer, with a couple questions regarding incidental take permits for sturgeon. The responses received varied quite a bit; some were very direct, some were vague. It was clear that some states, it was a little harder to answer these questions than I thought they might be.

In any event, we tried to summarize those responses as best as possible. We tried to fit it all into one table on the back of that memo. I would just ask that if any of those summaries of the responses mischaracterized anything, please let me know. Get in touch with me, and we can correct that language. Again, in the interest of time, if there were any questions about that memo, feel free.

CHAIRMAN NOWALSKY: Okay, questions for Max or any discussion that feels has to be had here at the table today? Again, I appreciate the Board's efforts here this morning for moving through this agenda as well as we did. Is there any other business? Chris Batsavage.

MR. BATSAVAGE: Not other business, but I did want to just go back and clarify something that came up earlier regarding the disposition of dead sturgeon that are encountered as bycatch. I checked with staff, with my agency on what happens when we encounter one through our observer program.

We do bring those back, and they're either given to the Natural Science Museum in Raleigh or to the Sturgeon Salvage staff. We also collect genetic samples off all the live and dead sturgeon that we collect through the ITPs. But it took a little bit of administrative hoops to jump through in order to get authorization for possessing those dead sturgeons. Anyway, I just wanted to clear that up on the record, at least what we're doing in North Carolina.

ADJOURNMENT

CHAIRMAN NOWALSKY: Before we adjourn, I'll turn to Bob for direction on where Commissioners go from here. Having concluded the business on the agenda; we stand adjourned.

(Whereupon the meeting adjourned at 11:54 o'clock a.m. on October 18, 2017)

minimal environmental impact in a mixed trap trawl configuration in the first year of the project, then the applicant may also test the practicality of deploying trawls with only the purse trap type in the following year. The depth of trap deployments is expected to be between 150 to 300 ft (46 to 91 m). Trap soak time would range from 3 to 10 days depending on trap type and location. Setting and hauling of the traps is expected to occur during daylight hours. Bait would only be used in the modified spiny lobster traps and would include cowhide and fish heads.

Vessels to be used in the proposed study would be three federally permitted commercial fishing vessels. Vessel crew would be responsible for collecting detailed records during the sampling trips. Data to be collected per trip would include: Gear configuration and fishing effort data (*e.g.,* date and time of deployment and retrieval, latitude, longitude, and water depth of each deployed trawl, bait type used); soak time per area for each trawl; alternative weight and trawl configurations used in different sea states and conditions; trap loss and movement from original set position; protected species interactions; bycatch species, amount, and disposition; and lionfish catch data for each trap type. Any fish species other than lionfish caught in the traps would be released once the traps are onboard the project vessels; only lionfish would be retained as part of the project. Retained lionfish would be sold on return to port.

The applicant has requested the EFP be effective for a 2-year period from the date the EFP is issued.

NMFS finds the application warrants further consideration based on a preliminary review. Possible conditions the agency may impose on the permit, if granted, include but are not limited to, a prohibition of conducting research within marine protected areas, marine sanctuaries, special management zones, or areas where they might interfere with managed fisheries without additional authorization. Additionally, NMFS may require special protections for ESA-listed species and designated critical habitat, and may require particular gear markings. A final decision on issuance of the EFP will depend on NMFS' review of public comments received on the application, consultations with the appropriate fishery management agencies of the affected states, Councils, the U.S. Coast Guard, and a determination that they are consistent with all applicable laws.

Authority: 16 U.S.C 1801 *et seq.*

Dated: March 12, 2018.

Emily H. Menashes,

Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2018–05335 Filed 3–15–18; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XF995

Initiation of 5-Year Review for the Endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon and the Threatened Gulf of Maine Distinct Population Segment of Atlantic Sturgeon

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of initiation of 5-year review; request for information.

SUMMARY: We, NMFS, announce our intent to conduct a 5-year review for the threatened Gulf of Maine distinct population segment (DPS) of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), the endangered New York Bight DPS of Atlantic sturgeon, the endangered Chesapeake Bay DPS of Atlantic sturgeon, the endangered Carolina DPS of Atlantic sturgeon and the endangered South Atlantic DPS of Atlantic sturgeon under the Endangered Species Act of 1973, as amended (ESA). We are required by the ESA to conduct 5-year reviews to ensure that the listing classification of the species remains accurate. The 5-year review must be based on the best scientific and commercial data available at the time of the review; therefore, we are requesting submission of such information on the status of each DPS, particularly information on population trends, distribution, abundance, habitat amount and suitability, threats, and conservation measures for any DPS that has become available since their original listings under the ESA in 2012. Based on the results of this 5-year review, we will make the requisite findings under the ESA.

DATES: To allow us adequate time to conduct this review, we must receive your information no later than May 15, 2018. While we will continue to accept new information about any listed species at any time, failure to timely submit the information in accordance with the deadline above may preclude the information from being included in this review.

ADDRESSES: Submit your comments by including NOAA–NMFS–2018–0041, by either of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal e-Rulemaking Portal.

1. Go to *www.regulations.gov/document?D=[NOAA-NMFS-2018-0041],*

2. Click the ''Comment Now!'' icon, complete the required fields

3. Enter or attach your comments.

- *Mail:* Submit written comments to Lynn Lankshear, NMFS, Greater Atlantic Region Fisheries Office, 55 Great Republic Drive, Gloucester, MA 01930 or Andrew Herndon, NMFS, Southeast Regional Office, 263 13th Avenue South, Saint Petersburg, FL 33701.

Instructions: We may not consider comments if they are sent by any other method, to any other address or individual, or received after the end of the specified period. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. We will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

FOR FURTHER INFORMATION CONTACT: Lynn Lankshear at the above address, by phone at 978–282–8473 or *Lynn.Lankshear@noaa.gov* or Andrew Herndon at the above address, by phone at 727–824–5312 or *Andrew.Herndon@noaa.gov.*

SUPPLEMENTARY INFORMATION: On February 6, 2012, we listed the Gulf of Maine DPS of Atlantic sturgeon as threatened and the New York Bight, Chesapeake Bay, Carolina and South Atlantic DPSs as endangered (77 FR 5880 and 77 FR 5914). Section 4(c)(2)(A) of the ESA requires that we conduct a review of listed species at least once every five years. On the basis of such reviews, under section 4(c)(2)(B), we determine whether a species should be delisted or reclassified from endangered to threatened or from threatened to endangered. Delisting a species must be supported by the best scientific and commercial data available and only considered if such data substantiate that the species is neither endangered nor threatened for one or more of the following reasons: (1) The species is considered extinct; (2) the species is

considered to be recovered; and/or (3) the original data available when the species was listed, or the interpretation of such data, were in error (see 50 CFR 424.11(d)). A 5-year review ends with a determination of whether the species should be delisted or the listing status changed. A 5-year review does not change the listing status of the species. Changes to the listing status of a species can only be made following publication of a proposed rule with an opportunity for public comment and our consideration of the comments before making a final determination to reclassify or delist the species.

The ESA implementing regulations at 50 CFR 424.21 require that we publish a notice in the **Federal Register** announcing those species currently under active review. This notice announces our active review of the Gulf of Maine DPS of Atlantic sturgeon currently listed as threatened, and the active review of the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon that are currently listed as endangered.

Background information for the Gulf of Maine, New York Bight, and Chesapeake Bay DPSs of Atlantic sturgeon is available on the NMFS GARFO website: *https://www.greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/index.html.* Background information for the Carolina and South Atlantic DPSs of Atlantic sturgeon is available on the NMFS SERO website at: *http://sero.nmfs.noaa.gov/protected_resources/sturgeon/index.html.*

Public Solicitation of New Information

To ensure that the 5-year review is complete and based on the best available scientific and commercial information, we are soliciting information that has become available since the 2012 listing determination from the public, concerned governmental agencies, tribes, the scientific community, industry, environmental entities, and any other interested parties concerning the status of each of the five DPSs of Atlantic sturgeon. For example, we are aware that the Atlantic States Marine Fisheries Commission has just completed an Atlantic Sturgeon Benchmark Stock Assessment. This is an example of new information we will consider during our review. Categories of requested information include: (1) Species biology including, but not limited to, population trends, distribution, abundance, demographics, and genetics; (2) habitat conditions including, but not limited to, amount, distribution, and suitability; (3) status and trends of identified limiting factors or threats; (4) conservation measures that have been implemented that benefit the species; and (5) other new information, data, or corrections including, but not limited to, taxonomic or nomenclatural changes, identification of erroneous information contained in the list of endangered and threatened species, and improved analytical methods for evaluating extinction risk.

Since there are no recovery plans for any of the DPSs, we will analyze the available information for the 5-year review relative to the ESA definitions of endangered and threatened and in the context of the five listing factors. The five factors are: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or, (5) other natural or manmade factors affecting its continued existence.

During the 5-year review, we are also required to consider whether the 1996 DPS policy (61 FR 4722; February 7, 1996) is appropriately applied to the species. The DPS Policy specifies that we consider the available information with respect to three elements. These elements are: (1) The discreteness of the population segment in relation to the remainder of the of the species to which it belongs; (2) the significance of the population segment to the species to which it belong; and (3) the population segment's conservation status in relation to the ESA's standards for listing (*i.e.,* is the population segment endangered or threatened?). Because the five DPSs of Atlantic sturgeon have already been classified as DPSs following the 1996 DPS policy, a re-evaluation of the DPSs will not be necessary, unless there is new information specific to these DPSs relevant to the application of the policy.

If you wish to provide information for this 5-year review, you may submit your information and materials electronically at *www.regulations.gov* or via mail (see **ADDRESSES** section). We request that all information be accompanied by supporting documentation such as maps, bibliographic references, or reprints of pertinent publications. We also would appreciate the submitter's name, address, and any association, institution, or business that the person represents; however, anonymous submissions will also be accepted.

Authority: 16 U.S.C. 1531 *et seq.*

Dated: March 12, 2018.

Angela Somma,

Chief, Endangered Species Division, Office of Protected Resources, National Marine Fisheries Service.

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BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG092

North Pacific Fishery Management Council; Public Meeting

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of public meetings.

SUMMARY: The North Pacific Fishery Management Council (Council) and its advisory committees will meet April 2 through April 10, 2018, in Anchorage, AK.

DATES: The meetings will be held Monday, April 2 through Tuesday, April 10, 2018. See **SUPPLEMENTARY INFORMATION** for specific dates and times.

ADDRESSES: The meeting will be held at the Anchorage Hilton Hotel, 500 W 3rd Ave., Anchorage, AK 99501.

Council address: North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501–2252; telephone (907) 271–2809.

FOR FURTHER INFORMATION CONTACT: Diana Evans, Council staff; telephone: (907) 271–2809.

SUPPLEMENTARY INFORMATION:

Agenda

The Council will begin its plenary session at 8 a.m. in the Aleutian Room on Wednesday, April 4, continuing through Tuesday, April 10, 2018. The Scientific and Statistical Committee (SSC) will begin at 8 a.m. in the King Salmon/Iliamna Room on Monday, April 2, and continue through Wednesday, April 4, 2018. The Council's Advisory Panel (AP) will begin at 8 a.m. in the Dillingham/Katmai Room on Tuesday, April 3 and continue through Friday April 6, 2018. The Enforcement Committee will meet on Tuesday, April 3, 2018 in the Birch/Willow Room from 1 p.m. to 4 p.m.

Monday, April 2, 2018 Through Tuesday, April 10, 2018

Council Plenary Session: The agenda for the Council's plenary session will

NOAA FISHERIES
Protected Resources

RECOVERY OUTLINE for the Atlantic Sturgeon Distinct Population Segments

This outline is meant to serve as an interim guidance document to direct recovery efforts, including recovery planning, for the endangered New York Bight, Chesapeake Bay, Carolina, and South Atlantic distinct population segments (DPS) of the Atlantic sturgeon and the threatened Gulf of Maine DPS (77 FR 5880 and 77 FR 5914; February 6, 2012) until a full recovery plan is developed and approved. A preliminary strategy for recovery of the species is presented here, as are recommended high priority actions to stabilize and recover the species.

This Recovery Outline commences our recovery planning process. The Recovery Outline is intended primarily for internal use by NOAA Fisheries as a preplanning document. Formal public participation in recovery planning for these DPSs will be invited upon the release of the draft Recovery Plan for these DPSs. However, any new information or comments that members of the public may wish to offer as a result of this Recovery Outline will be taken into consideration during the recovery planning process. Parties interested in the Gulf of Maine, New York Bight, Chesapeake Bay DPS may contact Lynn Lankshear 978-282-8473, Lynn.Lankshear@noaa.gov. Parties interested in the Carolina and South Atlantic DPSs may contact Andy Herndon 727-824-5312, Andrew.Herndon@noaa.gov.

INTRODUCTION

This document presents the broad, preliminary outline for the recovery of all five DPSs of Atlantic sturgeon. A recovery team will likely be assembled for these species to inform the Recovery Plan, which will provide a complete roadmap for activities necessary to recover the DPSs so they no longer need the protections of the Endangered Species Act (ESA). Meanwhile, this outline will serve to guide recovery-planning efforts and provide information for ESA Section 7 consultations, permitting activities, and conservation efforts until the formal Recovery Plan has been developed, finalized, and approved.

Available information on the life history, range, and habitat requirements of the five DPSs is described in the listing rules (77 FR 5880 and 77 FR 5914; February 6, 2012). The most significant uncertainties with respect to setting recovery objectives and prioritizing recovery actions include the following: availability of specific information on each DPS's current and historical distribution and abundance; success of spawning and recruitment; response to climate change; sub-lethal effects of pollution; vessel strikes; fishery bycatch mortality including post-release mortality; and the effects of habitat loss. These uncertainties are acknowledged as playing a limiting role in the early recovery efforts for these DPSs and should be resolved to the extent possible through coordination with the sturgeon research community during the recovery planning process.

RECOVERY NEEDS ASSESSMENT

BIOLOGICAL ASSESSMENT

Recovery implications of the species' demographic and genetic status

Atlantic sturgeon occur along the eastern coast of North America from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida, USA. An anadromous species, Atlantic sturgeon spawn in freshwater of tidal-affected rivers that are part of a coastal estuary. Tagging records and the relatively low rate of gene flow observed provide evidence that Atlantic sturgeon return to their natal river to spawn (ASSRT 2007).

Atlantic sturgeon from the Gulf of Maine DPS spawn in the rivers of Maine, as well as rivers that drain into the Gulf of Maine from as far south as Chatham, Massachusetts. There are only two currently known spawning subpopulations within the Gulf of Maine DPS; the Kennebec River and Androscoggin River spawning subpopulations. There are no abundance estimates for either subpopulation or for the Gulf of Maine DPS as a whole (ASSRT 2007; Wippelhauser 2012; Wippelhauser et al. 2017). In 2017, the Atlantic States Marine Fisheries Commission (ASMFC) conducted a benchmark stock assessment of Atlantic sturgeon (ASMFC 2017). The assessment contains the latest and best available information on the status of U.S. Atlantic sturgeon populations. The stock assessment concluded that the abundance of the Gulf of Maine DPS is "depleted" relative to historical levels. The assessment also concluded that there was a 51% probability that the abundance of the Gulf of Maine DPS has increased since implementation of the 1998 fishing moratorium, but there was a 74% probability that mortality for the Gulf of Maine DPS exceeds the mortality threshold used for the assessment (ASMFC 2017).

The New York Bight DPS of Atlantic sturgeon originates from rivers that drain into the coastal waters from Chatham, Massachusetts, to the Delaware-Maryland border at Fenwick Island. There were two known spawning subpopulations when the New York Bight DPS was listed as endangered under the ESA: the Hudson River and Delaware River spawning subpopulations. Since then, new information provided from the capture of juvenile Atlantic sturgeon suggests the Connecticut River likely also supports a spawning subpopulation of Atlantic sturgeon for the New York Bight DPS. There are no abundance estimates at this time for the Connecticut River. The Hudson River spawning subpopulation is believed to be the most robust because animals from the Hudson River show up most frequently in genetic samples collected from Atlantic sturgeon in coastal aggregations, with the exception of the summer aggregation in the Bay of Fundy, Canada. Conversely, Atlantic sturgeon from the Delaware River subpopulation show up less frequently even when the sampling area is in proximity to the Delaware River. For example, of the 261 adult-sized Atlantic sturgeon captured for scientific purposes off the Delaware Coast between 2009 and 2012, 100 were subsequently identified by genetics analysis to belong to the Hudson River subpopulation while only 36 belonged to the Delaware River subpopulation (Wirgin et al. 2015). Researchers have had recent success capturing juvenile Atlantic sturgeon in the Delaware River and estimate there were 3,656 (95% CI = 1,935–33,041) age 0-1 juvenile Atlantic sturgeon in the Delaware River subpopulation in 2014 (Hale et al. 2016). The 2017 ASMFC stock assessment determined that abundance of the New York Bight DPS is "depleted" relative to historical levels (ASMFC 2017). However, the assessment also determined there is a relatively high probability (75%) that the New York Bight DPS abundance has increased since the implementation of the 1998 fishing moratorium, and a 31% probability that mortality for the New York Bight DPS exceeds the mortality threshold used for the assessment (ASMFC 2017).

The Chesapeake Bay DPS is comprised of Atlantic sturgeon that originate from rivers that drain into the Chesapeake Bay and into coastal waters from the Delaware-Maryland border on Fenwick Island to Cape Henry, Virginia. There are three known spawning subpopulations: the James River, the Pamunkey River of the York River system, and Marshyhope Creek of the Nanticoke River system (NMFS 2017). Comprehensive information on current abundance and population trends for any of the Chesapeake Bay spawning subpopulations is lacking (ASSRT 2007). Based on research captures of tagged adults, an estimated 75 Chesapeake Bay DPS Atlantic sturgeon spawned in the Pamunkey River in 2013 (Kahn et al. 2014). In the James River, the total number of adult-sized Atlantic sturgeon captured in the spring and fall for 2012 through spring 2014 is 239 sturgeon. This is a minimum count of the number of adult Atlantic sturgeon in the James River during the time period because capture efforts did not occur in all

areas and at all times when Atlantic sturgeon were present in the river. In addition, more recent genetic evidence suggests that the James River spring and fall spawning Atlantic sturgeon are separate subpopulations (Balazik and Musick 2015). The 2017 ASMFC stock assessment determined that abundance of the Chesapeake Bay DPS is "depleted" relative to historical levels (ASMFC 2017). The assessment also determined there is a relatively low probability (37%) that abundance of the Chesapeake Bay DPS has increased since the implementation of the 1998 fishing moratorium, and a 30% probability that mortality for the Chesapeake Bay DPS exceeds the mortality threshold used for the assessment (ASMFC 2017).

Atlantic sturgeon from the Carolina DPS spawn in the rivers of North Carolina south to the Cooper River, South Carolina. There are currently seven spawning subpopulations within the Carolina DPS: Roanoke River, Tar-Pamlico River, Neuse River, Northeast Cape Fear and Cape Fear Rivers, Waccamaw and Great Pee Dee Rivers, Black River, Santee and Cooper Rivers; one is likely extinct (Sampit River). The existing subpopulations are likely at less than 3% of their historical abundance (ASSRT 2007). The 2017 ASMFC stock assessment determined the Carolina DPS abundance is "depleted" relative to historical levels (ASMFC 2017). The assessment also determined there is a relatively high probability (67%) that the Carolina DPS abundance has increased since the implementation of the 1998 fishing moratorium, and a relatively high probability (75%) that mortality for the Carolina DPS exceeds the mortality threshold used for the assessment (ASMFC 2017).

Atlantic sturgeon from South Atlantic DPS spawn from the Edisto River, South Carolina, to the St. Marys River at the Florida/Georgia border. The South Atlantic DPS historically supported eight spawning subpopulations. At the time of listing only six spawning subpopulations were believed to have existed: the Combahee River, Edisto River, Savannah River, Ogeechee River, Altamaha River, and Satilla River. The two remaining spawning subpopulations in the Broad-Coosawatchie River and St. Marys River were believed to be extinct. However, new information provided from the capture of juvenile Atlantic sturgeon suggests the spawning subpopulation in the St. Marys River is not extinct and continues to exist, albeit at very low levels. Two of the spawning subpopulations in the South Atlantic DPS are relatively robust and are considered the second (Altamaha River) and third (Combahee/Edisto River) largest spawning subpopulations across all five DPSs. These two spawning subpopulations are likely less than 6% of their historic abundance. There are an estimated 343 adults that spawn annually in the Altamaha River and less than 300 adults spawning annually (total of both sexes) in the river systems where spawning still occurs (75 FR 61904; October 6, 2010). The abundance of the remaining three spawning subpopulations in the South Atlantic DPS is likely less than 1% of their historical abundance (ASSRT 2007). The 2017 ASMFC stock assessment determined the South Atlantic DPS abundance is "depleted" relative to historical levels (ASMFC 2017). The assessment concluded there was not enough information available to assess the abundance of the DPS relative to the 1998 fishing moratorium, but did conclude there was a 40% probability that mortality for the South Atlantic DPS exceeds the mortality threshold used for the assessment (ASMFC 2017).

Although specifics vary from north to south, generally speaking, Atlantic sturgeon in all five DPSs live relatively long and do not become sexually mature until later in life. Atlantic sturgeon recovery will likely be slow because it is a late-maturing species. While a long life-span also allows multiple opportunities to contribute to future generations, it also increases their exposure to the multitude of threats facing each DPS.

THREATS ASSESSMENT

What are the recovery implications of the threats facing the species?

The threats to the five DPSs are generally the same and have been fully described through the listing process. Those general threat categories include: habitat changes; impeded access to historical habitat by dams and reservoirs; degraded water quality; reduced water quantity; vessel strikes; and bycatch in commercial fisheries. The impact of each of these threats varies by DPS.

For the Gulf of Maine, New York Bight, and Chesapeake Bay DPSs, historical spawning habitat is accessible in nearly all current and known historical spawning rivers. This is not the case for the Carolina and South Atlantic DPSs of Atlantic sturgeon. Within the range occupied by the Carolina DPS, dams have restricted Atlantic sturgeon spawning and juvenile developmental habitat by blocking over 60% of the historical sturgeon habitat upstream of the dams in the Cape Fear and Santee-Cooper River systems. Dams also prevent access to the vast majority of historical spawning habitat on the Savannah River in the South Atlantic DPS.

Even where spawning habitat is available, accessibility does not necessarily equate to functionality. In particular, water quality, while showing signs of improvement, continues to rate only fair to poor in areas of the New York Bight, Chesapeake Bay, Carolina and South Atlantic DPSs. Non-point sources for pollution from terrestrial activities have caused reductions in water quality leading to degradation of habitat. In addition, dredging for navigation channels has significantly altered depth, rates of sedimentation, substrate and water flow in some areas. Of the threats to habitat that were considered when the Atlantic sturgeon DPSs were listed, water quality was of greatest concern in terms of its contribution to the risk of endangerment for each DPS, overall.

For the Carolina and South Atlantic DPSs, water allocation issues are growing threats. Water withdrawals may potentially slow recovery by exacerbating existing water quality problems. Water withdrawals can alter natural water flows, which can affect DO levels, temperature, and a river's ability to assimilate pollutants (GWC 2006). Water quality within the river systems in the range of the South Atlantic and Carolina DPSs is negatively affected by large water withdrawals. Water shortages and "water wars" are already occurring in the rivers occupied by the Carolina and South Atlantic DPSs and will likely be compounded in the future by population growth and potentially by climate change.

Other in-river threats to the Atlantic sturgeon DPSs include predation by non-native species, impingement and entrainment at facilities that withdraw water from the rivers, and vessel strikes. The presence of introduced fish species in Atlantic sturgeon spawning rivers and the lack of evidence of sturgeon spawning success has raised concerns that introduced fish may be eating native fish. Throughout the range of the Atlantic sturgeon DPSs, most, if not all, subpopulations are at risk of entrainment or impingement in water withdrawal intakes for commercial uses, municipal water supply facilities, and agricultural irrigation intakes. Vessel strikes of Atlantic sturgeon have been documented in a number of rivers in the New York Bight and Chesapeake Bay DPSs, including the Hudson River, Delaware River, and James River. An increasing number of reports of Atlantic sturgeon with apparent vessel strike injuries suggest vessels strikes may also impact animals in the Carolina and South Atlantic DPSs. The information needed to accurately quantify the degree that vessel strikes threaten these populations is not currently available.

While directed fisheries for Atlantic sturgeon are prohibited in U.S. waters, all DPSs of Atlantic sturgeon are incidentally caught in many U.S. fisheries that operate in state and federal waters. Overall, there is limited observer coverage of fisheries that interact with Atlantic sturgeon. As a result, the total number of Atlantic sturgeon interactions with fishing gear in state and federal waters is unknown. Even when a fish is observed captured and released alive, the rate of post-release mortality is unknown.

Threats in the ocean also affect all five DPSs. Ocean temperature in the U.S. Northeast Shelf and surrounding Northwest Atlantic waters has increased faster than the global average over the last decade

(Pershing et al. 2015). New projections for the U.S. Northeast Shelf and Northwest Atlantic Ocean suggest that this region will warm two to three times faster than the global average (Saba et al. 2015). A first-of-its-kind climate vulnerability assessment, conducted on 82 fish and invertebrate species in the Northeast U.S. Shelf, concluded that Atlantic sturgeon from all five DPSs were among the most vulnerable species to global climate change (Hare et al. 2016).

CONSERVATION ASSESSMENT

What steps have been taken to address the species' recovery needs?

Various governmental agencies, groups, and individuals are carrying out a number of efforts aimed at protecting and conserving the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon. These actions are directed at reducing threats faced by Atlantic sturgeon and/or gaining additional knowledge of specific Atlantic sturgeon subpopulations. Such actions could contribute to the recovery of the Atlantic sturgeon DPSs in the future. However, there is still considerable uncertainty regarding whether the current efforts to reduce the threats to Atlantic sturgeon are being effective, and, if they are, the extent to which they are reducing threats.

In 1998, the ASMFC amended the Atlantic Sturgeon Fishery Management Plan (FMP) instituting a moratorium on the harvest Atlantic sturgeon. The expressed goal of the Amendment was to restore Atlantic sturgeon spawning stocks to population levels that will provide for sustainable fisheries, and ensure viable spawning populations. The 1998 Amendment strengthened conservation efforts by formalizing the closure of the directed fishery and banning retention of bycatch. However, bycatch is known to still occur in several fisheries, and it is widely accepted that bycatch is underreported. Contrary to information available in 1998 when the Amendment was approved, Atlantic sturgeon bycatch mortality is now considered a primary threat affecting the recovery of all five DPSs of Atlantic sturgeon, despite actions taken by the states and NOAA Fisheries to prohibit directed fishing and retention of Atlantic sturgeon. There are also limited resources for assessing the current abundance of spawning females (the identified metric for assessing success of the ASMFC FMP measures for Atlantic sturgeon) for each of the DPSs. Almost 20 years after the implementation of the moratorium, there are signs of slow recovery for at least some Atlantic sturgeon populations. The ASMFC completed an Atlantic Sturgeon Benchmark Stock Assessment in 2017 that considered the status of each DPS individually, as well as all 5 DPSs collectively as a single unit (ASMFC 2017). The assessment concluded all five DPSs of Atlantic sturgeon, as well as each individual DPS remain depleted relative to historic abundance. The assessment also concluded that the population of all five DPSs together appears to be recovering slowly since implementation of a complete moratorium in 1998. However, there were only two individual DPSs, the New York Bight DPS and Carolina DPS, for which there was a relatively high probability that abundance of the DPS has increased since the implementation of the 1998 fishing moratorium. In addition, there was a relatively high probability that mortality for animals of the Gulf of Maine DPS and the Carolina DPS exceeded the mortality threshold used for the assessment. Therefore, while Atlantic sturgeon populations are showing signs of slow recovery when all five DPSs are considered collectively, these trends are not necessarily reflected with individual DPSs (ASMFC 2017).

Several states within the range of the Atlantic sturgeon DPSs have received funding under the ESA's Section 6, Species Recovery Grants to States, program to conduct studies that resulted in new information necessary for management and recovery of one or more of the Atlantic sturgeon DPSs. The new information has helped to further conservation efforts. Similarly, the Greater Atlantic and Southeast Regional Offices have funded studies directly. These studies, as well as others, have resulted in a greater number of acoustically tagged Atlantic sturgeon that can be detected for up to 10 years. However, there are still many unanswered questions (e.g., how do different life stages of Atlantic sturgeon use different habitats?) that need to be considered to adequately quantify and address the threats to each DPS. Continued funding is needed to support the activities and research that are providing insights on these

unanswered questions. These activities include improved understanding of genetic differentiation, maintenance of receiver arrays that detect and store data from the tagged sturgeon, as well as greater and more accurate population estimates. Continued funding is also needed to analyze and apply the findings of these activities and research so the information can be used to address recovery of each Atlantic sturgeon DPS.

SUMMARY ASSESSMENT

Overall, clear, robust population estimates and indications of population trends of the five DPSs of Atlantic sturgeon have proven to be difficult to obtain. Abundance across all five DPSs is very low relative to historical populations, albeit the data available for estimating population abundance is often limited. Atlantic sturgeon face human-caused threats like interactions with fishing gear, vessel strikes, and habitat loss or modification. Recovery will depend on successful reproduction and reducing mortality of extant populations. Many of the activities causing harm to the Atlantic sturgeon DPSs have occurred for years, even decades. Similarly, some conservation actions have been in place for years (e.g., prohibition on catch and retention of Atlantic sturgeon). The past impacts of human activity on the Atlantic sturgeon DPSs cannot be particularized in their entirety. Similarly, the benefits to Atlantic sturgeon DPSs as a result of conservation activities already implemented may not be evident for years, given the relatively late age to maturity for Atlantic sturgeon and depending on the age class(es) affected.

PRELIMINARY RECOVERY STRATEGY

RECOVERY PRIORITY NUMBER WITH RATIONALE

Based on the 1990 recovery priority ranking guidelines, the recovery priority number for each of the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs is 5 (55 FR 24296; June 15, 1990). This number is based on three criteria: magnitude of threat, recovery potential, and conflict. These DPSs face a moderate threat of extinction if recovery is temporarily held off, although there continue to be threats to their habitat. Recovery potential is high for these DPSs because the major threats affecting these DPS (i.e., water quality/quantity alterations, bycatch in state/commercial fisheries, and impeded access to historical habitats) are relatively well understood and necessary management actions are known. These DPSs also conflict with construction or other developmental projects or other forms of economic activity.

RECOVERY VISION STATEMENT

Subpopulations of all five Atlantic sturgeon DPSs must be present across the historical range. These subpopulations must be of sufficient size and genetic diversity to support successful reproduction and recovery from mortality events. The recruitment of juveniles to the sub-adult and adult life stages must also increase and that increased recruitment must be maintained over many years. Recovery of these DPSs will require conservation of the riverine and marine habitats used for spawning, development, foraging, and growth by abating threats to ensure a high probability of survival into the future.

INITIAL ACTION PLAN

The initial focus will be to protect extant subpopulations and the species' habitat through reduction of threats. Further, we must gather information through research and monitoring on current distribution and abundance; vessel strikes; effects of climate change; and bycatch. We will also be seeking fish passage

designs that are effective in safely moving sturgeon upstream and downstream of barriers to migration (i.e., dams) where access to historical habitats is blocked.

Specific actions that will be undertaken early in the process may include the following:

- Improve understanding of population dynamics, population distribution, abundance, trends, and structure through research, monitoring, and modeling.
- Continue researching fish passage designs that allow Atlantic sturgeon access to historical spawning grounds currently blocked by dams.
- Continue research and monitoring of human-caused sources of injury or mortality such as fisheries bycatch and vessel strikes with the goal of minimizing those impacts.
- Develop standardized methods to create reliable abundance indices.

Recovery actions needed in the longer term may also include:

- Work with dam owners/operators to implement fish passage once designs that successfully pass fish are identified.
- Implement region-wide initiatives to improve water quality in sturgeon spawning rivers, with specific focus on eliminating or minimizing human-caused anoxic zones.
- Implement regional initiatives to improve access to historical habitats and ensure water withdrawals have minimal impact on Atlantic sturgeon.

PREPLANNING DECISIONS

PLANNING APPROACH

A Recovery Plan will be prepared for all five DPSs of Atlantic sturgeon pursuant to Section 4(f) of the ESA. We are also considering expanding the scope of the plan to include shortnose sturgeon (*Acipenser brevirostrum*), which co-occur with Atlantic sturgeon in most rivers. A joint plan would afford the opportunity to address threats that affect multiple DPSs as well as shortnose sturgeon.

A recovery team consisting of key stakeholders and sturgeon experts is expected to be assembled to develop the Recovery Plan. Recovery planning efforts will be coordinated across the Greater Atlantic and Southeast Regional Offices, as well as the Northeast Fisheries Science Center.

INFORMATION MANAGEMENT

All information relevant to recovery management of the Atlantic sturgeon DPSs will be housed in NOAA Fisheries Southeast Regional Office's and Greater Atlantic Regional Fisheries Office's administrative files.

STAKEHOLDER INVOLVEMENT

Key stakeholders:
Federal, state, territorial, and local agencies
Domestic and foreign universities and research organizations
Domestic and foreign conservation organizations

Stakeholder involvement strategy:
Representatives of key stakeholder groups are expected to be invited to participate in the recovery planning process. As needed, meetings and/or conference calls will be held to discuss particular issues, and stakeholders will be invited to participate as warranted. All stakeholders will be afforded an opportunity to review and comment on a draft of the Recovery Plan in conformance with the ESA.

Stakeholders may also be asked to contribute directly in the development of implementation strategies for planned actions.

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Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Sturgeon Management Board**

FROM: **Sturgeon Technical Committee**

DATE: **July 12, 2018**

SUBJECT: **Review of Priority Data Sets for Atlantic Sturgeon Stock Assessment**

The 2017 Atlantic Sturgeon Benchmark Stock Assessment indicated that efforts to assess the status of Atlantic sturgeon are hampered by a lack of data and that more work is needed to establish reliable indices of abundance for spawning populations and juveniles prior to the next assessment. Despite the fact that there has been a tremendous amount of new information about Atlantic sturgeon collected in recent years, the species is not well monitored by existing fishery-independent (FI) surveys and landings information does not exist after 1998 due to implementation of a coastwide moratorium. Because of this, Atlantic sturgeon are considered a "data-poor" species which hindered the Stock Assessment Subcommittee's (SAS) ability to use complex statistical stock assessment models, particularly at the distinct population segment (DPS)-level. Furthermore, total losses from ship-strikes and bycatch are largely unknown due to a lack of reporting, insufficient data collection, or low to non-existent rates of on-board observer coverage in most fisheries that may encounter Atlantic sturgeon.

In response to the assessment's findings, the Management Board (Board) discussed the need to support management actions that have contributed to recovery seen to date (e.g., the moratorium, habitat restoration/protection, better bycatch monitoring), and acknowledged the need to improve data collection along the Atlantic coast to support future stock assessments and improve the current understanding of stock status. Accordingly, the Board tasked the Technical Committee (TC) to identify the data sets most important to Atlantic sturgeon stock assessment, and develop recommendations regarding where to focus state resources.

The TC met June 18 via conference call to review the data sources used (and considered for use) in the benchmark assessment (Table 1), as well as the research recommendations identified in the assessment regarding data collection (Appendix 1). The TC expressed concern about unfunded mandates, noting that most of the research recommendations relating to data needs cannot happen without securing additional funding. The TC is hesitant to recommend unfunded data collection and monitoring requirements as states are already running into funding issues to maintain long-term survey programs that collect valuable FI assessment data. Although Section 6 of the Endangered Species Act (ESA) does provide a mechanism to receive federal grants to fund the conservation of endangered species, only a minority of these funds support Atlantic sturgeon and those so allocated do not typically support long-term research

and survey programs needed for the species. That being said, the TC made the following recommendations listed in order of importance:

1. State and federal partners as well as academic institutions should encourage data sharing to better assess this species in the future. The success of the 2017 benchmark stock assessment depended on a community of state, federal, and academic partners who freely shared data which should continue to be encouraged. Some DPSs had limited data availability and more work is needed to ensure all information on the species is made available to stock assessment.

2. Continue to conduct the FI surveys that were used for developing indices of relative abundance for Atlantic sturgeon (Table 1) and continue to collect associated environmental (e.g., temperature, salinity) and biological (e.g., length, weight) data. This recommendation puts the least financial burden on the states as there is no need to secure additional funding. Additionally, states are encouraged to continue to conduct those surveys that were not used in the assessment due to short or broken time series. With the addition of more years of data, these surveys could meet the TC's criteria for relative abundance indices in future benchmark assessments. However, the TC noted that it is critical that states maintain current methodologies as well. If states are required to modify its surveys as a result of ESA Section 7 consultations, it will impact the time series and potentially render that survey unusable for the next assessment.

   For FI surveys that were not used due to low encounter rates of Atlantic sturgeon, states should consider expanding those surveys to include annual Atlantic sturgeon monitoring (e.g., sample additional sites/strata in areas where Atlantic sturgeon occur). This was also identified as a lower cost recommendation, although the TC noted that navigating permitting requirements may require state resources.

3. Continue to implant acoustic tags in Atlantic sturgeon and maintain receiver networks. The acoustic tagging data provide important information on current mortality rates and was used heavily in the assessment. It is critical that states maintain and support current networks of acoustic receivers and acoustic tagging programs, and expand the programs in underrepresented DPSs to improve the estimates of total mortality. However, this recommendation comes with a high price tag and many programs already struggle to secure funding to maintain their acoustic receiver arrays. Appropriate permits must also be acquired.

4. Continue to collect and improve data on incidental catch of Atlantic sturgeon. The primary source of data on Atlantic sturgeon bycatch comes from the Northeast Fisheries Observer Program which covers federal waters north of Cape Hatteras, North Carolina, but there is likely bycatch occurring in state water fisheries which are not well monitored. Accordingly, to improve estimates of bycatch, the number of trips and gears covered by observer programs should be increased and expanded to include more inshore and estuarine waters. Although some states (e.g., New York) have recently allocated resources to collect better

information on sturgeon bycatch in its fisheries in order to apply for Section 10 Incidental Take Permits, the TC reiterates its concerns of unfunded mandates.

Alternatively, the TC discussed the benefits of fishery-specific studies that estimate bycatch over a short period of time. As long as the results of the studies are comparable (e.g., similar methodologies), the TC can determine if (and how) Atlantic sturgeon bycatch in that fishery has changed from one time period to the next. Conducting one year studies every 3-5 years, for example, would reduce the financial burden of annual observer coverage. Additionally, this approach could promote collaboration with academic institutions since such studies are ideal thesis opportunities for graduate student research.

5. Collect data needed to quantify the numbers of Atlantic sturgeon killed by ship strikes each year at the DPS and river-level. The 2017 benchmark stock assessment identified ship strikes as a potential significant source of Atlantic sturgeon mortality. States are encouraged to respond to Atlantic sturgeon carcass sightings and determine if the cause of death was due to ship strike. Delaware State University is conducting an Atlantic sturgeon carcass reporting rate study for the Delaware Bay, the results of which could be applied to observed ship strike deaths to estimate total ship strike mortality for a given DPS or river.

6. Processing of genetic samples should be a priority in order to update the genetic baseline at the coastwide, DPS, and river-specific level and improve the genetic stock definitions of Atlantic sturgeon. The TC noted that efforts are already being made to address this; NOAA has provided funding to USGS to analyze and genetically assign 850 samples in the repository to hopefully fill the gaps in the baseline for the Carolina and South Atlantic DPSs.

7. Similar to the discussion on bycatch data needs, the TC discussed more fiscally reasonable approaches to evaluate trends in abundance in future assessments. Initiating a FI survey explicitly designed to monitor Atlantic sturgeon abundance would require a considerable amount of time and resources before it met the TC's time-series requirements as an index of abundance (i.e., 15+ year time series with consistent methods), although any biological information collected could be used immediately. As an alternative, the TC discussed generating a time series of repeated studies which measure abundance and recruitment over a short period of time (e.g., a series of 2-3 year studies carried out every 5-10 years instead of long term monitoring conducted on an annual basis). Again, as long as the results of the studies are comparable, the TC can determine if (and how) Atlantic sturgeon abundance and recruitment in a particular river or DPS has changed from one time period to the next. States and academic institutions could combine resources to complete studies under mutually agreed upon terms and conditions, including an appropriate timeline and data sharing protocols.

Work Cited:

Atlantic States Marine Fisheries Commission (ASMFC). 2017. Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report. Arlington, VA. National Oceanic and Atmospheric Administration Award No. NA15NMF4740069. p. 456

Table 1. Surveys considered, accepted and rejected for developing indices of relative abundance for Atlantic sturgeon. Asterisks in the "Accepted" column indicate a survey that was developed into an index but should not be used in analysis at this time due to the time series being too short. All surveys are fishery-independent unless indicated with "(FD)" (fishery-dependent). (*Table 8 from ASMFC 2017).*

Surveys Considered	Accepted	Rejected	Reason(s) Rejected						
			Time series too short or broken	Rare occurrence of sturgeon	Unusable as suggested by data submitter	Inconsistent methods, gear changes	Limited covariates	Incomplete dataset or unavailable	FD survey concerns
ME Gillnet		X	X			X	X		
ME-NH Trawl	X								
MA FD Investigation Maintenance Sampling		X		X					
MA FI Trawl Survey		X		X					
MA Industry based survey for cod		X		X					
RI Trawl		X		X	X				
CT LIS Trawl	X								
NY Juvenile Gillnet	X*		X						
NY Hudson River shad gillnet fishery (FD)		X	X						X
NY Hudson River power generator monitoring		X			X	X			
NYSDEC bottom trawl for striped bass		X		X	X				
NJ Ocean Trawl	X								
DE DFW ATS juvenile survey		X	X						
DE trawl (16' and 30')		X		X					
DSU inshore juvenile sampling & offshore sampling		X	X		X				
MD Coastal Offshore Trawl Survey		X		X					

Table 11. *Continued* (*Table 8 from ASMFC 2017).*

Surveys Considered	Accepted	Rejected	Reason(s) Rejected						
			Time series too short or broken	Rare occurrence of sturgeon	Unusable as suggested by data submitter	Inconsistent methods, gear changes	Limited covariates	Incomplete dataset or unavailable	FD survey concerns
VIMS Shad Monitoring	X								
NEAMAP	X*		X						
NC Program 120		X		X					
NC Program 135	X								
NC Program 915		X		X					
SC Edisto River Sturgeon Montoring	X*								
UGA Work		X	X						
USFWS Winter Trawl COOP Cruise	X								
NEFOP / ASM (FD)		X			X	X			X
NEFSC trawl		X		X	X	X			
The following surveys were rejected immediately due to extremely low encounter rates, or due to limited geographic coverage and survey design methods:									
NY Fall Shoals Survey		X				X			
VT Trawl Survey		X							
Upper James River Work		X						X	
James River FRG		X				X		X	
NC AR Gillnet -Fall/Winter		X							
NC AR Gillnet - Spring		X							
Historic Altamaha Study		X						X	
NJ Striped Bass Tagging Survey		X		X					
DE Carcass Report		X							
MD Striped Bass Gillnet Survey		X		X					

Table 1. *Continued (Table 8 from ASMFC 2017).*

Surveys Considered	Accepted	Rejected	Reason(s) Rejected						
			Time series too short or broken	Rare occurrence of sturgeon	Unusable as suggested by data submitter	Inconsistent methods, gear changes	Limited covariates	Incomplete dataset or unavailable	FD survey concerns
VIMS Juvenile Fish and Blue Crab Survey		X		X		X			
ChesMMAP		X							
Southeast Area Ocean Gillnet		X	X	X					
NC AS Trawl		X		X					
NC South Gillnet		X	X	X					
Cape Fear Gillnet		X	X						
Carolina Power and Light Surveys		X							
GA Brunswick River Sampling		X	X						
Pee Dee River Run Atl. Sturgeon Gillnet		X	X	X					
Pee Dee River Survey		X							
Winyah Bay		X							
Santee River		X		X					
Two South Carolina Rivers Studies**		X	X	X					
Savannah River and Selected Tribs		X	X	X					
Georgia Shad Tagging		X							
SEAMAP		X		X					

**It was noted by the South Carolina TC Representative on the June 18th, 2018, TC call that these studies do in fact encounter Atlantic sturgeon regularly and therefore the check in the "Rare occurrence of sturgeon" is incorrect.

Appendix 1

The SAS identified several research recommendations that would benefit Atlantic sturgeon and future stock assessments. Specific recommendations flagged to be improved upon before initiating another benchmark stock assessment are as follows (ASMFC 2017):

Future Research

- Expand and improve the genetic stock definitions of Atlantic sturgeon, including developing an updated genetic baseline sample collection at the coastwide, DPS, and river-specific level for Atlantic sturgeon, with the consideration of spawning season-specific data collection.

Data Collection

- Establish regional (river or DPS-specific) fishery-independent surveys to monitor Atlantic sturgeon abundance or expand existing regional surveys to include annual Atlantic sturgeon monitoring. Estimates of abundance should be for both spawning adults and early juveniles at age. See Table 1 for a list of surveys considered by the SAS.
- Establish coastwide fishery-independent surveys to monitor Atlantic sturgeon mixed stock abundance or expand existing surveys to include annual Atlantic sturgeon monitoring. See Table 1 for a list of surveys considered by the SAS.
- Continue to collect biological data, PIT tag information, and genetic samples from Atlantic sturgeon encountered on surveys that require it (e.g., NEAMAP). Consider including this level of data collection from surveys that do not require it.
- Encourage data sharing of acoustic tagged fish, particularly in underrepresented DPSs, and support programs that provide a data sharing platform such as The Atlantic Cooperative Telemetry Network. Data sharing would be accelerated if it was required or encouraged by funding agencies.
- Maintain and support current networks of acoustic receivers and acoustic tagging programs to improve the estimates of total mortality. Expand these programs in underrepresented DPSs.
- Collect DPS-specific age, growth, fecundity, and maturity information.
- Collect more information on regional vessel strike occurrences, including mortality estimates. Identify hot spots for vessel strikes and develop strategies to minimize impacts on Atlantic sturgeon.
- Monitor bycatch and bycatch mortality at the coastwide level, including international fisheries where appropriate (i.e., the Canadian weir fishery). Include data on fish size, health condition at capture, and number of fish captured.

Assessment Methodology

- Establish recovery goals for Atlantic sturgeon to measure progress of and improvement in the population since the moratorium and ESA listing.
- Expand the acoustic tagging model to obtain abundance estimates and incorporate movement

2018 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC STURGEON *(Acipenser oxyrinchus oxyrinchus)***

2016 FISHING YEAR

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Drafted January 2018

REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR ATLANTIC STURGEON *(Acipenser oxyrinchus oxyrinchus)* FOR 2016

I. Status of the Fishery Management Plan

Date of FMP Approval:	November 1990
Amendments:	Amendment 1 (July 1998)
Addenda:	Technical Addendum #1 (October 2000) Addendum I (January 2001) Addendum II (May 2005) Addendum III (November 2006) Addendum IV (September 2012)
Management unit:	Migratory stocks of Atlantic sturgeon from Maine through Florida
Jurisdictions with declared interest:	Maine through Florida, including District of Columbia and the Potomac River Fisheries Commission
Committees:	Sturgeon Management Board, Plan Review Team, Plan Development Team, Technical Committee, Stock Assessment Subcommittee, Advisory Panel, Culture and Stocking Committee

The Atlantic Sturgeon Fishery Management Plan (FMP) was approved by the Atlantic Sturgeon Management Board (Board) in 1990. By 1995, the member states and jurisdictions determined that the FMP was insufficient for conservation and restoration of Atlantic sturgeon stocks, and initiated development of Amendment 1, which was approved by ASMFC in June 1998. The goal of the Amendment is "to restore Atlantic sturgeon spawning stocks to population levels which will provide for sustainable fisheries, and ensure viable spawning populations." Based on recommendations of the 1998 ASMFC Atlantic Sturgeon Stock Assessment, the specific objectives to achieve this goal include:

- Establish 20 protected year classes of females in each spawning stock;
- Close the fishery for a sufficient time period to reestablish spawning stocks and increase numbers in current spawning stocks;
- Reduce or eliminate bycatch mortality of Atlantic sturgeon;
- Determine the spawning sites and provide protection of spawning habitats for each spawning stock;
- Where feasible, reestablish access to historical spawning habitats for Atlantic sturgeon; and
- Conduct appropriate research as needed, especially to define unit stocks of Atlantic sturgeon.

Under Amendment 1, states must maintain complete closure of any directed fishery for Atlantic sturgeon and prohibit landings from any fishery. Additionally, possession of Atlantic sturgeon,

or any parts thereof including eggs, is prohibited. Exemptions to the moratorium on possession for the purpose of scientific research or educational display are detailed in Technical Addendum 1. Applicants for exemption for the purpose of aquaculture and importation of non-indigenous Atlantic sturgeon (i.e., originating from outside U.S. jurisdiction) must adhere to the terms, limitations, enforcement and reporting requirements which were approved by the Commission in January 2001, and receive approval from the Board through the adaptive management process (e.g., see Addenda I-III detailed below).

Amendment 1 requires that, beginning in 1999, states report annually on the following topics to ASMFC:

- Results of bycatch monitoring for Atlantic sturgeon in other fisheries (Table 1);
- Monitoring results (tagging, juvenile abundance indices, etc.; Table 2);
- Habitat status (restoration efforts, FERC relicensing studies, etc.), in accordance with the recommendations in the FMP; and
- Aquaculture operations authorized, status of regulations, disease-free certification status, etc., including any additional reporting requirements outlined in the ASMFC Terms, Limitations, Enforcement and Reporting Requirements Document (2001).

Addendum I (2001) to the Atlantic Sturgeon FMP exempts Florida from the possession moratorium for the purposes of developing private aquaculture facilities for cultivation and propagation of the species. Addendum II (2005) exempts a private company in North Carolina from the moratorium on possession, propagation, and sale of Atlantic sturgeon meat and eggs, and allows a Canada-based exporter to export Atlantic sturgeon fry and fingerlings into North Carolina. Addendum III (2006) similarly allows a private company in North Carolina to import Atlantic sturgeon from a Canada-based exporter. Addendum IV (2012) updates habitat information for Atlantic sturgeon and identifies areas of concern and research needs.

II. Status of the Stock

In 1998, a benchmark stock assessment conducted by the Commission concluded that Atlantic sturgeon populations throughout the species' range were either extirpated or considered to be at historically low abundances. Also in 1998, NOAA Fisheries evaluated the status of the species with regard to listing under the Endangered Species Act (ESA) and concluded that listing was not warranted at the time (NOAA 1998). In 2007, a Status Review Team (SRT) identified five Distinct Population Segments (DPS; discrete population units with distinct physical, genetic, and physiological characteristics) along the Atlantic coast (NOAA 2007).

In 2009, and based on the recommendations from the 2007 Status Review, the National Resources Defense Council petitioned NOAA Fisheries to list Atlantic sturgeon under the provisions of the ESA. Following review, NOAA Fisheries published two proposed rules (75 FR 61872 and 75 FR 61904) in October 2010 to list each DPS under the provisions of the ESA. In April, 2012, NOAA Fisheries published two final rules (77 FR 5880 and 77 FR 5914) declaring the Gulf of Maine DPS as threatened and the remaining four DPSs as endangered. In 2013, in

response to the ESA listing, the Board initiated the development of a coast-wide benchmark stock assessment to evaluate stock status, stock delineation, and bycatch. The benchmark assessment was externally peer-reviewed in August 2017 by a panel of independent experts, and approved by the Board for management use in October.

The Stock Assessment Subcommittee (SAS) explored a number of different models and analyses to evaluate the status of Atlantic sturgeon, including trend analysis, data poor methods, genetic methods, per recruit models, and a multi-state Jolly-Seber tagging model based on telemetry records to estimate mortality. Unfortunately, efforts to assess the status of Atlantic sturgeon are hampered by a lack of data. Of the 50 fishery-independent surveys that were evaluated, only nine of the surveys met the criteria to be used as indices of relative abundance in the assessment. The accepted surveys ranged from Maine to South Carolina and mostly caught juveniles and sub-adults. The other surveys were not used because they rarely encountered sturgeon or because their methods were inconsistent throughout the time series.

The assessment based stock status on the results of the ARIMA (Auto-Regressive Integrated Moving Average) trend models and the tagging models. The ARIMA model uses fishery-independent indices of abundance to estimate how likely an index value is above or below a reference value. The tagging model estimated the survival rate of Atlantic sturgeon at the coast-wide and DPS levels. An egg-per-recruit (EPR) model was used to compare recent total mortality (Z) with a total mortality reference point that would result in 50% of the egg production of an unexploited population. This reference point ($Z_{50\%EPR}$) was used in the 1998 benchmark assessment and continued in the 2017 assessment as an appropriate target to aid in stock recovery. The survival estimate from the tagging model was compared to $Z_{50\%EPR}$ to determine if total mortality was too high.

According to the 2017 Atlantic Sturgeon Stock Assessment Report, Atlantic sturgeon populations remain depleted at the coast-wide and DPS-levels relative to historical abundance (Table 1). The “depleted” determination was used instead of “overfished” because of the many factors that contribute to the low abundance of Atlantic sturgeon. On a coast-wide basis, however, the population appears to be recovering slowly since 1998 – the year the moratorium was implemented. Despite the fishing moratorium, the population still experiences mortality from several sources, but the assessment indicates that total mortality is sustainable.

Impediments to recovery include directed and incidental fishing, habitat loss, ship strikes, and climate change. The 2017 report indicates that anthropogenic mortality is a leading cause of Atlantic sturgeon mortality. Despite there being no directed fisheries for Atlantic sturgeon for nearly two decades, sturgeon are caught as bycatch in fisheries for other species, predominantly in gillnets, and to a lesser extent trawls and pound nets. Other potential emerging threats include invasive species, such as blue (*Ictalurus furcatus*) and flathead (Pylodictis olivaris) catfishes. In regions where sturgeon from different DPS mix in coastal aggregations, threats to these aggregations (e.g., bycatch mortality and ship strikes) may have disproportionate population effects at the DPS-level. Poaching of Atlantic sturgeon, at an unknown level, also occurs.

III. Status of the Fishery

Directed Harvest

Atlantic sturgeon have been harvested for their flesh and eggs (i.e., caviar) along the Atlantic coast since pre-colonial times. Commercial landings records for Atlantic sturgeon were first kept in 1880. At that time, landings were high and concentrated in the Delaware and Chesapeake systems, although commercial fisheries rapidly expanded to include most known spawning rivers. Reported landings of Atlantic sturgeon peaked in 1890 at 7.5 million pounds and declined precipitously thereafter. During the 1970's and 80's, the bulk of fishing effort and landings shifted to South Carolina, North Carolina, and Georgia (NOAA 1998). During the 1980's, landings from these states declined, and coast-wide landings shifted to New York and New Jersey.

By 1996, following approval of the 1990 Interstate FMP which suggested that the dramatic decline in landings was likely caused by overfishing, Atlantic sturgeon fishery closures were instituted in 10 states and jurisdictions along the Atlantic coast. Since 1997, all states have enacted bans on harvest and possession of Atlantic sturgeon and sturgeon parts. NOAA Fisheries enacted a ban on harvest and possession of Atlantic sturgeon in federal waters in 1998. Per Amendment 1, these moratoria will remain in effect until stocks exhibit a minimum of 20 protected year classes of spawning females and the FMP is modified to permit harvest and possession.

Bycatch

Since Atlantic sturgeon are an anadromous species spending portions of their lives in rivers, estuaries, and both nearshore and offshore ocean waters, they are vulnerable to incidental capture in many different fisheries conducted along the Atlantic coast. Accordingly, bycatch is one of the most significant threats to the viability of Atlantic sturgeon populations (ASMFC 2017). The Commission hosted several workshops between 2003 and 2007 that focused on collecting information on Atlantic sturgeon bycatch, identifying bycatch issues, estimating fishery-specific bycatch, and developing recommendations for dealing with Atlantic sturgeon bycatch in other directed fisheries. Amendment 1 requires states and jurisdictions to report Atlantic sturgeon bycatch, although the quality of available data varies (Table 2). Anecdotal evidence suggests that many Atlantic sturgeon bycatch encounters are unreported, indicating the need for reliable state-directed reporting programs.

The 2017 benchmark stock assessment was able to estimate bycatch from three different data sources; the Federal observer program, i.e., the Northeast Fisheries Observer Program (NEFOP) and the At-sea Monitoring Program (ASM), the North Carolina estuarine gill-net fishery observer program, and the South Carolina American shad fishery logbook program. However, it is hard to compare the estimates from the Federal and North Carolina observer programs to the estimates from the South Carolina logbook program due to the differences in how the data are collected. The South Carolina data are self-reported and are most likely an underestimate, since under-reporting is known to occur, while the Federal and North Carolina estimates are

developed from a sample of fishing trips in these regions and have their own degree of uncertainty.

Estimates of total bycatch from the Federal observer programs (gillnets and trawls combined) were lower than estimates from the North Carolina observer programs, but estimates of dead discards were similar because the Federal observer program encountered a higher proportion of dead fish on gillnet hauls than North Carolina did. Estimates of bycatch from the Federal observer data averaged 1,139 Atlantic sturgeon caught per year with 295 dead in the gillnet fishery and 1,062 a year with 41 dead in the otter trawl fishery. Estimates of bycatch from the North Carolina gillnet fishery were averaged 4,179 per year with 218 dead. The South Carolina American shad fishers reported an average of 4.3 Atlantic sturgeon caught per year in rivers in the South Atlantic DPS and 92.4 per year in waters in the North Carolina DPS. Refer to ASMFC 2017 for more information regarding bycatch and bycatch mortality estimates.

Aquaculture

A management objective of the 1990 FMP is to enhance and restore Atlantic sturgeon stocks. The use of aquaculture aims to achieve that objective by providing a unique opportunity to research conservation, restoration, and recovery techniques for wild-spawning Atlantic sturgeon.

The U.S. Fish and Wildlife Service (FWS) received an Endangered Species Act Section 10(a)(1)(A) Permit for Scientific Research from NMFS on March 14, 2013 (permit number 17367-01). The U.S. FWS maintains 45 Atlantic sturgeon at the Northeast Fishery Center in Lamar, Pennsylvania. Primary research goals include cryo-preservations and extending the viability of fresh milt of wild versus hatchery-reared sturgeon. The U.S. FWS also maintains eight adult Atlantic sturgeon at the Bears Bluff National Fish Hatchery in South Carolina. These fish were collected from 2008-2010 from the Altamaha River. Fertilized eggs have been produced from at least one tank of Atlantic sturgeon at Bears Bluff every year since 2011. One female produced 2,647 eggs during the 2016 effort, but Bears Bluff gave the 2,591 high quality eggs produced to a partner who had requested them and kept only the 56 low quality eggs to hatch themselves (approximately 8,394 fry were hatched from the 2015 effort). This year's spawning effort likely produced lower fertilization rates and egg quality because the spawning female had spawned for three consecutive years, a behavior that is highly unusual in the wild. Lastly, the U.S. FWS Welaka National Fish Hatchery in Florida maintains 125 Atlantic sturgeon from three year classes. These fish were obtained from the Bears Bluff National Fish Hatchery for future research, and as a refugium for endangered species.

Maryland's Department of Natural Resources Sturgeon Conservation Partnership is currently rearing Atlantic sturgeon for captive brood research at Maryland-based research laboratories in cooperation with NRG Energy and the University of Maryland. NRG Energy's Chalk Point Generating Station houses 9 adult wild Atlantic sturgeon and approximately 382 Canadian hatchery origin Atlantic sturgeon. The University of Maryland's Restoration Ecology Laboratory houses 18 adults and sub-adults and 29 juveniles, and the Cooperative Oxford Laboratory houses 52 individuals. All research and restoration activities using wild origin stock were

suspended due to the ESA listing. Maryland DNR filed a full application for an ESA Section 10 scientific research permit to continue research activities, and the application was approved in January 2015 (NMFS culture permit #17364).

In 2005, LaPaz LLC of Lenoir, North Carolina, received approval from the ASMFC and North Carolina Department of Marine Fisheries to commercially rear Atlantic sturgeon for the purpose of sale of meat and caviar (Addendum II and Addendum III to Amendment 1). From 2006-2008, LaPaz imported 5,883 fertilized Atlantic sturgeon eggs from Supreme Sturgeon in Canada. All eggs, fry, and fingerlings were imported from Canadian sources. From 2010-2012, LaPaz reduced the number of Atlantic sturgeon being held. Nearly all of the 2006 fish had been culled and 435 fish from 2008 were transported from LaPaz to the West Virginia University (WVU) to be involved in a research study evaluating aquaculture potential of reclaimed water from coal mining. The fish were accompanied by proper tracking and documentation and WVU received permission from the West Virginia Fish and Game Division to possess the fish at their facility. However, the PRT expressed concerns regarding the transfer of fish to facilities outside of ASMFC jurisdiction and regarding the ability for facilities under import exemption to transfer live Atlantic sturgeon to research facilities that may not be held to the same Best Management Practices as the exempt facility. Since West Virginia is not an ASMFC member state, the disposition of these fish is not well documented.

LaPaz recently shifted their focus away from the species and no longer has Atlantic sturgeon in their possession. During 2013-2014, 937 Atlantic sturgeon were culled from the facility. Later in 2014, La Paz accepted an offer from Horse Creek Aquafarm (a commercial food farm in Arcadia, Florida) to purchase the remaining 679 fish; Horse Creek Aquafarm received 600 Atlantic sturgeon in February 2015. Unfortunately, several power outages resulted in mortalities and only 117 Atlantic sturgeon remain on the farm. The Horse Creek received a Division of Aquaculture certificate from the Florida Department of Agriculture and Consumer Services under the provisions of Addendum I to Amendment 1.

ESA Section 10 Incidental Take Permits

It is recommended that states and jurisdictions coordinate with the ASMFC regarding the progress of ESA Section 10(a)(1)(b) Incidental Take Permit (ITP) applications. As of 2016, North Carolina and Georgia have acquired ESA Section 10 ITPs for Atlantic sturgeon for their commercial gill net fisheries. Virginia's and South Carolina's applications for Section 10 ITPs are currently pending. Rhode Island, New York, New Jersey, and Delaware are currently developing Section 10 ITP applications. Rhode Island intends to use a modeling approach similar to that used in the 2017 benchmark stock assessment. Also, New York is currently funding two years of increased NMFS observer coverage to develop better estimates of Atlantic sturgeon bycatch for its Section 10 ITP permit application. Virginia is similarly implementing an observer program to improve Atlantic sturgeon bycatch estimates. Connecticut's work on the Section 10 ITP is currently on hold due to staffing and budgetary considerations. Maine, New Hampshire, Massachusetts, Pennsylvania, D.C., the Potomac River Fisheries Commission, and Florida are not pursuing Section 10 ITPs due to low number of interactions with Atlantic sturgeon in their

waters. Maryland is also not pursuing a Section 10 ITP at this time due to insufficient data and resources.

IV. Status of Management Measures and Issues

Mandatory management measures include:

1. Complete closure, through prohibiting possession of Atlantic sturgeon, and any and all parts thereof including eggs, of any directed fishery for and landings of Atlantic sturgeon until the fishery management plan is modified to reopen fishing in that jurisdiction. In February 1999, NMFS imposed a harvest and possession moratorium on Atlantic sturgeon in the EEZ.
2. In addition, states shall implement any restrictions in other fisheries as outlined in bycatch reduction sections of the FMP.
3. States may grant limited specific exceptions to prohibitions on possession for imports of non-U.S. Atlantic sturgeon and/or cultured Atlantic sturgeon upon adoption of FMP addenda that specify the terms, limitations, and enforcement requirements for each such exception. It is intended that each such addenda shall be developed by the Atlantic Sturgeon Plan Development Team (PDT), in consultation with representatives of the ASMFC federal partners, applicable state aquaculture authorities, the ASMFC Law Enforcement Committee, the state(s) for which shipments are intended, and the party(ies) requesting the exception.

In addition to these mandatory regulations, states are implementing several recommendations in the FMP including development of a coast-wide tagging database and culture techniques, incorporation of shortnose sturgeon issues in Atlantic sturgeon research (and vice versa), stock identification, and habitat restoration.

V. Current State-by-State Implementation of FMP Compliance Requirements

As described in *Sections 3.4* and *5.1.2* of Amendment 1, states and jurisdictions must report on monitoring programs and provide estimates of bycatch of Atlantic sturgeon in other fisheries under their jurisdiction. Reports on compliance are submitted by each jurisdiction, annually, by October 1, and are reviewed by the PRT. Compliance reports must cover the previous calendar year at a minimum and should include significant findings of the current year. Based on 2017 compliance reports, all states and jurisdictions met the requirements of Amendment 1 (and its four addenda) to the Atlantic sturgeon FMP in 2016. See Table 4 for a state-by-state summary of compliance in 2016.

VI. Research Needs

The following research priorities and recommendations were identified to support stock assessment and interjurisdictional fisheries management for Atlantic sturgeon in state and federal waters (ASMFC 2017).

Future Research Priorities

High

- Identify spawning units along the Atlantic coast at the river or tributary and coast-wide level.
- Expand and improve the genetic stock definitions of Atlantic sturgeon, including developing an updated genetic baseline sample collection at the coast-wide, DPS, and river-specific level for Atlantic sturgeon, with the consideration of spawning season-specific data collection.
- Determine habitat use by life history stage including adult staging, spawning, and early juvenile residency.
- Expand the understanding of migratory ingress of spawning adults and egress of adults and juveniles along the coast.
- Identify Atlantic sturgeon spawning habit through the collection of eggs or larvae.
- Investigate the influence of warming water temperatures on Atlantic sturgeon, including the effects on movement, spawning, and survival.

Moderate

- Evaluate the effects of predation on Atlantic sturgeon by invasive species (e.g., blue and flathead catfishes).

Data Collection

High

- Establish regional (river or DPS-specific) fishery-independent surveys to monitor Atlantic sturgeon abundance or expand existing regional surveys to include annual Atlantic sturgeon monitoring. Estimates of abundance should be for both spawning adults and early juveniles at age.
- Establish coast-wide fishery-independent surveys to monitor Atlantic sturgeon mixed stock abundance or expand existing surveys to include annual Atlantic sturgeon monitoring.
- Continue to collect biological data, PIT tag information, and genetic samples from Atlantic sturgeon encountered on surveys that require it (e.g., NEAMAP). Consider including this level of data collection from surveys that do not require it.
- Encourage data sharing of acoustic tagged fish, particularly in underrepresented DPSs, and support programs that provide a data sharing platform such as The Atlantic Cooperative Telemetry Network. Data sharing would be accelerated if it was required or encouraged by funding agencies.
- Maintain and support current networks of acoustic receivers and acoustic tagging programs to improve the estimates of total mortality. Expand these programs in underrepresented DPSs.
- Collect DPS-specific age, growth, fecundity, and maturity information.
- Collect more information on regional vessel strike occurrences, including mortality estimates.

- Identify hot spots for vessel strikes and develop strategies to minimize impacts on Atlantic sturgeon.
- Monitor bycatch and bycatch mortality at the coast-wide level, including international fisheries where appropriate (i.e., the Canadian weir fishery). Include data on fish size, health condition at capture, and number of fish captured.

Assessment Methodology

High

- Establish recovery goals for Atlantic sturgeon to measure progress of and improvement in the population since the moratorium and ESA listing.
- Expand the acoustic tagging model to obtain abundance estimates and incorporate movement.

Moderate

- Evaluate methods of imputation to extend time series with missing values. ARIMA models were applied only to the contiguous years of surveys due to the sensitivity of model results to missing years observed during exploratory analyses.

VII. Ongoing Research and Notable Comments Highlighted in 2017 Compliance Reports

Amendment 1 does not require any research in participating states and jurisdictions. Nonetheless, several state and federal agencies, and academic institutions, are conducting research projects to further understand Atlantic sturgeon life history, genetics, behavior, and aquaculture. States and jurisdictions are encouraged to include such information in annual compliance reports. Accordingly, please see the 2017 state-specific compliance report for details regarding ongoing research and other notable comments (ASMFC 2017a).

VIII. Recommendations of Plan Review Team

The PRT recommends that states:

1. Continue to coordinate with the ASMFC regarding the progress of incidental take permits under Section 10(a)(1)(b) of the ESA.

2. The PRT stresses the importance of mandatory reporting and/or observer coverage requirements to effectively monitor Atlantic sturgeon bycatch in state fisheries.

3. Regarding the transfer of live Atlantic sturgeon to facilities for scientific research and/or educational display, the PRT recommends states review and consider the management practices of the receiving facility prior to transfer. Additionally, states are reminded that it is difficult to monitor the disposition of fish that are moved to a state or jurisdiction that is not a member of the ASMFC.

IX. Work Cited

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Table 1. Stock status determination for the coast-wide stock and DPSs based on mortality estimates and biomass/abundance status relative to historic levels, and the terminal year (i.e., the last year of available data) of indices relative to the start of the moratorium as determined by the ARIMA analysis. *For indices that started after 1998, the first year of the index was used as the reference value. Source: ASMFC 2017.

	Mortality Status	**Biomass/Abundance Status**	
Population	**Probability that $Z > Z_{50\%EPR}$ 80%**	**Relative to Historical Levels**	**Average probability of terminal year of indices > 1998* value**
Coastwide	7%	Depleted	95%
Gulf of Maine	74%	Depleted	51%
New York Bight	31%	Depleted	75%
Chesapeake Bay	30%	Depleted	36%
Carolina	75%	Depleted	67%
South Atlantic	40%	Depleted	Unknown (no suitable indices)

Table 2. Atlantic sturgeon bycatch (number of fish) reported from fishery-dependent data sources, 2015-2016. Fishery-dependent bycatch likely underreported due to majority reporting through voluntarily-based programs. Source: 2016 and 2017 ASMFC state compliance reports and NEFOP/ASM. *confidential information

State	Location	Fisheries	Target Species	Data Source	State-Directed Monitoring	2015	2016	Comments
ME	ocean	gillnet, trawl, purse seine	multiple	NEFOP	NO	0	0	Bycatch usually highest in November (1991-2014).
NH	ocean	unspecified	unspecified		NO	0	0	
MA	ocean	pot, trawl, hook, gillnet	multiple	at-sea observers	NO	0	0	Fisheries-Dependent Investigations project via ad hoc at-sea observer program.
RI	ocean	unspecified	unspecified	NEFOP & ASM	NO	1	0	
CT	Connecticut River	drift gillnet	American shad	logbooks	NO	37	58	Includes both Atlantic and shortnose sturgeons, mortality thought to be rare due to actively fished gear. No Long Island Sound bycatch data obtained.
NY	ocean	unspecified	unspecified	mandatory logbooks	NO	0	0	No shad or striped bass gill net fishery on Hudson River since 2010. NY funded additional NEFOP trips for 2016.
NJ	Delaware Bay	gillnet	American shad	Mandatory logbooks	NO	9	*	Although American shad fishers are required to report shad landings, report of Atlantic sturgeon bycatch is on a voluntary basis
PA	No commercial fishing permitted in the PA portion of the Delaware River or Estuary							
DE	Delaware River	gillnet	multiple	voluntary logbook	NO	0	0	Reporting program terminated in 2012
MD	ocean	Trawl	unspecified	DNR Observers	YES	0	0	A reporting reward program was terminated in 2012.
PRFC	Potomac River	*	unspecified	Mandatory Reports	NO	0	*	These confidential fish were released alive

Table 2 continued.

State	Location	Fisheries	Target Species	Data Source	State-Directed Monitoring	2015	2016	Comments
VA	unspecified	gillnet	multiple	observers	YES	N/A	9	Program began in May 2016 as part of VA's Incidental Take Permit application.
NC	NC Estuaries	gillnet	Southern Flounder (primarily)	observers	YES	74	82	Large and small mesh fisheries throughout the state; three mortalities in 2015 and five in 2016.
SC	Winyah River	gillnet	American shad	reporting	YES	10	15	Winyah Bay and Santee System; no mortality data available.
GA	Altamaha River	gillnet	American shad	GA DNR	YES	19	34	Reported and observed. Only one was observed. All released unharmed.
	Savannah River	gillnet	American shad	GA DNR		2	0	
FL	Atlantic coast	unspecified	unspecified	FL FWC	NO	0	0	Small sub-adult captured and released by rec. angler from the Jacksonville Beach Pier in 2015.
NMFS	Atlantic coast	Trawl and gillnet	Unspecified	NEFOP/ASM	N/A	110 (14)	310 (22)	Observations coded as "sturgeon, Atlantic" (Observations coded as "unknown sturgeon")

Table 3. Atlantic sturgeon takes (number of fish) reported from fishery-independent data sources, 2015-2016. Source: 2016-2017 ASMFC state compliance reports.

State	Location	Method	Type of Survey or Research	Data Source	2015	2016	Comments
ME	ocean	trawl	Groundfish	ME/NH joint survey	5	1	61 captured from 2000-2016
NH	Estuarine	NA	-	USGS	0	0	No known reproducing populations within NH waters.
MA	ocean	trawl	-	DMF	0	0	No known reproducing populations within MA waters.
RI	RI Sound	trawl	Coastal Trawl Survey	RI DFW	0	0	Only 3 Atlantic Sturgeon since 1979 (1997, 2005, and 2014).
CT	Connecticut River	unspecified	Research	CT DEP	175	133	Directed research; efforts and methods highly variable over time and should not be used as an index of abundance
	Long Island Sound	trawl	Survey	CT DEP	1	12	Multi-species survey; unreliable for abundance trends
NY	Hudson R. Estuary	anchored gillnet	Survey	NYSDEC-USFWS	554	362	Juveniles and sub-adults; juvenile abundance sampling
NJ	Coastal ocean	trawl	-	NJ DEP-DFW	32	13	Sandy Hook to Cape May; 0.17 mean tow per haul
	Delaware Bay	gillnet	Striped Bass & American Shad	NJ DEP-DFW	4	2	Striped bass tagging program
	State waters	unspecified	Voluntary reporting	NJ DEP-DFW	7	21	Online volunteer reporting for sturgeon interactions
NJ/PA/ DE	Delaware River	Trawl	DRMCD Project.	ERC/USACE	482	575	All sturgeon were relocated upriver of blasting area; two mortalities (ERC 2016).
DE	Delaware River	ship strike	-	DE DFW-Reporting	12	12	Collaboration with DSU. Includes fish reported in PA's portion of Delaware Estuary.
	Delaware River	trawl	Juvenile abundance	DE DFW	6	3	Two otter trawl surveys; large (30') and small (16')
	Delaware River and Bay	gill and trammel nets	Juvenile abundance	DE DFW	61	7	2”-3” mesh monofilament gillnets used; targeting early stage juveniles (age 0-2)
MD	Chesapeake Bay	gill net	Striped Bass spawning stock survey	MD DNR	0	1	
	Nanticoke River System	gill net	Adult Atlantic Sturgeon Tagging	MD DNR	7	5	

Table 3 continued.

State	Location	Method	Type of Survey or Research	Data Source	2015	2016	Comments
VA	Chesapeake Bay	trawl	Juvenile fish and Blue Crab survey	VIMS	0	1	
	James River	gillnet	Adult Atlantic Sturgeon Tagging	VCU	81	52	
	James, York & Rapp. Rivers	anchored gillnet	American Shad monitoring	VIMS	10	2	
NC	Albemarle Sound	gillnet	Survey	NCDMF	86	124	Mortalities: 15 in 2015, nine in 2016.
	Pamlico Sound and River, Pungo, Neuse Rivers	gillnet	Survey	NCDMF	24	10	Mortalities: five mortalities in 2015, two in 2016.
	Cape Fear and New Rivers	gillnet	Survey	NCDMF	1	5	Mortalities: no mortalities in 2015 or 2016.
SC	Edisto River System	unspecified	Juvenile Atlantic Sturgeon	SCDNR	64	133	2016: 13 recaptures, 24 nominal age-1 fish.
	Freshwater and estuarine rivers	gillnet	Shortnose Sturgeon	SCDNR	53	117	Freshwater Fisheries Section; designed for Shortnose.
GA	Altamaha River	drift gillnet	Adult shad	GADNR-WRD	0	0	All measured and released alive.
	ocean	trawl	Commercial crustaceans	GADNR-CRD	5	10	Released alive.
	Altamaha & Wassaw Sound	trammel & gill nets	Spotted Sea Trout & Red Drum	GADNR-CRD	0	0	Entanglement gear surveys.
	Ogeechee, Satilla, and Altamaha	trammel & gill nets	Research	UGA	364	580	
	Savannah River	trammel & gill nets	Juvenile Sturgeon	UGA	434	501	May-August, fresh/saltwater interface.
	St Marys					5	
FL	St. John's River	gill net	-	FL FWC	1	0	2015; UGA scientific collection permit. Released alive.

Table 4. State-by-State compliance, 2016. Note: C = In Compliance, P = Partial, N = Not in Compliance/No Report Submitted, NA = Not Applicable

State	Bycatch Monitoring [1]	Monitoring Results[2]	Habitat Status [3]	Aquaculture Operations[4]	Moratorium on Harvest and Possession[5]
ME	C	C	NA	NA	C
NH	C	NA	C	NA	C
MA	C	C	C	NA	C
RI	C	C	C	NA	C
CT	C	C	C	NA	C
NY	C	C	C	NA	C
NJ	C	C	NA	NA	C
PA	C	C	NA	NA	C
DE	C	C	C	NA	C
MD	C	C	C	C	C
PRFC	C	NA	C	NA	C
DC	NA	NA	NA	NA	C
VA	C	C	NA	NA	C
NC	C	C	C	NA	C
SC	C	C	C	NA	C
GA	C	C	C	C	C
FL	C	C	NA	C	C

[1]**REQUIRED** Bycatch Monitoring may be implemented via law enforcement observations, FI surveys, ACCSP and/or at-sea observer programs.

[2]**RECOMMENDED** Monitoring Results should include: (a) details of how juvenile abundance survey will be performed (recommended every 5 years), (b) calculated CPUE estimates of juveniles, (c) reports on tag and release programs, and (d) assessment of spawning stock status including examination of sex ratio, size, and age structure by sex of the larger sub-adults and adults.

[3]**RECOMMENDED** Habitat Monitoring reports should include: (a) assessment of sturgeon habitats of particular concern, (b) restoration programs, and (c) FERC relicensing evaluations.

[4]**RECOMMENDED** Aquaculture monitoring reports should include: (a) aquaculture research and development, (b) collection of brood stock and release of cultured progeny, (c) translocation of sturgeons and inadvertent spread of diseases, (d) introduction of non-native sturgeons for commercial aquaculture, (e) collection and archiving tissue samples for genetic analysis, and (f) monitoring effectiveness of restoration programs.
REQUIRED for states with private aquaculture exemptions to the harvest and possession moratorium.

[5]**REQUIRED** State moratorium on the harvest and possession of Atlantic sturgeon currently applies throughout ASMFC jurisdiction.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

July 19, 2018

To: **Atlantic Sturgeon Management Board**

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

RE: **Recommendation to Disband Advisory Panel**

It's been 20 years since the Atlantic Sturgeon Advisory Panel met to provide input on Amendment 1 to the Interstate Fishery Management Plan, which instituted a moratorium on all directed fisheries for the species. Since that time, the Advisory Panel has been kept abreast of developing issues with the resource but have not formally met. With Atlantic sturgeon federally-listed as threatened or endangered, depending upon the distinct population segment, and the 2017 benchmark stock assessment showing very little change in the resource's abundance since the 1998 assessment, it's unlikely that there will be any management activity for the foreseeable future.

Rather than maintaining a defunct panel, staff would like the Board to consider disbanding the Advisory Panel. If, down the road, the Board determines that it would benefit from the input of an Advisory Panel, staff will work with the states to re-establish an Advisory Panel.

We offer you this recommendation for your consideration at the August 2018 Board meeting.

cc: Max Appelman, Fishery Management Plan Coordinator