Atlantic States Marine Fisheries Commission

Atlantic Herring Management Board

October 22, 2018
1:30 – 3:30 p.m.
New York, New York

Draft Agenda

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

1.	Welcome/Call to Order *(P. Keliher)*	1:30 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from August 2018	1:30 p.m.
3.	Public Comment	1:35 p.m.
4.	Review 2018 Atlantic Herring Benchmark Assessment Peer Review Report *(P. Campfield)* **Final Action** • Review and Consider Approval of Benchmark Stock Assessment and Peer Review Report for Management Use	1:45 p.m.
5.	Review and Discuss White Paper on Atlantic Herring Spawning Protections *(M. Ware)* **Possible Action**	2:15 p.m.
6.	Update on 2019-2021 Fishery Specifications Process *(M. Ware)*	3:00 p.m.
7.	Set 2019 Specifications for Area 1A *(M. Ware)* **Final Action**	3:05 p.m.
8.	Review and Populate Atlantic Herring Advisory Panel *(T. Berger)* **Action**	3:25 p.m.
9.	Other Business/Adjourn	3:30 p.m.

The meeting will be held at the Roosevelt Hotel, 45 East 45th Street & Madison Avenue, New York, NY; 212.661.9600

MEETING OVERVIEW

Atlantic Herring Management Board
Monday, October 22, 2018
1:30 – 3:30 p.m.
New York, New York

Chair: Pat Keliher (ME) Assumed Chairmanship: 02/18	Technical Committee Chair: Renee Zobel (NH)	Law Enforcement Committee: Michael Eastman (NH)
Vice Chair: Dr. David Pierce (MA)	Advisory Panel Chair: Jeff Kaelin (NJ)	Previous Board Meeting: August 7, 2018
Voting Members: ME, NH, MA, RI, CT, NY, NJ, NEFMC (8 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2018

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. 2018 Benchmark Stock Assessment Peer Review Report (1:45 – 2:15 p.m.) Final Action

Background

- The 2018 Benchmark Stock Assessment was completed in June and a peer review was held on June 26-29 as a part of the SAW/SARC 65 review workshop.
- While the Board reviewed the results of the Stock Assessment at their August meeting, the Peer Review Report had not yet been released and, as a result, it was not reviewed by the Board.

Presentations

- Peer Review Report by P. Campfield **(Briefing Materials)**

Board actions for consideration at this meeting

- Accept the Stock Assessment Report and Peer Review Report for management use.

5. Atlantic Herring Spawning Protections (2:15 – 3:00 p.m.) Possible Action

Background

- Results of the 2018 Stock Assessment indicate reduced recruitment and spawning stock biomass over the last five years.
- In response, the Board tasked staff with reviewing the current protections provided to spawning Atlantic herring, with the aim of assessing whether additional protections need to be considered.
- The white paper re-visits management alternatives selected in Amendment 3, which specify the current inshore Gulf of Maine spawning closures, and provides considerations regarding the protection of spawning aggregations in Georges Bank and Nantucket Shoals.

Presentations

- Overview of spawning white paper by M. Ware **(Briefing Materials)**

Board actions for consideration at this meeting

- Consider initiation of management action in response to white paper

6. Update on 2019-2021 Specifications Process (3:00 – 3:05 p.m.)

Background

- 2019 marks the start of a new specification package for Atlantic herring. Given action on NEFMC's Amendment 8, it is likely that a complete specification package wouldn't be implemented until mid-2019. This is of concern since the 2019 ACL is expected to be reduced.
- The NEFMC has recommended that NOAA Fisheries implement 2019 specifications via an in-season adjustment.

Presentations

- Update on the 2019-2021 fishery specifications by M. Ware

7. Set 2019 Specifications for Area 1A (3:05-3:25 p.m.) Final Action

Background

- Per Amendment 3, states annually set the quota specifications, including the quota period system, in Area 1A.
- For the 2018 fishing year, the Board adopted a trimester approach in which 72.8% of the Area 1A sub-ACL was available from June through September and 27.2% was allocated from October through December.

Presentations

- Overview of quota period options in Amendment 3 by M. Ware

Board actions for consideration at this meeting

- Set the season split of the Area 1A sub-ACL, quota rollovers, and sub-ACL trigger.

8. Atlantic Herring Advisory Panel Membership (3:25 – 3:30 p.m.) Action
Background • Joseph Jurek from MA has been nominated to the Atlantic Herring Advisory Panel
Presentations • Overview of nomination by T. Berger **(Briefing Materials)**
Board actions for consideration at this meeting • Consider approval of nomination.

9. Other Business/Adjourn

Atlantic Herring Technical Committee Task List

Activity Level: Medium

Committee Overlap Score: Medium

Committee Task List
While there are no Board tasks for the TC at present, there are several annual activities in which TC members participate, both through the Commission and NEFMC • Summer/fall collection of spawning samples per the spawning closure protocol • Participation on NEFMC PDT and SSC (will be working to recommend specifications for the 2019-2021 fishing years) • Annual state compliance reports are due February 1

TC Members Renee Zobel (NHFG – Chair), Kurt Gottschall (CT DMF), Dr. Matt Cieri (ME DMR), Micah Dean (MA DMF), John Lake (RI DFW)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC HERRING SECTION

The Westin Crystal City
Arlington, Virginia
August 7, 2018

These minutes are draft and subject to approval by the Atlantic Herring Section
The Section will review the minutes during its next meeting

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Section Members

Pat Keliher, ME (AA)
Doug Grout, NH (AA)
G. Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
David Pierce, MA (AA)
Raymond Kane, MA (GA)
Bob Ballou, RI, proxy for J. McNamee (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Pete Aarrestad, CT (AA)
Sen. Craig Miner, CT (LA)
John McMurray, NY, proxy for Sen. Boyle (LA)
Maureen Davidson, NY, proxy for J. Gilmore (AA)
Tom Fote, NJ (GA)
Joe Cimino, NJ, proxy for L. Herrighty (AA)

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

Ex-Officio Members

Staff

Robert Beal
Toni Kerns
Megan Ware
Jessica Kuesel

Guests

Rachel Baker, NOAA
Ellen Boler, VMRC
Matt Cieri, ME DMR
Zach Greenberg, PEW Trusts
Sarah Heil, NOAA
Peter Himchak, Omega Protein
Peter Kendall, NEFMC
Aaron Kornbluth, PEW Trusts
Michael Pentony, NMFS
Bryan Plumlee, VA (GA)
Nick Popoff, ME DMR
Sam Rauch, NOAA
Abden Simmons, MEFA
Melissa Smith, ME DMR
Darrel Young, MEFA

Please note: Due to a technical issue, the first five minutes after the break was not recorded. The motion made and passed during that period is shown in the Index of Motions

The Atlantic Herring Section of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia; Tuesday, August 7, 2018, and was called to order at 10:30 o'clock a.m. by Chairman Patrick C. Keliher.

CALL TO ORDER

CHAIRMAN PATRICK C. KELIHER: We'll start the Atlantic Herring Section meeting a little bit late. We apologize; the Executive Committee ran over just a tad. I'm going to call the meeting to order. We've got a few additional items on the agenda; but before we go there, both of the other two Commissioners from the state of Maine were not able to attend today.

This is their busy time of year; both Steve Train from a lobstering perspective, and Senator Langley, because of his restaurant in Ellsworth, so I'm it. My plan is to Chair this meeting; and if we get into a situation where I have to advocate on behalf of Maine on a specific position, I will turn the meeting over to Bob, in regards to running that portion of the meeting if we have to make any motions.

Does anybody have any objections to that approach? Seeing none; thank you. You have objections to that approach, Toni? Okay. Don't confuse me. We do have some additional items on the agenda that we'll take up under other business. One is revisiting the issue regarding moving the Section and turning it into a Board. This is a result of conversations that leadership from the Council and the Commission had; and Bob can give some additional information when that portion comes up.

Because of that conversation, because we're going to deal with some of the issues related to Council work on A8, Peter Kendall, who is the Herring Committee Chair, is here in a great spirit of cooperation. He expected to be hiding in the back of the room; but I said no, with that shirt on he needs to sit up at the front. Then we also have AP nominations. Is there any other business to be brought before the Section? Ritchie, did you want to address?

MR. G. RITCHIE WHITE: We had discussed talking about spawning issues going forward. Is this something that you would like to delay until the October meeting?

APPROVAL OF AGENDA

CHAIRMAN KELIHER: Because we're a little bit behind schedule, why don't we put it at the end of the agenda? If we get to it today we can start the conversation; and then if we don't have additional time we can finish it in October. Are there any other additional items for the Section?

APPROVAL OF PROCEEDINGS

CHAIRMAN KELIHER: Seeing none; the proceedings from the May, 2018 meeting were in your packet.

Are there any additions, deletions, corrections to those proceedings? Seeing none; I will take that as approval of the proceedings from the May, 2018 meeting.

PUBLIC COMMENT

CHAIRMAN KELIHER: We've got a few folks from the public here today. Are there any public comments on items that are not on the agenda?

REVIEW AND CONSIDER APPROVAL OF THE 2018 ATLANTIC HERRING BENCHMARK ASSESSMENT (SAW 65)

CHAIRMAN KELIHER: Seeing none; we'll go to Item Number 4, Review and Consider Approval of the 2018 Atlantic Herring Benchmark Assessment. There potentially is an action here; but because the peer review has not been completed, we are in a little bit of a quandary.

We may want to consider a motion that is conditional in its approach. But I think we'll go through the reports from both Matt Cieri, and are you doing the presentation on peer review? There will be none. The agenda is incorrect. We'll have a presentation on a stock assessment from Matt. After he presents a stock assessment report, we'll review the comments of the peer review which following the presentation there will be a time for questions and comments. Then we'll figure out what path forward will be from there. With that Matt, I'll turn it over to you.

PRESENTATION OF STOCK ASSESSMENT

DR. MATT CIERI: My name is Matt Cieri. I work for the Maine Department of Marine Resources. I'm on the Herring PDT, the Herring Technical Committee, as well as the Work Group that did the SARC this year. This presentation is for the stock assessment that we completed this past June; well this past May, and was actually peer reviewed in June.

Some of these slides have been ripped off from John Deroba; he's the primary analyst for Atlantic Herring from the Population Dynamics Center. Back in 2012, we had a little bit of a retrospective pattern associated with this stock. That tended to overestimate SSB, and underestimate F in the terminal year.

One of the ways to fix this sort of problem was to increase the natural mortality rate by about 50 percent; starting in about 1993. When we did that we noticed that it actually changed the natural mortality rates so that it sort of matched the consumption seen by the Food Habits database from the bottom trawl for National Marine Fisheries Service.

On this axis we have consumption; or the associated consumption. Year is on the Y, I mean Year is on the X, sorry. The dotted line is what happens from the model if you assume that sort of natural mortality; what that sort of translates in as far as consumption goes. The orange and black lines are the actual sort of model consumption from the NMFS bottom trawl Food Habits database. As you can see; they pretty much line up fairly well. This is when we actually increase the natural mortality rate by about 50 percent in 1993.

We got through that assessment. It sort of helped the retrospective pattern immensely; and so we moved on. Then we went to go update the assessment in 2015 and we did exactly the same sort of run; where we broke the natural mortality and sort of increased it by about 50 percent. Afterwards it didn't seem to match the consumption quite so well. More to the point, it actually didn't really solve the retrospective pattern anymore.

We were kind of left with this whole issue of, we've got a retrospective pattern that is overestimating SSB and underestimating F relative to the terminal year. We ended up, because that was an update and not a benchmark, all we did was do a Mohn's rho correction. Basically we correct downward for SSB and upwards for F in the terminal year; to figure out stock status. This year, in 2018 we went through and we did a continuity run; which is basically we just take the last model, we put new data in it, and we run it. When we do that you'll notice a couple of things. The first is the blue line is the 2015 run. There is SSB here on the top panel. The blue line is the SSB from the 2015 run. The red line is the SSB if we simply just updated the information; right if we just simply put in new data. That black diamond there is the retrospective adjustment that we did in the 2015 assessment.

One of the first things that you'll notice is our retrospective adjustment in 2015 seemed to be fairly dead on. It actually brought that spawning stock biomass down in the final year; to what we think it is. But that there is a very large difference between just simply adding in the data and this is all due to the retrospective pattern change.

Not only does the retrospective pattern sort of change things in the terminal year. But it also changes things back further. You'll see that throughout the entire time series, or nearly the entire time series, back to almost 1989. You're actually ratcheting down spawning stock biomass. You can also see that the recruitment, the differences in recruitment between the blue line and the red line are also fairly significant.

Ratcheting down what we've seen in recruitment over the last few years as well. It was pretty clear, sorry one more slide on retrospective patterns, sorry about that. For those people who are familiar with this type of thing, we're looking at a Mohn's Rho in the terminal year of about 0.73. That is actually pretty darn high.

It was pretty clear that this active retrospective pattern was going to preclude us from simply doing a simple update. It was back to the drawing board. This is something that is not unexpected. But we ended up doing was actually taking a look at a few different types of modeling approaches.

We basically just started from scratch again; which is something that you can do in a benchmark assessment. I think it's always a good idea to at least take a look at. We took a look at three different models. We looked at ASAP, which is the model that we've used previously; and actually what is our base run for this time around.

We also looked at SAM; which is a state space model that is currently in use a lot in ICES for Baltic herring and North Sea herring. We also used SS3; which is something that's used out on the west coast quite a bit. The stock synthesis, the SS3 model that was developed was done by SMAS, and it was actually spatially explicit.

It had a lot of issues; in particular because we don't really know a lot of the migration rates back and forth between the subcomponents of Atlantic herring, and also partially because when you catch herring in sort of these mixed areas, you really can't identify what's Georges Bank, and what is Gulf of Maine herring.

As some of you may already know, herring are sort of broken into two large subcomponents; the Gulf of Maine spawning component and the Georges Bank spawning component, and we assess them together. But they do tend to mix together during times in which they're not spawning. When they're feeding they tend to be a little bit fairly well mixed. However, they are separate spawning components. That is a very complex thing for a model to actually go through and look at; particularly when you don't have the data. The SAM model that we took a look at was actually kind of definitely, definitely cool. But the Workgroup wasn't quite as familiar with this sort of formulation. We relied almost exclusively on the ASAP model. There is an appendix and a working paper that deals with the SAM model; as well as comparisons between ASAP and the SAM model. There are some fairly significant differences.

Let's start off with fishery dependent data. Stop me if I'm boring you, hah. Fishery dependent data, one of the first things that we have actually is catch, of course. As you can see year is on the X, catch is on the Y, and we have two separate fleets in this particular model formulation. One is fixed gear; which isn't gillnets, like most people think, but is actually stop seines, weirs, and pound nets. These are fixed stationary gears used predominantly in Maine; but also in a few other places, as well as New Brunswick, Canada.

There is also the mobile gear fleet; which are purse seines and midwater trawlers, you know that you guys are more familiar with. As you can see; catches were really high back here during the ICNAF fisheries when the Russians were in the Gulf of Maine and Georges Bank before the 200 mile limit. Catches sort of declined in the late 1970s early 1980s, and then

rebounded again and been on a slight decline ever since.

The other thing that we have in fishery dependent data of course is age sampling. This is actually a very important part for an age-structured model, as you can possibly imagine. On this axis we have year, and on this axis we have age. The bubbles that you see here represent the proportion of the catch that is that age.

If you follow this sort of bubble plot, you can make out that there are some very strong year classes. There are strong year classes back here; and then more recently there is a strong year class here with the 2008 year class and the 2011 year class. What I want to show you here in particular is what you don't see.

What you're not seeing are Aged 2s and Aged 3s in the 2015-2016 range. This represents sort of a hole in the age structure of Atlantic herring; and we'll get into why in a few minutes. We also have weights at age. We've had a dramatic shift in weight at age in this population. It was much higher back here in the '70s, '80s, and almost to the early '90s. But then it dropped precipitously, I'm sorry in the mid-1980s.

Since then it has been variable; but it has stayed about the same level. The other thing that comes into this, of course for any type of modeling approach, is to look at maturity. Maturity is actually a really important component when you start trying to figure out things like spawning stock biomass. You need to know how many fish are mature; before you can figure out how much spawning stock biomass you have.

We went through and we did this again from scratch. What I want to show you is the black line here is the maturity schedule; and you can see that it's near zero for Age 1 fish, goes up to Age 2 by a little bit, is almost 50 percent mature at Age 3, and is nearly about 90 percent mature by Age 4. What you can see here again, is by Age 4 they are nearly fully mature. However, the selectivity is measured by the model this time around, shows that they're not actually fully selected by the fishery at Age 4, in fact they're less than 50 percent selected by Age 4. In this model formulation they're not actually fully selected, they are not fully exposed to the fishing mortality until they're Age 7. They mature at Age 3 and 4; they are not fully actually exposed to the fishery until Age 7.

We also looked at some other data to round out our fishery dependent stuff. This other data includes from the observer data, the at-sea observer data from National Marine Fisheries Service, as well as the FLDRS, the fishery logbook and data recording software that is new this year. Mostly what this was doing was just trying to take a look at whether or not discarding was an issue.

For lots of years now it's been believed; and actually there is a lot of data to support that relative to Atlantic herring catch, Atlantic herring discards in the Atlantic herring fishery are fairly minimal. On to fishery independent data, we've got only a certain number of trawl surveys in which to actually take a look at.

We have the spring and the fall National Marine Fisheries Service Bottom Trawl Sampling. That is a fishery independent survey. Previously, and again this time around, we've broken them into time series. The first time series for National Marine Fisheries Service Bottom Trawl Sampling occurs prior to 1984, and then we broke it, used it as a separate survey in the model past 1984.

We did that specifically because it was a door change that made an actual real difference in the amount of Atlantic herring that they catch. In past assessments, and in 2015 and in 2012, we sort of merged that change in the NMFS Bottom Trawl Sampling from Albatross to Bigelow using a conversion factor.

This past assessment we were actually able to put the Bigelow time series as its own separate

index into the model; and that's because the calibration coefficients for Atlantic herring could be considered somewhat difficult, because it is a pelagic fish that you're catching in a bottom trawl. Now we've got for just the National Marine Fisheries Service Bottom Trawl Surveys we've got six different indices; fall and spring, prior to 1984, past 1984 to 2009, and then post 2009.

In addition we also have the summer survey, which is named the Shrimp Survey that covers a good portion of the interior Gulf of Maine, and actually samples both inshore and offshore components. Again more bubble parts. This is the time series for the Bigelow for fall. Notice that there is nothing past 2009, which is really good, because they weren't running the survey past 2009. I would be really worried if we did have data back there.

You can again see that there is some strong year classes; again starting here in the 2008 range for Age 2s, 2006s and again for 2008. What you don't see is Age 2s and 3s in the '16 and '17 timeframe. Again, even the fishery independent indices are showing that there are very few younger fish in the population.

There is actually a new survey or a new index that we put in the model this time. This is an acoustic survey; again from the bottom trawl. It's a great research platform; by the way. We can get so much data from it. In this particular index, what's used is an actual acoustic sounder onboard, and has been on board since about 1998. As it goes from place to place, as it does its bottom trawling, as it moves from station to station. It is continuously collecting acoustic information, acoustic signals from Atlantic herring. Mike Jech from National Marine Fisheries Service actually cobbled this together into an index; so that we can actually use to survey the entire Gulf of Maine.

From an analyst perspective, what this does is while there might be some difficulty catching Atlantic herring with a bottom trawl; this sort of takes that information out of the picture. You just have to drive over them; in order to see them as a good scientific index. We found this to be actually pretty useful in this particular assessment model.

There were other indices which we considered; but we ended up not putting in this particular model. The first is the National Marine Fisheries Service Winter Bottom Trawl; or the Flatfish Survey. That is partially because it had lots of inconsistencies in its area of coverage. It's again, centered more on flatfish than Atlantic herring.

The state surveys were for Maine and New Hampshire as well as Massachusetts, are important. But they only survey the inshore spawning component; they don't actually survey the Georges Bank component, and as a result are probably not useful for a model that's based on the entire stock complex.

There is also something new this year that we tried; which was a Food Habits Index. This basically, as Jon describes it, using predators like striped bass or monkfish or skates as an actual research platform; and actually using their information in their guts from the Food Habits database, to figure out an index for Atlantic herring.

On to the parameterization, one of the first things of course that we need to talk about is natural mortality, and so as I suggested earlier in this conversation, in 2012 we used a variable M at age, which was scaled to a maximum age. See if you can think about this. In 2012 we had a variable natural mortality that was static across all years; but in 1993 onward, it was ramped up by 50 percent.

That sort of matched the consumption that was coming out of the National Marine Fisheries Service Food Habits database. In 2015, we used this same sort of variable natural mortality at age, which we call Lorenzen, because it's based on size. But we didn't do a 50 percent increase;

and that's because there wasn't really any justification.

It didn't solve the retrospective pattern, as I showed you, and it also didn't match the Food Habits database. That whole split of that 50 percent increase was actually not done in 2015. During this past assessment in 2018, we actually removed the variable natural mortality at age. We did that as a workgroup for a lot of different reasons.

One is this idea of parsimony, the idea that your simplest answer is probably going to be your best answer. More to the point, when we remove that sort of natural mortality at age, the model fit dramatically improved, or slightly improved I should say. The other thing is that when we ran side-by-side comparisons using natural mortality at age variable and static at one number, there wasn't any difference in the results. We got the same results, we got the same reference points, and we got the same pretty much everything. It was decided by the Workgroup to actually use one value for natural mortality. That value happens to be 0.35. That was the static natural mortality for all ages across all years for Atlantic herring.

When you do that you get this black line; which is the assumed consumption, if you assume that fixed rate of natural mortality. The blue line is the results from the Food Habits database; and as you can see it matches on some level. There is certainly a lot of variability; but it doesn't do quite a bad job at matching the Food Habits data that comes out of the National Marine Fisheries Service.

Note that these are all on the same scale; so they are not on separate scales. Another pretty dramatic change in this model, and I kind of alluded to it earlier, was about selectivity. Selectivity or when these fish are actually vulnerable to the fishing that's occurring within the area.

In 2012, when we went through the benchmark, we ended up with this particular sort of selectivity curve for the mobile fleet. The black line is mobile fleet; the blue line is the fixed gear. Taking a look again at sort of a reference Age 4, in 2012 Age 4 was about 50 percent selected by the fishery; meaning that when they were mature they were about 50 percent exposed or 50 percent vulnerable to the fishery.

They were fully exposed by Age 5. I'm sorry they were 70 percent exposed at Age 4, my bad. Doing this formulation, they are 50 percent exposed to the fishery here at again about Age 5, but aren't fully exposed to the fishery until Age 7. What's happening is we've shifted that selectivity curve backwards, or towards the right.

That means that herring are older when they're first and when they're completely exposed to fishing mortality in this fishery. That actually has some pretty important implications. Before we can really talk about a lot of the results, let's talk about recruitment, folks. On this axis is SSB, and on the Y axis are recruits.

This kind of looks like you went out hunting for birds. It's pretty much a shotgun, sort of blast. For those of you who are familiar with menhaden, or who are on the Menhaden Board, you've seen this sort of pattern before. It's pretty much the same issue that has arisen in menhaden. There are a couple of things to note. One is that '15, '16, '14, they're all down here; so all of the recruitment over the last few years has been pretty low.

More to the point, the difference at the same biomass between 2015 and 2008, there is a huge spread. That huge spread for the same biomass makes it almost impossible to figure out a stock recruitment relationship. There is that much variability. Thinking about it that is a huge difference to have that is a huge amount of variability to have at the same biomass over time.

The unfortunate part about all of this is the model actually produces recruitment over time. Here we are in the most terminal years; here is recruitment again, here's year, and here is our recruitment recently. As you can see from this particular graph, 2016 was the lowest recruitment on record. We've had low recruitment now or below median recruitment since about 2012. This is our estimate of recruitment. I will note that the last two years have CVs that are greater than 1. But as one of the Peer Reviewers pointed out, the CV on the last year was 2. Even if you double that number, you're still below the median.

To sort of drive this point home, this is the recruitment here. This will be your 2021 SSB. This next year will be your 2020 SSB; if you assume that they're fully mature at Age 4. This will be your 2019 SSB. Pretty much for the next specification cycle the recruitment is already there. We already have an estimate of it; and it's not particularly high, it's certainly below the median average.

As I alluded to earlier, because it's such a shotgun pattern we are unable to actually figure out a stock recruitment relationship. We're using median recruitment. This means if you look along this line, your recruitment from the model here is the same as it would be here. You get the same amount of fish for surprisingly different levels of biomass.

This of course leads us to a problem with our reference points. In 2015 our reference points were based on a Beverton Holt stock recruitment fit. We got this sort of MSY of 77,000 and F at MSY at about 0.24, an SSB at MSY of 311, and the stock status was not overfished and overfishing wasn't occurring.

During this assessment we don't really have an estimate of a stock recruitment relationship; so you can't produce MSY reference points when you don't have a stock recruitment relationship. As a result we've started using an F SPR proxy at 40 percent. This sort of proxy you guys might know it from menhaden. It's something that we do in a very similar way,

This sort of SPR at 40 percent is something that is used on the West Coast quite often. This leads us to an MSY proxy, an MSY value of 112,000 metric tons; significantly different or significantly higher than the MSY value we had previously. The F at MSY proxy is about 0.51. There is a little bit more than double the F at MSY previously; but we should also note that F at MSY applies to fully selected fish, which in this case are no longer Aged 4s, but are now Aged 7s.

The SSBMSY proxy snow is 189,000 metric tons. This is quite a difference in biological reference points. Likewise, the biological reference points that we're currently using are no longer valid. You really can't justify them and you can't translate them. Getting into more of the results from the document, we have biomass, year, we have in the red is total biomass.

The dash line is SSB, and the green line is exploitable. As you can see, total biomass, spawning stock biomass, and exploitable biomass, all of these were high back here in the late 1960s and '70s, declined to the early 1980s, increased again in the late '80s, early '90s, has remained fairly flat until the 2000s, and then has taken somewhat of a shallow decline, and then an increase in decline in the last few year as a result of low recruitment.

The other thing to note is that in here your total biomass and your SSB have become closer and closer together. What this is saying is that most of your biomass now is SSB or mature fish; ad that is that lack of recruitment that we've seen over the last few years. F sort of gives you a similar pattern to what you would expect. Over the time series where I want you to concentrate on the black line, here has been your F, which has been slowly declining here in the late '70s to the early '90s. There has been somewhat of an increase in the mid-1990s all the way up to the late 2000s, and then it has declined again.

Again, this is a standard control plot found for a lot of fisheries that you guys will see. Fishing mortality as ratio of F at MSY here, spawning stock biomass as a ratio of its reference point here, the 1-1 line is here. This line here is basically half your spawning stock biomass at MSY or your reference points.

This is your spawning stock biomass target. Here is your threshold. This is your F target. What you can see from the point estimate and the 80 percent confidence intervals is we're not overfished, and overfishing is not occurring. There is not a nonzero probability that you're not however above F at MSY; or overfishing, but it's not 50 percent.

When you use a retrospective adjustment pattern, because even this particular model in this formulation has a retrospective pattern, you get very close to your F at MSY reference point, and your spawning stock biomass comes a little bit closer to one-half BMSY. I don't want to get into the weeds; but we do have a retrospective pattern associated with this particular assessment.

The Mohn's Rho for spawning stock biomass is not particularly high; but it is there. There is a little bit of a retrospective pattern. There is a little bit of overestimating SSB and underestimating F. However, because it's within the 80 percent confidence intervals, generally there is not a correction factor applied to this.

Everyone's favorite topic, and everything everyone keeps calling me about; projections. We ran two separate scenarios for the peer review for projections for this year. One uses a bridge year; or 2018 catch of 111,000 metric tons, which is the actual ABC, and 55,000 metric tons, which is what was caught in 2017.

Generally the Workgroup didn't really think that it was likely that this fishery was going to catch 111,000 metric tons. It hasn't caught that amount for quite a while. Going into projections we took a look at 2019 through 2021. We use F and MSY proxy; basically we projected forward if you caught F at MSY over the time series. Then we used a median recruitment; because we don't have that sort of stock recruitment relationship like you would normally put in.

However, we took out 2016 and 2017; and that's because in general those have really, really high CBs associated with them. We decided not to put them into the projections. The Working group did sort of note that these projections will likely be optimistic; if recruitment doesn't really pan out to go back to the median.

When you do this you end up with sort of two sets of projections. The top one is at 111,000 metric tons. The bottom one is at 55. This is your catch on the first line here, under each year when you apply the F at MSY. For example, in 2018 you catch 111,000 metric tons; you have a 95 percent chance of overfishing, you have a 96 percent chance of being overfished. In the following year when you apply the F at MSY value, you have a catch of 13,000 metric tons, 13.7 thousand, but you still have a high probability of being overfished and of course because you're fishing at F at MSY, overfishing is not occurring. Looking at the 55,000 metric ton, which I think is probably going to be a little bit more realistic, as well as given this fisheries performance, as well as pending actions by the Council.

At 55,000 metric tons for 2018, you'll have roughly a 70 percent chance of overfishing, and there is a 76 percent chance that you will be overfished. By 2019, when you apply the F at MSY, you get a catch of 28,900 metric tons; you have a 92 percent chance of being overfished, below one-half of BMSY.

Applying that sort of F at MSY there is still a greater than 50 percent chance that you will be overfished by 2021. That is the good news. I'm just kidding. Wow, it's a tough room tonight.

For some final sort of thoughts and Pat can stop me; because he's seen this slide before. To sort of highlight, the good thing is that you're not overfished and your overfishing is not occurring currently.

There is a limited retrospective pattern associated with this model as it's currently formulated. The model has got pretty decent diagnostics; it has good fits, there are not a lot of residual patterns. The MSY to my mind is actually more representative of the long term catch associated with this stock than previous models; it's 112,000 metric tons as opposed to 77.

You have older age at full recruitment to this fishery; which means that herring are allowed to spawn at least a couple of more times before they're fully exposed to the fishing mortality for this stock. Your F at MSY has gotten higher; and your biomass at MSY has gotten lower, so just think productivity, right.

The not so good thing about the sort of update of the assessment, or this assessment benchmark is that the recruitment has obviously been off in the last few years. It's not only just showing up as a modeling artifact, it is showing up in your catch, it's coming in your fishery dependent indices and your fishery independent indices.

This sort of lower recruitment has led to an erosion of the spawning stock biomass over the last few years; and will more than likely lead to probably being overfished in a very short amount of time. The lack of a strong stock recruitment relationship means that you're going to be relying on proxies for your estimates and for management purposes.

There is a lot of stuff that is still uncertain within this particular model; so the CVs on the recruitment in the last couple of years are greater than 1, which is pretty darn high. There is a lot of uncertainty about whether or not this retrospective pattern will come back. As we talked about, there has been a series of you do an assessment, you have a retrospective pattern, you fix it, and then you do an update and it's back.

That's the reason why Jon put up the DeLorean up there for the Back to the Future thing, simply because we've been through this treadmill before. There is some uncertainty as to whether or not, when we go to update this model in three years, whether or not the retrospective pattern will be back. None of know; because none of us have a crystal ball. The other thing is that this use of F at MSY proxies can increase the uncertainty associated when doing things like setting OYs or in management, frankly, because we're not using F at MSY or MSY-based reference points but rather proxies.

PEER REVIEW REPORT

DR. CIERI: The peer review was conducted in June. Pat Sullivan, who is also on the SSC, was the Chair; and there were the different people included, Kathy Dichmont, Jeff Tingley, and Coby Needle. They were a good group and they gave a lot of really good suggestions. Their report is currently not out yet; as I'm sure you guys have already heard about, so I really can't speak to it.

In general they seemed fairly receptive. They gave some really good comments; and I thought that they helped and improved the model immensely. But I don't expect for them to either reject or to completely change the model from what we have in the report; but I don't know that for sure.

This is our summary. You guys have probably seen this table before. It gives one of the interesting things is it allows you to take a look at your point estimate of F at MSY; and take a look at how well we've done in the past about staying on top or under that F at MSY target in the past retrospectively.

You can also see the change in recruitment in a table form. Note that 392, is what we have in 2017. That is slightly up from 2016 of 175. But it wasn't that long ago where it was closer to 2 or even 10,000. There has been a fairly large drop in recruitment. I know everyone is always interested in the assessment and the assessment results.

A lot of people don't actually read the appendices. I read the appendices; but you know. There are a lot of appendices associated with this model. If you want more information, there is a lot of information on how we do aging. That SAM state space model that is used in ICES a lot; there is a run through with Atlantic herring.

There is also consideration of what do you do when you have different models that are giving you slightly similar results; but are off by just a little bit. That is a thing on model averaging; which I'm sure you guys have talked about a little bit in the sort of risk and uncertainty framework. There is also the two-area stock synthesis model that was done; which is also very interesting. I recommend that as a read, as well as a study free program and using predation pressure as an actual index in a model like this.

One of the cool things that we've noticed, when we went through and we did this model is we actually have documented occurrences of spring spawning in the Gulf of Maine; which is something that because the fishery hasn't been taking place, we haven't actually seen. But if you go out there in late May and in June, there are herring that are in spawning condition.

I thought that was actually kind of cool; because we haven't seen that in the Gulf of Maine in quite a while. Here are the Herring Working Group members; they include myself, Jon, Chris Legault, Deirdre, Sarah, Ashleen, and Gary Shepherd, who was Chair, and with that I think that is the last one. That's it; I'll take your questions.

CONSIDER ACCEPTANCE OF BENCHMARK STOCK ASSESSMENT AND PEER REVIEW REPORT FOR MANAGEMENT USE

CHAIRMAN KELIHER: Are there any questions for Matt? Ritchie White.

MR. WHITE: Would the layman's take away from this be that we're going to have to drastically cut quotas for a minimum of three years; I guess four years, and if we do not return to more normal recruitment that this is going to be a fairly long term problem.

DR. CIERI: Yes, if your levels of recruitment don't increase and if they don't go back to the median then the stock will be in a low state. You can't take fish that aren't there.

CHAIRMAN KELIHER: Dennis.

MR. DENNIS ABBOTT: Could we go to the summary sheet that was one of your last slides? The answer to my question might have been 20 slides back. Why are we getting such poor recruitment from a sizeable spawning stock biomass that I see in the third from the bottom line? What is the relationship? Is it traceable to fishing pressure? Is it traceable to environmental issues? I mean what do you feel is the driver in the sudden drop; not sudden but the continuing drop in recruitment, if that's a good question?

DR. CIERI: Yes, so the answer to your question is complex, right. I mean you've got spawning stock biomass for example, at this level, which is capable of producing near next to no recruitment or a whole lot of recruitment like you've never seen before, literally. There is no easy answer. We don't really know if there is an environmental driver, if it's simply a match or a mismatch associated with whether or not larvae are in the water column at the right time.

You know it tends to be sort of hit or miss. It has been four years in a row. I get it; for a lot of people that's concerning, and I understand. I think it is. But true to form, if you flipped a coin a hundred times there is a good chance that

you could come up with heads four times in a row, right? Some of this is random chance.

I don't think we haven't really explored the idea of an environmental covariates associated with recruitment; but it's the last four years. You'll notice that even in the last few years, we've still had pretty good recruitment. I mean this recruitment event back here in 2009 that is the third highest recruitment we've ever had in the time series. This is probably; I think when I calculated it was the sixth highest. It is hard to gauge whether or not some environmental drivers are at play here. Does that hopefully answer your question a little?

CHAIRMAN KELIHER: David Pierce.

DR. DAVID PIERCE: A lot of work went into this. You of course having a major role, so thanks to you and all of your colleagues for putting in this incredible amount of effort, appendices and otherwise. I mean this was no small chore; it was huge. A couple of questions, how old is an Age 4 sea herring? I'm sorry, how large is it; the length of an Age 4. That was a trick question.

DR. CIERI: It's usually about 23.

DR. PIERCE: About 23 centimeters.

DR. CIERI: Correct; actually a little bit larger than 23.

DR. PIERCE: Okay, I guess I'm trying to fathom why, or try to understand why Age 4 fish are not yet fully selected for the fishery; why it's gone from 4 to 7. These are purse seiners, the midwater trawlers, they don't have large mesh, and they're relatively small mesh. I mean when the fish are let's say 9 inches total length thereabouts, which is kind of around Age 3 or Age 4. They are caught by the industry; they're caught by the fishery. If they are there they are caught; so why has it shifted from 4 to 7, which is a very important conclusion that's been drawn?

DR. CIERI: This fishery, Age 4s was never fully selected. They were actually fully selected usually by Age 5s was when they were fully selected. Selectivity isn't just about gear. Selectivity is also exposure to fishing pressure in the fact that they may be in a different location than where the fishing operations are taking place; or they may be deeper, or they simply may not be in the same area that all the fish that are fully exposed to the fishery are.

There are a lot of explanations. You'll see it with menhaden as well; as we talk about that. Being able to be physically captured by the fishery is just one part of selectivity. There is also whether or not they're exposed to the fishery; being in the same place, the same time, and at the right depth.

DR. PIERCE: For whatever reason, Age 4 and Age 5 and Age 6 fish are no longer as available to the fishery as they used to be; as a part of this selectivity question. It's perplexing. Where are they? Are they all inshore so that they're not being captured by the fisheries that tend to be a little bit more offshore; although the purse seine fishery is fairly close to shore, isn't it?

I don't get that but nevertheless that is the conclusion that has been drawn. My other question is looking at the spawning stock, first a comment. Looking at the figure that shows spawning stock biomass going back over time, and reflecting on when I was involved in sea herring fishery management back in the 1970s, we had concluded that the sea herring resource had collapsed.

That led to all sorts of very low quotas for a long period of time; and it led to the decimation of the Massachusetts sea herring fishery, it just ended for all practical purposes. I see now that's we're at about that same SSB, so I'm going to conclude that we pretty much are collapsed. That may be the inappropriate word to use; but that's what was used back then.

It looks like we have a collapsed sea herring resource; based upon the SSB, and of course the future recruitment that we expect to get. The question is 2015, 2016, 2017; Age 1 recruitment was extremely low. How does one assess in a timely way; real time, the abundance of those young fish? What sampling gear, what survey was used to come up with those very low numbers of recruiting year classes Age 1?

There is no longer a fixed gear fishery like it used to be. If I recall correctly, the fixed gear fishery stop seine and weirs, they were extremely important in judging the strengths of incoming year classes, because they caught those small fish. What do we now use to get this confident conclusion that well, we've gone to hell in a hand basket, 2015, '16, and '17 Age 1 fish are pretty much not there?

DR. CIERI: Can you go to a slide that shows the SSB over time first? Yes, you're right. We are above the bottom of that curve for sure. We're not quite as a bad spot as we were back in the late 1970s. Your second question dealt with, I'm sorry?

DR. PIERCE: How did you come up with reliable estimates of Age 1 strength?

DR. CIERI: Right. You do actually have some fixed gear catches associated with this fishery. The New Brunswick weir fishery is still in operation; and so that does provide us some pretty good reliable information on year class strength, as well as the NMFS Bottom Trawl Survey does actually catch decent incoming year classes.

But as we've suggested that recruitment vector that we've seen has a fairly high CV in 2016, and even in 2015. You know those CVs are monstrous; in many cases a greater than 50 percent. I think we're reasonably certain that the year classes aren't stellar; but the actual amount themselves is highly variable. That is one of the most uncertain portions of this model; is that incoming recruitment. Are you good?

CHAIRMAN KELIHER: Ray Kane.

MR. RAYMOND W. KANE: Thank you Matt for your presentation. Can we go back to the recruitment slide, please? Yes that one. In the last specs package in '15, looking at this recruitment slide you had an abundance in '09; it dropped off in '10, '11. It looks like it went back up in '12; and then it nose-dived '13, '14, '15, '16, and '17. How as management bodies did we come up with the specs package that we did for '16, '17, and '18; looking at this recruitment slide? Can you give me an answer?

DR. CIERI: That's how. When you guys set your specifications package in 2015, you were working off the blue line; as opposed to the red line. Now, you adjusted and we adjusted for that down to that black diamond, right. But adjusting things in the terminal year doesn't really quite capture all that a retrospective badness does; when it comes to management decisions. You can see that it drops your recruitment, right?

It also drops your SSB a few years backwards from where you do the terminal adjustment; so it's not just the terminal estimate. It's not just the important part. Your recent recruitment, your recent spawning stock biomass is all lower. You set stuff based on the blue line. The red is this year; and even that has a small, you know when we went through and we did this and we did a retrospective peel, even that has a retrospective pattern. Even that red line is an overestimate.

CHAIRMAN KELIHER: Are there any additional questions for Matt? Eric Reid.

MR. ERIC REID: Now you're using a new tool; which is your acoustic survey. Can you talk about that a little bit more? What input did that have? Was it different than your other sources of data? Mostly, how was it

conducted? Are we just going on a boat ride and keeping the sounder on? I mean that's what it looks like to me. If you want to put that graph up that would be fine.

DR. CIERI: Okay, so this is the passive echo sounder that's on the trawl survey. They take these; they go out and they do their trawl survey stations. But they move from place to place. As they move from place to place, we're passively grabbing acoustic signal. It covers a fairly large swath of area; and it's taken over time.

For this particular model, how that was done, there is a whole working paper in the Appendix that talks just about that and how that was derived. I'm not the foremost expert on that. That was Mike Jech that did the bulk of the work. However, in the document there is a figure that's called – and I don't think I have it with me – that's called, leave one out. In that figure we sequentially drop every single one of our surveys for each sequential run. We do that to see what the influences are of those particular surveys.

Every time we dropped any of these surveys, the estimate basically stayed within the confidence intervals associated with the terminal years within the timeframe. None of these surveys individually carry a lot of weight within the model. They do carry a lot of weight together; and so it doesn't really give you, dropping that acoustic survey doesn't really give you that much of a change. As I remember it, and somebody could correct me if I'm wrong.

As I remember dropping the acoustic survey slightly decreased the spawning stock biomass; and slightly increased the fishing mortality. But I would have to go back and actually pull up that figure to be certain. But that figure is in the document; and I forget which one it is, but it's basically called Drop One.

CHAIRMAN KELIHER: All set, Eric? As my staff likes to tell me, it's not complicated it's just complex. Do you want to follow up?

MR. REID: Yes. It is one of the two or all three, I'm not sure. Mr. Jech and his staff of zero, the way I understand it he is the staff in the acoustic business. He would much rather prefer multibeam sonar; so you can see what you're actually looking at. I don't know if they actually catch the fish that they ride over; to make sure they know what they're looking at.

DR. CIERI: Oh yes they do actually; that is part of it. They always do an acoustic sounding; and it's not a dedicated survey by any stretch of the imagination. But they're out and it's in the normal process of the NMFS Bottom Trawl sampling. That's exactly it; they have those estimates.

CHAIRMAN KELIHER: Doug.

MR. DOUGLAS E. GROUT: Matt, you mentioned in your last slide that you discovered some examples of spring spawning. Is this at a level that we should start considering spawning closures; or was it just a couple of examples that you had never seen before?

DR. CIERI: Actually there is a whole working paper on this in the Appendix Section of the Assessment. I think the estimate is at about 2 percent. Including or excluding doesn't really make a difference within this particular modeling framework. But there is good evidence of spawning activity happening in May; which is completely surprising.

MR. GROUT: Location where they were gotten? Is it Georges Bank?

DR. CIERI: Inshore. It's mostly inshore.

CHAIRMAN KELIHER: Before I take any additional questions from the Section, I'm going to recognize Jon Hare from Northeast Science Center.

MR. JONATHAN A. HARE: I just wanted to talk a little bit about the Acoustic Survey; since the question came up from Mr. Reid. The Northeast Fisheries Science Center used to have a dedicated Herring Acoustic Survey on the NOAA ship, Delaware. When the Delaware was retired and not replaced in the region; that dedicated acoustic survey ended.

Dr. Jech, who is an acoustic expert, then used his expertise from that dedicated survey to go in and analyze the acoustic data coming from the Bigelow; and came up with the index that was used in the assessment. He is a staff of one; but he has a lot of expertise, and has worked very hard over the past year to develop the data for use in this assessment, working closely with Jon Deroba; the assessment lead. I just wanted to provide that background; thank you.

CHAIRMAN KELIHER: Thank you Jon, I appreciate that. Does anybody have any questions or clarifications from Jon on that? Seeing none; back to the Section, any additional questions for Matt? Seeing none; as was stated, we have a peer review that has not been finalized. Matt indicated that the peer review group did have favorable comments.

I'm not sure if we're seeing any problems associated with its release; but that has yet to be known. We do have a stock assessment obviously that was just reviewed. One way to move forward on this would be to accept the stock assessment; pending the approval of the peer review so that could be used from a management perspective. Toni.

MS. TONI KERNS: I think that what we would do, unless you all want to do differently. We can give the peer review results at the October meeting; and then you could accept the assessment for management use then, or you can do a conditional approval. But that would mean you would approve it prior to hearing the results of the peer review; which I'm not sure that would be a more unusual thing.

MR. GROUT: I guess because we're accepting the peer review for use in management. The question is between now and the October meeting, is there a potential that the Herring Section could be brought together to consider some management options such as specifications?

CHAIRMAN KELIHER: Toni.

MS. KERNS: That will be a discussion that we take up next, Doug. There are several ways that we can move forward. Megan will have some information for the Section to consider. We could not do anything on the assessment for now. We could come back to a motion to approve it if you want; in some sort of conditional way based on the conversation that occurs after this, or we can just wait until October, or approve it conditionally.

CHAIRMAN KELIHER: Ritchie White.

MR. WHITE: How does making this decision affect the next agenda item?

CHAIRMAN KELIHER: Toni.

MS. KERNS: The next agenda item. Without spoiling, you know Megan is going to let you all know that there is potentially a change in how we're going to move forward in the specification process; in particular the timeline, and what the New England Council is considering, and what NOAA Fisheries will be considering.

There hasn't been a final decision; so this is still a possibility of how the timeline will change, but I think it's somewhat likely. But I'll let P.K. speak to that. There will be some questions that the Section will have to consider today. I think it is fine for you all to use this information as you consider those changes in the timeframe; and recommendations that you want to make to NOAA Fisheries, and to the New England Fishery Management Council.

The Section will have to decide whether or not they want to conditionally change 2018 specifications; or if you want to get back together and do a phone call to make some changes to specifications, because we don't have all of the information in front of us today. I think maybe the easiest thing to do is let Megan give some information, Pat, and then the Section can decide what to do with the assessment, if you're willing to do that.

CHAIRMAN KELIHER: Yes, I don't disagree.

DISCUSS RECENT NEFMC RECOMMENDATION TO NOAA FISHERIES ON THE 2018 SUB-ANNUAL CATCH LIMITS

CHAIRMAN KELIHER: I think unless there is some objection from the Section; why don't we move into Agenda Item Number six. We have information from Matt; as it relates to the Peer Review now that will help potentially inform us in those discussions. Then we can make a determination if we need to make a motion in regards to the Peer Review from a conditional perspective, addressing questions and concerns, Ritchie that you brought up, as far as further management actions.

With that if there are no objections; I'll turn it over to Megan then for Item Number 6. Keep in mind that we have a lunch break on the agenda here. One good thing here is we can get through this presentation; break for lunch, be thinking about this as we have a steak sandwich, or a bowl of fruit, whatever your heart desires, and then come back to the table with clear minds on a path forward. Megan.

RECONSIDER THE ASMFC 2018 SUB-ANNUAL CATCH LIMITS

MS. MEGAN WARE: We're first going to talk about the 2018 sub-ACLs. Before we get started, I just want to note as many of you know that there are a lot of moving parts for herring right now. We have the assessment we just heard. We have the Council's Amendment 8. We have a potential in-season adjustment for 2018; and then we also have 2019 through 2021 Specs. A complicating factor here is that while all of these actions are interrelated, they're happening on slightly divergent timeframes. As a result, some of the things that we'll be discussing today are contingent on other actions happening. I'm going to do my best to kind of tee up those issues; and show how they're related. But I do want to note that the Section will be talking about some things that are one or two steps down the road today.

In June the Council met and discussed preliminary results of the 2018 herring assessment; which Matt just noted indicates reduced biomass and poor recruitment over the last five years. Based on those results, it is expected that there will be severe cuts in catch, which will be implemented in 2019 through 2021.

Specifically, two of the projections that the Council focused on were two that Matt showed. The first one is the full 2018 ABC being harvested; which is the 111,000 metric tons. That would potentially result in a 2019 coastwide catch of 13,700 metric tons. Then the second one was half of that 2018 ABC; and that would result in a 2019 coastwide catch of potentially 28,900 metric tons.

Over all what these projections are suggesting is that an in-season adjustment in 2018 could reduce the severity of cuts in 2019. In light of this information, the Council passed a motion, which is on the screen here regarding the 2018 herring fishery. It is recommending that the Regional Administrator allow for in-season adjustments for the 2018 fishery; such that the 2018 fishery would be capped at 2017 catch levels, for Management Areas 1A, 1B, and 3.

Then Area 2, the 2018 would be capped at 8,200 metric tons. The reason that Area 2 is slightly different is that they had already surpassed their 2017 catch levels; so that 8,200 metric tons is intended to provide some quota for the early winter small-mesh-bottom-trawl

fishery. The table is a numeric version of that motion.

Our first column is the current 2018 sub-ACL; so for Area 1A that is just over 32,000 metric tons. The next column is what's being recommended by the Council, so again for Area 1A that is the 28,682 metric tons. The next column is the difference between that and then the final column is what is that percent of the original sub-ACL. Again, for Area 1A the recommended amount is 89 percent of our current sub-ACL.

Why is the Section talking about this? If NOAA Fisheries makes an in-season adjustment, ASMFC will have different herring sub-ACLs in place for 2018. This is because the Section passed a motion in November of 2015; approving the 2016 to 2018 herring specification package. If the Section would like to align the state and federal sub-ACLs for 2018, we will need a motion to reconsider, and that will require a two-thirds majority vote.

As I kind of preface this presentation with timing is a complicating factor here, it is important to note that NOAA Fisheries has not released action on the 2018 in-season adjustment. Unfortunately I don't have those final sub-ACL values to show to you today. Given some challenges with timing; and the fact that we don't have those 2018 values, from a staff perspective there are kind of three actions for the Section to consider today. The first would be no action; so that means the Section would maintain the current or the existing 2018 sub-ACLs. This could mean that the state and federal sub-ACLs would be different; if that in-season adjustment is implemented. The second option is to make a motion to reconsider the 2018 sub-ACLs, and make it conditional on action by NOAA Fisheries. This will insure that the state and federal sub-ACLs align; but again, we don't know those final numbers.

Then the third option is to wait for action by NOAA Fisheries; and then address a sub-ACL change via a conference call. Under this option the Section would know what those adjustments would be; but it means that we may have to move quite quickly via a conference call after NOAA Fisheries action. I'm going to leave these three potential options up here on the slide for discussion; and we will pass it off to the Board Chair when he comes back.

CHAIRMAN KELIHER: Sorry about that sidetracked. As you can see, based on the last slide there are three potential actions for the Section to consider. Before I open it up for additional comments from the Section on a path forward, I think it would be not to put you on the spot, Mike, but maybe I could bring you up to the microphone. Mike Pentony and staff and I, along with Toni, talked yesterday. Obviously there is some difficulty in timing here. I think it would be good to get your thoughts on this, Mike, and maybe we can prod you a little bit for some information.

MR. MICHAEL PENTONY: Megan did a really good job of laying out the Council discussion in June. I might ask actually, would it be helpful to this brief discussion if you could pull up one of the slides that were in Matt's presentation that showed the projected catch and fishing mortality rates for 2018 and '19. I think it was a table that showed at the current levels and at the potentially adjusted levels.

As Megan relayed, the Council had a discussion similar to this Section in June; based on the preliminary information coming out of the assessment, and obviously was very concerned with what they were hearing. Recognizing that one possible way to mitigate significant impacts to the fishery next year – thank you that is exactly what I was looking for – to mitigate potential impacts to the fishery next year and the year after, would be to reduce catch in 2018 through an in-season action.

As that table shows you, which was presented to the Council or at least the information behind that table was available for the Council.

As Matt and Megan both described, at the 111,000 ton ABC we currently have, the projection is that next year's ABC would be on the order of 13,700 tons. But if the catch was reduced for 2018 to 55,000 tons, catch could be something on the order of 28,900 tons.

The Council had the discussion about requesting that the Agency, under our authority in the regulations, take an in-season action to adjust the 2018 specifications to constrain catch to 2017 levels. Megan showed the table; which the Council was using based on preliminary information about 2017 catch. That was updated and the information that Megan showed you reflects the final catch for 2017.

Council also had a lengthy discussion about Area 2; and the best way to address that since it would have already exceeded its 2017 catch, when you factor in the adjustments and the in-season actions. The Council passed a motion 16-0-1 requesting that the Agency take this in-season action. I just want to highlight one aspect of that motion. I'm going to reread it; even though Megan showed it to you. Upon approval of the 2018 Stock Assessment Peer Review, the RA under existing authority allowing in-season adjustments, take action to cap the 2018 harvest at 2017 catch levels, and set the Area 2 sub-ACL at 8,200 metric tons.

The first part of that is important. As you've heard, the stock assessment has not yet been approved; so we are eagerly awaiting the final results of that. Meanwhile, although we are seriously considering the Council's motion, the action is still under consideration, pending final review and release of that stock assessment.

We have not made any final decisions yet on the Council's request. But I do want to highlight two things. The in-season adjustment regulation that the Council is referring to says that the specifications may be adjusted by NMFS to achieve conservation and management objectives; after consulting with the Council, during the fishing year.

Any adjustments must be consistent with the FMP objectives and provisions. The reason I stressed that last point; any adjustment must be consistent with the FMP objectives is I want to point to the bottom table there. Under catch at 55,000 tons, you can see that the probability of overfishing is 0.69.

Generally, the golden rule is that we not set any catch levels that would have more than a 50 percent probability of resulting in overfishing. The challenge for us as we look at the Council's recommendation and weigh what to do; is we feel that we cannot set specifications or make an adjustment that would result in higher than a 50 percent probability of overfishing.

Now, what you don't have in front of you is, what is that number? Toni may have some information that she can share with you. We have been looking at some projections. You know if you did a linear run from 111,000 at a 95 percent probability of overfishing to the 55,000 ton with a 69 percent probability of overfishing, it might look very grim.

It is actually not a linear run; so it's actually not quite as bad. But what we are doing is we are looking at the Council's recommendation in light of this provision to ensure that we are preventing overfishing; looking to set an overall catch level consistent with that. Taking into account the Council's recommendation, for example that we set the Area 2 sub-ACL at 8,200 metric tons, and that we try to preserve as much as possible the catch levels in the other three areas as close to as possible their 2017 actual catch.

Then we're also looking at what that might mean for 2019. I think we'll have that discussion probably after lunch. But I realize you're probably not getting as much information as you would like from me; in terms of specifics. But hopefully, if Toni can share you with the information that she has, and I'll be happy to answer any questions.

CHAIRMAN KELIHER: Reading between the lines, and the fact that it's not a linear run, would leave me to believe that it's not as low as I was thinking it might be. But Toni, do you want to comment on that?

MS. KERNS: Recognizing that NOAA is still in their process; but that the Section probably is not as comfortable making a change to an ACL if you don't have all the information in front of you. I have some information on projections that achieve a 50 percent probability in 2018; and I can give it to the group in sort of about numbers in 2018 that that would leave a catch that is not quite, but close to 50,000 metric tons, and in 2019 somewhere in the range of 30 to 31 metric tons, thousand metric tons, sorry.

But that doesn't tell you how that catch would be distributed. For today, as Megan said before, we can either consider making a change to the 2018 sub-ACLs conditionally on what comes from the rule that NOAA is currently working on; or the Section could have a conference call following the rule coming out.

CHAIRMAN KELIHER: Before I go to Matt, Peter Kendall.

MR. PETER KENDALL: Toni, those numbers, is that with the updated 2017 landing; because we didn't have those as of the PDT last week?

MS. KERNS: I believe so. But I would have to go back to confirm that.

DR. CIERI: Just something that Deirdre and Jason reminded me that these are OFLs that we're talking about here not ABCs; and so there is that thing to keep in mind as well. Those will be reduced by Canadian catch; as well as the SSC.

CHAIRMAN KELIHER: You always bring a ray of sunshine into the conversation. All right, back to the Section. Ritchie White.

MR. WHITE: Trying to think about the process here and our role. Do I understand correctly that today we could change the quotas effective immediately? Am I correct in that or not?

MS. KERNS: It depends on what you would want to do. I think that the best thing to do is if you approve something today, it should be conditional on what comes out of NOAA Fisheries; so that would not be effective immediately, it would be effective after their rule came forward.

MR. WHITE: Right. I'm trying to work through this process. If we have that ability, so we can be more nimble and do things quicker. Can we then be an asset to the Council and the Service to put something in place that at this point it looks like they're in favor of, and then we could undo that if necessary going forward.

CHAIRMAN KELIHER: My understanding is it was for our role today, if we had all of the information, was to give advice on Area 1 and the breakdown of Area 1 and the sub-ACLs. I'm reading between the lines a little bit on what Mike said; as far as the quota by areas that the rule that will be coming out in regards to that you will be addressing those for '18 and '19.

Not for '19, okay. Just for '18, okay. On our plate today would be in the memo that Megan sent around on July 20, our role here today could be to deal with RSA. We could comment on RSA issues. We could comment on fixed-gear set aside for west of Cutler. There are probably two or three others that I'm not thinking of right off the bat. What's that? Oh that's for '19 then too. Okay, Toni, get me back on track.

MS. KERNS: I think for '18 what you're looking at is just making a possible change to the sub-ACL itself, just the numbers. Everything else would hold. For '19, separate discussion later on, we can make some recommendations to NOAA Fisheries, as well as the New England Fishery Management Council on possible

changes to a couple of factors within the document, which Megan can go through later.

Today before the Section it's just the question of do you want to do a conditional change that would be effective immediately when NOAA Fisheries comes out with their rule for the 2018 sub-ACLs, or do you want to wait, have a conference call after their rule comes out, and consider that change? Because we've already set sub-ACLs for 2018, it does require a two-thirds majority vote to make that change.

CHAIRMAN KELIHER: I'm going to go to David, and then back to Peter Kendall.

DR. PIERCE: Yes first of all, I don't think it requires a two-thirds majority vote; because this was announced beforehand. When it's announced beforehand so the public knows it is coming, it can be a majority vote. That is the way it usually works. If it's advertised it's a majority; if it's not advertised, if it comes up at a meeting then it is two-thirds majority.

Anyways, apart from that we'll be discussing what to do after lunch. Frankly, because the vast majority of the sea herring fishermen have federal permits, the heavy hitters, those who really have an impact on what's being caught. I don't really think that what we do as a group of states is going to be of much consequence; in terms of changing the numbers.

Because they're going to be affected by whatever the federal government does, 50,000 metric tons or so reduced to whatever number. Yes, it will be good to get on the same page; but in terms of the need to scramble to make a change, I don't see it since they're federal permit holders.

CHAIRMAN KELIHER: Is there any other questions or comments from the Section? Seeing none; I think why don't we break for lunch, think about a path forward, and return back at one o'clock, and start the conversation again. Does that sound good? We're adjourned until one o'clock.

(Whereupon a recess was taken.)

PROVIDE RECOMMENDATIONS TO NEFMC ON 2019-2021 FISHERY SPECIFICATIONS

Due to technical issues the beginning of this section was not recorded; Megan Ware's presentation is in progress:

MS. WARE: As an example, Area 1A allocates 100 percent of the sub-ACL to the months of June through December. We have border transfers; so that's the amount of herring that can be taken in U.S. waters and transshipped to Canada. We have research set asides, which can be up to 3 percent of a sub-ACL; a fixed-gear set aside that is up to 500 metric tons of the Area 1A set aside for fixed gear fisheries west of Cutler. Then we have our river herring and shad catch caps; so those are limiting the amount of river herring and shad that are caught in specific regions by specific gear types. Kind of a reminder of our current specification package, this was what was put in place for 2016 through 2018.

Our ABC again is that 111,000 metric tons; and then after accounting for management uncertainty, the ACL was 104,800 metric tons. For the division of the sub-ACLs, the 2016 to 2018 Spec package, maintained the same division of the ACL between the management areas, as was used in 2013 to 2015.

This was because the ABC was not substantially different; and there was no biological need to consider modifying the distribution based on the 2015 stock assessment. The border transfer, the RSA, and the fixed-gear set aside were also all maintained at their values so that it was 4,000 metric tons, 3 percent, and the 295 metric tons.

For the river herring and shad catch caps, they did use a revised method; so specifically that 2016 to 2018 caps used two additional years of

data, and they were based on a weighted mean. In the briefing memo that was sent out as a part of briefing materials, there was a timeline that looked at the specification package for 2019 through 2021.

In that timeframe it showed that the SSC would be meeting in October; and then the Council would be taking final action on that Spec package in December. This would mean that the Final Rule would be implemented sometime in the summer of 2019. Obviously this timeline poses a few challenges; notably that the Spec package is going to be or would be implemented after January 1, 2019. This would necessitate the need for an interim rule for the start of 2019.

To address some of these challenges there is a potential for a new timeline. Under this new timeline there would be 2019 rule making and then the Spec package which would focus on 2020 through 2021. The 2019 catch values would be implemented via a rule making. It would not be subject to the Amendment 8 Control Rule.

Then 2020 through 2021 would go through the specification package. The potential timeline is up on the screen there; so that October SSC meeting would just focus on the 2019 ABC. That 2019 rule would be published in January; and then after that time the Council would focus on the 2020 to 2021 specification package, and all of those elements.

Obviously there are still some questions about the timing and the implementation of herring specs moving forward. However, given the Section is not scheduled to meet again until the end of October, and there will probably be several decisions that are made between now and then, we wanted to provide an opportunity for the Section to discuss the specification package, and provide recommendations to the Council as they move forward.

The recommendations at this point would be for potential analysis or alternatives that the Section would like to see considered or developed during that Spec process; as opposed to preferred alternatives. The briefing memo did include some questions; which I've put up on a slide here. These are hopefully intended to prompt discussion by the Section this afternoon. Some of those include; does the Section recommend the Council set aside quota for research, and if yes does the Section recommend that RSA be maintained at 3 percent, or should a range of options be considered? I think kind of underlying that question is does the expected reduction in the 2019 or 2019 through 2021 ACL impact the range of RSAs that should be considered. After that we have; does the Section recommend the Area 1A quota be set aside for fixed gear?

Similarly, if yes do we recommend it be maintained at those 295 metric tons or should a range of options be considered? Does the Section recommend the Council look at various alternatives on how to distribute the ACL between management areas; and then does the Section recommend the Council consider any other alternatives to the seasonal split of 1A quota, beside 100 percent to June through December? Again, these are just intended to prompt discussion; and we'll leave these up while you guys talk about these.

CHAIRMAN KELIHER: Great. At this time, since as I mentioned earlier I don't have any of my other state Commissioners here. At this time I'm going to have Bob take over the role as Chair to get us through this item; so I can possibly advocate on a couple of these areas. Bob.

CHAIRMAN ROBERT E. BEAL: Are there any questions for Megan on Megan's questions? Toni, Toni first and then I'll go to Ritchie.

MS. KERNS: Just to help us get along with the time and keep us focused. With the timeframe as Megan said, what the Section might want to

consider today is making recommendations to the Council for 2019 only. Not necessarily the numbers or pounds of quota, but just in these questions recommendations on RSA, fixed gear set aside, and the rationale for that recommendation.

We could ask Mike if there were any of these questions that they would not be considered changing in an in-season adjustment. I'm not sure that changing the percentage for each of the areas would be something that they could do in an in-season adjustment. But we will have time to make recommendations for 2020 and 2021 later in the process; either at our October meeting, or even potentially February. I would have to look at the timeframe. It would only be 2019 that we need to focus on today.

CHAIRMAN BEAL: Ritchie.

MR. WHITE: Megan, do we know how much revenue the RSA generates?

MS. WARE: I don't know off the top of my head. I look to see if anyone else does. But I don't know.

MR. WHITE: Does Massachusetts? Okay then, my thinking is depending on the amount that it might make sense to not continue with an RSA; at least for next year, and if the funds are not substantial. I mean 3,000 tons; I can't imagine that that generates a ton of money that we could offset that with some of the excess money that was discussed this morning that we have available.

CHAIRMAN BEAL: Doug, did you have your hand up; or is that to answer Ritchie's question?

MR. GROUT: Yes, I would suggest to the Council that we consider a range of RSA options; you know from 0 to 3 percent. I also wanted to suggest that we consider a range of fixed-gear set aside; anywhere from 0 to what it is right now, and one could be a proportional reduction in the fixed-gear set aside.

The other thing I wanted to ask is either now or for 2019, or for '20 and '21. Should we make any recommendations on options for the border transfer? This year for the first time we recommend that a border transfer not take place when consulted by National Marine Fisheries Service. Is that another thing that we should put up there on a list for consideration for 2019; as well as into the future, '20 and '21?

CHAIRMAN BEAL: That's a good point, Doug. We'll put that sort of in a parking lot and get back to that border transfer issue. Other questions, yes, David Pierce.

DR. PIERCE: Not questions. I was going to follow up on what Doug just said. I do support having a range of options for the RSA; for a number of reasons. One being that if we do away with the RSA that has a rather significant impact on our ability to sample the catch dockside; and to do all the work that is so important for us to monitor what's happening with the fishery, spawning condition and all of that the move along strategy.

With a range of options that will likely result then in a better evaluation of the consequences of reducing the RSA; which some people might want, in light of the dramatic drop in the quotas that we're expecting to have. Everyone needs to know the consequence of that dropping it to 2 percent or 1 percent or 0 percent.

What does that mean for monitoring of this fishery; since the RSA is important for that reason? Then for the fixed gear west of Cutler. Sure, I think it makes sense to do what Doug suggested; just a range of options, because I have no opinion on that at this point in time. But still, it does beg for some evaluation; different numbers, consequences to the state of Maine and all of that.

CHAIRMAN BEAL: I've got Eric and then Ray and then Pat, and then I think we'll see where we are as far as consensus on some of these points;

and if we can wrap some of them up and then get to the stickier ones after that. Eric.

MR. REID: I'm supportive of the RSA in the fishery. I can't answer Ritchie's question. But I know that the industry was buying RSA; even though they really didn't need it at the time. That was to help finance dockside monitoring. That was an important component. That was the industry demonstrating that they supported dockside monitoring; not only in theory, but financially.

But I think we need an RSA; and it goes back to my conversation this morning about the new tool in the tool box; the acoustical survey. Industry platforms are far more capable of doing effective acoustic surveys; because of the electronics they have onboard. I could see that being a reasonably ripe fruit to pick out of RSA. But if in fact acoustic survey data is going to be considered; then I think we need to be able to involve the industry, because they're the ones that have the capabilities of really doing the job, not the vessels, not to short side the vessels that the government has.

CHAIRMAN BEAL: Ray.

MR. KANE: Yes, I'm in both Eric and David's camp on the RSA; with one caveat. They caught 3,000 metric ton of mackerel; and in order to afford our dockside sampling and keep it in place. I'm hearing sentiment from the table maybe reduce RSA to 2 percent or 1 percent. But I think industry should be charged or taxed on the mackerel that was landed. I believe those numbers came from '16 or '17 in the RSA, 3,000 metric ton of mackerel were landed. In order to keep this dockside sampling, moving along and get new funding for it, I think that should be addressed.

CHAIRMAN BEAL: Pat.

MR. KELIHER: I would be supportive for a range of options. We were originally thinking, as far as the fixed gear fishery west of Cutler to maintain a level of status quo. But I know that may be a little bit of a lift considering the reductions that we're taking. Dealing with a range of options for RSA and fixed gear I think is appropriate.

I think Doug is right. I think we just submitted a letter on border transfers to zero. I think with the expected scarcity of bait issues that we're going to be having; I would advocate maintaining zero as a border transfer at this time. You know in the RSA piece, I think Ray brings up an interesting comment; as far as trying to find the ways to ensure that we're not getting mixed catches associated with the RSA fishery.

I'm not sure how to deal with that from a language perspective; but I take your point, Ray. But I would also point out that 3 percent of the reductions and quota, 3 percent of nothing isn't very much; so a range of options up to 3 percent may not get us to where we want to be. But I think David makes a good point.

We do get a lot of additional value from a sampling perspective. I would not be opposed to maintaining even some low level. Mr. Chairman if I may. Just a question for David; because I think am I mistaken, is your sampling program in some way related to, is it funded by some relationship to RSA?

CHAIRMAN BEAL: Dr. Pierce.

DR. PIERCE: Yes it is.

CHAIRMAN BEAL: Based on everyone that has commented so far; it sounds like the Section is comfortable with RSA set aside from providing a range or recommending a range to the Council from 0 to 3 percent, and for the fixed-gear set aside 0 to the current set aside level. Then based on what Doug said and what Pat said, they were the only ones that commented on the border transfer. But based on the letter that we recently sent, does anyone have any objection to maintaining or having consistency

in saying the Section does not support any border transfer; given the scarcity of bait? I see a lot of heads nodding. We'll go with those three points as a recommendation. That moves us down I think to the third bullet and question talking about various alternatives for distributing the ACL between management areas. Comments or thoughts on that or is that not needed? Toni.

MS. KERNS: I think this is one of the issues that it would be very difficult to make an in-season adjustment to. I would turn to NOAA if that is an incorrect response.

MR. PENTONY: Just for clarification. This would be if the New England Council recommends for 2019 that rather than going through the full spec setting process, of Council spec setting process that the Council requests the agency take an in-season adjustment action to effectively revise what would otherwise rollover from 2018.

Toni is correct. The more complicated that action becomes; the more difficult it is to justify and to implement as an in-season adjustment, which tends to be reserved for very straightforward modifications like we discussed earlier for 2018, where we would simply drop the overall ABC, and drop the sub-ACLs. Does that answer the question, Toni?

CHAIRMAN BEAL: Toni.

MS. KERNS: Yes, and I believe the same goes for the last bullet as well.

CHAIRMAN BEAL: Is everyone comfortable with that guidance and not taking or making a recommendation at this time on the last two bullets? Seeing everyone is comfortable; Peter Kendall had his hand up.

MR. KENDALL: Yes, and I was just going to follow along with what Mike said. I mean the Executive Committee, the Herring Committee and the Council have not even discussed maybe splitting out 2019 yet. Once we go through that I would imagine, I can't predict, but with everything going on with Amendment 8, and having to take final action on that in September. Like Mike just said, trying to get this streamlined for 2019. I don't expect the Council to add on a lot to that interim action as well. The quicker they can get it done the better off we'll all be.

CHAIRMAN BEAL: Ray.

MR. KANE: Question, I was on that call on the transfer to Canadian vessels. Now we have Matt Cieri sitting at the table. What age are those fish that we're not allowing that permit on for the Canadian transfer for the four vessels? I mean what is the length of those fish and what is the age of those fish that go to the canneries?

DR. CIERI: They generally prefer smaller fish. But they do have the ability to steak, so I would probably guess, given my experience back when we had canneries in Maine. Those would probably be 3s or 4s on average.

MR. KANE: Three to four year olds. Thank you.

CHAIRMAN BEAL: Any other thoughts or recommendations that the Section wants to convey to the New England Council? Not seeing any. Mr. Chairman, do you want to take over the Chair, or do you want me to keep going?

CHAIRMAN KELIHER: Okay so moving right along then and being mindful of ending around two o'clock or shortly thereafter gives us about a half an hour to deal with a couple other issues.

OTHER BUSINESS

CHAIRMAN KELIHER: One, why don't we deal with the AP issues first, Megan; AP nomination and you handle that and then we'll go revisit the conversations regarding the Section to a Board. Megan.

ADVISORY PANEL NOMINATIONS

MS. WARE: Sure. Toni had e-mailed each of the states about kind of all of their AP members in general; and we got two nominations from Massachusetts to the Herring AP; Beth Casoni, and Gerry O'Neill. I will look to Massachusetts for a motion.

DR. PIERCE: Yes, I would move that we accept as members of the Advisory Panel. Well, there it is. Move to approve Beth Casoni and Gerry O'Neill to the Atlantic Herring Advisory Panel.

CHAIRMAN KELIHER: **Do we have a second? Eric Reid. Are there any questions or comments on the motion on the Board? Seeing none; any objections. Seeing none; the motion passes without objection.** Thank you very much. Moving along, and I'm going to put you on the spot a little bit, Bob.

CONSIDER RECOMMENDATION TO CHANGE THE HERRING SECTION TO A BOARD AND INVITE THE NEFMC TO HAVE ONE VOTING SEAT

CHAIRMAN KELIHER: Based on the conversations around moving the Section to a Board, a letter was drafted and sent to the Commission; and there is ultimately a meeting between Commission leadership and Council leadership about all management areas and management species boards. But in particular toward the Atlantic Herring Section and Bob if you could recap that meeting and then we'll.

EXECUTIVE DIRECTOR BEAL: A series of letters have gone back and forth between this Section, the Commission, and New England Council talking about voting seats and membership, and how the different bodies should relate and coordinate and communicate. One of the most recent letters from us to the Council offered a nonvoting seat on the Section; and also suggested at a meeting of the Council and Commission leadership to talk about the issue, and how to communicate and collaborate would be a productive thing.

The Council said well, we would rather not take advantage of your offer and have a nonvoting seat at the Section; despite Peter being here. They also said, but the meeting sounds like a good idea let's go ahead and do that. Pat Keliher, Jim Gilmore and I met with the leadership; Tom Nies, Terry Stockwell and John Quinn from the New England Council. We talked for two or three hours about communication and collaboration.

There was an agreement I think by all six of us that more communication and better flow of information helps both bodies out. It's getting complicated given the specs; and this was before we even knew, I think about this quota issue that we're going to be faced with. We had just heard preliminarily there was some bad news coming our way. It was a good conversation; it was productive I think. We agreed that we should probably continue to meet, the six of us, and talk about shared issues. One of the direct outcomes of that was we agreed to bring the idea back to the Section of turning the Section into a management board. If this Section is changed to a management board it would provide the opportunity for the Commission to invite the Council to have a voting sea on the Board; and it would also allow the federal services to sit at the Board and vote, should they elect to participate.

There is a little bit of a nuance there the way that the charter works is if this becomes a management board it's up to NOAA Fisheries and U.S. Fish and Wildlife Service if they decide to participate or not. It's their decision. As far as the Council participating, it's up to this Section to invite New England Council to have a voting seat, and they can either accept or decline that invitation.

Pat, we talked about a lot of different things at that meeting. I don't know if you want to chime

in on any more. But really that's the one deliverable that came back to this Section. Again, we all agreed more communication will help out these issues of shared management of sea herring are tricky; and there is a lot of overlap between jurisdictions and sort of turf issues at times.

Having the voting membership back and forth seemed to be a way to help out with some of those turf issues; and ensure the flow of information back and forth, just so both bodies knew what the other ones are doing. Obviously there is a lot of membership that overlaps; in particular state directors and some others. It's up to the group; but one option would be changing this to a board would afford some flexibility as far as membership goes.

CHAIRMAN KELIHER: We are; I think the word David used on stock status was in a collapsed situation, comparing it back to the '70s. I think the thing that has definitely resonated with me, especially over the last week after the PDT met in Gloucester last week was the fact that we are definitely in need of more communication and collaboration amongst the bodies and with the Agency.

You know we are in a very difficult time; and will be for the next three or four years, potentially longer with Atlantic herring. I think now is the time to really step up and make sure that we're all kind of rowing in the same direction; instead of arguing about who should be doing what. The last conversation we had about this, I know one of the concerning factors was on the days out side. Days out would not be impacted. This would still be Maine, New Hampshire and Massachusetts dealing with the issues of days out.

The only thing that this does is change the title; and adds a couple new voting members to what would then be a board. Just to remind everybody here. This was on the agenda for the Policy Board. It was not originally on this agenda; because it was supposed to be a Policy Board discussion. But because of the business that we had here today, I think it is very appropriate for this Section to make a recommendation to the Policy Board, with that David Pierce.

DR. PIERCE: I would move this Section recommend to the Policy Board that the Sea Herring Section be converted to a management board with a New England Fishery Management Council member having a vote on the Board.

CHAIRMAN KELIHER: I have a motion, do we have a second, Doug Grout on the second.

ERIC REID: I know you've got some thoughts on this. Yes, I make a motion to substitute. If you want to put it up that would be great.

CHAIRMAN KELIHER: Bob, I am going to have you take it.

CHAIRMAN BEAL: All right, I turned over the keys to the original chairman prematurely. I'll go ahead and take back over the Chairmanship. Let's make sure the first motion reflects what Dr. Pierce wanted it to be. Is that correct, David what's up there now?

DR. PIERCE: It's not correct, but it's fine. I didn't use the word offer, I just said with a New England Fishery Management Council member having a vote on the Board, so just say that's what it should be. I don't think the New England Council is going to refuse the offer. I would say with a New England that's fine. That's the way I worded it.

CHAIRMAN BEAL: All right, so we're all set with that motion. Then I think Mr. Reid was indicating he has a substitute motion. Eric.

MR. REID: Somebody has it already.

CHAIRMAN BEAL: Yes Doug, do you have a question?

MR. GROUT: I guess I look at what you had suggested, what you had indicated was in the Charter, and that we can invite them. They don't have to take it. I mean it is still ultimately their decision on it. I almost thing inviting the Council to have a voting seat on the Board is a more appropriate word. But if people are okay with just giving them a seat, they still have to take it. It's still their final decision after we invite them.

CHAIRMAN BEAL: Yes, we can invite them to our party but they don't have to show up. Yes, it's their decision to accept or not. You know the other thing with that first motion. I think it should actually be move to recommend to the Policy Board to take this Action. But Toni is Eric Reid's motion in the works? Eric, are you ready?

MR. REID: I move to substitute to recommend to the Policy Board to change the Herring Section to a Board and provide one voting seat to the New England Council, if that should say invite that's fine. This action is conditional on the New England Fisheries Management Council adding an ASMFC seat to their Herring PDT and Herring Committee as well.

CHAIRMAN BEAL: Is there a second to that motion? Pat Keliher. Eric, do you want to speak to your motion to substitute?

MR. REID: Yes there has been a lot of conversation with this. I've had discussions with Council leadership; New England Council leadership about it's a give and take situation. They would like to have a voting seat on our Herring Board. Currently they already have a seat on our Technical Committee. This is just a summation of some discussions I've had with the Council; just to expedite the situation. I don't mean to shortcut David, but basically this puts it you give and you get and there you have it. That was the whole rationale behind it.

CHAIRMAN BEAL: Pat, as seconder, do you want to say anything?

MR. KELIHER: No. I don't what the maker of the original motion thinks of this. But I was just thinking if acceptable we may be able to dispense with "friendlies" instead of going back and forth.

CHAIRMAN BEAL: I'll get to the original motion folks here in a second. But Doug Grout has his hand up.

MR. GROUT: This concept I am certainly supportive of; except I'm a little puzzled by a seat on the Herring PDT. I have a member of my staff on the PDT. I believe the state of Massachusetts has a member of their staff on the PDT. Do you have a member? We already have a number of state scientists on the PDT.

I don't see the need to have a seat on their PDT in there. There was no restriction. In fact they were looking for people to be on their PDT. That is the only thing that I don't think we need to really have that in there, and I was wondering if Mr. Reid would be willing to remove that particular part of it.

CHAIRMAN BEAL: I think Pat has a comment; then I'll go to Eric.

MR. KELIHER: I think the way that we were looking at it, Doug was that Council is represented on the Commission PDT, and when Megan who usually goes to the PDT is reminded that she's not a member of the PDT and can't vote. This would allow us to have Commission staff also there; potentially as a voting member.

MR. GROUT: Then maybe if I might follow up. Maybe we should refine it to say having an ASMFC staff seat to their Herring PDT; because as I said, ASMFC already has.

CHAIRMAN BEAL: Eric, any comments?

MR. REID: Yes, if you want to change it to ASMFC staff that's fine with me. It is my understanding that this is something that is acceptable to both the Commission and the

Council. I'm with you, Doug, no problem. If you want to change it to ASMFC staff, a staffer, one seat, however you want to say it. But it would be designated as staff that's fine.

CHAIRMAN BEAL: Pat Keliher as a seconder shook his head yes, he's okay with that. Does anyone have any problems with that change? I'll go to Tom.

MR. THOMAS P. FOTE: New Jersey and New York don't have members on the PDT. I mean I'm just pointing that fact out, Doug. You pointed out the three states, but two of the members of the Section don't have members on the PDT. Maybe it would be an opportunity for one of those states if they wanted to have a member on the PDT to basically do that. There is always this conversation going back and forth. Before we vote on the final motion I would like to say a little bit more. But I'll wait until that. I just wanted to comment on that immediately.

CHAIRMAN BEAL: Peter Kendall.

MR. KENDALL: Yes, I was just going to say. I appreciate this motion. I mean as the Herring Committee Chair too, I would be fine with having someone on the Committee meeting sit on the Committee meeting that's fine, and also somebody on the PDT, whether it be staff or even another state's staff that's fine as well. Then of course it still will have to be approved by the Executive Committee and the Council at that point too. But it sounds good to me.

CHAIRMAN BEAL: Dennis, I'll get to you. I have one question for Eric. The way it's worded now, ASMFC staff seat to the Herring PDT and Herring Committee. Is it the understanding that the Herring Committee seat would also be an ASMFC staff seat; or is that just for the PDT? Does that make sense?

MR. REID: I'll get my weed whacker out and get through all this. Well, I'm assuming it would be smart to have the Herring PDT be a staffer. I'm very willing to leave a seat on the Herring Committee open. That perhaps gives an opportunity to New York and New Jersey; should they so choose, given Mr. Fote's comments. Yes, okay fine.

CHAIRMAN BEAL: That's good. I just wanted to make sure the current Section knew what the intent of the motion was. Pat, you're okay with that.

MR. KELIHER: Yes.

CHAIRMAN BEAL: We'll need to read this into the record before we vote; because it's been changed a time or two. Dennis and then I'll go to Tom.

MR. ABBOTT: When we change from a Section to a Board that automatically includes the Services, and have the Services prior to this proposed action expressed any interest in becoming members of the Herring Section Board?

CHAIRMAN BEAL: According to the Charter, if you all decide to go from a Section to a Board and the Policy Board agrees. Then it's up to NOAA Fisheries and Fish and Wildlife Service to decide if they want to be on that. They are not obligated to sit on the management board for Herring. Mike Pentony is in the back. I don't think the Service has indicated a preference one way or another yet; on whether they would or would not sit on the management board. Toni has got her hand up though.

MS. KERNS: NOAA has sent us a letter saying they were interested in a seat on the Board. Fish and Wildlife Service has not.

CHAIRMAN BEAL: Okay, I stand corrected. They have indicated that. Tom, and then I'll come back to Eric.

MR. FOTE: The Herring Section has a real sentimental value for me; because when I first got to the Commission in 1990, it was the only place that a Governor's Appointee or a

Legislative Appointee had a vote, because you weren't a Board. The Sections were made up of a caucus vote. I used to travel with Bruce Freeman up to New England; and basically sit on every Herring Board, because I said at least I get to vote at this Board and not just sit in the audience and not even being recognized to ask a question. It's a sentimental value for me. I also realized it was the states cooperating amongst themselves without the National Marine Fisheries Service, sometimes their strong handedness in past years, way back then basically directing us.

It was us deciding how we would function and work. It seemed to work fine for all these years. Times have changed and there is a lot more cooperation. I can understand why this move, but it has a little value to me and a little tug of my heart that this was the first place I was allowed to vote when I came to the Commission.

CHAIRMAN BEAL: No one is kicking you off, Tom, good news. Eric.

MR. REID: Just some clarifying info that just came to me. New England's PDT Policy doesn't allow a PDT member to be on a Committee as well. It would not be the same person in this motion; just so we're clear on that.

EXECUTIVE DIRECTOR BEAL: That's helpful, thank you. I'm glad you thought of that.

MR. REID: I was told to think of it, just so they can hear me.

CHAIRMAN BEAL: All right, any other discussion on the substitute motion? I guess we go back to Mr. Keliher's point earlier. Are the maker and seconder of the original motion willing to sort of make that motion go away if the Board is comfortable with that so we only have to vote once? It's kind of a formality either way. **Does anyone have any objection if the original motion is withdrawn and removed from the list of motions? No one objects to that.**

We're going to remove the original motion and we're going to make the motion by Mr. Reid, seconded by Mr. Keliher into the Main Motion. It's essentially a vote. Then I think is the Section ready to vote on that motion from Mr. Reid and Mr. Keliher, which I need to read into the record since it's been modified a time or two?

Move to recommend to the Policy Board to change the Herring Section to a Board and invite the New England Fishery Management Council to have one voting seat. This action is conditional on the New England Fishery Management Council adding an ASMFC staff seat to their Herring PDT and an ASMFC seat to the Herring Committee, with the understanding that that will not be the same person.

I ad-libbed that last part, are there any objections to the motion that is on the board right now? Seeing none; it carries unanimously. We'll bring that forward to the Policy Board on Thursday morning later this week.

DISCUSS SPAWNING PROTECTION

CHAIRMAN BEAL: Ritchie, we've got about ten minutes to at least introduce the spawning issue and start the dialogue there, and see how far we can get. If you're ready it's all yours.

MR. WHITE: It should take a lot less than that. I was thinking and looking at Matt's report; and the only thing we can really affect other than quota is to ensure that there is the best spawning process that can take place. My thoughts are that we start an addendum to tighten spawning to the best extent that we can. I think there are tools in the last addendum that we could use. My suggestion is in October that that be an agenda item to discuss; starting an addendum to tighten our spawning regulations. That would be in 1A. Secondly, Matt refreshed my memory that in talking about spawning on Georges Bank the Technical Committee had talked about a

$50,000 figure that it might take to implement a program like that.

If this soon to be Board thinks that makes sense to pursue that; then we might recommend to Executive Committee, or whoever is going to make decisions on the pot of money that we found out about this morning that possibly that could be a use of 50 odd thousand dollars.
CHAIRMAN BEAL: Any comments or questions or concerns about adding that to the October agenda? Dr. Pierce.

DR. PIERCE: I think that's an appropriate course of action; consideration of steps to deal with spawning protection on Georges Bank. We've talked about that for a long time. My fellow Commission member, Ray Kane and Sarah Peake have always pushed that. For a number of reasons we haven't gone in that direction, but we should in light of the status of the stock.

Now that we have I assume, Mike Pentony, or his representative going to be a member of the Board. We now have more formal federal representation. That should promote more discussion about what can be done relative to a spawning closure in those federal waters; and the extent to which NOAA Fisheries can be onboard and can assist with that endeavor. Yes, I think it's smart.

CHAIRMAN BEAL: Doug Grout.

MR. GROUT: Yes, I would certainly support the Addendum and this recommendation of looking back at the paper that Matt had put together about that; about how to do it, how much it was, some of the drawbacks. That was probably six years ago, I would guess, somewhere around there five. Okay, so maybe inflation hasn't gone up. Just to consider that the price might be a little bit higher now that we're a few years down the road. But still, I think that both of them are excellent ways to move forward.

CHAIRMAN BEAL: Ray.

MR. KANE: Thank you, Doug, for reminding us of inflation. But speaking with Matt this morning, I believe a lot of the spawning work is being done at the dockside now, Matt, is that the discussion we had this morning?

DR. CIERI: Yes, I'm not sure if you guys are aware but the state of Maine actually is going to start doing a fishery independent spawning survey starting this year hopefully, if we can get all of our ducks in a row, for at least the inshore Gulf of Maine. But yes, a lot of the work that I talked about earlier was portside.

Basically, going out and taking a look at samples from commercial vessels. That might be difficult; depending on where these quotas wind up, as you can possibly imagine. But we can certainly think our way through the problem; if you guys put it on the agenda, and after I send Megan this paper.

CHAIRMAN BEAL: Sounds good. Are there any other comments or thoughts? It sounds like there is an overall agreement to get that onto the agenda for October. All right we will add that.

ADJOURNMENT

CHAIRMAN BEAL: Anything else to come before the Herring Section, seeing none; that's probably the last time anyone ever says this. The Herring Section stands adjourned.

(Whereupon the meeting adjourned at 2:00 o'clock p.m. on August 7, 2018)

Summary Report of the 65th Northeast Regional Stock Assessment Review Committee (SARC 65)

Stock Assessment Review Committee (SARC) Meeting
June 26-29, 2018
Northeast Fisheries Science Center
Woods Hole, Massachusetts

Prepared by the Stock Assessment Review Committee
Benchmark Assessment for A. Sea Scallop and B. Herring
(SAW/SARC 65)

July 20, 2018

SARC 65 Panel Members

Patrick Sullivan (Chair)
Cathy Dichmont
Coby Needle
Geoff Tingley

1. Introduction

1.1 Background

The 65th Stock Assessment Review Committee (SARC 65) met in the Stephen H. Clark Conference Room of the Northeast Fisheries Science Center, Woods Hole, MA on June 26-29 2018. The purpose of the meeting was to review the most recent benchmark assessments of A. Sea Scallop and B. Herring (see SOW, Attachment 1). The review committee included three external scientists appointed by the Center for Independent Experts (Cathy Dichmont, Coby Needle, and Geoff Tingley), and was chaired by Patrick J Sullivan, a member of the New England Fisheries Management Council Scientific and Statistical Committee.

The SARC was assisted by the NEFSC Stock Assessment Workshop (SAW) Chairman, James Weinberg. The SAW 65 Sea Scallop Working Group chaired by Burton Shank provided supporting documentation with presentations given by the lead assessment scientists Dvora Hart and Jui-Han Chang (NEFSC) on the general assessment and by Jonathon Peros (NEFMC) on Sea Scallop assessment activities in the Gulf of Maine. The SAW 65 Herring Working Group chaired by Gary Shepherd provided supporting documentation with the presentations given by the lead assessment scientist Jon Deroba. Toni Chute, Dan Hennen, Chris Legault, Brian Linton, Alicia Miller, and Tony Wood from the NEFSC served as rapporteurs. Approximately 47 people participated in the SARC 65 meeting, representing NMFS/NEFSC, the NMFS/Greater Atlantic Regional Fisheries Office (GARFO), Fisheries and Ocean Canada (DFO), NEFMC, Massachusetts DMF, Maine DMR, various academic institutions, non-governmental organizations and fisheries stakeholder organizations (see Attachment 2).

1.2 Review of Activities and SARC Process

Between one and three weeks prior to the meeting, assessment documents and supporting materials were made available to the SARC Panel via a server on the NEFSC website. On the morning of Tuesday June 26th, 2018, before the meeting, the SARC Panel met with James Weinberg and Russell Brown (NEFSC) to review and discuss the meeting agenda, reporting requirements, and meeting logistics. During the SARC meeting, background and working documents were made available electronically by Toni Chute and in print by request. The meeting opened later that morning on June 26th with welcoming remarks and comments on the agenda by James Weinberg and Patrick Sullivan. Participants and audience members introduced themselves. Following introductions, the morning session on June 26th was devoted to presentations and discussion on the Sea Scallop assessment, followed by SARC discussion with the presenters and chair of the Working Group; the discussion carried over into the afternoon. Wednesday, June 27th from 8:30am to 4:00pm was devoted to presentation and discussion of the Herring assessment. Late afternoon of June 27th was focused on Sea Scallops. On Thursday, June 28th the SARC Panel met again with assessment scientists and SAW chairs to wrap up discussions on Sea Scallop and Herring. Friday, June 29th the SARC Panel devoted time to finalizing the Assessment Summary Reports in order to address the SAW Terms of Reference for each stock and in drafting this Panel Summary Report. Chris Legault and James Weinberg were particularly helpful in assisting the SARC Panel with editing and revising the Assessment Summary Report.

The SARC 65 Panel Summary Report was completed by correspondence. This report evaluates each Term of Reference that had been addressed by the Working Groups. A draft Panel Summary Report was shared with James Weinberg (SAW Chair) at the NEFSC for fact checking before the final report was submitted. Additionally, each Panelist drafted and submitted an independent reviewer's report to the Center for Independent Experts and to the NEFSC.

The SARC Panel worked with meeting participants throughout the week to gain a better understanding of the assessment. NOAA scientists were extremely helpful in providing figures, data summaries and outputs from additional model runs during the meeting to assist the Panel in exploring residual patterns, sensitivity to model assumptions and alternative reference point estimation methods. The meeting was collegial, good-natured and informative. Both stock assessments were clearly presented and were generally well documented. The SARC appreciated the level of audience participation, which added to the value of the discussion. The terms of reference (TORs) used to guide development of the benchmark assessments were clearly worded and progressed in a logical order. The organization of the assessment texts, tables, and figures, which cross-referenced to the TORs, facilitated the assessment review and discussion. The SARC Panel felt that it was able to conduct an in-depth and thorough review.

The SARC Panel agreed that scientific and statistical analyses conducted by the Working Groups were thorough and of high quality. The assessments were effective in helping to determine the current status of both stocks. Discussed below in responses to the TORs are what the Panel viewed as the strengths and concerns of each assessment. The SARC considered the process effective in structuring a critical review of the work of the Working Groups and in identifying areas in need of additional work for future assessments.

A. Sea Scallop

1. Estimate catch from all sources including landings, discards, and incidental mortality. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

    - This TOR was fully met.
    - Noting that the majority (80%) of discards are believed to survive, discards are not included in the model directly, but as incidental mortality. This falls under what ends up being described as fishing mortality, so that the reported fishing mortality rates are the sum of the landed and incidental fishing mortalities. There is also a separate component of other forms of incidental mortality (incorporated as a flat percentage).
    - Uncertainty in these sources of data was adequately covered during the review but would have benefitted from further expansion and explanation. Confidence intervals for survey biomass estimates were fully presented at the request of the SARC. Qualitative comments on uncertainties were provided for landings and discards, including some brief discussion on the possible scale of illegal, unreported and unregulated (IUU) removals (poaching).
    - It was acknowledged that the Sea Scallops in Canadian waters immediately to the east were likely to be the same biological stock but were not included in this

assessment. It would have been helpful to have more information about this area to inform the panel on scale (spatial extent, biomass estimates from assessments or surveys if available, catch history) and the basis for stock structure assumptions.

2. Present the survey data being used in the assessment (e.g., regional indices of relative or absolute abundance, recruitment, size data, etc.). Characterize the uncertainty and any bias in these sources of data.

    - This TOR was fully met.

    - There were clear and detailed presentations of the various abundance surveys describing the advantages and issues with each.

    - Uncertainty was well understood in most areas, and where not understood, this was made clear and the need for further work acknowledged and identified. Uncertainty of the dredge efficiency at high density levels needs further work.

    - Optical survey selectivity might be changing with variations in intra- and inter-survey size-specific density. The protocol for reviewing the optical data to ensure reader variation is understood and minimized should be reconsidered to ensure that this survey is producing an internally consistent time-series and that this is fully comparable with the other survey indices.

    - The dredge survey provides a key set of input data to the assessment. It appears from the fitting of the model that this survey may be overestimating local abundance. This should be investigated and, if real, corrected by, for example, restratification of the survey data and use of model-based approaches to determine local areal abundance.

3. Summarize existing data, and characterize trends if possible, and define what data should be collected from the Gulf of Maine area to describe the condition and status of that resource. If possible provide a basis for developing catch advice for this area.

    - This TOR was fully met.

    - Consider what data are needed to run the SAMS model in the immediate future and then prioritize the collection of the information needed through surveys and fishery monitoring. Plan to expand information collection to support other applications, including the CASA model at a later date.

    - Evaluate the cost-benefits of developing research surveys and monitoring the fishery (landings and discards) relative to the net socio-economic benefits.

    - Historically a number of different survey approaches have been applied. From this point, a single survey methodology should be selected and applied to create a single, informative and consistent abundance time series. Consideration of fishery-dependent data should explicitly include options for using the available VMS data to provide a usable measure of effort. Consider using an optical survey, while obtaining the required biological information from the fishery.

    - An outline approach for informing management for this area was presented. For the immediate future, consider a data-limited method for informing management (such as that proposed), with further development of fishery-dependent (e.g. CPUE) and fishery-

independent (survey) derived abundance indices to inform adjustment of the ABC (up and down) in proportion to change in the most informative index.

- With limited research options available, collation and use of appropriate and informative fishery-dependent information to support assessment should be fully explored. This should include approaches to quantify metrics for catches, discards and landings (i.e. to give representative CPUE and LPUE) and also patterns of spatial density distribution.

- Due to the range and scale of uncertainties, multi-year projections are unlikely to be sufficiently accurate at this point and therefore not useful at the moment. One year projections may still be useful.

4. Investigate the role of environmental and ecological factors in determining stock distribution and recruitment success. If possible, integrate the results into the stock assessment.

    - This TOR was fully met.

    - Ecological perspectives were included in the assessment analyses. Information was presented on, for example, predators, parasites, disease, invasive organisms and unusually slow growth of Sea Scallops in the southern Nantucket Lighthouse area (SNL), but was not integrated directly into the assessment, which is probably appropriate at this point.

    - Environmental drivers of population change were considered during the assessment. These included temperature mediated spatial distribution and the short- and longer-term implications of climate change. Spatial differences in growth were also presented, including aspects of density-dependent growth.

    - The spatial aspects of the SAMS model is an acknowledgement that there are some spatial environmental differences. Regional stratification may be more reflective of differences in fishing pressure.

5. Estimate annual fishing mortality, recruitment and stock biomass for the time series, and estimate their uncertainty. Report these elements for both the combined resource and by sub-region. Include retrospective analyses (historical, and within-model) to allow a comparison with previous assessment results and previous projections.

    - This TOR was fully met.

    - The forward projecting size-structured model, CASA, has been appropriately implemented for Sea Scallops. Three regional assessments were undertaken – for the Mid-Atlantic and the open and closed portions of Georges Bank. The southeast corner of Nantucket Lightship was not assessed at this time, since growth rates and potentially other life history parameters are extraordinary. The area is also not currently fished, but as the local scallops grow they will eventually become vulnerable to fishing and should in the future be included in the assessment.

    - New aspects to the benchmark assessment included how natural mortality and growth were implemented. Natural mortality was estimated by year, and by size (Georges Bank open and Mid-Atlantic), and for juveniles and adults separately (Georges Bank open and Mid-Atlantic). Growth included individual random effects on the growth rate (K) and asymptotic length at which growth is zero (L_∞). Given results that showed annual deviation patterns in the growth rate, growth transition matrices were

incorporated to describe low to high growth rate time blocks within the assessments. The panel appreciated the innovative approaches that were incorporated into this benchmark assessment.

- These changes were in part applied to address past underestimation of the survey indices in the model. The assessment was able to explain some increases in survey indices and subsequent substantial decreases through increased juvenile mortality (as supported by the size frequencies and indices in subsequent years) and therefore adequately fit the indices for these years.
- However, the inclusion of variable growth and natural mortality was only partially successful in addressing this underestimation. There are periods when the model biomass estimates are below the survey observations, particularly in the Mid-Atlantic and Georges Bank Open. The main reason for this is that observation error, natural mortality, and fishing mortality can be confounded in the model. Generally, the model allows the survey indices to have elevated levels of observation error (i.e. it underestimates these due to error in the survey index). Despite this potential for large observation error within the dredge surveys (see ToR 2), in some years the correlated deviations suggest some component of mortality is missing from the model for these years. It is unclear whether this is due to underestimation of natural mortality, fishing mortality, or both.
- The CASA model calculates annual estimates of additional mortality that cannot directly be accounted for by fishery landings. Most of this mortality is due to natural causes (principally predation and disease), but there remains a small proportion that may be due to unaccounted fishing-related mortality. For brevity, the additional mortality is included in the natural mortality calculations.
- Generally, the panel deemed the model retrospective patterns as reasonable, although this is still an important aspect to consider for the next benchmark assessment. The most problematic patterns were observed in the Georges Bank assessment. These could be adequately explained by very noisy and conflicting survey indices, and were therefore considered by the panel to be defendable. It did highlight further issues to be resolved with the survey indices.
- This benchmark assessment did not consider alternative assessments (e.g. age-based and space-time approaches), which the panel considered as important to include in the next benchmark assessment (and which are discussed in ToR 9).

6. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

    - This TOR is fully met.
    - A second model, SYM, is applied to estimate the biological reference points and includes estimating a stock-recruitment relationship and undertaking the per recruit calculations. Uncertainty is correctly addressed within the model. The output of the CASA model (e.g. selectivity, mortality, stock biomass and recruitment estimates) is linked to the SYM model to ensure consistency. CASA is also used as a check.

- The panel notes that the stock recruitment relationship uses age-3 as an index of recruits, while the CASA assessment model treats recruitment as age-1. CASA uses all size classes in the model to adequately address juvenile mortality. Juvenile mortality, though, is hard to predict under the equilibrium conditions assumed when calculating biological reference points and there appears to be density dependent mortality. Thus, the use of age-3 recruits as an index of recruitment is supported by the panel.
- For the first time in the scallop assessment, an index of spawning stock biomass, gonad weight, was introduced. This was proposed to be used in conjunction with stock biomass estimates based on meat weight. Although the concept behind the introduction of gonad weight to describe spawning stock biomass has merit, the implications of using this approach have not been fully investigated. The panel recommends further development of the gonad-based spawning stock biomass metrics before full implementation. These include updating the shell height to gonad weight relationships (especially for areas where these are not available or out of date e.g. the southeast Nantucket Lightship area) and evaluating the relative impact of these changes by region.
- For the present benchmark assessment, the panel therefore recommends that both time series (gonad weight and meat weight) be reported, but that the stock biomass based on meat weights is used as the criterion for determining stock status within this 2018 assessment. We further recommend research on developing the gonad weight based spawning stock biomass index in ToR 9.
- There is a legal requirement to base management on MSY, an approach that is not ideal for this stock. Reasons include a high degree of spatial patchiness in the resource and spatial changes to key life history parameters such as growth and mortality. These translate into increased uncertainty within the estimation of Yield per Recruit and the stock-recruitment relationship. The fishery is actually managed using an adaptive recruitment-based spatial approach, which seems to be a better framework for sustainable management.

7. Make a recommendation[a] about what stock status appears to be based on the existing model (from previous peer reviewed accepted assessment) and based on a new model or model formulation developed for this peer review.

   a. Update the existing model with new data and evaluate stock status (overfished and overfishing) with respect to the existing BRP estimates.

   b. Then use the newly proposed model and evaluate stock status with respect to "new" BRPs and their estimates (from TOR-5).

   c. Include descriptions of stock status based on simple indicators/metrics.

- These TORs were fully met.
- The existing model was updated with new data and information (e.g. updated shell height to weight relationships, updated growth indices, a new method approach for natural mortality, etc.)
- A gonad-based SSB and relative reference points were developed and presented, but the panel has recommended the interim use of the meat-based reference points for this benchmark assessment. As stated in Terms of Reference 6, the method of using

gonad weight to calculate spawning stock size looks promising, but additional work is needed to fully develop the approach. The meat-based total biomass method used in previous assessments was applied to estimate biological reference points, although both versions are available in the report.

- The updated SYM model output was used to see if biomass was above overfished status and if fishing mortality was below overfishing status. A Kobe plot was provided. The panel supports the conclusion that the resource is not overfished and overfishing is not occurring.

8. Develop approaches and apply them to conduct stock projections.
    a. Provide numerical annual projections (through 2020) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).
    b. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.
    c. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

- These TORs were fully met.
- A third model, SAMS, was used to simulate projections for spatial management. This model is more spatially discrete than CASA and SYM in order to address the needs of management. Area management plays an important role in Sea Scallop stock dynamics, with much of the biomass during some periods located in long-term and/or rotational closures. The data and required information are such that estimating dynamics and biological reference points at the same spatial scale as SAMS is not, as yet, feasible.
- Although three models are used in this assessment (the CASA model estimated historical biomass and fishing mortality rates at a regional scale; the SYM model estimated biological reference points based on CASA outputs; the SAMS model forecast future abundance, biomass, and landings at a finer spatial scale to address management needs), the structure of each model is similar and they are coherent where required. They are each used to address distinct questions for the assessment and management. The panel supports this approach, although it does suggest potential alternate future options in ToR 9.
- The panel agrees with the approach that projections developed by the PDT use the most current survey information as a starting point for SAMS projections, because the surveys are more up-to-date than the CASA output.
- Sea Scallop population dynamics in recent years have been dominated by two very large cohorts. These have been the 2012 year class on Georges Bank, primarily

located in the Nantucket Lightship Area, and the 2013 year class in the Mid-Atlantic, much of which is in the Elephant Trunk rotational area off of Delaware Bay. These very high densities of scallops have rarely been observed previously. The panel therefore notes that forecasts of the future of these large year classes are highly uncertain.

- Due to these high levels of recent biomass, as expected, both total biomass and landings projections are predicted to decline due to the reduced presence of these strong year classes.
- The panel highlights that fully-recruited fishing mortalities prior to 2005 cannot be directly compared to the SARC-65 recommended F_{MSY} estimate due to changes in fishery size-selectivity over time.
- The panel notes that there are some inconsistencies between how the law indicates the stock should be managed and what metrics are required compared to how the fishery is actually (sustainably) managed.
- The panel also concurs with the summary report that, under area management, the reported fishing mortality calculated across all areas, underestimates fishing mortality in areas where fishing occurs. Such spatial heterogeneity in fishing mortality may reduce yield compared to fishing uniformly across areas and therefore it is possible that the areas open to fishing could be depleted even if overfishing is not occurring on the whole-stock. As long-term closures have reopened, differences between whole stock and reopened area fishing mortality will be reduced while overall fishing mortality is likely to increase.

9. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent SARC reviewed assessment and review panel reports. Identify new research recommendations.

    - This TOR was fully met.
    - Previous research recommendations were reviewed and the SAW added new ones that were prioritized at the SARC review meeting. The panel recommends that in future the SAW establish priorities for these recommendations during the SAW process.
    - Where justified, redundant earlier research recommendations were removed from the list during the SARC review meeting. The panel recommends that this be an ongoing exercise for the SAW.
    - In addition to the restratification of the survey, the size frequency information should also be considered for restratification. Also consider reweighting survey size frequency information by survey catch (e.g. sqrt weighting) to balance the information content of the different data sources (i.e. to account for spatial variation in survey observations).
    - Pursue further the gonad-based SSB and biological reference point approaches. To support this, consider gathering more information on the shell height to gonad weight relationship for all areas.
    - Gulf of Maine: start collecting key information now, use approaches in other areas and SAMS to prioritize what is important information to be collected, and identify a single survey from which to build a time series.

- Alternative assessments such as space-time models should be considered for the next assessment. These could be both for the historical time series and the forward projection models. These could ultimately bring the model framework into a single approach.

[a]NOAA Fisheries has final responsibility for making the stock status determination based on best available scientific information.

B. Atlantic herring

1. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize uncertainty in these sources of data. Comment on other data sources that were considered but were not included.

    - This TOR was fully met.

    - Spatio-temporal information was presented in some detail and used to describe the behavior of the fishery and possible impacts of key environmental drivers.

    - Survey catch and fleet landings-at-age were described, as were age structure and maturity-at-age.

    - Information on the quantities of discards were provided and discussed.

    - Fishery catches were presented in a spatio-temporal format for US and Canadian fleets and were also split by gear types.

    - The likely relative importance and influence of illegal or unreported catches prior to about 1977 were discussed. Impacts were not explored in the model runs.

    - Bycatch of other fish in the herring fishery represents a small proportion of the total catch. However, bycatch of some species may be sufficiently large to impact those species and should be considered more broadly. Bycatch caps that are in place for some species may achieve this to some degree.

2. Present the survey data being used in the assessment (e.g., regional indices of abundance, recruitment, state surveys, age-length data, food habits, etc.). Characterize the uncertainty and any bias in these sources of data.

    - This TOR was fully met.

    - A number of different regional surveys were fully described, some of which were of relatively short duration.

    - Selectivity and catchability were fully investigated and were used to inform the development of time series indices.

- The appropriateness of using bottom trawl surveys to monitor a semi-pelagic fishery was raised by the SARC and discussed, with most participants satisfied this was appropriate.

- The SARC requested additional diagnostics on the ability of surveys to track year class strength and found this useful for examining year class trends and understanding model fit.

- Uncertainty was well described for all surveys, with confidence intervals on all plots. Bias was discussed during the examination of the calibration between the different survey vessels. A break in the time series for catchability and selectivity in the model was used to address this. In addition, one other selectivity break was used to address door changes in the survey.

- The acoustic survey associated with the demersal trawl survey was useful to have and if appropriately developed may become a key index for this assessment. Additional efforts should be made to explore the impact of the non-standard nature of the survey design (from an acoustic perspective) and to find statistical approaches to minimize bias. Development of a directed acoustic survey to address questions such as survey design and independence of the survey indices should be considered.

- Several other indices were examined and prioritized for use. Other fishery-dependent information, such as acoustics from lobster boats, should be examined for developing additional biomass or abundance indices.

3. Estimate consumption of herring, at various life stages. Characterize the uncertainty of the consumption estimates. Address whether herring distribution has been affected by environmental changes.

    - This TOR was fully met.

    - Consumption of herring by the main fish predators was documented and the information available for characterizing predation by marine mammals, birds and larger finfish such as sailfish and tuna was also discussed. It was indicated that the scale of this mammal, seabird and large fish predation was likely to be minor relative to the main fish predators.

    - The consumption of herring by tuna was further discussed, especially given the assessed stock status of herring. The panel's interpretation was that the population of tuna was likely to be small and that tuna consumption would be low compared to consumption by other predators. The herring fishery was responsible for less removals when compared to the natural predators and would likely have a low impact on food availability to tuna.

4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Incorporate ecosystem information

from TOR-3 into the assessment model, as appropriate. Include retrospective analyses (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.

- This TOR was fully met.
- The analysis was thorough. Several models were explored, and different types of retrospective and sensitivity analyses were conducted anticipating many of the questions likely to be raised during the review process. These covered assessment sensitivity to *M*, calibration between survey indices, time-varying mobile fleet selectivity, "leave one out" survey tests, and the use of food-habits data as an index of abundance. The sensitivity analyses successfully explained the observed assessment scale difference from 2015.
- The principal assessment model was ASAP, a forward-iterating statistical catch-at-age model in the Fournier-Archibald family that is implemented in the NOAA Fisheries Toolbox. The assessment scientists were familiar and experienced with this model (one of the authors of the original paper was part of the SAW team), and although the assessment report was on occasion not very clear about run settings and assumptions (and the report contained no information about the model itself), the assessment scientists were able to explain clearly what had been done following questions during the SARC meeting.
- The key changes in the ASAP model used from the last assessment were in assumptions about *M* and selectivity, in the introduction of new index time series (including an acoustic survey series for the first time), and in some further relatively minor issues. The SARC meeting presentation stepped through these changes in a logical and clear manner, although the report text was rather more piecemeal and a little difficult to follow in places.
- Two exploratory models were also presented. The first was SAM, a state-space model that is widely used in ICES assessments for European stocks. The results from this were similar, although the assessment scientists had much less experience with this model and were consequently less confident in the outcomes. Model averaging was also attempted to combine the results of ASAP and SAM, as discussed in Appendix B3. The second was a Stock Synthesis III (SS3) model, but this remains in the early stages of development and is not yet proposed as a basis for advice.
- Consumption calculations were used to check that the approximately correct scale of natural mortality *M* had been used, rather than including them directly in the assessment, to avoid including excess random variation into the model. However, the estimates were based on consumption by a number of specified fish species only, and were not able to include marine mammals, seabirds, and some fish predators such as tuna: because of this, they were necessarily incomplete. In future assessments, it would be advantageous to determine whether data exist to help quantify these other consumption contributions. It may also be appropriate to consider a state-space (or similar) approach to include this information directly into the model while allowing for a smoothing of the process.

- Given the importance of natural mortality in this stock, it did seem strange that only one value of M (0.35) was used in the presentations (and that it was assumed to be both age- and time-invariant). The panel requested a sensitivity analysis to see the response of the population time-series to the *M* that represented the minimum negative log likelihood under the likelihood profiling exercise. A reasonable justification for the *M* implemented was provided, but sensitivity to this parameter is often requested during reviews so the panel suggests that this should be a standard sensitivity analysis in future assessments (unless improved age- and time-varying estimates of *M* can be determined).
- A Mohn's rho adjustment was not applied during this assessment because the adjusted values were well within the 80% confidence intervals (although not for recruitment, for which the values for the years 2011-2013 were significantly overestimated). The Mohn's rho adjustment had been applied in the previous assessment, although the form the adjustment took was not explained in the report or during the meeting. However, the retrospective bias does seem to be larger than would be expected elsewhere (in Europe in particular), so that *ad hoc* adjustments to assessments are often applied (as in the previous assessments, although not in the current assessment). One hypothesis suggested for this by the panel is that European survey indices tend to come from the same vessels that are used for many years, whereas the survey vessels used for American indices tend to change more often. The assessment report goes on to suggest that the current retrospective pattern is likely to get worse as additional years are added in future assessments. This implies that more is known about the causes of the retrospective pattern than is actually the case. Retros are often caused by mismatches between different sources of data, and the panel recommends that these are explored in future analyses rather than attempting to "fix" retros by *ad hoc* adjustments to input parameters which may mask underlying problems
- In addition, the panel recommends that the NEFSC should evaluate whether some standardization of the CI protocol is needed, as it varied between 80% and 90% at different points within the assessment report.
- The report is lacking some key tables that would normally be found in an assessment report, such as survey indices, and F and N estimates by age and year. Without these, it is difficult for an interested reader to try and replicate the results should this be required.
- The panel noted that the last 5 recruitment estimates were among the lowest in the time series. Although the CVs on the most recent 2 estimates are high, even the upper limit of the confidence intervals for these would be below the long-term geometric mean, and this suggests that the short-to-medium term prognosis for the stock is likely to be relatively poor.

5. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

    - This TOR was fully met.

- A Beverton-Holt stock-recruitment model was fitted as part of the ASAP model used in previous assessments and was used as the basis for calculation of F_{MSY}, but this model was considered to be inadequate for management in this assessment (and recruitment was estimated without constraint to an underlying stock-recruitment model). Therefore, an $F_{40\%}$ proxy was used to determine management scenarios. This is a standard proxy used in many management areas worldwide.
- In future assessments, the panel suggests that it might be beneficial to consider alternative approaches to the estimation of reference point proxies, such as length-based methods that are increasingly used for data-limited stocks.
- New reference points were derived because of changes in selectivity in the commercial fishery over time, as the fishery is now apparently targeting older larger fish more strongly. In addition, the overall assessment has been rescaled due to a number of explicable factors (see ToR 4), and MSY and SSB_{MSY} have changed as a result of these changes. This approach is scientifically sound.

6. Make a recommendation[a] about what stock status appears to be based on the existing model (from previous peer reviewed accepted assessment) and based on a new model or model formulation developed for this peer review.

   a. Update the existing model with new data and evaluate stock status (overfished and overfishing) with respect to the existing BRP estimates.

   b. Then use the newly proposed model and evaluate stock status with respect to "new" BRPs and their estimates (from TOR-5).

   c. Include descriptions of stock status based on simple indicators/metrics.

   - This TOR was fully met.
   - The Beverton-Holt stock recruitment relationship was found to be inadequate to characterize future recruitment (see ToR 5), meaning that biological reference points were based on an alternative proxy ($F_{40\%}$). Therefore, this assessment's reference points cannot be compared directly to those from past assessments.
   - New reference points were provided in a Kobe time-series phase-plane plot, following a panel request that this be generated for reference and historical context.
   - Mohn's Rho adjustments were not applied as the protocol did not indicate that these were needed.
   - It seems likely that no immediate management action is planned because $½\ B_{MSY} < B < B_{MSY}$ – currently, action is only taken if $B < ½\ B_{MSY}$. However, MSE explorations of alternative management strategies may prove to be helpful in understanding the implications of stock declines, and the panel recommends that these be considered for future benchmarks.
   - Currently the stock is not overfished and overfishing is not taking place with at least 50% probability. However, under current low recruitment patterns it is expected that the stock would continue to decline to overfished levels.

7. Develop approaches and apply them to conduct stock projections.

a. Provide numerical annual projections (through 2021) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for *F*, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).

b. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.

c. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

- This TOR was fully met.
- Projections based on the ASAP assessment model were provided. Stochasticity was incorporated through 1000 draws from the MCMC uncertainty estimates of the base ASAP model, based on short-term (for 2018) and long-term (for 2019-2021) means. The forecast assumptions about weights-at-age were not clearly specified in the report. The panel requested a table of projections assuming half of the long-term geometric-mean recruitment to examine a scenario that was comparable to more recent recruitment patterns.
- The projections considered hypothesized immigration and emigration from other areas, but these explorations did not seem to significantly change model outputs and so were not included in the final version of the model.
- The SAW reported the high uncertainty associated with recent recruitment estimates when developing projections. The assessment report states that projections assumed that future recruitment will approach the mean for the time series 1965-2015, which may be optimistic in the short term.
- Projections were examined at the SARC review regarding alternative harvest scenarios and alternative recruitment scenarios. Lower harvest scenarios result in less pessimistic projections, and lower recruitment scenarios (which result in more pessimistic projections) seemed to better represent current stock conditions. The latter could therefore be considered to be more realistic.

8. If possible, make a recommendation about whether there is a need to modify the current stock definition for future assessments.

- This TOR was fully met.
- The information needed to advise on changes to stock structure is inadequate to motivate management actions at this time, and consequently the report said very little about stock structure.
- Data were presented and a Stock Synthesis III (SS3) spatial model was explored, but the analysis was inconclusive given the information available

- Aspects of stock structure are worthy of further exploration for future assessments, including genetic separation, rates of movement and distinguishing stock specific harvesting from mixed catch fisheries.

7. For any research recommendations listed in SARC and other recent peer reviewed assessment and review panel reports, review, evaluate and report on the status of those research recommendations. Identify new research recommendations.

    - This TOR was fully met.
    - Previous research recommendations were reviewed, the SAW added new ones and these were prioritized at the SARC review meeting. The panel recommends that in future the SAW establish priorities for these recommendations during the SAW process.
    - The full research recommendation list was very broad, and many of the items had not been considered (or had only been partially considered) since the last assessment. The panel recommends that a list of this kind should include only those areas which are both beneficial to the assessment concerned, and achievable with the likely financial, technical and staff resources that will be available.
    - Where justified, redundant earlier research recommendations were removed from the list during the SARC review meeting. The panel recommends that this be an ongoing exercise for the SAW.
    - Aspects of stock structure are worthy of further exploration for future assessments, including genetic separation, rates of movement and distinguishing stock specific harvesting from mixed catch fisheries.
    - Stock Synthesis III (SS3) can use length information in a single stock modelling exercise, although a number of alternative length- or size-based assessment methods exist that could also be implemented if appropriate.
    - Ecological and environmental factors influencing recruitment and mortality should continue to be explored. The panel suggests that simple correlational analyses are unlikely to be successful and that the determination of true causal relationships between said factors and fish stock dynamics is required before the factors can be incorporated in management decisions.
    - Directed acoustic surveys should continue to be considered as a fruitful alternative to the current acoustic surveys which are conducted during demersal trawl surveys. The SAW commented on the desire to explore whether it would be possible to derive an absolute estimate of abundance from surveys, but the panel suggested that this may not be essential as a relative survey index can be equally informative.

[a]NOAA Fisheries has final responsibility for making the stock status determination based on best available scientific information.

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Attachment 1

Statement of Work

National Oceanic and Atmospheric Administration (NOAA)
National Marine Fisheries Service (NMFS)
Center for Independent Experts (CIE) Program
External Independent Peer Review

65th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC)
Benchmark stock assessment for Sea scallop and Atlantic herring

Background

The National Marine Fisheries Service (NMFS) is mandated by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act to conserve, protect, and manage our nation's marine living resources based upon the best scientific information available (BSIA). NMFS science products, including scientific advice, are often controversial and may require timely scientific peer reviews that are strictly independent of all outside influences. A formal external process for independent expert reviews of the agency's scientific products and programs ensures their credibility. Therefore, external scientific peer reviews have been and continue to be essential to strengthening scientific quality assurance for fishery conservation and management actions.

Scientific peer review is defined as the organized review process where one or more qualified experts review scientific information to ensure quality and credibility. These expert(s) must conduct their peer review impartially, objectively, and without conflicts of interest. Each reviewer must also be independent from the development of the science, without influence from any position that the agency or constituent groups may have. Furthermore, the Office of Management and Budget (OMB), authorized by the Information Quality Act, requires all federal agencies to conduct peer reviews of highly influential and controversial science before dissemination, and that peer reviewers must be deemed qualified based on the OMB Peer Review Bulletin standards.
(http://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf).
Further information on the CIE program may be obtained from www.ciereviews.org.

Scope

The Northeast Regional Stock Assessment Review Committee (SARC) meeting is a formal, multiple-day meeting of stock assessment experts who serve as a panel to peer-review tabled stock assessments and models. The SARC peer review is the cornerstone of the Northeast Stock Assessment Workshop (SAW) process, which includes assessment development, and report preparation (which is done by SAW Working Groups or Atlantic States Marine Fisheries Commission (ASMFC) technical committees), assessment peer review (by the SARC), public presentations, and document publication. This review determines whether or not the scientific assessments are adequate to serve as a basis for developing fishery management advice.

Results provide the scientific basis for fisheries within the jurisdiction of NOAA's Greater Atlantic Regional Fisheries Office (GARFO).

The purpose of this meeting will be to provide an external peer review of a benchmark stock assessment for **Sea scallop and Atlantic herring**. The requirements for the peer review follow. This Statement of Work (SOW) also includes: **Appendix 1**: TORs for the stock assessment, which are the responsibility of the analysts; **Appendix 2:** a draft meeting agenda; **Appendix 3:** Individual Independent Review Report Requirements; and **Appendix 4:** SARC Summary Report Requirements.

Requirements

NMFS requires three reviewers under this contract (i.e. subject to CIE standards for reviewers) to participate in the panel review. The SARC chair, who is in addition to the three reviewers, will be provided by either the New England or Mid-Atlantic Fishery Management Council's Science and Statistical Committee; although the SARC chair will be participating in this review, the chair's participation (i.e. labor and travel) is not covered by this contract.

Each reviewer will write an individual review report in accordance with the SOW, OMB Guidelines, and the TORs below. All TORs must be addressed in each reviewer's report. No more than one of the reviewers selected for this review is permitted to have served on a SARC panel that reviewed this same species in the past. The reviewers shall have working knowledge and recent experience in the application of modern fishery stock assessment models. Expertise should include forward projecting statistical catch-at-age (SCAA) models. Reviewers should also have experience in evaluating measures of model fit, identification, uncertainty, and forecasting. Reviewers should have experience in development of Biological Reference Points (BRPs) that includes an appreciation for the varying quality and quantity of data available to support estimation of BRPs. For scallops, knowledge of sessile invertebrates, length-structured models, and spatial management would be desirable. For herring, knowledge of migratory pelagic species and SCAA models would be useful.

Tasks for Reviewers

- Review the background materials and reports prior to the review meeting
- Attend and participate in the panel review meeting
    - The meeting will consist of presentations by NOAA and other scientists, stock assessment authors and others to facilitate the review, to provide any additional information required by the reviewers, and to answer any questions from reviewers
- Reviewers shall conduct an independent peer review in accordance with the requirements specified in this SOW and TORs, in adherence with the required formatting and content guidelines; reviewers are not required to reach a consensus.
- Each reviewer shall assist the SARC Chair with contributions to the SARC Summary Report
- Deliver individual Independent Review Reports to the Government according to the specified milestone dates

- This report should explain whether each stock assessment Term of Reference of the SAW was or was not completed successfully during the SARC meeting, using the criteria specified below in the "Tasks for SARC panel."
- If any existing Biological Reference Points (BRP) or their proxies are considered inappropriate, the Independent Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRPs are the best available at this time.
- During the meeting, additional questions that were not in the Terms of Reference but that are directly related to the assessments may be raised. Comments on these questions should be included in a separate section at the end of the Independent Report produced by each reviewer.
- The Independent Report can also be used to provide greater detail than the SARC Summary Report on specific stock assessment Terms of Reference or on additional questions raised during the meeting.

Tasks for SARC panel

- During the SARC meeting, the panel is to determine whether each stock assessment Term of Reference (TOR) of the SAW was or was not completed successfully. To make this determination, panelists should consider whether the work provides a scientifically credible basis for developing fishery management advice. Criteria to consider include: whether the data were adequate and used properly, the analyses and models were carried out correctly, and the conclusions are correct/reasonable. If alternative assessment models and model assumptions are presented, evaluate their strengths and weaknesses and then recommend which, if any, scientific approach should be adopted. Where possible, the SARC chair shall identify or facilitate agreement among the reviewers for each stock assessment TOR of the SAW.
- If the panel rejects any of the current BRP or BRP proxies (for B_{MSY} and F_{MSY} and MSY), the panel should explain why those particular BRPs or proxies are not suitable, and the panel should recommend suitable alternatives. If such alternatives cannot be identified, then the panel should indicate that the existing BRPs or BRP proxies are the best available at this time.
- Each reviewer shall complete the tasks in accordance with the SOW and Schedule of Milestones and Deliverables below.

Tasks for SARC chair and reviewers combined:

Review both the Assessment Report and the draft Assessment Summary Report. The draft Assessment Summary Report is reviewed and edited to assure that it is consistent with the outcome of the peer review, particularly statements about stock status recommendations and descriptions of assessment uncertainty.

The SARC Chair, with the assistance from the reviewers, will write the SARC Summary Report. Each reviewer and the chair will discuss whether they hold similar views on each stock assessment Term of Reference and whether their opinions can be summarized into a single

conclusion for all or only for some of the Terms of Reference of the SAW. For terms where a similar view can be reached, the SARC Summary Report will contain a summary of such opinions. In cases where multiple and/or differing views exist on a given Term of Reference, the SARC Summary Report will note that there is no agreement and will specify - in a summary manner – what the different opinions are and the reason(s) for the difference in opinions.

The chair's objective during this SARC Summary Report development process will be to identify or facilitate the finding of an agreement rather than forcing the panel to reach an agreement. The chair will take the lead in editing and completing this report. The chair may express the chair's opinion on each Term of Reference of the SAW, either as part of the group opinion, or as a separate minority opinion. The SARC Summary Report will not be submitted, reviewed, or approved by the Contractor.

If any existing Biological Reference Points (BRP) or BRP proxies are considered inappropriate, the SARC Summary Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRP proxies are the best available at this time.

Foreign National Security Clearance
When reviewers participate during a panel review meeting at a government facility, the NMFS Project Contact is responsible for obtaining the Foreign National Security Clearance approval for reviewers who are non-US citizens. For this reason, the reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, passport number, country of passport, travel dates, country of citizenship, country of current residence, and home country) to the NMFS Project Contact for the purpose of their security clearance, and this information shall be submitted at least 40 days before the peer review in accordance with the NOAA Deemed Export Technology Control Program NAO 207-12 regulations available at the Deemed Exports NAO website: http://deemedexports.noaa.gov/ and http://deemedexports.noaa.gov/compliance_access_control_procedures/noaa-foreign-national-registration-system.html. The contractor is required to use all appropriate methods to safeguard Personally Identifiable Information (PII).

Place of Performance
The place of performance shall be at the contractor's facilities, and at the Northeast Fisheries Science Center in Woods Hole, Massachusetts.

Period of Performance
The period of performance shall be from the time of award through August 17, 2018. Each reviewer's duties shall not exceed **16** days to complete all required tasks.

Schedule of Milestones and Deliverables: The contractor shall complete the tasks and deliverables in accordance with the following schedule.

No later than May 21, 2018	Contractor sends reviewer contact information to the COR, who then sends this to the NMFS Project Contact
No later than June 12, 2018	NMFS Project Contact will provide reviewers the pre-review documents
June 26-29, 2018	Each reviewer participates and conducts an independent peer review during the panel review meeting in Woods Hole, MA
June 29, 2018	SARC Chair and reviewers work at drafting reports during meeting at Woods Hole, MA, USA
July 13, 2018	Reviewers submit draft independent peer review reports to the contractor's technical team for review
July 13, 2018	Draft of SARC Summary Report, reviewed by all reviewers, due to the SARC Chair *
July 20, 2018	SARC Chair sends Final SARC Summary Report, approved by reviewers, to NMFS Project contact (i.e., SAW Chairman)
July 27, 2018	Contractor submits independent peer review reports to the COR and technical point of contact (POC)
Aug. 3, 2018	The COR and/or technical POC distributes the final reports to the NMFS Project Contact and regional Center Director

* The SARC Summary Report will not be submitted to, reviewed, or approved by the Contractor.

Applicable Performance Standards

The acceptance of the contract deliverables shall be based on three performance standards: (1) The reports shall be completed in accordance with the required formatting and content (2) The reports shall address each ToR as specified (3) The reports shall be delivered as specified in the schedule of milestones and deliverables.

Travel

All travel expenses shall be reimbursable in accordance with Federal Travel Regulations (http://www.gsa.gov/portal/content/104790). International travel is authorized for this contract. Travel is not to exceed $12,000.

Restricted or Limited Use of Data

The contractors may be required to sign and adhere to a non-disclosure agreement.

NMFS Project Contact

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Appendix 1. *Stock Assessment Terms of Reference for SAW/SARC-65*

Final Stock Assessment Terms of Reference for SAW/SARC65 (June 26-29, 2018) (to be carried out by SAW Working Groups)

(file vers. Revised 11/26/2017-b)

A. Sea scallop

1. Estimate catch from all sources including landings, discards, and incidental mortality. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

2. a. Present the survey data being used in the assessment (e.g., regional indices of relative or absolute abundance, recruitment, size data, etc.). Characterize the uncertainty and any bias in these sources of data.

3. Summarize existing data, and characterize trends if possible, and define what data should be collected from the Gulf of Maine area to describe the condition and status of that resource. If possible provide a basis for developing catch advice for this area.

4. Investigate the role of environmental and ecological factors in determining stock distribution and recruitment success. If possible, integrate the results into the stock assessment.

5. Estimate annual fishing mortality, recruitment and stock biomass for the time series, and estimate their uncertainty. Report these elements for both the combined resource and by sub-region. Include retrospective analyses (historical, and within-model) to allow a comparison with previous assessment results and previous projections.

6. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

7. Make a recommendation[a] about what stock status appears to be based on the existing model (from previous peer reviewed accepted assessment) and based on a new model or model formulation developed for this peer review.
    a. Update the existing model with new data and evaluate stock status (overfished and overfishing) with respect to the existing BRP estimates.
    b. Then use the newly proposed model and evaluate stock status with respect to "new" BRPs and their estimates (from TOR-5).
    c. Include descriptions of stock status based on simple indicators/metrics.

8. Develop approaches and apply them to conduct stock projections.
    d. Provide numerical annual projections (through 2020) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range

of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).

e. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.

f. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

9. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent SARC reviewed assessment and review panel reports. Identify new research recommendations.

[a]NOAA Fisheries has final responsibility for making the stock status determination based on best available scientific information.

B. Atlantic herring

1. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize uncertainty in these sources of data. Comment on other data sources that were considered but were not included.

2. Present the survey data being used in the assessment (e.g., regional indices of abundance, recruitment, state surveys, age-length data, food habits, etc.). Characterize the uncertainty and any bias in these sources of data.

3. Estimate consumption of herring, at various life stages. Characterize the uncertainty of the consumption estimates. Address whether herring distribution has been affected by environmental changes.

4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Incorporate ecosystem information from TOR-3 into the assessment model, as appropriate. Include retrospective analyses (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.

5. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

6. Make a recommendation[a] about what stock status appears to be based on the existing model (from previous peer reviewed accepted assessment) and based on a new model or model formulation developed for this peer review.

   a. Update the existing model with new data and evaluate stock status (overfished and overfishing) with respect to the existing BRP estimates.

b. Then use the newly proposed model and evaluate stock status with respect to "new" BRPs and their estimates (from TOR-5).
c. Include descriptions of stock status based on simple indicators/metrics.

7. Develop approaches and apply them to conduct stock projections.
    a. Provide numerical annual projections (through 2021) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).
    b. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.
    c. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

8. If possible, make a recommendation about whether there is a need to modify the current stock definition for future assessments.

9. For any research recommendations listed in SARC and other recent peer reviewed assessment and review panel reports, review, evaluate and report on the status of those research recommendations. Identify new research recommendations.

[a]NOAA Fisheries has final responsibility for making the stock status determination based on best available scientific information.

Clarification of Terms
used in the Stock Assessment Terms of Reference

Guidance to SAW WG about "Number of Models to include in the Assessment Report":

In general, for any TOR in which one or more models are explored by the WG, give a detailed presentation of the "best" model, including inputs, outputs, diagnostics of model adequacy, and sensitivity analyses that evaluate robustness of model results to the assumptions. In less detail, describe other models that were evaluated by the WG and explain their strengths, weaknesses and results in relation to the "best" model. If selection of a "best" model is not possible, present alternative models in detail, and summarize the relative utility each model, including a comparison of results. It should be highlighted whether any models represent a minority opinion.

On "Acceptable Biological Catch" (DOC Nat. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

Acceptable biological catch (ABC) is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of Overfishing Limit (OFL) and any other scientific uncertainty…" *(p. 3208) [In other words, OFL ≥ ABC.]*

ABC for overfished stocks. For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. *(p. 3209)*

NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. (p. 3180)

ABC refers to a level of ''catch'' that is ''acceptable'' given the ''biological'' characteristics of the stock or stock complex. As such, Optimal Yield (OY) does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. (p. 3189)

On "Vulnerability" (DOC Natl. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

"Vulnerability. A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce Maximum Sustainable Yield (MSY) and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality)." (p. 3205)

Participation among members of a Stock Assessment Working Group:

Anyone participating in SAW meetings that will be running or presenting results from an assessment model is expected to supply the source code, a compiled executable, an input file with the proposed configuration, and a detailed model description in advance of the model meeting. Source code for NOAA Toolbox programs is available on request. These measures allow transparency and a fair evaluation of differences that emerge between models.

Appendix 2. Review Meeting Agenda

65th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC)
Benchmark Stock Assessment for A. Sea scallop and B. Herring

June 26-29, 2018

Stephen H. Clark Conference Room – Northeast Fisheries Science Center
Woods Hole, Massachusetts

AGENDA* (version: 6/22/2018)

TOPIC	PRESENTER(S)	RAPPORTEUR

Tuesday, June 26

10 – 10:45 AM
Welcome/Description of Review Process **James Weinberg**, SAW Chair
Introductions/Agenda **Patrick Sullivan,** SARC Chair
Conduct of Meeting

10:45 – 12:45 PM Assessment Presentation (A. Scallops)
Dvora Hart, Jui-Han Chang,
Jonathon Peros **Alicia Miller**

12:45 – 1:45 PM Lunch

1:45 – 3:45 PM Assesssment Presentation (A. Scallops)
Dvora Hart, Jui-Han Chang **Toni Chute**

3:45 – 4 PM Break

4 – 5:45 PM SARC Discussion w/ Presenters (A. Scallops)
Patrick Sullivan, SARC Chair **Toni Chute**

5:45 – 6 PM Public Comments

TOPIC	PRESENTER(S)	RAPPORTEUR
Wednesday, June 27		
8:30 – 10:30 AM	Assessment Presentation (B. Herring) **Jon Deroba**	**Dan Hennen**
10:30 – 10:45 AM	Break	
10:45 – 12:30 PM	Assessment Presentation (B. Herring) **Jon Deroba**	**Dan Hennen**
12:30 – 1:30 PM	Lunch	
1:30 – 3:30 PM	SARC Discussion w/presenters (B. Herring) **Patrick Sullivan,** SARC Chair	**Brian Linton**
3:30 – 3:45 PM	Public Comments	
3:45 -4 PM	Break	
4 – 6 PM	Revisit with Presenters (A. Scallops) **Patrick Sullivan,** SARC Chair	**Brian Linton**
7 PM	**(**Social Gathering**)**	

TOPIC	PRESENTER(S)	RAPPORTEUR

Thursday, June 28

8:30 – 10:30	Revisit with Presenters (B. Herring) **Patrick Sullivan,** SARC Chair	**Tony Wood**
10:30 – 10:45	Break	
10:45 – 12:15	Review/Edit Assessment Summary Report (A. Scallops) **Patrick Sullivan,** SARC Chair	**Tony Wood**
12:15 – 1:15 PM	Lunch	
1:15 – 2:45 PM	(cont.) Edit Assessment Summary Report (A. Scallops) **Patrick Sullivan,** SARC Chair	**TBD**
2:45 – 3 PM	Break	
3 – 6 PM	Review/edit Assessment Summary Report (B. Herring) **Patrick Sullivan,** SARC Chair	**TBD**

Friday, June 29

9:00 AM – 5:00 PM	SARC Report writing

*All times are approximate, and may be changed at the discretion of the SARC chair. The meeting is open to the public; however, during the SARC Report Writing sessions we ask that the public refrain from engaging in discussion with the SARC.

Appendix 3. Individual Independent Peer Review Report Requirements

1. The independent peer review report shall be prefaced with an Executive Summary providing a concise summary of whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.).

2. The report must contain a background section, description of the individual reviewers' roles in the review activities, summary of findings for each TOR in which the weaknesses and strengths are described, and conclusions and recommendations in accordance with the TORs. The independent report shall be an independent peer review, and shall not simply repeat the contents of the SARC Summary Report.

   a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.

   b. Reviewers should discuss their independent views on each TOR even if these were consistent with those of other panelists, but especially where there were divergent views.

   c. Reviewers should elaborate on any points raised in the SARC Summary Report that they believe might require further clarification.

   d. The report may include recommendations on how to improve future assessments.

3. The report shall include the following appendices:

   Appendix 1: Bibliography of materials provided for review
   Appendix 2: A copy of this Statement of Work
   Appendix 3: Panel membership or other pertinent information from the panel review meeting.

Appendix 4. SARC Summary Report Requirements

1. The main body of the report shall consist of an introduction prepared by the SARC chair that will include the background and a review of activities and comments on the appropriateness of the process in reaching the goals of the SARC. Following the introduction, for each assessment reviewed, the report should address whether or not each Term of Reference of the SAW Working Group was completed successfully. For each Term of Reference, the SARC Summary Report should state why that Term of Reference was or was not completed successfully.

   To make this determination, the SARC chair and reviewers should consider whether or not the work provides a scientifically credible basis for developing fishery management advice. If the reviewers and SARC chair do not reach an agreement on a Term of Reference, the report should explain why. It is permissible to express majority as well as minority opinions.

   The report may include recommendations on how to improve future assessments.

2. If any existing Biological Reference Points (BRPs) or BRP proxies are considered inappropriate, include recommendations and justification for alternatives. If such alternatives cannot be identified, then indicate that the existing BRPs or BRP proxies are the best available at this time.

3. The report shall also include the bibliography of all materials provided during the SAW, and relevant papers cited in the SARC Summary Report, along with a copy of the CIE Statement of Work.

   The report shall also include as a separate appendix the assessment Terms of Reference used for the SAW, including any changes to the Terms of Reference or specific topics/issues directly related to the assessments and requiring Panel advice.

Attachment 2

SARC 65 ATTENDEE LIST

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Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Atlantic Herring Management Board

FROM: Megan Ware, FMP Coordinator

DATE: September 27, 2018

SUBJECT: Consideration of Atlantic Herring Spawning Protections

At its August 7th meeting, the Atlantic Herring Management (Board) asked staff to review the current protections provided to spawning herring. The purpose of this task was to assess whether additional spawning protections need to be considered, particularly in light of the 2018 Stock Assessment which showed declines in recruitment and spawning stock biomass over the last five years. This memo seeks to provide background on the current spawning closures in the Gulf of Maine while re-visiting the management alternatives selected in Amendment 3. Based on inquiries from Board members, the memo also outlines considerations regarding the protection of spawning aggregations in Georges Bank and Nantucket Shoals. Staff highlights that the purpose of the discussion on Georges Bank and Nantucket Shoals is to inform preliminary conversations and there is no recommendation on whether these spawning protections should be pursued.

It is important to note that the New England Fishery Management Council (NEFMC) and NOAA Fisheries are federal partners in the management of Atlantic herring. The NEFMC recently took action under Amendment 8 to establish a 12 nautical mile buffer in management areas 1A, 1B, 2 (east of 71°, 51° W), and 3 which prohibits the use of mid-water trawls year-round. In addition, along the backside of the Cape, the buffer is extended by two 30 minute squares. It is likely that this buffer, if implemented by NOAA Fisheries, will impact catch in and around Nantucket Shoals, and could impact future discussions on spawning protections.

I. Overview of Herring Spawning Locations and Current ASMFC Protections in the GOM

Atlantic herring primarily spawn in the northern extent of the species range (Cape Cod to Newfoundland)[1]. Within the Gulf of Maine-Georges Bank stock complex, three primary spawning locations have been identified: 1) the coast of Gulf of Maine; 2) Georges Bank; and 3) Nantucket Shoals[2]. Each of these primary spawning areas are comprised of smaller, discrete spawning sites (e.g. Jeffreys Ledge in the Gulf of Maine). Figure 1 provides an overview of general herring spawning locations, as identified in green.

[1] Atlantic States Marine Fisheries Commission (ASMFC). 2016. Amendment 3 to the Interstate Fishery Management Plan for Atlantic Herring.
http://www.asmfc.org/uploads/file/5b2138d8AtlHerringAmendment3_revisedJune2018.pdf

[2] ASMFC, 2016.

Amendment 3 provides protections to spawning herring in the inshore Gulf of Maine by instituting spawning closures which prohibit directed fishing. The closure protocol uses a gonad-to-body index (GSI) to measure herring maturity in three closure areas: Eastern Maine (EM), Western Maine (WM), and Massachusetts/New Hampshire (MA/NH). Given larger herring spawn first, the GSI values are standardized to a 30 cm fish. A minimum of three samples of fresh herring, either from fishery independent or dependent sources, are used to model the relationship between GSI and date, and forecast the timing of spawning closures. If there are insufficient samples to forecast the timing of spawning, a default closure date is used. This default date is derived from median trigger dates over the last decade as well as applicable literature. The initial 4-week spawning closure can be extended two additional weeks if a sample indicates a significant number of spawning herring remain in the area.

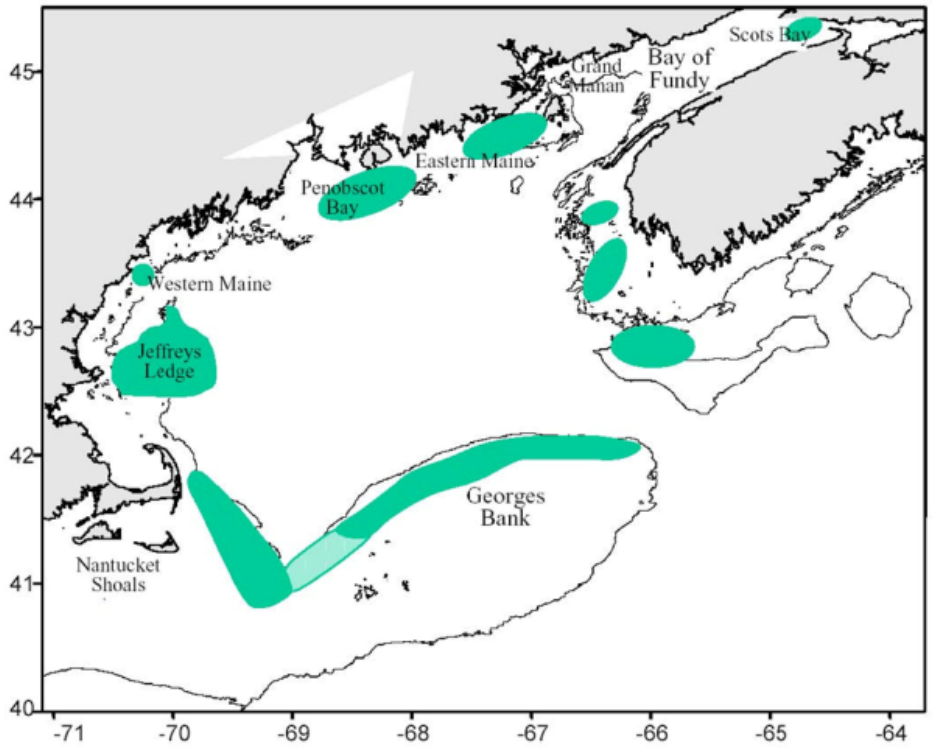


Figure 1: Overview of major Atlantic herring spawning areas, identified in green, in the Gulf of Maine and on Georges Bank. Source: Overholtz et al. 2004.

II. Assessing Spawning Protections in the Gulf of Maine

Given results of the 2018 Stock Assessment, questions have been raised regarding current spawning protections in the Gulf of Maine and whether they can be improved. One way to assess the adequacy of the current spawning protocol is to revisit the suite of management alternatives presented in Amendment 3 to determine if the options selected are still appropriate. Table 1 summarizes the management alternatives considered and selected in Amendment 3; these alternatives are described in greater detail below.

Table 1: Management alternatives included in Amendment 3 pertaining to the spawning protocol. Shaded rows represent the management alternative selected by the Board during final action.

Spawning Area Closure Monitoring System	Status quo (length based protocol)	**GSI_{30} Trigger Value**	23
	Status quo with adjustments to allow for fishery independent and dependent samples		25
	GSI_{30} based forecast system		28
Spawning Area Boundaries	Status quo (three spawning areas)	**Closure Period**	Status quo (4 weeks)
	Combine WM and MA/NH		6 weeks
Re-closure Protocol	Status quo (2 weeks)		
	Status quo with greater definition		
	No re-closure protocol		

Spawning Area Closure Monitoring System

One of the principal changes approved through Amendment 3 was the adoption of the GSI_{30} spawning protocol for Atlantic herring. Previously, the Board had used a system which monitored herring maturity within two size classes. When three consecutive samples within a week showed that either size class had exceeded its threshold, the spawning closure was implemented. The new GSI_{30} protocol standardized observations to larger herring (30cm fish), allowing the spawning closure to be inclusive of most spawning fish. In addition, since samples are used to project the relationship between GSI and a date, the implementation of a GSI_{30} spawning closure is not dependent on obtaining consecutive samples from the fishery within a single week.

In January 2018, the Atlantic Herring Technical Committee (TC) compared the performance of the GSI_{30} spawning protocol to the previously used length-based system[3]. This review only evaluated data from the MA/NH closure given it had the greatest number of samples from 2015-2017. Overall, the TC concluded that the GSI_{30} protocol represents a significant improvement in the protection of spawning fish as it is better able to predict inter-annual changes in the timing of spawning. Using 2015 as a case study, the TC showed that under the previous length-based protocol, the spawning closure in MA/NH was initiated nearly 2 weeks early, requiring the subsequent use of the 2 week re-closure. In contrast, if the GSI_{30} protocol had been used, the spawning closure would have started 3 days after spawning began and likely without the need for a re-closure (Figure 2).

GSI_{30} Trigger Value

A key component of the GSI_{30} protocol is the value at which a spawning closure is triggered. A higher trigger value closes the fishery later and just prior to spawning while a lower trigger value provides additional protection to maturing fish by encompassing time before the

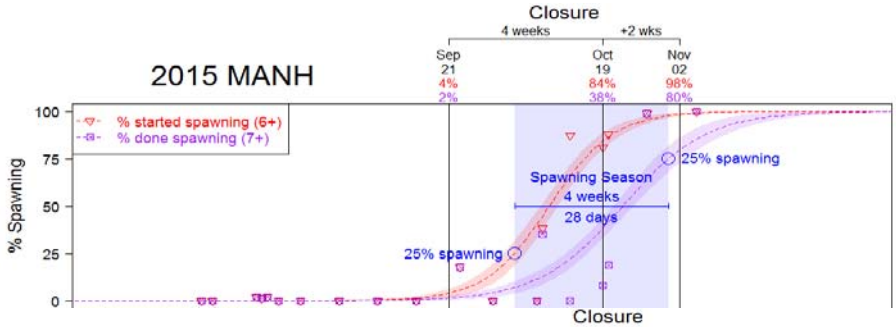
[3] ASMFC. 2018. A Review of the modified Gonadal-Somatic Index (GSI) Monitoring System for Atlantic Herring Spawning Closures in US Waters.
http://www.asmfc.org/uploads/file/5a95d99eHerringSpawningClosureReport_Jan2018.pdf

spawning season begins. Through Amendment 3, the Board implemented a trigger value of 25, in between the other two alternatives of 23 and 28. Rational for the trigger value of 25 was that it closes the fishery in the later stages of maturity but before spawning.

To assess the effectiveness of the current GSI_{30} trigger value, the TC, in their January 2018 memo, defined a spawning season as beginning when there is expected to be 25% spawning herring in the population. This definition was derived from re-closure protocol which defines a significant number of spawning herring to be when 25% or more mature herring have yet to spawn. The TC then compared the start of a spawning closure via the trigger value to the population reaching this 25% threshold. Overall, results showed that, from 2015 to 2017, the current GSI_{30} trigger value (25) resulted in a spawning closure that started within a few days of when the population reached 25% spawning (Figure 2). Specifically, in 2015, if the GSI_{30} protocol had been used, the current trigger value would have started the spawning closure 3 days after the population reached the 25% threshold; in 2016, the spawning closure started 5 days after the population reached the 25% threshold; and in 2017, the closure started 2 days prior to the population reaching the 25% threshold.

One of the questions for the Board to consider is whether initiating a spawning closure when approximately 25% of the population is spawning is still appropriate, given the poor condition of the stock. The TC's analysis suggest that reducing the GSI_{30} trigger value to 23 or 24 would reduce the probability of greater than 25% spawning fish in the catch. This is particularly true in years, or regions, where there are few GSI_{30} samples. However, a lower trigger value will require an earlier default date, and may require frequent re-closures, unless the closure duration is extended beyond the current four weeks.

A.



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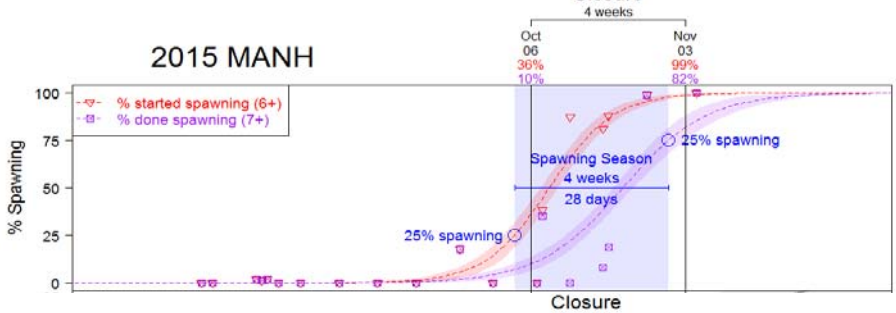

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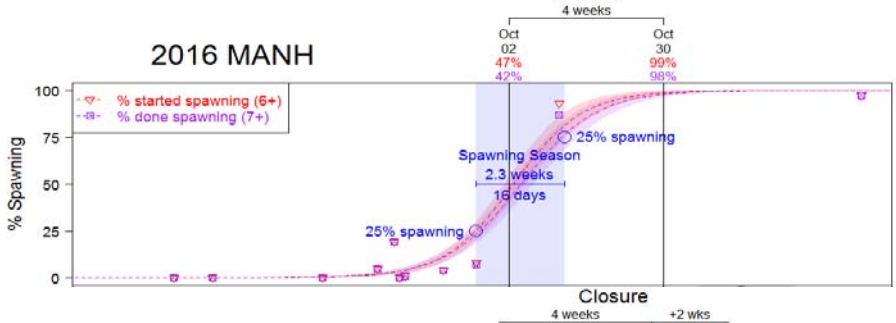


D.

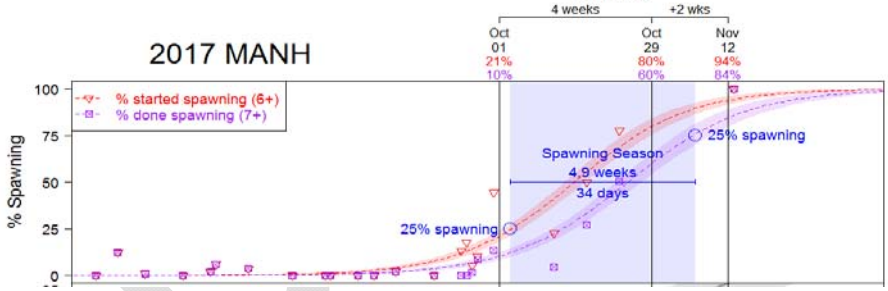


Figure 2: Estimated spawning season for the MA/NH spawning area 2015-2017. A) 2015 closure dates under the previously used length-based protocol. B) 2015 closure dates under the GSI_{30} protocol. C) 2016 closure dates under the GSI_{30} protocol. D) 2017 closure dates under the GSI_{30} protocol. The spawning season is identified by the blue shaded regions while the black vertical lines represent the spawning closures enacted by management. Source: Atlantic Herring TC Memo January 2018.

Spawning Closure Period

Amendment 3 established a 4 week spawning closure with the ability to re-close a spawning area for an additional 2 weeks if a sample indicates a significant number of spawners remain. The primary rational given by the Board for this management alternative was that this option balanced the need to protect spawning fish while minimizing negative impacts on the fishing

industry; it maximized coverage of the spawning season and access to herring quota. Other management alternatives in Amendment 3 included a 6 week closure period and no re-closure protocol.

The TC's January 2018 review of the GSI_{30} spawning protocol showed that, between 2015 and 2017, spawning seasons in the MA/NH area were 4 weeks, 2.3 weeks, and 4.9 weeks. The TC expressed greater confidence in the longer spawning season estimates given a significantly higher number of samples in 2015 and 2017. Again, the TC defined the onset of the spawning season by achieving 25% spawners in the fishery; if the Board wanted to define the start of the spawning season at a lower percentage, this would increase the length of the spawning season (Figure 3). Based on these results, the TC concluded that use of the 4 week initial spawning closure would likely result in frequent use of the re-closure protocol. The TC also noted that if the Board was interested in simplifying the closure protocol, increasing protection during spawning, and potentially providing greater predictability to industry, the Board could consider a longer initial closure period of five to six weeks. This would likely reduce the need for frequent 2 week re-closures.

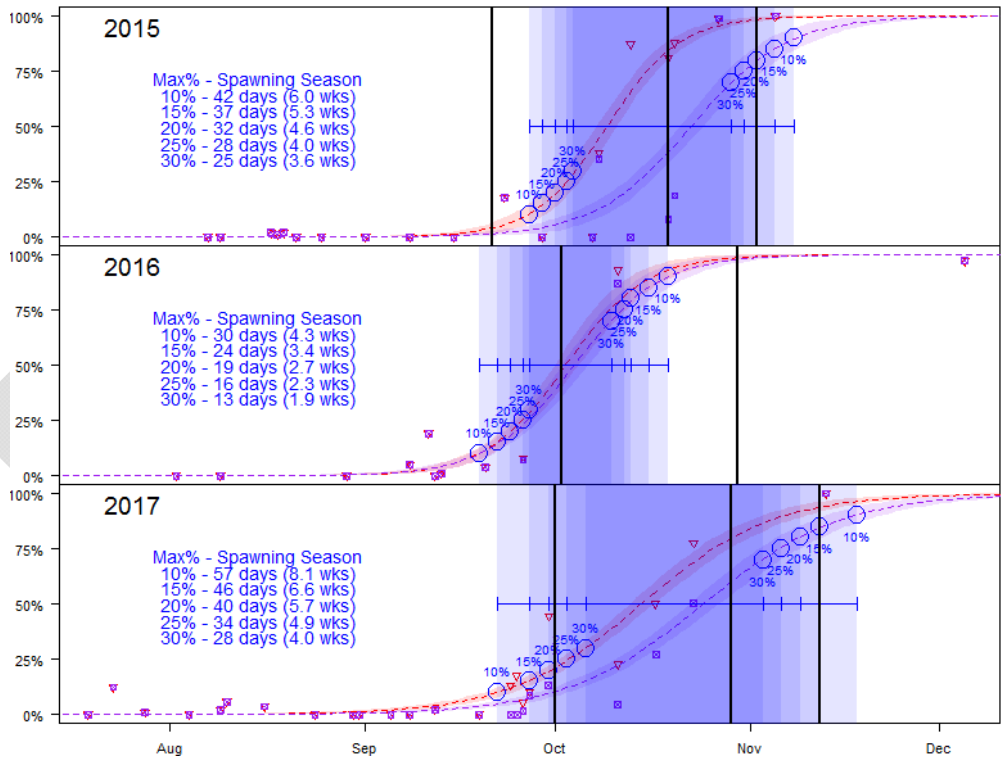


Figure 3. Effect of choice of maximum allowable % spawning in the catch on duration of the spawning season. Source: Atlantic Herring TC Memo January 2018.

Spawning Area Boundaries

Finally, Amendment 3 defined the area boundaries for the herring spawning closures. Specifically, Amendment 3 considered combining the WM and MA/NH spawning areas into a single unit given there was no significant difference in the default spawning times between the

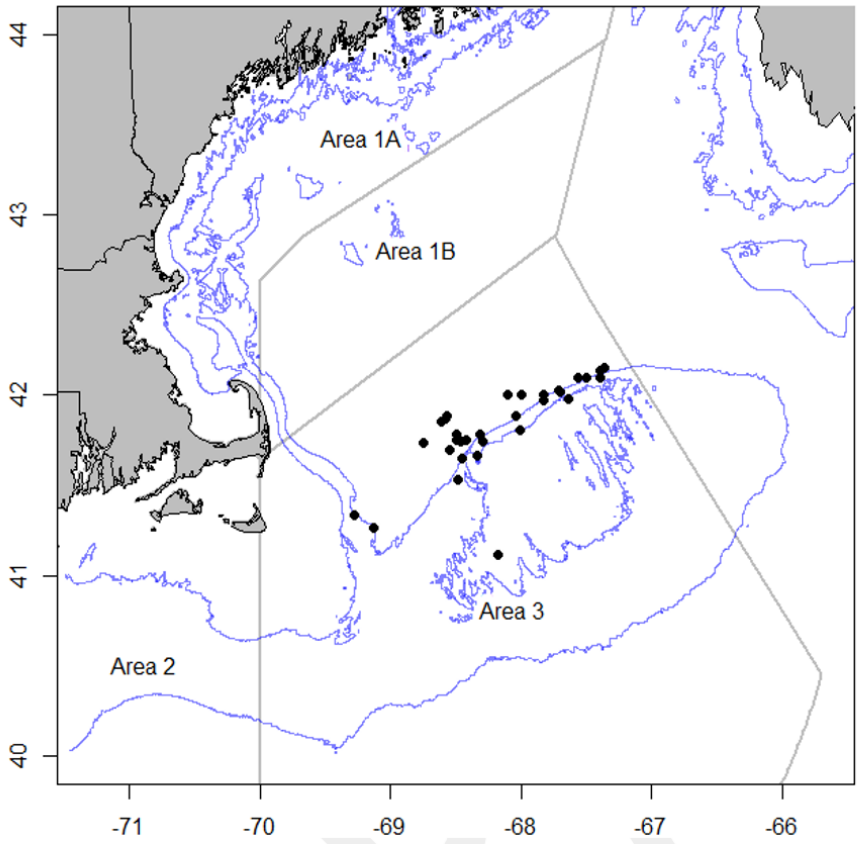
two areas under the GSI_{30} protocol. Combining spawning areas would also reduce the need to collect GSI samples from 3 distinct areas in the Gulf of Maine. Ultimately, the Board decided to maintain the three distinct spawning areas given concerns that a wide-spread closure could limit bait availability.

While the TC's January 2018 analysis did not evaluate the effectiveness of maintaining the three distinct closure areas, it is possible to compare the timing of spawning closures in WM and MA/NH in 2016 and 2017. Specifically, in 2016, the WM closure began on September 18th while the MA/NH closure began on October 2nd. In 2017, the WM closure began on September 26th and the MA/NH closure began on October 1st. None of these closures relied on the default date as sufficient samples were available. Thus, it does appear that over the last two years, there have been slight differences in the timing of the spawning closures between the two areas.

III. Considerations for Georges Bank and Nantucket Shoals

Given the recent declines in recruitment and spawning stock biomass, several questions have been raised regarding the need for, and ability to implement, spawning protections in Georges Bank and Nantucket Shoals. Both of these areas are recognized as major spawning areas for Atlantic herring but do not have protections specific to spawning. This section seeks to highlight some of the considerations that would need to be made if the discussion moves forward; it does not intend to provide a recommendation as to whether these spawning protections should be pursued.

The existing GSI_{30} spawning closure system requires enough samples to inform the relationship between GSI and maturity, and annually project spawning closures. In the Gulf of Maine, the long term use of closures to protect spawning aggregations has prompted the collection of samples to meet these needs. In contrast, significantly fewer samples have been collected from Georges Bank and Nantucket Shoals. Staff from Massachusetts Department of Marine Fisheries provided a table of herring samples taken in Georges Bank and Nantucket Shoals over the last 20 years (Figure 4). Of these samples, the majority are from Georges Bank (~96%), with only 2 samples taken from Nantucket shoals.



Year	Trips sampled
1998	2
1999	0
2000	8
2001	0
2002	5
2003	1
2004	0
2005	1
2006	0
2007	0
2008	0
2009	0
2010	1
2011	2
2012	4
2013	5
2014	5
2015	4
2016	3
2017	2
2018	3
Total	46

Figure 4: Number of Atlantic herring samples taken from vessels fishing in Georges Bank and Nantucket Shoals (1998-2018). Samples obtained by MA DMF.

The current low number of samples prompts considerations about extending the existing spawning closure protocol offshore. As outlined in an October 2012 memo to the Board[4], the TC noted that while there are known spatial and seasonal spawning patterns in the Gulf of Maine, these are not as well documented in offshore regions. Recent conversations with the TC indicate it may be possible to elucidate the relationship between GSI and maturity stage for Georges Bank based on the number of samples from MA DMF; however, it is unlikely that this would be possible for Nantucket Shoals. This means that, particularly for Nantucket Shoals, another management strategy may need to be considered if the Board is interested in extended spawning protections to these regions. In addition, the ability to collect samples from all regions (Gulf of Maine, Georges Bank, Nantucket Shoals) may be impacted by results of the 2018 Stock Assessment. Specifically, since it is expected that there will be significant decreases in the 2019-2021 Atlantic herring Annual Catch Limits (ACLs), it may become increasingly difficult to obtain samples from the directed commercial fleet. The GSI_{30} protocol for Gulf of Maine does allow samples to be collected from fishery independent and dependent sources, so there may be greater reliance on samples from outside the herring fishery.

[4] ASMFC. 2012. Potential issues and considerations with Georges Bank/Nantucket Shoals off shore spawning area. http://www.asmfc.org/uploads/file/atlHerringTCreport_NantucketShoals_Oct2012.pdf

Another consideration, particularly for Georges Bank, is the size and location of protections provided to spawning areas. The Georges Bank spawning area (see Figure 1) is large, encompassing most of the northern edge of the Bank. Given this expansive size, spawning throughout the region may not occur at the same time. Ideally, spawning closures occur at the exact time of the spawning season in order to maximize the protection given to the population while minimizing economic impacts on the industry. In the Gulf of Maine, this is achieved by having discrete closure areas that encompass slightly different spawning times (e.g. EM versus WM). If a similar approach is considered for Georges Bank, a higher number of annual samples will be required to determine the spatial extent of specific spawning locations and their timing. In contrast, implementing a single, large spawning closure across the northern edge of Georges Bank would require fewer annual samples but would likely require a longer closure in order to protect asynchronous spawning. Potential economic impacts of this larger and longer closure may need to be considered.

Finally, while multiple spawning closures areas could provide additional protections to spawning fish, it may also have an unintended consequence of concentrating fishing effort into the remaining open regions. In particular, if spawning closures in the Gulf of Maine and Georges Bank do not occur at the same time, a closure in one area may cause industry to aggregate in the other.

IV. References

Atlantic States Marine Fisheries Commission (ASMFC). 2016. Atlantic Herring Amendment 3. http://www.asmfc.org/uploads/file/5b2138d8AtlHerringAmendment3_revisedJune2018.pdf

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ASMFC. 2018. A Review of the modified Gonadal-Somatic Index (GSI) Monitoring System for Atlantic Herring Spawning Closures in US Waters. http://www.asmfc.org/uploads/file/5a95d99eHerringSpawningClosureReport_Jan2018.pdf

Overholtz, W.J., Jacobson, L.D., Melvin, G.D., Cieri, M., Power, M., Libby, D. and Clark, K. February 2004. Stock Assessment of the Gulf of Maine – Georges Bank Atlantic Herring Complex, 2003. Northeast Fisheries Science Center Reference Document 04- 06.

New England Fishery Management Council

FOR IMMEDIATE RELEASE
October 1, 2018

PRESS CONTACT: Janice Plante
(607) 592-4817, jplante@nefmc.org

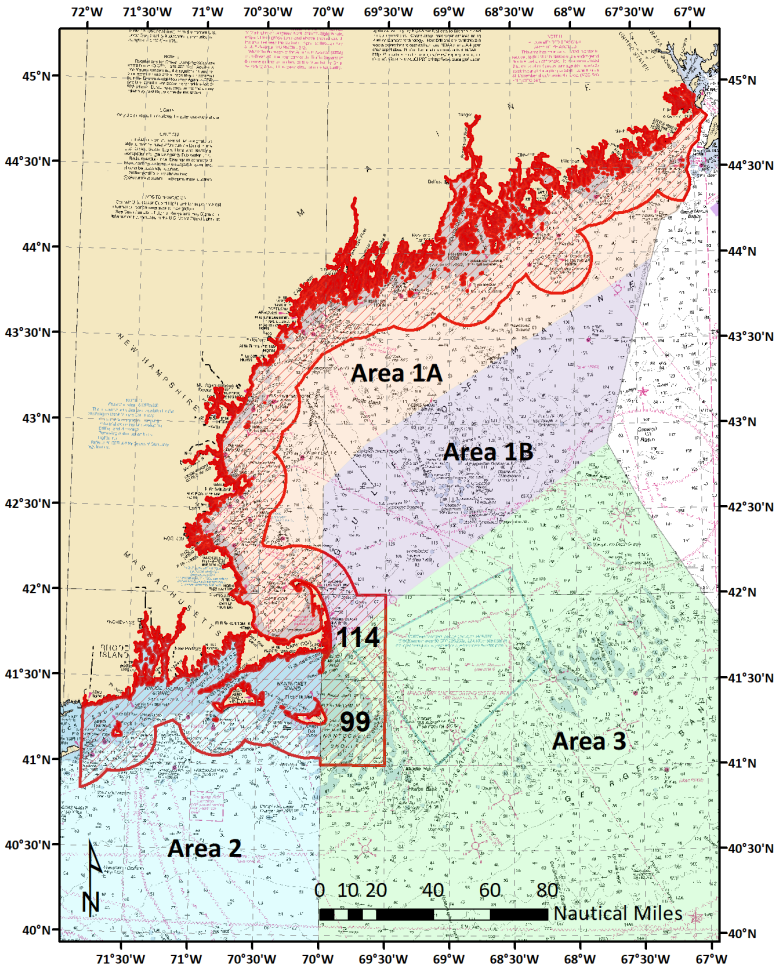
Atlantic Herring: Council Approves Amendment 8 With New ABC Control Rule, Buffer Zone; Asks NMFS to Set 2019 Specs

On September 25 during its meeting in Plymouth, MA, the New England Fishery Management Council approved Amendment 8 to the Atlantic Herring Fishery Management Plan. The Council also asked the National Marine Fisheries Service (NMFS, NOAA Fisheries) to develop an in-season action to set 2019 specifications for the herring fishery.

Amendment 8

Here are the two measures the Council approved for Amendment 8:

- **ABC Control Rule:** The acceptable biological catch (ABC) control rule is a formula that will be used to set annual catch limits. The Council considered close to a dozen alternatives that would allow different levels of fishing mortality depending on the estimated level of herring biomass in the ecosystem. In the end, the Council adopted a control rule that balances many objectives by capping overall fishing mortality at 80% of sustainable levels. Previously, fishermen were allowed to harvest up to 100% of sustainable catch levels. Under the proposed control rule, a portion of the available catch would be set aside to explicitly account for the important role of Atlantic herring as forage within the ecosystem. The new control rule also will better address uncertainty in year-to-year variation in biomass estimates. While the control rule will reduce catches in the near term, it has a lower probability of resulting in overfishing than previous methods used to set catch limits.



The 12-nautical-mile buffer zone adopted by the Council runs from the Canadian border to Connecticut and includes blocks 114 and 99 eastward of Cape Cod. If approved by NMFS, midwater trawling would be prohibited inside this zone year-round. – *NEFMC graphic*

New England Fishery Management Council

- **Potential Localized Depletion and User Conflicts – Buffer Zone:** The Council also considered numerous alternatives to address potential localized depletion and user conflicts in the Atlantic herring fishery. After carefully weighing all public comment and thoroughly debating the issue before a large crowd of stakeholders, the Council approved a blend of two modified alternatives, which resulted in the following. If approved by NMFS:
    - Midwater trawling would be prohibited year-round within 12 nautical miles of the territorial sea baseline from Maine to the 71° 51' W longitude line off Connecticut. The outer boundary of this "buffer zone" is the same as the territorial sea limit; and
    - Midwater trawling also would be prohibited year-round within two 30-minute squares eastward of Cape Cod, which are known as blocks 114 and 99. This second step essentially expands the width of the buffer zone to roughly 20 nautical miles east and southeast of the Cape (see map on previous page).

What's Next?

Q: Will Amendment 8 go into place immediately?

A: No. Even though the Council has cast its final votes on Amendment 8, Council staff and the Herring Plan Development Team need to finalize the document and submit the amendment to NMFS/NOAA Fisheries for review and potential approval.

Q: When will NMFS implement the amendment?

A: NMFS first will publish a proposed rule, and the public will have another opportunity to provide comments. The agency then will review those comments, approve or disapprove the amendment, and, if approved, publish a final rule. Timing for implementation of the final rule is uncertain but is expected sometime in 2019.

The New England Council had a full house of stakeholders on hand during its deliberations in Plymouth, MA on September 25, 2018 on Amendment 8 to the Atlantic Herring Fishery Management Plan. – NEFMC photo

Amendment 8 goals

1. To stabilize the fishery at a level designed to achieve optimum yield;
2. To account for the role of Atlantic herring in the ecosystem, including its role as forage; and
3. To address potential localized depletion and potential user conflicts in the fishery, a goal that was added to Amendment 8 following the initial scoping period.

Visit the Council's Atlantic Herring Amendment 8 webpage.

New England Fishery Management Council

Stock Status and 2019 Catch Limits

Before it began discussing Amendment 8, the Council received a presentation on the results of the new benchmark stock assessment for Atlantic herring. The assessment concluded that overfishing was **not** occurring, and the stock was **not** overfished.

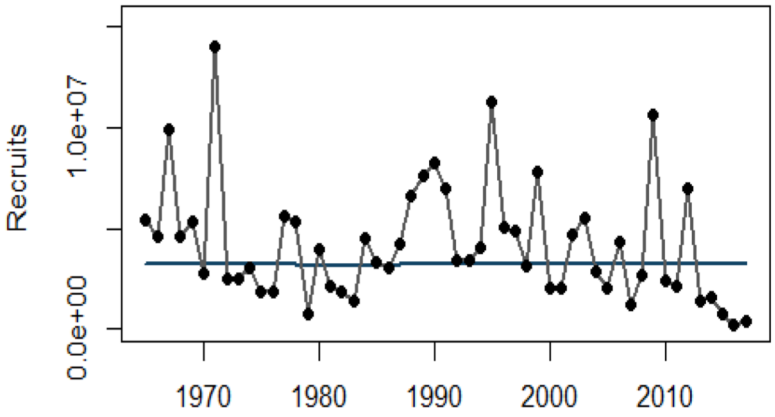
However, assessment scientists found that recruitment of age-1 fish "has been below average since 2013," and four of the lowest recruitment estimates on record occurred in 2013, 2015, 2016, and 2017. Assessment scientists concluded, "If the recent estimates of poor recruitment are confirmed and continue into the future, projected stock status will continue to decline."

The Council weighed this sobering information and then voted to ask NMFS to develop an in-season action to set 2019 catch limits. Although the Council is developing a new specifications package for 2019-2021, the Council recognized that NMFS may be able to act more quickly for fishing year 2019 and reduce the probability of overfishing.

Given the Council's request, NMFS now will have the final say on how the 2019 catch limits are set. The Council asked the agency to:

- Use the most recent assessment and projections;
- Use the ABC control rule approved the by Council in Amendment 8;
- Maintain the sub-annual catch limits for herring management areas based on the same proportions as the 2016-2018 specifications package:
    - Area 1A = 28.9%
    - Area 1B = 4.3%
    - Area 2 = 27.8%
    - Area 3 = 39%
- Proportionally reduce the fixed gear set-aside for the weir fishery west of Cutler, ME, which is a very small fishery; and
- Set the border transfer to 0 mt. This provision allows U.S. vessels to transfer herring to Canadian vessels to be processed as food.

Atlantic Herring Recruitment 1975-2017



***ABOVE**: Recruitment of age-1 fish has been below average since 2013. For reference, the record high in the time series occurred in 1971 when the population contained an estimated 1.4 billion age-1 fish. Record lows were estimated for 2016 and 2017, when estimates were 1.7 million and 3.9 million age-1 fish respectively.*

– NEFSC, SAW/SARC graphics

Atlantic Herring (*Clupea harengus*). – NOAA Fisheries graphic

For more information, contact Deirdre Boelke, the Council's Atlantic Herring Plan Coordinator, at (978) 465-0492, ext. 105, dboelke@nefmc.org.

The Council will continue working on specifications for fishing years 2020 and 2021.

Atlantic States Marine Fisheries Commission

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

MEMORANDUM

September 17, 2018

To: **Atlantic Herring Section**

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

RE: **Advisory Panel Nomination**

Please find attached a new nomination to the Atlantic Herring Advisory Panel – Joseph Jurek, a commercial otter trawl fisherman from Massachusetts. Please review this nomination for action at the next Section meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: Megan Ware

ATLANTIC HERRING ADVISORY PANEL

Bolded names await approval by the Atlantic Herring Section Board
Bolded and italicized name denotes Advisory Panel Chair September 17, 2018

Maine (6)

Jennie Bichrest (bait)
21 Sandy Acres Dr.
Topsham, ME 04086-5157
Phone: 207.841.1454
jennieplb@yahoo.com
Appt. Confirmed 3/26/97
Appt. Reconfirmed 10/1/01; 1/1/05; 5/10; 4/14

Glenn Robbins (comm/purse seine)
ME Seiners Assn F/V Western Sea
7 Alden Lane
Eliot, ME 03903-2102
Phone: 207.439.2079
robbins62@gmail.com
Appt. Confirmed 3/26/97
Appt. Reconfirmed 10/1/01; 1/1/05;
5/10; 4/14

Mary Beth Tooley (comm/mid-water trawl & purse seine)
415 Turnpike Dr.
Camden, ME 04843-4437
Phone: 207.763.4176
FAX: 207.837.3537
mbtooley@live.com
Appt. Confirmed 7/14/03
Appt Reconfirmed 7/07; 4/14

John Stanley (comm inshore/stop seine, traps, rod & reel)
789 Indian Point Road
Mt. Desert, ME 04660
Phone (cell): 207.460.2395
Phone (eve): 207.244-7409
FAX: 207.244.3089
dogwood@acadia.net
Appt Confirmed 5/4/17

Stephen B. Weiner (At-large, comm. bluefin tuna harpoon)
12 Judson Road
Andover, MA 01810
Phone: 978.764.3637
weinersb@gmail.com
Appt. Confirmed 8/18/09
Appt. Reconfirmed 4/14

- **Has been a ME resident for past few years. MA maintained him as one of its AP members until recently**

Vacancies – Processor and at-large seat

New Hampshire (2)

Mike Anderson (comm. trawler)
10 Washington Road
Rye, NH 03870-0055
Phone: 603.436.4444
padi.anderson@gmail.com
Appt. Confirmed 8/18/09
Appt. Reconfirmed 5/14

Shawn Joyce (rec)
270 Washington Road
Rye, NH 03870
Phone: 603.548.5267
sjoycemail@comcast.net
Appt. Confirmed 10/27/14

Massachusetts (4)

Captain Patrick Paquette (rec. & for-hire)
MA Striped Bass Association
61 Maple Street
Hyannis, MA 02601
Phone: 781.771.8374
BasicPatrick@aol.com
Appt. Confirmed 2/1/10
Appt. Reconfirmed 4/14; 8/18

Joseph Jurek (comm. otter trawl)
8 Annisquam Heights
Gloucester, MA 01930
Phone: 978.497.3652
mystiqueladyfishing@gmail.com

Gerry O'Neil (comm. midwater trawl/dealer/processor)
Cape Seafoods
3 State Fish Pier
Gloucester, MA 01930

ATLANTIC HERRING ADVISORY PANEL

Bolded names await approval by the Atlantic Herring Section Board
Bolded and italicized name denotes Advisory Panel Chair September 17, 2018

Phone: 978.479.4646
gerryjr@capeseafoods.com
Appt. Confirmed 8/7/18

Beth Casoni (commercial)
Massachusetts Lobstermen's Association
96 Meetinghouse lane
Marshfield, MA 02050
Phone: 781.545.6984 ext 1
bethcasoni@lobstermen.com
Appt. Confirmed 8/7/18

Rhode Island (1)
Philip Ruhle Jr (At-large, comm. trawl – multispecies)
28 Serenity Way
Peacedale, RI 02879
Phone (cell): 401.265.8862
Phone (home): 401.792.0188
FAX: 401.788.8275
pruhle@cox.net
Appt. Confirmed 11/2/09

New York (1)
Mark Phillips (comm/otter trawl)
Seafood Harvesters Association
210 Atlantic Avenue
Greenport, NY 11944-1201
FAX: 631.477.8583
Appt. Confirmed 5/30/96
Appt. Reconfirmed 9/15/00; 1/23/06; 5/10

New Jersey (3)
Greg DiDomenico (comm.)
Garden State Seafood Association
13103 Misty Glen Lane
Fairfax, VA 22033-5080
Phone: 609.898.1100
FAX: 609.898.6070
gregdi@voicenet.com
Appt. Confirmed 1/23/06

Chair – Jeff Kaelin (comm. trawl and purse seine) (5/12)
Lund's Fisheries, Inc.
997 Ocean Drive
Cape May, NJ 08204
Phone: 207.266.0440
Office: 609.884.7600 x213
jkaelin@lundsfish.com
Appt. Confirmed 8/18/09
Appt Reconfirmed 4/2014

Vacancy – At-large seat

Nontraditional Stakeholders (2 seats)

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

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

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

Name of Nominee: Joseph B. Jurek

Address: 8 Annisquam Heights

City, State, Zip: Gloucester, MA 01930

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

Phone (day): 978 407 3652 Phone (evening): 978 407 3652

FAX: — Email: Mystiquedayfisher@Gmail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Atlantic herring
   2. _____
   3. _____
   4. _____
2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?
   ☐yes ☒no
3. Is the nominee a member of any fishermen's organizations or clubs?
   ☐yes ☐no

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

NEFS Sector II
Yankee Fishermans Coop
Northeast Seafood Coalition

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

Groundfish
Loligo Squid
Herring
Northern Shrimp RSA
Whiting
Bluefin Tuna

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

Scallops
Bluefin tuna
Northern Shrimp
Groundfish
Herring/Whiting
Loligo Squid

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? 25
2. Is the nominee employed only in commercial fishing? ☒yes ☐no
3. What is the predominant gear type used by the nominee? Otter trawl

FOR CHARTER/HEADBOAT CAPTAINS:

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

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

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

   _____

FOR RECREATIONAL FISHERMEN:

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

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

   If "yes," please explain.

   _____

FOR SEAFOOD PROCESSORS & DEALERS:

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

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

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

   _____

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

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

   _____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? 40 years

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

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

   _____

FOR ALL NOMINEES:

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

To whom it may concern:

As a captain who has fished with a raised footrope trawl in area 1a for herring I have a different perspective than some of the larger scale herring boats. This perspective includes years of following the local biomass thru its typical spawning progression and how that effects other fisheries that I participate within. Most scientists and regulators will agree that as the conditions change within our management areas abnormality has become the new norm.

(Continued Next Page)

Nominee Signature: JBL Date: 8/21/19

Name: Joseph B Juick
(please print)

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

Dave Reid
State Director

State Legislator

Governor's Appointee

This is why herring management will become an important and difficult topic for managers to make desicisions with. I am very dppreciative that my perspectives will be included in these discussions. And plan to take my role seriously. At this point I am not aware of the frequency and location of the meetings but will make every effort to be deligent about attendance. I dont think anyone will dispute the Fact of the importance of herring as a base for the rest of the species that live and visit the New England management area. that is why I greatly dppreciate your consideration for this nomination.

Sincerely

Joe Jur. K