Atlantic States Marine Fisheries Commission

Atlantic Herring Management Board

February 5, 2019
9:00 – 11:15 a.m.
Arlington, Virginia

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)* 9:00 a.m.

2. Board Consent 9:00 a.m.
   - Approval of Agenda
   - Approval of Proceedings from October 2018

3. Public Comment 9:05 a.m.

4. Consider Approval of Draft Addendum II for Public Comment *(M. Ware)* **Action** 9:15 a.m.

5. Advisory Panel Report *(J. Kaelin)* 9:50 a.m.
   - Setting Quota Periods in Area 1A

6. Consider Postponed Motion from October 2018 Meeting *(P. Keliher)* **Action** 10:10 a.m.

   Postponed Motion: Move to initiate an Addendum which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. Task the PDT to expand the quota period options to increase flexibility when distributing Area 1A herring quota. During years in which sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of harvest to meet the needs of the market.

7. Set Sub-ACL Specifications for the 2019 Fishing Year *(M. Ware)* **Final Action*** 10:45 a.m.
   *Pending release of final rule from NOAA Fisheries

8. Update on Draft Addendum III and New England Fishery Management Council 2019 Priorities *(M. Ware)* 11:00 a.m.

9. Other Business/Adjourn 11:15 a.m.

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

MEETING OVERVIEW

Atlantic Herring Management Board
Tuesday, February 5, 2019
9:00 – 11:15 a.m.
Arlington, Virginia

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: October 22, 2018
Voting Members: ME, NH, MA, RI, CT, NY, NJ, NMFS, NEFMC (9 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from October 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. Draft Addendum II (9:15 – 9:50 a.m.) Action

Background

- The Board initiated development of draft Addendum II to consider strengthening the protections provided to spawning herring in Area 1A.
- The PDT met via conference call on November 27th and January 7th to develop the document. **(Briefing Materials)**

Presentations

- Overview of draft Addendum II for public comment by M. Ware

Board actions for consideration at this meeting

- Approve draft Addendum II for public comment

5. Advisory Panel Report (9:50 – 10:10 a.m.)

Background

- In October, the Board postponed a motion which considered modifications to the annual setting of quota periods in order to provide time for the Advisory Panel to meet and discuss the topic.
- The Atl. Herring Advisory Panel met via conference call on January 3rd to discuss the postponed motion and provide recommendations to the Board. **(Briefing Materials)**

Presentations

- Advisory Panel report by J. Kaelin

6. Postponed Motion From October 2018 Meeting (10:10 – 10:45 a.m.) Action

Background

- In October, the Board postponed the following motion until the Advisory Panel could meet: *Move to initiate an Addendum which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. Task the PDT to expand the quota period options to increase flexibility when distributing Area 1A herring quota. During years in which sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of harvest to meet the needs of the market.*
- The motion is back on the table given the Advisory Panel has met.

Board actions for consideration at this meeting

- Consider action on the postponed motion

7. Set 2019 Sub-ACL Specifications (10:45 – 11:00 a.m.) Final Action

Background

- In October the Board set the quota periods for the 2019 Area 1A fishery but Area 1A sub-ACL specifications were not available at the time.

Presentations

- Overview of 2019 sub-ACL specifications M. Ware

Board actions for consideration at this meeting

- Set the 2019 sub-ACL specifications via a Board motion, pending release of final rule by NOAA Fisheries

8. Update on Draft Addendum III and NEFMC 2019 Priorities (11:00 – 11:15 a.m.)

Background

- In October, the Board initiated Draft Addendum III to establish spawning protections in Area 3. The Board also sent a letter requesting the NEFMC add herring spawning protections to their 2019 priorities.
- At their December meeting, the NEFMC added a priority to consider spawning closures on Georges Bank. This work will likely start through the development of a discussion document.

• The PDT has also begun investigating available data on Georges Bank spawning, outside of state collected samples.
Presentations • Overview of NEFMC 2019 priorities and PDT work by M. Ware

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 • Participation on ASMFC PDT (currently working on Draft Addendum II and III) • Participation on NEFMC PDT and SSC (will be working to recommend specifications for the 2020-2021 fishing years) • Summer/fall collection of spawning samples per the spawning closure protocol • 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 BOARD

The Roosevelt Hotel
New York, New York
October 22, 2018

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

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INDEX OF MOTIONS

1. **Move to approve agenda** by Consent (Page 1).

2. **Move to approve proceedings of August, 2018** by Consent (Page 1).

3. **Move to approve the 2018 Atlantic Herring Benchmark Stock Assessment and Peer Review Report for management use** (Page 3). Motion by David Borden; second by Raymond Kane. Motion carried (Page 3).

4. **Move to initiate an Addendum to consider strengthening the spawning protections provided to Atlantic herring in the Gulf of Maine. This addendum should consider measures including, but not limited to, the closure period length and GSI30 trigger value** (Page 8). Motion by Ritchie White; second by David Pierce. Motion carried (Page 8).

5. **Move to request the ASMFC Executive Committee direct funds to initiate a research program for increased sampling to support herring spawning protections in the northwest corner of Georges Bank and Nantucket Shoals – protection through a 2020 ASMFC addendum to the ASMFC Sea Herring Management Plan. The Board recognizes the need for increased sampling in these regions in order to inform management and protection. Recognizing the New England Fishery Management Council as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities** (Page 9). Motion by Eric Reid; second by Pat Keliher. Motion substituted.

6. **Move to substitute to request that the ASMFC Executive Committee direct funds for increased spawning sampling in Georges Bank and Nantucket Shoals. The Board initiates an addendum to develop a herring spawning protection program in Area 3. Recognizing the New England Fishery Management Council as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities** (Page 15). Motion carried (Page 15).

   Main Motion as Substituted: Move to request that the ASMFC Executive Committee direct funds for increased spawning sampling in Georges Bank and Nantucket Shoals. The Board initiates an addendum to develop a herring spawning protection program in Area 3. Recognizing the New England Fishery Management Council as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities.

7. **Move to allocate Area 1A quota bimonthly; in a manner consistent with the options in Table 5 in Section 4.2.3.2 of Amendment 3 that is labeled "No Landings Prior to June 1 (with June as a one-month period)." This results in the following distribution: Period 1, which is June, 16.4 percent, Period 2, which is July/August, 40.1 percent, Period 3, which is September/October, 34.0 percent and Period 4, which is November/December, 9.5 percent. The fishery will close when 92 percent of the seasonal period's quota has been harvested and any underages from one period may be rolled into the following period** (Page 22). Motion by Doug Grout; second by Pat Keliher. Motion carried (Page 26).

8. **Move to initiate an addendum which considers providing the Atlantic Herring Board flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document** (Page 26). Motion by Ritchie White; second by Steve Train. Motion amended with final vote postponed.

9. **Move to approve Joseph Jurek (MA) to the Atlantic Herring Advisory Panel** (Page 27). Motion by David Pierce; second by Bob Ballou. Motion carried (Page 27).

Main Motion: Move to amend to include to task the PDT to expand the quota period options to increase flexibility when distributing Area 1A herring quota. During years in which sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of harvest to meet the needs of the market.

Main Motion as Amended: Move to initiate an Addendum which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. Task the PDT to expand the quota period options to increase flexibility when distributing harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for expansion of harvest to meet the needs of the market. Motion postponed.

10. **Move to postpone the motion until the AP can be convened to discuss options for greater flexibility for Area 1A allocations** (Page 31). Motion by Adam Nowalsky; second by Emerson Hasbrouck. Motion carried (Page 31).

11. **Motion to adjourn** by Consent (Page 31).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Steve Train, ME (GA)
Sen. Brian Langley, ME (LA)
Doug Grout, NH (AA)
G. Ritchie White, NH (GA)
Sen. David Watters, NH (LA)
Rep. Sarah Peake, MA (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)
David Borden, RI (GA)
Justin Davis, CT, proxy for P. Aarrestad (AA)
Bill Hyatt, CT (GA)
Sen. Craig Miner, CT (LA)
Sen. Phil Boyle, NY (LA)
Maureen Davidson, NY, proxy for J. Gilmore (AA)
Tom Fote, NJ (GA)
Joe Cimino, NJ, proxy for L. Herrighty (AA)
Terry Stockwell, proxy for T. Nies, NEFMC
Allison Murphy, NMFS

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

Ex-Officio Members

Mike Eastman, Law Enforcement Representative
Renee Zobel, Technical Committee Representative

Staff

Robert Beal
Toni Kerns
Megan Ware
Jessica Kuesel
Mark Robson

Guests

Arnold Leo, E. Hampton, NY
Jeff Kaelin, Lund's Fisheries

The Atlantic Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Terrace Ballroom of the Roosevelt Hotel, New York, New York; Monday, October 22, 2018, and was called to order at 1:00 o'clock p.m. by Chairman Patrick C. Keliher.

CALL TO ORDER

CHAIRMAN PATRICK C. KELIHER: Okay, I think we're all present and accounted for. I am not sitting at the head of the table; because of the issues that are going to be brought up today and their importance to the state of Maine. I am going to turn the Chairmanship over to Toni; who will run the meeting.

Before I do that I want to remind everybody we're no longer a management section, we're now a board. We have two additional folks at the table now; Terry Stockwell, who was here for the New England Fisheries Management Council. We don't have four people from the state of Maine on the Board; so Terry, he did move over one extra seat for separation from Maine.

We would also like to welcome Ali Murphy from GARFO; so welcome, Ali! We are obviously at a point in time with herring and herring management that we have many challenges ahead of us; and again that is the reason why I'm going to turn the Chair over to staff for this particular meeting, so with that Toni.

APPROVAL OF AGENDA

CHAIRMAN TONI KERNS: The Board has an agenda before them. Are there any changes to the agenda? If none then we will, oh Pat, sorry.

MR. PATRICK C. KELIHER: I will have one item on enforcement under other business.

CHAIRMAN KERNS: We will add one enforcement item. With that change are there any other changes? Seeing none; without objection we'll consider this agenda approved.

APPROVAL OF PROCEEDINGS

CHAIRMAN KERNS: In the meeting materials you have the proceedings from the August, 2018 meeting. Were there any changes to those proceedings? With none, without objection we'll consider those proceedings approved.

2018 ATLANTIC HERRING BENCHMARK ASSESSMENT FOR PEER REVIEW REPORT

CHAIRMAN KERNS: We'll move right into the first agenda item; which is the 2018 Atlantic Herring Benchmark Assessment for Peer Review Report. If you recall at the August meeting, we had the report of the assessment itself; but the Peer Review Report had not been released. Pat is going to go through what the Peer Reviewer said about the assessment.

MR. PATRICK A. CAMPFIELD: The Herring Benchmark Stock Assessment was peer reviewed in late June in Woods Hole. The Review Committee consisted of Dr. Pat Sullivan, from Cornell University and the New England Council SSC. Other panelists included Cathy Dichmont from Australia, Dr. Needle from United Kingdom, and Geoff Tingley from New Zealand. The assessment terms of reference are listed on the board; I won't go through them individually, but will simply state that all the terms of reference were successfully addressed and completed through the assessment and based on the Review Panel's evaluations.

The overall Review Panel findings are that the 2018 Assessment is accepted by the Review Panel; and they agreed that the stock status is not overfished and no overfishing occurring. Also, given low recent recruitment, the Panel agreed and concluded the prognosis for future stock size is relatively poor.

New reference points were presented; and the Panel found that the approaches used to develop the reference points and to rescale the assessment are scientifically sound, and that

the new biological reference points cannot be compared to past reference points, because they have a different basis.

In addition, the Panel found that the Acoustic Index added to the Trawl Survey was an important component of the stock assessment; and also that the herring fishery was responsible for fewer removals than natural predators. This assessment derived consumption estimates by mostly fish predators; and did not include marine mammals, seabirds and some fish predators like tuna. Finally, the Panel agreed with the natural mortality values that were used in the stock assessment.

They thought they were reasonably justified. In addition, the Review Panel had a handful of recommendations. The first for future assessments is to explore alternative management strategies; to better understand implications, stock declines, and also to continue building on examination of ecological and environmental factors influencing recruitment and mortality.

The addition of the Trawl Survey acoustic survey or acoustic measures were an improvement; but they also suggested that the Assessment Group and the Science Center consider a directed acoustic survey, to complement and compare with acoustic data collected during the Trawl Survey.

Although a number of predators and consumption estimates were derived for future assessments, the Panel thought the Assessment Team could try to include additional predator species if the data are available; also consider alternative approaches to estimating reference point proxies, and finally to continue exploring stock structure.

I think you all have seen these figures before; but you can see the herring catch by gear type; notably declines in recent years, perhaps tied to increased management measures. Perhaps most importantly, herring recruitment has been very low since 2013; including very all-time lows in 2016 and 2017.

Again, I think you've seen these before, but these are the trends in spawning stock biomass and fishing mortality. Current values for 2017 estimated at a little over 141,000 metric tons for SSB; and F2017 of 0.45. I'll wrap up with herring stock status that in 2017 the stock was not overfished and overfishing not occurring. The current reference points are up there as well. Thank you, Madam Chair. That concludes the Review Panel Report.

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

CHAIRMAN KERNS: Does anybody have any questions for Pat? Dr. Pierce.

DR. DAVID PIERCE: Yes Pat, do you know how the projections were run; that is did they use average recruitment over the time series or did they factor in this rather alarming last five years way below average value, because it has a lot to do with the conclusion that overfishing is not occurring and we're not overfished.

MR. CAMPFIELD: Sure. They used I think two different ranges of years. I think they used the recent recruitment in part for the projections; I think for the coming year, to develop the 2018 estimates. Then they used the entire time series; I think 1965 to 2016 for further out years.

DR. PIERCE: All right thanks for that kind of rhetorical question. I've got the Assessment in front of me; and you're quite correct. I wondered if you knew, and you did know. God bless you; you're right on top of it. But in the special comment section of the Assessment, it says something that really hasn't been highlighted at all by anybody.

This includes at the New England Council, where it says, "Note that based on the recent run of below average estimated annual recruits and the assumed catch in 2018 in both example projection scenarios the projected status would change to the stock being overfished and overfishing occurring in 2018 and likely overfished in the years 2019 through '21.

I'm going with the assumption that we're working with a rather desperate situation regarding the status of sea herring and how we manage it; because I don't believe that it was appropriate to use an average recruitment level, when over the last five years it was abysmally low. That is a very special comment that highlights that for all practical purposes we are overfished, and overfishing did occur in 2018. This should affect our decisions as we move forward.

CHAIRMAN KERNS: Any other questions about the Peer Review? Seeing none; is there a motion to approve the Stock Assessment and Peer Review for management use? Is that a yes, David? So moved; is there a second to that motion, Ray Kane. I'm going to read that motion that is on the board.

Move to approve the 2018 Atlantic Herring Benchmark Stock Assessment and Peer Review Report for management use; motion by Mr. Borden, seconded by Mr. Kane. Is there any objection to the approval of this motion? Are there any abstentions? **This motion carries without objection.**

REVIEW AND DISCUSS WHITE PAPER ON ATLANTIC HERRING SPAWNING PROTECTIONS

CHAIRMAN KERNS: Moving on to the next agenda item, we will have Megan review the white paper on the Atlantic Herring Spawning Protections that was requested by the Management Board.

MS. MEGAN WARE: I'll be walking through the Herring White Paper today. As Toni alluded to, this was requested by the Board in August; to review protections that are provided to spawning herring. This is primarily prompted by the results of the 2018 Stock Assessment, which as you just saw showed reduced signs of recruitment and SSB; particularly over the last five years.

The memo has two focuses; the first is a focus on the existing Gulf of Maine spawning closure protocol to assess the adequacy of our current protections. Then it also provides some considerations regarding spawning aggregations in Georges Bank and Nantucket Shoals. This is really intended to inform preliminary discussions. Before getting into the White Paper though, I do want to take a quick detour to the New England Council action; which could impact the discussions had today.

The Council recently took action under Amendment 8; to establish a 12 nautical mile buffer in Management Areas 1A, 1B, 2, east of basically Montauk, and 3, which prohibits the use of midwater trawls year round. That is the red line that is seen on the figure on the right. Along the Cape this buffer is extended by two 30 minute squares, so those are the Squares 114 and 99 that are on that figure.

This still needs to go through Federal Review and consideration for implementation by NOAA. But if this buffer is implemented, it could impact catch in these red highlighted areas. I wanted to bring this to the Board's attention before we talk about spawning protections. Just a reminder on spawning; herring primarily spawn in the northern extent of the species range, and within the Gulf of Maine/Georges Bank stock complex there are three primary spawning locations that have been identified.

Those include the coast of Gulf of Maine, Georges Bank, and Nantucket Shoals. Just to make sure everyone is on the same page here. When I am referring to Nantucket Shoals, I am meaning kind of this green area on the left hand figure that is off to the backside of the Cape. It

almost looks like it forms a checkmark with Georges Bank.

I am talking about the check part of that checkmark as Nantucket Shoals; and then the longer line would be the Georges Bank area, just so everyone is on the same page. Right now through our plan we do provide protections to the Gulf of Maine spawning areas; and we do this through a closure protocol, which uses a gonad to body index to measure herring maturity in three closure areas. That is what is shown on the figure in the right.

I'm going to start with the Gulf of Maine spawning closures. One way to assess the adequacy of our current spawning protocol is to revisit the management alternatives that were included in our Amendment 3; to determine if the options selected are still appropriate. I am going to talk about four of the issues that were in that Amendment; the monitoring system, the trigger value, the closure period, and the closure area boundaries.

The thesis of the next four slides is that the GSI30 Protocol is really a significant improvement in how we monitor the spawning of herring; but there are ways to continue to strengthen this protocol, if the Board is interested in that. Starting with our monitoring system, really a paramount change in Amendment 3 was the adoption of the GSI30 Spawning Protocol.

In January the TC compared the performance of this new protocol versus the previously used length-based system. They did this by looking at the 2015 Massachusetts/New Hampshire spawning closure. In 2015 we were still using the length-based system; but we have those samples so we can go back and see what would have happened under the GSI30 system. What the TC found is that the spawning closure was initiated nearly two weeks early using the length-based protocol; and then this required subsequent use of the two week reclosure. In contrast, if GSI30 had been used in 2015, the Mass/New Hampshire spawning closure would have started three days after spawning; and likely without need for a reclosure.

The TC concluded that this GSI30 system is a significant improvement; as it's better able to predict inter-annual changes in the timing of spawning. Next is our trigger value. The trigger value is incorporated into the protocol such that the forecasted closure date is the day when GSI30 is projected to exceed that trigger value.

In Amendment 3 the Board implemented a trigger value of 25; and generally higher trigger values are going to close the fishery later, and just before spawning, whereas lower trigger values would encompass more time before spawning. But with the existing four-week closure you may run the risk of not fully covering the spawning season.

Some of the other values in Amendment 3 range from 23 to 28; so you can see the value of 25 is really right in the middle of that range. Again, in their January memo the TC evaluated the effectiveness of the trigger value. They found that from 2015 to 2017, the current trigger value resulted in a spawning closure that started within a few days of when the population reached 25 percent spawning.

I think the question for the Board to consider is whether initiating a closure when about 25 percent of the population is spawning is appropriate. The TC did note that reducing a trigger value to 23 or 24 would reduce the probability of greater than 25 percent spawning fish in the catch.

However, it's important to note that if you reduce the trigger value, you will also change the default closure dates in this spawning protocol, and so they'll be slightly earlier in the season. With the existing four-week closure, you may be frequently reusing the two-week reclosure period.

This leads us to Number 3, which is the closure period. Obviously these two issues are closely linked. Amendment 3 did establish a four-week closure; with the ability to reclose for two additional weeks. However, there was also an option in Amendment 3 for an initial six-week closure.

Again, the January TC memo showed that between 2015 and 2017 the spawning seasons in Massachusetts and New Hampshire were approximately 4 weeks, 2.3 weeks, and 4.9 weeks. But there are two important caveats here. The first is there is greater confidence in the longer spawning seasons; due to limited sampling in 2016.

There is greater confidence in that 4 week and 4.9 week estimate. The TC in their analysis is also defining a spawning season as when 25 percent of the population is spawning. If the Board is interested in defining a spawning season at a lower percentage, then this is going to increase the length of the spawning season. Overall the TC did conclude that use of the four-week spawning closure would likely result in frequent use of the reclosure protocol. In contrast, a six week initial closure could increase spawning protection, simplify the protocol, and provide greater predictability. Then the last element in Amendment 3 is the area boundaries. Amendment 3 did consider combining the Western Maine and the Massachusetts/New Hampshire spawning areas into a single unit; given that there was no difference in the default closure dates under the GSI30 protocol.

Ultimately, the Board decided to maintain these distinct spawning areas, given concerns that a widespread closure could impact the availability. The TC did not evaluate this in their January memo; but we can look at 2016 and 2017 to see when those two areas had their spawning closures started, to see if there are any differences.

We do see that there are slight differences. Western Maine was started September 18th and September 26th; versus Massachusetts/New Hampshire starting a little later, October 2nd, and October 1st. There does seem to be a slight difference; at least for those two years. Moving on to the second portion of the Spawning White Paper, this is considerations for Georges Bank and Nantucket Shoals.

Both of these areas are recognized as major spawning areas for herring; but they do not have protections that are specific to spawning. As a result, we had several questions from Commissioners; and so hopefully this will start the discussion on that topic. I'm going to talk about two things; the availability of samples, and then also the size and location of a closure.

Our current GSI30 protocol requires samples to annually inform the relationship between GSI and maturity. While we've had a long term practice of using closures in the Gulf of Maine to protect spawning herring, we have not had that in Georges Bank and Nantucket Shoals; and as a result we have much fewer samples from those regions.

A result of this is that the spatial and seasonal spawning patterns in Georges Bank and Nantucket Shoals are less well known; and so it may not be as simple as just moving one system to a new area. There may need to be some work that is done ahead of time to inform that GSI process. I also want to note that the ability to collect samples from all regions may be impacted by expected reductions in the ACL starting next year.

That is just something to keep in mind as we talk about this. Then secondly, consideration for the size and location of a closure – and speaking specifically on Georges Bank – that is a large spawning area, which encompasses almost the entire northern edge of the Bank. As a result it may be that spawning is not occurring at the same time throughout that whole region.

Ideally we want spawning closures that are going to maximize protection to herring, and minimize economic impacts. In the Gulf of Maine we have done that by using discreet areas that can account for these spatial and temporal differences in spawning. But the cost of this is that we require more samples from the Gulf of Maine each year.

In contrast, we could also take an approach of a single large closure; and that would require fewer samples to inform each year. But likely this is going to be a longer closure; to encompass all of the different timing of spawning in a large area, and it may have greater impacts on industry. Just to summarize, for the Gulf of Maine the GSI30 protocol is a significant improvement over the length-based system; and there may be opportunities to strengthen protections to spawning, particularly through the trigger value and the closure period.

For Georges Bank and Nantucket Shoals, we do have fewer samples collected to date. There is some uncertainty about the spawning patterns that are occurring in those regions. It is also important to consider the size of a closure, sampling needs, and then impacts to industry; and with that I will take any questions.

CHAIRMAN KERNS: Do we have questions for Megan? Senator Watters.

SENATOR DAVID H. WATTERS: On the economic impact issue, I guess the question in my mind is there a way really to weigh the economic impacts on the extended closure potential on Georges Bank against the economic impact of not doing the closure on the resource?

MS. WARE: I haven't seen any analysis of that to date. It sounds like that could be a cumbersome endeavor. I don't have a great answer to that question; but I don't have an answer is my answer.

CHAIRMAN KERNS: Do you want to respond?

MS. RENEE ZOBEL: I was going to say some of that work has been done by the Council, but not specifically regarding this. That would have to be something that some economists would have to take a look at.

CHAIRMAN KERNS: Dr. Pierce.

DR. PIERCE: Yes, first of all thanks for the White Paper Megan; you and those who contributed to the White Paper. It was very helpful, and it was a nice follow up to the white paper that was done in 2013, again by ASMFC staff working with the different states. My question is of all the information you have provided regarding where and when sea herring spawn in the Nantucket Shoals/Georges Bank Area.

Do you believe that enough investigation or we're looking into what the Northeast Fisheries Science Center has in hand has been done? In other words, have we gotten everything out of the Center regarding their insights into where and when fish spawn on Georges Bank and the Shoals?

MS. WARE: In the discussions I had with the TC, to kind of help prep for this memo, we primarily talked about the state samplings; so I don't know if there were any samples from Northeast Fisheries Science Center included in that. The general feeling I got from the TC was that for Georges Bank there may be some samples, or an adequate number of samples to try and take a stab at identifying some of the properties of the GSI30 protocol. But really for Nantucket Shoals there is a lack of sampling that has occurred; and so it may be quite difficult to do that from where we are right now.

CHAIRMAN KERNS: Bob Ballou.

MR. ROBERT BALLOU: I realize that New England Council's Amendment 8 came in after the analysis. But I'm wondering if you can speak to, well I guess the question would be to

what extent might the 12-nautical-mile closure overlap existing spawning areas, and have an impact on protecting spawning populations? Obviously it would be conjecture, I would guess. But wondering if you might have any thoughts on that Megan?

MS. WARE: I'll start and note that obviously this has not been implemented yet; so it's going to still have to go through review by GARFO, when we'll see what happens there. You know obviously there has been historically a fair amount of catch off the backside of the Cape; and in that Nantucket Shoals Area that I've been referring to.

I think we would have to see where that catch migrates; and a lot of that may be also impacted by these large reductions in the ACL that we're expecting to see. If and where that catch migrates could impact the effects on spawning. But I do believe portions of that area in green are within the 12-nautical-mile buffer, but there has not been a formal analysis that we've done.

CHAIRMAN KERNS: David Borden.

MR. DAVID V. BORDEN: Did the New England Council, I guess this is a question through the Chair to Terry. Did the New England Council offer up any preferences on these issues?

MR. TERRY STOCKWELL: Specific to spawning closures offshore, no.

CHAIRMAN KERNS: Dr. Pierce.

DR. PIERCE: Yes, regarding the question that was asked about the buffer zone, and to what extent might it overlap into areas where sea herring spawn. It pays to hang around for a while. I was around in the 1970s, spent a lot of time on herring back then working with the New England Council on the early development of the sea herring plan.

There is one paper that I would reference for everyone's look see. It is one that can be found in the NAFO Scientific Council Studies. This is 1983, Changes in Time and Location of Herring Spawning Relative to Bottom Temperature in the Georges Bank and Nantucket Shoals Area, 1971 through '77. Well obviously that's a while ago.

But still back then it is quite clear from the plots of larvae, herring larvae that were found through the sampling, done by foreign nations working on research with their U.S. counterparts that some rather significant areas of spawning do overlap, using these data, do overlap with the buffer zone. Not all of course, but certainly a considerable amount. I'll make the paper available to staff, because you'll find it quite interesting, since it really does have a lot to say about the Georges Bank as well.

CHAIRMAN KERNS: Ritchie White, and then we'll go to Terry.

MR. G. RITCHIE WHITE: I don't have a question, but I have a motion when it's appropriate.

CHAIRMAN KERNS: Thank you, Ritchie, Terry Stockwell.

MR. STOCKWELL: Follow up to a comment made by David Pierce concerning spawning areas in Georges Bank and Nantucket Shoals. In the past when the previous Section had contemplated spawning in the offshore waters there was opposition by the TC towards the development of any related action.

Part of it was, because the state of Maine did the heavy lift with the sampling in Area 1A there were no willing partners in southern New England. Part of it was because the samples require fresh fish. The implementation of RSW since then has since changed that. But also part of it was the TC, at least in my recollection, was not sure exactly what specific areas should be closed.

I guess my question is to Megan. Did the TC have discussion and starting to drill down into specific areas; because assuming a motion is made and it goes forward in this collaboration with the Council for an action in federal waters? The New England Council is going to be heavily invested in trying to ensure that there is still some fishery out there after pushing the trawlers off the 12 miles, assuming that is GARFO approves that proposed measure.

MS. WARE: There was no specific location that was identified by the TC. I think we were talking more broadly about those areas. But we did talk about, as I mentioned in the presentation, kind of one large spawning closure versus multiple smaller spawning closures, and kind of the pros and cons of those approaches. That is more where the discussion went with the TC.

CHAIRMAN KERNS: Renee is here as our TC Chair, so she'll speak to that.

MS. ZOBEL: Speaking to that. If you look at the table in the White Paper of the number of samples that we have with GSI value for Georges Bank/Nantucket Shoals spawning. There is not a great deal of information there. At this point the only thing that the TC could recommend is a broad sweeping closure. There is not enough information we believe at the moment to get down into more discreet spawning areas with different temporal nature to them.

CHAIRMAN KERNS: Eric Reid followed up with Pat Keliher.

MR. ERIC REID: Just a point of clarification, just so we all know. The action by the New England Council restricts a gear type. It doesn't necessarily restrict effort inside a buffer zone. It's midwater trawl specific, and whether or not that effort and those vessels repurpose to purse seining or small mesh bottom trawling is certainly allowable. Whether or not we protect spawning fish because of a midwater closure is uncertain; because of the action of the fleet once the thing is enacted, should it be enacted.

CHAIRMAN KERNS: Pat Keliher.

MR. KELIHER: Just thinking about what Terry Stockwell just brought up, the TC memo. I do know both DMR staff and Mass DMF coordinate pretty closely. They've got pretty impressive spawning protocols in place for sampling. I think moving forward there is probably going to need to be more collaboration if we went down this road.

But from talking to my staff, I know from their standpoint it's doable. Hopefully Mass DMF would feel the same. I think it's now with the refrigerated sea water, and how these fish are being handled. I think we've got a much better potential than we have had in the past; at least in relationship to the memo that Terry spoke of.

CHAIRMAN KERNS: Any other questions? Seeing no other questions, I will go back to Ritchie with his motion.

MR. WHITE: Because we don't have anything in the tool box beyond protecting spawn to try to turn this species around, I'll make a motion in regards to Area 1A. I would move to initiate an Addendum to consider strengthening the spawning protections provided to Atlantic herring in the Gulf of Maine. This addendum should consider measures including, but not limited to, the closure period length and GSI30 trigger value.

CHAIRMAN KERNS: Is there a second to this motion; seconded by Dr. Pierce? Ritchie, would you like to speak to your motion?

MR. WHITE: I don't think I have too much to add, although I think we just have to do everything we can to assure that we get as much spawn as we possibly can. I think that goes to making sure we do not disrupt spawning prior to the event, as well as immediately after spawning.

CHAIRMAN KERNS: Is there anybody that would like to speak to this motion; in favor or against? Seeing none; we can vote on this motion**. Are there any objections to this motion? Seeing none; the motion carries unanimously.** Dr. Pierce.

DR. PIERCE: Since we're dealing with the issue of spawning fish and protecting spawning fish. I have a motion I would like to make; and Megan has the motion. This is a motion that is tied to an Executive Committee discussion that is going to occur later on; I think tomorrow or the day after. I've lost track of time already, where we discuss as an Executive Committee allocation of approximately $400,000.00 in Plus-up Funding from Congress.

One of the priority projects that has been suggested by the Executive Committee, not yet adopted yet, but one of the projects relates to Georges Bank/Nantucket Shoals spawning, and the increased sampling that is needed for us to better divine when and where they are spawning, all again with the objective of increasing spawning protection in dealing with the status of the stock, which is now very poor, notwithstanding we're not overfished and overfishing is not occurring.

I move to request the ASMFC Executive Committee direct funds to initiate a research program for increased sampling to support herring spawning protections in the northwest corner of Georges Bank and Nantucket Shoals – protection through a 2020 ASMFC addendum to the ASMFC Sea Herring Management Plan. The Board recognizes the need for increased sampling in these regions in order to inform management and protection. Recognizing the New England Fishery Management Council as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities. If I get a second I'll make mention of one other thing.

CHAIRMAN KERNS: Is there a second; Senator Watters. Dr. Pierce.

DR. PIERCE: We need to get additional information, needed to put in place an addendum. I didn't want to just say move to have an addendum right now, because we don't have enough information that would justify that. However, we do need to send a signal that through an addendum we need to implement an approach for this protection.

If we give 2019 for the acquisition of information regarding where and when, it's not going to be everything we ever want to get, but still it's a good step in the right direction. Then through this motion I make it very clear that we would make it very clear that in 2020 we would then have that addendum, and it would draw upon the information collected through this research program, and other information that would be made available at that time.

Clearly there is a need for the New England Council to be onboard with this. We are in a sense continuing to manage federal waters fisheries by virtue of spawning, regulation spawning closure regulations. That is fine. That is all well and good. That is the reason, the primary reason why the last part of the motion references the Council; to once again send a signal to them that they need to be onboard, of course I'm a member of the Council. They need to be onboard regarding the sea herring protection in federal waters, Nantucket Shoals and Georges Bank.

CHAIRMAN KERNS: Senator Watters.

SENATOR WATTERS: I had a question really for Mr. Pierce on this. As you referenced towards the end of your comments about the ways in which, in a sense we're monitoring an area in federal waters through spawning protections. The intent of your motion here is that regardless of any schedule or agreement with the Fisheries Management Council that we would commence under our own authority this

sampling and research to prepare for an addendum.

DR. PIERCE: Yes that is correct.

CHAIRMAN KERNS: Ritchie White.

MR. WHITE: Also that your suggesting that the Council put this a priority in 2019. Would your intent be that if they do not, or they don't proceed along this line that we then go ahead on our own?

DR. PIERCE: Yes, absolutely. This needs to be done, and we have done it for the Gulf of Maine for quite a long time now. The New England Council years ago said it didn't want to enter that arena; and we took it on. I suspect there may be a change of heart now; in light of the status of the stock. Again, this sends a signal, and if I recall correctly the discussions that occurred at the New England Council meeting when we last had that there was a shared concern about the status of the stock. I suspect the motivation is now there to move in this direction.

CHAIRMAN KERNS: Pat Keliher. Renee did just whisper in my ear that for 2019, spawning in the Georges Bank Area is a research priority for the Council that Terry; it's on the list of things. Pat.

MR. KELIHER: A question for David through the Chair. I guess I'm trying to get my head around this still; why we would need to initiate a research program to do this. I mean from a sampling protocol, with the low quotas that we're going to have, it seems like we've got enough staff between the Commonwealth and the state of Maine to collect and process samples. What is the research you're trying to get at? Is it to further define the areas? If you could help me out I would appreciate it.

DR. PIERCE: Yes, I've got a memo from Bob Beal to the Executive Committee regarding prioritizing the ASMFC Plus-up Funding, and there is a lot of text associated with each idea. Regarding the Georges Bank and Nantucket Shoals maturity sampling that would be needed for us to initiate spawning closures in those areas.

Staff did a very good job describing why we do need more information, more samples to be acquired, in order to better define, especially on Georges Bank the sequential nature of spawning that may be occurring on the Bank. It's very much related to temperature. It's a thorny issue to say the least. Again, this information, this data that would be collected in 2019, would go a long way towards setting the stage giving us the necessary justification analytical work for an addendum to justify again that which will eventually be put in place for that protection.

CHAIRMAN KERNS: Follow up, Pat.

MR. KELIHER: The idea is we would have the additional research done. We would initiate an addendum; but that addendum would be a joint management effort between the Commission and the Council at that point?

DR. PIERCE: Not necessarily. If the Council can't move fast enough, and probably won't, we would do it; because we have the ability to move quickly, the Council cannot. I would suspect that whatever the Council decides to do, if anything, it would not be until 2021, '22. But we can do it in 2020.

We could maybe do it in 2019, but I don't think we're going to have enough in hand to carry the day to get it in place for 2019, so require the information. Then we are in a good place, and we'll have the justification for putting this in place. Plus of course we're now working with much lower quotas; it fits well.

MR. KELIHER: I think you're getting to kind of a little bit of the crux of my problem here is the timing issue. With the amount of information that we have at hand, I'm surprised we can't

find a way to have something in place sooner than 2020, considering the status of the stock. It seems to me that the more we can expedite this process the better off the management of the resource will be.

DR. PIERCE: If I may. In that document that I referenced it's noted that the majority of samples have come from Georges Bank; only two samples came from Nantucket Shoals. There is no way we're going to be able to justify a Nantucket Shoals spawning closure with two samples, I suspect. This is going to be a very significant action taken by this Commission; if indeed we take that action, I suspect we will. We really need to be in a position to defend it to the extent that we can. Two samples are not going to do the job.

CHAIRMAN KERNS: If I can try to help to add some clarification for information that was in the memo that went to the Executive Committee. I've had a couple of conversations with Mike, Renee, and Matt Cieri; all TC members from the three northern states. In my understanding, and Renee correct me if I'm wrong, but that the TC has enough information to make as Megan said earlier in her memo, a broad brush for Georges Bank, and that the sampling that is occurring right now informs that.

This would most likely be closures that would work similar to how eastern Maine occurs, because there aren't enough samples coming in on a regular basis. What we think will happen if there is an extremely reduced quota, there won't be a lot of samples then as well; that that closure would work very similar to eastern Maine by the default dates that get established, through the work that Micah has already done.

Then we would have discussions with the rest of the TC on evaluation of that work. There would be a way to use that information. If we wanted to do something more defined and more specific, then we would need that additional funding in order to have that sampling; which probably wouldn't be sufficient enough, if I'm correct Renee, from just fishery dependent data. You would need to pay fishermen to go out and do samples. I don't know if that helps your discussion along at all or not. I will go to Pat and then I have Terry, Ritchie, and Eric Reid.

MR. KELIHER: If that is the case, it seems to me we could potentially initiate some sort of a process for 2019 and fine tune it; kind of a parallel track, and then fine tune it with additional data moving forward.

CHAIRMAN KERNS: If that's the will of the Board then it would be an option. Terry Stockwell.

MR. STOCKWELL: I appreciate the intent of the motion; but I did want to point out to the Board that unlike the Area 1A spawning closures, which include state waters, these proposed closures are solely in federal waters, and the Council is going to have an active interest in having some participation in the discussion.

I'm a little concerned process wise about the request of the Council to consider herring spawning protection in 2019 priorities. If this was to move to the top of the bar, the Council and the Committee would begin work on this in the winter. It would be ready for a Council vote at the April or June meeting for implementation of 2020. The lag period that I see in the motion on the board is due to the research program. I think that might put the Commission and the Council out of sync. I think should this move ahead, it's going to be very important to have both bodies working closely together, in order to have the outcome we all are hoping additional spawning protection might result in.

CHAIRMAN KERNS: Ritchie and then Eric.

MR. WHITE: I guess I would ask the state of Maine and the Commonwealth of Massachusetts, if they're going to have the financial resources to expand their sampling

into these new areas, and if not shouldn't we also be asking for Plus-up money to implement the spawning closure plan?

CHAIRMAN KERNS: Dr. Pierce.
DR. PIERCE: The motion does, Ritchie. It begins by making that request to direct those funds. Again, that is one of the priority projects that staff has recommended to the Executive Committee. If the Executive Committee says thumbs down, then we don't have the funds necessary to do the sampling.

CHAIRMAN KERNS: Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Just a quick comment on the memo and what is included there. It went to the Executive Committee, but not everyone has seen that memo. As Dr. Pierce said earlier, the Commission was fortunate enough to get some Plus-up money this year, about $400,000.00. The question to the Executive Committee is how do you want to spend that $400,000.00?

One of the five priority projects is this Nantucket Shoals/Georges Bank spawning issue. It is on the priority list, recommended for funding. The range of funding that is included in the memo is from zero dollars to $100,000.00. The zero dollar option is I think a little bit as Pat Keliher may have been referring to earlier, where the existing staff takes samples from existing fishing trips, and they just analyze those for where they stand relative to spawning.

If there are additional samples that need to be taken, and we need to pay fishermen to go out there and collect some samples from specific areas, then that is when you get to the other end of the range. I think there is a range, and the Executive Committee is going to have to decide how much money they want to commit to this.

It is a high priority. But the difficult part I think maybe, which is where Ritchie is going is that it's not a one-time deal. If there is continued monitoring that needs to happen, there is going to be multi-year funding that's needed to continue going out, collecting those samples and analyzing them.

That is a long term funding question. This $400,000.00 is as of now just a onetime Plus-up. We're hoping that becomes the new baseline for the Atlantic Coastal Act, and we'll have that money moving forward. But we don't know that. The federal budget is still a bit uncertain moving forward. There is a slug of money that is recommended to be used to fund to cover this work right now. But moving forward I think that is a subsequent discussion that the Commission will have to have on where they want to find that money. If we continue to get Plus-up money, then maybe that discussion is pretty easy. If we don't, then it gets a bit harder. That's a little bit more background on that memo; and the range of funding that's included in that memo.

CHAIRMAN KERNS: Pat, did you want to respond to Ritchie's question?

MR. KELIHER: Yes. From Maine's perspective we thought it looked like it was a wash, because we're going to have lower quotas, lower fishing effort, so we figured we would be shifting away from sampling where we would be normally into areas of trying to sample these new areas, so just shifting our effort. David, is your funding then also going to be impacted by the impacts to RSA; because don't you have some connection back to RSA for some of that sampling work as well?

CHAIRMAN KERNS: David.

DR. PIERCE: Yes, there is a connection to the RSA. Obviously the RSA is going to go down; in terms of the amount available, because the quota is going to be dropping. The amount of sampling that will occur will hopefully be augmented by whatever the Executive

Committee feels is appropriate to spend out of the amount available for that surplus.

CHAIRMAN KERNS: Eric, thank you for your patience.

MR. REID: I'll try to ask a question this time instead of making a statement. I wanted to bring up the discussion about the RSA as well. It's one thing to have a funding mechanism; it's another thing to actually have fish to go get, because with a lower tax you may not have any fishing when you're going to want those samples. I mean that's entirely possible.

The RSA program now, as far as I understand it, helps fund dockside monitoring. I don't know whether or not we would envision expanding the amount of RSA, in order to finance two valuable programs or not. I'm not sure what Dr. Pierce has in his long term vision. I guess that's the question. What is the impact that he sees to RSA moving forward, once we run out of one year's worth of funding?

CHAIRMAN KERNS: David, do you have a response to that?

DR. PIERCE: Well regarding this particular initiative on Georges Bank and Nantucket Shoals, I mean I would love to have something long term. But I'm going to be very satisfied with just one year, hopefully of good information to use, again as a way to help justify the steps that will be taken for the addendum.

I'm looking at one year; I'm not looking long term, because looking long term is basically wishful thinking. It may materialize, it may not. Right now we only have two samples from the Nantucket Shoals Area. I don't expect that to be any better than what it is; unless we have some additional resources to get that additional sampling, hence the motion.

CHAIRMAN KERNS: Adam Nowalsky.

MR. ADAM NOWALSKY: I think the need for the sampling is clear; and everyone here around the table is in 100 percent agreement for that. How we wind up achieving that through this motion or some variation, I think is what we're trying to best decide. I see three different elements to this motion.

The first part is requesting the Executive Committee to direct funds. It is my understanding that there is this memo to the Executive Committee already suggesting that happen; I haven't seen that memo, but it sounds like they're going to get that advice whether or not this Board asks them to.

I do have a question about the merits of a species board making that request now. I wonder what position that leaves other species boards that are going to meet later this week after the Executive Committee meets, in terms of well we didn't get our chance to make that similar request. I'm not sure if there is any staff comment on that.

But that is one concern that I have here that this isn't coming through the Policy Board or something that has a chance to consider all of these together. Second question I have with this is what comes after the hyphenated portion of that first sentence; protection through a 2020 ASMFC addendum. Does this motion essentially initiate that addendum here today, or is this just a hypothetical that this is potentially how we would use the information we glean here?

CHAIRMAN KERNS: I'm going to let Bob address the first portion of your question; and then I will go to the maker of the motion to hear what his intent was on whether or not he sees this as an initiation of an addendum today, or is it being informative of what the long term thinking would be. I also would like folks to know that there is coffee outside for those that were asking about it earlier. When you're ready you can caffeine it up, Bob Beal.

EXECUTIVE DIRECTOR BEAL: I'll do this with no caffeine; we'll see how it goes. To Adam's question about the comment from this Board to the Executive Committee and other subsequent boards. The list of the five projects that were included in the staff memo was compiled from an e-mail I sent out soon after the August meeting to all Commissioners; saying, what are your high-priority projects that you would like to see funded?

We compiled all those, as well as looked at the number of research priorities for individual species that are compiled after stock assessments and a number of things. For full disclosure on the list are one striped bass project, two lobster projects, a menhaden project, and this herring project. It's a range of species that are up and down the coast; and there is adequate money to cover all five of those priority projects.

Obviously, if this motion passes it does convey a message to the Executive Committee this Board thinks it's important. But I don't think any of the other boards are being shortchanged necessarily, because all the Commissioners had their opportunity to chime in when we developed that list after the August meeting.

CHAIRMAN KERNS: I apologize, I said the wrong maker of the motion. Dr. Pierce, what is your intent?

DR. PIERCE: It's premature to make a motion to have an addendum; so this is informative, sending the signal. I've had this discussion with other Board members. Should we initiate it now or not? It's too soon to initiate it. Nevertheless, again it sends the strong signal.

CHAIRMAN KERNS: Senator Watters.

SENATOR WATTERS: It seemed to me that if it would allay some of the concerns that were raised about whether this is a directive or not that we could insert the word potentially after protection. Northwest corner of Georges Bank and Nantucket Shoals – protection potentially through a 2020, and that might clarify that it's a direction but not a requirement if that's a friendly amendment for Mr. Pierce.

DR. PIERCE: I prefer to leave it as is, with an understanding that this Board very clearly could say later on in 2019 that it's not prepared to have an addendum. We can change course if need be, if the data we have in hand doesn't make a convincing case or if it's strong enough and we still feel it's necessary.

CHAIRMAN KERNS: Ritchie White.

MR. WHITE: I am starting to get concerned now after what Terry said that we're going to hold up the process with this. What I would rather see the intent of this motion be is that we will start an addendum as soon as we have the information. It's not let's get the information, and then decide what we're going to do. I want us to go at least as fast as the Council can, and if they can go ahead on the time schedule that Terry just said, we're going to be behind them, and that's not where we want to be.

CHAIRMAN KERNS: Terry Stockwell.

MR. STOCKWELL: To that point. I don't believe the Council will move ahead based on this motion. The way I read it, research is going to be done. The Council is being asked to consider herring spawning protection of what nature; where, when, why, how? It's a heavy lift; and if the two bodies are going to work together, it ought to be concurrently.

The Council may initiate something that is totally out of sync with what this Board intends to do. We also have a very different process involving the public. As someone mentioned, should the Agency approve the 12-mile buffer these boats in this fishery they have to have some place to fish. I would be concerned about it being approved by the Agency, if we all don't work together.

Ali is sitting on the Board right now, may be able to chip in on that. But every time the Council makes a decision, we try to weigh as best we can whether or not it's going to be an approvable action, and that's considering everything, including enforcement, including the TC, including the public opinion before the final decision is made. I would support either initiating an addendum right now or perhaps if it's going to ask the Council to consider herring spawning protection in 2019, probably I'm not going to vote for this; because I don't know what it means.

CHAIRMAN KERNS: Let's take a five minute coffee break and get your caffeine; and we will come back to this motion on the table.

(Whereupon a recess was taken)

CHAIRMAN KERNS: We have everyone back at the table; and I think we've come to some conclusions in our side discussions here, Mr. Grout.

MR. DOUGLAS E. GROUT: **I would like to make a substitute motion; if you can put that up on the board, it's a modification of Dr. Pierce's motion, and this is to move to substitute to request that the ASMFC Executive Committee direct funds for increased spawning sampling in Georges Bank and Nantucket Shoals.**

The Board initiates an addendum to develop a herring spawning protection area program for Area 3. The third point is recognizing the NEFMC as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities.

CHAIRMAN KERNS: Steve Train is the seconder. Do you want to speak to your motion, Doug, or your substitute?

MR. GROUT: This is very similar to Dr. Pierce's motion; except essentially we are initiating an addendum right now to try and develop a herring spawning protection program in Area 3. It's important for us to start moving down this road; because of the status of our stock right now. We need to protect as many spawning herring, get something in place to protect as many spawning areas as possible throughout its range.

CHAIRMAN KERNS: Dr. Pierce.

DR. PIERCE: Well initially I had some reservations about this particular approach; however, we have had those sidebar conversations and now their convinced that this is a reasonable way to proceed. It's a substitute to the motion that I had originally made; and I'll be supporting the substitute motion.

CHAIRMAN KERNS: Anybody else? Ali Murphy.

MS. ALLISON MURPHY: Thank you, Madam Chair Woman. I think NMFS fully supports the increased collaboration and efforts that have been proposed here. But I think I will be abstaining on this motion to substitute, and then on the main motion; just to allow the process to play out here and at the New England Council.

CHAIRMAN KERNS: Any other comments by the Board? Are there any comments from the members of the public on this motion to substitute? Seeing none**; back to the Board, noting that NOAA Fisheries is abstaining, is there any objection to this motion? Seeing no objection, but one abstention by NOAA Fisheries, this motion carries, so it will become the main motion.** I'm going to give Jess a second to get that all up on the screen. I will just read this motion. It will no longer have a maker and a seconder; it is a motion of the board. **Move to request that the ASMFC Executive Committee direct funds for increased spawning sampling in Georges Bank and Nantucket Shoals.**

The Board initiates an addendum to develop a herring spawning protection program in Area

3. Recognizing the New England Fishery Management Council as a federal partner in the management of Atlantic herring, the Board requests the Council consider herring spawning protection in its 2019 priorities. Is there any objection to this motion, noting the abstention from NOAA Fisheries? Seeing none; the motion carries. Mr. Grout.

MR. GROUT: Just a clarification, now that we have National Marine Fisheries Service and a Council member here. We are recommending that the Council consider spawning herring protection as one of its priorities. Do we need to write a letter now that we have someone from the Council on the Board? Is this something that needs to go to the Policy Board to approve, or can the representative from the Council just bring that message back to the Council?

CHAIRMAN KERNS: That's the prerogative of this management board. If you would like to write a letter then we would bring that forward to the Policy Board to send the letter. If you think that Terry will carry that message strongly enough, then we will lay that burden on his shoulders. But it's up to the management board. Mr. Kane.

MR. RAYMOND W. KANE: So moved, we're talking about the Vice-Chair of the New England Fishery Management Council.

CHAIRMAN KERNS: You moved to send the letter or, you want to send a letter. Is there any objection to making a recommendation to the Policy Board that the Commission send a letter to the Council requesting that they make spawning protections a priority for 2019? Seeing no objections; we will make that recommendation to the Policy Board. No motion necessary. It will be on my list for Policy Board. All right, any other issues to come before the management board considering spawning protections? I'm sorry, Bob Ballou.

MR. BALLOU: I just want to note the obvious, and that is we've now initiated two addenda, both addressing spawning protections. I just wonder out loud if there is any potential to merge those two, or whether they could be kept separate.

CHAIRMAN KERNS: Bob, I think we can, staff can look at that and determine if that will be a possibility. I think it depends on the actions that the New England Council takes. If it is possible for us to do a joint action, then having a joint document may not work if the timing of the two groups doesn't align, and if this management board wants to get the changes for the other areas in a more timely fashion. Ritchie White.

MR. WHITE: My intent on the first motion was that it be in place for next year. If this motion can follow the same timeframe, which I would be surprised at, then I would have no objection with the two; but otherwise I would like to see them done separately.

CHAIRMAN KERNS: Anything else on spawning?

UPDATE ON 2019-2021 FISHERY SPECIFICATIONS PROCESS

CHAIRMAN KERNS: Seeing none; we will move on to Agenda Item Number 7; looking at setting the 2019 specifications for Area 1A, Megan.

MS. WARE: First I'm going to talk about the 2019-2021 Herring Specifications. This is just an update on what's been happening; because I know at the August Board meeting there were still some questions. But again, detouring to the New England Council, again through Amendment 8 the Council did select a Harvest Control Rule for herring.

The one they've selected is 4B Revised, which is a light purple dotted line that is second from the top. Just to orient you to the figure, the Y axis is going to be our fishing, and the X axis is our SSB. Thinking back to the days of

menhaden, it's quite similar in that the further right you are on this graph, the healthier and higher your SSB is; until you can fish at a higher rate.

But as we move from right to left, our SSB is decreasing, and as a result our fishing rates continue to decrease. But those decreases happen at different rates and at different times; depending on what line you're on. The Council chose 4B; and that caps overall fishing mortality at 80 percent of FMSY, and then it starts to drop off when we have a lower SSB. If there are any questions about that I can try and answer those.

Moving on to 2019-2021 Specs, originally 2019 was expected to be the start of a new three-year specification package; but there have been some challenges with that. Given that the Council just approved Amendment 8, this means that the NMFS review and consideration of implementing that document would probably not occur until spring of 2019.

Then we would start our implementation of a Spec Package, and so that likely wouldn't occur until summer of 2019. We would already be half way through the year before the Spec Package is implemented. This is of concern; because the 2019 catch limits are expected to be reduced due to the poor stock status.

If we roll over the 2018 catch levels into the start of 2019, our probability of overfishing and being overfished would be too high. As a result, the Council has recommended that NOAA Fisheries develop an in-season action to set 2019 catch limits; and this means that our next Spec Package would start with 2020.

In their motion the Council did provide guidance to NOAA Fisheries on the 2019 in-season action; and that guidance included using the Harvest Control Rule selected in Amendment 8, proportionately reducing the fixed-gear set-aside, setting the boarder transfer to zero, and then maintaining the sub-ACL proportions from the last Spec package.

We would continue to divide the ACL the way we did in the 2016 to 2018 Specification Package. In terms of timing, we are expecting that a proposed rule-making will be published ahead of the December New England Fishery Management Council meeting; so we'll have a bit more information then. I also did want to note that there was an SSC meeting on October 10, to consider Atlantic herring OFLs, and ABCs. Those that are on the screen are what the SSC approved. I want to highlight asterisks that these are not set in stone yet. These will be reviewed by the New England Council, and then they will be forwarded to NOAA for their consideration. These are not final numbers. But I did want to put these up on the board so that the Board has some idea of the level of reductions that we could be looking at in this fishery.

Just to put some context to this. Right now our Area 1A sub-ACL is just under 28,000 metric tons. That number is higher than any of the ABCs that you see in this table here. That shows the level of reductions that this fishery is looking at. The SSC also recommended that the New England Council request an operational stock assessment update in 2020; and this was due to concerns or uncertainty regarding recruitment. With that I'll take any questions.

CHAIRMAN KERNS: Dr. Pierce.

SET 2019 SPECIFICATIONS FOR AREA 1A

DR. PIERCE: Megan, I can't recall. The numbers you showed, the SSC determinations, the OFLs, the ABCs, do those numbers include the application of the Control Rule that you just mentioned?

MS. WARE: I believe they do.

CHAIRMAN KERNS: Any other questions? Pat.

MR. KELIHER: I guess it's not a question; it's a comment. Is it time for comments? I don't want to step on anybody's toes, Madam Chairman.

CHAIRMAN KERNS: I didn't see any other hands raised for questions; so we can move into comments.

MR. KELIHER: The SSC recommendation for the Council to request an operational stock assessment for 2020. I know the NRCC is meeting in a couple weeks to set priorities or for assessment work coming up. As it pertains to herring, we know we have a lot of two-year olds coming up in this population. The Canadian weir fishery is at roughly 11,000 metric tons this year alone.

These are fish that are not counted yet. They have not been part of the assessment process. I am wondering if it would be worthwhile; and what the thoughts of this Board would be, if it would be worthwhile having staff attending the NRCC to request an update in 2019 instead of 2020. I think there is obviously a lot at stake here; and having an update with recent catch data may be very beneficial to the conversation of this Board and the Council over the next few years.

CHAIRMAN KERNS: Eric Reid.

MR. REID: At the SSC meeting there was a lot of discussion about 2021; about setting that number. There was a lot of discussion. That is where the request for an update in 2020 came from; because of what is at stake. The discussion basically said yes, you can ask for an operational stock assessment; good luck getting it. I mean we all understand the gravity of the situation. Hopefully that will be what prevails. But I don't want to say that the 2021 number is only a placeholder; but that is what I would like to say. But that is where the request for 2020 came in.

They could revisit 2021; and maybe pick a more informed number. That doesn't necessarily talk about 2019, Mr. Keliher. But just so we're clear on what the conversation was about 2021; and where that request was coming from. I don't know if that helps anything or not; but there was a long conversation about what to do with 2021 in that room.

CHAIRMAN KERNS: Follow up, Pat.

MR. KELIHER: No. I mean I appreciate that and I appreciate the conversation that happened at the SSC. We're now seeing more and more data associated with the catch in Canada. It's still not clear to me what this 11,000 metric ton catch with the Canadian weir fisheries means to us in the future.

I think it would be nice to get input from the Agency on, does that mean payback; does that not mean payback in the future? Frankly that's the least of my worries. I would rather see if we can't get a turn of the crank, or whatever we want to call it, to add this new data in to see if it really changes the future of how we're looking forward at management over the next three to six years.

CHAIRMAN KERNS: Dr. Pierce and then Terry Stockwell.

DR. PIERCE: Pat, you said that the Canadian fixed-gear fishery took 11,000 tons; what was it the year before? Do you recall, zero? I asked the question because we've been lucky over the years; because the Canadians have caught hardly any in their fixed-gear fishery. They're not subject to our rules, to restraints on catch. We take off the top of what's available for U.S. fishermen what the Canadians are expected to take.

If this is a new number that's larger than we anticipated it would be; it's going to come off the top of U.S. catch, which means these numbers will plummet down to half of what they are now, at least that's my current

thinking. This has to be clarified. This has been a stumbling block for me over the years; always with the fingers crossed, Canada, don't take many fish. If they took 11,000 then we're in trouble.

CHAIRMAN KERNS: Terry Stockwell, then Doug Grout.

MR. STOCKWELL: As a long term participant in the NRCC, I just want to brief the Board briefly on the ongoing assessment prioritization process; as well as try to manage the Board's expectations. The NRCC is comprised of the New England, the Mid-Atlantic Councils, this Commission, GARFO and the Science Center.

It meets twice a year. Its primary purpose is to schedule the stock assessments; with a whole lot of caveats and a whole lot of resource issues. Each Council and the Commission all have pressing issues. We are in the process of contemplating entering into a programmatic scheduling process; which will set things out into probably a five to seven year time period out. It seems unlikely that any accelerated Atlantic herring update would happen in 2019. As one member of the New England Council said, be careful what you ask for.

The New England Council asked for an update on Gulf of Maine cod; and it got worse. We do meet, Toni and Bob come to these meetings; Pat Campfield as well. We'll troll it out there; but the Mid-Atlantic has its issues and the Center has its resource problems, and both Councils and the Commission have a very long wish list as well.

CHAIRMAN KERNS: Doug Grout.

MR. GROUT: One of the things we have to take into consideration here, obviously is that Canadian herring catch in their weirs. That is what we have been using primarily to set as the management certainty; so we've been reducing our ABC by that amount, an average, recent historical amount has been to set the ACL.

I can see where, to Dr. Pierce's point, where when we start putting together our 2020 and '21 specifications, where that may impact how much management uncertainty we're going to be setting between the already very, very low ABCs and the ACLs that we would be setting there. That is of concern. I don't know how it would work in from NMFS standpoint; as how much they might approve on this, just because if we're not conservative enough with this they may say that we have a chance of overfishing.

CHAIRMAN KERNS: There has been a recommendation by a member of the Board to ask the NRCC to bump up the herring assessment to an update for 2019. Is there concurrence by the management board to do so? It's currently on the books in the current assessment schedule for 2021. Doug Grout.

MR. GROUT: I certainly would support that. I would support either it being moved up to 2019 or 2020; '19 would be perfect, would be ideal, but if we could get it to 2020 that would be great too; so that we could be setting the specifications for the next three years with current information.

CHAIRMAN KERNS: No objection, Bob and I can take that to the NRCC and make that request. Eric Reid.

MR. REID: That 2019 is an addition to 2020 is that correct or are we trying to get it substituted?

CHAIRMAN KERNS: My understanding is to substitute it to get it in 2019, to get it earlier. We currently have updates on the books for 2021 and 2024. I think if we were to be successful in getting it earlier; then the NRCC would then readjust that schedule to make another update work within that timeframe. I wouldn't be able to quote exactly when that would be or not. If we wanted to make a suggestion for a second one to follow up, would we want another one in 2021? We could also

bring that back to the NRCC. It's the pleasure of the Board. Doug.

MR. GROUT: I think one of the issues here, and the reason the SSC brought up the recommendation for 2020 was to have specifications, have an assessment approved in time to start developing the next three years-worth of specifications. Now in 2021 having an assessment, we're going to end up in the same situation we were originally at here; where those assessments typically take place later in the year.

We're trying to develop a Specification Package sort of while not really knowing what the results of the assessment are. If we had one in 2020, we would be setting the specifications for '21 and for the next three years with the full knowledge of what that is. Having an assessment in 2021 would be, I always see that as a challenge, because it is so close to the time that we have to set specifications. I'm in favor of moving it up.

MR. REID: Thanks Mr. Grout, I appreciate that. But I just want to tell you that at that SSC meeting. I mean this is a request from the SSC. To me that means something. The conversation about setting 2021, they were just about split down the middle about maybe only doing a two year Spec. But it was staff from the Council that said that they really wanted three years out of it.

The SSC at about 50/50, 60/40 something like that I think would have easily gone with a two year Spec, and then gotten the thing in 2020 and then set 2021. Just so you know what went on and the thinking in the whole thing. I mean to me, if this Board is going to ask to switch it to 2019 that is fine with me.

But I would certainly hope that the New England Council, through its SSC, would ask for one in 2020; just because of where it came from. I mean I think that is a very important component we should be aware of. I mean if they ask for it that means something; just so we know what dynamics we have.

CHAIRMAN KERNS: Bob Beal.

EXECUTIVE DIRECTOR BEAL: Yes, if the Board does want Toni and I to bring forward the message and request the 2019 update or Operational Assessment or whatever we're calling them these days. I think we need the backing of the Council; to kind of pull back the curtain on the NRCC. If only ASMFC is asking for the 2019, and New England Council doesn't support that we'll never get the 2019 slot; to be pretty blunt. I think we need to coordinate with New England and see what timing would work best for them as well; prior to the NRCC.

CHAIRMAN KERNS: NRCC is the 14th, 15th, of November. Doug Grout.

MR. GROUT: Another way of saying that is we'll have a much stronger chance of getting a change to the updated assessment if we're both recommending the same thing; as opposed to separate. I guess in that sense I would be more in favor of 2020; so that we have a better chance of actually getting something changed from 2021.

CHAIRMAN KERNS: Eric Reid.

MR. REID: My question is how does the timing of all this work? I mean the Council is not going to meet until December. How are we going to have this conversation? Are you going to have Mr. Stockwell on his first tour of duty at the management Board to go up to New England and raise hell?

I don't know; how is that going to work out? I'm all in favor of safety in numbers. Given that it's coming from the SSC. I mean to me, I've said it three times, I'll say it four or five times more if you like. What do you envision as your mechanism to talk to each other?

CHAIRMAN KERNS: Bob Beal.

EXECUTIVE DIRECTOR BEAL: I think we can talk staff to staff. There is the standing recommendation as you mentioned, Eric, for the SSC to accelerate this to 2020. If that is where this Board ends up, then I think we can get aligned pretty easily. You know the New England Council staff and leadership that show up at NRCC will probably bring forward the SSC recommendation. If this Board says 2020, the SSC says 2020; we can probably make that unified request at the November meeting.

CHAIRMAN KERNS: Ray Kane.

MR. KANE: A question, thank you Madam Chairman. In the past we've had a three-year Specs package. With the conundrum which occurred recently with the stock assessment; GARFO will come out with Specs for '19 by the middle of '19, by June? Can you answer that question number one, please?

CHAIRMAN KERNS: Ali, do you have a response of when Specs will come out? The question is when will the Specs package come out on the 2019 fishery from NOAA Fisheries?

MS. MURPHY: I believe the plan is to have a proposed rule; hopefully on the street ahead of the New England Council meeting so that it can be discussed. Then I believe that's early December; and then probably another several weeks before the Final Rule is out.

CHAIRMAN KERNS: Thank you, is that follow up, Ray?

MR. KANE: Follow up. In the Specs package we're talking '19, '20, and '21, right? No.

CHAIRMAN KERNS: That will be just '19 and in a moment Megan will finish her presentation and will give us some more information.

MS. WARE: So 2019, the recommendation from New England Council is for an in-season action. The Spec Package would be started in 2020.

MR. KANE: Follow up once again; for three years, 2020, 2021, 2022 or '20 and '21?

CHAIRMAN KERNS: We don't know yet. We'll find out; unless Ali knows the difference. Terry Stockwell.

MR. STOCKWELL: Thanks for the question, Ray. The Agency is doing the Interim Rule for 2019. The Council is going to do a two-year Spec Package.

MR. KANE: If I may. If we turn the crank in '20 – and that's what I'm hearing around the table – as opposed to '19, to work in concert with GARFO. We would be addressing the '22, 3 and 4 Specs Package? Are we going to get back to a three-year Specs Package, Number 1, and if we turn the crank in '20, would that be addressing '22, 3, and 4 or '21, 2, and 3?

CHAIRMAN KERNS: We don't have the answer to that question right now, Ray. It could be a three-year or it could just be a two-year, and then you'll get back into the three-year cycle; because you could inform just '21. I guess it would be a one-year then, and then go back into your regular cycle or not. But we'll find out as these things come forward; and if we get information at different times.

MR. NOWALSKY: This won't answer Ray's question; but I will offer that dealing with summer flounder and black sea bass for the last five years, probably. We've gone through this process of the Council setting a three-year Spec Process that goes on; the Service putting forward a rule.

We get new information. We go to the NRCC; we push for an update. The Science Center has usually been as helpful as they can be. We then bring it back. We reconsider the Spec Package that we had already set up. The Service has been as accommodating as they can be to change that.

This idea of this three-year Speck Package really has been nothing other than an attempt to make the paperwork more efficient for Council staff. But in reality we've been going back and doing it pretty much whenever we want to, whenever we could, and I'll just offer that we found the Science Center and GARFO to be very accommodating to the best of their ability.

CHAIRMAN KERNS: All right, we're going to move on to the rest of Megan's presentation.

MS. WARE: Now we're going to talk about 2019 Area 1A Specifications. If this was a typical year, what we would do is I would be looking for two motions at this meeting. We would do a motion to approve the Spec Package, and then there would be a motion to allocate the 2019 Area 1A sub-ACL with the percentages that you guys would want to see. These are example motions.

Unfortunately we all know that this is not a typical year. We do not know what the 2019 numbers will be. We're still waiting on some more information; so we're going to postpone that to a future meeting, when we have the 2019 Specs from NOAA. However, this Board can talk about the 2019 Area 1A sub-ACL; given we have pretty strong suggestion that the ACL will be significantly lower next year than it is right now.

Per Amendment 3, the Board can consider distributing the Area 1A sub-ACL using bimonthly, trimester, or seasonal quota periods. The Board can also decide whether quota from January 1 through May 31 will be allocated to later in the fishing season. Recently this Board has allocated the Area 1A sub-ACL such that there is zero percent allocated from January through May, 72.8 percent from June through September, and then 27.2 percent from October through December. These are Tables 5 and 6 from Amendment 3; and we'll leave them up on the slide here. They were also included in your supplemental materials. These are the options that are built into Amendment 3 for the Board to consider; regarding the Area 1A quota periods. I do want to highlight that these allocation percentages are fixed; so they can only be changed through an addendum process. With that we'll take any questions.

CHAIRMAN KERNS: Seeing no questions; are there any comments? Doug Grout.

MR. GROUT: I would like to put forward a motion, Madam Chair.

CHAIRMAN KERNS: Go ahead.

MR. GROUT: You can put that up; I gave that to you. **It's to move to allocate Area 1A quota bimonthly, in a manner consistent with the options in Table 5 in Section 4.2.3.2 of Amendment 3 that is labeled "No Landings Prior to June 1 (with June as a one-month period)." This results in the following distribution: Period 1, which is June, 16.4 percent, Period 2, which is July/August, 40.1 percent, Period 3, which is September/October, 34.0 percent and Period 4, which is November/December, 9.5 percent.**

The fishery will close when 92 percent of the seasonal period's quota has been harvested and any underages from one period may be rolled into the following period. If I get a second to this I'll provide some rationale.

CHAIRMAN KERNS: Is there a second? Pat Keliher, thank you. Doug.

MR. GROUT: I think with our lower quotas here that we are anticipating here for 2019, it would be very imprudent to increase the flexibility for management and monitoring of our quotas. That is one of the reasons I'm proposing to go to a bimonthly as opposed to a trimester approach; which is what we had been using previously.

Allocating quota bimonthly, while maintaining the Days-Out Program will allow for targeting

harvest of Atlantic herring during the months of July through September, when the supply of fresh herring for bait is most needed, and help further minimize herring fishing activity around the fall spawning season in herring management Area 1A.

CHAIRMAN KERNS: Dr. Pierce.

DR. PIERCE: First a question. I don't have Amendment 3 in front of me. We made decisions about what to do with the periods a while ago. The Amendment 3 provides us with the ability to, on an annual basis, without going out to public hearing, make changes in the percentages; correct, all right, interesting?

CHAIRMAN KERNS: That is correct. This is one of the options that you have every year.

DR. PIERCE: Okay, a couple of points. Obviously I've spoken about this with my colleagues in the other states quite a bit; and I've raised concerns about this bimonthly approach for this reason. That is, Number one, the New England Council at its last meeting, we debated. We actually voted on an effort to change the percent allocations of Area 1A quota between the tri-semesters. October through December is the third tri-semester; and that motion was defeated. The Council decided to keep those percentages by tri-semester.

With this particular approach, I recognize the motivation for it. But with this particular approach setting aside for a moment the fact that the quotas are going to be much lower. It is very likely that in September, Period 3, the 34 percent will be taken; meaning there will be no landings in October. Okay, which would mean then that the third tri-semester would only have 9.5 percent; November and December, which is not the way it should be, according to the New England Council that again voted against changing the trimester percentages.

In 2018, you know this year, we had for example a spawning closure that did not include the first few weeks of October. October was open in Area 1A for continued fishing. Indeed, some fishing occurred; how much I'm not sure. But anyways, it's been opened for about three weeks. Those midwater trawlers, notably, waiting to have some access into Area 1A finally did have that access; because the spawning closure had not yet kicked in.

It's about to kick in October 23, something like that. The announcement went out. With this particular approach, there would be no fishing; in this particular case midwater trawling, in October, assuming the spawning closure doesn't kick in. Again, we have no way to know for sure. Now setting aside for a moment the question about whether midwater trawling is a good thing or a bad thing.

This particular strategy has the potential to dramatically impact one of the main components of the sea herring fishery; that is the midwater trawlers that are already impacted by the buffer zone, assuming the Service puts it in place. I just wanted to highlight for the benefit of everyone that I recognize the rationale for it; but there is an unintended consequence, and it does put us at odds with what the New England Council just did.

CHAIRMAN KERNS: Mr. Grout.

MR. GROUT: I'm a little bit confused, Dr. Pierce, by your statement that the Council took a vote on tri-semesters. The Council doesn't have any seasonal allocation of the quota; it's only an annual allocation. What we did take a vote on was a recommendation on the 2019 Specs; as to how we would allocate between the different management areas.

Commissioner Keliher's staff actually put up a motion that was defeated that would have, instead of having the current allocation under the specifications process that we had set up back at the beginning of the specifications; that we would be using the 2018 allocations. But

the Council doesn't have any seasonal allocations that I'm aware of; maybe Terry Stockwell can tell me whether I'm wrong or right on this, and actually Ali, you might be able to tell me. Is there any seasonal allocation in the Council plan?

CHAIRMAN KERNS: Dr. Pierce, because Megan and I just were looking at all of the motions that just happened.

DR. PIERCE: I'm incorrect. However, my other comment regarding the impact on the midwater trawlers that is the October fishing still stands.

CHAIRMAN KERNS: Pat Keliher.

MR. KELIHER: I am glad you made that clarification. I did get hung up a little bit, Dr. Pierce, on where you were going. I understand the desire to try to maintain some level of access for 1A. I would also remind the Board that 70 percent of the quota was allocated to Area 2 and Area 3. While you want to try to maintain access for a portion of that time of year, I understand.

But we're trying to figure out a way to also create some level of support for all of the fleet. You're trying to protect a portion of your fleet; I'm trying to protect a portion of my fleet, and we're trying to figure out how to make lemonade out of all the lemons. As the seconder I'm going to support this motion.

CHAIRMAN KERNS: Ritchie White.

MR. WHITE: I'm going to support this as well. My concern with our current regulations keeps the 27 percent until after October. I believe last year very little was caught if anything; and I think we left a lot of fish on the table last year for the October through December season. This year I don't believe there has been one midwater trawl fish caught in Area 1A yet.

If that is the case, we're going to leave like 5,000 tons on the table; and next year with such a small quota, we can't afford to leave a large percentage like that. The other issue is that in the state of Maine, which would be the largest user of herring for lobster bait, they have consistently said they want July through September is where the majority of the bait should be coming in for them.

For New Hampshire, Massachusetts south that there is some demand later on; the Area 3 fishing can certainly provide that as we're seeing now, because we are getting landings right now from Area 3. For all those reasons I support this; and I think we need to try to adjust to these extremely low quotas that we're going to be dealing with.

CHAIRMAN KERNS: Any other comments on this motion? Eric Reid.

MR. REID: I'm fine with understanding what Area 1A needs; and I'll support this motion. Just a technical question, I'm assuming that any overages would accumulate into the Period 4. It just says it will be rolled over from one period to the next. I'm assuming that all of the underages, if there are any, would accumulate into Period 4. Is that correct?

CHAIRMAN KERNS: Well, it would continually roll. If there was an underage from Period 1, it would roll into Period 2, 2 to 3, 3 to 4.

MR. REID: That's the way I understand it. I just want to make sure that if Period 2 is short, and then I don't want the fish uncaught. I guess that is what I'm trying to say, so okay fine, thank you.

CHAIRMAN KERNS: Any additional comments? David Pierce and then Ray Kane, and then we're going to.

DR. PIERCE: I guess I still struggle with comments that have been made in public forums; such as at the New England Council

meeting when the buffer zone was decided, and the midwater trawlers represented by Cape Seafoods out of Gloucester made it clear that the buffer zone would dramatically impact their ability to survive.

To what extent that is true I have no clue; but that is what he said. The inference was that they are not going to be able to continue to fish with just access to Area 3; because of a lack of fish. Now whether that's true, I don't know. My point is if indeed they're not going to be able to, for whatever reason, get fish in Area 3, it means that by losing October with this particular approach, there will be a dearth of lobster bait for lobstermen in Massachusetts.

I've checked with MLA in Massachusetts; and I've been told that they are very dependent on midwater trawler landings of sea herring in October, of course prior to any spawning closure. Then that would be bait needs by lobstermen from just north of Gloucester down to Boston. I try to be sensitive in Massachusetts, as of course the state of Maine is, sensitive to the bait needs of lobstermen.

That is reason why I continue to express concern about this particular approach. If they can find fish in Area 3 then fine, in October, then that will provide bait needs. But as far as I'm concerned at this point in time, I don't know whether they'll be able to do that; especially if you have a spawning closure in place. I'm going to again, not support this motion.

CHAIRMAN KERNS: Ray Kane.

MR. KANE: Yes, a technical question. Doug, going with a Period 1, 2, 3, and 4, we could drop the conference call? Right now we're on it, right?

MR. GROUT: I don't believe so. I mean the intent would be. I'll tell you what I was to try and get as much of the quota into July, August, and September as I stated. One of the things that I think we would still have to have is the Days Out meetings; to one, I was hoping that we might set zero landing days in June, and then rollover June into July and August. I think we would have to have a discussion as to whether we're going to have landing days for July and August and September.

It's going to be caught pretty quickly if we don't. If that depends on what the lobster and the herring fishery, if they want to catch it quick then we just give them seven days, once we get into the July, August and September. If we want to stretch it out then we would have to put in some management restrictions. We would still have to have some. I think it would be prudent for us to have a Days Out call or meeting.

MR. KANE: I can support this motion. I mean I'm looking at landings right now, and they're catching fish in Area 3, and this is the month of October. They've been catching fish in Area 3 since the end of September. My colleague tells me fish aren't available in Area 3; but I look at the landing reports weekly, and they are catching fish in Area 3 as we speak.

I know there was a motion put forward at the New England Council; where they wanted to change percentages throughout the sub-management areas. That was voted down. You're looking at what 27 percent of the overall quota going to Area 1A; so I can support this motion.

CHAIRMAN KERNS: In the interest of time; I think unless there is anything else I'm going to go to the public to see if anybody wants to speak on the motion. Jeff Kaelin.

MR. JEFF KAELIN: Good afternoon everybody. I'm Jeff Kaelin with Lunds Fisheries in Cape May, New Jersey. I'm also the Chairman of the Commission's Herring AP. Unfortunately this issue wasn't addressed by the Herring AP; didn't know this was coming. I kind of suspected it. I don't really do think that it is a motion with unintended consequences. I think the

consequences are pretty clear to the midwater trawl fleet here; with the potential for the Area 1A access to be limited.

It's a competition with the seiners; but as Dr. Pierce pointed out, the way this works it's very likely that the opportunity for midwater fishing in the region is going to drop from about 27 percent of that 1A quota to probably 10 percent, no public notice and so forth. Really, I am opposed to this. It's important I think to keep in mind that midwater trawl access to the Gulf of Maine not only benefits the herring fishery; but it is an important issue for the mackerel fishery, managed by the Mid-Atlantic Fishery Management Council.

There is very valuable fish, the mackerel is. There has been mackerel in the Gulf of Maine. I think that we'll find it again this fall; I think it's still there. The value of the RSA has been maintained in this region by the New England Council. They have allowed RSA fishing in 1A in the fall trimester; because they recognize the potential to take mackerel, and create value in the RSA, which as was pointed out earlier is funding the only shoreside monitoring program that is in place right now. I think this is unfortunate.

I'm opposed to the motion; and I think Dr. Pierce's comments are right on target, and I think this ought to be rejected, and maintain the status quo trimester approach that has worked for a long time, and not give one fleet another hit here. We're already reeling from the 12-mile-year-round buffer that has been proposed, which eliminates the access to the fleets to somewhere around 30 percent of where we have found it historically. Here is another hit; and I don't think it's warranted. I think you should oppose it in the interest of competition.

CHAIRMAN KERNS: Back to the Board. This is a final action. I'm going to see if we have any objections. If we have objections then I'll have Megan do a roll call vote. Okay, we will do a roll call; Megan.

MS. WARE: Maine.

MR. KELIHER: Yes.

MS. WARE: New Hampshire.
MR. WHITE: Yes.

MS. WARE: Massachusetts.

DR. PIERCE: No.

MS. WARE: Rhode Island.

MR. REID: Yes.

MS. WARE: Connecticut.

SENATOR CRAIG A. MINER: Yes.

MS. WARE: New York.

MR. EMERSON C. HASBROUCK: Yes.

MS. WARE: New Jersey.

MR. JOE CIMINO: No.

MS. WARE: New England Council.

MR. STOCKWELL: Abstain.

MS. WARE: NOAA Fisheries.

MS. MURPHY: Abstain.

CHAIRMAN KERNS: **That is 5 in favor, 2 against, 0 null and 2 abstentions. The motion carries.** Are there any other issues regarding the specifications? Ritchie White.

MR. WHITE: Because of the extremely low quota, and because the Board lacks some ability of flexibility; as the process we've just gone through. I propose that I would like to move to initiate an addendum, and this addendum

would be attached to the previous addendum approved concerning 1A.

This is move to initiate an addendum which considers providing the Atlantic Herring Board flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. I'll wait and see if it's seconded.

CHAIRMAN KERNS: Do we have a seconder; Steve Train, Ritchie, to your motion.

MR. WHITE: As I said, I think with these extremely low quotas we're going to be dealing with for the next probably at least three years; that I think having maximum flexibility to figure out when and how we can maximize the herring harvest and use in 1A, I think is going to be critical. Therefore, I think just putting more tools in our toolbox can do nothing but help us.

CHAIRMAN KERNS: Ritchie, just a clarification question. Do you mean to be able to change the fixed percentages? Is that what you're asking for?

MR. WHITE: Yes, it's to expand on, what there are four alternatives in Amendment 3 now, so to expand those so there is more flexibility so the PDT would come up with additional options to provide us more flexibility, possibly monthly quotas. I would be looking for whatever options they could come up with.

CHAIRMAN KERNS: I think it would be helpful if this management board gave them goals and objectives that you're trying to seek. This is a pretty broad range. They might need some definition; in order to come back to you with something specific. It might be helpful to have a little bit more direction for them.

MR. WHITE: Yes can we take a couple minute recess; to try to come up with some.

CHAIRMAN KERNS: What if we table this decision and let Pat go over his enforcement question. We can actually take up the Advisory Panel and the enforcement while you think about this and then come back to this.

MR. WHITE: Absolutely.

REVIEW AND POPULATE ADVISORY PANEL

CHAIRMAN KERNS: Motion to table to the end of this meeting. Is there objection to that? Seeing no objection; we will move on to Tina Berger.

MS. TINA BERGER: Thank you, Madam Chair. I have one Advisor, Joseph Jurek, a commercial otter trawl fisherman from Massachusetts for the Board's consideration and approval to the Atlantic Herring AP.

CHAIRMAN KERNS: Is there a motion to approve? Dr. Pierce. Is there a seconder; Bob Ballou. I will read the motion. **Move to approve Joseph Jurek from the state of Massachusetts or the Commonwealth of Massachusetts to the Atlantic Herring Advisory Panel. Motion by Dr. Pierce; seconded by Mr. Ballou. Is there any objection to this motion? Seeing no objection; the motion carries.**

OTHER BUSINESS

ENFORCEMENT INVOLVING STRIPED BASS IN HERRING CATCH

CHAIRMAN KERNS: Moving on to the next agenda item, Pat you had an issue on Enforcement.

MR. KELIHER: Thank you, Madam Chair. I'll be brief. Not that I want to manage on social media reports as it pertains to bycatch. But we have seen quite a flurry of activity in regards to bycatch of striped bass with the herring fishery this year. The Maine Marine Patrol is in the process right now of finalizing an investigation of striped bass bycatch.

We believe a summons will be issued for it; for possession and sale of striped bass, as it pertains to lobster bait. The one bit of information that we have right now is for the sample checked out of one load of fish, 5 percent of, I can't remember how many exactors, but 5 percent of a tractor trailer load was striped bass. It was not an insignificant amount of fish. I just raise that as an issue. It's an ongoing issue associated with this; and would ask that the states talk to their enforcement folks, to see if they are also seeing striped bass within the herring catch.

CHAIRMAN KERNS: Mr. Kane.

MR. KANE: Pat, any idea where that fishery occurred where they caught all these striped bass?

MR. KELIHER: Off the Cape.

CHAIRMAN KERNS: Any other questions? We're back to you, Ritchie, how we doing?

MR. WHITE: No pressure and I am part way there. I'm thinking that it would contain an option that would eliminate trimester quotas, and institute quotas to maximize market demands. I don't know if that is enough or not for the PDT.

CHAIRMAN KERNS: I'm looking to two PDT members on either side of me. I'm going to confer with them and get back to you.

MR. WHITE: Madam Chair, I've got a little addition. I would say to maximize catch in accordance with market demands.

CHAIRMAN KERNS: Bob Beal.

EXECUTIVE DIRECTOR BEAL: We've got a procedural corner we've painted ourselves into. We've got a tabled motion and we're perfecting a tabled motion. You may really want to do a substitute motion or if the Board is okay with it, you can do friendly amendments to the tabled motion; which is a little, Robert would be rolling over in his grave, Robert's Rules of Order. The Board can decide to withdraw that motion if you want, and then you can start all over. Any one of those options would be good. But we've got to do something on the record.

CHAIRMAN KERNS: I was asking Ritchie before to just give the PDT a little bit of direction; asking for sort of what is the direction to the PDT for what he meant by flexibility. We were not necessarily incorporating it into the motion; but information to take back to the PDT, in order to write the addendum. We can add it to a motion.

EXECUTIVE DIRECTOR BEAL: It's up to the Board. If they feel that the additional points that Ritchie made are direction to the PDT, and don't need to be included in the motion then that's fine. But it sounded like Ritchie was massaging the motion a little bit. It was getting a little bit tricky.

CHAIRMAN KERNS: Ritchie.

MR. WHITE: Pat has some additional wordage that is going to be much clearer. We will hear from Pat and then I will ask the Board if this is just direction or if we need a motion to substitute.

MR. KELIHER: Trying to capture what Ritchie is doing. This would task the TC to expand quota period options to increase flexibility when distributing Area 1A herring quota; during years in which the sub-ACLs are lower may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of harvest to meet the needs of the market.

MS. WARE: Just to clarify. That would probably be the PDT, not the TC.

MR. KELIHER: Yes.

CHAIRMAN KERNS: Dr. Pierce.

DR. PIERCE: Is this a motion? It wasn't made as a motion, but I would like to respond to it if indeed it is a motion, Madam Chairman if it is appropriate. This is what I feared; and Ritchie kind of set the table regarding the motion that we're addressing now, and that is I could see flexibility, considering the state of Maine's demand for bait.

Period 2 give it all to July and August, 100 percent. Therefore, it is only the purse seine fishery out of the state of Maine predominantly. Now September was put in the remarks made by Pat. Once again, it is all to the state of Maine and the purse seine fishery in Area 1A to the detriment of any other user, except of course for otter trawl will still go out on daily trips.

I'm very concerned about actions that this Board might take that would be burdensome, overly so, on one important component of the sea herring fishery. I say that in the context of the highly charged environment in which we are now working regarding the buffer zone. It may not be relevant, but I suspect it may be.

I don't want to jeopardize the buffer zone by actions that this Board would take that would unduly impact one important element of the fishery; which is the midwater trawlers. Again, I understand why midwater trawling is under the microscope. It's under my microscope as well, but this is just too much of an attempt to garner the majority of the Area 1A quota for one user group and one state.

CHAIRMAN KERNS: Pat I think that we would, based on David's comments, make that a motion to amend the current motion to include what you stated; and we're going to work on that to get on the board.

MR. KELIHER: That's fine. We were trying to work on kind of the goals; but if we wanted to turn it into a motion to further debate that's fine.

CHAIRMAN KERNS: While we're getting that up are there any other comments? David Borden.

MR. BORDEN: It's just the process. I'm confused late in the day. Are we making a motion to amend a motion that just got tabled? Is that what we're doing?

CHAIRMAN KERNS: Well we tabled the motion to the end of the meeting; and then we came to the end of the meeting, so we went back to Ritchie to ask him for clarification on what he meant by.

MR. BORDEN: But the tabled motion is now on the floor.

CHAIRMAN KERNS: It's now on the floor, because it was the end of the meeting, and so we have this amendment that provides more specificity on what the goal of the addendum would be, and that is move to amend to include to task the PDT to expand the quota period options to increase flexibility when distributing the Area 1A herring quota.

During years in which the sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for the expansion of harvest to meet the needs of the market. Motion by Mr. Keliher, we would need a seconder to this motion. Motion seconded by Mr. White. Ritchie.

MR. WHITE: To respond to David's comments. This would be a tool in the toolbox, and this Board would have to approve implementing this. At the time that this might be proposed then there could be arguments pro and against, if there were both. Those people would have to convince the rest of the Board members that it was either a good thing to do or not a good thing to do.

CHAIRMAN KERNS: Ray Kane.

MR. KANE: Yes, can we see some numbers in this motion? I mean we're talking about lower, higher, sub-ACLs. What is the higher sub-ACL, what they currently caught for this year 49,000 metric ton, or is it 90,000 metric ton? Can we put some numbers into this motion?

CHAIRMAN KERNS: Ray, I think that could be something for the discretion of the PDT to make recommendations to the Board; if the PDT finds that's a prudent way to define the tool in the toolbox that they bring back to the management board. But I'm not sure we would be able to define numbers here today. Again, this would be an option in the addendum to be considered. Are there any other comments? Emerson.

MR. HASBROUCK: I'm just wondering what market we're talking about here. Choose options that would allow for an expansion of harvest to meet the needs of the market. What does that really mean? I just heard Jeff Kaelin a few minutes ago saying that his market was going to be negatively affected by our previous motion.

CHAIRMAN KERNS: Pat Keliher.

MR. KELIHER: The bait market.

CHAIRMAN KERNS: Adam Nowalsky.

MR. NOWALSKY: It's my intention Madam Chair, to allow this motion to amend to be voted on; but prior to voting on the final motion, I intend to make a motion to postpone until we can convene the AP to discuss options to increase flexibility based on public comments; if you would be so kind as to allow me that at that point.

CHAIRMAN KERNS: Thank you Adam, will do. I'm going to ask the Board to vote on this issue; and then if it passes then I will take the main motion to the public. Any other comments, all right then we will vote on this issue. All those in favor raise your right hand. We're caucusing. Are we ready?

All those in favor please raise your hand, 4 yeses, those against, 3 opposed, any null votes, any abstentions? Two abstentions, the motion carries. The new motion, we will get that up there in a second. Ritchie, you know what your new amended motion says, so if you want to speak please go ahead.

MR. WHITE: Yes, I just wanted to Adam's suggestion. If this passes and it starts the addendum process, the Advisory Panel would be commenting on an Addendum. I don't think they are left out of this process.

CHAIRMAN KERNS: Adam.

MR. NOWALSKY: It was clear that the fact that we had to table this to this point that there was some question about the direction we were giving the PDT to look at. Given the comments we've heard already from the public about the process we've gone through today. I think it would be prudent to allow the AP some input; to help the PDT craft those options, and that is what my intent will be when the time is ready.

CHAIRMAN KERNS: All right, I'm going to read the new motion. **Move to initiate an addendum which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum, initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. We tasked the PDT to expand the quota period options to increase flexibility when distributing the Area 1A herring quota.**

During the years in which sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of the harvest and meet the needs of the market.

I'm going to go to the public. In the interest of time, if you do need to make comments, please keep them to one minute. Is there anyone from the public that wants to comment on this motion? Jeff Kaelin.

MR. KAELIN: Yes, I'm opposed to this. I can see where this is going. There is no mention of equal access for federal permitted fishermen with different gears or anything like that. It's another anti midwater trawl approach. We're completely opposed to it, thank you. I appreciate the members who voted against the motion earlier. Thank you.

CHAIRMAN KERNS: Thank you Jeff, and thank you for your brevity. Adam, I will come to you as I said I would before.

MR. NOWALSKY**: I would move to postpone this motion until the AP can be convened to discuss options for greater flexibility for setting Area 1A period specifications.**

CHAIRMAN KERNS: Is there a second; Emerson Hasbrouck. Adam, do you want to speak to your motion?

MR. NOWALSKY: I think I've added most of it here. Again, I think we've had difficulty directing the PDT. We've heard concerns from the audience. I think it would be good to get some more information to them before we develop this.

CHAIRMAN KERNS: Are there any other comments on the motion to postpone? **Seeing none; we'll vote on this motion. All in favor please raise your hand; 7 in favor, those opposed, 2 opposed any null votes, any abstentions? The motion carries.**

ADJOURNMENT

CHAIRMAN KERNS: Is there any other business that comes before the management board? Seeing none; is there a motion to adjourn? Thank you, Tom Fote.

(Whereupon the meeting adjourned at 3:40 o'clock p.m. on October 22, 2018)

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM II TO AMENDMENT 3 TO THE ATLANTIC HERRING INTERSTATE FISHERY MANAGEMENT PLAN

Gulf of Maine Spawning Protections

ASMFC Vision: Sustainably Managing Atlantic Coastal Fisheries

This draft document was developed for Board review and discussion at the February 2019 meeting week. This document is not intended to solicit public comment as part of the Commission/State formal public input process. However, comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. Also, if approved, a public comment period will be established to solicit input on the issues contained in the document.

January 2019

Atlantic States Marine Fisheries Commission Seeks Your Input on Atlantic Herring Management

The public is encouraged to submit comments regarding this document during the public comment period. Comments will be accepted until 5:00 p.m. EST on **DAY, MONTH YEAR**. Regardless of when they were sent, comments received after that time will not be included in the official record.

You may submit public comment in one or more of the following ways:

1. Attend public hearings held in your state or jurisdiction.
2. Mail, fax, or email written comments to the following address:

Megan Ware
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201
Fax: (703) 842-0741
comments@asmfc.org (subject line: Herring Draft Addendum II)

You may also refer comments to your state's members on the Atlantic Herring Management Board or Atlantic Herring Advisory Panel; however, only comments submitted to the Commission or given at a public hearing will be included in the public comment summary present to the Board. If you have any questions please call Megan Ware at 703.842.0740.

Commission's Process and Timeline

October 2018	Atlantic Herring Board Tasks PDT to Develop Draft Addendum II
Nov. 2018-Jan. 2019	PDT Develops Draft Addendum II for Public Comment
February 2019	**Atlantic Herring Board Reviews Draft Addendum II and Considers Its Approval for Public Comment**
March-April 2019	Board Solicits Public Comment and States Conduct Public Hearings
May 2019	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum II
TBD	Provisions of Addendum II are Implemented

1. INTRODUCTION

The Atlantic States Marine Fisheries Commission (ASMFC) is responsible for managing Atlantic Herring (*Clupea harengus*), under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACFMA). The U.S. Atlantic herring fishery is currently managed as a single stock through complementary fishery management plans (FMPs) by ASMFC and the New England Fishery Management Council (NEFMC). ASMFC has coordinated interstate management of Atlantic herring in state waters (0-3 miles) since 1993. Management authority in the exclusive economic zone (EEZ, 3-200 miles from shore) lies with the NEFMC and National Marine Fisheries Service (NMFS).

Atlantic herring reproduce by spawning (releasing) eggs each year in the fall and early winter months. To protect aggregations of spawning fish and support the sustainability of the resource, spawning closures are annually implemented in the Gulf of Maine (GOM). The start of these closures is determined by the collection of biological samples which are used to project inter-annual changes in the timing of spawning. The closures are initially implemented for four weeks, but can be extended for two additional weeks if sampling indicates the continued presence of spawning fish.

Results of the 2018 Benchmark Stock Assessment indicate that the health of the Atlantic herring resource has declined in recent years. Specifically, the Assessment found that recruitment has been well below the time-series average since 2013, with 2016 representing the lowest level of recruitment on record (NEFSC 2018). In addition, spawning stock biomass, a measure of the reproductively mature portion of the population, has decreased.

Given this new stock information, the Board initiated Draft Addendum II in October 2018 to consider strengthening the protections provided to spawning herring in Area 1A (Figure 1). This document considers extending the length of the spawning closures as well as altering the point at which they are triggered, in order to provide greater protection to the stock.

2. OVERVIEW

2.1 Statement of the Problem

The 2018 Benchmark Stock Assessment indicated significant declines in recruitment in the Atlantic herring stock, particularly over the last five years. This suggests a reduction in herring biomass in the coming years. Given successful spawning and recruitment are essential to the future health of the resource and fishery, the Board initiated Draft Addendum II to consider strengthening the protections provided to spawning herring in the Gulf of Maine. Specifically, the Draft Addendum considers management alternatives related to the length of a spawning closure and the point at which a spawning closure is initiated.

2.2 Background

2.2.1 Atlantic Herring Spawning

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

Atlantic herring generally reproduce in the late summer and fall; however, the onset and duration of spawning may vary by several weeks from year to year (Winters and Wheeler, 1996). In addition, spawning typically occurs earlier in the eastern Gulf of Maine as opposed to the western Gulf of Maine and waters off of Massachusetts and New Hampshire (Reid et al., 1999).

When spawning, herring deposit adhesive eggs that stick to coarse sand, pebbles, cobbles, and boulders on the ocean floor (NEFMC 2018). Essential fish habitat identified for herring eggs include benthic habitats of inshore and offshore Gulf of Maine, Georges Bank, and Nantucket shoals in depths of 5-90 meters (NEFMC 2018). Eggs are often laid in layers, creating mats along the ocean floor. A single female herring can produce between 55,000 and 210,000 eggs (Kelly and Stevenson, 1983). Once hatched, herring larvae can be found in the inshore and offshore pelagic habitats of the Gulf of Maine, Georges Bank, and in the upper Mid-Atlantic Bight (NEFMC 2018).

2.2.2 Benchmark Stock Assessment

Results of the 2018 Stock Assessment presented concerning trends for the Atlantic herring resource. The assessment showed that age-1 recruitment has been below the time-series average for the last five years (Figure 3) (NEFSC 2018). In addition, four of the six lowest estimates of recruitment have occurred in recent years (2013, 2015, 2016, and 2017) (NEFSC 2018). While the assessment did note that recruitment estimates at the end of the model time series may have greater uncertainty, the document highlighted that 2016 represented the lowest level of annual recruitment on record (NEFSC 2018).

Overall, the assessment concluded that, in the terminal year of the model (2017), the stock is not overfished and overfishing is not occurring; however, the assessment did state that, given declines in recruitment, spawning stock biomass is likely to remain low, putting the stock at risk of being overfished (NEFSC 2018). In addition, the assessment noted that without improved recruitment, the probability of overfishing in the future is high (NEFSC 2018).

2.2.3 Existing Gulf of Maine Spawning Closure Protocol

Under Amendment 3, spawning aggregations in the Gulf of Maine are protected through the use of spawning closures. These closures prohibit directed fishing during specific times of the year in three distinct areas: Eastern Maine, Western Maine, and Massachusetts/New

Hampshire (Figure 1). Based on the goals of the Atlantic Herring Fishery Management Plan (which include providing adequate protection for spawning herring, preventing overfishing of discrete spawning units, achieving full utilization of herring catch, and maximizing social and economic benefits of the fishery), these spawning closures look to reduce interaction between fishing and spawning while also providing access to quota (ASMFC 2016).

The implementation of the spawning closures is determined by the GSI_{30} protocol. For female herring, GSI is a calculation of the gonad (ovary) mass as a proportion of the total body mass and it is used to measure herring maturity. Per the GSI_{30} protocol, three or more samples of herring, either from fishery independent or dependent sources, are used to model the relationship between GSI and date, and forecast the timing of spawning. Given larger herring spawn first, the GSI values are standardized to a 30 cm fish to ensure protection of the majority of the population. If there are insufficient samples in a given year and area to forecast the timing of spawning, a default closure date is used. This default date is derived from historical GSI samples over the last decade as well as applicable literature.

The initiation of a spawning closure is determine by a trigger value established in Amendment 3. The relationship between GSI and the date is monitored as the season progresses and compared to the trigger value; when GSI is projected to exceed the trigger value, a spawning closure is implemented. Generally, a higher trigger value closes the fishery later and closer to spawning while a lower trigger value provides additional protection to maturing fish by encompassing time before the spawning season begins. Through Amendment 3, the Section implemented a GSI trigger value of 25 which sought to close the fishery in the later stages of maturity but just before spawning.

Under Amendment 3, the length of a spawning closure is initially set at four weeks. A closure can be extended by two weeks if a sample taken from the area indicates a significant number of spawning herring. A 'significant number' of spawn herring is defined as 25% or more mature herring, by number in a sample, that have yet to spawn. To qualify, a sample must have a minimum of 80 randomly selected adult sized fish.

A full copy of the spawning closure protocol can be found in Section 4.2.6 of Amendment 3. Implementation dates of spawning closures from 2015-2018 can be found in Table 1.

2.2.4 Evaluation of Current Protections

In a January 2018 memo to the Board (Dean *et al.,* 2018; included as Appendix 1), the Atlantic Herring Technical Committee (TC) evaluated the performance of the GSI_{30} spawning closure protocol. The aim of this review was to assess whether the program was meeting its objectives, given it had been implemented two years prior. Data used in this evaluation included spawning samples collected through 2017. The memo evaluated several components of the GSI_{30} protocol, including the trigger value and the length of the closure, and updated the calculation of default closure dates. The TC also looked at the overall success of the GSI_{30} protocol and concluded that it represents a significant improvement over the previously used system as it is better able to respond to inter-annual changes in the timing of spawning (Dean *et al.,* 2018).

One of the questions evaluated in the TC memo was whether spawning commences near the current trigger value. This is an important question to ask since initiating a closure too early or too late may diminish the effectiveness of the spawning closures. To answer this question, the TC compared the start of spawning closures in Massachusetts/New Hampshire to the estimated percentage of spawning herring in the population (Dean *et al.,* 2018). Only closures in the Massachusetts/New Hampshire spawning area were evaluated given significantly fewer samples have been collected in Eastern Maine and Western Maine. Overall, the TC found 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 (Figures 4 and 5) (Dean *et al.,* 2018). For example, in 2017, the spawning closure started 2 days prior to there being approximately 25% spawning herring in the population.

An important question to ask following the TC's analysis is whether initiating a closure when approximately 25% of the population is spawning is appropriate given the condition of the stock. The TC's memo does note that reducing the GSI_{30} trigger value would initiate a spawning closure earlier and would reduce the probability of exceeding 25% spawning fish in the catch (Figure 5). However, it is important to note that a lower trigger value corresponds with an earlier default date which may precipitate the need for a longer closure to provide protection throughout the spawning season (Dean *et al*., 2018). In addition, lowering the trigger value may shorten the time available to collect spawning samples and project a closure given the earlier default date.

The TC memo also evaluated whether the existing four week closure period is sufficient to cover the typical spawning season. To conduct this analysis, the TC defined a spawning season as starting when 25% of the herring population has begun spawning and ending when 75% of the herring population has ended spawning (Dean *et al.,* 2018). The TC then compared the lengths of the spawning seasons under this definition. The analysis showed that, between 2015 and 2017, spawning seasons in the Massachusetts/New Hampshire area were 4 weeks, 2.3 weeks, and 4.9 weeks, respectively (Figure 4). The TC expressed greater confidence in the longer spawning season estimates given a significantly higher number of samples in 2015 and 2017. 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 (Dean *et al.,* 2018). The TC also noted that if the Section was interested in simplifying the closure protocol and increasing protection during spawning, the Section could consider a longer initial closure period of five to six weeks (Dean *et al.,* 2018). Notably, longer closure periods may result in a greater overlap between the three spawning closures, resulting in multiple areas being closed at the same time.

It is important to highlight that the trigger value and the closure length are interconnected components of the spawning closure protocol. Earlier trigger values which decrease the percentage of spawning herring in the catch result in longer spawning seasons (Figure 6). As a result, under a lower trigger value, a longer closure may be needed to provide protection throughout the spawning season. Table 2 outlines the relationship between the trigger value and the approximate length of the spawning closure season. Specifically, it shows that as the trigger values decrease, the percentage of spawning herring in the population at the start of the

closure also decreases but the average length of the spawning season increases. For example, under a trigger value of 23, a spawning closure is initiated when approximately 20% of the herring population is spawning and the average spawning season length is 4.3 weeks (but can range up to 5.7 weeks). Under a trigger value of 22, a spawning closure is initiated when approximately 15% of the herring population is spawning and the average spawning season length is 5.1 weeks (but can range up to 6.6 weeks).

2.2.5 Overview of Herring Fishery

The domestic Atlantic herring fishery is predominately commercial. Landings in the Atlantic herring fishery increased in the 1960's, peaking in 1968 at 477,767 mt (1.05 billion pounds; NEFSC 2018), largely due to a foreign fishery which developed on Georges Bank. Catch declined in the early 1980's to 44,613 mt (98.4 million pounds) in 1983 but subsequently increased through the late 1980's and early 1990's (NEFSC 2018). Landings in the 2000's were fairly stable around 113,358 mt (250 million pounds) but have decreased over the last four years to 50,250 mt (111 million pounds) in 2017 (NEFSC 2018).

Several gear types participate in the Atlantic herring fishery, including mid-water trawls, purse seines, small mesh bottom trawls, and fixed gear. In recent years, the majority of Area 1A landings have come from purse seiners (80% of landings between 2012 and 2015). Historically, 0% of the Area 1A sub-ACL has been allocated to the months of January – May. In addition, vessels using single and paired midwater trawls are prohibited from fishing for Atlantic herring in Area 1A between June 1 and September 30.

In recent years, the greatest amount of herring from Area 1A has been landed in July and August (Table 3). Specifically, between 2015 and 2017, average herring landings in July and August were 6,067 mt and 7,564 mt, respectively. Average Area 1A landings were lower in September (2015-2017 average is 2,688 mt) and then increased again in October (2015-2017 average is 5,768 mt). This increase in October coincides with mid-water trawl vessels being permitted to fish for herring in Area 1A. Monthly landings trends are likely impacted by the existing spawning closures, which occur in the fall and prohibit directed fishing for herring in portions of Area 1A.

The 2018 annual catch limit (ACL) for the Atlantic herring fishery was originally set at 111,000 mt. However, in response to results from the 2018 Benchmark Stock Assessment (see *Section 2.2.2*), NOAA Fisheries took an in-season action to reduce the 2018 ACL to 49,900 mt in order to decrease the risk of overfishing in 2018 and increase the estimated herring biomass in future years. It is expected that ACLs in 2019 through 2021 will continue to be low given the condition of the stock; a proposed ACL for 2019 is 24,488 mt. Given these low quotas, it is possible that the directed herring fishery will catch the majority of Area 1A sub-ACL prior to the implementation of spawning closures in the fall. As a result, the full benefits and/or costs of changes to the spawning protocol may not be evident for several years.

3. MANAGEMENT PROGRAM

The management alternatives in this section consider modifying the provisions of *Section 4.2.6: Spawning Restrictions* in Amendment 3 to the Interstate Fishery Management Plan for Atlantic Herring. Table 2 outlines the relationship between the GSI_{30} trigger value and the closure length. Table 4 summarizes all the alternatives under consideration.

Issue 1: GSI_{30} Trigger Value

The default closure dates in Option A represent those implemented under Amendment 3. In Options B-D, additional spawning samples collected through 2017 were used to update the calculation of default dates (analysis based on samples from 2005-2017). The Eastern Maine default closure date does not change between the GSI_{30} trigger values as, due to a low number of spawning samples collected to in that area, the default date is based on literature.

Option A: Status Quo (GSI_{30} Trigger Value = 25)

Under this option, the GSI_{30} trigger value is 25. This option closes the fishery in the later stages of maturity but just before spawning. The default closure dates associated with this trigger value are those implemented in Amendment 3.

Eastern Maine	August 28
Western Maine	October 4
Massachusetts/New Hampshire	October 4

Option B: GSI_{30} Trigger Value = 25 with Updated Default Dates

Under this option, the GSI_{30} trigger value is 25. This option closes the fishery in the later stages of maturity but just before spawning. The default closure dates associated with this trigger value have been updated to incorporate additional spawning samples collected through 2017.

Eastern Maine	August 28
Western Maine	October 1
Massachusetts/New Hampshire	October 1

Option C: GSI_{30} Trigger Value = 23

Under this option, the GSI_{30} trigger value is 23. This option closes the fishery at an earlier date to provide more protection to pre-spawning fish and reduces the probability of catching spawning fish at the beginning of the spawning season; however, it may not provide complete protection to spawning fish toward the end of the season, unless the closure length is extended (Issue 2). The default closure dates associated with this trigger value are below.

Eastern Maine	August 28
Western Maine	September 23
Massachusetts/New Hampshire	September 23

Option D: Trigger Value = 22

Under this option, the GSI_{30} trigger value is 22. This option provides the earliest date to close the fishery, providing the greatest protection to pre-spawning fish; however, it may not provide protection to spawning fish toward the end of the season, unless the closure length is extended (Issue 2). The default closure dates associated with this trigger value are below.

Eastern Maine	August 28
Western Maine	September 19
Massachusetts/New Hampshire	September 19

Issue 2: Spawning Closure Length

Option A: Status Quo (Four Week Initial Closure)

Under this option, the spawning closures established in Area 1A extend for four (4) weeks. As shown in Table 2, for a GSI_{30} trigger value of 25, a four week closure is slightly longer than the average spawning season of 3.7 weeks but shorter than the maximum observed spawning season of 4.9 weeks.

Option B: Five Week Initial Closure

Under this option, the spawning closures established in Area 1A extend for five (5) weeks. As shown in Table 2, for a GSI_{30} trigger value of 25, a five week closure is longer than maximum spawning season observed of 4.9 weeks. For a GSI_{30} trigger value of 23, a five week closure is longer than the average spawning season of 4.3 weeks but shorter than the maximum observed spawning season of 5.7 weeks.

Option C: Six Week Initial Closure

Under this option, the spawning closures established in Area 1A extend for six (6) weeks. As shown in Table 2, for a GSI_{30} trigger value of 25 and 23, a six week closure is longer than the maximum observed spawning season of 4.9 weeks and 5.7 weeks, respectively. For a GSI_{30} trigger value of 22, a six week closure is longer than the average spawning season of 5.1 weeks but shorter than the maximum observed spawning season of 6.6 weeks.

Option D: Eight Week Initial Closure

Under this option, the spawning closures established in Area 1A extend for eight (8) weeks. As shown in Table 2, an eight week closure is longer than the maximum spawning season length for all trigger value alternatives and may reduce the need for a re-closure protocol.

Issue 3: Re-closure Protocol

Option A: Status Quo

A spawning closure can be extended for two (2) additional weeks if one (1) sample taken from within a spawning closure area, by Maine, New Hampshire or Massachusetts, indicates a significant number of spawn herring. Sampling will resume in the final week of the initial closure period or at the end of the initial closure period. Mature or 'spawn' herring are defined as Atlantic herring in ICNAF gonadal stages V and VI. A sample is defined as a minimum of 80

randomly selected adult sized fish, with a target of 100 fish, from a fishery dependent or independent source.

Sub-Option 1 (Status Quo): In the re-closure protocol, a 'significant number' of spawn herring is defined as 25% or more mature herring, by number in a sample, that have yet to spawn. This corresponds to the percentage of spawning herring in the population when an initial closure is implemented under a trigger value of 25.

Sub-Option 2: In the re-closure protocol, a 'significant number' of spawn herring is defined as 20% or more mature herring, by number in a sample, that have yet to spawn. This corresponds to the percentage of spawning herring in the population when an initial closure is implemented under a trigger value of 23.

Sub-Option 3: In the re-closure protocol, a 'significant number' of spawn herring is defined as 15% or more mature herring, by number in a sample, that have yet to spawn. This corresponds to the percentage of spawning herring in the population when an initial closure is implemented under a trigger value of 22.

Option B: No Re-Closure Protocol

There is no re-closure of a spawning closure. As a result, samples will not be collected at the end of an initial closure period to inform the possibility of a re-closure and a closure cannot be extended.

4. COMPLIANCE SCHEDULE

If the existing Atlantic herring management plan is revised by approval of this draft addendum, the Atlantic Herring Management Board will designate dates by which states will be required to implement the addendum. A final implementation schedule will be identified based on the management tools chosen.

5. LITERATURE CITED

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6. TABLES

Table 1: Area 1A spawning closure implementation dates from 2015 – 2018. Bolded text represents spawning closures which were enacted via the default date. It is important to note that the 2015 closures were implemented under the previously used length-based spawning closure protocol given Amendment 3 was not finalized until 2016.

	Eastern Maine	Western Maine	Massachusetts/New Hampshire
2015	**Aug. 15 – Sept. 11**	**Sept. 1 – Sept. 28**	**Sept. 21 – Oct. 18;** Re-closure Oct. 21 – Nov. 3
2016	**Aug. 28 – Sept. 24**	Sept. 18 – Oct. 15	Oct. 2 – Oct. 29
2017	**Aug. 28 – Sept. 24** Re-closure Oct. 16 – Oct. 30	Sept. 26 – Oct. 24	Oct. 1 – Oct. 28 Re-closure Oct. 29 – Nov. 11
2018	**Aug. 28 – Sept. 24**	**Oct. 4 – Oct. 31**	Oct. 26 – Nov. 22

Table 2: Relationship between GSI_{30} trigger value, approximate percentage of spawning herring in population when the closure begins, and spawning season length. Average spawning season lengths are based on data from 2015-2017. The range of spawning season lengths represents the shortest and longest spawning season length between 2015 and 2017 for each trigger value.

GSI_{30} Trigger Value	Approx. % of Spawners in Population When Closure Begins	Avg. Spawning Season Length (2015-2017)	Range of Spawning Season Length
25 (status quo)	25%	3.7 weeks	2.3 – 4.9 weeks
23	20%	4.3 weeks	2.7 – 5.7 weeks
22	15%	5.1 weeks	3.4 – 6.6 weeks

Table 3: Average Atlantic herring Area 1A landings (in metric tons) by month for 2015-2017. During these years, the directed herring fishery in Area 1A began in June and, as a result, the months of January – May are not shown in the table.

Month	Average 2015-2017 Landings (mt)
June	3,098
July	6,067
August	7,564
September	2,688
October	5,768
November	2,040
December	837

Table 4: Summary of options under consideration in this action

Trigger Value (Issue 1)	Closure Length (Issue 2)	Re-closure (Issue 3)
Option A (Status quo – Trigger of 25)	Option A (4 weeks – corresponds to trigger value options A or B)	Option A1 (re-closure if 25% or more mature herring; percentage corresponds to trigger value options A or B)
Option B (Trigger of 25 with updated default dates)	Option B (5 weeks – corresponds to trigger value options A, B or C)	Option A2 (re-closure if 20% or more mature herring; corresponds to trigger value option C)
Option C (Trigger of 23)	Option C (6 weeks – corresponds to all trigger value options)	Option A3 (re-closure if 15% or more mature herring; corresponds to trigger option D)
Option D (Trigger of 22)	Option D (8 weeks – corresponds to all trigger value options, minimizes need for re-closure)	Option B (no re-closure protocol; could be selected with any of the trigger values but problematic with shorter closure length options)

7. FIGURES

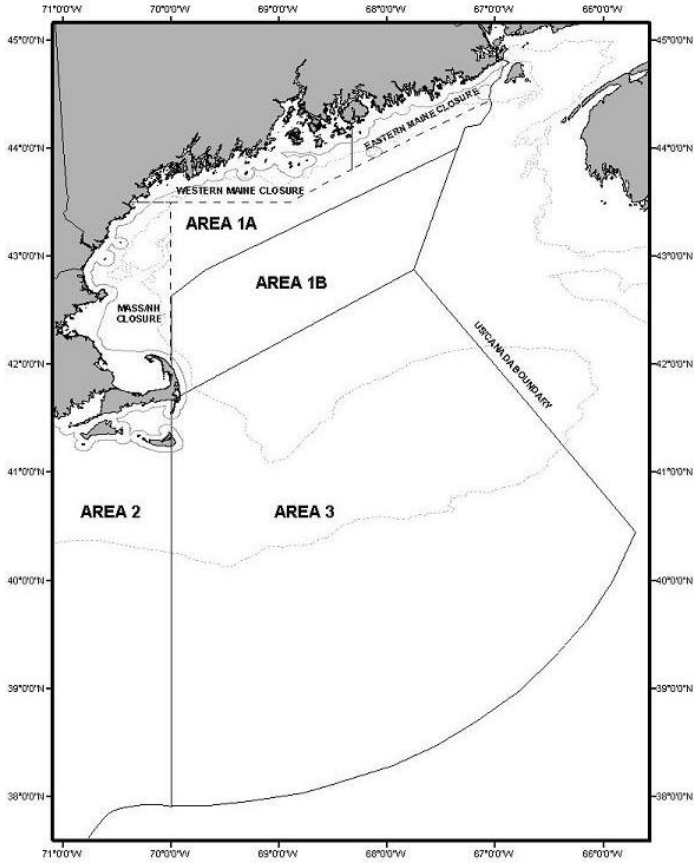

Figure 1: Atlantic herring management areas and spawning closure areas in the Gulf of Maine.

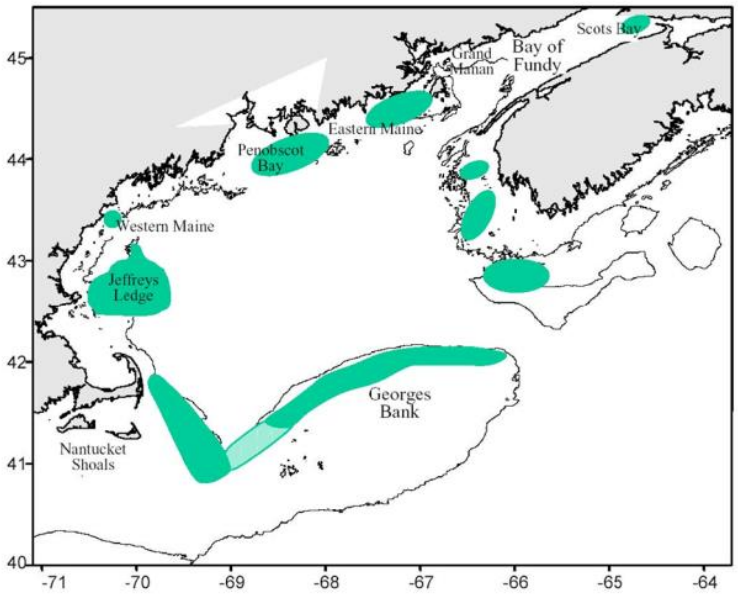

Figure 2: Overview of major Atlantic herring spawning areas, identified in green, in the Gulf of Maine and on Georges Bank. Source: Overholtz et al. 2004.

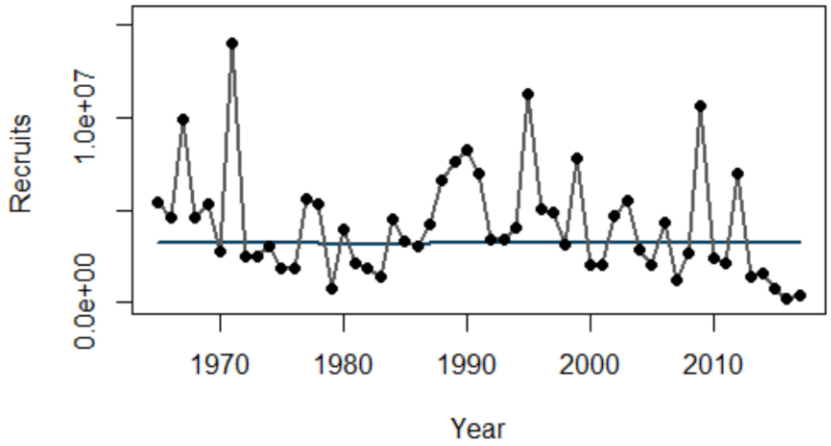

Figure 3: Atlantic herring annual recruitment, in 1000's, from 1965-2017. The horizontal line is the time-series average. Source: NEFSC 2018.

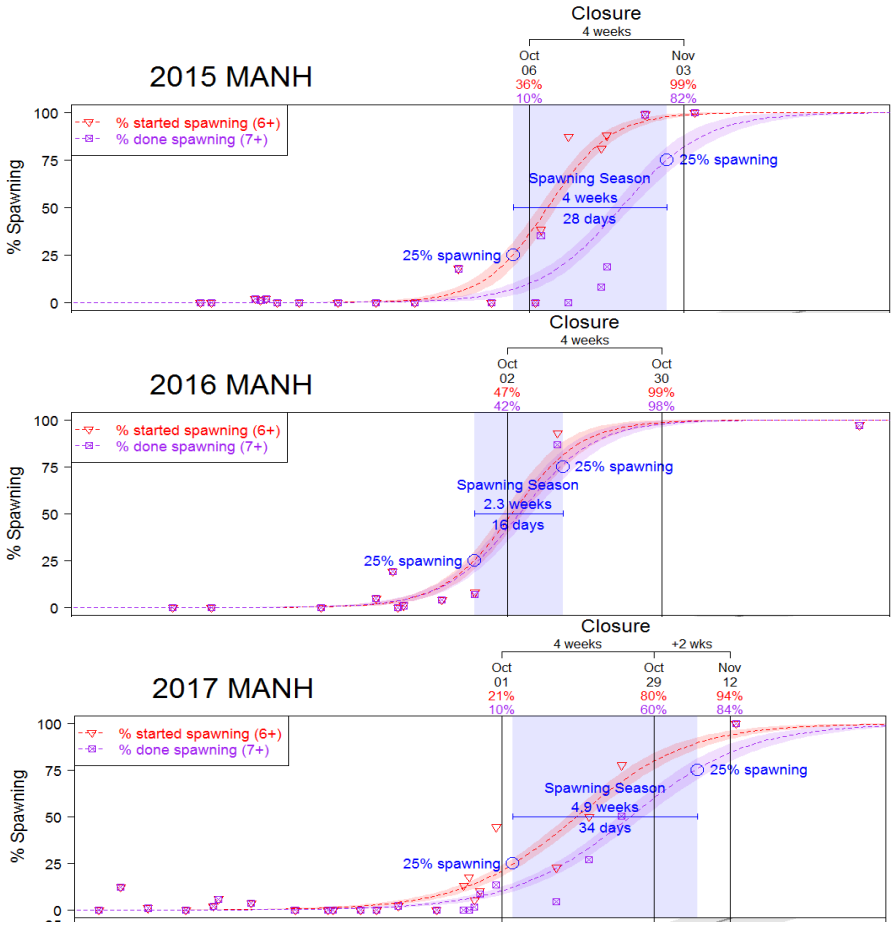

Figure 4: Estimated spawning seasons under the current GSI_{30} spawning closure protocol for the Massachusetts/New Hampshire spawning area in 2015 through 2017. The spawning season is identified by the blue shaded regions while the black vertical lines represent the spawning closures enacted by management. The length of the spawning season is calculated as starting when 25% of the herring population has begun spawning and ending when 75% of the herring population has ended spawning. The trigger value used to initiate the spawning closures was 25. In 2017, there was the use of the two week re-closure protocol given the continued presence of spawning herring. It is important to note that in 2015, the previously-used spawning closure protocol was used to determine the spawning season, as opposed to the GSI_{30} protocol shown above. As a result, the 2015 closure dates shown above do not match those in Table 1. Source: Dean et al. 2018.

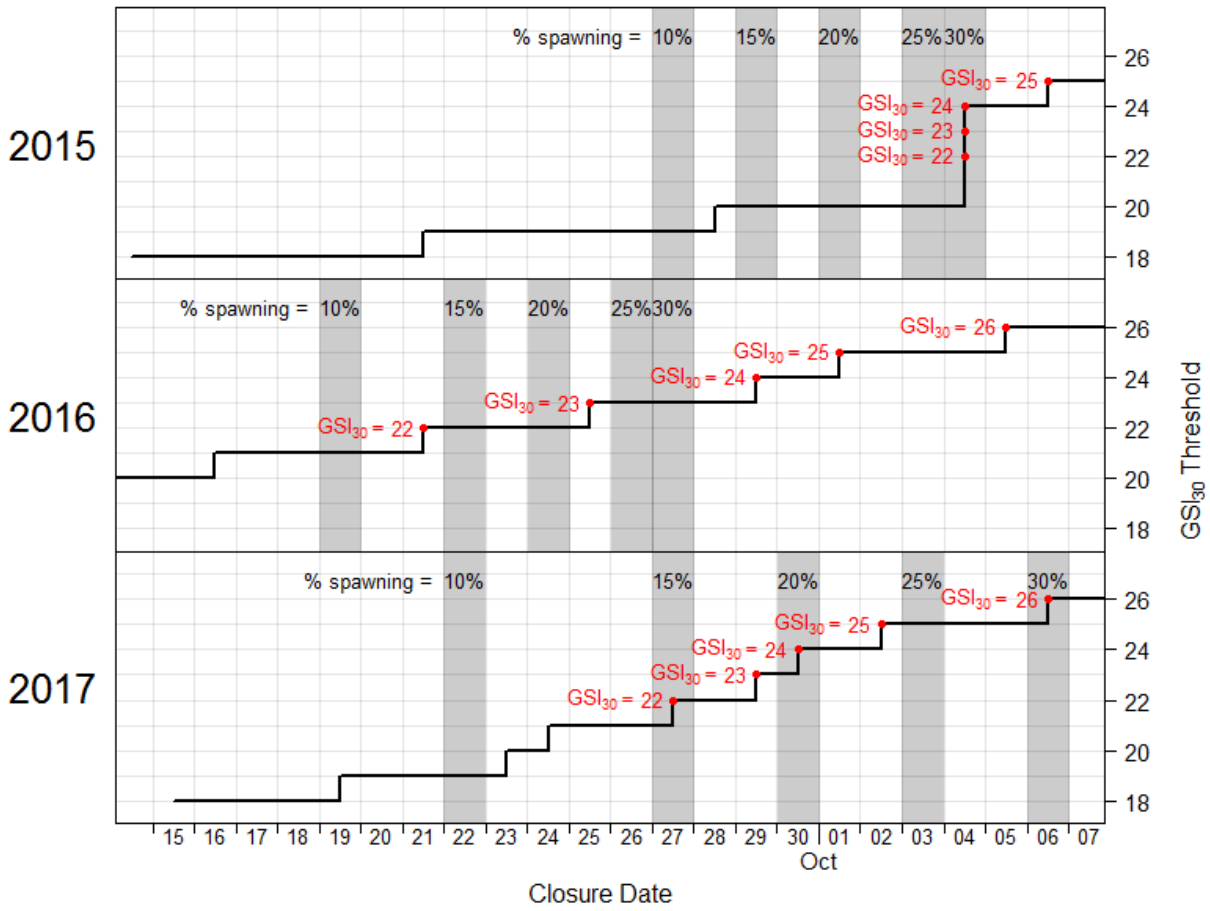

Figure 5. Date when the Massachusetts/New Hampshire spawning closure would have started, under different GSI_{30} trigger values. The vertical gray bands indicate the percent of the population expected to be spawning for that trigger value in a given year. Note: in 2015, spawning closures under GSI_{30} trigger values 24, 23, and 22 all would have started on the same date due to a lack of resolution in the samples; several samples were collected at the beginning of spawning but few were taken when approximately 15%-25% of the population was estimated to be spawning. Source: Dean et al. 2018.

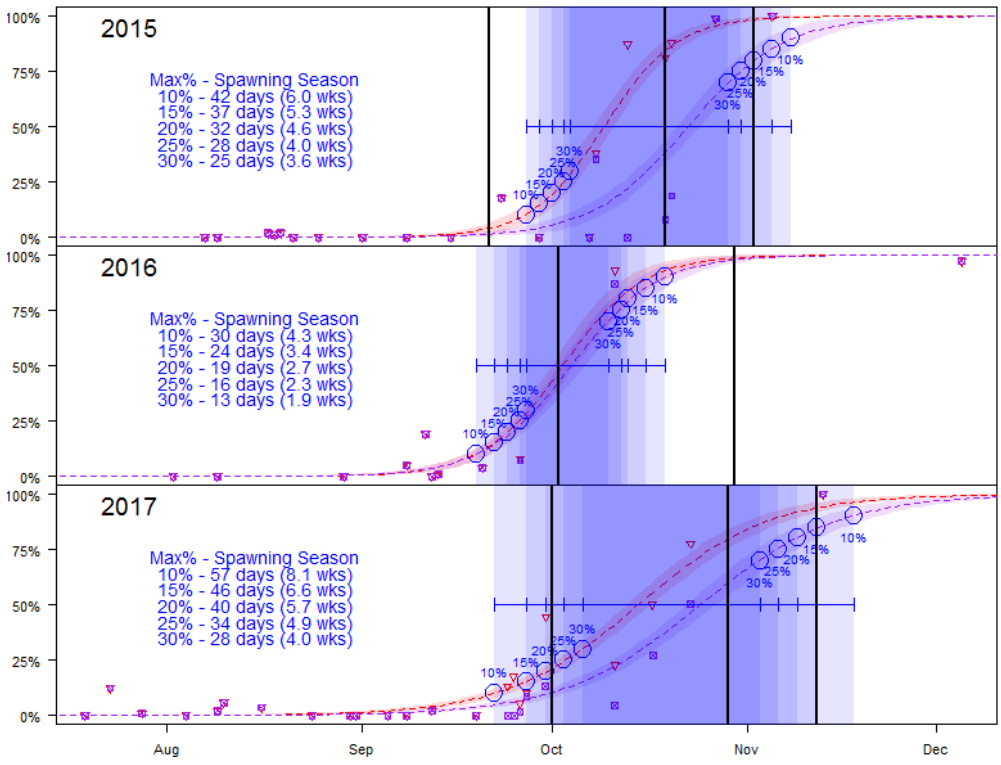

Figure 6. Effect of choice of maximum allowable percentage spawning in the catch on duration of the spawning season. This figure shows that as a lower percentage of spawning fish in the catch is required, the length of the season closure extends. Source: Dean et al. 2018.

Appendix 1

Atlantic States Marine Fisheries Commission

A Review of the modified Gonadal-Somatic Index (GSI) Monitoring System for Atlantic Herring Spawning Closures in US Waters

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Of the ASMFC Atlantic Herring Plan Development Team

January 2018

Introduction

In 2015, the ASMFC adopted Amendment 3 to the Atlantic Herring FMP, which established a new model-based GSI monitoring program for herring spawning closures. This closure system, first implemented in 2016, replaced an earlier program that had operated for more than 15 years. The earlier system relied on monitoring the development of female herring (stages 3-5) within 2 size classes and compared the average observed GSI of each size class to its own threshold. Once three consecutive samples within a week showed that either size class exceeded their threshold, the fishery would close. If three consecutive samples were not available in the week prior, area-specific default closure dates would apply. Amendment 3 sought to critically evaluate the parameters and assumptions of this earlier system (size classes, GSI thresholds, default dates, closure duration) and implement modifications to improve performance.

Since the adoption of Amendment 3, there has been a concerted effort to collect GSI and maturity data from all sampled herring (not just stage 3-5 females) throughout the entire spawning season, including during the closure period. These new data provide an invaluable perspective from which to evaluate the performance of the current spawning closure program. The aim of this paper is to review the current spawning closure system in light of these new data, and evaluate the validity of the model's assumptions and whether the program in general is meeting its objectives.

Program Objectives

There are four main objectives of the ASMFC herring spawning closure program:

1) *Reduce interaction between fishing and spawning:*

   From a management perspective, it is impractical to eliminate *all* fishery-spawning interaction and still allow full utilization of the annual quota. Consequently, there must be some acceptable low level of spawning fish present in the catch both before and after the spawning closure. A long-established rule allows the fishery to operate if a sample contains less than 25% spawning fish after the closure has been lifted (i.e., re-closure protocol). For the purpose of this review, we will mirror this logic and consider <25% spawning to be acceptable at the beginning of the season as well.

2) *Maximize coverage of the spawning season AND access to quota*:

To provide the greatest benefit with the least cost, the spawning closure should ideally cover the spawning season and no more. This requires understanding the timing and duration of spawning and aligning the closure system to the reproductive cycle. Closing the fishery too early or too late may unnecessarily restrict the fishery and provide inadequate protection for spawning herring.

3) *Account for interannual variation in spawning time*:

The onset of spawning in Atlantic herring can vary by several weeks from one year to the next. Measuring gonadal development via sequential GSI samples allows for predicting when spawning is likely to commence each year. Over-reliance on fixed closure dates (i.e., "default" dates) increases the possibility of a mismatch between the closure and spawning.

4) *Allow flexibility to extend closures, if necessary*:

Given the observation error inherent in small samples from a high-volume fishery, combined with the natural variability in reproductive biology, there may be instances when the timing and duration of the spawning closure is insufficiently matched to the actual spawning season. In these cases, a backup measure is needed to prevent the fishery from opening prematurely to significant spawning activity.

Current Closure Protocol

Samples are routinely collected from the directed herring fishery as it operates within the three defined spawning areas (EM = Eastern Maine; WM = Western Maine; MANH = Massachusetts/New Hampshire). Samples of 100+ fish are collected and the GSI of female herring in maturity stages 3-5 are recorded. To account for the effect of length on GSI, all values are standardized to that of a 30 cm fish (i.e., GSI_{30}), using a previously established formula. Once three samples from a given spawning area have been collected and processed, a linear model is fit to the mean GSI_{30} of stage 3-5 females, using sample date as the sole predictor variable. If a significant increase in GSI_{30} can be detected ($\alpha = 0.05$), the model is used to predict the closure date (i.e., when the threshold value of $GSI_{30} = 25$ will be reached). The model and predicted closure date are updated as additional samples are collected. Once the predicted closure date is five days away, the closure date is announced to the fishery (and thus 'fixed', regardless of subsequent samples). If an update to the model predicts that the threshold value will be reached in less than five days, the closure date will be set at five days from the model update date (i.e., a five day notice to the fishery will always be provided). If there are insufficient samples to predict a closure date, a default closure date, which represents the average date that the threshold value would have been reached in past sampling seasons, will apply.

Validity of Assumptions

Several assumptions underlie the current spawning closure program. The validity of each is evaluated here using recent full-season maturity and GSI data for the Massachusetts-New

Hampshire (MANH) spawning area. Unfortunately, a lack of samples from the other spawning areas (Western Maine, Eastern Maine) prevents an equivalent analysis.

Assumption 1: Larger herring arrive and spawn earlier than smaller herring
It has long been noted that within a sample of fish, the GSI of smaller herring is less than that of larger herring. However, during the re-design of the spawning closure program, existing data suggested that this was due to larger herring maturing earlier, and that all sizes approached a similar maximum GSI prior to spawning. Consequently, the length effect on GSI was estimated from sample data and used to adjust all GSI values to that of a standard length (i.e., GSI_{30} = expected GSI of a 30 cm female herring).

Recent data confirm this assumption in that larger herring comprise a greater portion of fishery samples early in the season, and are replace by smaller fish as the spawning season progresses (Figure 1). In addition, the average size of fish decreases sequentially as the population moves through the maturity stages (Figure 2). This suggests that not only are larger fish present earlier; they are also maturing and likely spawning before smaller fish. The 30 cm standardization also appears to be having the desired effect of combining information from all sizes to achieve a more consistent measure of the maturation for the spawning population as a whole (Figure 3).

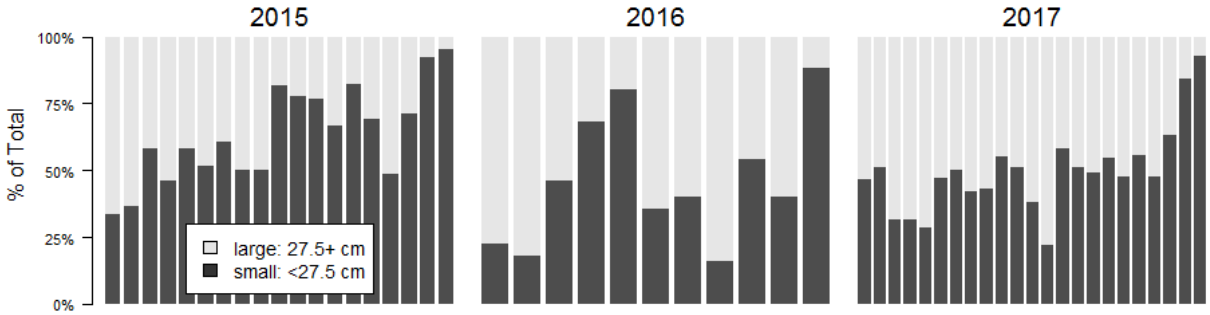

Figure 1. Fraction of herring in "large" or "small" size classes over the sequence of samples from the Massachusetts-New Hampshire spawning area, 2015-2017.

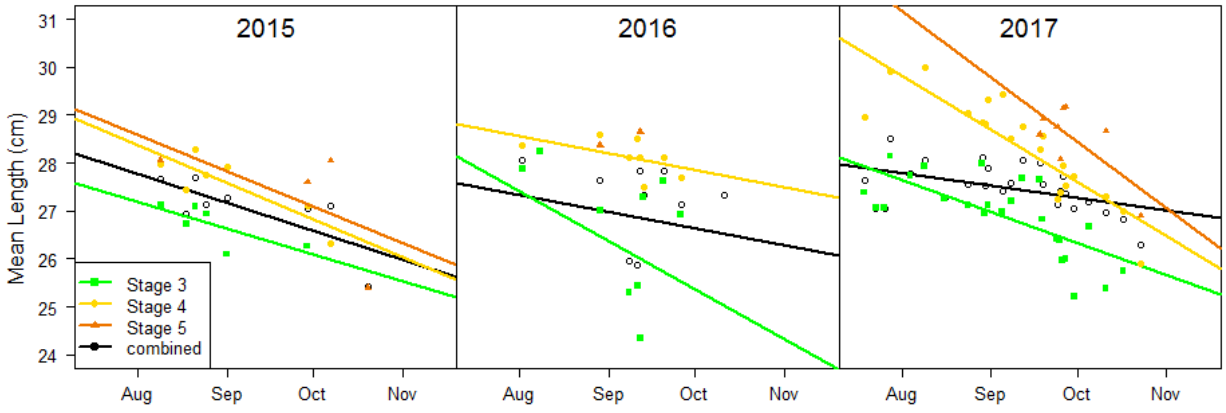

Figure 2. Mean length (cm) of female herring sampled for GSI, by maturity stage and sample date.

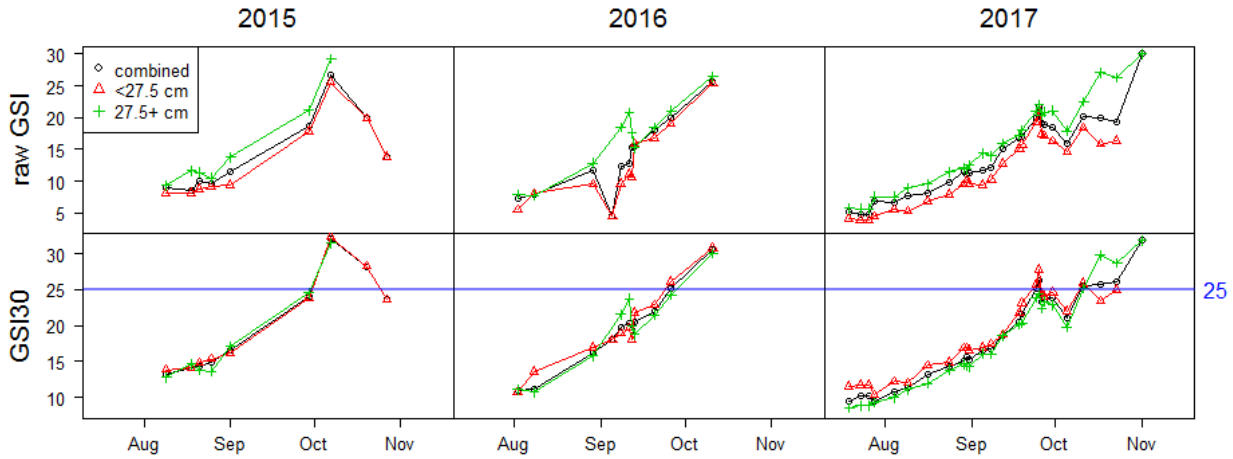

Figure 3. Mean GSI (top) and mean GSI_{30} (bottom) by sample year, date, and size class.

Assumption 2: Spawning commences near the closure threshold of GSI_{30} = 25
To adequately address this assumption, we need an objective measure of when spawning actually occurs. Prior to the collection of full-season maturity data, the only information available to us were pre-spawning GSI measurements from prior seasons. As such, the closure threshold was selected from a range of observed values at the high end of maturity stage 5, which is the last stage prior to spawning. While this approach is relevant for the maturation of an individual herring, the mean GSI of a sample (and the population) represents a mix of individuals with different developmental trajectories, even after accounting for the length effect. In other words, the peak GSI for the population may be less than that of individual fish due to this heterogeneity in spawning time.

Fortunately, by collecting maturity samples both during and after the spawning season, we can now quantitatively describe the timing and duration of the spawning season. Although more "noisy" than GSI data, we can clearly see a sequential progression of maturity stages in each of the last three years (Figure 4). The earliest samples are dominated by stage 3 (early maturing) fish, followed in sequence by later maturity stages and ending in post-season samples comprised primarily of spent (stage 7) and resting (stage 8) fish. Interestingly, the last sample in each year included some fish just entering the maturation cycle (stage 2), suggesting a portion of the population may spawn in the spring.

To describe the start of the spawning season, we fit a logistic regression to the proportion of fish in each sample that had begun to spawn (stages 6+). Likewise, to describe the end of the spawning season, we fit a logistic regression to the proportion of fish that had completed spawning (stages 7+). In both cases, stages 1 (juveniles) and 2 (initial maturation) were omitted from this analysis because it is not likely they would have spawned in the current season. A threshold percentage value can then be selected, above which we consider the "spawning season" to be underway (Figure 5). As mentioned previously, there is a long-standing rule that accepts 25% spawning herring in a fishery sample; however, lower values could be selected if there is a desire to further minimize the potential for fishery-spawning interaction. Please keep in mind that a 25% threshold for defining for the spawning season refers to the expected value

for the population, meaning that individual samples may contain greater than, or less than, 25% spawning herring.

The previous closure system was still in effect in 2015, yet for the first time we were able to collect maturity samples throughout the entire spawning season. The closure began on the default date of 9/21 in this year due to a lack of 3 consecutive GSI samples from either large or small herring above their respective thresholds. In retrospect, maturity data indicate that this resulted in closing the fishery nearly two weeks early (Figure 6). Consequently, when the initial four-week closure ended, additional samples contained more than 25% spawning fish, leading to an additional two-week closure. In total, the fishery was closed for six weeks, even though the spawning season (under the 25% definition) was only four weeks long. However, if the new model-based system had been in place in 2015, the closure would have achieved a better match to the spawning season, beginning 3 days after the 25% spawning point and likely without the need for a re-closure (Figure 7).

The progression of spawning appears to have occurred earlier and more rapidly in 2016 (Figure 8). However, with only one sample during the closure and one post-season sample, the description of the spawning season has the greatest uncertainty in this year. The newer model-based closure protocol was first implemented in this year, resulting in a closure 5 days after 25%[1]. A sample collected 10 days into the closure period contained 87% spent or resting herring, indicating the bulk of the population had already spawned. No additional samples were available until early December, when it was further confirmed that the spawning season had concluded. The logistic model fit to these data suggested the entire 2016 spawning season was only 2.3 weeks long; However, it should be emphasized that the scarcity of samples toward the end of the season adds significant uncertainty to this estimate. It's possible that the season was several weeks longer and we simply lacked the temporal resolution to measure it.

The 2017 season resulted in the most detailed and complete description of spawning to date, with 29 samples collected between July 19th and November 1st (Figure 9). In this year, the model-based system resulted in a closure that was slightly before 25% spawning (2 days). The accumulation of fish entering and passing through the spawning stage can clearly be seen in the sequence of maturity samples. These data suggest that the 2017 spawning season was 4.9 weeks long (34 days), making the initial 4-week closure period insufficient. Samples collected during the fourth closure week indicated that 50% had yet to finish spawning, resulting in an additional 2-week re-closure.

The current GSI_{30} threshold of 25 appears to result in a closure that starts within a few days of the point when 25% of the population is expected to be spawning, considered here to be the start of the spawning season. However, in years with few GSI samples (2015) or accelerated maturation (2016), the current threshold may result in greater than 25% spawners in the catch. Selecting a lower GSI_{30} threshold (i.e. 23 or 24) would reduce this possibility. Regardless, the current model-based system achieves a far better match to the spawning season than the prior

[1] The model actually recommended closing on 10/1/16, four days after 25% spawning, but managers opted to wait an additional day.

version, which tended to close the fishery several weeks early and rely more heavily on default dates.

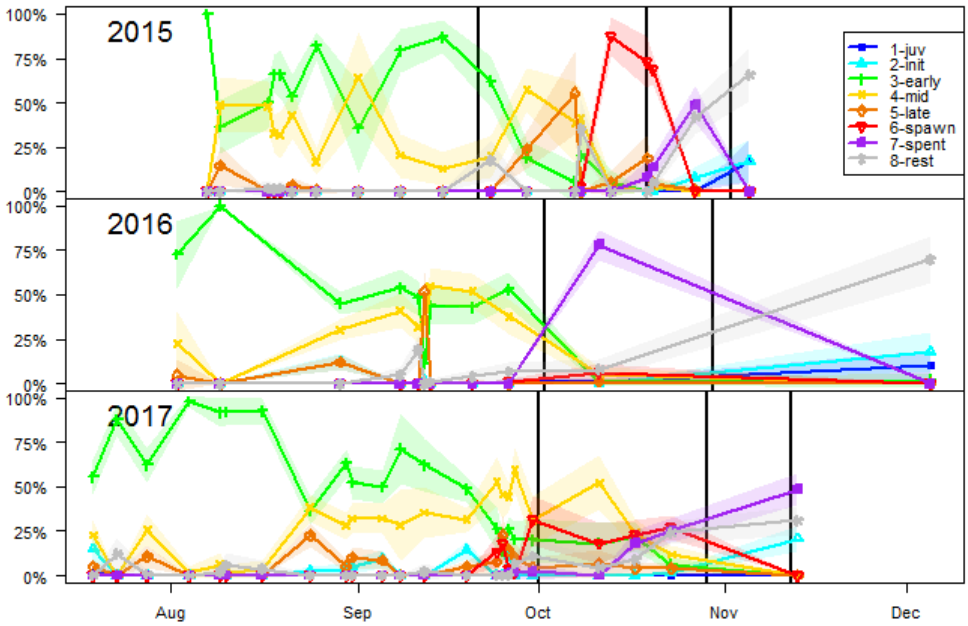

Figure 4. Fraction of MANH herring in each maturity stage by sample year and date. Black vertical lines indicate closures.

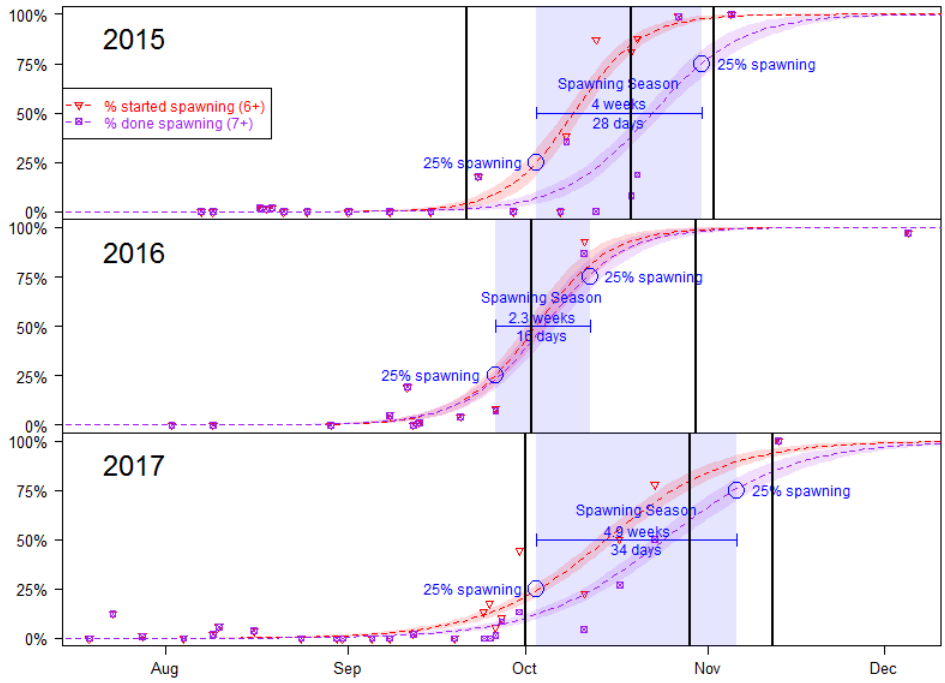

Figure 5. Observed fraction of sampled herring that had started spawning (red: stage 6+) and completed spawning (purple: stage 7+), with fitted logistic regression lines. The shaded blue region represents the spawning season, as defined by the period between when 25% of fish had begun to spawn and when 25% of fish had yet to complete spawning. Vertical black lines represent spawning closures.

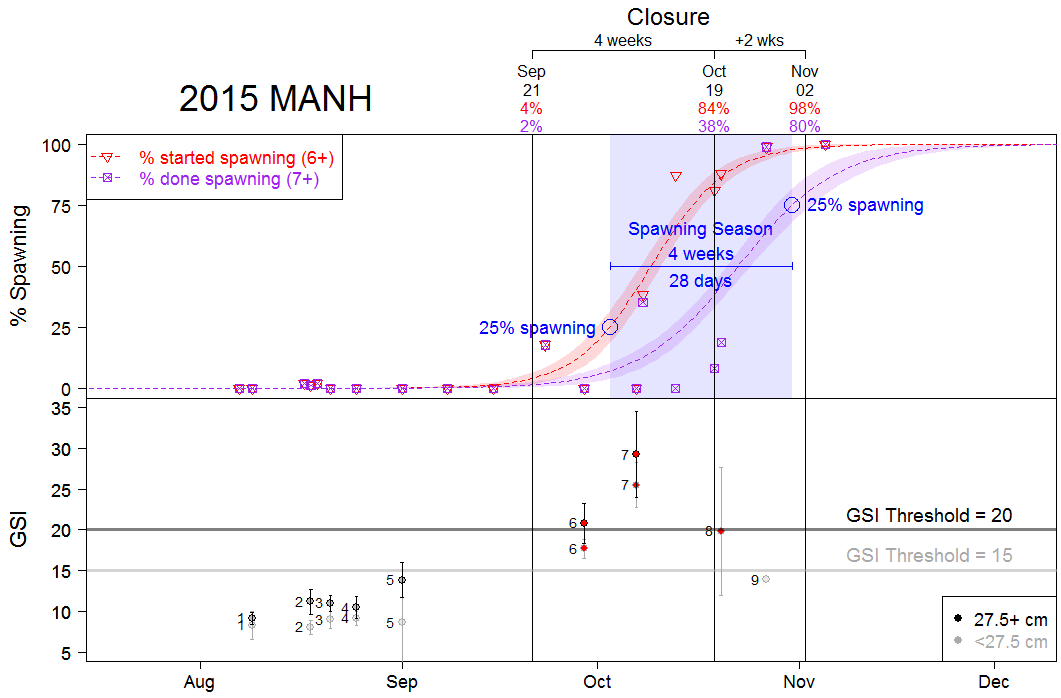

Figure 6. Estimated spawning season (top) and mean GSI (bottom) by sample date, for 2015 in the MANH spawning area. Closure dates refer to the actual closure dates under the old closure system.

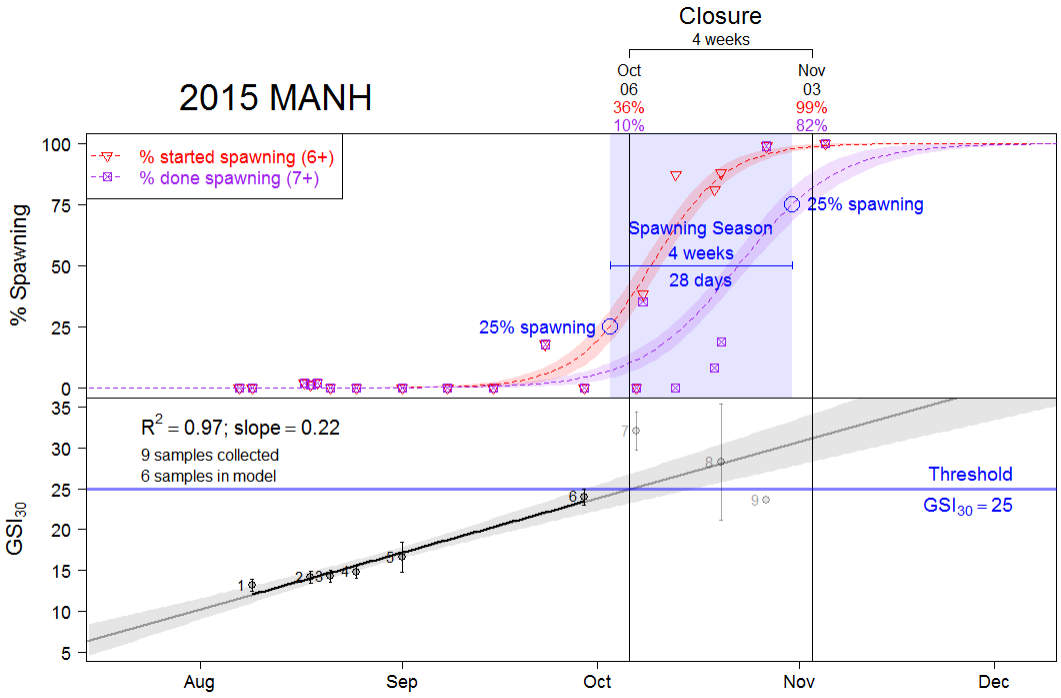

Figure 7. Estimated spawning season (top) and mean GSI_{30} (bottom) for 2015 in the MANH spawning area. Closure dates refer to what would have occurred under the current model-based system.

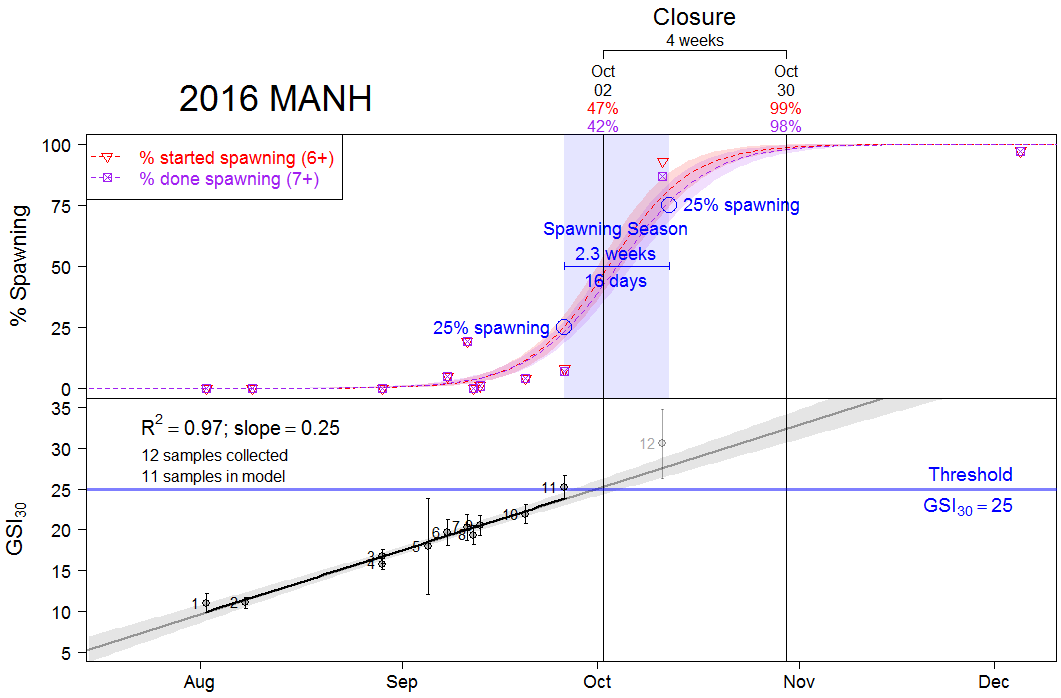

Figure 8. Estimated spawning season (top) and mean GSI (bottom) for 2016 in the MANH spawning area. Closure dates refer to the actual closure dates under the current closure system.

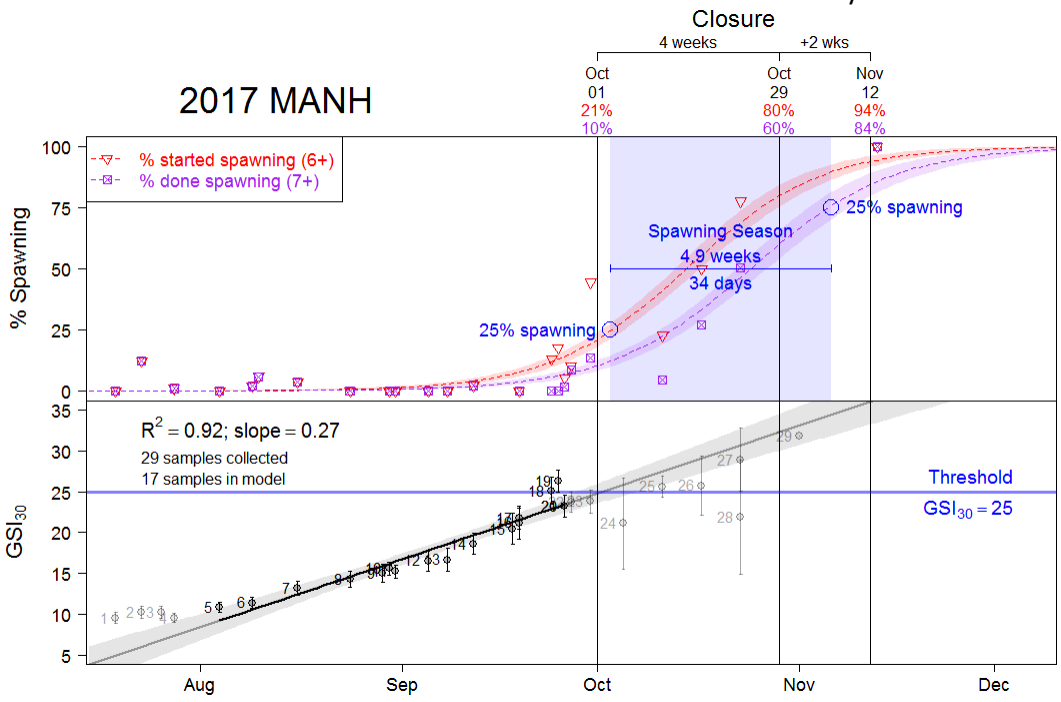

Figure 9. Estimated spawning season (top) and mean GSI (bottom) for 2015 in the MANH spawning area. Closure dates refer to the actual closure dates under the current closure system.

Assumption 3: Four weeks is a sufficient to cover the typical spawning season
The appropriate closure duration largely depends upon the percent of spawning fish deemed to be acceptable in fishery catches. Under the assumption that 25% spawning is acceptable, the spawning seasons of 2015-2017 were estimated to be between 2.3 to 4.9 weeks long; although, there is far greater confidence in the longer season estimates (2015 and 2017) than with the shorter (2016) due to a low number of samples from during/after the closure in that year. Consequently, an initial closure period of 4 weeks is likely to result in frequent use of the re-closure protocol to extend the closure. If the uncertainty inherent in frequent use of the re-closure protocol is deemed undesirable, the initial closure period could be lengthened (e.g., to 5 or 6 weeks). Furthermore, if 25% is considered an unacceptable level of spawners in the fishery, alternative values could be selected. However, it should be noted that lowering the management target for maximum acceptable % spawning will increase the defined spawning season (Figure 10) and therefore require a longer initial closure period, a lower GSI_{30} threshold (Figure 11) and an earlier default date (Table 1).

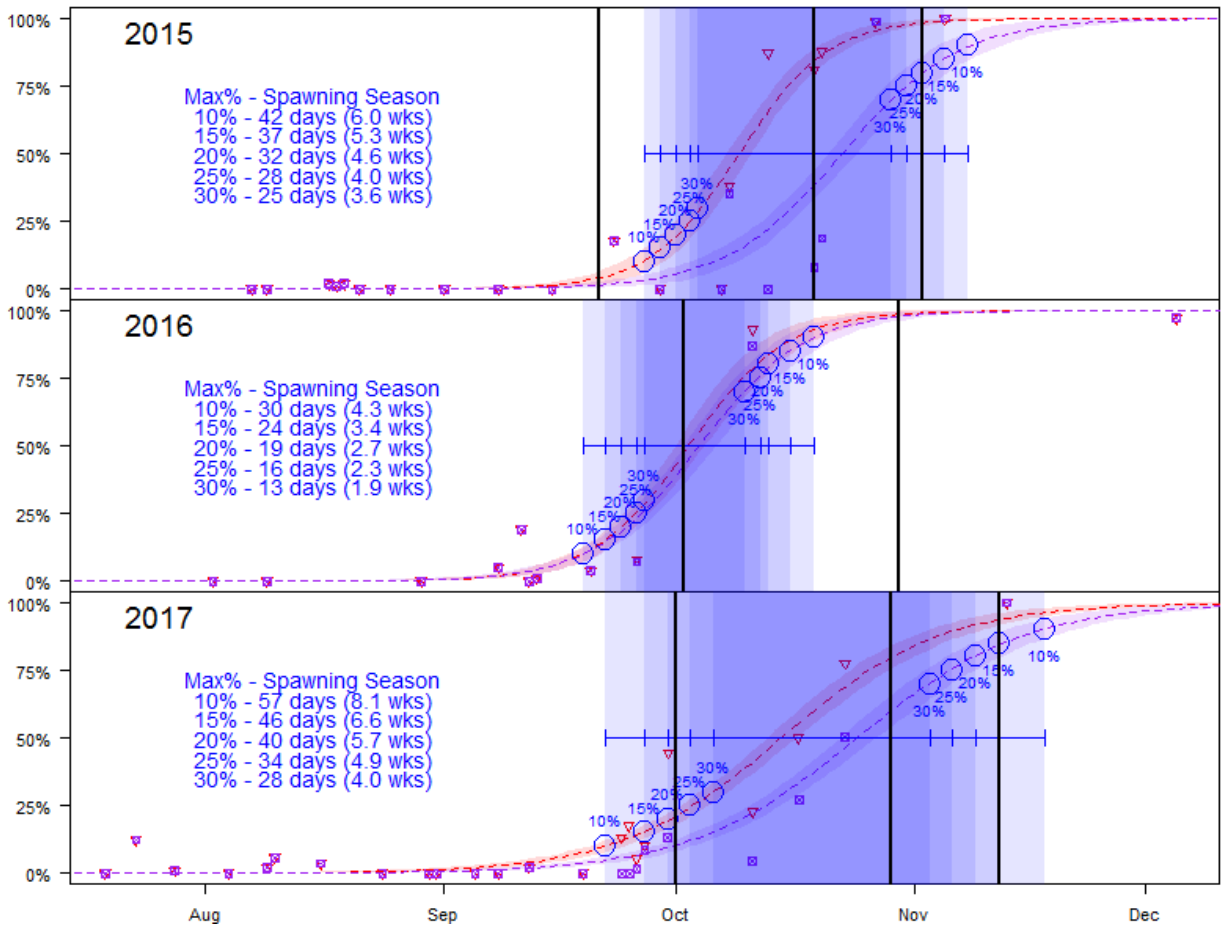

Figure 10. Effect of choice of maximum allowable % spawning in the catch on duration of the spawning season.

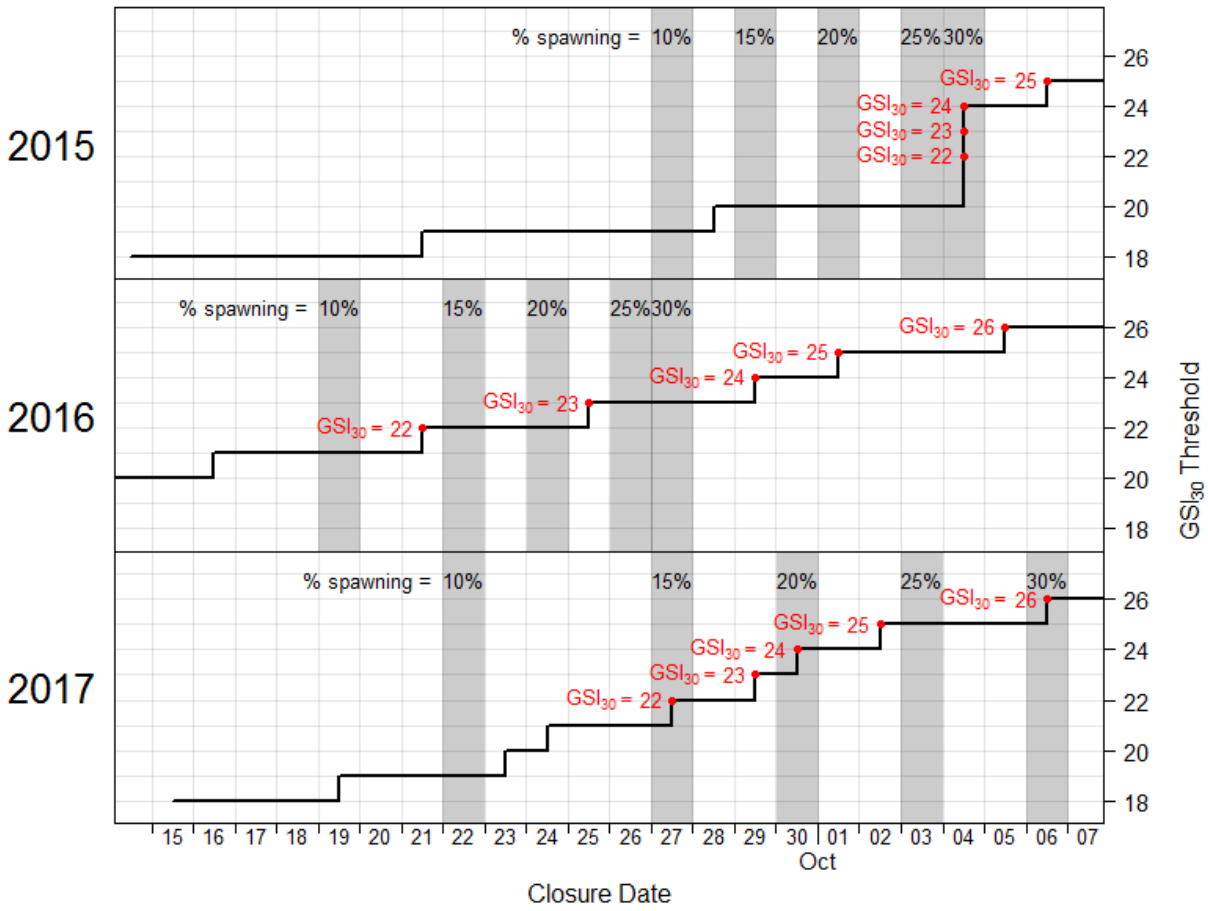

Figure 11. Date when the MANH spawning closure would have started, under different GSI_{30} thresholds. The vertical gray bands indicate the percent of the population expected to be spawning.

Table 1. Updated default dates for different GSI_{30} thresholds and spawning areas, using GSI observations from 2005-2017. As with the original analysis conducted under Amendment 3, sample data from the WM and MANH spawning areas were combined due to a lack of detectable difference in spawning time. There are insufficient samples from which to estimate a default date for the EM area. As such, the previous default date would remain (based on historical observations of herring eggs on lobster traps).

	Default Date		
GSI_{30} Threshold	MANH	WM	EM
26	Oct-6	Oct-6	Aug-28
25	Oct-1	Oct-1	Aug-28
24	Sep-27	Sep-27	Aug-28
23	Sep-23	Sep-23	Aug-28
22	Sep-19	Sep-19	Aug-28

Assumption 4: GSI increases linearly during the last 2 months prior to spawning
During the development of Amendment 3, a review of 15 years of sample data suggested that a linear model could adequately represent the increase in GSI during the pre-spawning period (i.e., ~2 months preceding spawning), despite an expected exponential relationship over the full course of gonadal development. The recent effort to sample the population over the full season now provides us with a longer time series of GSI observations to evaluate the conditions under which this assumption remains valid.

Data from the most recent 3 sampling seasons indicate that the rate of change in mean GSI_{30} (i.e., slope of the linear model) does increase slightly as the population approaches spawning (Figure 12). This results in a trend toward earlier forecasted closure dates with the addition of subsequent samples. However, the linear model continued to explain more than 90% of the variation in mean GSI_{30} (i.e., R^2) prior to the spawning closure in all years. In 2017 (the year with the best sampling coverage), it appears that GSI_{30} increased linearly over most of the pre-spawning period, and only departed from linearity in the days immediately preceding spawning (at the GSI_{30} threshold of 25). Subsequent samples during the closure period showed that mean GSI became more variable as fish moved out of the spawning stage, leaving behind a smaller pool of pre-spawning (stage 3-5) females to sample from. Although four GSI samples were collected from the MANH spawning area in July of 2017, the Herring PDT decided to omit these samples from the model due to concerns that further extending the period of observation could increase non-linearity, and because July samples were never included in the original analysis from which the system was developed.

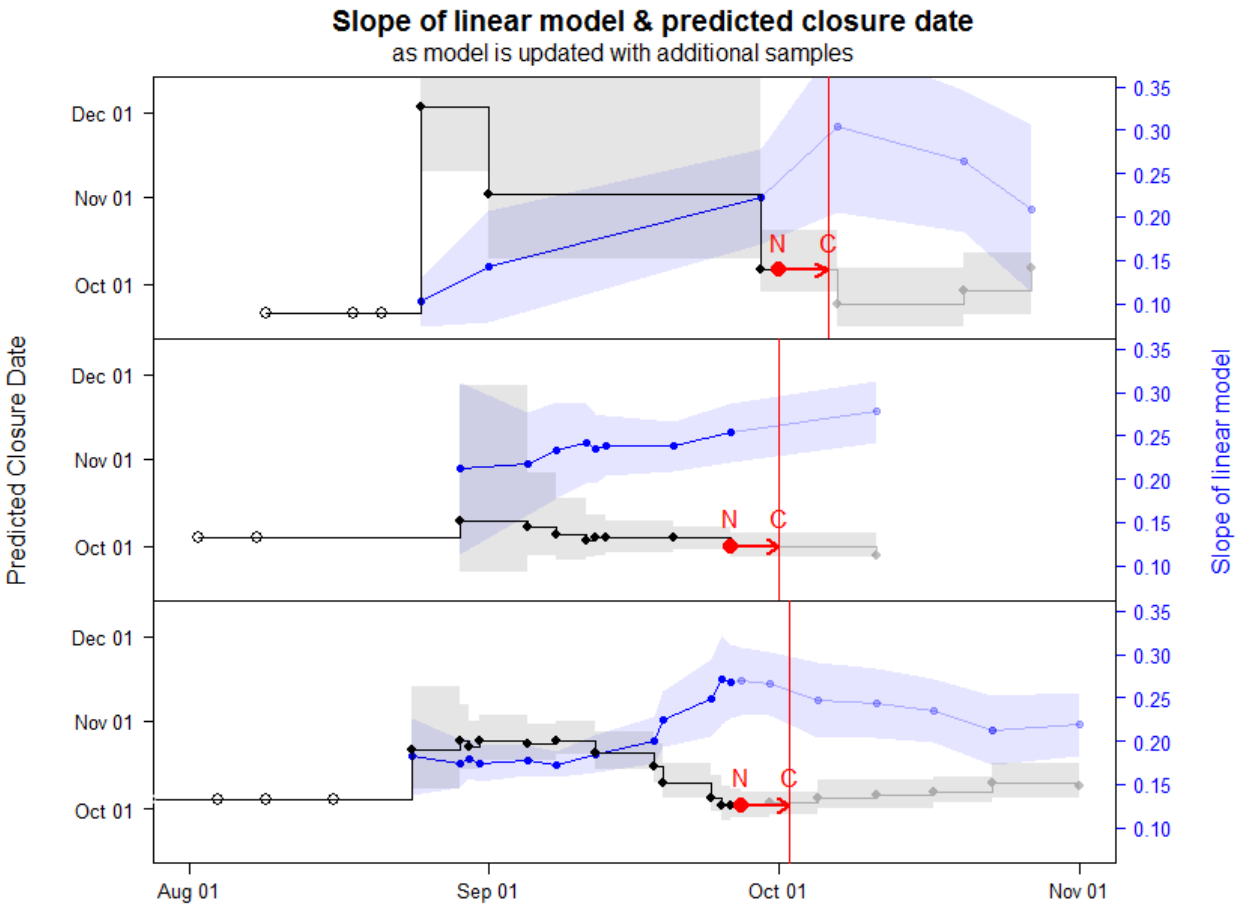

Figure 12. Slope of linear model GSI_{30}~DATE (blue, right y-axis) and predicted closure date (black, left y-axis) as the model is updated with additional samples. Open black circles show where the default closure date would apply: when <3 samples have been collected and/or the model fails to detect a significant increase in GSI_{30}. The red point labeled "N" indicates when the closure date is finally selected and the fishery notified. The red vertical line labeled "C" indicates the final selected closure date (5 days after the notify date). Darker points and lines indicate samples used in the model, whereas lighter points and lines indicate samples collected after the final closure date was selected.

Conclusions and Considerations for the Section

The current model-based spawning closure system appears to be meeting all of the Section's main objectives. The assumptions regarding length effects and spawning time appear sound, which allows the new system to be far better aligned with the reproductive biology of the population. Overall, this represents a clear improvement over the previous system.

If managers want to further minimize the risk of spawning herring in the catch, the TC notes two changes for consideration by the Section.

1) The TC found that in the two years with the most comprehensive maturity data (2015, 2017), the spawning season lasted 28 days and 34 days, respectively. This suggests that 2 week re-closures may occur frequently in the herring fishery, given that the initial closure period is currently set at 4 weeks. To simplify the herring closure protocol, provide greater predictability to industry, and provide greater protection during the spawning season, the Section could consider a longer closure of 5 or 6 weeks, reducing the need for a 2-week re-closure.

2) To further minimize the risk of spawning herring at the beginning of the season, a lower GSI_{30} threshold could be selected. As a reminder, the current threshold is 25; however, analysis suggests that a GSI_{30} threshold of 23 or 24 would reduce the probability of greater than 25% spawners in the catch. In addition, this change would have the added benefit of shortening the monitoring period by restricting it to the portion of the season when GSI increases most linearly. This may result in more consistent closure forecast dates from one sample to the next. However, please note that lowering the GSI_{30} threshold will require an earlier default date (Table 1) and will further increase the likelihood for re-closures, if the initial closure period remains at 4 weeks.

Finally, the TC highlights the need for fishery independent sampling during the spawning closures, especially in eastern and western Maine where there has are fewer fishery-dependent samples available. The information that these samples provide will be critical for our ability to further evaluate and improve the performance of this system.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Atlantic Herring Management Board

FROM: Atlantic Herring Advisory Panel

DATE: January 11, 2019

SUBJECT: Specification of Quota Periods in Area 1A

Introduction
On January 3rd, the Atlantic Herring Advisory Panel (AP) met via conference call to discuss the Atlantic Herring Management Board's (Board) proposed Addendum to provide it with greater flexibility when setting the Area 1A quota periods. This discussion was prompted by an October 2018 motion (see below) which was subsequently postponed in order to allow for AP input

> *Move to initiate an Addendum which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the Area 1A fishery. This issue can be included in the addendum initiated regarding the Gulf of Maine herring spawning protections, or it can be a separate document. Task the PDT to expand the quota period options to increase flexibility when distributing Area 1A herring quota. During years in which sub-ACLs are lower, it may be prudent to concentrate harvest during the months of July through September. However, in years of higher sub-ACLs, choose options that would allow for an expansion of harvest to meet the needs of the market.*

On the call, Commission staff reviewed the existing quota period options in Amendment 3, the postponed motion from the October 2018 Board meeting, and the quota periods which the Board implemented for the 2019 fishing year.

Attendance
The following AP members attended the conference call:
Jeff Kaelin (NJ, Chair)
Joseph Jurek (MA)
Gerry O'Neill (MA)
Patrick Paquette (MA)
Beth Casoni (MA)
Shawn Joyce (NH)
Mary Beth Tooley (ME)
Glenn Robbins (ME)
Stephen Weiner (ME)

Also in attendance were:
Raymond Kane (MA Commissioner)
Deirdre Boelke (NEFMC)
Megan Ware (ASMFC)

Advisory Panel Comments on Postponed Motion

- Three AP members did not support the motion to increase the flexibility provided to the Board in setting quota periods. Comments by these individuals were as follows.
  - One AP member commented that the Board already has flexibility in setting the Area 1A quota periods and this flexibility has resulted in decreased access for mid-water

trawl vessels in 2019. This individual felt that the Board was overstepping its reach in the management of a federal species.
    - A second AP member did not support the motion, commenting there is already enough flexibility in Amendment 3 and additional regulations are burdensome to industry.
    - The third AP member commented that there is not a clear reason why this action is being considered given the fishery can meet its goals under the existing regulations in Amendment 3. This member commented that a new addendum would complicate management of the species, increase the regulatory burden on fishermen, and end up decreasing flexibility in the fishery.
- Three AP members did support additional flexibility when setting the quota periods; however, two of these AP members noted that their support for the motion was weak. Comments by these individuals were as follows.
    - One AP member commented that their support of the postponed motion might be stronger if there was a good explanation as to why it is being considered along with some data available to analyze. Specifically, the member was interested in landings data from multiple bait species to see what is available to the lobster fleet at different times of the year.
    - Another AP member commented that he supported the concept of flexibility but would like to see more data on catches to understand potential impacts on gear types in the fishery.
    - The third AP member supported increased flexibility in Area 1A, stating that flexibility is good because it means the fishery isn't locked into a single management regime, particularly when the fishery is facing low quotas. This member also noted that, given spawning protections already limit access to the fishery, it is important that herring be caught when demand is highest.
- One AP member commented that the Board is trying to put herring quota in the summer months when the lobster fishery needs bait. This AP member wasn't in favor of additional regulations, commenting that there are already enough, but did recommend that the Board establish a quota period where 80% of the Area 1A sub-ACL is allocated June – September and 20% is allocated October – December.
- The AP Chairman abstained from saying whether he supported the Board's motion but did comment that the Atlantic herring fishery is a federal fishery with federal permit holders who could be negatively affected by the postponed motion. The Chairman stated that the decision made by the Board in October to alter the 2019 quota period allocations will negatively impact fishing access to some of those federal permit holders.
- One AP member did not feel the data necessary to make a recommendation on whether the postponed motion should be moved forward was available; however, he did note the importance of spreading herring landings throughout the year.

Advisory Panel Comments on 2019 Quota Periods

- Several AP members expressed concern about the October 2018 decision to use bimonthly quota periods in the 2019 fishery.

- One individual commented that this decision was made without landings data so the impacts of the change were not evaluated. This individual would have liked the opportunity for AP input prior to changing the quota periods.
- Another AP member stated that access to the fishery by mid-water trawlers was negatively impacted by this decision.
- A third AP member commented that the MA lobster fleet relies on bait caught by mid-water trawlers in the fall months so changes to the quota periods have broader impacts on other fisheries.
- Finally, an AP member noted that, under a bimonthly quota period, there is the potential for a closure every other month which could create chaos in the management of the species.