Atlantic States Marine Fisheries Commission

Atlantic Herring Management Board

April 30, 2019
8:30 – 10:00 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)*	8:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from February 2019	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Consider Addendum II for Final Approval **Final Action** • Review Options and Public Comment Summary (*K. Rootes-Murdy*) • Advisory Panel Report (*J. Kaelin*) • Consider Final Approval of Addendum II	8:45 a.m.
5.	Update on 2020-2021 Fishery Specifications *(K. Rootes-Murdy)*	9:15 a.m.
6.	Progress Update on Draft Addendum III (*K. Rootes-Murdy*)	9:30 a.m.
7.	Review the Management Tools Used for Setting Days Out Measures (*K. Rootes-Murdy*) **Possible Action**	9:40 a.m.
8.	Consider Approval of 2019 FMP Review and State Compliance Reports (*K. Rootes-Murdy*) **Action**	9:50 a.m.
9.	Other Business/Adjourn	10:00 a.m.

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

MEETING OVERVIEW

Atlantic Herring Management Board
Tuesday, April 30, 2019
8:30 – 10:00 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: February 5, 2019
Voting Members: ME, NH, MA, RI, CT, NY, NJ, NMFS, NEFMC (9 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 2019

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider Draft Addendum II for Final Approval (8:45 – 9:15 a.m.) Final Action

Background

- In October 2018, the Board moved to initiate initiated development of draft Addendum II to consider strengthening the protections provided to spawning herring in Area 1A.
- In February, the Board approved the draft addendum for public comment. (**Briefing Materials**)
- The public comment period was open from February to April 4. Public Hearings were held in ME, NH, MA, and via webinar.(**Briefing Materials**)
- The Advisory Panel met via conference call on April 16 to review the draft addendum (**Supplemental Materials**)

Presentations

- Review Options and Public Comment Summary by K. Rootes-Murdy
- Advisory Panel Report by J. Kaelin

Board actions for consideration at this meeting

- Select management options
- Approve final document

5. Update on 2020-2021 Fishery Specifications (9:15 – 9:30 a.m.)

Background

- In April, the NEFMC met to approve the 2019-2021 Overfishing Limit (OFL) and Acceptable Biological Catch (ABC) as well as a range of alternatives for setting the Annual Catch Limits (ACLs) based on recommendations from the Herring Committee. (**Supplemental Materials**)

Presentations

- Update on 2020-2021 Fishery Specifications by K. Rootes-Murdy

6. Progress Update on Draft Addendum III (9:30 – 9:40 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 consideration of spawning closures on Georges Bank as a 2019 priority.
- The NEFMC is seeking to hire a contractor to prepare an offshore spawning discussion document that could inform further development of Draft Addendum III.

Presentations

- Progress Update on Draft Addendum III by K. Rootes-Murdy

7. Review the Management Tools Used for Setting Days Out Measures (9:40 – 9:50 a.m.) Possible Action

Background

- Addendum I (2017) established management tools for the Area 1A fishery. The management tools were designed to meet the needs of the fishery by allocating the resource when the demand for bait is highest. (**Supplemental Materials**)
- In response to the 2018 stock assessment the 2019 ACL for Area 1A was reduced significantly. In April, the states of Maine through Massachusetts set effort controls that included no landings days during Quota Period 1 (June) in order to allocate quota efficiently throughout the remainder of the fishing season.

Presentations

- Review Management Tools for Setting Days Out Measures by K. Rootes-Murdy

Board actions for consideration at this meeting

- Initiate addendum to consider changes to management tools for the Area 1A fishery

8. Consider Approval of 2019 FMP Review and State Compliance (9:50 – 10:00 a.m.) Action

Background

- State compliance reports are due February 1.
- The Plan Review Team reviewed each state report and drafted the 2019 FMP Review. (**Briefing Materials**)

Presentations

- Overview of the 2019 Fishery Management Plan Review by K. Rootes-Murdy

Board Actions for Consideration at this Meeting

- Accept the 2019 Fishery Management Plan Review and approve *de minimis* requests

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 III) • Participation on NEFMC PDT (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), Corinne Truesdale (RI DFW), Deirdre Boelke (NEMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC HERRING BOARD

The Westin Crystal City
Arlington, Virginia
February 5, 2019

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

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Steve Train, ME (GA)
Doug Grout, NH (AA)
Cheri Patterson, NH, Administrative proxy
G. Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Rep. Sarah Peake, MA (LA)
David Pierce, MA (AA)
Raymond Kane, MA (GA)
Jason McNamee, RI (AA)
Bob Ballou, RI, Administrative proxy
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Sen. Craig Miner, CT (LA)
Emerson Hasbrouck, NY (GA)
Jim Gilmore, NY (AA)
Maureen Davidson, NY, Administrative proxy (AA)
Russ Allen, NJ, proxy for T. Fote (GA)
Joe Cimino, NJ, proxy for L. Herrighty (AA)
Adam Nowalsky, NJ, proxy for Sen. Andrzejczak (LA)
Terry Stockwell, proxy for T. Nies, NEFMC
Allison Murphy, NMFS

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

Ex-Officio Members

Jeff Kaelin, Advisory Panel Chair
Renee Zobel, Technical Committee Representative

Staff

Robert Beal
Toni Kerns
Megan Ware
Jessica Kuesel

Guests

Rodney Avila, Orsted US
Chris Batsavage, NC DMF
Peter Burns, NMFS
Joseph Gordon, PEW Trusts
Zach Greenberg, PEW Trusts
Arnold Leo, E. Hampton, NY
Patrice McCarron, MLA
Dan McKiernan, MA DMF
Derek Orner, NMFS
Kathleen Reardon, ME DMR
Melissa Smith, ME DMR
Mike Thalhauser, MCCF
Kevin Wark, Orsted, GSSA
Danny White, Maine Marine Police

The Atlantic Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia; Tuesday, February 5, 2018, and was called to order at 9:00 o'clock a.m. by Chairman Patrick C. Keliher.

CALL TO ORDER

CHAIRMAN PATRICK C. KELIHER: I would like to welcome everybody to this morning's Atlantic Herring Management Board. It is a beautiful day; the sun is out. It's going to be almost 70. It is a great day for a parade; and here we are, exactly. Let's wrap this up so we can get back to Boston and join the parade.

APPROVAL OF AGENDA

CHAIRMAN KELIHER: I want to thank everybody for being here this morning. The first order of business is, actually I don't believe we have anybody signed up for public comment. Is there anybody that planned on speaking on any items that are not on the agenda? Seeing none; let's go right into Item Number 2, which is Board Consent, Approval of the Agenda. Is everybody all set on the agenda; any additions, any new business?

APPROVAL OF PROCEEDINGS

CHAIRMAN KELIHER: Seeing none; Approval of the Proceedings from the October, 2018 meeting. Has everybody had an opportunity to look at the minutes? I'm assuming everybody has. Is there any objection to those minutes? Seeing no objections they are accepted as written.

CONSIDER APPROVAL OF THE DRAFT ADDENDUM II FOR PUBLIC COMMENT

CHAIRMAN KELIHER: I went a little bit out of order, Item Number 4 is Consider Approval of the Draft Addendum II for public comment; and Megan is going to go over that document.

MS. MEGAN WARE: With some mood music.

CHAIRMAN KELIHER: I asked for that.

MS. WARE: Today I'm going to go through Herring Draft Addendum II. Just a reminder on our timeline, the Board initiated this at annual meeting and the PDT developed this document between November and January of this year. Today the Board is going to review this document and consider approving it for public comment.

If it is approved, our public comment period would be March through April of this year and the Board would return in May for reviewing that public comment and potentially taking final action. This addendum was largely in response to results of the 2018 stock assessment, which showed reduced levels of recruitment over the last five years.

While in the terminal year of that assessment the stock was not overfished and overfishing was not occurring. There were still serious concerns about the future health of this stock. As a result, the Board initiated this addendum to consider strengthening the existing spawning protections in Area 1A. In the motion for the addendum the Board recommended that the PDT consider measures, including the GSI trigger value, and the closure period length. Just to review our existing spawning program.

Right now we're focused on Area 1A and there are three closures: We have the Mass/New Hampshire Closure in green, the Western Maine Closure in yellow, and the Eastern Maine Closure in blue. We used samples to forecast the timing of spawning by modeling the relationship between GSI and date.

GSI as a reminder is a calculation of the gonad mass to total body mass. It's a tool that we use to measure herring maturity. The initiation of a spawning closure is determined by a trigger value; so that when GSI is projected to exceed the trigger value a spawning closure is implemented. If there are insufficient samples we use default closure dates.

Spawning closures last for four weeks; but they can be extended by two weeks if samples indicate a significant number of spawning herring. Before I get into a bit more details about the spawning program and TC analysis, I did want to preview the issues that are in this document. There are three issues that this document considers.

The first is the trigger value, so what is the trigger value that we use to initiate a closure. The second is the closure length, so how long do we close for? The third is the reclosure protocol, so do we need to reclose and if so what is the threshold we use to determine when that happens? I wanted to preview these issues for you, because they are all connected.

Depending on what trigger value you chose that may influence how long you have to close for. Depending on how long you close for that may determine whether you need to reclose and at what trigger. Kind of the overall message of this slide is, it's important to think holistically about this addendum and the options in it when the Board reviews the document.

Talking a little more specifically about the trigger value again, that is, the value that we use to see when GSI exceeds it and then implement a spawning closure. Generally, a higher trigger value closes the fishery later and closer to spawning while a lower trigger value closes the fishery earlier; to provide protection to maturing fish.

Our current trigger value is 25, and TC analysis showed that that results in spawning closures that start within a few days of when the population reaches 25 percent spawning. The question that's prompted here is, is initiating a closure when 25 percent of the population is spawning still appropriate? The TC did note that lowering the trigger value would reduce fishery spawning interactions.

You will see options in this document with lower trigger values. However, it is important to highlight that, when we use a lower trigger value we would implement a closure earlier. You may need a longer closure period to provide protection throughout the spawning season. Again this is getting at how these options are related. If you lower the trigger value, you really need a longer season. Also, lowering the trigger value and then having an earlier closure may shorten the time available to collect spawning samples. Then to talk a little bit about the closure length and our reclosure protocol, so I think the question here is, is the current four-week closure sufficient? Through the TCs analysis they found that in the past three years the Mass/New Hampshire spawning season has lasted 4 weeks, 2.3 weeks, and 4.9 weeks.

But, they noted that there was much greater confidence in the longer seasons due to a higher number of samples in those years. The TC concluded that that four week closure would likely result in frequent use of a reclosure protocol. They noted that longer initial closures would increase protection during spawning; and could simplify the protocol by removing the need for a reclosure.

You'll see in this document there are options for longer spawning closures. But, it is also important to note that a longer closure may increase the chance of multiple areas being closed at once. Now we'll go into the management issues and alternatives. Our first issue again is the trigger value; and we have four options here. Option A is going to be our status quo, so it's a trigger value of 25.

Again, that is closing the fishery when approximately 25 percent of the population is spawning. On the right you can see the default closure dates that are associated with that trigger value. Option B, we are still using a trigger value of 25; so again we're still going to close when approximately 25 percent of the population is spawning, but with additional years of data the TC was able to update those default closure dates.

You'll see it is three days earlier for Western Maine and Massachusetts/New Hampshire. The only change between A and B is the default closure dates. Option C is lowering the trigger value to 23. That would close the fishery when approximately 20 percent of the population is spawning; and you can see by looking at the default closure dates, they are earlier than the ones that we have at the top of the screen.

Then Option D is a lower trigger value of 22. That would close the fishery when approximately 15 percent of the population is spawning. Again, with the default closure dates you can see they are earlier and earlier the further down you go on this slide. Issue 2 is the closure length; so how long are we going to close for.

Option A is status quo, so a four-week initial closure, and then Options B, C, and D are all extensions on that so a five week closure, a six week closure, and an eight week closure. On a future slide I'm going to show how the trigger values and the closure lengths are related. But I did want to note for Option D that eight week initial closure.

The PDT included that because it may be long enough that we don't need a reclosure protocol for any of the trigger values in this document. Then Number 3 is our reclosure protocol. There are two options here. Option A is we keep a reclosure protocol; such that the spawning closure can be extended for two additional weeks.

Then Option B is that there is no reclosure protocol; there is no option to reclose for two additional weeks. Under Option A there are sub-options, and that is related to the threshold at which we would reclose. Hopefully my coloring of the percentages is a reminder to two slides before, and that those percentages look familiar. Option A is status quo; so that is defining our threshold as when 25 percent of more mature herring are found in that sample. That is related to the trigger value of 25.

Sub-Option 2 is a 20 percent; so again that threshold is at the 20 percent or more mature herring, and that is related to a trigger value of 23. Then Sub-Option 3 is 15 percent or more mature herring; and that is related to the trigger value of 22. Again, all of these options are related to one another, and they go back to what trigger value you chose.

Then this is the final slide here. This is Table 2 in the Addendum; and if there is one table to look at, I really recommend that it's this one. This one shows how the different management options are connected. As an example, if we take a trigger value of 23 so that would close when approximately 20 percent of the population is spawning. We can see what the average spawning season lengths are as well as the range of spawning season lengths.

We have an average of 4.3 weeks; but we have seen one as long as 5.7 weeks. This would suggest that when the Board subsequently chooses a closure length, you might want to consider a longer closure length for that trigger value than what you have now, because 4.3 weeks and 5.7 weeks is certainly longer than the four weeks we have now. Hopefully that shows how all the options are connected; and I will take any questions.

CHAIRMAN KELIHER: Ray Kane.

MR. RAYMOND W. KANE: Megan, can you go back to that slide on reclosures? My question is; are the vessels that are actually participating in the fishery landing, and those are the herring that are checked? They take a sample of 100 or 200 fish and check the spawn, or are the small boat vessels still doing the spawn check, you know running out there and grabbing samples, and dissecting right onboard? How is that done?

MS. WARE: I'm going to pass that to Renee; who is our TC Chair.

MS. RENEE ZOBEL: In the past reclosure samples have come from a variety of places and a variety of fisheries. They have been fisheries related, but they also could be fisheries independent, as far as the reclosure is concerned. Does that answer your question, Ray? It's been small boats and big boats. I mean the whiting fishery has been a place where we have taken spawning samples; when there is a closure in 1A, to see if a reclosure is necessary. But we've also taken samples once the fishery is opened back up off of the purse seiners, et cetera.

MR. KANE: Yes thank you. I know in Megan's presentation she talked that a couple years they didn't really have enough samples. I think it was in that 2.3 to 5.9 range. What is the minimum number of samples that we need?

MS. WARE: For the initial reclosure there is a 3-sample requirement to not use the default dates, so to project for the closure using GSI-30 protocol, and then for the reclosure I believe it's just one sample is needed to trigger that reclosure.

CHAIRMAN KELIHER: Are there any additional questions for Megan? Seeing none; we have before us the draft Addendum with no additional comments or questions for Megan. Is there any interest in modification of the draft Addendum, or adding to the draft Addendum? Seeing none; I think a motion would be in order; if the Board is considering advancing this to public comment. Doug Grout.

MR. DOUGLAS E. GROUT: I would move to approve this addendum for public comment today.

CHAIRMAN KELIHER: We have a motion on the table, a second, second by Ray Kane. Are there any additional questions or comments, Doug or the seconder? Mr. Pierce.

DR. DAVID PIERCE: After we vote on the addendum, are you going to be entertaining a motion for a preferred alternative to be brought to hearing; or would you like that motion to be made prior to adopting the addendum for public comment?

CHAIRMAN KELIHER: I think it's at the pleasure of the Board, Dr. Pierce. I have no preference either way. If you have some thoughts on that I think we could probably take that up after we advance this. Are there any additional questions or comments? **Seeing none; are there any objections? Seeing none; the motion carries without objection.** Dr. Pierce, do you have a question?

DR. PIERCE: Yes, I'll offer up a suggested preferred set of alternatives, and Megan can correct me if I'm out of bounds or confusing the way in which these are laid out. But I'm referencing Table 4, some of the options and the consideration in this action. With the Trigger Value being Issue 1, the Closure Length being Issue 2, and the Reclosure being Issue Number 3.

In light of the fact that we're looking at right now, as best we can judge, four years in a row of historical low recruitment. Megan noted that in her presentation; circling in red those low years of recruitment. In light of the fact that we may end up with a National Marine Fisheries Service decision to go with the Council recommended ACL for 2019 and beyond.

I would make a motion that we adopt as a preferred alternative within the addendum, Trigger Value Option D; that's a trigger of 22, Closure length Option D; which is the eight-week closure length, and for Reclosure Option B, the no reclosure protocol. That's my motion, Mr. Chairman for a preferred alternative in the Addendum.

CHAIRMAN KELIHER: We have a motion on the table, is there a second? There is no second to your motion. The motion dies without a second. Is there any other interest from the Board in putting a preferred alternative

forward? Seeing none; we will advance the document to public hearing without a preferred alternative. That will take us to Item Number 5 on the agenda; which is the Advisory Panel Report from Jeff Kaelin. Terry.

MR. TERRY STOCKWELL: Before we move on to the next agenda item, just a question from the Council as to when and how many public hearings are going to be scheduled. The Council is not likely to have major issues; but would like to reserve the opportunity to comment.

CHAIRMAN KELIHER: Let me ask the jurisdictions, the states what they're interest is in holding public hearings. Can I see a show of hands? Maine, New Hampshire, Massachusetts, any states to the south of Massachusetts interested in a public hearing? Seeing none; so Megan if you could work with those states on the timing, and whether we'll need more than one. Does that answer your question, Terry? Thank you very much, for bringing that forward. Toni.

MS. TONI KERNS: Terry, are you asking us to have it overlap with the Council meeting, the public comment period?

MR. STOCKWELL: Not necessarily. There is a Herring Committee meeting being scheduled in either late March or April. It would be an opportunity for the Herring Committee, with our new Commission member to have some discussion, and hopefully provide comments if the Committee so wants to forward them through the Council. Council meeting is mid-April.

CHAIRMAN KELIHER: I'm sure Ritchie White, the newest Council Committee member will be glad to offer comment.

ADVISORY PANEL REPORT

CHAIRMAN KELIHER: If there are no other comments, I'll move on to Item Number 5, which is the Advisory Panel Report from the AP Chair, Jeff Kaelin.

MR. JEFF KAELIN: Good morning members of the Board. I'm Jeff Kaelin with Lund's Fisheries, I'm the AP Chair. I was going to let Megan run with this; but she's asked me to do it. The other thing I'll say, there also is a Federal Herring AP meeting, too, at the same time as that Committee meeting, so there could be an opportunity for that AP to review this.

I don't know if there will be an AP meeting on this addendum that we just approved or not. Well I appreciate the opportunity for the AP to have met. On January 3, the postponed motion that was considered is in three places; it's on the meeting overview, it's in the January 11 memo, which is our report, and you'll see it in a minute on the Advisory Panel report here too, on the first slide. I won't bother reading that.

I think everybody knows why this meeting was held. It says that we did meet by conference call; the members of the AP are listed here. I also know that Commissioner Kane was on the phone with us and Deirdre Boelke, who is the New England Council's FMP coordinator, also listened in. The staff reviewed the existing quota period options in Amendment 3, and the postponed motion from October 2019, and then the quota periods that were selected by the Board for 2019.

Three AP members did not support the motion; stating that the Board already has flexibility in setting the Area 1A quota periods, which has resulted in decreased access for midwater trawls in 2019. Board overstepping its reach in the management of a federal species was a concern. Already enough flexibility in Amendment 3, additional regulations would be burdensome on the industry.

No clear reason why this action is being considered; given the fishery can meet its goals under Amendment 3. A new addendum would complicate management of the species; increasing the regulatory burden on the fishermen, and ultimately decrease flexibility in the fishery. Three AP members did support the

motion; although they commented their support was weak. The comments ranged from supporting additional flexibility in Area 1A, particularly when facing low quotas, because the fishery shouldn't be locked into a single management regime. It is important herring are caught when demand is highest. Another comment that they supported the concept of flexibility; but would like to see data on herring catches to understand impacts on the various gear types during the period of the fishery.

There was some support for the motion; stating it would be stronger if there was a clear explanation as to why the action is being considered, and also looking for data to analyze relative to landings data from multiple bait species. I think that AP member was beginning to consider the need for projections on menhaden productivity; given the fact that the herring productivity is going to be very low in the following years.

In the next slide one AP member wasn't in favor of additional regulations; but did recommend a quota period where 80 percent is allocated June to September, and 20 between October and December, a specific recommendation. I think the only one we had, and one AP member didn't feel the data necessary to make a recommendation was available, but did note the importance of spreading herring landings throughout the year.

Another member abstained from saying whether he supported the motion; but commented that Atlantic herring is a federal fishery with federal permit holders who could be negatively impacted by the motion. That gives you an idea of what people thought of the motion in the AP, and then we did get into comments on the 2019 quota period.

I believe the Board made a decision on this at the annual meeting. Several AP members expressed concern about that decision to use bi-monthly quota periods in the 2019 fishery, and concerned the decision was made without landings data, so the impact of the changes wasn't evaluated. There was a statement that members of the AP would have liked an opportunity for AP input; that has come and gone, obviously.

Access to the fishery by midwater trawls was negatively impacted by that decision; and the Massachusetts lobster fleet, it was stated by an AP member, relies on bait caught by the trawlers in the fall, so changes of the quota periods have broader impacts than may have been considered.

Under the bi-monthly approach the fishery could close every other month; which could create chaos, and the '18 and '19 quota periods are reflected on the slide. I think that is what we went through, Mr. Chairman. Thanks to Megan, for helping me put together the report; and I'm happy to answer any questions the Board might have.

CHAIRMAN KELIHER: Thank you Jeff, I appreciate that. It's a very thorough report; it sounds like you guys had a great discussion. Are there any questions for Mr. Kaelin? We'll start off with Dr. Pierce.

DR. PIERCE: Jeff, right at the end of your presentation you highlighted one AP member commenting that the Massachusetts lobster fleet relies on bait caught by midwater trawlers in the fall months, so changes to the quota periods have broader impacts on other fisheries. At the meeting was there any discussion of herring being caught on Georges Bank being adequate enough to account for what might not be available with the shifting quota in Area 1A seasonally? In other words, would that offshore fishery for sea herring meet the needs of the Mass lobster fleet; assuming that was discussed at the Advisory meeting?

MR. KAELIN: Well, I think the comment was really relative to the splitting of the 1A quota. It didn't really get into whether the Georges fishery would be available to provide bait or

not. I don't think anybody really understands what happened to the herring; maybe they're in Canada that's where the Calanus went. I don't' really know.

We're out looking. I know the fleet is out looking now in Area 2 and Area 3 for fish. It's not a great time to go to Area 3; but you can sneak out there if the weather is good, and people are trying to look for herring and mackerel right now. Who knows, David? That didn't specifically come up, but we didn't get into Georges productivity in the AP meeting.

CHAIRMAN KELIHER: Justin Davis.

MR. JUSTIN DAVIS: It seemed like a theme in some of the AP member comments was that they wanted to see more data; more information about herring catches and certain other topics, in order to have a more informed opinion about the potential impacts of greater flexibility.

My question is; if the Board did decide today to take up the postponed motion and approve it, and initiate an addendum. Would there be an opportunity for the PDT and the AP to have some back and forth; and kind of so the PDT could get a little bit of information about what types of information the Advisory Panel members would like to see in the addendum document?

MR. KAELIN: Well that's a great question; and I think if the Board approved moving ahead with the motion and the addendum, and asked the PDT to do that. I'm sure that could be done. I think the AP would probably appreciate that. It would give you a little better idea of what the impacts would be on the various fleets involved.

CONSIDER THE POSTPONED MOTION FROM THE OCTOBER 2018 MEETING

CHAIRMAN KELIHER: Are there any additional questions for Mr. Kaelin? Seeing none; I think that conversation is a good segue into Item Number 6, which is Consider the Postponed Motion from the October, 2018 meeting. I won't read the entire motion; but if it passed it would have initiated an addendum, which considers providing the Atlantic Herring Board greater flexibility to set annual quota period specifications for the 1A fishery. Ritchie, you've got your hand up. Go ahead.

MR. G. RITCHIE WHITE: This is my motion originally; and after talking to a number of Board members, and also discussions with Megan about trying to better define what I was trying to accomplish. I have the sense now that let's let this lower quota run through the system this coming year.

Then see how that unfolds, and if it will be necessary to implement more flexibility, which I still kind of feel we'll need. But exactly what that kind of flexibility should be, I'm uncertain. I guess my sense is to let this sit for a year and let's come back to it next year; after we've seen what we do with an extremely low quota.

CHAIRMAN KELIHER: Process wise, Ritchie, the motion belongs to the Board. Is this something you would like to make a motion on in regards to postponement?

MR. WHITE: I would; as long as there is no other discussion. I didn't want to immediately do that if someone else wanted to discuss it.

CHAIRMAN KELIHER: On that note are there any additional comments in regard to Mr. White's suggestion? Eric Reid.

MR. ERIC REID: I appreciate Ritchie rethinking his original motion. We don't even know what the specs are going to be for this year. The difference between National Marine Fisheries Service and the New England Council is a pretty substantial difference in Year 1 and Year 2. We don't really even know what we're dealing with yet.

I appreciate the forethought in not dealing with this. I just think we should just take this and vote it up or down. With the maker of the motion not supporting his own motion at this time, I think it would be cleaner if we just voted it up or down and then revisit it, as opposed to tabling it to some time we don't even know when that's going to be.

CHAIRMAN KELIHER: We can go in both directions; a motion to table indefinitely. You could let it die on the table, or cleaner just to kill it outright. I'll take one more question from Mr. Stockwell.

MR. STOCKWELL: I guess my question is; and I do appreciate the ongoing discussion, what exactly does greater flexibility mean? As we continue our collaboration between the Council and the Commission process, their additional measures could effectively shut out some of the segments of the Federal fisheries in complicating raising issues with MSA and National Standard Guidelines. I think the go-slow approach is the better and more prudent at this point; particularly given Eric's comments about the soon to be extremely low specifications for next year.

CHAIRMAN KELIHER: Thanks for that Terry, I think based on Ritchie's comments, I think the idea that we've even defined flexibility is not clear. Is there any interest in moving this Addendum forward, from around the table? Seeing none; I'll look to Mr. White for a motion, since it is his motion, to determine the path forward.

MR. WHITE: Is the correct motion to table indefinitely? That's what I will move on this motion.

CHAIRMAN KELIHER: We have a motion on the floor to table indefinitely. The motion on the floor is to table indefinitely; which would allow the motion to actually just die on the table, if it wasn't taken back up at a later date. We have a second by Mr. Kane. We have a motion on the floor by Mr. White, seconded by Mr. Kane; which is move to table indefinitely. Do we have any questions or comments on the motion? Seeing none; is there any objection to the motion? Seeing none; the motion carries.

SET THE SUB-ACL SPECIFICATIONS FOR THE 2019 FISHING YEAR

CHAIRMAN KELIHER: This brings us to Item Number 7 on the agenda; which is to set the sub-ACL specifications for the 2019 fishing year, and unless somebody runs through the door in the next ten seconds, I would say we don't have it. Alison, can I put you on the spot to just update the Board on what you know, what you told me earlier?

MS. ALISON MURPHY: I touched base with folks back in my office early this morning; and the Final Rule will not file today and become public. I think we're still very hopeful that it will file and publish sometime this week. Knock on wood there can be a discussion maybe later in the week or as the Chairman sees fit to consider what is in the Final Rule.

CHAIRMAN KELIHER: Thank you, Alison for that update. I think there are a couple paths forward here. One would be to hold off on any decisions and table until the Policy Board to address this at the end of the week; with hopes that we would have new numbers. Then if we did not have numbers by then, likely conduct just an e-mail vote on the specifications to have the Commission accept them. Mr. Grout.

MR. DOUGLAS E. GROUT: I would like to move to postpone final action on Atlantic herring specifications until the Policy Board on Thursday if NOAA Fisheries provides the final rule.

CHAIRMAN KELIHER: Got a motion on the table, seconded by Mr. Train. Are there any additional comments from the maker? She's typing that up. We'll give her a second to get that up on the board. The motion is Move to

postpone final action on Atlantic herring specifications until the Policy Board on Thursday if NOAA Fisheries provides the final rule. It was a motion by Mr. Grout; seconded by Mr. Train. Are there any questions or comments on the motion? Adam.

MR. ADAM NOWALSKY: Just process-wise I'm trying to understand. Are we as a Board essentially giving the Policy Board the authority to take action on this; by virtue of this motion, and does that then say that for any spec setting to any Board that the Policy Board could supersede that decision moving forward? I'm just trying to understand what authority we're ceding to the Policy Board in this action. I'm not opposed to the concept of delaying a decision. I understand the importance of the Final Rule. But I think we should be clear what this Board may be ceding.

CHAIRMAN KELIHER: I'll turn it over to the Executive Director to comment.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Adam, it's a great question. Essentially the short answer is yes. The Herring Board is delegating authority to the Policy Board to make the final specs. But I think the precedence is something that makes me a little less concerned in that we ended up in this spot because we had this lengthy Federal shutdown.

We are sort of not operating under normal timelines and circumstances. The specs would have been available for this Board a number of weeks ago; and everything would have worked out easily. But I think this action is being considered because of the unique situation here. I don't think it will apply across the Board for all other specifications down the road, necessarily.

CHAIRMAN KELIHER: Mr. Grout.

MR. GROUT: Just a follow up for clarification. This motion applies to one issue; this particular issue. It's not succeeding our authority to the Policy Board for any other issues; it's just because of this unique situation that has happened due to the shutdown. I'm hoping that we can postpone; and maybe make our work more efficient by actually doing our work here, as opposed to having to do it by an e-mail vote.

CHAIRAMN KELIHER: Adam, does that satisfy your curiosity?

MR. NOWALSKY: Again, I think it's just important that we have clear on the record what we're doing here; so we know what we can do on Thursday, and what we might do on similar situations in the future.

CHAIRAMN KELIHER: I think the comments by Mr. Beal and Mr. Grout certainly make it clear that this is really a unique situation caused by the Federal shutdown; and I'll hold additional comments in regard to the Federal shutdown until the hospitality suite later this evening. With that we have a motion on the board. Are there any other questions in regard to the motion? Seeing none; I'll read it into the record. Oh, Eric.

MR. REID: Is this specific to 1A, or is this for the whole fishery?

MS. WARE: It's for the whole fishery, so it's the Sub-ACLs for the different management areas.

MR. REID: Only because in the bullet points it references 1A, it doesn't say anything about 2 and 3. I appreciate that.

CHAIRMAN KELIHER: Okay are you all set, Eric? Okay. Any additional questions, seeing none; I'll read into the record the motion**. Move to postpone final action on Atlantic herring specifications until Policy Board on Thursday if NOAA Fisheries provides the final rule; motion by Mr. Grout, seconded by Mr. Train. Is there any opposition to this motion? Seeing no opposition the motion carries.** This will move us. Dr. Pierce.

DR. PIERCE: Just a quick point. Let's assume for a moment that the National Marine Fisheries Service stands with its initial call, which was not to go with the New England Council's decision about what the ACL should be. The Council went with a lower number. NOAA has indicated, at least earlier on in the preliminary discussions and published material that they're going to go with a higher number.

It will be a bit of an interesting situation that if indeed we find out that they're going with a higher number, then I'm assuming the Policy Board would support that higher number. Therefore, ASMFC supports a higher number than the New England Council. It just creates a strange and opposite point of view that I wouldn't support; but we would have no option but to do so, except to be stubborn about it and create complications by going with the lower number that is the New England Council's number. I just wanted to highlight that. I'm hopeful that the New England Council's position after further consideration by NOAA that they'll go with what New England said was the appropriate set of numbers.

CHAIRMAN KELIHER: Eric Reid.

MR. REID: I would like to point out that the National Marine Fisheries Service number in Year 1 is substantially higher than the New England Councils. In Year 2 it is substantially lower. I think the number is 12,000 tons. It's a double-edged sword. New England's is more of an – average isn't the right word – but it's more of an average. National Marine Fisheries Service is substantially higher and substantially lower; which is a little problematic for me. I don't know how that's going to affect our decision. I guess we've got to see what the Final Rule is. That is my one cent.

CHAIRMAN KELIHER: I'm sure both of those comments I think will highlight some additional conversations will happen at the Policy Board, instead of a strict rubber stamp. If there are no additional comments, seeing none;

UPDATE ON DRAFT ADDENDUM III AND THE NEW ENGLAND FISHERY MANAGEMENT COUNCIL 2019 PRIORITIES

CHAIRAMN KELIHER: We'll move on to Item Number 8, which is Update on Draft Addendum III and the New England Fishery Management Council 2019 Priorities. Megan.

MS. WARE: This is just an update; and a reminder that at annual meeting this Board did initiate Addendum III, which is to consider spawning protections for Area 3. Also at annual meeting this Board voted to send a letter to the New England Council; asking that the Council add spawning protections in Georges Bank to their 2019 priorities.

As an update to that letter, at their December meeting the Council did add a priority to consider spawning closures in Georges Bank for 2019; so that was added to their priority list. Given this action, I think at staff level the hope is to work cooperatively to identify what data is available for this action, and to explore potential paths forward to consider spawning protections in Georges Bank.

CHAIRMAN KELIHER: Thanks for that quick update, Megan. Ritchie.

MR. WHITE: Megan, and then possibly Terry. What is the best-case scenario timeline by which the Council could have spawning protection in place?

MS. WARE: I don't have an exact answer for you. But in talking with Council staff, my impression is that their work on this would likely start, or they are going to first focus on 2020-2021 specifications, and then work on this Georges Bank protection. That is their plan for the year. I don't have a date for when they would take an action on it or implement it.

MR. WHITE: Follow up. Thank you. Then I guess a question for Terry would be. If the Council decides to go forward with an action;

how long might that take? My concern being that we could have substantial fishing on spawned fish for at least two years. I'm not sure that that kind of timing is what we need to protect herring at this point.

CHAIRMAN KELIHER: Mr. Stockwell.

MR. STOCKWELL: It's not if the Council is going to proceed with this work plan, it's when. As Megan reported, the Council did add this as a 2019 work priority; but the Council's current plan is to focus on the 2020-2021 specs first. This body is about to vote on the 2019 specs. As most everyone knows there is going to be another stock assessment in 2020, so the Council needs to put forward a second-year plan.

Short answer to you, once we get the white paper how complicated do the two bodies want to make this? If the Commission and the Council want to make it very complicated spawning closures, it is going to take longer. If the two bodies can agree upon something sooner than later that is more simplified, I would project it would go out the latter part of 2020.

MR. WHITE: Additional follow up, Mr. Chairman if I may.

CHAIRMAN KELIHER: Sure, go ahead.

MR. WHITE: I appreciate your indulgence. This time schedule really concerns me with the state that we find ourselves with herring. It may be that doing everything we can to have a good year class as soon as possible may make the difference to restoring this stock in a timely manner. I'm certainly not looking for this body to take things on that the Council can do.
We've got plenty of work ahead of us, and I'm not looking for additional work. On the other hand, we can act quickly and nimbly. I just throw out an idea. Would it make any sense for us to try to implement something interim; so that we're not doing the Council's work, but can we protect some spawning, some spawn herring in the interim faster, while this work is being done?

I believe we have the ability to protect spawned herring from a landing standpoint, not a fishing standpoint. Does it make any sense for us to try to have something in place for the 2020 season? We could even do it quickly for the end of 2019 season that would restrict landing of spawned herring from Area 3. I kind of throw that out as a question and see what other people think.

CHAIRMAN KELIHER: I understand where you're going with this. I certainly would like to hear comments from the Board. I would also say, I think the protections in '19, '20, and '21, are going to be based on the incredibly low quotas that we'll be fishing on. Based on that my feeling is; that while I think it would be important to ensure that we get something developed jointly between both bodies that because of the low quotas, I feel like we've got time to do that and going through the process.

I would hate to get into a situation where, we moved in the direction of turning this into a Board to ensure we had continuity with the Council and the Council with the Commission. I think we need to give that process, I personally believe we need to give that process time to work out. I think the low quotas over the next couple of years will do that. With that said; are there any additional questions or comments? Dr. Pierce.

DR. PIERCE: I agree with the Chair's perspective. In addition, I'm waiting for the discussion document that has been referenced in our reading materials. That discussion document is in progress I understand. In addition, as noted in our material for this meeting, the Plan Development Team has also begun investigating available data on Georges Bank spawning outside of state collected samples. The PDT still has work to do; the discussion document still needs to be brought

before us. As indicated, this is more complicated than it might seem at first. I certainly support protection of Georges Bank spawn herring; I always have. But 2019 is impractical.

Now if we found out that the Council for whatever reason, the Council of which I am part, is unable to do anything for 2020. Then that puts more of a burden on us; that is this Board, to consider action that would be as you indicated, Ritchie, a bit of kind of an interim action. But by then we would have the discussion document.

By then we would have a lot more information to use as a basis for doing something in 2020. I'm confident that the Council will move this forward relatively quickly; in light of the status of the stock, and of course the overall ACL. I hear what you're saying. I think 2019 really would not work; but I think 2020 is ripe for further ASMFC discussions on what to do.

CHAIRMAN KELIHER: Mr. Stockwell.

MR. STOCKWELL: I appreciate your concerns and comments. They essentially echo the position that I was ready to advocate for. I would like to add that in addition to the extremely low quotas, the likely implementation of the 12-mile buffer, which will add further protection south of the Cape. The question I have is what is the Commission's plan for the research money that was allocated; and how could this inform our collaborative process in the next year?

CHAIRMAN KELIHER: I don't believe we've made final decisions on the research money; but I'll pass it to Bob.

EXECUTIVE DIRECTOR BEAL: You're correct. We haven't made final plans. But the way I envisioned this is that the Working Group, the joint Council Commission, and Technical Folks that are working on the white paper or discussion document, whatever we're calling it. I think that is all part of that discussion; you know what data is available, what data is still needed?

Once we determine what data is still needed, they can decide what the best way to use that money. The good news is we don't have to spend that money in the next six or eight months. We've got about two years to spend that; so we've got plenty of time to use that money as wisely as possible, but it is all part of the same preliminary discussion that's happening now, the way I see it anyway.

CHAIRMAN KELIHER: Is that satisfactory, Terry? I would put one more item on the table as well. ACCSP dollars that have been funding monitoring in regards to herring, there is talk about tightening up and reallocating some of those dollars. I know the research set-aside dollars that are going to be much less that is funding the sampling in the Commonwealth will be lower.

We do have some additional challenges when it comes to sampling, if in fact we get to a point where we need to collect samples from spawning with the low quotas. Ali, sorry I should have been looking farther down the table.

MS. MURPHY: I appreciate your comments; as well as Mr. Stockwell's. We would be supportive of these two bodies working together to collaborate on this issue going forward.

CHAIRMAN KELIHER: To Dr. Pierce's tenor, we cooperate until we can't cooperate any more. Is that where you were going with that Dr. Pierce? Are there any additional comments on this item? Justin.

MR. DAVIS: Just a quick question. The discussion we're having here is about spawning closures on Georges Bank. Is that exclusive of the Nantucket Shoals spawning area, and if so, is it just because there is not enough available

information to even think about spawning closures on Nantucket Shoals?

MS. WARE: The Council priority, and Terry correct me if I'm wrong, was focused on Georges Bank. The Commission Addendum was Area 3. There is a bit of a difference there that we will have to reconcile between the two bodies as we start to work on this document. But we do have a lack of data on Nantucket Shoals; that is true.

CHAIRMAN KELIHER: Dr. Pierce.

DR. PIERCE: I hadn't thought about that but it's true. But I suspect when we get deeper in discussions about protection of spawning on Georges Bank, the link between Nantucket Shoals and Georges Bank will become quite obvious. As a matter of fact, the scientific perspective, U.S. perspective is the Georges Bank we built after it had collapsed in the 1970s, and the early '80s that we built because of spawning on Nantucket Shoals that seeded the Georges Bank area.

That is the prevailing scientific opinion. There is a linkage there that has to be respected. I suspect that once our discussion document is completed, and once we have more discussions, you know with the Council staff. The connection will be obvious; and there will be no other option but to pursue an approach that would deal with the fishing in the Nantucket Shoals area right adjacent to Georges Bank, I mean they're connected. That is what I foresee.

CHAIRMAN KELIHER: Are there any additional comments? Seeing none; that was our last agenda item.

ADJOURNMENT

CHAIRMAN KELIHER: One more call for any additional business to be brought up to the Herring Board. Seeing none; a motion would be in order to adjourn. I didn't hear one, but motion to adjourn is accepted, thank you. Thanks everybody!

(Whereupon the meeting adjourned at 10:00 o'clock a.m. on February 5, 2019)

Atlantic States Marine Fisheries Commission

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

Gulf of Maine Spawning Protections

ASMFC Vision: Sustainably Managing Atlantic Coastal Fisheries

April 2019

Draft Addendum for Board Review

In February 2019, the Atlantic States Marine Fisheries Commission's (Commission) Atlantic Herring Management Board initiated the development of an addendum to Amendment 3 of the Interstate Fishery Management Plan (FMP) to provide options to strengthen spawning protections in Area 1A (inshore Gulf of Maine). This Draft Addendum presents background on the Commission's management of Atlantic herring, the addendum process and timeline, and a statement of the problem.

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
February – April 4, 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

Draft Addendum for Board Review

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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New England Fishery Management Council (NEFMC). 2018. Amendment 8 to the Atlantic Herring Fishery Management Plan Draft Environmental Impact Statement. Volume 1. https://s3.amazonaws.com/nefmc.org/Herring-A8-DEIS.Submission.April-12.pdf

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

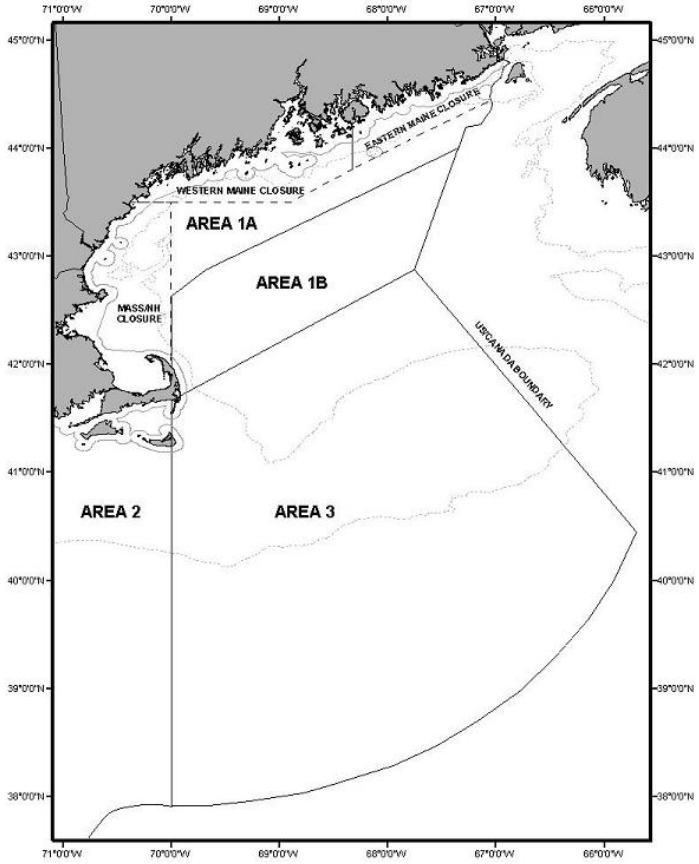

Figure 1: Atlantic herring management areas and spawning closure areas in the Gulf of Maine.

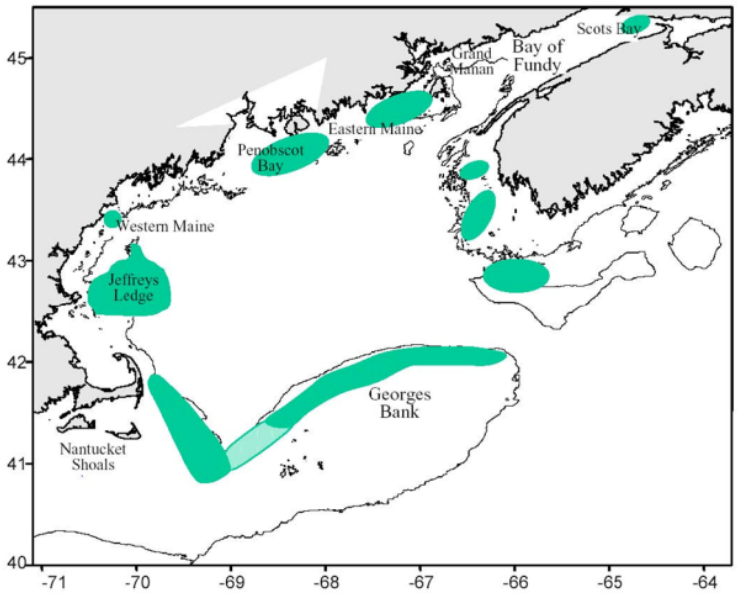

Figure 2: Overview of major Atlantic herring spawning areas, identified in green, in the Gulf of Maine and on Georges Bank. Source: Overholtz et al. 2004.

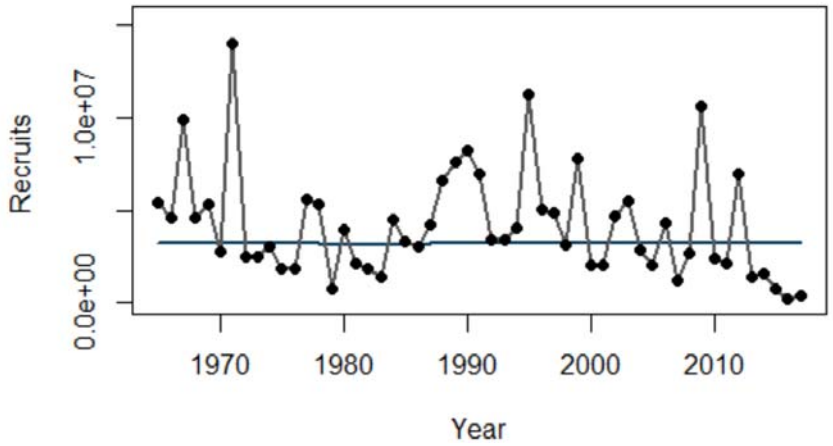

Figure 3: Atlantic herring annual recruitment, in 1000's, from 1965-2017. The horizontal line is the time-series average. Source: NEFSC 2018.

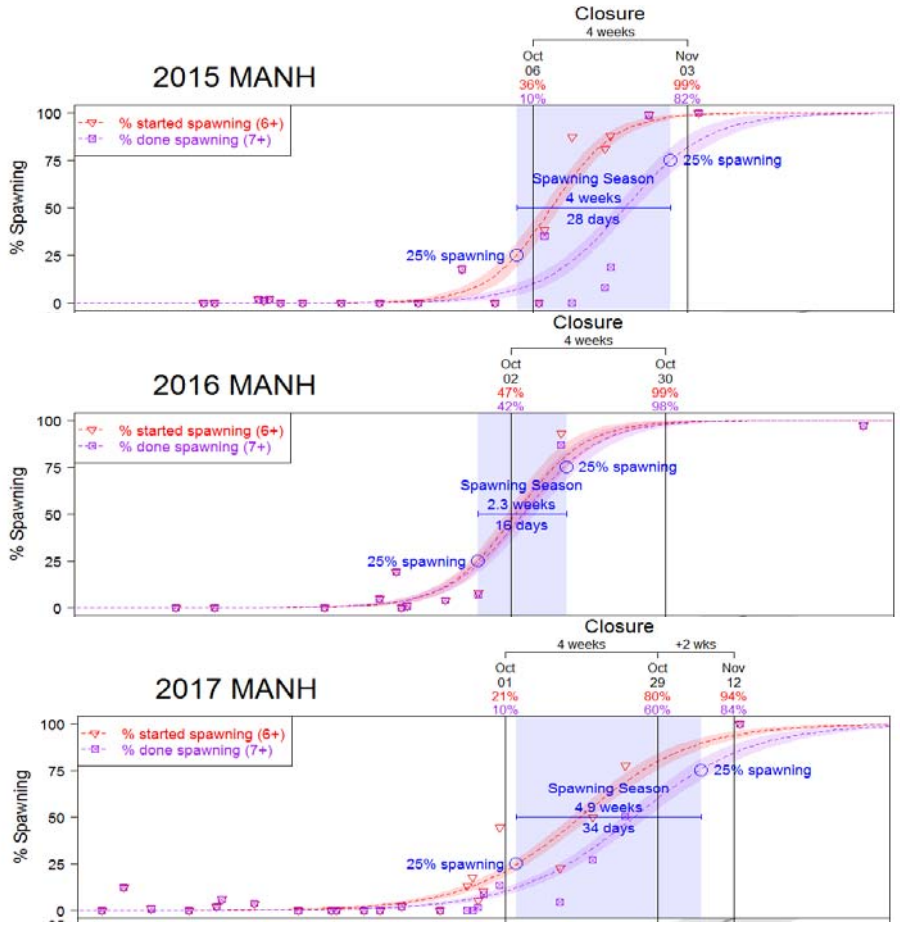

Figure 4: Estimated spawning seasons under the current GSI_{30} spawning closure protocol for the Massachusetts/New Hampshire spawning area in 2015 through 2017. The spawning season is identified by the blue shaded regions while the black vertical lines represent the spawning closures enacted by management. 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.

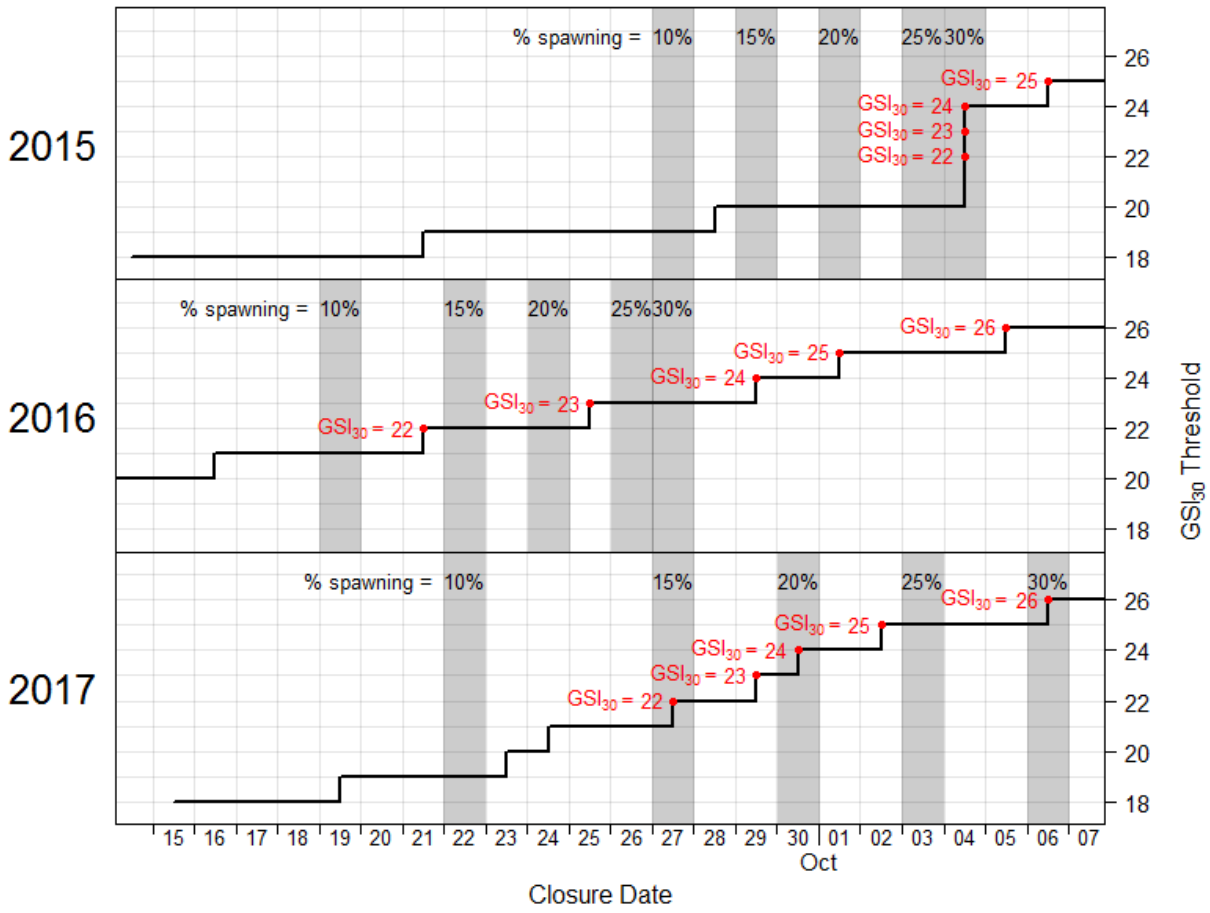

Figure 5. Date when the Massachusetts/New Hampshire spawning closure would have started, under different GSI_{30} trigger values. The vertical gray bands indicate the percent of the population expected to be spawning for that trigger value in a given year. Note: in 2015, spawning closures under GSI_{30} 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.

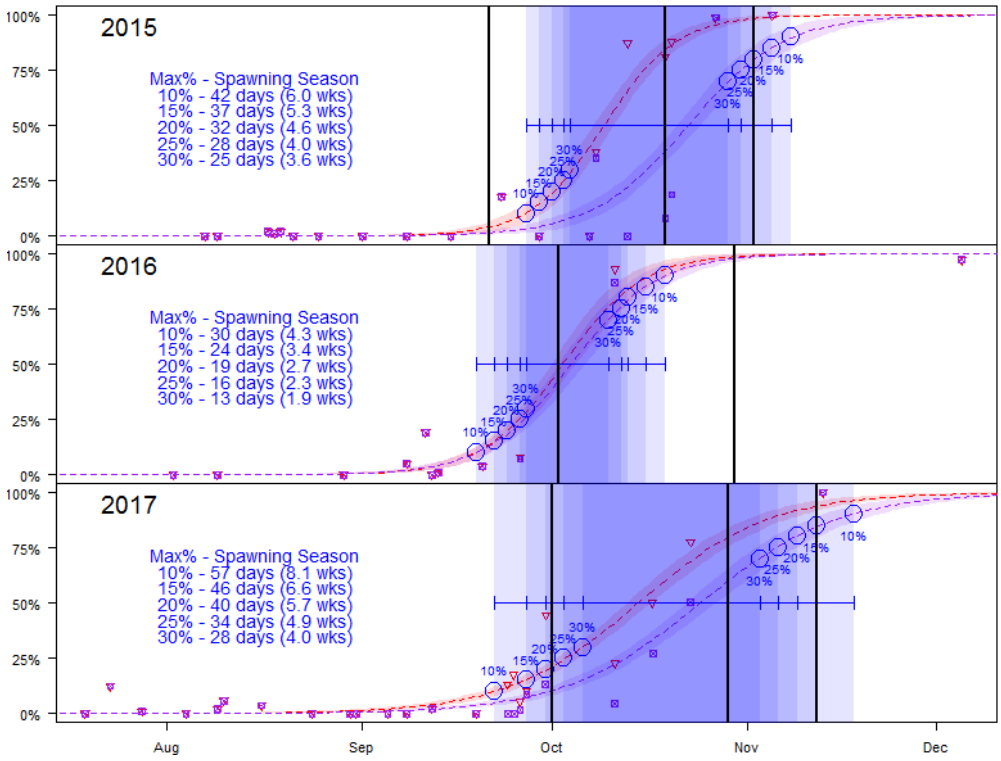

Figure 6. Effect of choice of maximum allowable percentage spawning in the catch on duration of the spawning season. This figure shows that as a lower percentage of spawning fish in the catch is required, the length of the season closure extends. Source: Dean et al. 2018.

Draft Addendum for Board Review

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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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).

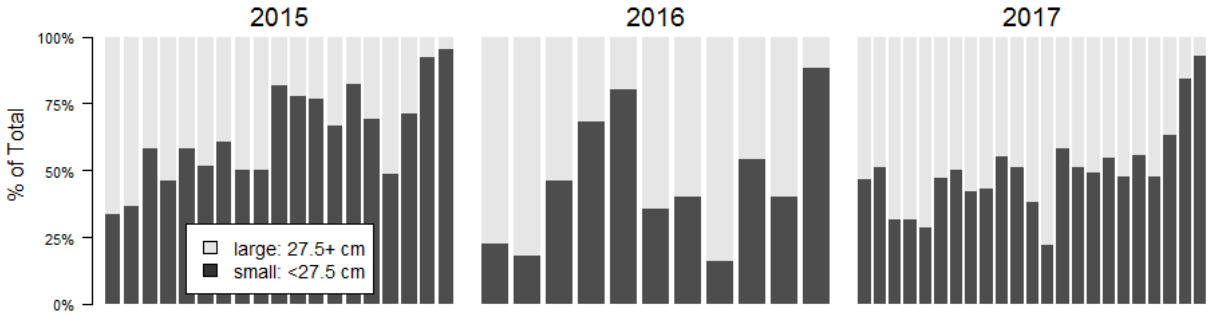


Figure 1. Fraction of herring in "large" or "small" size classes over the sequence of samples from the Massachusetts-New Hampshire spawning area, 2015-2017.

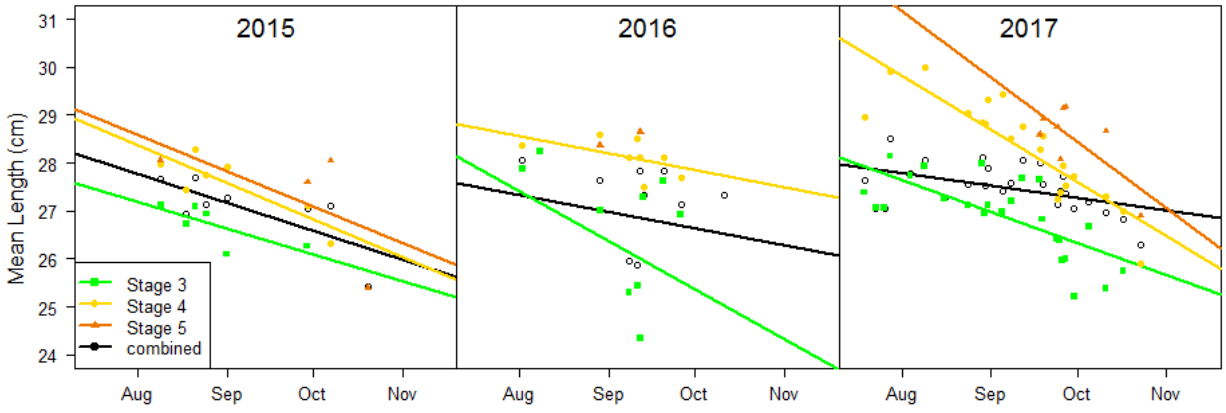


Figure 2. Mean length (cm) of female herring sampled for GSI, by maturity stage and sample date.

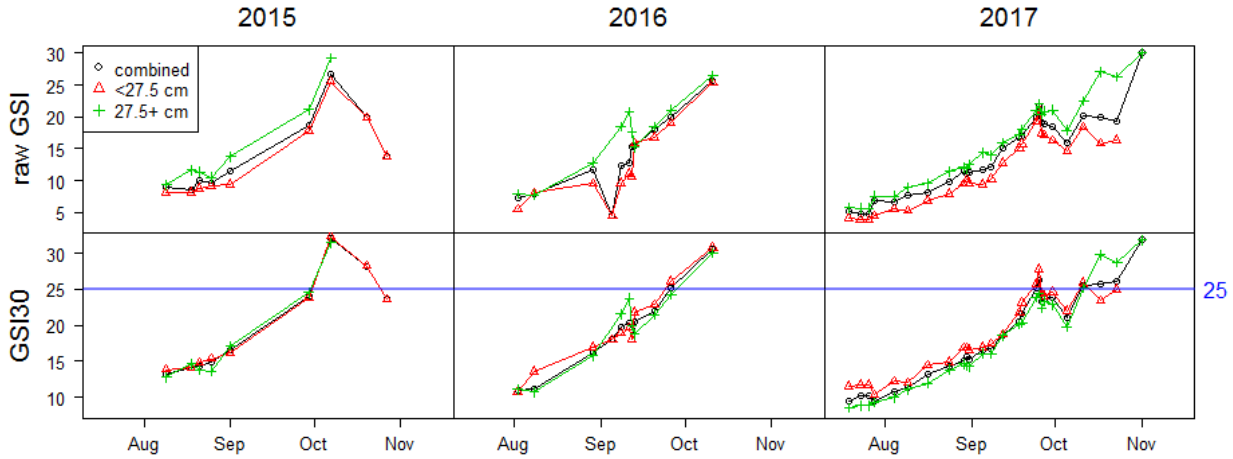


Figure 3. Mean GSI (top) and mean GSI_{30} (bottom) by sample year, date, and size class.

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.

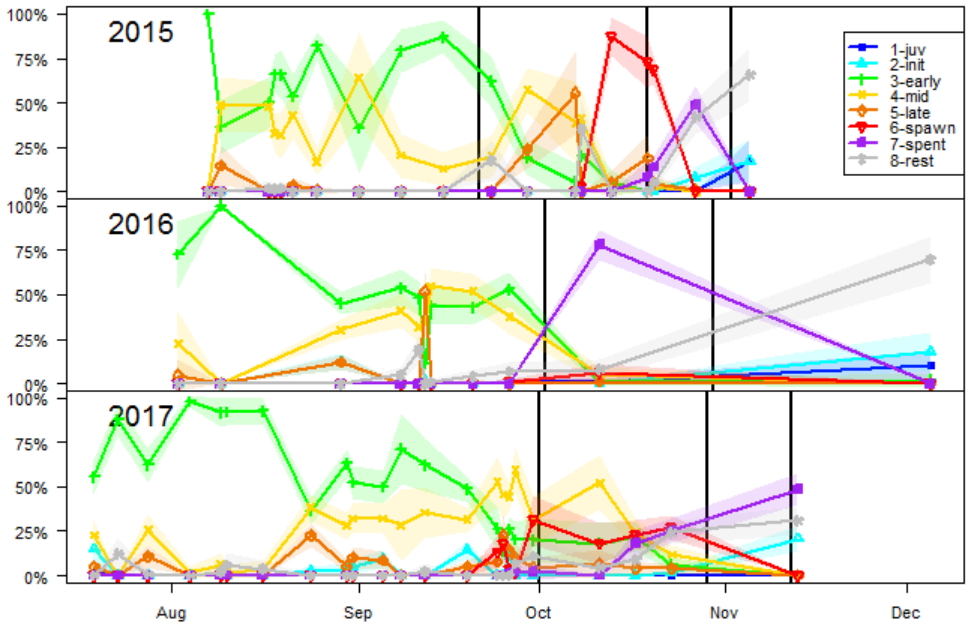


Figure 4. Fraction of MANH herring in each maturity stage by sample year and date. Black vertical lines indicate closures.

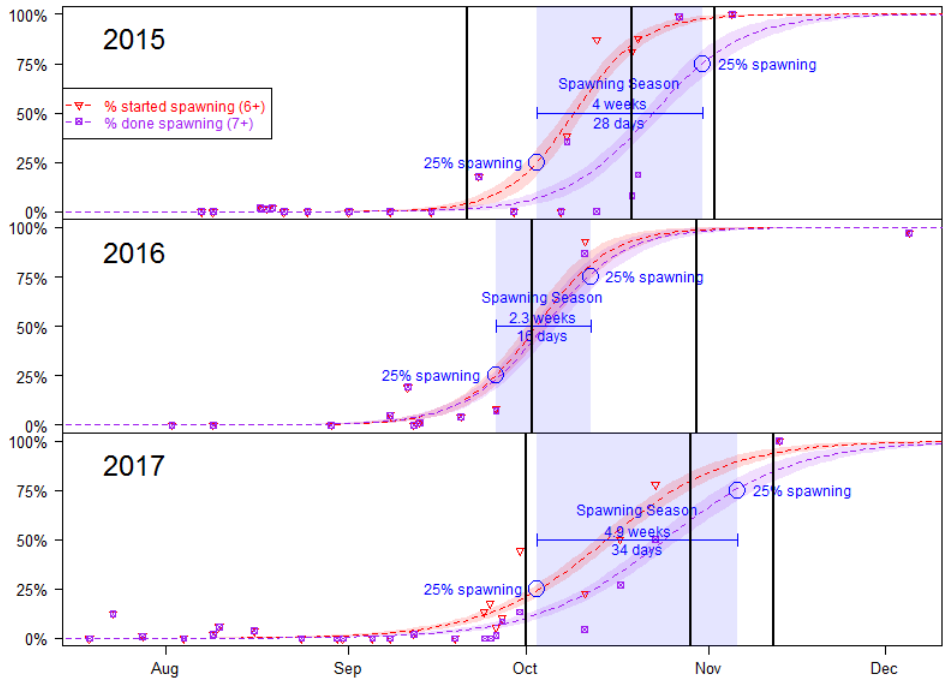


Figure 5. Observed fraction of sampled herring that had started spawning (red: stage 6+) and completed spawning (purple: stage 7+), with fitted logistic regression lines. The shaded blue region represents the spawning season, as defined by the period between when 25% of fish had begun to spawn and when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

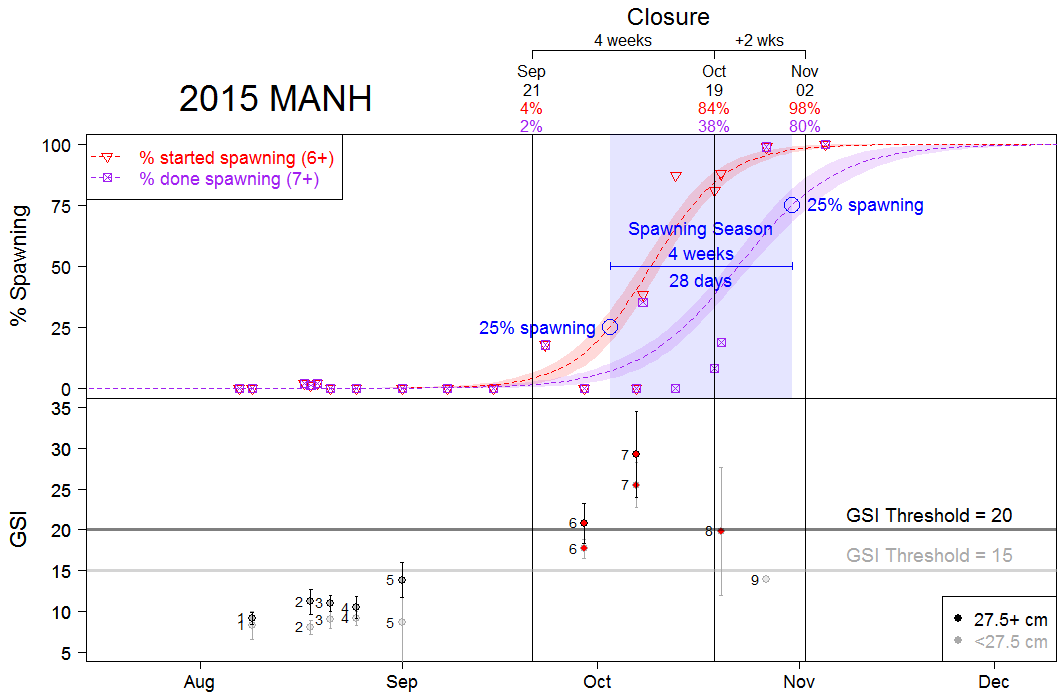


Figure 6. Estimated spawning season (top) and mean GSI (bottom) by sample date, for 2015 in the MANH spawning area. Closure dates refer to the actual closure dates under the old closure system.

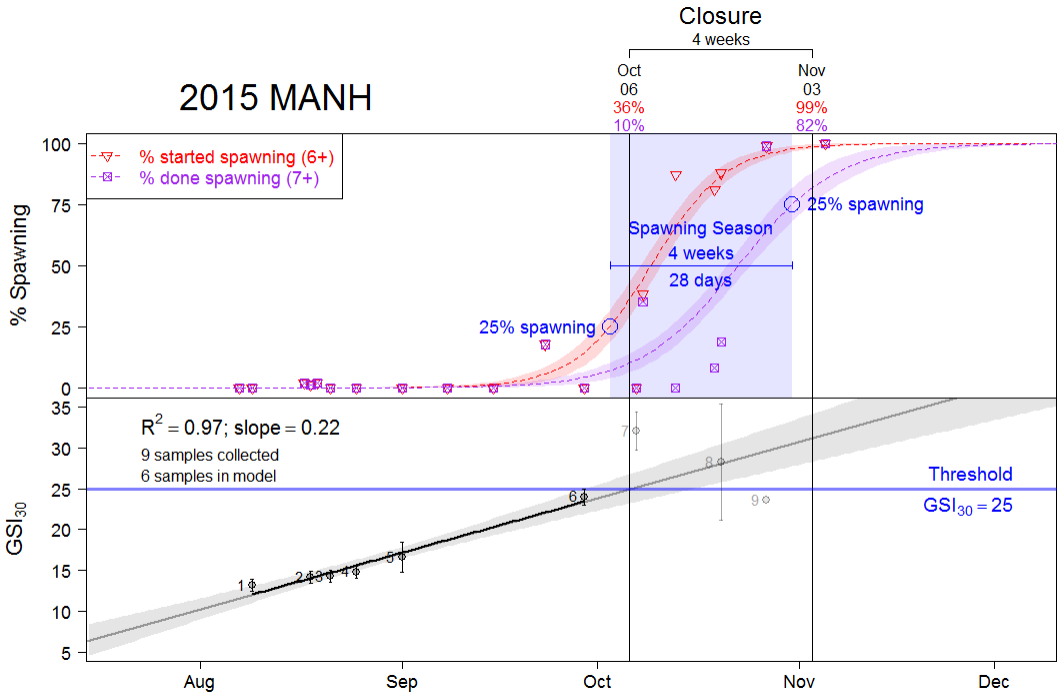


Figure 7. Estimated spawning season (top) and mean GSI_{30} (bottom) for 2015 in the MANH spawning area. Closure dates refer to what would have occurred under the current model-based system.

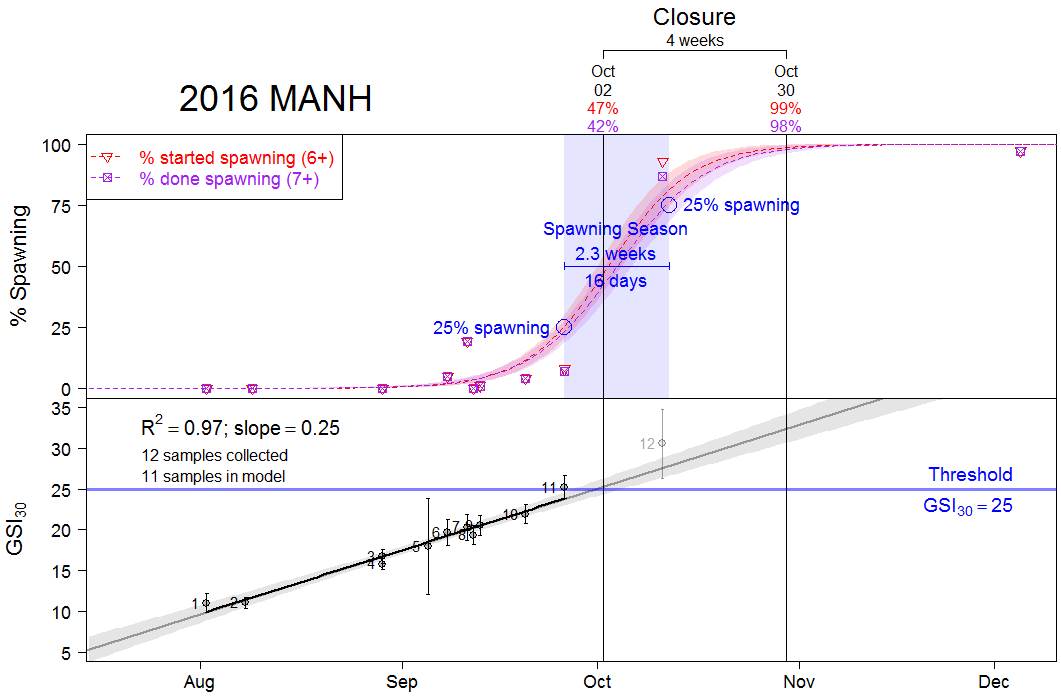


Figure 8. Estimated spawning season (top) and mean GSI (bottom) for 2016 in the MANH spawning area. Closure dates refer to the actual closure dates under the current closure system.

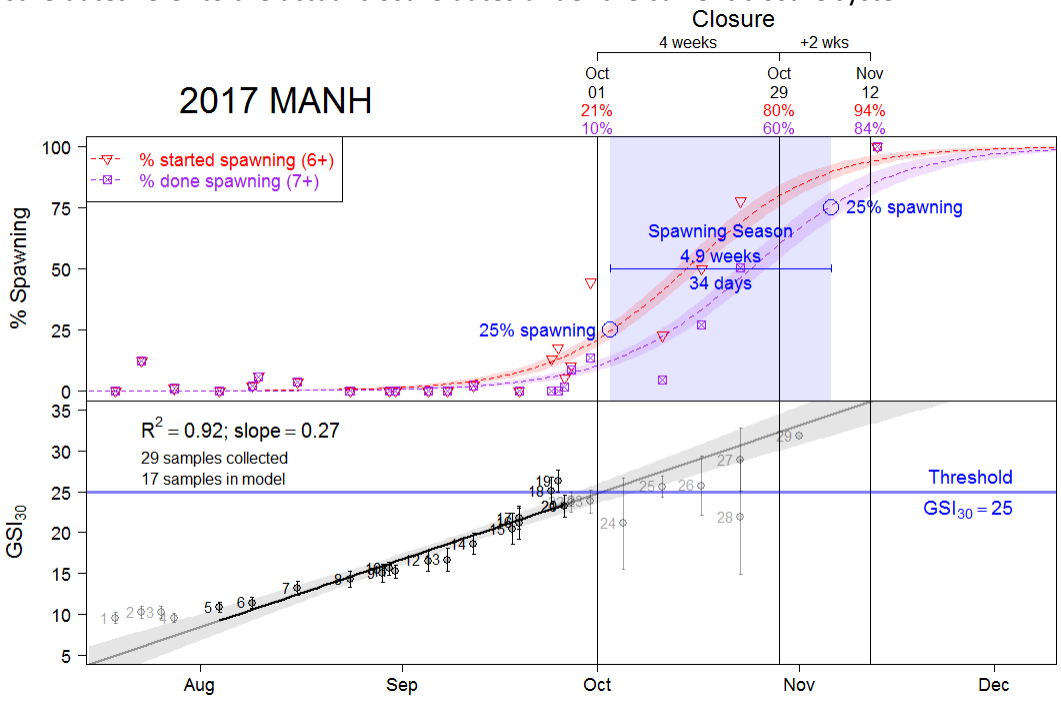


Figure 9. Estimated spawning season (top) and mean GSI (bottom) for 2015 in the MANH spawning area. Closure dates refer to the actual closure dates under the current closure system.

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).

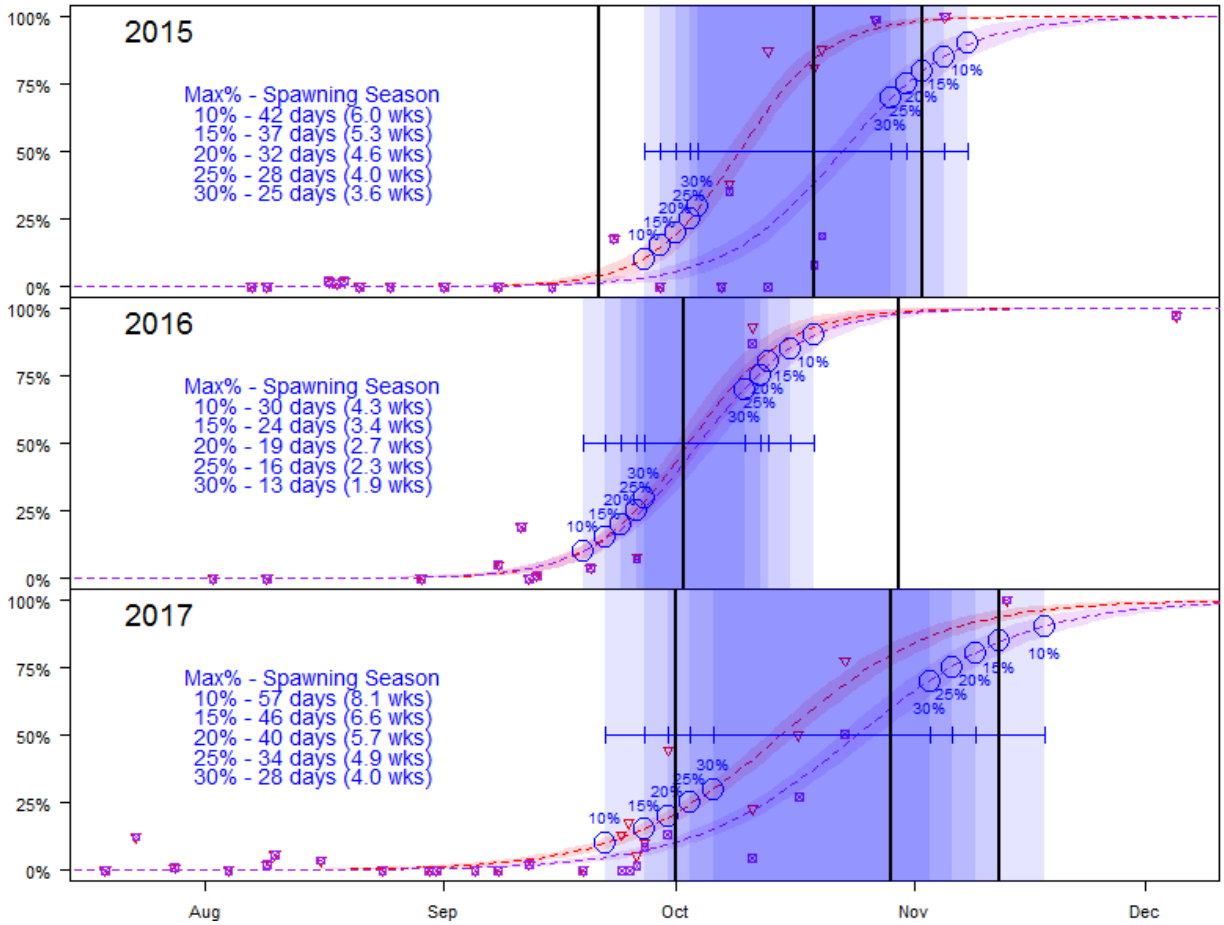


Figure 10. Effect of choice of maximum allowable % spawning in the catch on duration of the spawning season.

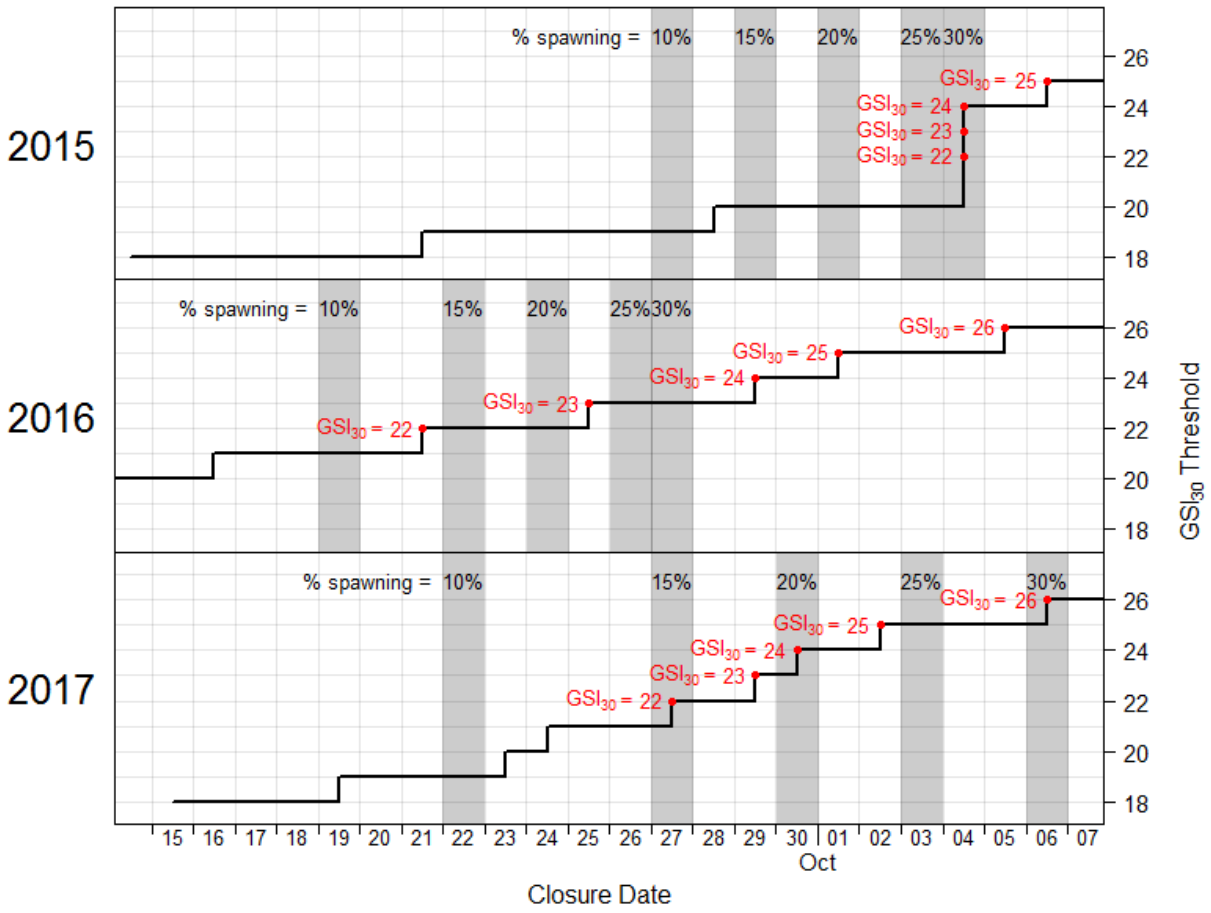


Figure 11. Date when the MANH spawning closure would have started, under different GSI_{30} thresholds. The vertical gray bands indicate the percent of the population expected to be spawning.

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.

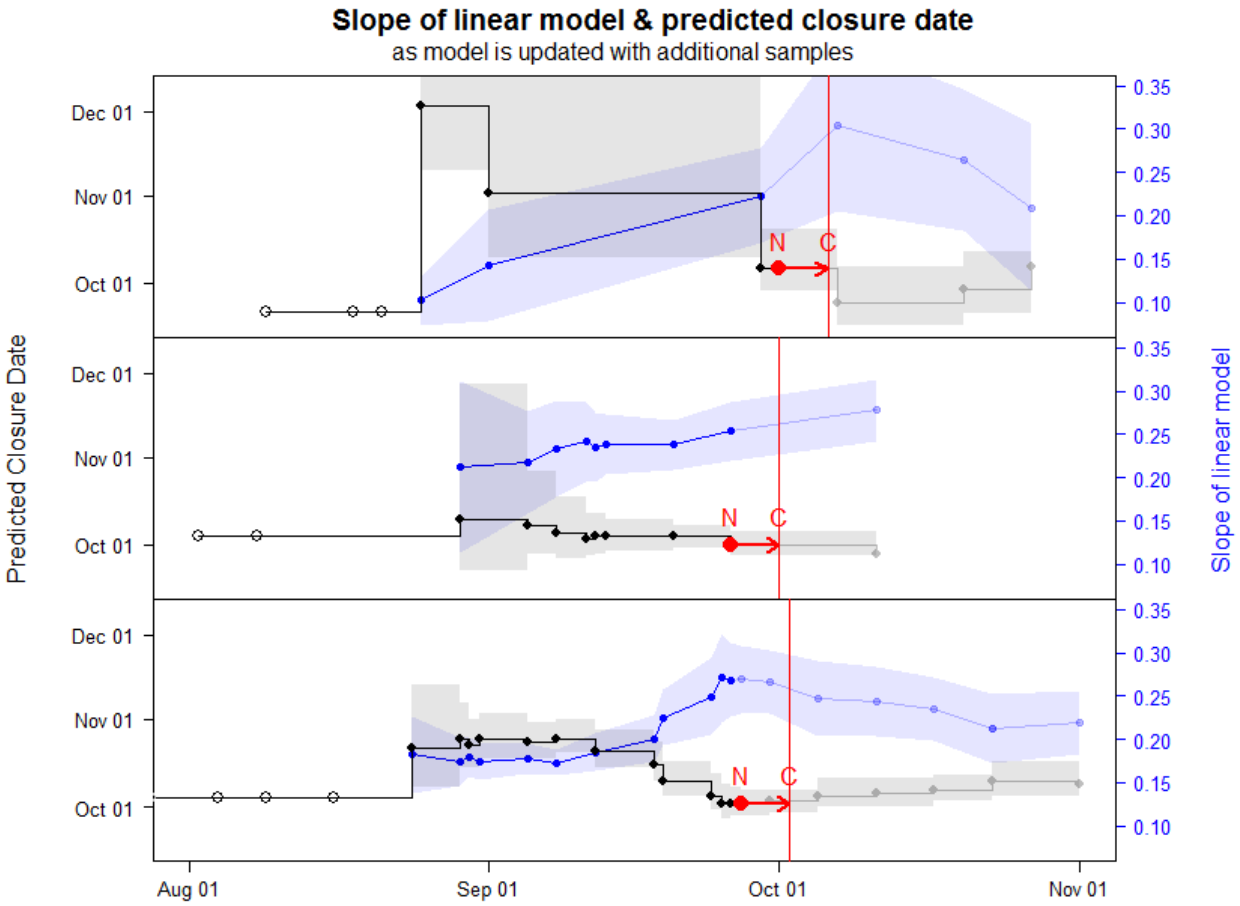


Figure 12. Slope of linear model GSI_{30}~DATE (blue, right y-axis) and predicted closure date (black, left y-axis) as the model is updated with additional samples. Open black circles show where the default closure date would apply: when <3 samples have been collected and/or the model fails to detect 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

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

MEMORANDUM

TO: Atlantic Herring Management Board

FROM: Kirby Rootes-Murdy, Senior FMP Coordinator

DATE: April 12, 2019

SUBJECT: Public Comment on Atlantic Herring Draft Addendum II

The following pages represent a draft summary of all comment received by ASMFC on Atlantic Herring Draft Addendum II as of 5:00 PM (EST) on April 4, 2019 (closing deadline).

A total of 8 comments were received on Draft Addendum II from individuals and organizations. A total of 5 organizations submitted comments on Draft Addendum II. The remaining three comments came from individual stakeholders, including commercial fishermen and concerned citizens.

Three public hearings were held in three jurisdictions, and one additional public hearing was conducted by webinar during which no public comment was offered. 21 individuals are estimated to have attended the hearings.

The following tables (pages 2-4) are provided to give the Board an overview of the support for specific options and issues contained in the Draft Addendum. Summaries of the public hearings can be found next and are ordered from North to South. This is then followed by letters sent by organizations and emails received from both organizations and individuals.

Public Comment Summary Tables

Issue 1: GSI30 Trigger Value				
	Option A	**Option B**	**Option C**	**Option D**
	Status Quo: GSI30 Trigger Value = 25	GSI30 Trigger Value = 25 with Updated Default Dates	GSI30 Trigger Value = 23	GSI30 Trigger Value = 22
Individual	1			1
Organization	2		1	
Hearings				
ME			2	
NH				
MA				1
TOTAL	**3**	**0**	**3**	**2**

Additional Comments:

Lund's Fisheries is opposed to reducing the trigger for spawning closures in the Gulf of Maine.

One individual suggested using a percentage shut down in the Eastern Closure area. When purse seining, they recommended taking a sample, for example a five gallon bucket, and having the spawning closure trigger set at 20%. If you have 20% spawning individuals in the seine sample, you should dump the catch and contact DMR for a closure.

One individual at the Maine hearing supported no options for trigger value; preferred the old system of year-round spawning closures with a 20% catch tolerance. They believe a spawning closure from 0-200 nm is the most effective way to conserve the fish.

Three individuals at the New Hampshire hearing offered support for Option B or C and were opposed to Option D.

Issue 2: Spawning Closure Length				
	Option A	**Option B**	**Option C**	**Option D**
	Status Quo: Four Week Initial Closure	Five Week Initial Closure	Six Week Initial Closure	Eight Week Initial Closure
Individual	1		1	
Organization	2	1		
Hearings				
ME	1	1		
NH				
MA				1
TOTAL	**4**	**2**	**1**	**1**

Additional Comments:

NMFS supports shorter spawning closure periods.

Lund's Fisheries is opposed to extending the spawning closures in the Gulf of Maine.

At the New Hampshire hearing, two individuals supported either Option A or B.

Issue 3: Re-closure Protocol		
	Option A	**Option B**
	Status Quo	No Re-closure Protocol
Individual	1	1
Organization	3	
Hearings		
ME	1	
NH	2	
MA	1	
TOTAL	**8**	**1**

Additional Comments:

NMFS supports more flexible re-closure protocols.

One individual at the Maine hearing was undecided as to whether maintaining re-closure protocol was the most effective procedure.

One individual at the New Hampshire meeting was in support of Option A, Sub-Option 2, and was strongly opposed to Option B.

Issue 3: Re-closure Protocol (Option A Sub-Options)			
	Sub-Option 1	**Sub-Option 2**	**Sub-Option 3**
	Status Quo ("Significant number" = 25%)	"Significant number" = 20%	"Significant number" = 15%
Individual			1
Organization	2	1	
Hearings			
ME	1		
NH		2	
MA			1
TOTAL	**2**	**3**	**2**

Additional General Comments:

NMFS urges the Commission to consider management measures that are consistent with the Federal fishery management plan and allow the fishery to fully utilize the optimum yield. They support options that provide opportunities for the herring industry, such as shorter spawning closures and more flexible re-closure protocols.

Lund's Fisheries is in strong opposition to further restrictions on the Area 1A herring fishery by reducing the trigger for, and extending the duration of, spawning closures in the Gulf of Maine. They encourage the Management Board to indefinitely postpone further consideration of Addendum II to A3.

One individual commented that current sampling is not sufficient and we need to close the inshore spawning areas quicker and for a longer period of time until sampling improves.

One individual at the Massachusetts hearing commented that mid-water trawlers have had a disproportionately negative impact on the resource compared to other gear types, and that if herring crash, it will have significant impact on other fisheries. They additionally noted that there should be more time between the public hearing and the last day of the public comment period.

Draft Addendum II Public Hearing

Augusta, ME
March 6, 2019
9 Participants
Staff: Melissa Smith (DMR), Matt Cieri (ME DMR/Herring TC),
Patrick Keliher (DMR Commissioner/ Herring Board Chair)

Issue 1: Trigger Value

➔ **General support for Option C**

- One individual didn't support any options for trigger value and referenced the old system of year-round spawning closures with a 20% catch tolerance. This individual spoke to the effectiveness of the old ways and how it deterred effort on aggregating fish. While spawning may not be an issue this upcoming season, he concluded that a spawning closure from 0 – 200 nm was the most effective way to conserve fish.
- Two individuals spoke to Option C, referencing the 20% level of population spawning fish as a suitable target. However, additional concern was placed on how this (or any option) would work in the case where only juvenile fish were being landed, as that would not constitute an appropriate sample collection for spawning data.

Issue 2: Closure Length

➔ **No consensus**

- One individual supported Option B, a 5 week initial closure. Rationale for supporting this stemmed from multiple comments heard by industry during previous fishing seasons that suggested an extra week may have been more suitable and sufficient to not require further re-closures.
- One individual supported status quo, Option A, especially regarding Eastern Maine, as the area is data poor. Until more data becomes available, they did not feel the options were suitable.

Issue 3: Re-Closure Protocol

➔ **No consensus**

- One individual supported status quo, especially regarding Eastern Maine, as the area is data poor. Until more data becomes available, they did not feel the options were suitable.
- One individual was undecided as to whether maintaining re-closure protocol was the most effective procedure for the spawning program.

Draft Addendum II to Amendment 3 of the Interstate Fishery Management Plan for Atlantic Herring for Public Comment

Atlantic States Marine Fisheries Commission
March 6, 2019
Augusta, Maine

-- PLEASE PRINT CLEARLY --

Name	Company/Organization	City, State
Dana Wood	Atheara Maine	Machiasport ME
Earl Small		Eastport ME
Gary Small		Eastport ME
Chris Weiner		
Sam Fuller		Boothbay Hbr ME
COREY PROCK		ROCKLAND
Jason Parent	Western Sea	Rockland, ME
Steve Wood	Fowler	Boothbay Harbor
Glenn Hawkinson	Double Eagle	Owls Head

Draft Addendum II Public Hearing

Portsmouth, NH
April 2, 2019
7 Participants
Staff: Kirby Rootes-Murdy (ASMFC), Renee Zobel (NH DFG/TC Chair),
Cheri Patterson (NH DFG Commissioner Proxy),
Doug Grout (NH DFG Commissioner)

Issue 1: Trigger Value

➔ **Three in support of either Option B or Option C**

- Three individuals spoke in support of setting the trigger value at 25 with data through 2017 (Option B) or at 23 (Option C). The reason cited was that these options would allow the fishery to still operate while affording greater protection to spawning herring in light of the 2018 stock assessment results. In offering comments, one individual questioned whether the trigger values will be needed for the 2019 fishery given the reduction the Sub-Annual Catch Limit for Area 1A.
- All three individuals also indicated they were opposed to a trigger value of 22 (Option D) and cited concern that it may have a significant economic impact on the fishery.

Issue 2: Closure Length

➔ **Two in support of either Option A or B**

- Two individuals spoke in support of having the spawning closure be status quo (4 weeks; Option A) or slightly longer than the current 4 weeks (5 weeks; Option B). The reason cited was the new GSI_{30} Sampling Program has become a more accurate way of evaluating spawning events within the population and responding appropriately. In offering comments in support of these two options, it was noted that the length of the closure has an impact on whether a re-closure is needed in a given year. While some expressed concern about the current length potentially creating scenarios in certain years where a re-closure is more likely, there was ultimately more support for a shorter closure than a longer one.

Issue 3: Re-Closure Protocol

➔ **Two in support of Option A2**

- Two individuals spoke in support of maintaining the re-closure protocol with an updated definition of a 'significant number' of spawn herring as 20% or more of the sample (Option A2). Reason cited was that it provides a tool to protect spawning herring if necessary after an initial closure has ended.
- One individual who spoke in support of Option A2 also indicated they were very much opposed to Option B.

Draft Addendum II to Amendment 3 of the Interstate Fishery Management Plan for Atlantic Herring for Public Comment

Atlantic States Marine Fisheries Commission
April 2, 2019
Portsmouth, New Hampshire

-- PLEASE PRINT CLEARLY --

Name	Company/Organization	City, State
Peter Whelan		Portsmouth NH
Gene Marconi	Marine Fisheries	Strafford NH
Eileen Goethel	F/V Ella Dru	Hampton, NH
Ritchie White		Rye
Chris Wallace		Portsmouth
Peter Kendall		Rye NH
[illegible]	NHCTA	PORTS. NH

Draft Addendum II Public Hearing
Gloucester, MA
April 1, 2019
5 Participants
Staff: Kirby Rootes-Murdy (ASMFC), Brad Schondelmeier (MA DMF),
Cate O'Keefe (MA DMF)

Issue 1: Trigger Value

➔ **1 supported Option D**

- One individual spoke in favor of Option D, highlighting that reducing the trigger value down to 15% would result in protection for an additional 10% of the spawning population by reducing the catch and allowing more spawning herring to survive.

Issue 2: Closure Length

➔ **1 supported Option D**

- One individual spoke in favor in favor of Option D, an 8 week initial closure. The rationale for supporting this was that the difference between 6 and 8 weeks was not a lot from an economic impact standpoint and the added protection to the spawning fish would be worth it.

Issue 3: Re-Closure Protocol

➔ **1 supported Option A, Sub-Option 3**

- One individual spoke in support of re-closure if 15% or more mature herring are detected through sampling. The reason cited was this would allow the greatest conservation benefit to the population during spawning of the re-closure options. This individual noted that when he goes to buy herring, many of the fish are in peak spawning, and that these fish should be in water, not on the counter.

Additional Comments

One individual noted that the mid-water trawlers have had disproportionate negative impact on the resource relative to other fishing gear types. For example, purse seine fishing allows for a sample pump, where the fishermen can evaluate whether the herring are a good product to bring to market or not and can release them with minimal damage. For mid-water and pair trawlers, once they have completed a set, there may be a significant number of dead herring that will not be good for market and are released; this is wasteful and harmful to the resource. This individual also noted that if the herring population were to crash it will have a significant impact on other fisheries. Last, this individual noted that there should be more time given between the public hearing and the last day of the public comment period.

Draft Addendum II to Amendment 3 of the Interstate Fishery Management Plan for Atlantic Herring for Public Comment

Atlantic States Marine Fisheries Commission
April 1, 2019
Gloucester, Massachusetts

-- PLEASE PRINT CLEARLY --

Name	Company/Organization	City, State
Julia Poliseno	Stakeholder	Rockport
Allison Murphy	NOAA Fisheries	Gloucester MA
Lindsey Williams	MIT Sea Grant	Cambridge, MA
Brad Schondelmeier	MA DMF	Gloucester, MA
Joshua D'Connor	NOAA	NJ
Pam Thames	NOAA	Portland, Me

F/V Ocean Spray Partnership
Deake's Wharf
446 Commercial St.
Portland, ME 04101

PROVIDIAN

April 3, 2019

RECEIVED
APR 0 4 2019
ASMFC

Atlantic States Marine Fisheries Commission
Attn: Kirby Rootes-Murdy
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201

Kirby Rootes-Murdy,

I am writing to provide comments on behalf of the F/V Providian. The F/V Providian fishes for Atlantic Herring throughout the range of the fishery using both midwater trawl and purse seine gear. The F/V Providian harvests herring for the lobster bait markets in Maine, New Hampshire and Massachusetts.

We support status quo (no action) on Draft Addendum II to amendment 3 to the Atlantic herring interstate fishery management plan.

The timeline for this action is too aggressive and the final decision is too close to an already burdened fishing season to consider this action for the 2019 fishing season. It will have no effect on the protection spawning fish in the near future. The weekly 4/truck limit will have the fishery closed well before historic spawning dates.

At this point, there is not enough data to determine the need for changing the current closure protocols. The new model-based GSI monitoring system was just implemented in 2016. We are only considering data from two seasons that showed much different results for the length of the spawning season. For example, the data suggests that the 2016 spawning season was 2.3 weeks and 4.9 weeks in 2017. At best, this suggests that the spawning season is highly variable. There needs to be more years of data before and educated action to change spawning protocols can be justified.

Any decision made this early would be a politic and emotional decision based on current quota cuts that are already in place to protect the fish stock. The only reasonable action at this time is the status quo alternative.

Sincerely,

John-Paul Bilodeau
Regulations and Compliance

(207) 253-5626 Telephone (207) 253-5622 Fax jp@fvprovidian.net

New England Purse Seiner's Alliance

April 4th, 2019

Patrick Keliher, Chairman
Atlantic Herring Management Board
Atlantic States Marine Fisheries Commission
1050 N. Highland Street; Suite 200 A-N
Arlington, VA 22201

Re: Herring Draft Addendum II

Dear Pat,

I am writing on behalf of the New England Purse Seiner's Alliance ("NEPSA") to comment on Herring Draft Addendum II ("Addendum"). NEPSA is an industry group consisting of purse seine vessels that fish the inshore Gulf of Maine. Our vessels supply fresh herring exclusively to U.S. lobstermen during times of peak bait demand. NEPSA members are long-time participants in the fishery and have a vested interest in the future health of the herring resource.

One of the main reasons for the relative health of the herring resource in Area 1A is that it is the only area in which there are protections for spawning fish. Herring are highly vulnerable just before and during the spawning period due to their inclination to congregate densely in specific areas—and then remain in those areas even in the face of heavy fishing pressure. Sitting lazily on bottom, these fish are perfect targets for highly effective 'midwater' trawlers before they are able to spawn. Additionally, given the staggered nature of spawning activity, by targeting these dense congregations during peak spawning activity, any previously-fertilized eggs on bottom are at risk of being mowed down, too. Targeting spawning herring aggregations is a surefire way to negatively impact future recruitment. As such, you cannot effectively manage herring without the use of spawning closures. Thankfully, we long ago took steps to address this in 1A.

But, as the analysis in the Addendum shows, the current spawning closure system in 1A is not perfect. As such, NEPSA supports the following measures to increase the efficacy of the system:

Issue 1: Option C—Trigger Value 23
Issue 2: Option B—Five Week Initial Closure
Issue 3: Sub-Option 2—Re-Closure at 20% Maturity

We believe that this suite of measures will more adequately protect spawning activity in Area 1A. By lowering the trigger slightly, increasing the initial closure period, and modifying the re-closure level, it is likely that managers will be able to better protect the bulk of spawning activity. This will hopefully allow us to avoid the heavy midwater trawl fishing pressure that certain areas have seen because of the inadequacies in the current system in recent seasons.

To be clear, we strongly believe that these measures *must* be coupled with increased sampling in order for maximum effectiveness to be achieved. No model or number on paper will accurately predict something as variable as herring spawning activity. Ours support for these increased protections comes with a strong request for ASMFC to proactively prioritize funding in order to make sure that there is enough sampling to feed into the system and make it run properly. Given what our fleet is dealing with right now, it should not be too much to ask for the states to find enough money to sample adequately.

Furthermore, *our support for increased protections in 1A also comes with a demand for spawning protections in Area 3*. To be honest, we initially supported this addendum with the belief that it was going to be developed alongside an addendum to protect Area 3. To see that action delayed is incredibly frustrating. What has happened in Area 3 over the last decade is an atrocity. It is completely unacceptable that we sit here in 2019 without any spawning protections for those fish. It should be no wonder that George's Bank has collapsed, or that the resource overall has declined. You simply cannot allow the midwater trawl fleet to continually target spawning fish during peak spawning without having catastrophic results. We sincerely hope that the ASMFC will follow through with its promise to install protections for Area 3 by 2020 if the NEFMC has not fully approved an action by that time.

While these measures will likely impact our ability to fish in Area 1A, we know that our future relies on the health of this resource. Purse seiners have and will continue to fight for what it is right so that we can hopefully get our of the current catastrophe and ensure it never happens again.

Thanks for your time,

Chris Weiner
NEPSA

Atlantic States Marine Fisheries Commission
Attn: Kirby Rootes-Murdy, Senior FMP Coordinator
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201
comments@asmfc.org

Herring Draft Addendum II

April 4, 2019

Dear Commissioners:
I am writing on behalf of the Atlantic herring catcher vessels E/V Starlight and F/V Sunlight; owned and operated by the O'Hara Corporation of Rockland ME and the Osgood family of Vinalhaven ME; on Draft Addendum II to the states Atlantic Herring Fishery Management Plan (FMP). These vessels represent a combined history in the fishery that exceeds 80 years.

We appreciate the Commission's review of the present spawning regulations in the fishery. However, it is difficult to discern any true benefits of additional changes to the current methodology from this draft document and do not support any changes at this time. As the document indicates spawning events are variable in time and length which points to the need for a flexible system to respond. The current system of 4 week closures with the ability to reclose as necessary provides this needed flexibility.

Status of the Stock
The document characterizes well the current known status of the resource following the 2018 benchmark assessment that finds the stock at a low level with poor recent recruitment. However, there is no mention of a major conclusion of the assessment that finds no evident relationship between spawning stock biomass (SSB) and recruitment. In fact, there is no known cause for the recent below average recruitment. Recruitment in the fishery is known to be variable over time and most often presents in pulse like patterns that are most likely due to environmental conditions – not directly related to SSB.

Technical Committee Evaluation
The Technical Committee (TC) evaluated the two years of data that follow the implementation of the GSI protocols in Amendment 3 (2016); and concludes the current program is an improvement that is better able to respond to inter-annual changes in the timing of spawning events. They also note that reducing the GSI trigger likely necessitates longer closures that result in multiple areas closed at the same time. And lastly the TC indicates that given the current quota reductions the majority of the fish in Area 1A will likely be caught prior to the spawning closures and any benefits and/or costs will not be known in the near future.

Comments

As a general principle we have been supportive of the inshore spawning regulations as they were initially developed by the Commission many years ago. In this case we do not support any changes to the current protocols based on scant available data of two years since the last changes to the program. Additionally, there is a lack of scientific support that tightening spawning restrictions and length of closures would actually result in an increase of SSB.

In review of the goals of the FMP relative to this action to protect spawning aggregations that states "these spawning closures look to reduce interaction between fishing and spawning while also providing access to quota (ASMFC 2016);" it is apparent that there is a need to increase sampling of the fishery to improve the timing and efficacy of spawning closures to achieve more certain results. Extending closures that overlap large areas reduces access and sampling opportunities with unknown benefits.

In the short term we also agree with the TC that the extremely low quotas in coming years will result in very few fish being taken during spawning activity and find no need to implement any changes at this time. Additionally, the stock will be reassessed in 2020 and its status could change again. There are no short term benefits identified in this action.

Magnuson Stevens Fishery Conservation and Management Act (MSA)

We continue to be concerned about the states actions that impact federally permitted vessels operating in federal waters. As you are aware the MSA is the overarching federal statute that mandates standards under which these fisheries must adhere. This document does not meet nor consider any of these National Standards for this action. Of particular note is lack of consideration of any social and economic impacts to the participants in the fishery or related fisheries that rely on access to the resource in the document.

Thank you for the opportunity to comment on this proposed action.

Sincerely

Mary Beth Tooley

Government Relations
O'Hara Corporation
10 Tillson Ave
Rockland Maine 04841
Mbtooley@oharacorporation.com

LUND'S FISHERIES

Wild caught product of USA

Managing the Needs of our Customers Through our Commitment to Sustainable Fisheries

April 4, 2019

Mr. Kirby Rootes-Murdy
ASMFC Senior FMP Coordinator
1050 N. Highland St., Suite 200 A-N
Arlington, VA 22201
Via: comments@asmfc.org
Re: Draft Addendum II to A3 – Gulf of Maine Spawning Closures

Dear Mr. Rootes-Murdy:

On behalf of the 150 employees of our family-owned seafood business and the independent fishermen supplying seafood to our processing facility in Cape May, New Jersey, thank you for the opportunity to comment in strong opposition to further restrictions on the Area 1A herring fishery by reducing the trigger for, and extending the duration of, spawning closures in the Gulf of Maine, as Addendum II would do.

Our two trawlers, with decades-long histories of access to the federal Atlantic herring resource, have already lost access to some portion of the 2019 fall herring fishery, with the Commission's management board's decision earlier this year to allocate the 1A quota on a bimonthly basis, rather than the traditional trimester system.

Also, with the federal herring quotas being cut drastically, again, over the next two or three years, this is not the time for the Commission to further limit access to the extremely limited Area 1A fishery.

A sceptic could ask, since spawning closures have been in place for years, and since recruitment into the fishery is projected at the lowest levels in the time series, how effective the closures have been in producing Gulf of Maine herring? Could environmental changes be overpowering our success in continuing to tinker with this fishery, for example?

In any case, with the potential to further limit our access to 1A herring, as this addendum would likely do, and given the tremendous disruption in the herring and lobster fisheries from the necessary federal quota cuts we are experiencing, we encourage the Management Board to indefinitely postpone further consideration of Addendum II to A3.

Thank you for your attention to and your consideration of our concerns.

With best regards,

Wayne Reichle

Wayne Reichle, President
wreichle@lundsfish.com

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

APR - 1 2019

Bob Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201

Dear Bob:

Pease accept these comments on draft Addendum II to Amendment 3 to the Interstate Fishery Management Plan for Atlantic Herring. Given the low herring catch limits expected for the next several years, we urge the Commission to consider management measures for the herring fishery that are consistent with the Federal fishery management plan and allow the fishery to fully utilize the optimum yield.

We reduced 2019 herring catch limits to prevent overfishing and reduce the risk of the stock becoming overfished. The available harvest in 2019 is less than half the 2018 available harvest, which will negatively affect participants in the herring and Atlantic lobster fisheries. The New England Fishery Management Council is currently developing herring catch limits for 2020-2021; those catch limits are expected to be as low or lower than 2019 catch limits. In order to hopefully minimize additional negative socioeconomic impacts on the fishing industry, I support options in Addendum II that provide opportunities for the herring industry, such as shorter spawning closures and more flexible re-closure protocols.

Thank you for the opportunity to provide comments on Addendum II. We will continue to provide input and guidance on this management action. I look forward to working with the Commission and Council in their consideration of spawning protection measures on Georges Bank. This is an opportunity for the Commission, Council, and National Marine Fisheries Service to continue working together on spawning protection measures in all areas to better align state and Federal measures. If you have any questions about our comments, please contact Allison Murphy at (978) 281-9122, allison.murphy@noaa.gov, or Carrie Nordeen at (978) 281-9272, carrie.nordeen@noaa.gov.

Sincerely,

Michael Pentony
Regional Administrator

cc: Tom Nies, NEFMC Executive Director
Patrick Keliher, Atlantic Herring Section Chairman
Toni Kerns, Commission Fishery Management Plan Coordinator

From:	Darren Turner
To:	Comments
Cc:	Patrick Keliher
Subject:	Atlantic Herring Draft Addendum II Comments
Date:	Saturday, February 23, 2019 3:26:05 PM

Dear Kirby,

Please add these comments to the public hearing comments for the Atlantic Herring Draft Addendum II proposal:

I am not in favor of the proposed changes and prefer the status quo for issue #1 and #2. I prefer option b for issues #3.

My family is from Eastport, ME and has fished for herring full time and opportunistically in Eastern Maine over the last four decades. The fish do not show up this far east until August. The quota and weather generally end our season in mid October which only gives us a ten week window to fish. When the 20% spawn herring tolerance was taken away, it devastated our business. It prevents us from fishing 4 weeks out of our 10 week season. The proposed spawning closure changes intend to increase the closure times, which will reduce my already limited fishing opportunity. I would like to see the 20% tolerance reinstated.

The claim that we need to protect herring more than we currently do is not a proven theory. Records show that Gulf of Maine fishermen have harvested 16,000 to 60,000+ metric tons of herring annually for 70+ years without depleting the resource. Therefore, to claim that we need to cut the quota to 4,354 tons is absurd. I personally witnessed more fish in Eastern Maine waters this past summer and fall of 2018 than I have in over twenty years on the water. I question the accuracy of the recruitment assessment when my personal experience has shown me the otherwise. The ocean is to big and to complex for surveys and models to be accurate. So it is very hard for me to sit back and watch unnecessary management measures destroy the fishing infrastructure of two fisheries.

The extended times and date changes have the possibility to create more overlap between area closures. I don't believe the claimed crisis is proven enough to justify the hardships it will cause in both the herring and lobster fisheries.

Thank you,

Darren Turner

From:	e small
To:	Comments
Cc:	MELISSA SMITH; William Tuell
Subject:	Herring Draft Addendum II)
Date:	Thursday, February 28, 2019 6:39:10 PM

I'm a herring fisherman from Eastport Me. and I'm in the Eastern Closure area and I have read that we haven't had any sampling up this way so the date isn't changing so my thought is we should go to a Percentage shut down in this area. So when we are purse seining we should take a sample, say a five gallon bucket and the spawning closure should start at 20 % if you have 20% in the seine you should dump the catch and contact DMR for a closure. I've been fishing herring in the 80's and 90s then again in the last 5 years and I haven't seen any spawning herring in Cobscook, Passamaquoddy Bay Area. All the herring in this area is between 6 to 10 inches.

I'm also going to volunteer to do some sampling and report to the state or if anyone from DMR wants to go we'll do some sampling though out the eastern closure area so we can get a better idea on what happening in this area.

Thank you
Earl Small
19 Evans St.
Eastport Me. 04631
(207)461-7751

From: Stephen Weiner
To: Comments
Subject: Herring Draft Addendum II
Date: Thursday, April 04, 2019 4:42:01 PM

I support the following as pertains to Herring Draft Addendum II:

~ Issue 1, Option D

~ Issue 2, Option C

~ Issue 3, Sub-Option 3

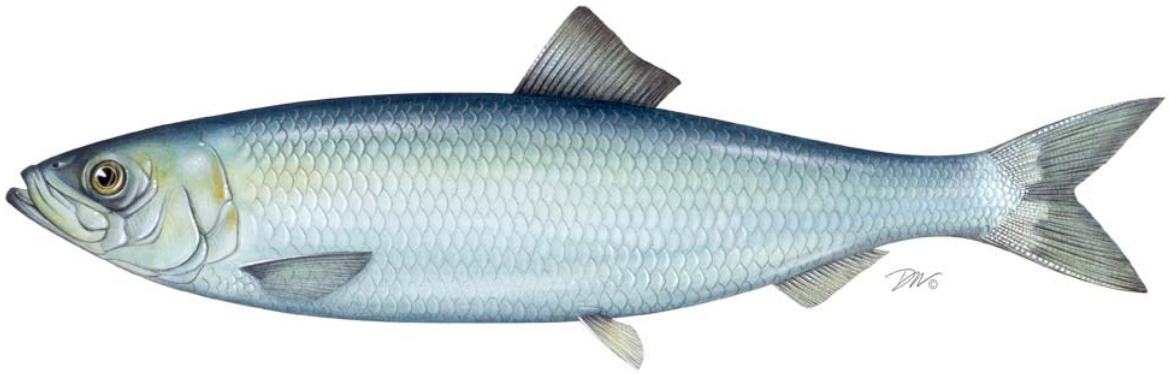
The sampling currently being done is not sufficient and until it improves we need to close these inshore spawning areas quicker and for a longer period of time. In a perfect world we would have dedicated and consistent sampling which would guide our decisions but as of now we do not. Closing herring fishing and then reopening and then closing again is not the optimal solution. Longer closure periods keeps that from happening.

Steve Weiner

2018 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR

ATLANTIC HERRING
(Clupea harengus)

2017 FISHING YEAR



Atlantic Herring Plan Review Team

Renee Zobel, New Hampshire Fish and Game
Melissa Smith, Maine Department of Marine Resources
Kirby Rootes-Murdy (Chair), Atlantic States Marine Fisheries Commission

Table of Contents

I. Status of Fishery Management Plan

Date of FMP Approval	November 1993
Amendments	Amendment 1 (February 1999) Amendment 2 (March 2006) Amendment 3 (February 2016)
Addenda	Addendum I to Amendment 1 (July 2000) Technical Addendum #1A to Amendment I (October 2001) Addendum II to Amendment I (February 2002) Technical Addendum 1 to Amendment 2 (August 2006) Addendum I to Amendment 2 (March 2009) Addendum II to Amendment 2 (December 2010) Addendum V to Amendment 2 (October 2012) Addendum VI to Amendment 2 (August 2013) Addendum I to Amendment 3 (May 2017)
Management Unit	US waters of the northwest Atlantic Ocean from the shoreline to the seaward boundary of the Exclusive Economic Zone (East Coast of Maine), and from the US/Canadian border to the southern end of the species range (Cape Hatteras, North Carolina).
States With Declared Interest	Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey
Active Boards/Committees	Atlantic Herring Section, Advisory Panel, Technical Committee, Stock Assessment Subcommittee, and Plan Review Team

Atlantic herring (*Clupea harengus*), also known as sea herring, are an oceanic fish that occur in large schools and undergo seasonal inshore-offshore migrations. Herring are important to the Northwest Atlantic ecosystem as a forage species and to the fishing industry as bait for lobster, blue crab, and tuna. To a lesser degree this resource also serves as a food, typically canned, pickled, or smoked. The U.S. Atlantic herring fishery is currently managed as a single stock through complementary plans by the Atlantic States Marine Fisheries Commission (ASMFC) and the New England Fishery Management Council (NEFMC).

The stockwide annual catch limit (ACL) is divided amongst four distinct management areas: inshore Gulf of Maine (Area 1A), offshore Gulf of Maine (Area 1B), Southern New England/Mid-Atlantic (Area 2), and Georges Bank (Area 3). The Area 1A fishery is managed by ASMFC's Atlantic Herring Section (Section), which includes representatives from Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York and New Jersey.

The 1993 ASMFC Atlantic Herring Fishery Management Plan (FMP) was implemented to address the growth of the herring resource and interest in Internal Waters Processing (IWP) operations. Amendment 1 to the FMP was developed to complement the goals and objectives of the NEFMC federal management plan. It established total allowable catch limits (TACs) for specific management areas. The Days Out program was established for state waters.

Addendum I (2000) redefined spawning areas in state waters. It also reduced the exploitation of herring spawning aggregations by imposing a limited landing restriction on herring caught in spawning areas (20% tolerance for spawn herring in Maine and Massachusetts). Technical Addendum #1A (October 2001) was approved to change the delineation of the Eastern Maine spawning area.

Addendum II (2002) was developed in conjunction with NEFMC's Framework Adjustment 1 to allocate the Management Area 1A TAC on a seasonal basis. This addendum also specified procedures to allocate the annual Internal Waters Processing (IWP) quota.

Amendment 2 (2006) to the FMP was developed to complement management measures in Amendment 1 to the federal FMP. Identical management area boundaries were adopted, in addition to a joint TAC specification setting process between NEFMC and ASMFC, and management area closure when 95% of the TAC is harvested. Technical Addendum I to Amendment 2 (2006) was developed to address inconsistent interpretation of the zero tolerance spawning provision.

Addendum I (2009) identified tools to address effort in Area 1A in order to maintain a steady supply of herring throughout the fishing season. States adjacent to Area 1A could set bi-monthly, trimester or seasonal quotas and roll the quota into later periods if there was under-harvest. It also required states to implement weekly reporting for timely quota management.

Addendum II (2010) was developed to complement Amendment 4 to the federal FMP. It revised the specifications process (sets measures for three-years) and terminology (e.g., TAC is now called ACL) to be consistent with federal management.

Addendum V (2012) compiled the previously approved spawning regulations into one document and revised the spawning sample provisions.

Addendum VI (2013) was developed to complement the NEFMC's Framework Adjustment 2 to the federal FMP. It established new provisions and consistent measures for the four management areas. States were allowed to seasonally split sub-ACLs for each management area, and up to 10% of unused sub-ACL could be carried over to the following fishing year (after data is available). Addendum VI also established new closure triggers: a directed fishery closes when 92% of an area's sub-ACL is projected to be reached, and the stock-wide fishery closes when 95% of the total ACL is projected to be reached.

Amendment 3 (2016) to the FMP consolidates prior amendments, addenda, and recent management decisions into a single document; it is now the comprehensive document for Atlantic herring management in state waters. The amendment refines the spawning closure system using a modified GSI-based spawning monitoring system. Additionally, the fixed gear set-aside is now available to fixed gear fishermen through December 31.

Addendum I to Amendment 3 was developed to stabilize the rate of catch in Area 1A and distribute the seasonal quota throughout Trimester 2 (June through September). The Addendum includes a variety of management tools which can be used by the Section, including weekly landings limits, restrictions on carrier vessels, vessel declaration requirements, and modifications to the 'days out' procedure for a variety of gear type and permit categories.

II. Status of the Stock

The most recent benchmark stock assessment for Atlantic herring was peer reviewed in August 2018 (SAW-65). The assessment found that Atlantic Herring are not overfished and overfishing is not occurring, but highlighted concerns about trends in recruitment and spawning stock biomass. Recruitment has been below the time series average for the last five years. In particular, 2016 recruitment was the lowest on record at 1.7 million fish. While recruitment has been variable throughout time, recent and continuing low levels of recruitment indicate that there will be fewer fish available to harvest in future years. Spawning stock biomass (SSB) has also been lower in recent years. In 2017, SSB was estimated at 141,473 mt, below the SSB threshold of 189,000 mt (417 million pounds). Fishing mortality has decreased in recent years, with a 2017 level of 0.45, below the fishing mortality threshold of 0.51.

III. Status of the Fishery

There is an Atlantic herring fishery in the United States and Canada. The U.S. Atlantic herring fishery is controlled by annual catch limits (ACL) set by NOAA Fisheries. The stockwide ACL is distributed among the four management areas. Specifications are set every three years and adjusted annually to account for overages or underages from the previous fishing season. Once 92% of the sub-ACL for an area is reached, the respective fishery is closed. The stockwide fishery closes when 95% of the total ACL is projected to be reached. Following a closure, there is a 2,000 lb trip limit to allow for incidental bycatch of Atlantic herring for the remainder of the fishing year. In addition to quota-based closures, the "days out" and spawning closure programs provide additional measures to control fishing effort.

For the 2016-2018 fishing season, the Council and Commission set the ACL at 231 million pounds (104,800 mt), a 2.6% decrease from the 2013-2015 fishing limits. For all three years, the ACL is further subdivided by Atlantic herring management areas as follows: Area 1A = 66.79 million pounds, Area 1B = 9.9 million pounds, Area 2 = 64.1 million pounds, and Area 3 = 90.16 million pounds. The Area 1A sub-ACL is distributed seasonally with 72.8% available from June 1-September 30 and 27.2% available from October 1-December 31. Underages from June through September may be rolled into the October through December period.

The domestic Atlantic herring fishery is predominantly commercial; recreational catch accounts for less than 1% of landings. Over the time series of 1965 to 2017, annual landings by the United States Atlantic herring fleet generally increased and averaged roughly 131.4 million pounds (59,612 mt). Landings reached the lowest level in 1983, at 51.263 million pounds (23,253 mt), and peaked in 2006 at 268.533 million pounds (121,804 mt).

Catch, in metric tons, from Area 1A is shown in Table 1. Preliminary information from 2018 indicates that 24,814 mt were caught in Area 1A, representing 89.4% of the sub-ACL. Since a directed fishery closes when 92% of an area's sub-ACL is projected to be reached, there was no closure in the Area 1A fishery in 2018.

Table 1: Area 1A catch, sub-ACL, and associated directed fishery closures from 2013-2018. Source of catch information: NOAA Fisheries Atlantic Herring Fishery Monitoring

Year	Sub-ACL (mt)	Catch (mt)	% Utilized	Sub-ACL Closure
2013	29,775	29,820	100%	Oct-15
2014	33,031	33,428	101%	Oct-26
2015	30,580	29,406	96%	Nov-2
2016	30,524	27,826	91.2%	Oct-18
2017	32,115	28,682	89.3%	NA
2018	27,743**	24,814*	89.4%	NA

*Preliminary landings data

**Adjusted August 22, 2018 from 31,962 mt to 27,743 mt

2018 Fishing Season

Based on preliminary data provided in state compliance reports, Maine and Massachusetts accounted for over 90% of the commercial Atlantic herring landings in 2018 (Table 2). Landings generally decreased across the states with the largest decreases occurring in Rhode Island (53% reduction from 2017) and New Hampshire (53% reduction from 2017). Connecticut did see noticeable increase in landings in 2017 (93%).

Table 2. 2018 commercial landings by state and percent of total harvest. 2018 landings data is considered preliminary at this time. Source: State compliance reports.

	Commercial Landings (lbs)	**Percent of Total**
ME	59,691,749	62.8%
NH	1,335,250	1.4%
MA	28,431,238	29.9%
RI	2,140,745	2.3%
CT	82,701	0.1%
NY	32,304	0.0%
NJ	3,374,027	3.5%

Table 3 outlines the 'days out' program and effort control measures which were implemented in Area 1A. Based on the accelerated landings of Area 1A quota during Trimester 2 in both 2015 and 2016, and the adoption of Addendum I, the original landing schedule for Area 1A was established at 3 days a week for vessels with a Category A permit. This was subsequently increased to 4, then 5 days as it became clear that landings were occurring at a slower pace than the two previous years. As of September 10 harvest had reached 97% of the Trimester 2 allocation, with the fishery moving to zero landings days through September 30. On October 1, a 5 days consecutive landings limit was implemented for Trimester 3. This was increased to 7 days in November once it became clear that landings were below the sub-ACL for Area 1A. Trimester 3 landings continued well into December, creating a longer season similar to 2017 (see Table 1).

Table 3: 2018 'days out' program for trimester 2 and 3 in Area 1A.

Trimester	Date Effective	Consecutive Landing Days for Category A Permit	Weekly Landings Limit for Category A Permit	Poundage that can be Transferred to a Carrier Vessel
2	June 1, 2018	4	480,000	80,000
	July 22* 2018	5	640,000	160,000
	August 22, 2018**	5	640,000	160,000
	September 10, 2018	0	0	0
3	October 1, 2018	5	NA	NA
	November 16, 2018	7	NA	NA

*Effective 6 p.m. Sunday July 22 for Maine, 12:01 a.m. Monday July 23 for New Hampshire and Massachusetts

ACL Adjusted August 22, 2018 from 31,962 mt to 27,743 mt

Spawning Area Closures

The Atlantic Herring Area 1A (inshore Gulf of Maine) fishery regulations include seasonal spawning closures for portions of state and federal waters in Eastern Maine, Western Maine and Massachusetts/New Hampshire. In 2017, the Commission's Atlantic Herring Section permanently implemented the GSI_{30} Based Forecast System for spawning closures in Area 1A. This forecasting method relies upon at least three samples, each containing at least 25 female herring in gonadal stages III-V, to trigger a spawning closure. If sufficient samples are not available, the spawning closure occurs on the default dates outlined in Amendment 3. Prior to 2017, the GSI_{30} spawning protocol had been implemented as a 1-year pilot program in 2016.

The Eastern Maine spawning area closed on the default date of August 28th through September 24th, given there were no samples from the area at the time. There was no spawning area closure for Western Maine in 2018.

For the Massachusetts/New Hampshire spawning area, closure began October 26th and continued through November 22nd, based on forecasting produced from eight samples.

IV. Status of Research and Monitoring

Under Amendment 3, states are not required to conduct fishery independent surveys for Atlantic herring. However, state survey programs designed to catch other species may encounter herring regularly, so some states do collect biological information on Atlantic herring. A summary of these surveys results follow.

Maine and New Hampshire: The states jointly operate an inshore bottom trawl survey in the spring and fall that is designed to catch groundfish, but regularly encounters Atlantic herring. In 2018, Atlantic herring catch was higher than in previous years in the spring survey but lower in than in previous years for the fall survey. In the Spring survey, Atlantic Herring were caught in 98 out of the 118 tows, and a maximum number of 16,146 were caught in one tow. In the fall survey, Atlantic Herring were caught in 64 of the 96 tows, and a maximum of 4,223 were caught in one tow.

Maine Department of Marine Resources also conducts commercial portside catch sampling. In 2018, 71 sampling events occurred, covering purse seine, mid-water trawl, and small-mesh bottom trips. The number of sampling events was a decline from 2018 levels (96).

New Hampshire Fish and Game Department also conducts a juvenile finfish seine survey in the Great Bay, its tributaries, and other coastal harbors. In 2018, 5,415 Atlantic herring were observed during the months of June and July.

In 2015, **Massachusetts** Division of Marine Fisheries and UMass-Dartmouth School for Marine Science and Technology (SMAST) applied for the 2016-2018 Atlantic herring Research Set-Aside (RSA), and were awarded the majority of RSA quota. Portside sampling and the River Herring Bycatch Avoidance program were conducted with both the midwater trawl (MWT) fishery (primarily operating out of Massachusetts ports) including both herring and mackerel trips, at 42.1% (40 of 95) by trip and 57.9% (6,033 of 10,418 mt) by weight, in 2018. Data from an additional four Northeast Fisheries Observer Program (NEFOP) trips and one Maine Department of Marine Resources portside sampled trip landed in MA were incorporated into the bycatch avoidance program. MA DMF continued to utilize its real-time reporting mechanism (laptops with custom-designed reporting software) to receive NEFOP data from captains while at-sea. This negates the need to sample these observed trips, and supplements the overall coverage levels. Thus, combined trip coverage of 47.4% was achieved in 2018

The primary goal of the River Herring Bycatch Avoidance program is to characterize the landings of vessels and advise the fleets of river herring bycatch, in an effort to minimize bycatch independent of management actions. Participating fishermen have generated over $210,000 through RSA compensation fishing since 2014, all from Herring Management Area 1A. This year

marked the final year of the 2016-2018 MA DMF and SMAST Atlantic Herring Research Set-Aside program. Over 3,000 mt of RSA quota were distributed among qualified participants, but fisheries circumstances created less demand for RSA quota than previous years. Only two companies utilized RSA quota, with only 216 of the 3,144 mt of compensation quota harvested. A total of $16,500 was generated by RSA harvest in 2018. Despite this reduced compensation, funds generated by the 2017 RSA (mainly through donations) continue to allow for high rates of sampling. Due to reduced fishery effort in 2018 there are still funds available for sampling activities. A no-cost extension was granted, thus, portside sampling and bycatch avoidance strategies will continue into 2019.

Rhode Island Division of Fish & Wildlife conducts a Seasonal Trawl Survey to develop abundance indices for Atlantic herring. Atlantic herring are mostly observed in the late fall and spring in the RIDFW seasonal trawl survey. Monitoring for 2018 suggested a decrease in the relative biomass and abundance of Atlantic herring in Rhode Island waters, a continued trend from 2017. An average of 0.24 kg/tow of Atlantic herring was observed in 2018, lower than the 1.28 kg/tow observed during 2017. Similarly, the Atlantic herring abundance index derived from the trawl data decreased from 84.65 fish/tow in 2017 to 70.13 fish/tow in 2018.

Connecticut Department of Energy and Environmental Protection monitors Atlantic herring through the Long Island Sound Trawl Survey (LISTS), which is conducted each spring and fall since 1984. The Long Island Sound Trawl Survey underwent significant changes to the collection procedure in 2018; as such, the QA/QC portion of the 2018 Survey is still underway and the finalized 2018 data is not available.

New York has *de minimis* status and does not conduct directed monitoring of Atlantic herring.

New Jersey Division of Fish and Wildlife monitors Atlantic herring through the New Jersey Ocean Trawl Survey, which collects samples during five surveys conducted throughout the year between Sandy Hook, NJ and Cape Henlopen, Delaware. In 2018, 189.76 pounds (2,320 individuals) of Atlantic Herring were caught in the ocean trawl surveys.

V. Status of Assessment Advice

The following research recommendations were included in the 2018 benchmark stock assessment.

<u>Research Recommendations from the 65th Northeast Region Stock Assessment for Atlantic Herring (2018)</u>

a. Further investigate methods for better survey coordination between the various survey programs, including survey design, timing, and standardized data formatting for easier sharing.
b. Investigate changes in dredge efficiency and saturation due to high scallop densities or high bycatch rates.

c. Analyze past juvenile scallop mortality events and develop better methods to model time-varying mortality in the assessment models.
d. Collect information needed for the management of the GOM fishery and development of appropriate reference points including biological parameters, fishery-independent surveys, and fishery-dependent data.
e. Continue development of scallop ageing methods and examination of scallop growth processes including density dependent effects.
f. Improve training of annotators used in optical surveys and develop standardized QA/QC procedures for data collected from imagery.
g. Investigate use of software for automated annotation of imagery from optical surveys.
h. Investigate methods to better estimating biomass and abundance variances from Habcam optical surveys including development of Bayesian geostatistical methods.
i. Investigate and estimate current and historical unreported landings and effects of spatially heterogeneous fishing mortality on mortality estimates.
j. Develop a spatially-explicit methodology for forecasting the abundance and distribution of sea scallops by incorporating spatial data from surveys, landings, and fleet effort (aka GEOSAMS).
k. Investigate and parameterize sub-lethal effects of disease, parasites, or discarding on mortality, growth, and landings.
l. Revive and streamline previously-developed methods for interpreting VMS data.
m. Further refine and test methods for forecasting LPUE.
n. Continued investigation of discard mortality, particularly during warm water periods, by incorporating environmental data.
o. Continue improvements of observer recordings for vessel fishing behavior including deck loading and shucking dynamics in responses to disease or poor scallop health.
p. Continue investigating the extent of incidental fishing mortality, particularly on hard bottom habitats

VI. Management Measures and Issues

Amendment 3 to the Interstate Fishery Management Plan for Atlantic Herring lists the following state regulatory requirements:

1. Each jurisdiction shall prohibit the landing of herring when the management area sub-ACL has been attained.
2. Vessels are prohibited from landing more than 2,000 lbs. of Atlantic herring from Area 1A when the fishery is closed, during a 'day out' or during spawning closures.
3. Jurisdictions will close the directed fishery when 92% of a management area's sub-ACL is projected to be harvested.
4. Each jurisdiction must enact spawning area restrictions that are at least as restrictive as those in Section 4.2.6.
5. States adjacent to Area 1A will implement days out restrictions as identified in Section 4.2.4.1.
6. States are required to implement weekly reporting by all non-federally permitted fishermen on Atlantic herring (including mobile and fixed gear).
7. Any herring vessel transiting a management area that is under a herring spawning closure or a 'day out' must have all of its fishing gear stowed.

8. The harvest of herring for the primary purpose of reduction to meal or meal-like product is prohibited.
9. Internal Water Processing operations will be prohibited from processing herring caught in all state waters.

VII. PRT Recommendations

State Compliance

All states with a declared interest in the management of Atlantic herring have submitted compliance reports and have regulations in place that meet or exceed the requirements of the Interstate Fisheries Management Plan for Atlantic herring as described in Amendment 3.

Request for *De Minimis* Status

A state may be eligible for *de minimis* status if its combined average of the last three years of commercial landings (by weight) constitute less than one percent of the coastwide commercial landings for the same three-year period.

New York has requested and met the requirements for *de minimis* status in 2018. The state's 2016-2018 combined average commercial landings (64,779 pounds) is less than 1% of coastwide commercial landings during the same three year period.

Research and Monitoring Recommendations

In addition to the research recommendations outlined in the 2018 stock assessment, the PDT also recommends the following research priorities.

<u>Fishery-Dependent Priorities</u>

High

- Investigate bycatch and discards in the directed herring fishery through both at sea and portside sampling.
- Continue commercial catch sampling of Atlantic herring fisheries according to ACCSP protocols

<u>Fishery-Independent Priorities</u>

High

- Expand monitoring of spawning components.

Low

- Continue to utilize the inshore and offshore hydroacoustic and trawl surveys to provide a fishery-independent estimation of stock sizes. Collaborative work between NMFS, DFO, state agencies, and the herring industry on acoustic surveys for herring should continue to be encouraged.

<u>Modeling / Quantitative Priorities</u>

Moderate

- Conduct simulation studies to evaluate ways in which various time series can be evaluated and folded into the assessment model.
- Develop new approaches to estimating recruitment (i.e., juvenile abundance) from fishery-independent data.
- Examine the possible effects of density dependence (e.g., reduced growth rates at high population size) on parameter estimates used in assessments.

Low

- Conduct a retrospective analysis of herring larval and assessment data to determine the role larval data plays in anticipating stock collapse and as a tuning index in the age structured assessment.
- Investigate the M rate assumed for all ages, the use of CPUE tuning indices, and the use of NEFSC fall bottom trawl survey tuning indices in the analytical assessment of herring.

Life History, Biological, and Habitat Priorities

Moderate

- Continue tagging and morphometric studies to explore uncertainties in stock structure and the impacts of harvest mortality on different components of the stock. Although tagging studies may be problematic for assessing survivorship for a species like herring, they may be helpful in identifying the stock components and the proportion of these components taken in the fishery on a seasonal basis.

Low

- Research depth preferences of herring.

Management, Law Enforcement, and Socioeconomic Priorities

High

- Continue to organize annual US-Canadian workshops to coordinate stock assessment activities and optimize cooperation in management approaches between the two countries.

Moderate

- Develop a strategy for assessing individual spawning components to better manage heavily exploited portion(s) of the stock complex, particularly the Gulf of Maine inshore spawning component.
- Develop socioeconomic analyses appropriate to the determination of optimum yield.

Low

- Develop economic analyses necessary to evaluate the costs and benefits associated with different segments of the industry.

XI. Figures

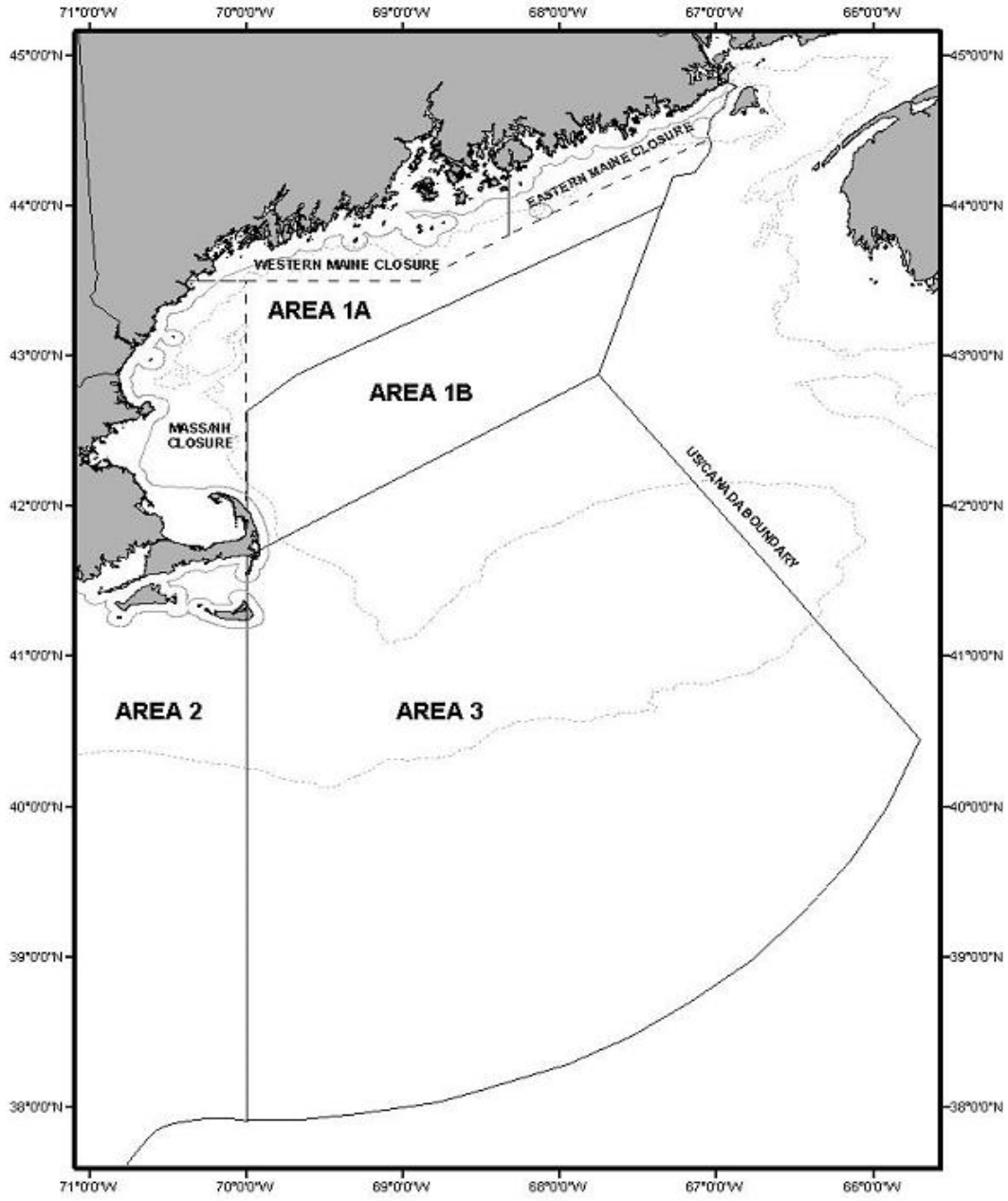


Figure 1. Map of Atlantic herring management areas with boundaries and the three spawning areas are within Area 1A, the inshore region of Gulf of Maine.

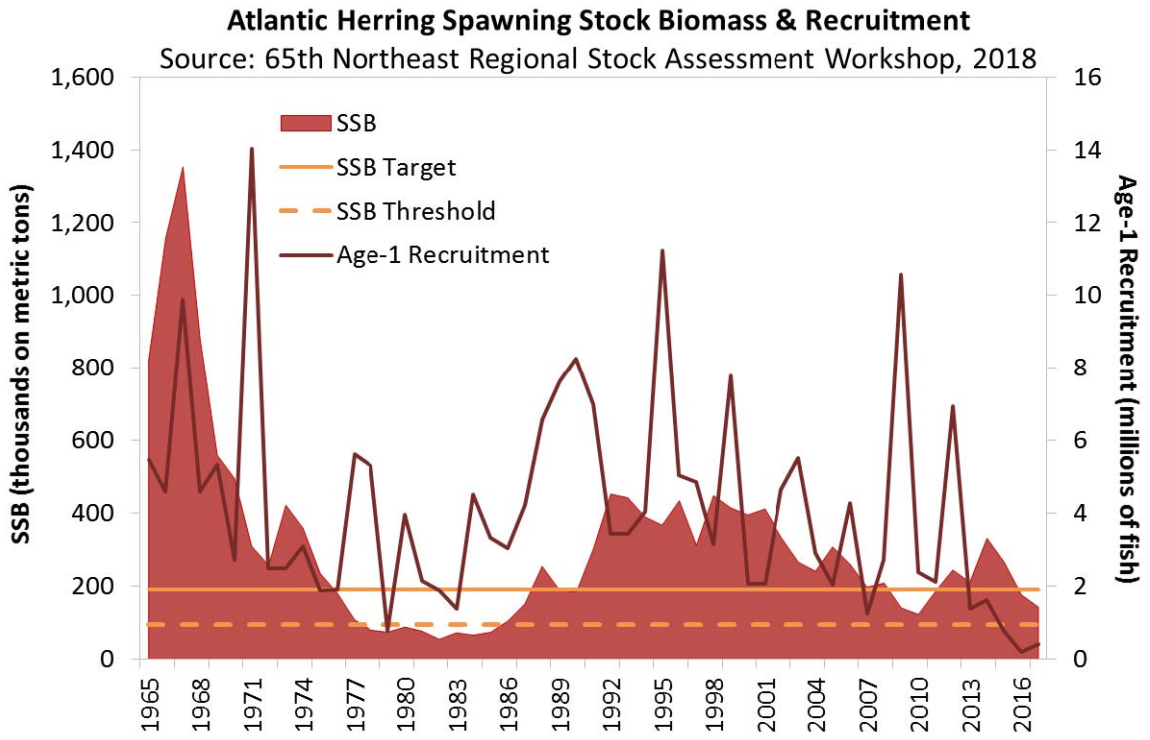


Figure 2. Spawning stock biomass from 1965 to 2017.

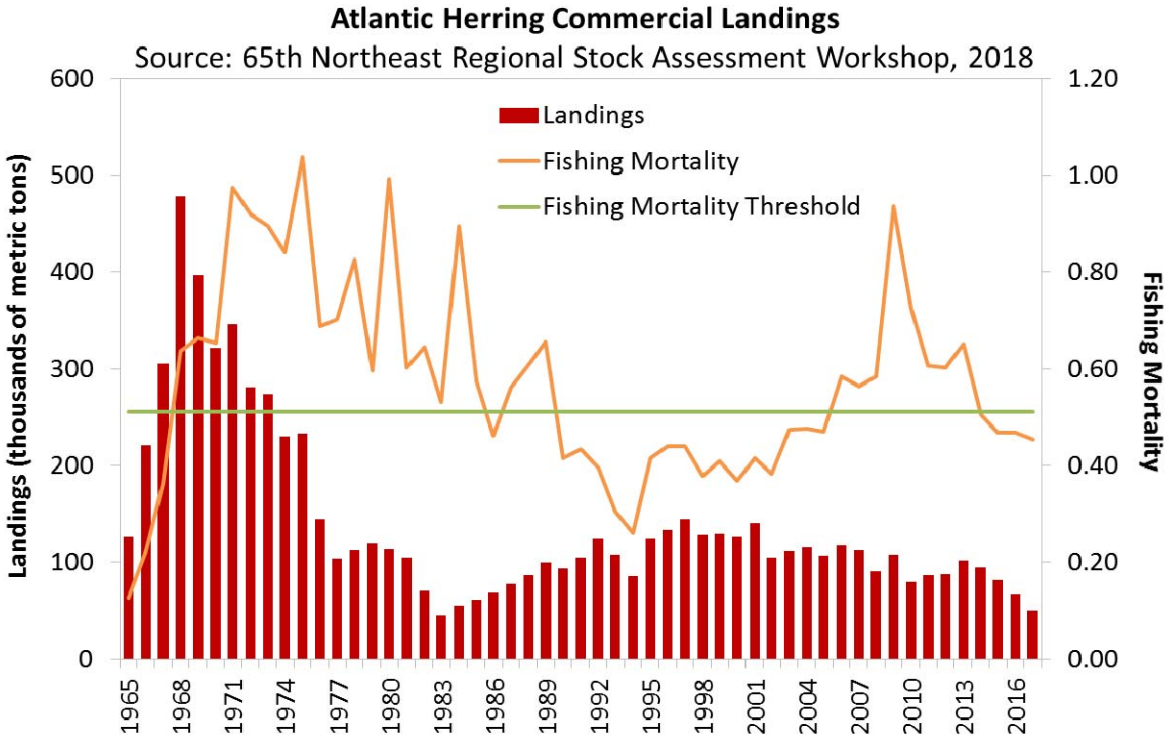


Figure 3. Commercial Atlantic herring landings by the U.S. fleet from 1965-2017