Atlantic States Marine Fisheries Commission

Atlantic Herring Section

February 19, 2013
1:00-2:30 p.m.
Alexandria, 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 (*D. Pierce)*	1:00 p.m.
2.	Section Consent • Approval of Agenda • Approval of Proceedings from October 2012	1:00 p.m.
3.	Public Comment	1:05 p.m.
4.	Update on New England Fishery Management Council Action (*L. Steele*) • NEFMC Framework Adjustment 2 to the Herring FMP • 2013-2015 Atlantic Herring Specifications	1:15 p.m.
5.	Set 2013-2015 Atlantic Herring Specifications *(T. Kerns)* **Action**	1:45 p.m.
6.	Other Business/Adjourn	2:30 p.m.

The meeting will be held at the Crowne Plaza Hotel, 901 North Fairfax Street, Alexandria, Virginia; 703-683-6000

MEETING OVERVIEW

Atlantic Herring Section Meeting
Tuesday, February 19, 2013
1:00-2:30 p.m.
Alexandria, Virginia

Chair: David Pierce (MA) Assumed Chairmanship: 08/11	Technical Committee Chair: Renee Zobel	Law Enforcement Committee Representative: Marston/Fessenden
Vice Chair: Terry Stockewell (ME)	Advisory Panel Chair: Jeff Kaelin	Previous Section Meeting: October 22, 2012
Voting Members: ME, NH, MA, RI, CT, NY, NJ (7 votes)		

2. Section Consent

- Approval of Agenda
- Approval of Proceeding from October 22, 2012

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 Section 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 Section Chair may allow limited opportunity for comment. The Section Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Update on NEFMC Action (1:15-1:45 p.m.)

Background

- The NEFMC met on January 29, 2013. The Council took action on Framework 2 to the Atlantic Herring FMP and set specifications for 2013-2015 (**Briefing CD**)
- The Framwork modifies the specifications process to allow for seasonal (monthly) quota splitting; authorizes carryover of un-utilized quota (sub-ACL, up to 10%) in each herring management area; and establishes the policy (details of the provisions will be analyzed in the specifications packages, every three years)

Presentations

- Lori Steele will present the NEFMC actions

5. Set 2013-2015 Atlantic Herring Specifications (4:10-5:10 p.m.) Final Action
Background • FMP specifies that Section will set specifications for 1 to 3 years. • The NEFMC recommended an ABC = 114,000 for 2013-2015 with an US OY/ACL=107,800 mt, Area 1A ACL = 31,200 mt (295 mt fixed gear set aside), Area 1B ACL = 4,600 mt, Area 2 TAC = 30,000 mt, and Area 3 ACL = 42,000 mt
Presentations • Staff will present the NEFMC Specification recommendations.
Section actions for consideration • Consider 2013+ Atlantic herring Specifications

6. Other Business/Adjourn

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC HERRING SECTION

Crowne Plaza Hotel - Old Town
Alexandria, Virginia
February 7, 2012

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

TABLE OF CONTENTS

INDEX OF MOTIONS

ATTENDANCE

Board Members

Pat Keliher, ME (AA)
Terry Stockwell, ME, Administrative proxy
Steven Train, ME (GA)
Sen. Brian Langley, ME (LA)
Doug Grout, NH (AA)
G. Ritchie White, NH (GA)
Rep. Dennis Abbott, NH, proxy for Rep. Watters (LA)
David Pierce, MA, proxy for P. Diodati (AA)
William Adler, MA (GA)
Rep. Sarah Peake, MA (LA)
Bill McElroy, RI (GA)
Rick Bellavance, RI, proxy for Rep. Martin (LA)
Dave Simpson, CT (AA)
Rep. Craig Miner, CT (LA)
Pat Augustine, NY (GA)
James Gilmore, NY (AA)
Brian Culhane, NY, proxy for Sen. Johnson (LA)
Peter Himchak, NJ, proxy for D. Chanda (AA)
Tom Fote, NJ (GA)
Tom O'Connell, MD (AA)

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

Ex-Officio Members

Matt Cieri, Technical Committee Chair
Jeff Marston, Law Enforcement Committee

Staff

Vince O'Shea
Robert Beal
Chris Vonderweidt
Danielle Chesky

Guests

Charles Lynch, NOAA
Steve Meyers, NOAA
Peter Burns, NOAA
Bob Ross, NMFS
Russ Allen, NJ DFW
Wilson Laney, USFWS
Dave Ellenton, Cape Seafoods
Mary Beth Tooley, Camden, ME
Steve Weiner, CHOIR
Raymond Kane, CHOIR
Pam Gromen, NCMC
Patrick Paquette, MSBA/RFA
Janice Plante, Commercial Fisheries News
Kristen Cevoli, Herring Alliance
Greg Wells, PEW Environmental Grp
Theresa Labriola, PEW Environmental Grp
Tom Rudolph, PEW Environmental Grp
Roger Fleming, Earthjustice

The Atlantic Herring Section of the Atlantic States Marine Fisheries Commission convened in the Presidential Ballroom of the Crowne Plaza Hotel, Alexandria, Virginia, February 7, 2012, and was called to order at 2:20 o'clock p.m. by Chairman David Pierce.

CALL TO ORDER

CHAIRMAN DAVID PIERCE: I call our meeting to order and welcome everyone. I've got a question for section members sitting at the table and for those in the audience who are still slowly getting ready to take their seats; was anyone here at the River Herring Board Meeting this morning? Everyone was at that meeting, so you've heard the discussions relative to actions that were not taken at that particular meeting and the strategy that was developed to move forward for further discussions on the amendment as it relates to river herring. All right, that will save some time.

APPROVAL OF AGENDA

You have the agenda before you. Unless someone has a suggested change to the agenda, I will adopt it by consent. Okay, I see no one raising their hand, so we will adopt the agenda as it appears before you. I should note that there was a request early on from someone in the audience that we actually move the technical committee review of spawning regulations up on the agenda, but I've decided to keep the agenda as is, and, of course, no one here has suggested any different arrangement of the agenda items.

APPROVAL OF PROCEEDINGS

Approval of proceedings of November 7, 2011; I assume everyone has had a chance to review those proceedings. Do I have a motion to approve them? Okay, Bill Adler has moved approval of the minutes and seconded by Bill McElroy. The motion is approved; the minutes of our November 7th meeting are approved.

PUBLIC COMMENT

All right, as always we provide an opportunity for the public to comment on any issue that relates to management of sea herring by ASMFC items of interest to us that are not on the agenda that you have before you. Is there anyone in the audience who would care to comment on any aspect of ASMFC business relative to sea herring that is not on the agenda? All right, I see no one raising their hands; therefore, we will go on to the next agenda item, and that is update of 2010 final landings. We turn to Chris for that update.

UPDATE OF 2010 FINAL LANDINGS

MR. CHRISTOPHER VONDERWEIDT: This is really just an FYI. There is a proposed rule that was distributed to the section and essentially it proposes that overages from the 2010 fishing season – they were tallied in late 2011 by comparing VTR reports to dealer reports, and in Area 1A there was an overage and in Area 1B there was an overage. We're talking about 2010.

However, the language is that it will be applied to the fishing year after the final catch is tallied. After that has all been said and done, there is a table up there. The Area 1A Sub ACL was initially 26,546 metric tons. It will be reduced by 1,878 metric tons to 24,668. 1B would be reduced by 1,638 to 2,724 metric tons, which is a more significant amount of the total quota. If you read through the proposed rule, you would have noticed that the methodology that they used to calculate the harvest was reviewed by the New England Fishery Management Council Plan Development Team, which has a lot of overlap with ASMFC groups.

Matt is on that group, Steve Correira from Massachusetts DMF, myself. They adopted the recommendations from that group when calculating the final harvest. It has gone through the scientific rigor. I talked to NMFS staff last week and they said that the final rule is expected to be published in the near future, so we'll probably see that soon.

This is just essentially a heads-up that these quotas will be reduced. If you look at our plan, Addendum II was developed jointly with the council's Amendment 4, and it is consistent with the proposed rule that once the final total catch for a fishing year is determined, during the subsequent fishing year, using the best available information, the ACL Sub ACL overage would result in a reduction the following fishing year for that ACL Sub ACL equal to the amount that was exceeded. Our plan is in line with that so we would also have the same Sub ACL.

CHAIRMAN PIERCE: All right, thank you, Chris, for that summary as to the nature of the overages and what we can expect the Service to do. Addendum II, as noted in our meeting overview, specifies how the section will deal with any overages, so it's prescribed for us. Any questions of Chris? Bill.

MR. WILLIAM A. ADLER: Mr. Chairman, I assume there are no underage allowances in the plan, of course. The question I had to do with is what is the latest on 1B right now? It sounds like it was they're almost halfway there already.

DR. MATT CIERI: Current landings as reported – and I'm pulling this directly from the NMFS Website – is 2,932; 67 percent. In fact, once this is implement, 1B will be over again.

MR. ADLER: That is just what I was going to say because your quota is 2,700 for 2012 and you're saying basically we're already going to be over it?

DR. CIERI: Correct.

DISCUSSION OF NEFMC AMENDMENT 5

CHAIRMAN PIERCE: Further questions of Chris? All right, I see none. The next item on the agenda is the council's Amendment 5. The agenda says select preferred alternatives in Amendment 5. Lori Steele, council staffer, who has done all the work or most of the work, anyway, the lion's share of the work on Amendment 5 for the council will be giving us a presentation describing some specifics.

If you recall, Lori gave us a presentation at our Boston meeting. This presentation will differ from the one she gave in Boston, and I'll ask her to elaborate in a bit. Before I do that, I'm going to suggest to the section that in light of the discussions we all heard and some of us participated in earlier this morning on river herring as it relates to Amendment 5, that we follow the same procedure that was adopted by the River Herring Board.

And that is public hearings have not been held. We don't have a final document yet from the National Marine Fisheries Service. They're still working on what was submitted to them by Lori and the rest of the council staff; Lori specifically, I suppose. Lori is preparing a public hearing document that will be available before the end of February, so I would suggest to the section – and we don't have to decide it at this moment, but I want to at least give you some feel for where I'm going.

I think it makes sense for us to have a subgroup of the section similar to a subgroup that has been formed for the River Herring Board. That subgroup would work on comments to provide to the section, and that would enable us to provide comments on Amendment 5 before the council meeting is held.

It would make sense, I suspect, for those individuals who volunteered to be on River Herring Board to perhaps also volunteer to be on this particular section subgroup, but we'll deal with that after Lori gives her presentation. We also have to discuss the strategy that we should adopt relative to getting advisors' input to us on the comments we would choose to submit to the council on Amendment 5.

That's my suggested course of action as opposed to our actually taking the time today to select preferred alternatives in the Amendment 5 Document. I don't believe we're in a position to do that. None of us have the full document. Yes, we have the earlier document, but still it seems a bit premature. With that said, I'll turn to Lori and – yes, Terry.

MR. TERRY STOCKWELL: Mr. Chairman, I concur with your approach. I will volunteer to be on the working group. Actually my request to Lori is that seeing as this Herring Section was also here before lunch, that if you could just highlight the different pages so we could focus on what is new I guess is a more concise way of saying it.

CHAIRMAN PIERCE: Well, let's address it right now. Does the section agree with that approach that I've just described for you? The only thing I would like to do is to have some additional discussion as to how we will deal with input from the advisors and from those who obviously will be impacted by whatever the second decides to offer up as comments on these different alternatives. I see no opposition to the approach so we will proceed in that direction.

I turn to you now, Lori, and I ask that for the benefit of the section it would be very helpful if you would right away highlight the differences between this presentation and the one you gave in Boston. That way everyone will be alert and attentive to the specifics that you offer up that we all need to focus on today, of course, but certainly as we move forward and get closer to the time when public hearings are held.

I would assume that many of us would actually attend those hearings and submit comments on our own on behalf of our own state or organization, but that's a different matter. We, the section, will obviously have to take a position, too. So if you would, Lori, highlight the differences between then and now.

MS. LORI STEELE: When I came in November to the meeting in Boston, I just gave a general presentation on the amendment. The council had just approved the management alternatives and I was in

the process of developing the Draft EIS. Today, because we had the benefit of doing a river herring presentation this morning, I spent a lot more time this morning on the details of the river herring measures, and now this presentation is going to focus more on a lot of the details of the measures. I think the November presentation was much more conceptual. I'm not going to go over the river herring measures again.

For those of you who were at the presentation this morning – and I'll get into it in just a minute – we had circle and I sort of focused on the lower left quadrant, the green part, that was all the measures to address river herring bycatch. I'm going to cover all three of the other sections of that circle in this presentation. David, would you like me just to right ahead?

CHAIRMAN PIERCE: Before you do, I want to highlight another document that is available that was prepared with a lot of involvement of council staff. I believe it was Pat Fiorelli working with you, obviously, Lori. This is an insert into the Commercial Fisheries News, special supplement. This is the February issue of the News.

There is a well-done, easily understood description of what is being prepared for public hearings; that is, the specifics of this amendment, well-done, easy to understand relatively speaking. Certainly it was written with fishermen in mind so that they would have a better understanding as to what exactly is being offered up as proposed alternatives for this amendment. I would encourage all of you who would like to have an additional source of information regarding what is being proposed to take a look at this special supplement because it again is a job well done. Okay, Lori, if you will.

MS. STEELE: Okay, thank you, and actually thank you for reminding me of that supplement. All of the section members should have a copy of that on your CD. I think that Chris was able to scan it for everybody, and it is in this month's Commercial Fisheries News. It's a really good summary of everything that we'll be taking to public hearings.

Very generally again, this is all part of the Draft Amendment 5 EIS, which the formal draft was just submitted to NMFS in late January. We are hopeful that we will hear very soon that the draft is moving through the process so that we can begin our 45-day comment period. We're anticipating a comment period during late February and March with public hearings in March.

If we can stick to this timeline and if the document doesn't get held up, the council will be making final decisions at the April council meeting. We're trying to get this amendment completed and submitted so that the new measures for catch monitoring can be implemented at the start of the fishing year with the new specifications on January 1, 2013.

Goals and objectives; again, I won't go through these in detail since most of you were here this morning, but the overall purpose of this amendment is to develop a comprehensive catch monitoring program for the herring fishery and to address bycatch to the extent possible. Beyond the regular goals and objectives of the amendment, the overall goals and objectives of the amendment, the council did identify some specific goals for the catch monitoring program that is developed in Amendment 5.

I put these on the screen since we're focusing this afternoon more on the catch monitoring program, and you'll see next to these goals there are little symbols. They're a little hard to see on the screen, but there is a star, a circle, a square and a triangle. Those are for each of the four goals in the catch monitoring program; and as you follow some of these tables and illustrations that we've put together, you'll see these symbols next to a lot of the management measures. It's just a key that you can see which goals the management measures are designed to address. Essentially the council's main goal is to create a cost-effective and administratively feasible catch monitoring program to obtain accurate and timely records of catch of all species in the herring fishery; and beyond that we have several other goals that we have identified.

The measures that are proposed in the document have been evaluated relative to the goals and objectives of the catch monitoring program. As I mentioned before, the measures and the alternatives in Amendment 5 can essentially be grouped into four categories; changes to the fishery management program, which we'll go into in a minute; measures to address catch monitoring at sea; measures to address river herring bycatch; and measures to establish criteria for midwater trawl vessels to access the year-round groundfish closed areas.

This is the visual sort of graphic representation of the Amendment 5 alternatives. The presentation this morning was the lower left, which were the measures to address river herring bycatch, recognizing that there are measures to address river herring bycatch in all of the other elements of this amendment as well,

but I'm going to go ahead and try to spend a little more time now on the pink, the blue and the orange.

Starting with the blue, which is all of our fishery management program adjustments, this is Section 3.1 of the document. These tables just provide you with the general description of all the options that are being considered. We're considering changes to some regulatory definitions, defining what a transfer at sea is and defining what an offload is.

We're also considering some general provisions to eliminate the VMS power-down on limited access vessels, establish a new permit for carrier vessels that sell fish at sea. We're trying to get a much better handle in this amendment on the transfer activities that may be occurring at sea and the utilization of carrier vessels in the fishery.

Carrier vessels, if they're buying or selling fish at sea, are dealers and it's not clear – we're trying to clarify some of the regulations and give them their own permit so that we can make sure to get reporting cleaned up a little bit. We also have some measures in here to address carrier vessels and provide some flexibility for vessels that do participating in carrying activities.

Moving on to the next slide, again these are the adjustments to the fishery management program. A couple of options are being considered to limit transfers at sea. Option 2 would only allow transfers to occur between A and B vessels. That's only about 40 vessels in the fishery, and those are the limited access directed fishery vessels.

The other option would just require that you have some sort of herring permit in order to transfer and receive herring as sea. This means under Option 3 that anybody who is going to transfer at sea has to go get a permit and then be subject to all of the reporting requirements associated with that permit, so that's something to consider for lobster vessels, recreational vessels, other vessels that would then be required to, for example, report through VTRs and everything else that's associated with the federal permit.

We're considering notification requirements. Right now some vessels are required to call pre-trip and notify NMFS to potentially have an observer put on the boat. We are proposing in this amendment to require all limited access herring vessels to comply with pre-trip and pre-landing notification requirements. This is to facilitate the deployment of observers on herring vessels and to make sure that we're actually covering the boats that we want to be covering in this fishery when they're fishing for herring.

We're also considering several options that I mentioned this morning to require dealers to accurately weigh all of their fish. In the last part of this section we're considering some changes to the open access provisions in Areas 2 and 3 for limited access mackerel vessels. This would be a new permit category. This I guess would be a Category E permit and it would be available to any limited access mackerel vessels that did not quality for a limited access herring permit.

Right now if you're a limited access mackerel vessel and you didn't qualify for a limited access herring permit, you're limited to three tons under the open access permit, so we're considering options just for these vessels that would increase their allowance to either 10,000 pounds or 20,000 pounds. This is in an effort to try to minimize regulatory discarding of herring when vessels are fishing for mackerel.

In the document – and I know this is probably little hard to read on the screen. Hopefully, you can see it on the pages – are some summary tables that summarize the impacts of the measures that are under consideration relative to the valued ecosystem components that we have identified in this amendment.

You'll notice, as you go through the document and the impact analysis, that each measure and each option is analyzed for its impacts on Atlantic herring, which is the first VEC. Non-target species in other fisheries is the second VEC. Non-target species in other fisheries includes bycatch in general as well as river herring, mackerel and groundfish. Those are the three other fisheries that we have identified as sort of being important for the impact analysis.

The third VEC is essential fish habitat and the fourth VEC is protected resources and the fifth VEC is fishery-related businesses and communities or the herring fishery. As you can see in the table here, we've gone through – and for the fishery management plan adjustments, the things that I just talked about, these are not things with huge impacts. These are mostly administrative largely, anyway.

A lot of them provide more flexibility for carrier vessels and things like that, so you don't see a whole bunch of significant impacts here. There are some estimates provided on how much a vessel monitoring system would be for boats that don't have one if they want to carry fish, but for the most part the measures

in the fishery management program section doesn't have a whole lot of significant impacts.

They should, however, help to streamline the catch monitoring program and improve monitoring and reporting. This is just a continuation of that same slide. I'm going to go ahead and move into the next section of the document, which is the catch monitoring at sea. This is probably the more complicated section of the document, and this includes the alternatives that are under consideration to allocate observer coverage on limited access herring vessels.

I went through these this morning because they do address river herring and the need to sample for river herring bycatch. I'm not going to go into too much detail, but there are four elements to each of these alternatives; one being what the priorities for allocating coverage are; two being what the process is; three being what the options for funding are; and four being what the provisions are for service providers should there be a need for additional service providers beyond the Science Center's Observer Program.

This is the same slide I had this morning that summarizes the four observer allocation alternatives. The first alternative is status quo, no action alternative. The second alternative would require a hundred percent observer coverage on Category A, B and C vessels anytime that they are on a declared herring trip.

The third alternative would require that the current SBRM process, whatever coverage levels come out of the current SBRM process, would be minimums for this fishery. It would essentially prohibit the council from having the ability to shift days out of the herring fishery and reprioritize them into another fishery because of lack of funds or something like that. It requires under this alternative that SBRM be mandated as a minimum so there wouldn't be any allowances for days to be shifted away.

The fourth alternative would allocate observer coverage based on a new set of priorities identified by the council. These priorities included obtaining a 30 percent CV, coefficient of variation or a precision estimate; a 30 percent CV for estimates of catch of herring and haddock as well as a 20 percent CV, which is a more precise estimate, for the estimate of bycatch of river herring.

This fourth alternative actually identifies river herring as a priority for allocating coverage and requires that we target a more precise estimate of bycatch than the standard sort of 30 percent CV that's used in the SBRM process. The other elements of the catch monitoring at-sea section of document include measures to maximize sampling and address net slippage.

I went through these this morning as well, but there are several measures in the document to enhance sampling by observers and several measures in the document are options in the document for requirements if there are slippage events in the fishery. I'm going to go ahead and flip right to this slide so I can go into them in a little bit more detail than the last slide.

This is Section 3.2.2 of the document; and in terms of the additional measures to improve sampling, as I mentioned the options under consideration include things like requirements for a safe sampling station, requirements to provide the observer with reasonable assistance to carry out their duties, requirements for notification when pumping starts and stops, a requirement if there is a multiple-vessel operation that observers be put on any vessel taking on fish, requirements for additional communication between pair trawl vessels and a requirement that the vessel operator provide the observer with visual access to the cod end after pumping has ended.

Regarding slippage, the options under consideration include requiring a released catch affidavit for slippage events any time the observer is on board, and that would be with pictures. Another option is to implement the Closed Area 1 sampling provisions throughout the entire fishery whenever there is an observer on board.

These provisions require that all fish be at least pumped across the deck for sampling and do not allow discarding prior to fish being sampled by the observer except for under very specific circumstances. And then another option being considered with several suboptions is a provision that would actually apply a catch deduction to the herring quota in the area if a slippage event occurs; and then a couple of the suboptions, as you see, after a certain number of events occur there would be a trip termination requirement as well.

These are again only on trips where there is an observer on board, and the observer coverage would be determined by one of those four alternatives to allocate observer coverage on the limited access vessels. Again, we have some summary tables that

go VEC by VEC in the document and talk about what the impacts are.

The impact analysis is very extensive in the document and it's somewhat hard to sort of read it and get just a sort of general idea of what the impact is, so we've tried to put these tables together. These are the alternatives here on this slide to allocate observer coverage in the fishery. Some of the alternatives to allocate observer coverage are likely to have significant impacts.

Again, we're talking about the limited access fishery so this is about a hundred vessels; Categories A, B and C. You can see obviously requiring a hundred percent observer coverage on the vessels is going to have a pretty high negative impact on the businesses. A lot of it depends on how much of the observer coverage is funded federally and how much would have to come from other funding sources.

Really, the only option in the document besides federal funding is that the industry would fund the additional observer coverage. Under Alternative 2 for a hundred percent coverage and under Alternative 4, it's very likely that those two alternatives would require observer coverage at levels that are going to be greater than what federal funds are going to support and even possibly under Alternative 3.

But, it's likely that the council, if any of these alternatives are selected, the council is going to have to make some decisions about how an industry-funded observer program would be constructed to sort of go into effect with this amendment. On this slide is a summary of the impacts of the measures to improve sampling and some of the measures to address net slippage.

Again, these are not big impact measures requiring communication between pair trawl vessels, requiring the vessel operators help an observer. These are not things that are going to have huge impacts, but collectively are likely to enhance sampling in the fishery. Some of the measures to address net slippage on the other hand are a little bit more substantial in terms of their potential impact, and that's both on things like bycatch as well as on the participants in the fishery.

The Closed Area 1 sampling provisions here at the bottom of the table in Option 3 are likely to have a positive impact in terms of bycatch in other fisheries because you're ensuring that everything that is caught will at least be observed or sampled when the observer is on board. And potentially some negative impacts on the fleet in terms of bringing operational discards on board.

We have no idea, we have no experience with this measure on purse seine vessels. This measure is in place in Closed Area 1 right now, which is on Georges Bank, and it is only applicable to midwater trawl vessels. This measure is proposed across the fishery, but there may be some logistical issues with the purse seine vessels that we're going to have to deal with.

The next slide here is a continuation of the measures to address net slippage. At the bottom you'll see that the bottom row here talks about an alternative for a maximized retention experimental fishery. Maximized retention was considered as a possible approach in Amendment 5 for ensuring a more comprehensive catch monitoring program, but we ran into a lot of problems in terms of trying to implement a maximized retention program across the entire fishery in this amendment.

What is in there now is an alternative that would allow NMFS to conduct an experimental fishery in the first four or five years under Amendment 5 to determine whether or not maximized retention is something that should be considered across the herring fishery. Through that experimental fishery we would try to figure out what the challenges would be for implementing maximized retention across the fishery.

We can't do it in Amendment 5 but there is a mechanism to consider it in the future that it could be established in Amendment 5. I'm not going to go through the measures to address river herring bycatch. I went through those this morning. I'm just acknowledging them here as another major component of this plan.

This figure here just sort of gives you a visual representation of the alternatives under consideration. We're looking at setting up areas for monitoring bycatch potential avoidance areas, and there is another alternative that sets up protection areas, which would be bimonthly closed areas for river herring protection.

Hopefully, everybody already heard all that this morning. I certainly can come back and answer any questions if anybody has any. And then the last element of this amendment that we're considering is criteria for midwater trawl access to groundfish year-round closed areas. This is Section 3.4 of the document.

There are five alternatives under consideration. They range from no action all the way to closing the areas entirely to midwater trawling. Right now midwater trawls are allowed into all of the year-round groundfish closed areas with some additional sampling provisions in Closed Area 1 and also with haddock catch cap in the multispecies incidental catch allowance.

These alternatives are being considered to potentially apply criteria beyond just Closed Area 1 into any of the other closed areas. Similar to the river herring areas, things that are being considered include a hundred percent observer coverage and applying the Closed Area 1 sampling provisions.

Here is a map of the year-round groundfish closed areas. In the solid orange shading, those are essentially the area that we're looking at here for midwater trawl access. Again, we have a summary table. There is not really a lot here on the midwater trawl access to the closed area issue. There isn't a lot of information to suggest that there is a significant bycatch problem.

The vast majority of the bycatch that we've seen on midwater trawl vessels, groundfish bycatch has been haddock, and it is being controlled through a catch cap now. In general, for the most part this is largely a policy call for the council as to whether or not they want to make some policy decisions about midwater trawl fishing in the groundfish closed areas. There is not a lot here that has significant impacts; although closing these areas completely to the herring fishery is obviously going to have some significant impacts.

One thing that has not been fully determined yet is which permit categories all of these measures are going to apply to. For the most part the catch monitoring measures, the allocation of observer coverage, the measures to address net slippage are all intended to apply to the limited access fishery. That's Categories A, B and C. That's about a hundred vessels. They catch 99.5 percent of the herring.

Category D vessels, that's our open access fleet, there are over 2,200 vessels and they catch very little; less than 1 percent of the total herring landings in a year. The council may apply some of the measures in the amendment to just the limited access fleet. They may decide to go A, B, C and D on some of them. The council stills retains the ability just apply measures to the A and B fleet.

There is some analysis in the document about cost differences and the impacts and the different impacts by vessel permit category, but for the most part the catch monitoring program is intended to apply to the limited access fleet. The river herring measures may apply to both limited access and open access.

The council will be seeking public comment during the comment period on which permit categories any of the measures should apply to. I'm not going to go into all of these other slides in the interest of time, but I did put some information in here just for your reference about the different permit categories and what kind of gears these boats are using and how much they contribute to the landings.

Hopefully you can see the first chunk of rows in this table represent the Category A vessels. These are the 42 vessels that have access to all management areas, and the Category A vessels are essentially landing 98 percent of the herring. Category B is in there, too. There are only four Category B vessels and we can't even really report them separately because I think in one year there is only three. Category C lands about 1 percent and Category D again less than 1 percent.

This is just a couple of tables that summarize landings recently; and since we just discussed the 2010 landings I won't go into that. Again, here I've just provided some information by permit category and by management area so you get a sense of what boats are really sort of participating most in this fishery. Again you're really looking at Category A and B when you're talking the vast majority of the fishery.

In terms of the impacts, there is a lot of information in the document about impacts. I don't want to get too into it because there is a lot of information, but you'll see some things in the document that look at the impacts of the alternatives to allocate observer coverage. Again, those are probably from an industry impact perspective going to be one of the more significant things in this amendment.

The impacts will depend largely on how much can be funded federally and how much will remain to be funded by the industry. We took a look at what the cost of an observer is and in general it's about $1,200 a day. There is information in the document that breaks down what that $1,200 is.

Essentially given the way this fishery operates and the level of sampling that is required in this fishery, the assumption is that if we're going to go hire a service provider to sample this fishery we want that

service provider to sample it consistent with the way that the Science Center observers sample it so that we get information that's consistent and we have data that is actually comparable.

We want to supplement the observer data and not create addition data that's not comparable. Under that assumption, with all of the training that is required and the subsampling methodology that has to be learned for this fishery, species identification training and everything else, you're looking at about $1,200 a day whether you're using a Science Center observer or a service provider.

Based on that, we looked at vessel operating costs and revenues per day, and we looked at what the costs of an observer would be as a percentage of the daily revenues and the daily operating costs, and you're looking on the order of 6 to 10 percent for the midwater trawl and purse seine fleet; 6 to 10 percent of the daily revenues for putting an observer on the boat.

The bottom trawl numbers are a little bit skewed because bottom trawl vessels do a lot more than just fish for herring and actually their contribution to the herring revenues and herring landings is a lot smaller. Just to kind of move through this, one of the other things that we looked at is general costs.

A hundred percent observer coverage, you're looking at for the Category A and B fleet, based on how many days they fished in 2007, 2008 and 2009, you're looking at around $2 million or so for a hundred percent coverage. And then Category C is where things start to get a little bit more confusing because Category C is an incidental catch category, but it is a limited access category. They fish on a lot of other things other than herring.

If you only look at the Category C days where herring was landed, you're looking at maybe an extra $115,000 cost, but this bottom table here shows how many days you're looking for the Category C fleet if you're actually going to do it across the whole fleet and all of the trips they take. In 2009 the Category C fleet landed herring on 96 days. In 2009 the Category C fleet fished 6,005 days.

So, multiply that out by $1,200 a day and it makes a huge difference in terms of an industry-funded observer program. Again, we're talking about the Atlantic herring fishery, so we need to make sure if we're going to develop regulatory requirements for the herring fishery that we're actually imposing those requirements on vessels that are fishing for herring.

Okay, this is part of the analysis of the impacts of the observer coverage alternatives, and it's really complicated. There is a very detailed technical analysis in the document that shows as to how we would go about allocating observer days to achieve the council targets, the 20 percent CV on river herring, 30 percent CV on haddock, and 30 percent CV for herring by gear type, by area.

This just gives you sort of an overall picture after you do the analysis and you sum it all up across the gear types and the areas how many days you would need in the fishery for each of these sectors based on 2010 – we did this in 2010 based on 2010 – to meet those CV targets. This is the kind of information that the council would be presented with but hopefully a little bit more clearer so that they could have an understanding of when they get an SBRM type report or whatever report we'll see in the future from the Science Center on how to allocate days to the various fleets.

They would then take this piece of information here as a supplement and look at just the herring fleets and look at the difference between the SBRM allocations and these allocations here, and the council would be able to make decisions on where they wanted to add extra days, which strata, which areas, which fleets in order to try to meet these targets for river herring bycatch and everything else. It's a little bit complicated.

Hopefully, you have had a chance to look at in the document. It's a little more clear if you can read through it. This is just a summary table of what the coverage rates have been in the fishery. We've had really good observer coverage in this fishery for the last couple of years. Actually, the PDT was confident enough in the 2010 observer data that we did generate some estimates of total removals across the fishery. We did some extrapolations

This is just a breakdown, again recognizing the bottom trawl vessels are sort of all over place, but you're looking at 30 to 40 percent coverage in this fishery for the pair trawl, midwater trawl and purse seine fleets, a little less for purse seine, in 2009 and 2010. In 2009 and 2010 for the Category A and B trawl fleets, 40 percent or more of the trips were observed. That's higher coverage than most fisheries get. That's it. I tried to shorten this up, believe it or not, and I'm sorry if it was all over the place but I had covered half of it this morning. I'm happy to answer any other questions.

CHAIRMAN PIERCE: Lori, never apologize for a comprehensive presentation of such an important issue facing the sea herring fishery in the New England and the Mid-Atlantic. Section members and audience, we have been well briefed. Between Boston and this meeting in Alexandria all the details of this amendment have been covered and covered very well.

Of course, there are some section members around this table on whose shoulders a lot has been placed and that would be David Simpson, Mark Gibson, Doug Grout, Terry Stockwell and myself because we are New Council members. Many of us I think have been members at one time or another of the Sea Herring Committee of the council so we have participated in developing this document with a lot of input from the industry and from the general public.

If all goes well, if NMFS releases it fairly soon, this document will go to public hearing as noted by Lori in March and then in April in Connecticut some very important decisions will be made after about five years of hard work regarding how to adequately sample the catch in the sea herring fishery.

The meeting will be April 24th, 25th and 26th, and that's about two and a half months from now, so it doesn't provide much time for consideration of this document by the section and some conclusion regarding preferred alternatives. With that said, I will turn to the section and ask you if you have any questions of Lori and her presentation? Okay, I see none.

Now, to the point I raised earlier regarding how we will effectively get public input into the process that we have established to deal with this amendment, be it river herring or specific measures to sea herring, I turn to you, Bob, and ask you to help us in that regard. Can you give us some guidance?

MR. ROBERT E. BEAL: Well, I can tell you what the River Herring Board did this morning. I think that might be an option for this board. The River Herring Board formed a working group similar to what this section did before Lori's presentation. What they agreed is that the advisory panel would meet and review the document once Lori has completed the public hearing document.

They would provide their feedback and comment to the working group and the working group would then distill their information with the position of the working group and then present that information to the section, and the section would sign off on those comments to the National Marine Fisheries Service. That's how the earlier group agreed to get the advisory panel involved in this process.

CHAIRMAN PIERCE: All right, that sounds like a reasonable approach. Do section members agree with that strategy or is there something else to offer up as an alternative approach? Okay, I believe that there seems to be agreement that is the way we should go with the advisory panel feedback being acquired. Now, I need to get some volunteers for the working group. Chris just indicated that Terry is on the working group, correct? Besides Terry, any other members of the section care to be on this working group; Bill Adler –

MR. STOCKWELL: I'm going to volunteer Doug.

CHAIRMAN PIERCE: Doug Grout has been volunteered. That's right; he is not at the table.

MR. G. RITCHIE WHITE: Mr. Chairman, wouldn't it make sense to just have the same people for the river herring and the herring; just have the same group?

CHAIRMAN PIERCE: It is my hope that the working group would consist of the same people. However, there may be some individual around this table that is not a member of the River Herring Board so that's why I asked if there was anyone else who might be interested. All right, we have a few volunteers that will join the River Herring Board participants in the working group, and I assume that Chris and ASMFC staff dealing with river herring will help coordinate that effort.

TECHNICAL COMMITTEE REVIEW OF SPAWNING REGULATIONS

All right, I see Vince shaking his head so that is how we will proceed relative to our providing some constructive input and preferred alternatives on these measures described in Amendment 5. All right, if there are no further questions or issues to be raised regarding the amendment, I'd like to go on to the next agenda item, and this leads us to a charge that the section gave to Matt Cieri I believe at our last meeting when we asked for technical committee review of spawning regulations, and Matt and other technical committee members I believe have put together a white paper. Matt is now going to describe the technical committee review; and I believe at the end of that review he is going to have a recommendation from the technical committee that the section needs to entertain.

DR. CIERI: My name is Matt Cieri. I'm with the Maine Department of Marine Resources, and I'm current Chair for the Atlantic Herring Technical Committee. Today I'm going to be basically going over that white paper, which you all should have received. It was actually in the supplemental materials and I think it is going to be passed out momentarily. Just to give you guys a little bit of a background, back in Boston the section sort of initiated a review of the spawning regulations and management among all the states.

The technical committee took a look at the issues and developed a white paper based around the section's discussions and their concerns. We took all this stuff and sort of hammered it all together and got on a conference call and examined all these issues and discussed them for a fair bit of time.

The TC also brought up a number of other issues, and so what we tried to do is actually put out a series of questions to be addressed through some analysis to give you guys a better sort of idea of where we were going with this white paper. But first things first; this whole thing sort of centered around this issue of smaller fish that are spawning.

It has generally been seen across the entire fishery, all areas, and spawning seems to be at the same age roughly, but that size at age has decreased over time since the mid 1980's. This has implications for our current spawning regulations which is sort of capped at a 24 or better centimeter total length for analysis.

Just to give a sort of a rough idea, here is the percentage of females that are mature by age 2005-2010, and as you can see age threes generally are 50 percent mature, so 50 percent of the females that are age three are mature, going up to 80 percent by age four and not actually reaching a hundred percent mature until about age six. However, the mean total length in millimeters this time of age three spawning females caught in the same area has sort of trended like this over time.

As you can see, since about the mid-1980's, back in the eighties it was about a 26-1/2 centimeter fish was a typical size for an age three, and now we're looking at something that was closer to 23 and below. That red line is the cut-off for which we sample for spawning fish, and so those fish that are below that size are probably in condition to spawn.

Again, slicing it a different way, this is the percentage of spawning or developing females in Area 1A during the spawning season. And here it's in this size bin, this 23 to 24, this is the size bin just below where our regulations say that we need to sample, so this is the next size bin down. As you can see over time, it's sort of been highly variable but it has certainly been trending upwards.

As you can see now, 20 percent of the fish back in 2004 in this size bin were spawning or were going to spawn, but in most recent years it has been about a quarter, so about 25 percent of the fish in the most recent years in that size bin that we're not sampling because of the regulations are showing signs of maturity and development.

Again, another way of looking at it, this is the actual data that went into that previous graph, and as you can see on average from 2000-2011 for that size bin directly below where we sampled, which I've highlighted here in yellow, about 11 percent of the fish are usually in spawning condition. However, it has shown up that it has been maybe 4, 6, 10 in 2001, 2002, 2003, but that in recent years it has been 13, 18 and 25 percent.

I just got out of a data workshop meeting in Woods Hole for the assessment. One of the issues is we've been dealing with this sort of issue also within the assessment and how to model it. As you can see from the NMFS bottom trawl information, this is a problem that has been happening over the course of the fishery since about 1980's.

As it shows here, the proportion of females that are mature – this is from the NMFS bottom trawl, all areas – back, for example, in 1987 and in 2006 and that timeframe between 1987 and 2007 was roughly about 21 and 22 centimeters fork length, which is different than the total length that we normally use, but that in recent years it has been about 2 centimeters smaller.

So now that we've beaten that one to death, the TC, as I told you earlier, proposed a number of questions for further analysis, and one of the biggest questions was do fish that are below 24 centimeters spawn earlier than larger spawners. There is some suggestions within the biological literature that this happens in fish populations.

In general, no, the fish that are in the same area tend to spawn roughly around the same time regardless of whether they're smaller fish or bigger fish. In general with herring, males tend to hang out in an area that is in a developmental stage. It's more advanced than their female counterparts in the same

area, and they sort of suspend their development, waiting for the females to be fully mature.

You can find males in a given area that have a well-advanced maturity stage than females and they have that ability to do that. The question was do the default spawning dates overlap with peak spawning times? This is a very difficult question to answer, of course, because most of our information comes from the commercial fishery that is closed out of those areas during that time.

However, it seems the TC felt the regulations generally work pretty well. There is some indication – and I'll highlight this a little bit later on – some indication that down east and mid-coast Maine, that the fish, when we have sampled, are spawning later than the defaults, so our defaults that we have set in the plan, when we actually go out and sample, those fish are spawning a little bit later on.

However, it's not really that significant. It's about five days. There seems to be about a five-day difference between the default and the average spawning date if you do it by sampling. Now, this could be changed, but TC made a sort of cautionary note that this may mean that spawning areas in mid-coast Maine and in eastern Maine and Massachusetts and New Hampshire, because that hasn't really changed its spawning dates very much, may overlap more strongly, which means that there would be areas of the coast and many times in many years in which all the coast would be closed for a certain portion of time.

Again, this is sort of a breakdown that Chris did of when the spawning closure dates happened 2005-2011. As you can see it has been fairly variable. For example, the eastern Maine area has closed the 25th, the 28th, in and around there; where western Maine has closed, its default is the 1st, but it has closed as late as the 17th or the 13th.

And then for Massachusetts and New Hampshire, again its general default date is the 21st but it has closed as late as October 1st, but generally has been around the same timeframe from about the 16th to the 21st, so there is some indication it's slightly early but not by much. But, again, getting back to eastern Maine, it has been fairly variable and the same thing with western.

Another question you'll find in the TC white paper is are regulations necessary or practical to address vast differences in herring being sampled from northern and southern areas of the same spawning area. What this comes down to is that we have three spawning areas along the coast of Maine and Massachusetts; the eastern Gulf of Maine, western Gulf of Maine and the Massachusetts/New Hampshire closure.

During certain years Massachusetts DMF will sample some of their fish that are closed by their facility, we'll sample fish that are fairly close by our facility, and we find that they're vastly different in their maturity stage, and this has caused some consternation. There may be an issue in which basically Massachusetts DMF and Maine DMR are sampling two separate bodies of fish that are all in very different spawning conditions.

There may be a need to adjust the Massachusetts/New Hampshire Boundary with the western Maine boundary; in other words, to adjust that boundary. That boundary currently is a little bit south of Cape Elizabeth; and so there was some suggestion by the TC that if the section wanted us to, we could go back and take a look at samples that have come in that general area across a lot of years and see if that line could be drawn a little better, but that's up to you guys to decide if you want that type of an analysis to be done because that requires a good amount of work.

The other question is do the current spawning closure regulations effectively protect local populations from extinction or extirpation and can the regulations be improved upon. In general the TC came up with this sort of consensus statement that the measures are pretty effective protecting spawning fish when they are aggregated for spawning.

So, if you're not going to allow people to fish on Atlantic herring while they're spawning during that timeframe, then generally they're going to be pretty effective. Of course, some improvement and standardization among states as far as protocols and as far as language within their regulations is probably warranted.

The other question that was posed was should the goals of the spawning closures and the objectives be clarified or expanded. The TC found this was pretty much a management issue. The goals and objectives of the spawning closures and the spawning management in general seem relatively unclear from a technical aspect and so you guys might want to go back and take a look at those goals, see if they currently address your needs and your current goals, the way they did when this plan was implemented back I believe in 1999.

Another technical question that came up was generally both Massachusetts DMF, Maine DMR and even New Hampshire Fish and Game have the ability to sample both directed trips and non-directed trips for Atlantic herring, and so there has been some discussion among all the samplers as to whether or not that's an appropriate representation of what is going on out there.

The TC sort of met on this particular issue and they came up with the idea that non-directed trips are probably important especially when the area that is being examined is closed to directed fishing because of spawning closures. The only way you're going to get fish is from a non-directed trip, and that these non-directed trips probably provide some insight and some window into a process that isn't normally sampled with a directed fishery.

Next came the question of how many samples is necessary. The current regulations as it's currently spelled out is that you need at least two samples of 50 fish or more per week in order to keep an area open or to close it. That has been what has been in the regulations as far as ASMFC is concerned. The TC suggested that be increased to two 100 fish samples generally because when you go through a sample you have to look for females in a particular size.

It's a lot easier to get the required number of females from a hundred fish than it is from fifty fish and it doesn't require that much more work. That is one technical change, for example, that the TC recommended. The other is whether or not the spawning regulations provide sufficient guidance and are they standardized among all the states.

In general the answer is, no, there are discrepancies in regulations among all three states, especially when it comes to what sizes to sample, how to sample, those sorts of things. There is a need to standardize among the states. In general things have worked pretty well in the past. There are not huge slugs of spawning fish that come across the dock that most people know about, but that's basically because Massachusetts, New Hampshire and Maine, usually the samplers have been in constant contact with each other usually during the process.

I know I call Mike Armstrong quite a bit during the spawning season just to see if we can line stuff up. But this isn't codified within any of our regulations and so at certain points as we go through budget cuts, personnel changes, those types of things, having states have a regulatory document that they can go back to that spells out what kind of sampling they need to do and when would be most helpful.

To sum up everything, the TC's recommendation is to initiate an addendum to address spawning management, including the goals and objectives to adjust the sampling size downward to account for this drop in weight and size of age; to examine the default dates if so desired, particularly in western Maine and in eastern Maine; to address the Massachusetts, New Hampshire and western Maine Boundary Issue; and to standardize the sampling protocol and the regulations associated with spawning among all the states involved. That's what I've got.

CHAIRMAN PIERCE: Thank you, Matt, to you and the technical committee for the followup that you did on this issue. Section members, any question of Matt? Pat.

MR. PATRICK AUGUSTINE: Great presentation, Matt. When you were talking about the difference in spawning areas – east/west, if you will – that they were spawning at different dates, if you will, how long a period of time are we talking about, a week or two weeks or three weeks?

DR. CIERI: Do you mean between the default dates or the two groups of fish in the same area, which one?

MR. AUGUSTINE: Two groups of fish in the same area to start with.

DR. CIERI: They could be almost I would say maybe a week and a half to two weeks apart sometimes. Yes, it might be a week, maybe two.

MR. AUGUSTINE: So a follow-on to that, it's almost as though you're suggesting a short-term or quick fix – I mean not a quick fix – might be to go ahead and close the whole area off one simultaneous period of time. At least that's the gist of what you're saying that I'm getting. I'm kind of outside looking in because we're not deeply involved in the herring fishery.

But, from an objective point of view, that sounds like one of the things you're saying in addition your recommendation from the technical committee in developing an addendum – and I'm not sure those would be terms of reference of the items that you've listed there or not. So, in response to the first part of it; and then when the chairman is ready, I'll make a motion to do your addendum.

DR. CIERI: Actually, no, that isn't what I'm suggesting. I'm suggesting that each of those three areas have three different default dates associated with them, and at least two of those areas have been – generally when we've gone out and sampled have been spawning later than those default dates.

In herring management in the Gulf of Maine for spawning if you have samples, you close based around the sample. If you don't have samples, the fishery is not operating there, then you close based around the default dates. It's sort of an either/or. The suggestion would be that if the section wanted to they could take a look at the default dates – this is when we don't have samples – and whether to push it back a little bit.

The TC's feeling is that five days probably wasn't statistically significant. Five days isn't that different statistically, but then it might be different enough from a fishery management point of view to warrant that kind of action. Does that make sense; am I explaining that?

MR. AUGUSTINE: It' makes sense. And then the next follow-on question would be what is the sense of urgency on behalf of the technical committee to move forward with this at a relatively quick pace? I'm not talking about fast-tracking it. The sense that I'm getting is that it looks we really should embark on this effort as quickly as possible.

DR. CIERI: This is my own personal take. You might want to have something done by the time we start doing the sampling for next year because it's pretty clear that you're missing a lot of potential spawners that are below that 24 centimeter cut-off, and so they're not being effectively sampled and used in closing those areas.

MR. AUGUSTINE: And then a final one and then I'll shut up; within our budget constraints, Bob, could you tell us whether or not we could actually go ahead and embark upon this issue. I know we have a lot of hot items on our agenda yet for the next couple of days, so could you help us with that.

MR. BEAL: I think doing an addendum to clarify these definitions and bring them all together because they're scattered out over a bunch of documents and those sorts of things is a pretty straightforward technical exercise more than anything else. I don't see a whole lot of public input and extensive public comment periods and those sorts of things which would generate a lot of expenses for the commission. We can have hearings up and down the coast if that's what the states would like, but we may ask the states to conduct some of those hearings themselves. I think it can be done and I think it's important to sort out these definitions soon we can, as Matt was saying, get it clarified.

MR. DENNIS ABBOTT: Mr. Chairman, I think it would just appropriate to make a motion that we initiate an addendum based on the five bullet points that Matt gave us. They always do good work for us and I think that it's important that we move forward regarding the size and the boundaries and the sampling protocols.

CHAIRMAN PIERCE: Okay, check the language on the screen and see if it's the motion you are intending to make. All right, is that your motion, Dennis? We should read that into the record, if you would.

MR. ABBOTT: That's correct.

CHAIRMAN PIERCE: I will read it then. A motion has been made; let's see what the motion is. All right, move to initiate an addendum implementing the technical committee's recommendations regarding spawning regulations. That is the motion by Dennis Abbott; is there a second to the motion; Bill Adler. Okay, Terry you had your hand up; was it to make a motion?

MR. STOCKWELL: No, it was to make a comment leading into a motion.

CHAIRMAN PIERCE: Okay, we have a motion, so discussion relative to the motion. Terry.

MR. STOCKWELL: I do support the motion on the board although those of us involved in herring know full well that the section and the technical committee spend an inordinate amount of time trying to balance the spawning herring protection and the needs of the industry. Matt and I have discussed a number of the issues that are in the white paper over the years, and I believe it's timely to initiate this addendum. I do think, Mr. Chairman, we need to have some discussion on the goals and objectives before we dispense with this motion.

CHAIRMAN PIERCE: Yes, I agree with you. For the benefit of the section, I reference Page 5 of the white paper where we find common themes regarding the section's goals and objectives for sea herring. The specific text that we have in Addendum I and Amendment 2 relative to goals and objectives for protection of spawning fish, specifically the

spawning closures, that is on Page 1 and o Page 2 of the document.

Again, to clarify the motion I think that the maker of the motion, his intent is to follow what the technical committee has recommended. Specifically they're noting that this is a policy decision on our part. The technical committee did not comment on what the goals should be but they feel that some clarification is necessary. I'm feeling the maker of the motion feels the same way that the goals and objectives need to be clarified. They're all listed for us now in the white paper. Chris, do you have a point?

MR. VONDERWEIDT: I just wanted to point out that on Page 5, as David mentioned, under should the goals of the spawning closures be clarified or expanded, we actually summarized the common themes. If you look at that second from the bottom paragraph, it says common themes include protecting schools of spawning fish when aggregated, to not interfere with spawning behavior, so on and so forth. You can kind of just use this list rather than looking at the actual regulations that are in the document, too.

CHAIRMAN PIERCE: Okay, with that said, we have a motion before us with a suggestion that we spend some time focusing on the goals and objectives, so why don't we do that? Sarah.

REPRESENTATIVE SARAH K. PEAKE: Mr. Chairman, a question on the motion. I think going back to that other slide, it looks as though we're looking at certain spawning areas that it delineates. I know recently I had a meeting with some fishermen about dogfish, but herring came up.

There was some concern expressed about the lack of appropriate protections for the Nantucket Shoals Spawning Area. Would this motion include that area as we're looking at herring spawning in general; and if not, is that something that could be included with a friendly amendment?

REPRESENTATIVE PEAKE: It does not include spawning closures outside of the Gulf of Maine. We do not have any spawning closures that pertain specific to Georges Bank or Nantucket Shoals. That's another issue entirely, so right now the motion is specific to the way we do business now, which would spawning closures for the Gulf of Maine. Terry.

MR. STOCKWELL: I hear where you're coming from, Sarah. I'm afraid that if we're going to make some technical corrections that's going to help the technical committee move ahead for this year, that modifications and/or additions to the existing closures and/or new ones will take more time than we have. Probably your interest would be better served in a subsequent action to follow this, and I'll second it.

CHAIRMAN PIERCE: Well, let's dispense with this motion first. Any further comment on this motion especially with regard to the clarification of goals and objectives? David.

MR. DAVID SIMPSON: Just one thing to be clear; this is entirely a Gulf of Maine issue; right?

CHAIRMAN PIERCE: All right, I will be going to the audience, yes, but first I need to make sure that everyone who would like to speak has an opportunity to do so. I see that is the case so I will go to the audience. Mary Beth.

MS. MARY BETH TOOLEY: Mr. Chairman, I'm still a little unclear following that discussion about how this motion relates to the goals and objectives. Is it your intent that the common themes that are listed on Page 5 be the goals and objectives or are you going to take it up under a separate motion? I wasn't too sure.

CHAIRMAN PIERCE: Well, as it stands right now the goals and objectives as they are in Addendum I and in Amendment 2, this motion does indicate that the goals and objectives need to be clarified, and I'm looking to section members to see if indeed there is any desire to do that, but right now they stand as in the addendum and as in the amendment.

MS. TOOLEY: So this motion, Mr. Chairman, then would be to move forward the technical committee's recommendations and then any consideration of changing the goals and objectives would be considered separately; is that correct?

CHAIRMAN PIERCE: Well, I turn to the maker of the motion for the maker to clarify his intent regarding the goals and the objectives. Dennis, do you care to elaborate a bit? No, okay. This motion was made principally because the technical committee has made some recommendations regarding the need for some changes in the way the fish is sampled, protocols. It's a technical issue, so the maker of the motion has included goals and objectives, which is not a technical issue. Well, my preference would have been not to have goals and objectives in the motion, but again the maker of the motion has spoken. Yes, Dennis.

MR. ABBOTT: I didn't try to cause any confusion. I tried to simplify things, but if it makes more simple to remove goals and objectives from the motion, that's perfectly fine with me.

CHAIRMAN PIERCE: That would be my preference especially because the technical committee has not taken a position on goals and objectives. They said it's a policy call.

MR. ABBOTT: Let's remove it, then.

CHAIRMAN PIERCE: Thank you, Dennis. To make it simpler and to be specific to required or suggested technical changes by the technical committee, let's do that. If there is no objection from the section, we will modify the motion before us. We are not talking about goals and objectives. The goals and objectives stand as is. This is about making some technical changes in how we deal with the spawning regulations themselves.

MS. TOOLEY: Thank you, Mr. Chairman, that clarifies the issue, and I certainly do support the motion.

CHAIRMAN PIERCE: Thank you, Mary Beth. I'll still go to the audience. You now know what the motion reads relative to the goals and objectives. Yes.

MR. STEVE WEINER: David, can I ask a question of Matt or is that out of bounds now? I had a question on his presentation; just a couple of small questions.

CHAIRMAN PIERCE: Questions that would relate to clarifying the motion itself?

MR. WEINER: Possibly; it's not that simple a question.

CHAIRMAN PIERCE: Go ahead, Steve.

MR. WEINER: Matt, how do you sample an area for spawned fish when there isn't any fishing going on in the area?

DR. CIERI: You don't. If there is no fishing going on, of course, you're pretty much out of luck, in which case that area closes on its default dates. If there are no samples to keep an area open or to close it, then it's within our regulations – in all the states actually is language that will close it on a day if there are no samples available. Sometimes we have the ability to get them off non-directed trips, and that includes, for example, some of the whiting vessels that fish in the Massachusetts/New Hampshire area or some other way.

MR. WEINER: And then the other question I had is given that a default date is just that, a default date, theoretically you could open an area, sample and then close an area again because the fish are still in spawning state; have you ever done that?

DR. CIERI: Yes, we have. That's happened I believe a couple of times in the last I want to say five or six years in which the area is closed based on defaults because we don't have any samples; and then when we go to reopen it, the fish are spawning later that year, and the area reopens for a week and then the guys go in, they fish – holy heck, they're still spawning; the whole place just gets closed right back up again for two weeks.

MR. WEINER: But that doesn't happen very often; does it?

DR. CIERI: It's actually fairly rare. Usually we have a good track with the fishery as to where the spawning conditions are. For example, down east there may be nobody fishing in that area and want to go fishing in that area once the area comes right back open again.

MR. WEINER: Okay, just one last question, David. I just spent the same four days as Matt did down at Woods Hole on the stock assessment data collection meeting. It was pretty obvious at least to me – as a layman sitting there it was hard to follow at times, but if I heard it right the biggest aggregation of herring and the largest potential for spawning is out in the Georges Bank/Nantucket Shoals area based upon what I heard there.

It seems hard for me to believe that this group wouldn't take up now as part of this effort the possibility that there are other spawning areas maybe even more important than the ones you're doing now. As I read this Page 5, Number 4, do the current spawning closure regulations effectively protect local populations from extinction; could the regulations be improved upon, I really think to not – I'm all for taking up and so are most of the people I represent; let's talk about spawning, let's talk about our goals, and let's talk about whether there really are other areas that might be more important than the ones we're protecting now. Thank you.

DR. CIERI: Just to that point, for those section members who weren't aware or weren't around when

this fishery management plan was implement – and I don't even think I was – initially the federal plan also had spawning areas basically in that management as well. Those were actually disapproved by the regional administrator's office at the time as being unenforceable and unneeded.

Because all of that occurs in federal jurisdictions where the fishing actually takes place, so that's actually more of a federal issue in some cases. I know there have been some indications – and I believe Terry remembers that there have been some people who have been trying insert that into another herring sort of management action, but right now that area is actually under federal jurisdiction, and so therefore the regional administrator disapproved that in the last go-around I believe in 1999, and that's where it stands.

CHAIRMAN PIERCE: Yes, a motion may be made relative to this particular issue, but I'll wait and see on that. The section will certainly entertain a motion if one is made relative to Georges Bank, but we have to dispense with this. I am going to come back to the section because we're running out of time with the allotted time for this particular section meeting. Are there any further questions or further debate on the motion? Okay, we need to caucus.

(Whereupon, a caucus was held.)

CHAIRMAN PIERCE: **The motion is move to initiate an addendum implementing the technical committee's recommendations regarding spawning regulations not including the goals and objectives. Motion by Mr. Abbott; seconded by Mr. Adler. All right, I assume everyone is ready to vote. All those in favor of the motion please signify by raising your hand, 6 in favor; any opposed; any null votes. It is unanimous.**

All right, we will move forward with this addendum to make these technical changes in how we deal with our herring spawning regulations. I turn you, Chris, and certainly you, Bob, could you give us some idea as to the requirements that you would need to prepare – the time requirements needed to prepare this addendum.

MR. VONDERWEIDT: I think as it sits right now, assuming that the goals and objectives are worked out, it would be pretty easy to put what is in the white paper, have Matt run a little bit more analysis, look at shifting the boundary between the Massachusetts, New Hampshire and eastern Maine. Well, it wouldn't be a big deal to kind of get the addendum out the door pretty quickly. And in thinking forward to the next board meeting in April and then following that, just following the standard two meeting weeks in between the timeline for these addendums, we could actually get the final addendum and have it voted on prior to the start of the spawning season.

That would be convenient for when it is going to impact; but if we were to include a new spawning closure, that's a whole new bag of worms and that would probably take quite a while to develop and probably not anytime soon with – I know Matt is real busy with the specifications and also the assessment is going on. I hope that answered the question.

MR. BEAL: I think I heard Chris right but if there is not a lot of additional work added to this, we could draft it for May, have hearings over the summer and final approval in August. Is that what we think we can do?

CHAIRMAN PIERCE: All right, very good, it certainly would be of great benefit to have it in place for this year. Sarah.

REPRESENTATIVE PEAKE: Mr. Chairman, based on what we heard from the public and some discussion here around the table, if a motion is in order now, **I would like to move to initiate an addendum to provide options to protect spawning herring in the Nantucket Shoals/Georges Bank area.** I'll leave it at that for the moment.

CHAIRMAN PIERCE: Okay, we have a motion from Sarah Peake; is there a second to the motion? Ritchie White has seconded the motion. Discussion on the motion? Let's make sure it's clear. Is that the motion, Sarah, the correct language?

REPRESENTATIVE PEAKE: That looks like it and I'm open to wordsmithing.

CHAIRMAN PIERCE: All right, so move to initiate an addendum to provide options to protect spawning herring in the Nantucket Shoals and Georges Bank areas. That is the motion. Matt.

DR. CIERI: From a technical issue, as Lori could probably tell you, we actually just went through this entire process with the council as some of this issue actually did come up. The issue seems to be that all of the fish that we get from Georges Bank and Nantucket Shoals are frozen. They're not fresh fish,

which is how we actually sample the inshore component to regulate the spawning closures.

Frozen fish cannot give you a good understanding of maturity, particularly gonad weight and staging. In order to put something like this into place, you would need a sampling program that would get you fresh fish from Georges Bank in a reasonable timeframe. That requires an additional monitoring component.

Currently that monitoring is done by the states of Massachusetts and Maine. Ours is under ACCSP, and so you would have to actually implement an entirely different monitoring program for fish coming into Massachusetts and New Hampshire from Georges Bank. That was one of the issues that were involved.

There is no record or data base that is associated with this, so we can't, for example, reach back in time and tell you what optimal spawning period there is going to be because that information wasn't collected from Georges Bank because there was no spawning closure. That would take time to implement as well. This is a very major undertaking. Rather than changing areas and changing boundaries, this is a significant amount of work and actually a significant amount of time and energy that would be required by the samplers getting fresh samples. Please keep that in mind.

CHAIRMAN PIERCE: Okay, Matt has raised some very legitimate issues. Nevertheless, we have a motion on the floor. Sarah.

REPRESENTATIVE PEAKE: If I may just respond to those issues, Matt, thank you for the explanation. I understand this may be time-consuming, we don't have a bank of data on which to rely. On the other hand, like many things in life, if we don't begin at some point in time, when do we ever begin if we say it's always going to be too difficult?

I'd hate to be like the Wizard of Oz who says, "Go get the broom from the Wicked Witch of the West" and we never set off to do that. I guess my question is or my statement would be I think that there is a spawning stock of herring that is there. My goal is to find a way to help develop protections for them, for the viability of this industry moving forward, and I'm seeking a way to do that. I think there has to be a way to get to get to yes from it doesn't seem likely or not possible. I'm open to ways to getting to yes. Thank you.

CHAIRMAN PIERCE: Any other comments on the motion? Terry.

MR. STOCKWELL: Mr. Chairman, I agree with much of what Representative Peake has said. However, I have been reminded through our conversations today of the ongoing specification package and a stock assessment that is going to take all the technical committee's time. Just reading part of the white paper here, I think in order to give this proposed addendum and/or of interest to me modifications to the current closures any justice, I'm inclined to support postponing this until we receive the updated assessment and we've been able to work our way through the specification process. If you're willing to withdraw this motion, I won't make a motion to postpone.

REPRESENTATIVE PEAKE: I'll withdraw it if you'll work with me on a motion for August; how is that?

MR. STOCKWELL: Deal.

REPRESENTATIVE PEAKE: **Mr. Chairman, I'd like to withdraw my motion.**

MR. STOCKWELL: Or later in the fall when we're – I guess I'd defer to Matt for timing on when the appropriate time would be.

CHAIRMAN PIERCE: All right, I believe the sentiment expressed by you, Terry, is that we're not going to be able to get this addendum done for this year. There will be a delay because of other priorities relative to sea herring assessment, sea herring work and followup on our previous action. Therefore, it makes sense, you're saying that we wait until after the assessment is in hand and that will then enable us to have what?

MR. STOCKWELL: A better understand on how to move forward as well as the specification package and the time for the technical committee to work with this.

CHAIRMAN PIERCE: Okay, so Terry has made that suggestion and, Sarah, you would like to withdraw the motion? Okay, obviously with the intent to make it later on in concert with Terry and others, I suppose. Does the section object to Sarah withdrawing the motion? I see no objection from section members so before I say it's withdrawn I'll turn to you, Vince.

EXECUTIVE DIRECTOR JOHN V. O'SHEA: Mr. Chairman, I think you're going in the right direction here. I think the focus to let us get this other addendum, we know we can get that done, but one of things I would suggest in response to the maker of motion's intent to get something started was we might be able to pull together a white paper sort of scoping out what the issues would be involved with this; much less labor-intensive than an addendum.

Because there are resource implications that the states are going to have to consider in doing that, it would give us a chance to scope that out for the board so that you could make an informed decision about what you wanted to do.

I think a reasonable time may not be in May but maybe for the August meeting we could get that pulled together for you, so it wouldn't be a total collapse of this motion. I mean, the motion goes away but the idea of continuing to work on this issue would still be alive.

CHAIRMAN PIERCE: That's a great suggestion, Vince, thank you. Matt, did you want to elaborate?

DR. CIERI: Yes, I actually produced the same exact white paper for the council, so I can do that fairly quickly. You guys are going to be tied up in August when you guys get the results of the SARC presentation for Atlantic herring, and you're going to start the specifications' process, so we can get that done by your next meeting.

CHAIRMAN PIERCE: Okay, thank you. I appreciate that, Vince and Matt. Clearly, protection of spawning fish is a priority of the section. The status of the resource as revealed to us later on this year certainly will provide us with better insight into how needed that spawning closure is. I suspect that when all is said and done there will be support for our moving forward to implement similar sorts of spawning protection.

That's the Chair speaking a personal opinion since I have a lot of history with Georges Bank sea herring, and I know that the collapse of the Georges Bank sea herring resource occurred because of concentrated fishing by the large pelagic fleet, the foreign fleet, back in the sixties and seventies on spawning concentrations on Georges Bank. It's a different fleet, foreign fleet versus domestic fleet, but nevertheless it's an issue that definitely deserves some further thought.

This white paper should help us in that regard. Any further business before the section? We've come to the end of the agenda. Other business is next. All right, I see none so without any objection we will adjourn. Well, hold on a second, I see some people in the audience. These hands have been waving. I think people have traveled some distance so I'll go to Chris.

MR. CHRISTOPHER WEINER: Chris, bluefin tuna fishermen, ABTA and CHOIR. I just had a question for Matt. You guys kind of glossed through the – and this is on that first notion and I know it's already done with, but I wanted to ask this then. Why would you move the western Maine closure south? From our perspective that is where we fish out of.

Our concern is that everything – the closures are too early. In years past – well, the last two years we didn't see any spawning on the traps and fish – or, last year we didn't see any spawning off of Maine. In years prior to that, the tuna boats and the lobster boats, the lobster gear that was out there was covered with spawn. In mid to late October it was covered in spawn then and guys that were fishing jigging up herring in Ipswich Bay or just north of Ipswich Bay – the bottom line is that our concern – and I've told this to Matt a number of times that things are too early.

Correct me if I'm wrong, if you move the western Maine spawning closure south, you're basically opening up more area earlier, right, because the western closure opens or closes earlier – or opens earlier than the Massachusetts/New Hampshire one, so basically you're just opening up more area earlier, right, by default?

DR. CIERI: Yes, in that way. What we found when we go through and we take look at sampling, the sampling that's occurring just south of Portland are usually are much more advanced, so they're spawning earlier than the fish that are happening, for example, in Ipswich Bay, and so they're going to be completed earlier as well than the fish at Ipswich Bay.

If both fish take roughly four weeks to do their spawning thing, then the ones in Portland are already finished but then the ones in Ipswich Bay are still going. If we base that closure only on the fish that are south of Portland, then the fish in Ipswich are still going to be spawning, correct?

MR. WEINER: I would agree with you, but just from our own observations, I think that, you know, maybe the bigger concern is when you open and

close it, and that would be the second part of my comment that I want to just quickly state is that it's troubling – and, again, I've told you this in this past that when you sample, you basically – and it's a shock to me.

I was unaware that you had opened and then closed an area in the last five years, but apparently I missed that one. But the point is that in my opinion that doesn't happen and there is a lot of pressure on the managers for that not to happen. I think the biggest concern – I still think I'm concerned with you moving that, and I when you do the analysis you carefully consider why you would do that. I would also suggest if you need to hire boats – you find a better way to sample before the boats get in there because I don't think your timing is correct in a lot of years. I think you're close, but I think it could be done better. I think once you open it, it's not closing.

ADJOURNMENT

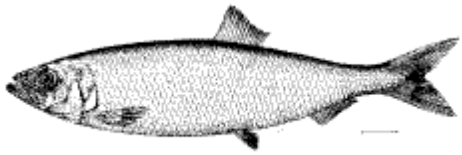
CHAIRMAN PIERCE: Chris, thanks for your views and I'm sure you'll continue to share them with Matt as well as Mike Armstrong and other members of the TC when they follow through with this issue. Thank you. All right, meeting adjourned.

(Whereupon, the meeting was adjourned at 4:05 o'clock p.m., February 7, 2012.)

DRAFT Framework Adjustment 2
to the
Atlantic Herring Fishery Management Plan (FMP)

AND

DRAFT Atlantic Herring Fishery Specifications for the 2013-2015 Fishing Years (January 1, 2013 – December 31, 2015)



Prepared by the
New England Fishery Management Council

in consultation with
Atlantic States Marine Fisheries Commission
National Marine Fisheries Service
Mid-Atlantic Fishery Management Council

Date: January 29-31, 2013 NEFMC Meeting

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ACL	Annual Catch Limit
AM	Accountability Measure
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
BH	Beverton-Holt Stock-Recruitment Curve
BT	Border Transfer
CAA	Catch at Age
CZMA	Coastal Zone Management Act
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DMF	Division of Marine Fisheries
DMR	Department of Marine Resources
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
E.O.	Executive Order
ESA	Endangered Species Act
F	Fishing Mortality Rate
FEIS	Final Environmental Impact Statement
FGSA	Fixed Gear Set-Aside
FMP	Fishery Management Plan
FSEIS	Final Supplemental Environmental Impact Statement
FW	Framework
FY	Fishing Year
GB	Georges Bank
GMRI	Gulf of Maine Research Institute
GOM	Gulf of Maine
IRFA	Initial Regulatory Flexibility Analysis
IOY	Initial Optimal Yield
IVR	Interactive Voice Response
IWP	Internal Waters Processing
JVP	Joint Venture Processing
M	Natural Mortality Rate

MA DMF	Massachusetts Division of Marine Fisheries
MAFMC	Mid-Atlantic Fishery Management Council
ME DMR	Maine Department of Marine Resources
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
mt	Metric Tons
NB	New Brunswick
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSGs	National Standard Guidelines
OFL	Overfishing Limit
OY	Optimum Yield
PDT	Plan Development Team
PS/FG	Purse Seine/Fixed Gear
RFA	Regulatory Flexibility Act
RFFA	Reasonably Foreseeable Future Action
RIR	Regulatory Impact Review
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
SFA	Sustainable Fisheries Act
TAC	Total Allowable Catch
TC	Technical Committee
TRAC	Transboundary Resource Assessment Committee
TRT	Take Reduction Team
USAP	U.S. At-Sea Processing
VMS	Vessel Monitoring System
VTR	Vessel Trip Report

1.0 INTRODUCTION

This document contains the New England Fishery Management Council's recommendations for Framework Adjustment 2 to the Atlantic Herring Fishery Management Plan (FMP) as well as the Atlantic herring fishery specifications for the 2013-2015 fishing years, consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Herring FMP approved by the National Marine Fisheries Service (NMFS) on October 27, 1999. This document also contains information and supporting analyses required under other applicable law, namely the National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA), and Executive Order 12866.

Framework 2 parallels the 2013-2015 fishery specifications (separate management action, same NEPA document) and authorizes the Council to split annual catch limits (ACLs) assigned to four Atlantic herring management areas (sub-ACLs) seasonally (by month) during the specifications process. It also establishes a general policy for authorizing annual carryover of unutilized sub-ACL (up to 10%) under specific conditions.

The Atlantic herring fishery specifications are annual amounts (for the 2013-2015 fishing years) including:

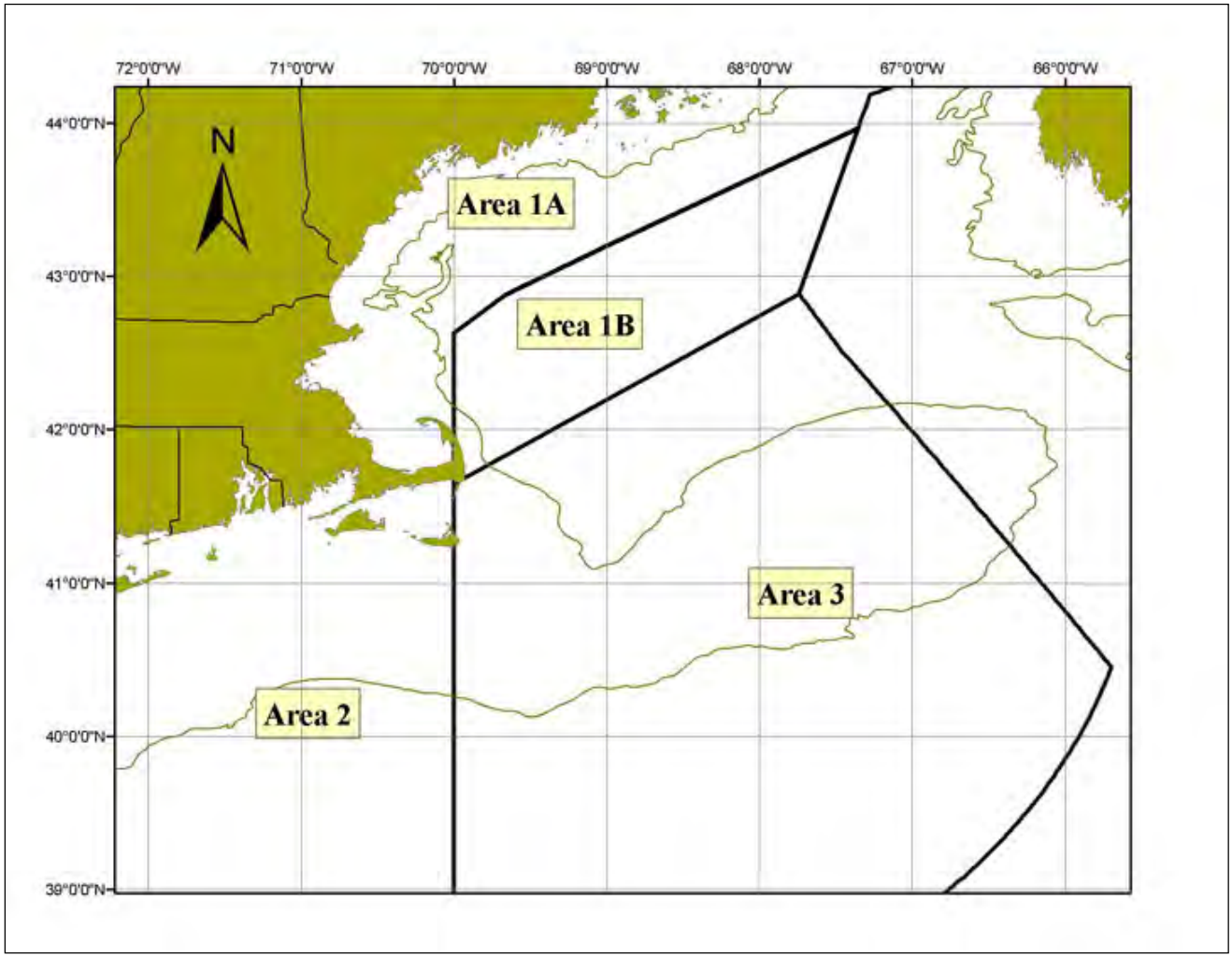
- Overfishing Limit (OFL);
- Acceptable Biological Catch (ABC);
- A Stock-wide Annual Catch Limit (ACL) = U.S. Optimum Yield (OY);
- Domestic Annual Harvest (DAH);
- Domestic Annual Processing (DAP);
- U.S. At-Sea Processing (USAP);
- Border Transfer (BT, U.S.-caught herring transferred to Canadian vessels for export);
- Management Area sub-ACLs;
- Research Set-Asides (RSA); and a
- Fixed Gear Set-Aside (FGSA).

XXX

1.1 BACKGROUND

The Atlantic herring (*Clupea harengus*) fishery is managed as one stock complex, but this stock is comprised of inshore and offshore components that segregate during spawning. In recognition of the spatial structure of the herring resource, sub-ACLs are assigned to four herring management areas. Area 1 is the Gulf of Maine (GOM) divided into an inshore (Area 1A) and offshore section (Area 1B); Area 2 is located in the coastal waters between MA and NC and,; Area 3 is on Georges Bank (GB) (Figure 1). Requirements of the Atlantic herring fishery are regulated by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Atlantic Herring Fishery Management Plan (FMP) approved by the National Marine Fisheries Service (NMFS) on October 27, 1999.

Figure 1 Atlantic Herring Management Areas



The assessments/specifications required by the Herring FMP are made every three years as part of the Atlantic herring fishery specification process. The Herring FMP mandates that the sub-annual catch limits (sub-ACLs, formerly TACs) be distributed among the four herring management areas in Figure 1 on an annual basis. The Council utilizes the best available information to consider the proportion of each spawning component of the Atlantic herring stock complex in each area/season and distribute the sub-ACLs such that the risk of overfishing an individual spawning component is minimized to the extent practicable.

In Amendment 4, the Council updated the Atlantic herring specifications process to ensure consistency with the newly-implemented provisions of the MSA. The Council opted to retain the general provisions for establishing specifications for the Atlantic herring fishery but modified the specifications and eliminated the need to annually specify Joint Venture Processing (JVP), Internal Waters Processing (IWP), Total Allowable Level of Foreign Fishing (TALFF), and a sub-ACL reserve. While TALFF will not have to be considered by the Council during the specifications process, countries interested in foreign fishing for herring may still request TALFF allocations from NMFS, and these requests will be addressed as they arise.

Amendment 5 to the FMP for Atlantic Herring, which is under final review by NMFS/NOAA, is referenced throughout the 2013-2015 Atlantic Herring specifications package. The proposed action in Amendment 5 focuses on establishing a comprehensive catch monitoring program for the herring fishery, addressing river herring bycatch, establishing criteria for midwater trawl vessel access to groundfish closed areas, and adjusting other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA.

On August 2, 2012, the United States District Court for the District of Columbia issued a remedial order in the civil action Flaherty, et al. v. Blank, et al. to address deficiencies with respect to Amendment 4 to the Atlantic Herring Fishery Management Plan (FMP). Consistent with the Court's remedial Memorandum Order, a letter from NOAA Fisheries Service (NMFS) was provided to the New England Fishery Management Council (NEFMC) on August 31, 2012, which addresses the legal deficiencies identified by the Court:

1. Failing to "reasonably and rationally consider [ ] whether Amendment 4's definition of the fishery [to exclude river herring] complied with the National Standards and with the MSA's directive that FMPs be generated for any fisheries requiring conservation and management" (MSA and APA);
2. Approving Amendment 4 "without addressing the minimization of bycatch to the extent practicable," (MSA National Standard 9 and APA); and
3. Failing to take "a 'hard look' at Amendment 4's environmental impacts" regarding a reasonable range of alternatives for acceptable biological catch (ABC) control rule, accountability measures (AMs), and measures for minimizing bycatch (NEPA).

NMFS' August 31, 2012 letter to the Council, ordered by the Court, describes the National Standard 1 Guidelines and other applicable law pertaining to determinations regarding stocks to be included in the fishery and suggests that the Council consider whether river herring and shad should be added as stocks in the fishery through the development of an amendment to the Herring FMP. It also describes several additional remedial actions ordered by the Court. Amendment 4 has been remanded to NMFS and will be vacated within one year from the date of the Memorandum Order unless NMFS:

- Files with the Court a supplemental explanation (within one month) setting forth consideration of whether Amendment 4's definition of the fishery complies with the MSA;
- Files with the Court a supplemental explanation (within one month) setting forth consideration of whether the Atlantic Herring FMP minimizes bycatch to the extent practicable under National Standard 9;
- Describes to the Council (in the August 31, 2012 correspondence) Amendment 4's inconsistencies with applicable law and recommends that the Council consider a range of alternatives in the 2013-2015 fishery specifications to minimize bycatch to the extent practicable, address accountability measures in the herring fishery, as well as alternatives to the interim ABC control rule, at least one of which shall be based on the best available science for herring and other forage fish;
- Files a status report to the Court no later than six months from the date of the Memorandum Order describing the progress of the remedial actions; within one year from the Memorandum Order (August 2013), NMFS must also provide a report describing all remedial actions taken to address the requirements.

The Court will retain jurisdiction over this action pending full compliance by NMFS in accordance with the Memorandum Order. The proposed Atlantic herring fishery specifications for the 2013-2015 fishing years include a range of alternatives for ABC control rules and accountability measures (AMs) for the herring fishery and address many elements of the court order. The target completion/implementation date for the 2013-2015 herring fishery specifications is prior to the court-mandated deadline.

XXX

1.2 PURPOSE AND NEED

XXX

The purpose of this action is to establish specifications for the Atlantic herring fishery during the 2013-2015 fishing years. The Atlantic Herring FMP requires that the NMFS Regional Administrator, after consultation with the Council, determine the specifications for the herring fishery. Amendment 1 to the Herring FMP established a process whereby the Council can set specifications for up to three fishing years. Amendment 4 to the Herring FMP modified the specifications process and implemented provisions for annual catch limits (ACLs) and accountability measures (AMs). Amendment 5 to the Herring FMP, currently under review by NMFS, proposes measures to establish a comprehensive catch monitoring program for the herring fishery, river herring bycatch measures, criteria for midwater trawl access to groundfish closed areas, and measures to address interactions with the Atlantic mackerel fishery.

The Herring FMP requires the Council and the Regional Administrator to review the best available information regarding the status of the resource and fishery and develop appropriate fishery specifications. The FMP also provides the Regional Administrator the authority to adjust the specifications in mid-season as necessary. Provisions in the plan require that the total herring ACL be distributed among the management areas shown in Figure 1 on an annual basis. The Council uses the best available information to estimate the proportion of each spawning component of the Atlantic herring stock complex in each area/season and distributes the sub-ACLs such that the risk of overfishing and individual spawning component is minimized.

The Atlantic herring fishery specifications are intended to meet the goal and many of the objectives of the Atlantic Herring FMP, as modified in Amendment 1, specifically:

Goal

- Manage the Atlantic herring fishery at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act.

Objectives

- Harvest the Atlantic herring resource consistent with the definition of overfishing contained in the Herring FMP and prevent overfishing
- Prevent the overfishing of discrete spawning components of Atlantic herring
- Avoid patterns of fishing mortality by age which adversely affect the age structure of the stock
- Provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery while minimizing waste from discards in the fishery. Optimum yield is the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, taking into account the protection of marine ecosystems, including maintenance of a biomass that supports the ocean ecosystem, predator consumption of herring, and biologically sustainable human harvest. This includes

recognition of the importance of Atlantic herring as one of many forage species of fish, marine mammals, and birds in the Northeast Region.

- Minimize, to the extent practicable, the race to fish for Atlantic herring in all management areas
- Provide, to the extent practicable, controlled opportunities for fishermen and vessels in other mid-Atlantic and New England fisheries
- Promote and support research, including cooperative research, to improve the collection of information in order to better understand herring population dynamics, biology and ecology, and to improve assessment procedures
- Promote compatible US and Canadian management of the shared stocks of herring
- Continue to implement management measures in close coordination with other Federal and State FMPs and the ASMFC management plan for Atlantic herring, and promote real-time management of the fishery

1.3 ATLANTIC HERRING FISHERY SPECIFICATIONS – DEFINITIONS AND FORMULAS

The following definitions and formulas are provided in the Atlantic Herring FMP and relate to the development of the Atlantic herring fishery specifications. These formulas form the basis of the specifications proposed for the 2013-2015 fishing years.

Overfishing Level (OFL). The catch that results from applying the maximum fishing mortality threshold to a current or projected estimate of stock size. When the stock is not overfished and overfishing is not occurring, this is usually F_{MSY} or its proxy.

OFL>=ABC>=ACL

Acceptable Biological Catch (ABC). The MSA interpretation of ABC includes consideration of biological uncertainty (stock structure, stock mixing, other biological/ecological issues), and recommendations for ABC should come from the Council's SSC. The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. ABC can equal but never exceed the OFL.

OFL – Scientific Uncertainty = ABC (Determined by SSC)

ABC Control Rule. The specified approach to setting the ABC for a stock or stock complex as a function of scientific uncertainty in the estimate of OFL and any other scientific uncertainty. The ABC control rule will consider uncertainty in factors such as stock assessment issues, retrospective patterns, predator-prey issues, and projection results.

The ABC control rule will be specified and may be modified based on guidance from the SSC during the specifications process. Modifications to the ABC control rule can be implemented through the specifications package or framework adjustments to the Herring FMP (in addition to future amendments), as appropriate.

Annual Catch Limit (ACL). The catch level selected such that the risk of exceeding the ABC is consistent with the management program. ACL can be equal to but can never exceed the ABC. ACL should be set lower than the ABC as necessary due to uncertainty over the effectiveness of management measures. The ACL equates to optimum yield (OY) and serves as the level of catch that determines whether accountability measures (AMs) become effective.

A stock-wide ACL for herring will be established that accounts for both scientific uncertainty (through the specification of ABC) and management uncertainty (through the specification of the stock-wide ACL and buffer between ABC and the ACL).

ABC – Management Uncertainty (determined by Council) = Stock-wide ACL = OY

Sub-ACLs. Once known as area-based total allowable catch (TAC) levels. The objective to prevent overfishing on a sub-component of the stock, to the extent possible, is achieved by defining sub-ACLs for each of four management areas. If the Council chooses, accountability measures (AMs) can be specified for the sub-ACLs within the specifications process, providing further incentives to avoid overfishing a sub-component of the herring stock complex.

Accountability Measure(s) (AMs). Management measures established to ensure that (1) the ACL is not exceeded during the fishing year; and (2) any ACL overages, if they occur, are mitigated and corrected.

Domestic Annual Harvest (DAH). DAH is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year(s). The Herring FMP specifies that OY is equal to DAH plus a reserve.

OY = DAH + Reserve (if one is assigned)

The Herring FMP also specifies that domestic annual harvest (DAH) will be composed of domestic annual processing (DAP), the total amount allocated to processing by foreign ships (JVPt), and the amount of herring that can be taken in U.S. waters and transferred to Canadian herring carriers for transshipment to Canada (BT). Amendment 4 eliminated the need to annually specify JVP allocations.

DAH = DAP + BT

Domestic Annual Processing (DAP). The amount of U.S. harvest that domestic processors will use, combined with the amount of the resource that will be sold as fresh fish (including bait). The Herring FMP specifies that DAP is a subset of DAH and is composed of estimates of production from U.S. shoreside and at-sea processors. The Herring FMP authorizes the allocation of a portion of DAP for at-sea processing by domestic processing vessels that exceed the current size limits (U.S. at-sea processing, USAP).

U.S. At-Sea Processing (USAP). Domestic at-sea processing capacity by U.S. vessels that exceed current size limits. When determining the USAP allocation, the Council should consider the availability of other processing capacity, development of the fishery, status of the resource, and opportunities for vessels to enter the herring fishery.

Border Transfer (BT). The amount of herring that can be taken in U.S. waters and transferred to Canadian herring carriers for transshipment to Canada, (4,000 mt for the 2010-2012 specifications).

Research Set-Aside (RSA). RSAs are allowed in any or all of the herring management areas and can be specified as 0-3% of any management area sub-ACL.

Fixed Gear Set-Aside (FGSA). This can be specified up to 500 mt in Area 1A and will be returned to the 1A sub-ACL if not utilized by November 1.

Table 1 provides an overview of the formulas and definitions related to the Atlantic herring fishery specifications.

Table 1 Overview of Formulas and Definitions for Herring Fishery Specifications

Acronym	Definition	Formula	Considerations
OFL	Overfishing Limit	Catch at $F_{Threshold}$*B	Current stock size
ABC	Acceptable Biological Catch	Catch at F_{MSY} or $F_{rebuild}$ <=OFL or OFL – Scientific Uncertainty = ABC (Determined by SSC)	Biological uncertainty over current stock size, estimate of F, or other parameters (stock mixing ratios, recruitment, etc.)
ACL	Annual Catch Limit	<=ABC or ABC – Management Uncertainty = Stock-wide ACL = OY	Uncertainty from other sources, evaluation of risk to achieving management goals if ABC is exceeded
Sub –ACLs	Sub Annual Catch Limit	Closure at 95% of the ACL in any FMA	To prevent overfishing on a sub-component level
AM	Accountability Measures	None	(1) minimizing risk of exceeding ACL during the fishing year; (2) addressing ACL overages, if they occur

2.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION

This section describes the alternatives under consideration as part of Framework Adjustment 2 to the Atlantic Herring FMP (seasonal splits/carryovers) as well as the New England Fishery Management Council's proposed Atlantic herring specifications for the 2013-2015 fishing years (values). The herring specifications package also includes alternatives for ABC control rules and accountability measures (AMs). Alternatives under consideration in Framework 2 are described in Section 2.1; alternatives under consideration in the 2013-2015 specifications package are described in Section 2.2.

2.1 ALTERNATIVES UNDER CONSIDERATION: FRAMEWORK ADJUSTMENT 2

The following subsections describe the alternatives under consideration in Framework 2 to the Herring FMP. Alternatives are proposed to allow for seasonal sub-ACL splitting and unutilized sub-ACL carryovers as part of the herring fishery specifications process.

2.1.1 Alternatives for Sub-ACL Splitting

2.1.1.1 Alternative 1 – No Action

This alternative would maintain the status quo regarding the Atlantic herring fishery specifications process. Under this alternative, no provisions would be established to allow for additional sub-ACL splitting in the herring fishery specifications process. Only the Area 1A sub-ACL could be split January-May/June-December, as currently authorized by Framework 1 to the Herring FMP.

2.1.1.2 Alternative 2 – Allow Sub-ACL Splitting in Fishery Specifications

Under this alternative, seasonal (by month) splitting of any management area sub-ACL would be authorized under the Atlantic herring fishery specifications process. The actual splits (amounts or percentages/months) would be analyzed as part of the specifications package.

2.1.2 Alternatives for Allowing Carryover of Unutilized Sub-ACL

2.1.2.1 Alternative 1 – No Action

This alternative would maintain the status quo regarding the Atlantic herring fishery specifications process. Under this alternative, no provisions would be established to allow for the carryover of any utilized sub-ACL in the herring fishery.

2.1.2.2 Alternative 2 – Allow for Up to 10% Sub-ACL Carryover

This alternative would allow un-utilized sub-ACL in a management area to be carried over from one fishing year to the corresponding sub-ACL for the following fishing year, up to a limit of 10% of the sub-ACL. Sub-ACL underages would be determined based on the same methodology used to determine overages (see XXX).

These four provisions would apply to all three options:

- All AMs would continue to apply to both the sub-ACLs and the stockwide ACL.
- All carryovers would be based on initial sub-ACL allocations for the fishery year.
- Sub-ACL carryovers would only be authorized if the total ACL for the fishing year is not exceeded.
- Provisions for carryovers, including percentages/amounts, can be modified in the future through the herring fishery specifications process (in addition to framework adjustments and amendments).

Option 1: If there is a carryover, the sub-ACL(s) in the corresponding management area(s) would increase for the following fishing year, but the stockwide ACL would remain unchanged.

Option 2: This options would authorize the NMFS Regional Administrator annually determine the amount of carryover for any sub-ACL underages, up to 10% of the sub-ACL for the management area, based on Council recommendations and analyses provided for the upcoming fishing year(s) in the specifications package. The RA would base determinations regarding carryovers annually on a variety of factors, consistent with the requirements of the MSA and information provided in the specifications package. The specification of management uncertainty would address the potential for sub-ACL carryovers during the upcoming fishing year(s), and the impacts of any carryovers that would increase the stockwide ACL would be analyzed as part of the specifications package. In addition, the Council may recommend that a buffer between the stockwide ACL and ABC be maintained even if carryovers are allowed, and the Council may provide recommendations regarding carryovers when sub-ACL overages occur (in other areas) and/or if the stockwide ACL changes substantially.

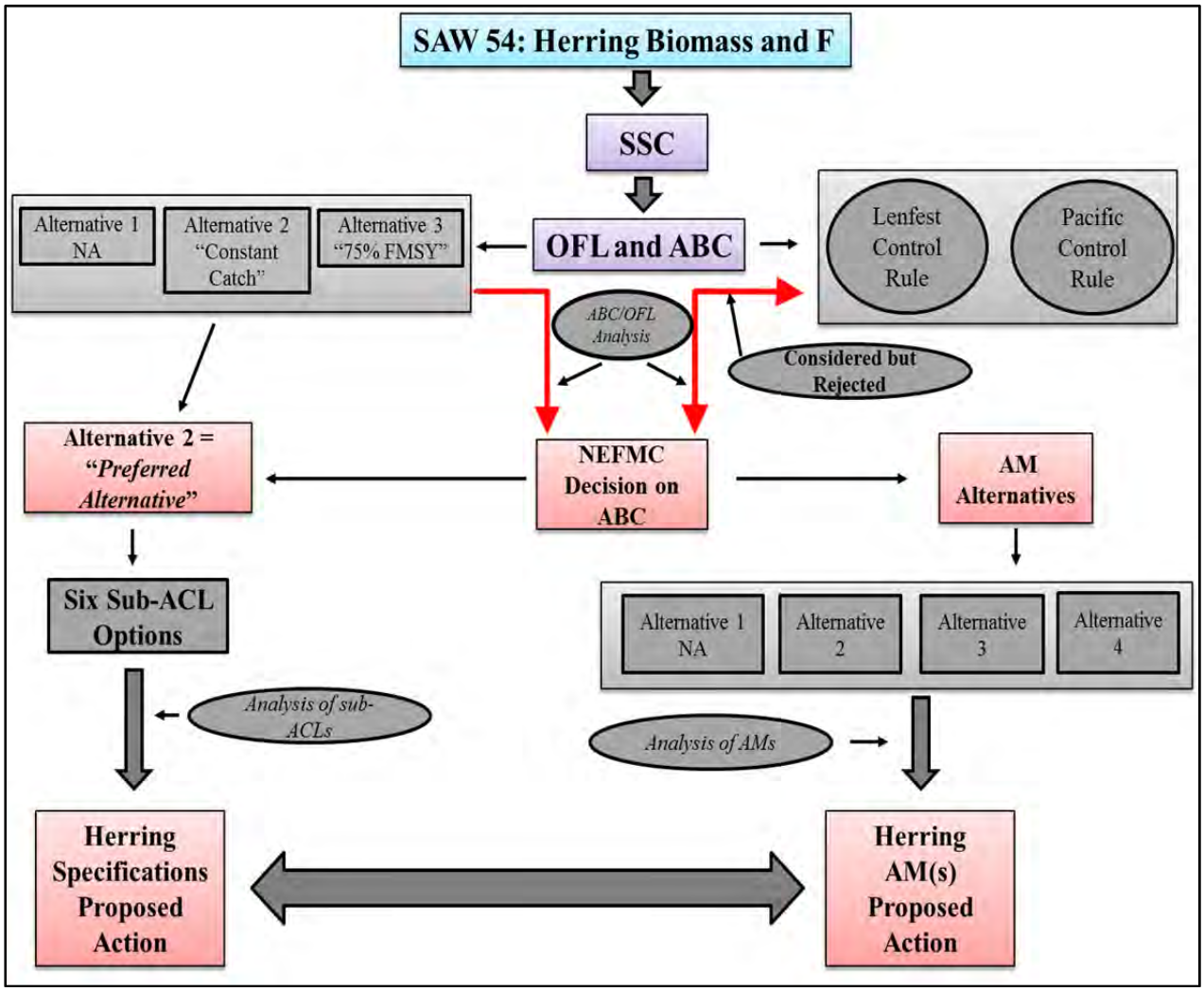
Option 3: If there is a carryover, both the sub-ACL(s) in the corresponding management area(s) and the stockwide ACL would increase for the following fishing year, but the stockwide ACL cannot exceed ABC in any fishing year. The specification of management uncertainty would address the potential for sub-ACL carryovers during the upcoming three fishing years, and the impacts of any carryovers that would increase the stockwide ACL would be analyzed as part of the specifications package.

2.2 ALTERNATIVES UNDER CONSIDERATION: 2013-2015 ATLANTIC HERRING FISHERY SPECIFICATIONS

The 2013-2015 Atlantic herring fishery specifications package includes alternatives for specifying OFL and ABC/ABC Control Rule, options for distributing the stockwide herring ACL into four management areas (sub-ACLs), and alternatives for modifying current accountability measures (AMs) in the herring fishery. The specifications also address management uncertainty, set-asides for research and fixed gear fishing, domestic annual harvesting, domestic annual processing, border transfer, and U.S. at-sea processing for the herring fishery. All elements of the 2013-2015 fishery specifications and alternatives/options considered by the Council are described in the following subsections. The specifications are based on the process outlined in the Herring FMP and the definitions/formulas provided in Section 1.3 of this document (p. 6).

XXX

Figure 2 Illustration of Decision-Making Process for 2013-2015 Herring Fishery Specifications



2.2.1 Alternatives for Specifying OFL, ABC, and ABC Control Rule

The following subsections describe the alternatives under consideration for specifying OFL and ABC for 2013-2015 and establishing an ABC control rule. **The Council's *Preferred Alternative* for specifying OFL and ABC for 2013-2015 is Alternative 2, which is based on a constant catch approach.**

2.2.1.1 Alternative 1 – No Action (Non-Preferred)

The no action alternative would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (Table 2).

Table 2 Alternative 1 (No Action) – Proposed OFL and ABC Specifications (mt) for 2013-2015

YEAR	2013	2014	2015
OFL (mt)	127,000	127,000	127,000
ABC (mt)	106,000	106,000	106,000

**OFL and ABC values are based on the 2012 herring fishery specifications.*

ABC Control Rule: Under this alternative, the interim control rule established in Amendment 4 would remain effective until modified by the Council through a future action:

ABC = Average Catch (2006-2008)

The specification of ABC for 2013-2015 under this alternative (106,000 mt) would reflect average catch in the fishery from 2006-2008.

2.2.1.2 Alternative 2 – Constant Catch Approach (Preferred Alternative)

Alternative 2 is the Council's ***Preferred Alternative*** for specifying OFL and ABC for 2013-2015. It was developed by the Herring PDT based on maintaining a constant catch for all three fishing years while accounting for scientific uncertainty. Under this alternative, ABC would be specified annually for 2013-2015 as 114,000 mt (the catch that is projected to produce a probability of exceeding F_{MSY} in 2015 that is less than or equal to 50%). OFL would be specified as 169,000 mt in 2013, 136,000 mt in 2014, and 114,000 mt in 2015 (Table 3).

Table 3 Alternative 2 (Constant Catch, *Preferred Alternative*) – Proposed OFL and ABC Specifications (mt) for 2013-2015

YEAR	2013	2014	2015
OFL (mt)	169,000	136,000	114,000
ABC (mt)	114,000	114,000	114,000

**OFL values are derived from a unique projection that applies F_{MSY} in every year but assumes that catch in prior years is 114,000 mt.*

ABC Control Rule: Under this alternative, the ABC Control Rule would specify ABC for three years based on the annual catch that is projected to produce a probability of exceeding F_{MSY} in the third year that is less than or equal to 50%. For 2013-2015, this value is 114,000 mt. The Council may modify this control rule or implement a new control rule at any time through a future management action.

2.2.1.3 Alternative 3 – 75% F_{MSY} Approach (Non-Preferred)

Alternative 3 was developed by the Herring PDT and is based on fishing at 75% F_{MSY} to account for scientific uncertainty. Under this alternative, ABC would be specified as 130,000 mt in 2013, 102,000 mt in 2014, and 104,000 mt in 2015 (the projected catch associated with fishing at 75% F_{MSY} – see Table 4).

Table 4 Alternative 3 (75% F_{MSY}, Non-Preferred) – Proposed OFL and ABC Specifications (mt) for 2013-2015

YEAR	2013	2014	2015
OFL (mt)	169,000	127,000	104,000
ABC (mt)	130,000	102,000	88,000

**OFL values are derived from a unique projection that assumes catch associated with F_{MSY} is taken in every year (see SAW 54 Assessment Summary Report in Appendix XXX).*

ABC Control Rule: Under this alternative, the ABC Control Rule would specify ABC annually as the projected catch associated with fishing at 75% F_{MSY}. The Council may modify this control rule or implement a new control rule at any time through a future management action.

2.2.2 Specification of Management Uncertainty for 2013-2015

For the 2013-2015 specifications, the Council is proposing to deduct **6,200 mt** from the ABC to account for management uncertainty due to potential catch of Atlantic herring in the Canadian (New Brunswick (NB)) weir fishery.

Discussion: An additional buffer established between the ABC, and the stock-wide ACL is defined as ***management uncertainty***. Amendment 4 states that management uncertainty should be addressed prior to establishing ACLs, and deductions should be made from ABC, if necessary, to account for management uncertainty. Once management uncertainty are deducted, the stock-wide ACL specification represents the U.S. Optimum Yield (OY).

ABC – Management Uncertainty (determined by Council) = Stock-wide ACL = OY

Consistent with the approach outlined in Amendment 4 to the Herring FMP as well as the 2010-2012 specifications, the Council considered three possible sources of management uncertainty for the 2013-2015 specifications:

1. Canadian Catch (NB weir fishery);
2. State Waters Catch; and
3. Herring Discards.

Based on the information/data considered by the Council (provided in Section 3.0 of this document) as well as the Herring PDT recommendations, the Council has determined that catch in the NB weir fishery is the source of management uncertainty for which there should be a deduction between ABC and the stock-wide ACL. The Council's proposed deduction of 6,200 mt for management uncertainty is based on the most recent three years' average catch in the NB weir fishery, as this best reflects expected catch in this fishery over the next three years. This means that, based on the *Preferred Alternative* for specifying OFL/ABC (Alternative 2, Section 2.2.1.2), the stock-wide herring ACL/OY specification for 2013-2015 is proposed to be 107,800 mt (see Table 5).

2.2.3 Research Set-Asides (RSAs)

The Council proposes **0% RSA** for all management areas for the 2013-2015 herring specifications. This would apply to all sub-ACL options under consideration.

Discussion: The research set-aside was established in Amendment 1 (0-3% for any management area) and includes a corresponding requirement that adjusts the accountability measure to require that the directed fishery in an area close when the catch is projected to reach 92% of its specified sub-ACL (or whatever the appropriate percentage is, based on the RSA). The Council reviewed options to allocate up to 3% RSA; the Herring Committee and Advisory Panel recommended that no RSA be allocated for 2013-2015 because the sub-ACLs already constrain the majority of the fishery, and the RSA amounts would not likely be significant enough to effectively fund cooperative research.

2.2.4 Fixed Gear Set-Aside (FGSA)

The Council proposes maintaining the current **295 mt** FGSA for fixed gear fishermen fishing in Area 1A west of Cutler, Maine.

Discussion: Amendment 1 allows for up to 500 metric tons of Atlantic herring to be set-aside in Area 1A for fixed gear fishermen west of Cutler until November 1. Unutilized set-aside is returned to the 1A fishery following November 1. ME DMR requires the ME state commercial fixed gear fishermen to be compliant with the federal IVR weekly reporting requirements and regulations as well as reporting monthly to ME DMR. The FGSA for Area 1A was set to 295 mt for the 2010-2012 specifications; it was not utilized for the 2012 fishing year and was returned to the herring fishery on November 1. The Council recommends maintaining the 295 mt for the 2013-2015 fishing years.

2.2.5 Options for Sub-ACLs

The Herring FMP requires that the total ACL be annually distributed as sub-ACLs (formerly known as TACs) among the four herring management areas (Figure 1). The sub-ACL options under consideration are based on the ***Preferred Alternative*** for specifying OFL/ABC (Alternative 2, see Section 2.2.1.2), with a deduction to account for management uncertainty (described in Section 2.2.2). The Council recommendation for Atlantic Herring ACL and U.S. OY for 2013-2015 is 107,800 mt (see Table 5).

Table 5 Proposed Stockwide ACL/OY Specification for 2013-2015

Preferred Alternative	**2013**	**2014**	**2015**
OFL (mt)	169,000	136,000	114,000
ABC (mt)	114,000	114,000	114,000
Management Uncertainty	6,200	6,200	6,200
ACL/OY (mt)	**107,800**	**107,800**	**107,800**

**Based on the Council's Preferred Alternative for OFL/ABC, Section 2.2.1.2)*

2.2.5.1 Option 1 – No Action

This option represents the status quo and maintains the 2012 herring management area sub-ACLs through the 2013-2015 fishing years.

Table 6 Option 1 – No Action (2012 Specifications)

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	127,000
ABC (mt)	106,000	106,000
ACL (mt)	91,200	91,200
Sub-ACL Area 1A	26,546	**26,546**
Sub-ACL Area 1B	4,362	**4,362**
Sub-ACL Area 2	22,146	**22,146**
Sub-ACL Area 3	38,146	**38,146**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		91,200

**2013-2015 numbers do not reflect overage deductions.*

2.2.5.2 Option 2

This option proposes to allocate additional available yield for 2013-2015 (16,600 mt) among the four management areas based on the proportional distribution of the total herring ACL in 2012. Under this option, the Area 1A sub-ACL continues to represent 29% of the total ACL, the Area 1B sub-ACL continues to represent 5% of the total ACL, and the Area 2 and 3 sub-ACLs continue to represent 24% and 42% of the total ACL, respectively.

Table 7 Option 2 – Proposed Sub-ACLs (mt) for 2013-2015

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000
ABC (mt)	106,000	114,000
ACL (mt)	91,200	107,800
Sub-ACL Area 1A	26,546 (29%)	**31,200**
Sub-ACL Area 1B	4,362 (5%)	**5,400**
Sub-ACL Area 2	22,146 (24%)	**25,900**
Sub-ACL Area 3	38,146 (42%)	**45,300**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800

**2013-2015 numbers do not reflect overage deductions.*

Seasonal Sub-ACL Splits (2014-2015): If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1), then the following seasonal splits may apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December
- Area 2: 67% January-February; 33% March-December

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (i.e., closure of directed fishery at 95% or other threshold). For Area 2, any un-utilized sub-ACL from the first season (January-February) would be carried over to the second season (March-December) to allow for full utilization during the fishing year.

2.2.5.3 Option 3

Option 3 was developed by allocating additional available yield for 2013-2015 (16,600 mt) equally among Areas 1A, 1B, and 2, the areas with sub-ACLs that are more often fully utilized. The sub-ACLs in Areas 1A, 1B, and Area 2 would increase about 5,500 mt, and the Area 3 sub-ACL remains similar to 2012 under this option.

Table 8 Option 3 – Proposed Sub-ACLs (mt) for 2013-2015

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000
ABC (mt)	106,000	114,000
ACL (mt)	91,200	107,800
Sub-ACL Area 1A	26,546	**32,100**
Sub-ACL Area 1B	4,362	**9,900**
Sub-ACL Area 2	22,146	**27,800**
Sub-ACL Area 3	38,146	**38,000**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800

**2013-2015 numbers do not reflect overage deductions.*

Seasonal Sub-ACL Splits (2014-2015): If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1), then the following seasonal splits may apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December
- Area 2: 67% January-February; 33% March-December

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (i.e., closure of directed fishery at 95% or other threshold). For Area 2, any un-utilized sub-ACL from the first season (January-February) would be carried over to the second season (March-December) to allow for full utilization during the fishing year.

2.2.5.4 Option 4

This option proposes to allocate additional available yield for 2013-2015 (16,600 mt) based on concerns and needs expressed by the industry fishing for both herring and mackerel in Area 2. Under this option, the sub-ACLs for Areas 1A, 1B, and 2 would all increase from 2012 levels; the Area 2 sub-ACL would increase about 10,000 mt, and the remaining yield would be distributed among Areas 1A and 1B.

Table 9 Option 4 – Proposed Sub-ACLs (mt) for 2013-2015

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000
ABC (mt)	106,000	114,000
ACL (mt)	91,200	107,800
Sub-ACL Area 1A	26,546	**32,000**
Sub-ACL Area 1B	4,362	**5,800**
Sub-ACL Area 2	22,146	**32,000**
Sub-ACL Area 3	38,146	**38,000**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800

**2013-2015 numbers do not reflect overage deductions.*

Seasonal Sub-ACL Splits (2014-2015): If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1), then the following seasonal splits may apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December
- Area 2: 67% January-February; 33% March-December

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (i.e., closure of directed fishery at 95% or other threshold). For Area 2, any un-utilized sub-ACL from the first season (January-February) would be carried over to the second season (March-December) to allow for full utilization during the fishing year.

2.2.5.5 Option 5

This option is similar to Option 4 but proposes different sub-ACL allocations for 2013 due to the late implementation of the 2013 specifications (anticipated implementation late summer 2013). Under this option, 5,000 mt of herring allocated to Area 1B during 2013 is shifted to Area 2 for the 2014 and 2015 fishing years.

Table 10 Option 5 – Proposed Sub-ACLs (mt) for 2013-2015

	2010-2012	2013	2014/2015
OFL (mt)	145,000/134,000/127,000	169,000	136,000/114,000
ABC (mt)	106,000	114,000	114,000
ACL (mt)	91,200	107,800	107,800
Sub-ACL Area 1A	26,546	**32,000**	**32,000**
Sub-ACL Area 1B	4,362	**10,800**	**5,800**
Sub-ACL Area 2	22,146	**27,000**	**32,000**
Sub-ACL Area 3	38,146	**38,000**	**38,000**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800	107,800

**2013-2015 numbers do not reflect overage deductions.*

Seasonal Sub-ACL Splits (2014-2015): If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1), then the following seasonal splits may apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December
- Area 2: 67% January-February; 33% March-December

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (i.e., closure of directed fishery at 95% or other threshold). For Area 2, any un-utilized sub-ACL from the first season (January-February) would be carried over to the second season (March-December) to allow for full utilization during the fishing year.

2.2.5.6 Option 6

This option was developed based on a Herring Committee recommendation to consider shifting some yield from Area 3 to Area 2 to address the needs of the mackerel/herring fishery in Area 2. Under this option, about 8,000 mt of the Area 3 sub-ACL is re-allocated to Area 2, and the majority of the additional yield available in 2013-2015 is allocated to Areas 1A and 1B.

Table 11 Option 6 – Proposed Sub-ACLs (mt) for 2013-2015

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000
ABC (mt)	106,000	114,000
ACL (mt)	91,200	107,800
Sub-ACL Area 1A	26,546	**40,000**
Sub-ACL Area 1B	4,362	**5,800**
Sub-ACL Area 2	22,146	**32,000**
Sub-ACL Area 3	38,146	**30,000**
No Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800

**2013-2015 numbers do not reflect overage deductions.*

Seasonal Sub-ACL Splits (2014-2015): If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1), then the following seasonal splits may apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December
- Area 2: 67% January-February; 33% March-December

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (i.e., closure of directed fishery at 95% or other threshold). For Area 2, any un-utilized sub-ACL from the first season (January-February) would be carried over to the second season (March-December) to allow for full utilization during the fishing year.

2.2.6 Other 2013-2015 Fishery Specifications

This section identifies the Council's recommendations for the remaining specifications for the 2013-2015 fishing years. Information to support these specifications is provided below, and additional information/discussion can be found in Sections 3.0 and 4.0 of this document.

2.2.6.1 Domestic Annual Harvest (DAH)

For 2013-2015, DAH is proposed to be set to equal OY for the U.S. Atlantic herring fishery (107,800 mt, based on the Council's ***Preferred Alternative***). Domestic annual harvest (DAH) is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year.

OY = DAH

Discussion: When specifying DAH for the herring fishery, important considerations relate to the actual and potential capacity of the U.S. harvesting fleet. Recent fishery performance (catch) is an important factor, as well as the potential for the fishery to expand in the short-term.

The Herring FMP became effective during the 2001 fishing year, and since 2001, total landings in the U.S. fishery have decreased, averaging 93,792 mt over the time series (Table 12). Herring landings from the most recent five-year period (2007-2011) averaged 86,373 mt.

The 2007-2009 specifications document provided data to indicate that the U.S. fleet was capable of harvesting all of the available yield from the herring resource (DAH was specified at 145,000 mt for 2007-2009). Thus, the Council determined that both the total allowable level of foreign fishing (TALFF) and joint venture processing (JVP) should be set at 0 mt for 2007-2009 primarily due to the potential for DAH and DAP to be realized by the domestic fishery and maximized benefits to the U.S. harvesting and shoreside processing sectors. From this time period through 2011, there has been no JVP activity for herring in recent years, so TALFF allocations to support these operations have not been necessary. Amendment 4 eliminated the need to specify JVP and TALFF on an annual basis.

The average herring catch of 86,373 mt from 2007 to 2011 has been lower than the proposed DAH specification for 2013-2015. Possible reasons for lower harvest relate to sub-ACL reductions during 2010-2012, which included a large buffer for scientific uncertainty due to a strong retrospective pattern in the assessment (the ACL was lower than previous years), as well as the impacts of the Amendment 1 measures implemented in 2006/2007, including a limited access program and a seasonal purse seine/fixed gear only area in the inshore GOM. The size and capacity of the herring fleet has not changed substantially since 2007, and the capability of the fleet to catch the available DAH exists; in 2009, the vessels caught 103,943 mt, close to the proposed DAH specification for 2013-2015. These data indicate that the proposed DAH specification is consistent with the harvesting capacity of the domestic fleet.

Table 12 Total U.S. Atlantic Herring Catch, 2001-2011

YEAR	TOTAL U.S. Herring Catch (MT)
2001	120,025
2002	93,183
2003	101,607
2004	93,205
2005	96,116
2006	95,714
2007	85,819
2008	83,240
2009	103,943
2010	72,852
2011	86,245

Source: NMFS
**2001 and 2002 totals are reported VTR landings; 2003-2011 data are provided by NMFS (year-end catch totals).*

2.2.6.2 Domestic Annual Processing (DAP)

DAP is proposed to be set equal DAH minus 4,000 mt for BT during the 2013-2015 fishing years (**103,800 mt**).

Discussion: Domestic Annual Processing (DAP) is defined in the Herring FMP as the amount of U.S. harvest that domestic processors will use, combined with the amount of the resource that will be sold as fresh fish (including bait). The Herring FMP specifies that DAP is a subset of DAH and is composed of estimates of production from U.S. shoreside and at-sea processors. While it is difficult to predict whether or not the U.S. processing sector will utilize all of the available DAP in 2013-2015, it is certainly possible given the capacity of the domestic processing sector.

2.2.6.3 Border Transfer (BT)

BT represents U.S.-caught herring transferred to Canadian vessels for export and is proposed to be set at **4,000 mt** for the 2013-2015 fishing years.

Discussion: Specification of BT has remained at 4,000 mt since the implementation of the Herring FMP, and there was no change for the 2010-2012 fishing years. Table 13 indicates a decrease in BT from 1994-2011, with zero utilization of the border transfer from 2008 to 2010 and in 2011 utilizing 946 mt (24% of 4,000 border transfer mt).

Table 13 Utilization of Border Transfer (mt)

YEAR	MT Utilized in BT
1994	2,456
1995	2,117
1996	3,690
1997	1,280
1998	1,093
1999	839
2000	1,546
2001	445
2002	688
2003	1,311
2004	184
2005	169
2006	653
2007	53
2008	0
2009	0
2010	0
2011	946

**Source: NMFS*

2.2.6.4 U.S. At-Sea Processing (USAP)

Specification of USAP for the 2013-2015 fishing years is proposed to be set at **0 mt**.

Discussion: The Herring FMP states that "part of DAP may be allocated for at-sea processing by domestic vessels that exceed the vessel size limits (see Section 3.6.6 of the Herring FMP). This allocation will be called the 'U.S. at-sea processing' (USAP) allocation. The term 'at-sea processing' refers to processing activities that occur in the Exclusive Economic Zone outside State waters. When determining this specification, the Council will consider the availability of other processing capacity, development of the fishery, status of the resource, and opportunities for vessels to enter the herring fishery." The USAP specification serves as a cap for USAP activities and is not a specific allocation to this processing sector.

USAP can provide an additional outlet for U.S. harvesters, particularly those who operate vessels that do not have refrigerated saltwater (RSW) systems to maintain catch quality for delivery to shoreside processors. Such vessels could offload product to USAP vessels near the fishing areas, increasing the benefits to the U.S. industry. This is consistent with one of the objectives of the Atlantic Herring FMP: to provide, to the extent practicable, controlled opportunities for fishermen and vessels in other mid-Atlantic and New England fisheries.

During the 2007-2009 fishing years, the Council maintained a USAP specification of 20,000 mt (Areas 2/3 only) based on information received about a new at-sea processing vessel that intended to utilize a substantial amount of the USAP specification. At that time, landings from Areas 2 and 3 – where USAP is authorized – were considerably lower than allocated sub-ACLs (formerly TACs) for each of the past several years. Moreover, the specification of 20,000 mt for USAP did not restrict either the operation or the expansion of the shoreside processing facilities during the 2007-2009 fishing years. However, this operation never materialized, and none of the USAP specification was used during the 2007-2009 fishing years. Consequently, the Council set USAP at zero for the 2010-2012 fishing years. The Council has not received any information that would suggest changing this specification for the 2013-2015 fishing years.

2.2.7 Alternatives for Accountability Measures

In August 2012, a Court Order addressing remedial action pertaining to deficiencies identified in Amendment 4 to the Atlantic herring Fishery Management Plan was issued. One of the issues ordered to be addressed within the 2013-2015 Atlantic herring specifications is reconsideration of existing Atlantic herring AMs. Consistent with the Court Order, the Council is considering the following range of alternatives to modify existing accountability measures in the 2013-2015 specifications package. If a new AM is recommended by the Council, it may require implementation through a future action (framework adjustment or amendment to the Herring FMP).

The current AM associated with the haddock catch cap is described in the No Action Alternative (Alternative 1, see following subsection) and will remain effective under any other alternatives for AMs under consideration in the 2013-2015 herring specifications package.

NMFS' Guidelines state that accountability measures (AMs) are management measures implemented for stocks such that exceeding the ACL is prevented, where possible, and corrected or mitigated if it occurs. The Guidelines suggest three kinds of AMs that could be considered: (1) those that can be applied in-season, designed to prevent the ACL from being reached/exceeded; and (2) those that are applied after the fishing year, designed to address the operational issue that caused the ACL overage and ensure that it does not happen in subsequent fishing years, and, as necessary, address any biological harm to the stock; and (3) those that are based on multi-year average data which are reviewed and applied annually. AMs should address and minimize the frequency and magnitude of overages and should be designed so that if an ACL is exceeded, specific adjustments are effective in the next fishing year or as soon as possible. The Guidelines also suggest that multi-year specifications (like those for the Atlantic herring fishery) should include AMs that provide for automatic adjustments in the subsequent year's harvest if an ACL is exceeded in one year.

2.2.7.1 Alternative 1 – No Action

This alternative would maintain status quo conditions regarding the current AMs in the herring fishery. The AMs that would remain effective under the no action alternative are described below.

AM – Management Area Closure (Directed Fishing)

Currently, the directed fishery for herring in a management area is closed when 95% of the sub-ACL is projected to be reached; 5% is provided after the closure to account for incidental catch fishing under a 2,000 pound trip limit (and up to an additional 3% for research set-aside, which would result in a directed fishery closure when 92% of catch is projected). Closing the directed fishery at a 95% projected catch level helps to minimize the risk of exceeding 100% of the sub-ACL during the fishing year. Once the directed fishery is closed, all vessels are limited to 2,000 pounds of Atlantic herring, which is accounted for through the 5% "buffer" that remains available.

Discussion: This accountability measure was implemented in the Council's Atlantic Herring FMP (1999) and has helped to keep catch at or near management area sub-ACLs since that time. While some overages have been experienced, the frequency and degree of overage has not been significant enough to compromise the health of the resource or stock complex. The rationale provided in the Herring FMP for this provision states:

> *Closing the fishery when the TAC is reached will protect the resource and ensure long term sustainable catches are achieved. This provision also sends a signal to the industry that harvests should be controlled or the fishery may close. The set-aside for incidental catches in other fisheries reduces the likelihood that the overall TAC will be exceeded. This level can be reduced by the Regional Administrator, or can be increased through a framework adjustment measure, if it appears to misstate the incidental catch.*

AM – ACL and Sub-ACL Overage Deduction

This AM establishes a process to address stockwide ACL and/or sub-ACL overages in the Atlantic herring fishery. Once the final total catch for a fishing year is determined during the subsequent fishing year using the best available information (including VTR reports to account for incidental catch in other fisheries), any ACL/sub-ACL overage results in a reduction of the corresponding ACL/sub-ACL for the fishing year after the final total catch is tallied. The ACL/sub-ACL deduction equals the amount that was exceeded. NMFS makes these determinations and publish any changes to the ACLs/sub-ACLs in the *Federal Register* prior to the start of the fishing year during which the deduction would occur.

Discussion: This accountability measure was implemented in Amendment 4, consistent with the NMFS Guidelines that suggest consideration of AMs that are applied after the fishing year, designed to address the operational issue that caused the sub-ACL overage and ensure that it does not happen in subsequent fishing years, and, as necessary, address any biological harm to the stock. An example of how this AM is applied is provided below.

Example (Using Area 1A): In Year 1, the directed herring fishery in Area 1A closes when 95% of the sub-ACL is projected to be reached, and *all* vessels fishing in Area 1A are subject to a 2,000 pound trip limit for herring. This includes vessels with limited access herring permits and vessels participating in other fisheries and catching herring incidentally (some with limited access permits for herring, and some with open access permits for herring). During Year 2, VTR reports from all fisheries are compiled to generate a final tally of all herring catch during Year 1 (likely around April of Year 2 given the VTR lag time). If the final tally indicates that there was a sub-ACL overage during Year 1, the overage would be deducted from the Year 3 sub-ACL for Area 1A. NMFS publishes the Year 3 sub-ACLs with appropriate deductions prior to the start of the Year 3 fishing year.

AM – Haddock Catch Cap

The Herring FMP includes an AM for the current haddock catch cap, consistent with the establishment of the catch cap as a sub-ACL in the groundfish fishery (Amendment 16) and consistent with current regulations regarding the catch cap. When the Regional Administrator has determined that the haddock catch cap (§648.85(d)) has been caught, all vessels issued an Atlantic herring permit or fishing in the Federal portion of the GOM/GB Herring Exemption Area, will be prohibited from fishing for, possessing, or landing herring in excess of 2,000 lb per trip in or from the GOM/GB Herring Exemption Area unless the vessel has a multispecies permit and is fishing on a declared groundfish trip.

2.2.7.2 AM Alternative 2

Alternative 2 relies on herring catch estimation from NMFS' "in-season" ACL/sub-ACL monitoring methods to trigger the AMs that close the directed fishery as well as the AMs for ACL/sub-ACL overage paybacks. NMFS' in-season monitoring methods are close to real-time and utilize daily VMS reports supplemented with state/federal dealer data; these methods are described in Section 3.5.1.2.1 of this document. Under this alternative, the following accountability measures (AMs) would apply:

1. The trigger for closing the directed herring fishery in a management area would be reduced to 92% of the sub-ACL (not including RSAs). When 92% of a management area sub-ACL is projected to be reached, the directed herring fishery in that area would close, and all herring permit holders would be limited to 2,000 pounds of herring per trip in that area for the remainder of the fishing year.
    - ***Option A:*** The trigger for closing the directed herring fishery in a management area would be 92% of the sub-ACL, and the trigger for closing the directed herring fishery in all management areas would be 95% of the stockwide ACL. When 95% of the stockwide ACL for herring is projected to be reached, the directed herring fishery in all management areas would close, and all herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year.

- ***Option B:*** Both the triggers for closing the directed herring fishery in a management area (sub-ACL) and for closing the directed fishery across all management areas (stockwide ACL) would be 92%.

2. The AM to require an ACL/sub-ACL overage deduction would be based on in-season catch estimates (as of the week ending December 31 of the fishing year) and would apply to both sub-ACLs and the stockwide ACL for herring. This AM would require a direct deduction of an overage from the ACL/sub-ACL in the following fishing year (versus the current one-year lag time based on year-end catch estimation methods).

***Option*:** As an option, this alternative may include a measure that would allow NMFS to prohibit all catch/possession of herring in a management area if 100% of the sub-ACL is projected to be reached, and across all areas if 100% of the stockwide herring ACL is projected to be reached.

Table 14 AM Alternative 2

AM	Description
Trigger for Directed Fishery Closure	This alternative would adjust the existing AM to require the directed herring fishery in a given management area to close when catch is projected to reach 92% (not including RSAs) of a sub-ACL (versus 95%). The remaining 8% is provided after the closure to account for incidental catch fishing under a 2,000 pound trip limit for all vessels with herring permits.
Overage Payback	This alternative would require a direct deduction of a sub-ACL overage in the following fishing year (versus the current one-year lag). The process for determining sub-ACL overages would be based on NMFS in-season sub-ACL monitoring (daily VMS catch reports supplemented with state and federal dealer data), consistent with management measures implemented as part of the Amendment 5 catch monitoring program. Under this alternative, once the final catch for a fishing year is determined by NMFS for sub-ACL monitoring purposes, any sub-ACL overage would result in a reduction of the corresponding sub-ACL for the following fishing year equal to the amount that was exceeded. NMFS would make these determinations and publish any changes to the ACLs in the Federal Register as early in the subsequent fishing year as possible.

2.2.7.3 AM Alternative 3

Alternative 3 would continue to rely on herring catch estimation from NMFS' "year-end" catch tallying methods to trigger the AM for overage paybacks (described in detail in Section 3.5.1.2.1.2 of this document). The AM for closing the directed fishery in a management area would continue to be triggered based on NMFS' "in-season" monitoring (described in Alternative 2 above) but would be modified (see below). Under this alternative, the following accountability measures (AMs) would apply:

1. The AM trigger for closing the directed herring fishery in a management area would be reduced to 92% of the sub-ACL (not including RSAs) in any area (for the next fishing year) when the following conditions are met:

    - The stock is overfished or overfishing is occurring; and
    - The sub-ACL for the area has been exceeded in at least one of the preceding two years.

    If this occurs, when 92% of a management area sub-ACL is projected to be reached, the directed herring fishery in that area would close, and all herring permit holders would be limited to 2,000 pounds of herring per trip in that area for the remainder of the fishing year. Triggers for other areas would remain at 95% unless the above conditions are met in any of those areas as well.

2. The current AM to require a pound-for-pound sub-ACL overage deduction based on year-end catch tallies (with a one-year lag) would remain effective, but the deduction would only be required if the sub-ACL is exceeded by 5% or more when overfishing is not occurring and the stock is rebuilt (i.e., above the target biomass). When the stock is above the target biomass, the pound-for-pound deduction would not be required for overages that total less than 5% of the sub-ACL, provided that the stockwide ACL is not exceeded during the same fishing year. If the stockwide ACL is exceeded and/or if the stock is not above target biomass, then all overage deductions would be required.

***Option*:** As an option, this alternative may include a measure that would allow NMFS to prohibit all catch/possession of herring in a management area if 100% of the sub-ACL is projected to be reached, and across all areas if 100% of the stockwide herring ACL is projected to be reached.

Table 15 AM Alternative 3

AM	Description
Trigger for Directed Fishery Closure	This alternative would adjust the existing AM to require the directed herring fishery in a given management area to close when catch is projected to reach 92% (not including RSAs) of a sub-ACL (versus 95%) under the following conditions: • The stock is overfished or overfishing is occurring; and • The sub-ACL for the management area has been exceeded in at least one of the preceding two years.
Overage Payback	Under this alternative, when overfishing is not occurring and the stock is rebuilt (i.e., above the target biomass), the pound-for-pound payback of a sub-ACL overage in a given management area would only be required if the sub-ACL is exceeded by 5% or more (year-end methodology).

2.2.7.4 AM Alternative 4

Alternative 4 modifies the current AM for triggering the closure of the directed fishery in a management area as well as the AM for overage paybacks. Under this alternative, NMFS' "in-season" methods (described in Section 3.5.1.2.1.1 and Alternative 2 above) would continue to be utilized to monitor catch against the ACL/sub-ACLs, and the "year-end" methods would continue to be utilized to determine overages and paybacks (with a one-year lag, described in detail in Section 3.5.1.2.1.2 of this document). If Alternative 4 is selected, the following accountability measures (AMs) would apply:

1. The percent trigger for closing the directed herring fishery in a management area where a sub-ACL overage occurs would be reduced during the following fishing year by the same percentage as the overage that occurred, based on NMFS' in-season monitoring methods (as of the week ending December 31). For example, under the current 95% closure AM (for the directed fishery), if NMFS in-season monitoring data indicate the sub-ACL in a management area was exceeded by 4% during the fishing year, then the directed fishery in that area would close at 91% of the sub-ACL in the following year (instead of 95%). NMFS would evaluate all available data and publish the change to the trigger for closure in the Federal Register as soon as possible during the following fishing year.

   ***Option A*:** Under this option, this AM would also apply to the stockwide ACL for herring. The trigger for closing the directed herring fishery in all management areas would be 95% of the stockwide herring ACL and would be reduced in the following fishing year if an overage occurs according to the provisions described above.

2. The current AM to require a pound-for-pound sub-ACL overage deduction based on year-end catch tallies (with a one-year lag) would remain effective, but the deduction would only be required if the sub-ACL is exceeded by 5% or more when overfishing is not occurring and the stock is rebuilt (i.e., above the target biomass). When the stock is above the target biomass, the pound-for-pound deduction would not be required for overages that total less than 5% of the sub-ACL, provided that the stockwide ACL is not exceeded during the same fishing year. If the stockwide ACL is exceeded and/or if the stock is not above target biomass, then all overage deductions would be required.

***Option*:** As an option, this alternative may include a measure that would allow NMFS to prohibit all catch/possession of herring in a management area if 100% of the sub-ACL is projected to be reached, and across all areas if 100% of the stockwide herring ACL is projected to be reached.

Table 16 AM Alternative 4

AM	Description
Trigger for Directed Fishery Closure	This alternative would reduce the percentage trigger for closing the directed fishery in Year 2 in any management area where a sub-ACL overage occurs in Year 1. The reduction from 95% would equal the overage percentage. For example, under the current 95% closure AM (for the directed fishery), if NMFS sub-ACL monitoring data indicate the sub-ACL in a management area was exceeded by 4% during the fishing year, then the area would close at 91% of the sub-ACL in the following year (instead of 95%).
Overage Payback	Under this alternative, when overfishing is not occurring and the stock is rebuilt (i.e., above the target biomass), the pound-for-pound payback of a sub-ACL overage in a given management area would only be required if the sub-ACL is exceeded by 5% or more (year-end methodology).

2.3 ALTERNATIVES CONSIDERED BUT REJECTED

Consistent with the court order and guidance from NMFS (see Section 1.1 for more information), a range of alternatives for ABC control rules and accountability measures were considered by the Council during the fishery specifications process. These alternatives were developed over the course of several meetings of the Council, Herring Committee, Herring Advisory Panel, and PDT during 2012. The Council approved the final measures for this action at its XXX meeting. The alternatives that were eliminated from further consideration at this time are discussed below, along with the Council's rationale for eliminating them. If appropriate and/or necessary, the Council may reconsider any of these alternatives in a future action related to the Atlantic Herring FMP (framework adjustment, amendment, specifications package). In some cases, details and preliminary analyses have already been provided, laying the groundwork for reconsideration of these measures in the future.

2.3.1 Alternatives for ABC Control Rule

XXX

"Lenfest Control Rule"

This alternative is generally based on the harvest control rule developed by the Lenfest Forage Fish Task Force (described in more detail in Appendix XXX). Given current herring stock size and reference points (SAW 54), fishing at 50% F_{MSY} for 2013-2015 would be broadly consistent with the approach suggested by Lenfest Control Rule. Under this alternative, OFL would be specified as 169,000 mt in 2013, 127,000 mt in 2014, and 104,000 mt in 2015. ABC would be specified as 93,000 mt in 2013, 77,000 mt in 2014, and 68,000 mt in 2015 (the projected catch associated with fishing at 50% F_{MSY} – see Table 17).

Table 17 Proposed OFL and ABC Specifications (mt) for 2013-2015 Under Lenfest Control Rule Approach

YEAR	2013	2014	2015
OFL (mt)	169,000	127,000	104,000
ABC (mt)	93,000	77,000	68,000

**OFL values are derived from a unique projection that assumes catch associated with F_{MSY} is taken in every year (see SAW 54 Assessment Summary Report in Appendix XXX).*

Under this alternative, the ABC Control Rule would specify ABC annually as the projected catch associated with fishing at 50% $F_{MSY.}$ The Lenfest Forage Fish Task Force control rule proposes a conservative target F (suggested 50% F_{MSY}) when stock biomass is above a target level and sets ABC as a function of biomass, decreasing catch as biomass decreases (hockey stick control rule) to a cutoff level, at which there would be no fishing.

XXX

"Pacific Control Rule"

This alternative is based on a harvest control rule used by the Pacific Fishery Management Council for forage fish (described in more detail in Appendix XXX). Given current herring stock size and reference points (SAW 54), fishing at 50% F_{MSY} for 2013-2015 is generally consistent with the approach suggested by Pacific Control Rule. Under this alternative, OFL would be specified as 169,000 mt in 2013, 127,000 mt in 2014, and 104,000 mt in 2015. ABC would be specified as 93,000 mt in 2013, 77,000 mt in 2014, and 68,000 mt in 2015 (the projected catch associated with fishing at 50% F_{MSY} – see Table 18).

Table 18 Proposed OFL and ABC Specifications (mt) for 2013-2015 Under Pacific Control Rule Approach

YEAR	2013	2014	2015
OFL (mt)	169,000	127,000	104,000
ABC (mt)	93,000	77,000	68,000

**OFL values are derived from a unique projection that assumes catch associated with F_{MSY} is taken in every year (see SAW 54 Assessment Summary Report in Appendix XXX).*

Under this alternative, the ABC Control Rule would specify ABC annually as the projected catch associated with fishing at 50% $F_{MSY.}$ The approach suggested in the Pacific Control Rule is similar to the 75% F_{MSY} approach (Alternative 3), in that the fishing rate will remain the same regardless of stock biomass, until biomass declines to a cutoff level, at which point fishing is ceased. The F rate, however, is set more conservatively than 75% F_{MSY} based on scientific uncertainty and an additional buffer to account for forage/ecosystem considerations. For the short-term (2013-2015), the F rate would be 50% $F_{MSY.}$

The SSC and Council have considered this alternative, but recommend that the reference points and projections receive further evaluation prior to implementation as a long-term strategy for managing the herring fishery (see SSC Report in Appendix XXX).

2.3.2 Alternatives for Accountability Measures (AMs)

There were two AM alternatives that the Council considered but rejected, which are described below along with Council's rationale for rejecting these two alternatives at this time.

AM for In-Season Adjustments

Current regulations in the Atlantic herring fishery grant authority to the NMFS Regional Administrator to adjust any of the management area sub-ACLs for herring during the fishing year, after consultation with the Council. During the development of the herring specifications, the Council reconsidered an alternative for an AM that would establish a threshold (% of sub-ACL, for example) to trigger a review by the NMFS Regional Administrator to determine if in-season adjustments are necessary to ensure that the sub-ACL in a management area is not exceeded during the fishing year.

Had this alternative been selected, the provisions would have had to state clearly what the trigger would be and what in-season actions/adjustments the RA may want to consider during the review. This alternative was discussed by the Herring Advisory Panel members and the Herring Oversight Committee. Further provisions considered were possession limits and days out at sea, but recognized a great deal of ambiguity surrounding this AM and couldn't identify specific details. For the same reasons, the Council eliminated this alternative from consideration again during the 2013-2015 specifications process.

AM for Overage Paybacks

This alternative would have established a process to address ACL/sub-ACL overages in the herring fishery following a review of the impacts of the overage. Once the final catch for a fishing year was determined using the best available information, any ACL or sub-ACL overage would trigger a review by the Herring PDT to determine if a negative biological impact occurred from the overage, and if so, to what extent. The Herring PDT would then recommend ACL/sub-ACL adjustments to account for the overage based on this review. As part of its review, the Herring PDT would consider all potential biological impacts resulting from the overage, including impacts on individual stock components, spawning, productivity, and ecosystem impacts. The PDT may also recommend no adjustments if it determines that the overage did not result in a negative biological impact.

This alternative would have required a one-year lag time to conduct the review and determine the appropriate adjustments. Changes to the ACLs/AMs for Year 3 would not have required a Council action, but would be made by NMFS through publication in the *Federal Register*, following a recommendation by the Council after reviewing the Herring PDT's analysis. Noting the time concerns and the possibility that the Herring PDT requirements would not be feasible, the PDT recommended the elimination of the option from consideration in Amendment 4, and Committee recommended the same. This alternative would also presumably become obsolete with the implementation of the catch monitoring program; if an overage was large enough to indicate a measurable impact then the problem would have originated from the failure of the catch monitoring program to prevent the overage from occurring. For the same reasons, the Council eliminated this alternative from consideration again during the 2013-2015 specifications process.

3.0 AFFECTED ENVIRONMENT

The Affected Environment is described in this document based on valued ecosystem components (VECs). The VECs for consideration include: Atlantic Herring; Non-Target Species and Other Fisheries; Physical Environment and Essential Fish Habitat (EFH); Protected Resources; and Fishery-Related Businesses and Communities. VECs represent the resources, areas, and human communities that may be affected by the management measures under consideration in this amendment. VECs are the focus since they are the "place" where the impacts of management actions are exhibited.

3.1 ATLANTIC HERRING

The NEFMC manages herring under the Atlantic Herring FMP. The stock is not overfished at this time and overfishing is not occurring (the stock is considered rebuilt). A complete description of the Atlantic herring resource can be found in Section 7.1 of the FSEIS for Amendment 1 to the Herring FMP. Updated information to supplement that presented in Amendment 1 can be found in Section 6.1 of the EA for Amendment 4 to the Herring FMP. The following subsections update information through 2011 where possible and summarize the stock status and recent biological information for Atlantic herring. Further information is presented in Amendment 5 to the Herring FMP.

3.1.1 Background Information

The Atlantic herring (*Clupea harengus*), is widely distributed in continental shelf waters of the Northeast Atlantic, from Labrador to Cape Hatteras. Herring can be found in every major estuary from the northern Gulf of Maine to the Chesapeake Bay. They are most abundant north of Cape Cod and become increasingly scarce south of New Jersey (Kelly and Moring 1986) with the largest and oldest fish found in the southern most portion of the range (Munro 2002). Spawning occurs in the summer and fall, starting earlier along the eastern Maine coast and southwest Nova Scotia (August – September) than in the southwestern Gulf of Maine (early to mid-October in the Jeffreys Ledge area) and Georges Bank (as late as November – December; Reid et al. 1999). In general, Gulf of Maine herring migrate from summer feeding grounds along the Maine coast and on Georges Bank to southern New England and Mid-Atlantic areas during winter, with larger individuals tending to migrate farther distances. Presently, herring from the Gulf of Maine and Georges Bank components are combined for assessment purposes into a single coastal stock complex.

Additionally, Amendment 5 to the Herring FMP describes a tagging project executed by Maine DMR between 2003 and 2006 to provide evidence of intermixing of Gulf of Maine, George's Bank, and Scotian Shelf herring. The tag recoveries showed a clear pattern of short-term residency during the summer feeding and spawning period, which was then followed by a long distance migration through time. German bank spawning ground turnover rates were also studied in 2009, and the results showed a trend towards staying on the spawning grounds, with most fish being recaptured by the third week after release on the spawning grounds, and some fish remaining on the grounds for up to five weeks. A number of inshore trawl surveys were

performed by NMFS and MA DMF from 1990-2011 and 1978 to 2010 respectively to examine trends in the distribution of Atlantic herring as an inshore component. Similarly, NMFS has performed Acoustic surveys since 1999 in an effort to study Atlantic herring population and distribution. Catch sampling of Atlantic herring has been collected since 1970 by ME DMR and there are between 175 and 250 samples processed each year, further in depth analysis can be seen in Amendment 5 to the Herring FMP.

Atlantic Herring as a Forage Species

To date, the Council, based on recommendations from its Herring PDT, has determined that the importance of herring as a forage species and the role of herring in the ecosystem is adequately addressed through analyses conducted as part of the SAW 54 and the benchmark stock assessment for Atlantic herring as well as through the specification-setting process and the SSC's determination of Acceptable Biological Catch, which includes a buffer for scientific uncertainty. Specifically, the role of herring as a keystone species in the ecosystem and the availability of herring as prey are two of several important considerations in the Council's ACL-setting process for the Atlantic herring fishery. It is well known that Atlantic herring are consumed by demersal and pelagic fish, marine mammals, and seabirds in addition to human exploitation. Overholtz and Link (2007) estimated the total annual removal of herring from the ecosystem by predator species for the period 1977-2002, using different modeling approaches, assumptions, and data inputs, depending on the information available. Overall, the authors estimated that predators often consumed more herring than the amount harvested by the fishery between 1959 and 2002, and that predation was likely important to the herring dynamics in the Gulf of Maine/Georges Bank area.

3.1.2 Updated Stock Information (SAW/SARC 54)

The Stock Assessment Review Committee (SARC) of the 54th Northeast Regional Stock Assessment Workshop (SAW 54) met in June 2012 to review the Northeast regional benchmark stock assessment of Atlantic herring in Woods Hole, MA. A statistical catch-at-age model (Age Structured Assessment Program, ASAP; Legault and Restrepo 1999) was proposed as the best scientific information for determining Atlantic herring stock status. The SARC 54 Panel recognized natural mortality (M), the 2008 year class, and Biological Reference Points (BRPs) as scientific uncertainties. The spawning stock biomass (SSB) was estimated at 517,930 mt in 2011 and fishing mortality rate at age 5 (F) was estimated to be 0.14. Age 5 was used because it is fully selected in the mobile gear fleet, which accounted for much of the catch in recent years.

The SAW/SARC 54 assessment did not have the same problems with retrospective patterns or inconsistent biological reference points as in the TRAC 2009 assessment. Rather after largely resolving the retrospective pattern, the three main sources of scientific uncertainty regarding Atlantic herring from this assessment included: the estimate of the 2008 year class, natural mortality, and the Biological Reference Points (BRPs). These sources of uncertainty were evaluated by the Herring PDT and the SSC during the development of the proposed ABC/ABC control rule specification (see Appendix XXX for the complete SSC Report).

This assessment included significant changes from previous assessments, with almost all data inputs and model settings being reconsidered. For example, catches from all sources were combined in previous assessments, but catch-at-age was partitioned into mobile and fixed gear fleets in the new formulation of the ASAP model. Furthermore, age - and time-varying natural mortality rates were developed and herring consumption by various predators justified a 50% increase in natural mortality beginning in 1996, whereas natural mortality equaled 0.2 for all ages and years in previous assessments. Selectivity in the SAW/SARC 54 assessment was also estimated for any data source with age composition, but was fixed in previous assessments. Lastly, maturity-at-age varied among years in this assessment, but held constant in previous assessments.

Biological Reference Points (BRPs)

The BRPs from SAW/SARC 54 were based on the fit of a Beverton-Holt stock-recruitment curve (estimated internally to ASAP model) and other inputs from the terminal year of the assessment (i.e., 2011). The BRPs were affected by the 50% increase in natural mortality beginning in 1996 (see below). The 2009 reference points are from the previous TRAC 2009 assessment and were based on the fit of a Fox surplus production model.

The BRPs seen in Table 19 differ due to (1) differences in natural mortality assumptions between assessments (i.e., SAW/SARC 54 used age-and time-varying M with a 50% increase beginning in 1996 and TRAC 2009 used 0.2 for all ages and years), and (2) the methods used to estimate the BRPs (Fox model was used in TRAC 2009 and the Beverton-Holt (BH) stock-recruitment curve estimated within ASAP for SAW/SARC 54).

Table 19 Atlantic Herring Biological Reference Points

Reference Points	TRAC 2009	SAW/SARC 54 (June 2012)
F_{MSY}	0.27	0.27
B_{MSY}	670,000 mt (1/2 SSB_{MSY} = 335,300)	157,000 mt (1/2 SSB_{MSY} = 78,500)
MSY	178,000 mt	53,000 mt

Uncertainty in the MSY BRPs is principally driven by two factors: 1) uncertainty in the estimate of the steepness parameter of the stock-recruitment relationship, and 2) the 50% increase in natural mortality during 1996-2011. For example, over approximately 95% confidence intervals for steepness (0.35-0.85), MSY ranged from 40,000 to 78,000 mt, SSB_{MSY} ranged from 73,000 to 277,000 mt, and F_{MSY} ranged from 0.12 to 0.7. Stock status in 2011, however, was robust to this uncertainty, with a broad range of comparisons resulting in the conclusion that overfishing is not occurring and the stock is not overfished ($SSB > ½ SSB_{MSY}$ and $F < F_{MSY}$). Also, as noted above, the 50% increase in natural mortality during 1996-2011 implies a decrease in sustainable yield (e.g., lower MSY than if the increase were not present).

3.1.2.1 Spawning Stock Biomass (SSB)

The herring total and spawning stock biomass increased after 2009, mostly due to the large 2008 year class. The estimated 2011 January 1 total biomass of Atlantic herring was 1,322,446 mt. Based on the ASAP model, SSB was 517,930 mt in 2011. SSB declined during 1997-2010, and ranged from 180,527 mt in 1982 to a max of 1,936,769 mt in 2009. Total biomass and SSB showed similar trends over time, but 1-2 year lags caused by total biomass being reflected immature recruits rather than SSB.

3.1.2.2 Fishing Mortality (F)

Fishing mortality (F) rates in 2010 and 2011 were relatively low due to the presence of the strong 2008 year class, which increased the stock biomass. Fishing mortality in 2011 equaled 0.14, but is not representative of fishing mortality rates in recent years which averaged 0.23 during 2000-2009.

3.1.2.3 Natural Mortality (M)

Natural mortality assumptions in SAW 54 were based on a combination of the Hoenig and Lorenzen methods, with the Hoenig method providing the scale of natural mortality and the Lorenzen method defining how natural mortality declined with age (Hoenig 1983; Lorenzen 1996). Natural mortality rates during 1996-2011 were increased by 50% to resolve a retrospective pattern and to ensure that the implied levels of consumption were consistent with observed increases in estimated consumption of herring. Consumption estimates were based on food habits data primarily for groundfish, but also informed by consumption estimates from marine mammals, highly migratory species, and seabirds. The 50% increase in natural mortality implies a decrease in sustainable yield (i.e. lower MSY absent the increase), such that monitoring for changes in predator consumption rates remains of particular importance.

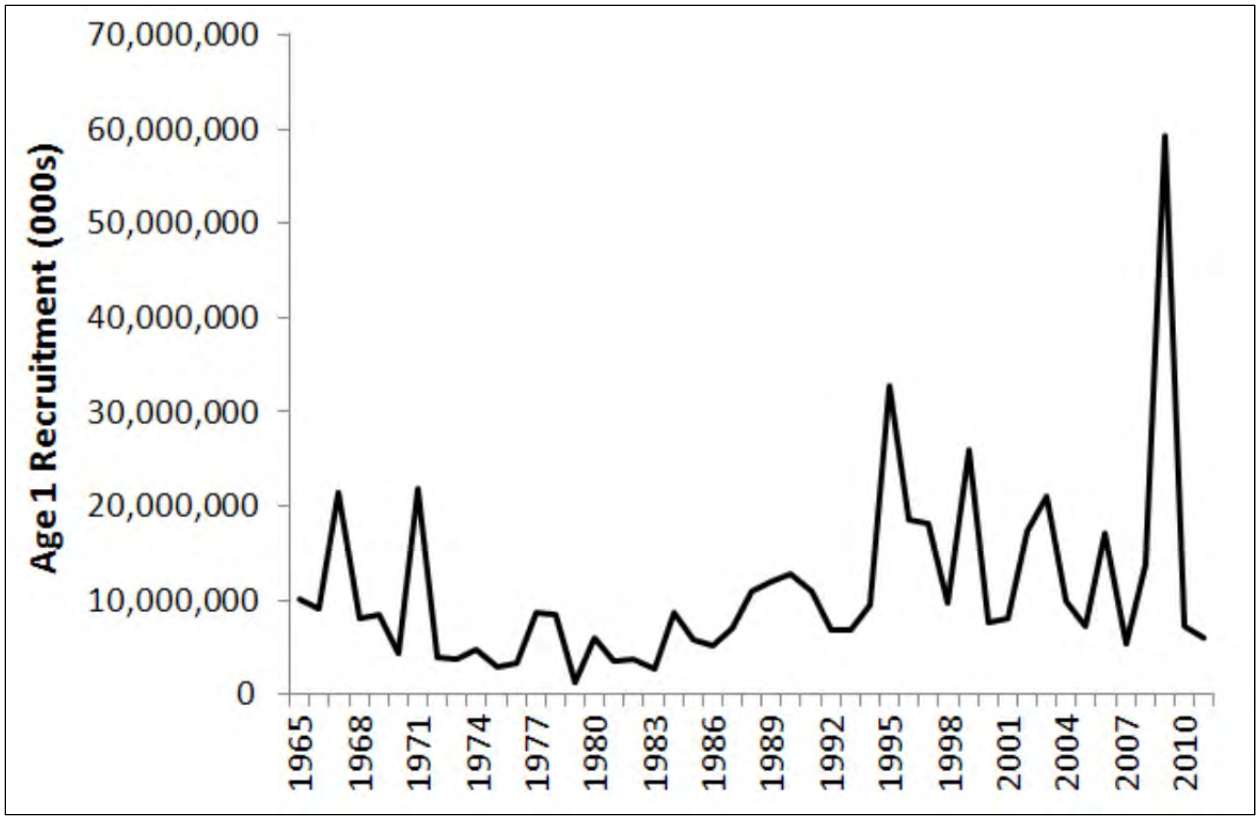
The Herring PDT reviewed the SAW 54 Assessment and discussed assumptions about natural mortality (M) and changes made in the assessment model. The PDT agrees that natural mortality and consumption of herring by predators has been addressed in this assessment to the extent possible. Addressing M in this manner seems appropriate given herrings importance as a forage species and appears to be consistent with other sources of information regarding food consumption and predation. Natural mortality and consumption have been evaluated in this assessment more thoroughly than assessments for other species in the Northeast Region. The SSC generally supported the Herring PDT's conclusions and recommendations (see SSC Report in Appendix XXX for more information).

3.1.2.4 2008 Atlantic Herring Year Class

The SAW/SARC 54 assessment estimated the 2008 year class as the largest recruitment on record, totaling 59.4 billion age-1 fish in 2009 (Figure 3). The signal for this cohort was consistently seen in all sources of data that contain age composition. The average age-1 recruitment has been below the 1996-2011 average of 15.8 billion fish except for the 2008 year class, which is likely to be a significant component of projected yield in the near future. The spawning stock and total biomass increased after 2009, most likely due to the strong 2008 year class.

The sensitivity of the stock status to the 2008 year class was tested on projections through 2015 at F_{MSY}. A projection of the 2008 year class was cut in half to approximately equal previous high recruitments and the probability of the stock being overfished or overfishing to occur still remained at zero. A Beverton-Holt relationship was also used to conduct a sensitivity run with variation of the annual recruitments (CV in base = 1, CV in sensitivity = 0.67), and with these additional restrictions on recruitment variation, the 2008 year class would still be the largest on record.

Figure 3 Atlantic Herring Age-1 Recruitment (000s), Estimated from the ASAP Model Base Run (SAW 54)



Source: NEFSC

3.1.2.5 Updated Catch-At-Age Information

The most recent peer-reviewed stock assessment for Atlantic herring (SAW 54) noted that the 2008 year class was one of the strongest on record. However, the assessment as a whole was examining the meta-complex of Atlantic herring in the Northeast US. When distributing the catch among the herring management areas, it may be important to consider whether this strong year class was derived from the inshore stock, offshore stock, or a combination of the two subcomponents. If this large year class is only from one stock component, for example, managers may wish to adjust management area sub-ACLs appropriately to better meet the objectives of the management program. To examine this issue, the Herring PDT utilized the catch-at-age matrix to determine if strong and weak year classes are detectible by subcomponent(s).

Methods

To examine this issue, two catch at age matrices were developed from 1997 to 2011; one for the inshore and one for the offshore. These matrices were derived by using landings and samples from that time of the year and in those locations where mixing was thought not to occur; i.e. during spawning on the spawning grounds. As such, samples and landings were restricted each year to Area 1 (Statistical Areas 511-514) and Area 3 (522, 526, 525, 526) during the spawning season (Aug-Oct.). Because the affinity of juveniles is uncertain, ages 1 and 2 were subsequently excluded. This results in two separate catch-at-age matrices, one for the inshore and one for the offshore, 1997-2011, for adult herring on the spawning ground during spawning season (Table 20).

To examine year class strength, an index was calculated for first-time spawners. The proportions caught at age were calculated for each year; then averaged across years at age 3. The proportion at age for any given year at age 3 was then divided by that average. The result is a relative index of strength, ranging from zero to one (Table 21), with strong year classes having a value greater than one and weak year classes have values less than one.

Age 3 was chosen as it represents the age at first spawning when roughly 50% of the females are mature. It is also the first year in which the 2008 year class was spawning in 2011, the latest year with data available.

Results/Discussion

Overall, both inshore and offshore stock areas showed some agreement on both strong and weak year classes. Strong year classes include 1994, 1998, 2002, and 2008. Weak year classes were seen in 1995, 1997, 1999, 2000, 2006 (Figure 4). Overall, there was not a significant correlation in year class strength between the two areas (Pearson's = 0.63; Probability = 0.54), suggesting a decoupling between recruitment.

It seems clear that very strong and very weak year classes occur in both areas during the same year. This suggests that a relationship is driven, perhaps, by broad scale environmental factors. However, the lack of correlation over the time frame examined indicates that both areas have separate recruitment signals. As such, strong year classes from one component may not indicate strong recruitment in the other.

However, it should be noted that in both cases full selection does not occur until Age 5. Further in the early part of the time series, sampling data from Area 3 was lacking. As such, the use of a catch-at-age matrix to measure year class strength, particularly among areas, is tenuous. Further examination, perhaps at fully-selected ages might yield a better measure. Additional examination in light of fishery independent indices is warranted. That noted; the 2008 year class is strong and occurs in both inshore and off-shore spawning components. Both inshore and offshore indices have historic highs for this year class as first-time spawners.

Table 20 Catch At Age Matrices (thousands of fish) in the Inshore (a) and Offshore (b) Areas During the Spawning Season 1997-2011

(a)

	Age								
Year	3	4	5	6	7	8	9	10	Total
1995	90,389	25,437	22,183	55,052	51,278	28,707	8,452	3,302	284,802
1996	116,342	30,011	31,281	59,371	36,317	12,661	1,450	787	288,220
1997	321,499	39,174	30,730	43,861	36,791	5,513	1,201	155	478,924
1998	40,391	57,877	17,185	11,070	11,527	4,712	1,269	377	144,407
1999	229,274	29,783	33,246	11,732	5,564	1,826	335	82	311,841
2000	21,099	27,908	42,332	40,104	5,598	2,115	711	234	140,100
2001	120,192	10,232	19,414	21,670	10,954	2,543	213		185,217
2002	71,356	79,847	27,871	14,758	10,841	2,885	336		207,894
2003	78,140	30,412	58,544	18,199	18,238	5,178	592		209,303
2004	223,725	31,498	14,251	10,978	2,795				283,246
2005	194,805	84,056	20,696	15,655	8,510	1,316	115		325,154
2006	116,558	55,061	31,128	11,566	6,579	3,858	251		225,001
2007	54,148	45,168	31,814	21,928	6,178	689	1,048	178	161,151
2008	95,093	35,251	26,756	27,757	14,575	3,633	1,338	665	205,069
2009	63,545	68,772	19,269	21,042	13,948	4,466	746	189	191,977
2010	38,536	30,794	55,735	14,436	7,613	2,064	1,070		150,249
2011	225,588	25,624	9,680	6,013	973	524	154		268,556

Source: ME DMR

(b)

	Age								
Year	3	4	5	6	7	8	9	10	Total
1997	15,522	1,772	329	911	540	574	101		19,750
1998	26,285	87,613	12,158	6,873	5,546	995	327	291	140,089
1999	5,613	2,525	10,415	2,243	1,372	1,091			23,258
2000	4,687	19,886	17,351	24,516	5,096	1,441	151		73,128
2001	92,356	12,600	18,785	26,227	25,349	7,892	840		184,049
2002	878	14,382	4,911	3,996	3,716	2,131	163		30,178
2003	3,170	3,302	17,059	5,805	4,710	6,814	2,100	326	43,286
2004	36,073	7,203	10,477	13,733	11,458	658	329		79,932
2005	92,834	32,976	5,434	3,775	2,265	415			137,700
2006	18,315	57,993	13,147	5,004	3,925	4,144	994	760	104,283
2007	5,757	3,769	3,935	2,112	1,118		166		16,857
2008	38,947	8,603	4,435	6,802	1,973	612		142	61,514
2009	2,811	105,867	25,881	15,730	22,703	5,203	814		179,010
2010	34,354	5,339	9,275	1,817	2,092				52,876
2011	124,770	19,237	3,569	5,143	1,050	1,050			154,818

Source: ME DMR

Table 21 Proportion at Age by Year and Resulting Index at First Time Spawning for (a) Inshore and (b) Offshore

(a)

	Age									
Year	3	4	5	6	7	8	9	10	Index	Year Class
1997	0.67	0.08	0.06	0.09	0.08	0.01	0.00	0.00	1.37	1994
1998	0.28	0.40	0.12	0.08	0.08	0.03	0.01	0.00	0.57	1995
1999	0.74	0.10	0.11	0.04	0.02	0.01	0.00	0.00	1.50	1996
2000	0.15	0.20	0.30	0.29	0.04	0.02	0.01	0.00	0.31	1997
2001	0.65	0.06	0.10	0.12	0.06	0.01	0.00	0.00	1.33	1998
2002	0.34	0.38	0.13	0.07	0.05	0.01	0.00	0.00	0.70	1999
2003	0.37	0.15	0.28	0.09	0.09	0.02	0.00	0.00	0.76	2000
2004	0.79	0.11	0.05	0.04	0.01	0.00	0.00	0.00	1.61	2001
2005	0.60	0.26	0.06	0.05	0.03	0.00	0.00	0.00	1.22	2002
2006	0.52	0.24	0.14	0.05	0.03	0.02	0.00	0.00	1.06	2003
2007	0.34	0.28	0.20	0.14	0.04	0.00	0.01	0.00	0.69	2004
2008	0.46	0.17	0.13	0.14	0.07	0.02	0.01	0.00	0.95	2005
2009	0.33	0.36	0.10	0.11	0.07	0.02	0.00	0.00	0.68	2006
2010	0.26	0.20	0.37	0.10	0.05	0.01	0.01	0.00	0.52	2007
2011	0.84	0.10	0.04	0.02	0.00	0.00	0.00	0.00	1.72	2008
Average	0.49									

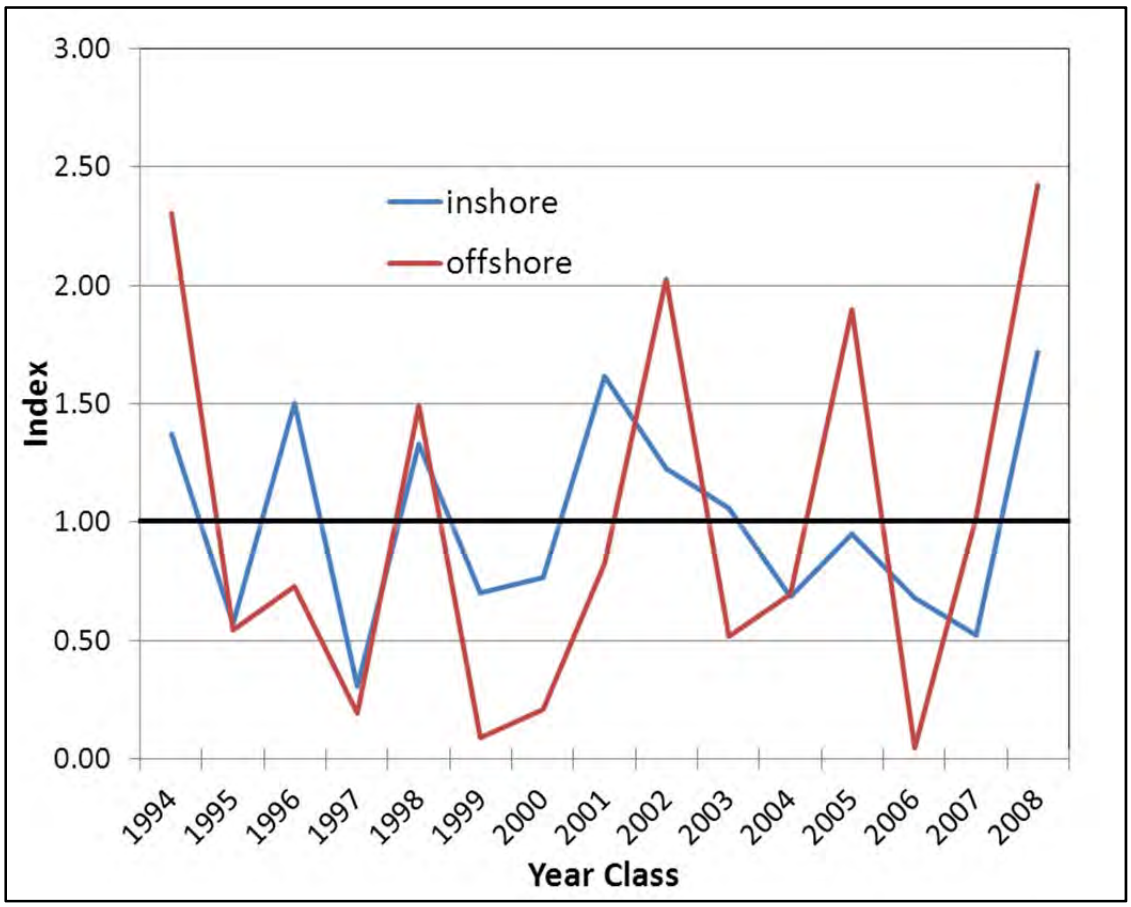
Source: ME DMR

(b)

	Age									
Year	3	4	5	6	7	8	9	10	Index	Year Class
1997	0.79	0.09	0.02	0.05	0.03	0.03	0.01	0.00	2.09	1994
1998	0.19	0.63	0.09	0.05	0.04	0.01	0.00	0.00	0.50	1995
1999	0.24	0.11	0.45	0.10	0.06	0.05	0.00	0.00	0.64	1996
2000	0.06	0.27	0.24	0.34	0.07	0.02	0.00	0.00	0.17	1997
2001	0.50	0.07	0.10	0.14	0.14	0.04	0.00	0.00	1.34	1998
2002	0.03	0.48	0.16	0.13	0.12	0.07	0.01	0.00	0.08	1999
2003	0.07	0.08	0.39	0.13	0.11	0.16	0.05	0.01	0.20	2000
2004	0.45	0.09	0.13	0.17	0.14	0.01	0.00	0.00	1.20	2001
2005	0.67	0.24	0.04	0.03	0.02	0.00	0.00	0.00	1.80	2002
2006	0.18	0.56	0.13	0.05	0.04	0.04	0.01	0.01	0.47	2003
2007	0.34	0.22	0.23	0.13	0.07	0.00	0.01	0.00	0.91	2004
2008	0.63	0.14	0.07	0.11	0.03	0.01	0.00	0.00	1.69	2005
2009	0.02	0.59	0.14	0.09	0.13	0.03	0.00	0.00	0.04	2006
2010	0.65	0.10	0.18	0.03	0.04	0.00	0.00	0.00	1.73	2007
2011	0.81	0.12	0.02	0.03	0.01	0.01	0.00	0.00	2.15	2008
Average	0.38									

Source: ME DMR

Figure 4 Relative Year Class Index for First Time Spawners (Age 3) by Year Class



Source: ME DMR

Note: Strong year classes have values greater than 1, weak year classes have values less than 1.

3.1.2.6 Stock Status – Overfishing Definition

The current overfishing definition (Atlantic Herring FMP, 1999) for Atlantic herring is provided below.

> *If stock biomass is equal or greater than B_{MSY} , overfishing occurs when fishing mortality exceeds F_{MSY}. If stock biomass is below B_{MSY} , overfishing occurs when fishing mortality exceeds the level that has a 50 percent probability to rebuild stock biomass to B_{MSY} in 5 years ($F_{Threshold}$). The stock is in an overfished condition when stock biomass is below ½ B_{MSY} and overfishing occurs when fishing mortality exceeds $F_{Threshold}$. These reference points are thresholds and form the basis for the control rule.*
>
> *The control rule also specifies risk-averse fishing mortality targets, accounting for the uncertainty in the estimate of F_{MSY}. If stock biomass is equal to or greater than 1/2B_{MSY} , the target fishing mortality will be the lower level of the 80 percent confidence interval about F_{MSY}. When biomass is below B_{MSY} , the target fishing mortality will be reduced consistent with the five-year rebuilding schedule used to determine $F_{Threshold}$.*

*The Herring PDT notes there may be an error or inconsistency in the language related to the rebuilding schedule and recommends that this overfishing definition be reviewed at the next appropriate discussion.

The 2012 SAW 54 benchmark assessment results estimated that Atlantic herring SSB in 2011 was 517,930 mt, which is well above B_{MSY} (157,000 mt). Estimated fishing mortality in 2011 was 0.14, which is below F_{MSY} (0.27). Therefore, the stock is not overfished and overfishing is not occurring. In fact, the stock is considered to be completely rebuilt.

3.2 NON-TARGET SPECIES AND OTHER FISHERIES

3.2.1 Non-Target Species (Overview from Amendment 5)

"Non-target species" refers to species other than herring which are caught/landed by federally permitted vessels while fishing for herring. These non-target species may be caught by the same gear while fishing for herring, and may be sold assuming the vessel has proper authorization or permit(s).

Standardized Bycatch Reporting Methodology (SBRM)

On September 15, 2011, upon the order of the U.S. Court of Appeals for the District of Columbia Circuit, the U.S. District Court for the District of Columbia, in the case of Oceana, Inc. v. Locke (Civil Action No. 08-318), vacated the Northeast Region Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment and remanded the case to NMFS for further proceedings consistent with the D.C. Circuit Court's decision.

To comply with the ruling, NMFS announced on December 29, 2011 (76 FR 81844) that the Northeast Region SBRM Omnibus Amendment is vacated and all regulations implemented by the SBRM Omnibus Amendment final rule (73 FR 4736, January 28, 2008) are removed. This action removed the SBRM section at § 648.18 and removes SBRM-related items from the lists of measures that can be changed through the FMP framework adjustment and/or annual specification process for the Atlantic mackerel, squid, and butterfish; Atlantic surfclam and ocean quahog; Northeast multispecies, monkfish; summer flounder; scup; black sea bass; bluefish; Atlantic herring; spiny dogfish; deep-sea red crab; and tilefish fisheries. This action also makes changes to the regulations regarding observer service provider approval and responsibilities and observer certification. The SBRM Omnibus Amendment had authorized the development of an industry-funded observer program in any fishery, and the final rule modified regulatory language in these sections to apply broadly to any such program. This action revises that regulatory language to refer specifically to the industry-funded observer program in the scallop fishery, which existed prior to the adoption of the SBRM Omnibus Amendment.

NMFS and the New England and Mid-Atlantic Fishery Management Councils are developing a new omnibus amendment to bring Northeast fishery management plans into compliance with Magnuson-Stevens Act requirements for a standardized bycatch reporting methodology. A SBRM Fishery Management Action Team has been constituted and has begun development of the new amendment.

XXX

Non-Target Species: Information from Observer Data

Table 22 summarizes coverage rates from the Northeast Fisheries Observer Program (NEFOP) for the 2009-2011 calendar years (also the herring fishing years) by gear type for all trips that landed greater than 2,000 pounds of Atlantic herring. During the 2011 fishing year, NEFOP covered trips for about 55% of all midwater trawl, 45% of pair trawl, 25% of purse seine, and 13% of bottom-trawl Atlantic herring landings. Observer coverage of mackerel catch has generally been less in recent years, partially because the observer program used to select away from trips that target mackerel but still notified for herring (this was due to coverage needs for herring related to groundfish).

Table 22 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2009-2011

Year	Gear Type	Total Trips	Total Days	Total Herring Landed (lbs.)	Obs Trips	Obs Days	Obs Herring Kept (lbs.)	% trips obs	% days obs	% herring obs
2009	OTF	180	306	9,647,215	11	15	554,579	6%	5%	6%
2009	OTM	50	242	13,875,075	16	69	3,747,316	32%	29%	27%
2009	PTM	356	1321	153,345,903	98	350	49,596,367	28%	26%	32%
2009	PUR	223	596	49,706,514	42	130	9,943,521	19%	22%	20%
2010	OTF	185	343	8,452,546	9	22	298,691	5%	6%	4%
2010	OTM	58	230	19,851,018	32	122	10,190,452	55%	53%	51%
2010	PTM	290	1129	98,165,321	128	545	47,528,352	44%	48%	48%
2010	PUR	222	506	18,799,340	24	58	1,850,818	11%	11%	10%
2011	OTF	175	368	9,449,163	24	59	1,208,293	14%	16%	13%
2011	OTM	61	165	17,647,500	27	91	9,758,411	44%	55%	55%
2011	PTM	295	1071	115,321,409	123	452	51,562,629	42%	42%	45%
2011	PUR	271	603	37,908,770	79	172	9,506,794	29%	29%	25%

OTF – small mesh bottom trawl; OTM – single midwater trawl; PTM – paired midwater trawl; PUR – purse seine
Herring is Atl Herring or Unk Herring;
Day defined as (date land - date sail) + 1;
Landings data from Vessel Trip Reports
Source: NEFSC Observer Program

The tables provided in Atlantic Herring Amendment 5 FEIS (Table 11 – Table 24) summarize information on non-target species in Federal waters, state waters (portside sampling in Maine and Massachusetts) as well as a discussion regarding the river herring bycatch program. The tables summarize the number of NEFOP observed herring trips from 2009 and 2010 along with the catch and discard of all species on observed trips, which are broken down by half year time period of January through June and July through December, and species observed are recorded as either discarded or kept in pounds.

Overall, the indicate that the four species/species groups that comprise the majority of the observed catch (either discarded or kept) in total pounds for the paired and single midwater trawl vessels, category A and B are Atlantic herring, Fish NK (primarily fish that are pumped to a paired vessel without an observer onboard (kept), and some unobserved fish that are discarded/released), Atlantic mackerel, and dogfish. Observed non-target species catch on limited access purse seine vessels was similar in terms of primary species composition. Other non-target species catch was more variable on midwater trawl vessels (versus purse seine), but in general, bycatch represents a very small fraction of total catch by limited access herring midwater trawl and purse seine vessels.

The composition of observed catch of non-target species on bottom trawl vessels is more variable (see Table 14 – Table 20 in the Amendment 5 FEIS). Squid is the most common species caught by herring vessels fishing with bottom trawls. The majority of the species are haddock, skate, Atlantic cod, and flounders on large-mesh bottom trawl vessels when fishing for herring. However, observed catch from the small mesh vessels with herring permits appears to differ. The Category A and B bottom trawl vessels fishing small mesh catch primarily squid, Atlantic mackerel, Atlantic herring, and butterfish; Category C bottom trawl vessels fishing with small mesh are observed to catch primarily silver hake, other fish, scup, and squid. The five species that comprise the majority of catch on Category D bottom trawl vessels are skate, silver hake, dogfish, other fish, and squid.

3.2.2 Other Fisheries (Overview from Amendment 5)

For the purposes of this document, the term "other fisheries" refers to those fisheries which are directly affected or related to the operation of the Atlantic herring fishery; namely river herring, the Atlantic mackerel fishery, and the Northeast groundfish fishery. In the Atlantic herring fishery, river herring are bycatch species that are not landed when caught. Mackerel is a primary alternate species caught by herring vessels and is commonly landed. The Northeast groundfish fishery is a primary alternate fishery for some herring vessels, and the areas of operation of both fisheries overlap (see the FEIS for Amendment 5 for more detail).

3.2.2.1 Shad and River Herring

As a non-target species in the Atlantic herring fishery, river herring are caught occasionally as a bycatch species but are not always discarded due to the high volume nature of the fishery; for example, discarding might take place in processing plants rather than at sea.

Based on 2009-2010 NEFOP observed trips only, river herring do not represent the majority of the bycatch composition on herring vessels (all permit categories), and seem to be most prevalent in Quarters 1 and 4 for paired midwater trawls, Quarters 1 and 2 for single midwater trawls, and are rarely caught by purse seine vessels (see XXX or Amendment 5 for more detail). Of the bottom trawl vessels the majority of river herring bycatch occurred on Category D vessels in Quarters 1, 2 and 3 and Category B and C in Quarters 1 and 4. Paired midwater trawls caught more river herring than bottom trawl vessels, however.

Life History

Shad and river herring are anadromous fish that spend the majority of their adult lives at sea, only returning to freshwater in the spring to spawn. Historically, shad and river herring spawned in virtually every river and tributary along the Atlantic coast.

American Shad

American shad stocks are river-specific; that is, each major tributary along the Atlantic coast appears to have a discrete spawning stock. The percentage of shad that survive to spawn more than once decreases from north to south. Shad that spawn in more northerly rivers may survive to spawn again (referred to as iteroparity), while shad native to the rivers south of Cape Fear, North Carolina die after spawning (referred to as semelparity). Mature females (ages five and older) produce a large quantity of eggs that are released into the water column and are fertilized by mature males (ages four and older). American shad adults that are iteroparous return to the sea soon after spawning and migrate northward to summer feeding grounds in the Gulf of Maine, while the fertilized eggs are carried by river currents, and develop into larvae which begin to feed four to seven days after hatching. Larvae drift downstream into tidal freshwater reaches of the spawning rivers, and gradually mature into juveniles. In early to late summer, juvenile shad migrate out of their nursery areas to the sea. Immature American shad will remain in the ocean for three to five years.

Alewife/Blueback Herring

Alewife and blueback herring are known as "river herring" and managed collectively by ASMFC. Alewife spawn in rivers, lakes, and tributaries from northeastern Newfoundland to South Carolina, but are most abundant in the Mid-Atlantic and the New England states. Blueback herring prefer to spawn in swift flowing rivers and tributaries from Nova Scotia to northern Florida, but are most numerous in waters from the Chesapeake Bay south. Mature alewife (ages three to eight) and blueback herring (ages three to six) migrate rapidly downstream after spawning. Larvae begin to feed three to five days after hatching, and transform gradually into the juvenile stage. Juveniles remain in tidal freshwater nursery areas in spring and early summer, but may also move upstream with the encroachment of saline water. As water temperatures decline in the fall, juveniles move downstream to more saline waters. Little information is available on the life history of juvenile and adult alewife and blueback herring after they emigrate to the sea as young-of-the-year or yearlings, and before they mature and return to freshwater to spawn.

Population Management

The ASMFC Interstate Fishery Management Plan for Shad & River Herring, approved in 1985, was one of the very first FMPs developed by the ASMFC. Amendment 1 was adopted in 1998 and focuses on American shad regulations as well as monitoring programs to improve data collection and stock assessment capabilities.

Additionally, Amendment 2 to the ASMFC FMP for Shad and River Herring was approved in 2009 and implemented a precautionary approach to river herring management. Amendment 2 requires states or jurisdictions to close all state fisheries by January 1, 2012, with exceptions for systems with a sustainable fishery. A sustainable fishery is defined as one that demonstrates that the river herring stock can support a commercial and/or recreational fishery without diminishing future stock reproduction and recruitment. Under Amendment 2, river herring from any state waters fishery may not be landed without an approved plan. State fishery proposals must contain 'sustainability targets' that are subject to Shad and River Herring Technical Committee (TC) review and Shad & River Herring Management Board (Board) approval.

Then, in 2010, the Board approved Amendment 3, which revised American shad regulatory and monitoring programs in place under Amendment 1. The Amendment was developed in response to the 2007 American shad stock assessment, which found that most American shad stocks were at all-time lows and did not appear to be recovering. Amendment 3 is similar to the management program required for river herring. The Amendment prohibits state waters commercial and recreational fisheries beginning January 1, 2013, unless a state or jurisdiction has a sustainable management plan reviewed by the TC and approved by the Board.

Fishery Performance

Since the early 1800s, the American shad supported major commercial fisheries along the Atlantic coast and was one of the most valuable food fish of the U.S. Atlantic coast before World War II. The estimated U.S. Atlantic coast catch in 1896 was 50 million pounds, and today the total coastwide harvest has averaged approximately 540,000 pounds annually since 2005 (Table 23). Each state is required to annually document that American shad ocean bycatch did not exceed 5% of the total landings (in pounds) on a per trip basis. Shad bycatch landings from ocean waters in 2010 comprised 8,546 pounds, or about 1.53% of the coastwide total.

River herring formerly supported significant commercial and recreational fisheries throughout their range. Fisheries were traditionally executed in rivers, estuaries, and coastal waters using weirs, traps, dip nets and gill nets. Commercial landings of river herring declined 95% from over 13 million pounds in 1985 to about 700 thousand pounds in 2005 (Table 24). The majority of the landings (64%) were reported by the state of Maine, followed by South Carolina (24%) and Virginia (9%). Although recreational harvest data are scarce, most harvest is believed to come from the commercial industry.

Table 23 Commercial Shad Landings (lbs.) by State from Maine to New Jersey, 1970-2010

YEAR	ME	NH	MA	RI	CT	NY	NJ
1970					78,518	118,208	26,127
1971					109,182	86,320	18,144
1972					113,037	148,645	24,494
1973					116,847	122,517	20,231
1974					112,130	110,860	24,358
1975					75,071	114,942	38,556
1976					177,811	100,064	31,933
1977					150,777	94,712	60,873
1978	11,118		363		138,938	207,114	59,512
1979			544		93,804	236,507	40,280
1980	12,682	3,130	3,810	907	140,843	647,106	54,296
1981	41,096	2,540	7,575	14,243	147,284	307,768	59,286
1982	11,741	1,225	13,336	35,970	128,369	205,254	127,416
1983	17,554	1,542	6,124	10,660	193,234	223,353	90,811
1984	15,157	2,313	13,472	16,602	180,966	333,396	98,159
1985	7,258	3,311	10,115	41,187	182,347	385,498	108,093
1986	10,438	7,666	27,261	23,769	146,490	395,389	79,244
1987	11,975	18,734	18,507	47,129	151,457	315,607	92,852
1988	14,461	20,837	22,967	55,339	85,957	362,169	113,763
1989	21,091	13,882	6,178	19,038	82,680	230,656	188,698
1990	5,354	17,330	2,540	10,337	119,068	212,701	222,110
1991	903	8,584	289	12,617	68,167	161,325	184,817
1992	658	4,492	140	6,029	65,616	130,060	148,497
1993	0	2,971	181	18,394	43,955	66,202	154,063
1994	477	12,803	130	8,137	48,023	92,794	102,484
1995	173	13,862	206	12,683	27,958	119,437	132,328
1996	485	16,118	61	6,452	30,281	95,148	95,774
1997	88	11,538	341	16,674	41,279	84,900	106,474
1998	192	6,881	801	15,236	40,526	146,907	105,712
1999	77	1,667	101	20,076	20,219	97,631	121,009
2000	132	2,695	122	7,854	48,724	81,159	116,624
2001	216	368	477	30,777	26,869	60,170	122,543
2002	8		192	39,553	49,034	86,876	125,341
2003	2	1	503	17,548	50,407	61,098	107,036
2004	4	49	12	6,652	30,086	39,868	98,760
2005	88	3,877		191,312	69,333	90,932	25
2006				2,292	38,547	9,271	62,920
2007				783	51,572	50,040	58,981
2008					7,344	22,720	6,761
2009				176	40,998	10,204	2,660
2010	7,140				24,187	11,375	14,363

Source: ASMFC
Recreational numbers included where available

Table 24 Commercial River Herring Landings (lbs.) by State from Maine to New Jersey, 1960-2010

Year	ME	NH	MA	CT	RI	NY	NJ
1960	966,235	95,000	17,651,100		20,000	38,200	3,000
1961	1,278,895	100,000	20,838,200		6,000	33,800	16,500
1962	1,137,420	125,000	8,275,700		19,000	38,200	20,300
1963	898,100	150,000	11,735,100	129,300	3,400	32,300	3,400
1964	903,677	75,000	5,528,800	140,000	14,800	37,000	14,200
1965	1,615,460	125,000	6,935,300	210,000	24,100	23,600	21,500
1966	1,153,180	75,000	6,633,200	192,500	6,600	4,188,000	12,400
1967	1,255,897	65,000	5,431,900	185,500	23,400	4,400	9,000
1968	1,498,447	40,600	116,700	190,000	32,800	7,000	8,400
1969	1,404,055	37,500	100,000	214,900	10,600	9,200	5,100
1970	1,066,975	31,000	1,156,300	122,300	143,600	11,000	7,500
1971	1,406,720	25,000	222,300	25,000	52,600	68	9,500
1972	1,445,200	24,000	1,907,400	22,800	34,000	400	14,700
1973	1,680,954	21,500	695,400	14,300	15,100	21,600	7,000
1974	2,232,790		228,500	17,000	36,100	16,900	10,600
1975	1,626,670		1,716,900	25,200	41,500	15,300	9,300
1976	1,894,860		44,900	67,100	34,000	1,500	11,300
1977	2,091,850	210,000	131,800	61,300	35,300	6,000	10,600
1978	1,704,075	165,000	701,300	39,800	26,200	700	2,400
1979	1,329,615		52,300	62,700	11,700	1,000	6,600
1980	1,449,405		144,000	55,100	7,400	900	18,600
1981	1,408,720		84,000	52,700		64,900	13,800
1982	576,677	114,500	53,500	41,800	4,800	229,200	13,600
1983	370,868	115,216	93,100	37,500	6,100	24,700	2,200
1984	499,555	90,000	194,100	32,400	900	4,200	3,100
1985	723,310	61,300	46,600	38,900	400	150	4,800
1986	937,720	26,990	32,400	40,100		2,900	4,200
1987	539,143	19,550	32,500	21,400	2,600	2,765	5,200
1988	625,975	12,087	42,580	2,100		100	700
1989	625,765	11,200	255,700	1,600		500	800
1990	436,625		20,700	1,150			42,494
1991	361,480		20,300	1,200			9,994
1992	438,042	9,802	18,700	3,200			3,069
1993	165,375	2,676	18,900	2,440			2,659
1994	83,318			2,000			328
1995	2,940			14,044	403	209	795
1996	136,395			252	750	741	4,449
1997	281,977		180			6,317	4,515
1998	386,365	25,994				12,234	7,371
1999	312,375					6,051	1,377
2000	246,680			77,985	574	98,845	2,246
2001	646,660			20		39,293	3,915
2002	819,554				12	40,716	4,669
2003	613,385					40,076	3,667
2004	543,172		89			36,685	7,131
2005	341,311					26,984	4,326
2006	1,178,758					23,505	3,414
2007	740,915					28,571	223
2008	1,170,469	8,137					631
2009	1,383,130	9,443				83	
2010	1,334,515	7,392	31	36,232		17,142	1,517

Source: ASMFC; Recreational numbers included where available

NAFO River Herring Catches, 1960-2009

The Northwest Atlantic Fisheries Organization (NAFO) is an intergovernmental fisheries science and management body founded in 1979, preceded by the International Commission of the Northwest Atlantic Fisheries (ICNAF), 1949-1978. Under the NAFO Convention, countries fishing within the (NAFO) Regulatory Area (RA) for certain NAFO managed species are required to report catches. The Foreign countries catching river herring included Bulgaria, Germany, Spain, Poland, Romania, and Russia. Reported NAFO foreign river herring catch began in 1967 and ceased in 1990, peaking in 1973 at 36,154 mt with the majority of catch by Russia (former USSR). By comparison, the total catch for US and foreign vessels combined in 1973 was 37,192 mt. US river herring catch peaked in 1961 at 10,205 mt and again in 1973 at 10,797 mt. Prior to and following the establishment of the EEZ, river herring catches fell for both US and foreign countries. No river herring catches were reported from 1994-2001 and 2003-2006 (see Amendment 5 to the FMP for Atlantic Herring for more detail).

Status of Stocks (American Shad & River Herring)

A stock assessment for American shad was completed in 1997 and submitted for peer review in early 1998 based on new information and the Board recommended terms of reference. The 1998 assessment estimated fishing mortality rates for nine shad stocks and general trends in abundance for 13 shad stocks. A coastwide American shad stock assessment was completed and accepted in 2007 and found that American shad stocks are currently at all-time lows and do not appear to be recovering. The 2007 report identified primary causes for stock decline as a combination of overfishing, pollution, and habitat loss due to dam construction. In recent years, coastwide harvests have been on the order of 500-900 mt, nearly two orders of magnitude lower than in the late 19th century. The peer review panel suggested that current and new restoration actions, including a reduction in fishing mortality, enhancement of dam passage, mitigation of dam-related fish mortality, stocking, and habitat restoration be addressed.

The ASMFC completed the river herring benchmark stock assessment and peer review in 2012, examining 52 stocks of alewife and blueback herring with available data in US waters. The status of 23 stocks were determined to be *depleted* relative to historic levels, and one stock was increasing. Statuses of the remaining 28 stocks could not be determined, citing times-series of available data as being too short. "*Depleted*" was used, rather than "*overfished* and "*overfishing*," due to many factors (i.e., directed fishing, incidental fishing/bycatch, habitat loss, predation, and climate change) contributing to the decline of river herring populations. Furthermore, the stock assessment did not determine estimates of river herring abundance and fishing mortality due to lack of adequate data. For many of these reasons, the stock assessment team suggested reducing the full range of impacts on river herring populations.

On August 5, 2011, the National Marine Fisheries Service (NMFS) received a petition from the Natural Resources Defense Council (NRDC), requesting that alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) be listed each as threatened throughout all or a significant portion of their range under the Endangered Species Act (ESA). In the alternative, NRDC requested that NMFS designate distinct population segments of alewife and blueback herring as specified in the petition (Central New England, Long Island Sound, Chesapeake Bay, and Carolina for alewives, and Central New England, Long Island Sound, and Chesapeake Bay for blueback herring). NMFS reviewed the petition and published a positive 90-day finding on

November 2, 2011, determining that the information in the petition, coupled with information otherwise available to the agency, indicated that the petitioned action may be warranted. As a result of the positive finding, the agency is required to review the status of the species to determine if listing under the ESA is warranted. NMFS recognized the ASMFC's extensive effort to compile the most current information on the status of these stocks throughout their range in the United States and, in order to not duplicate this effort, has been working cooperatively with ASMFC. The peer review reports and additional climate change analysis and extinction risk modeling results will be available in September/October, 2012. NMFS will use these reports and the modeling results along with the ASMFC river herring stock assessment and all other best available information to develop a listing determination which will be published in the *Federal Register* as soon as possible.

3.2.2.2 Atlantic Mackerel Fishery

A more detailed description of the Atlantic mackerel fishery can be found in the Final EIS for Amendment 5 to the Herring FMP, and the EIS for Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish (MSB) FMP: http://www.mafmc.org/fmp/msb_files/msbAm11.htm. The overlap between the Atlantic herring and mackerel fisheries is important, as many of the same vessels and processing plants participate in both of these fisheries, and many of the participants are primarily or entirely economically dependent on these two fisheries. Many pair trawl vessels and midwater trawl vessels are dependent on herring and mackerel although pair trawl vessels are generally less dependent on herring than mackerel. Most bottom trawl vessels are not significantly dependent on either herring or mackerel, while purse seine vessels were almost entirely reliant on herring and menhaden.

Population Management

The MAFMC manages the Atlantic mackerel fishery. For the 2012 fishing year, the MAFMC adopted an ABC of 80,000 mt per the recommendation of its Scientific and Statistical Committee (http://www.mafmc.org/fmp/msb_files/2012_Specs/SSC_Report_25-26_May_2011.pdf). After accounting for Canadian catch, the Council also specified recreational-commercial allocations and buffers for management uncertainty such that the effective proposed U.S. commercial quota for 2012 is 33,821 mt. This is much higher than 2011 landings (less than 1,000 mt) but also substantially lower than quotas as recently as 2010 (115,000 mt). 2012 landings will likely be around 6,000 mt according to preliminary data. The fishery is currently open access, but a new limited access program, detailed below, became effective for Atlantic mackerel on March 1, 2012. A proposed rule is pending to maintain the 2012 specifications for 2013-2015.

Amendment 11 –Limited Access Program

Amendment 11 to the MSB FMP (76 FR 68642, November 7, 2011) implemented a limited access system consisting of tiered limited access and open access components. NMFS will be accepting applications for the limited access program until February 28, 2013, but switched over to the new permit system on March 1, 2012. The qualifying criteria for the limited access component are a valid Federal Fisheries Permit for mackerel as of March 21, 2007 and a certain level of mackerel landings during a specified time period as detailed below:

- Tier 1: At least 400,000 pounds landed in any one year 1997-2005
- Tier 2: At least 100,000 pounds landed in any one year 3/1/1994-2005
- Tier 3: At least 1,000 pounds in any one year 3/1/1994-2005.
    - Tier 3 would be capped for a maximum catch up to 7% of the commercial quota, set annually during the specifications process (no other allocations).
- Open Access: All other vessels.

The number of vessels that were expected to qualify for each tier and associated trip limits are summarized below from the mackerel amendment (Table 25). The resulting capacity estimate for the vessels expected to qualify for Atlantic mackerel permits is 107,578 mt. The estimates for vessels in each Tier are based on analysis of unpublished NMFS dealer weighout data at the time, and all numbers did change as the program was implemented.

Table 25 Summary of Mackerel Limited Access Program and Predicted Number of Qualifiers

Access Category	Years Used for Qualification	Threshold of Poundage Needed to Qualify	Vessels Predicted to Qualify	Initial Trip Limits (adjustable via Specifications)
Tier 1	1997-2005	400,000	29	None
Tier 2	1994-2005	100,000	45	135,000
Tier 3	1994-2005	1,000	329	100,000
Open Access	N/A	N/A	N/A	20,000

Source: MAFMC, unpublished NMFS dealer weighout data

Amendment 11 sets initial trip limits for each tier, with all trip limits adjustable via specifications:

- Tier 1: No trip limit
- Tier 2: 135,000 lb per trip or calendar day
- Tier 3: 100,000 lb per trip or calendar day
- Open access: 20,000 lb per trip or calendar day

All permit categories are subject to a 20,000 lb trip limit during a closure of the mackerel fishery.

Since March 1, 2012, limited access mackerel permits have been issued to 126 vessels. Of the vessels with Atlantic herring limited access permits, all obtained either a limited or an open access mackerel permit (Table 26). Most of the Tier 1 mackerel vessels also hold limited access directed herring permits.

Table 26 Atlantic Mackerel Limited Access Program, 2012

			Total	Herring Permit Category			
				A	B,C	C	Total
Mackerel Permit Category	Limited Access	Tier 1	24	19	0	4	**23 (96%)**
		Tier 2	25	1	1	6	**8 (32%)**
		Tier 3	77	2	1	8	**11 (14%)**
	Open Access		1,630	14	2	23	**39 (2%)**
		Total	**1,756**	**36 (100%)**	**4 (100%)**	**41 (100%)**	

Source: NMFS Permit databases http://www.nero.noaa.gov/permits/permit.html (November 2012)
Note: Percentages indicate percent of the total permit holders in that category.

Stock Status

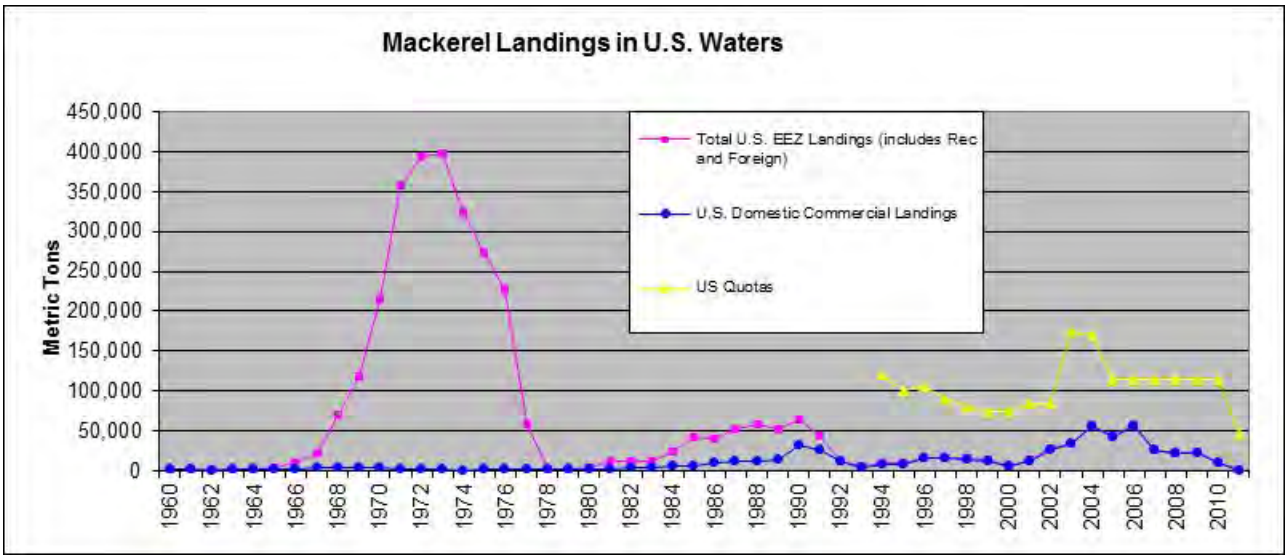
The status of mackerel is currently "unknown" with respect to both fishing mortality rates and stock size. The mackerel stock was last assessed in 2010 (utilizing data through 2008) via a joint U.S. – Canadian Transboundary Resource Assessment Committee (TRAC). The TRAC was unable to resolve uncertainties in the analyses to an acceptable degree so there are no accepted reference points. Various bureaucratic issues have left the official NMFS listing for mackerel as "not overfished" and "no overfishing" but these are not reflective of reality (the Mid-Atlantic Fishery Management Council is working with NMFS to have the designation updated).

Given current indications of reduced productivity and lack of older fish in the survey and catch, the TRAC recommended that annual total catches not exceed the average total landings over the most recent three years of data available at that time (2006-2008; 80,000 mt) until new information suggests a different amount is more appropriate. Results of the current TRAC assessment differ substantially from those in the 2005 NEFSC assessment, which indicated an increasing trend in SSB. If the 2005 assessment results had been adjusted for severe retrospective patterns, the adjusted results would have been similar to the current assessment results. Also, the current TRAC assessment results are consistent with the decreasing trend in SSB estimates in the Gulf of St. Lawrence during the past decade as derived from the egg surveys reported in the 2008 Canadian mackerel assessment. A recent Canadian assessment suggests continued low productivity (http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2012/2012_031-eng.html), at least in Canadian waters.

Mackerel Fishery Performance

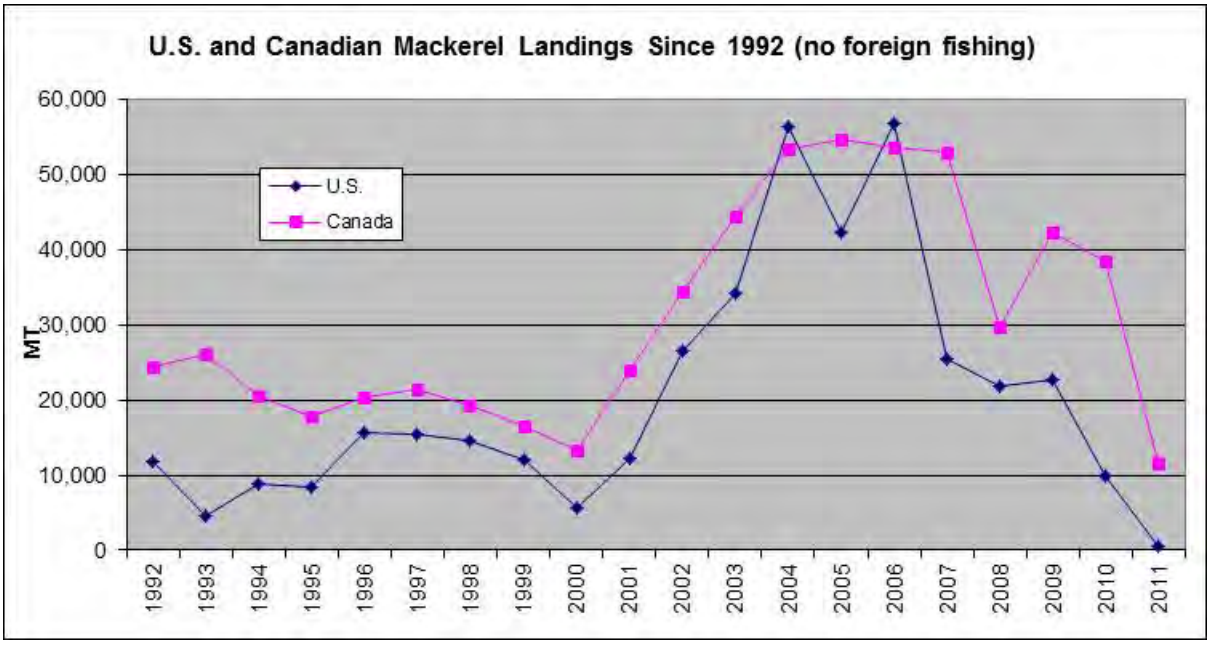
As Figure 5 and Figure 6 illustrate, catch in the fishery has varied substantially in the past 50 years. In the 1970s, foreign vessels came close to landing 400,000 mt of mackerel. In the early 1980s very little mackerel was caught, but by 1990 domestic boats were catching over 25,000 mt. Landings were relatively stable during the 1990's around 10,000 mt for domestic vessels, but the early 2000's saw landings rise to around 50,000 mt before dropping off in recent years. 2011 was a particularly low year with less than 1,000 mt of mackerel landed. Canadian landings since 1992 are included in Figure 6.

Figure 5 Atlantic Mackerel Landings Within 200 Miles of the US Coast (2011 Preliminary)



Source: TRAC 2010, unpublished NEFSC dealer reports

Figure 6 US and Canadian Atlantic Mackerel Landings (2011 Preliminary)



Source: Unpublished NEFSC Dealer Reports

The basic management approach for the Atlantic mackerel fishery is to use hard quotas with in-season closures. The principle measure used to manage mackerel catch is monitoring via dealer weighout data that is submitted weekly. The dealer data triggers in-season management actions that institute relatively low trip limits when 90% of the DAH is landed. Mandatory reporting for mackerel was fully instituted in 1997 so specification performance since 1997 is most relevant.

Table 27 lists the performance of the mackerel fishery (commercial and recreational together) compared to its DAH. There have been no quota overages. The gears used to catch mackerel have shifted from primarily bottom trawl before 2001 to primarily midwater trawl since 2001 (Table 28). See the MAFMC's Omnibus Amendment or 2012 mackerel specifications for details: http://www.mafmc.org/fmp/omnibus.htm; and http://www.mafmc.org/fmp/msb_files/msbSpecs2012.htm respectively.

Table 27 Mackerel Quota Performance

Year	Harvest (mt) (Commercial and Recreational)	Quota (mt)	Percent of Quota Landed
1997	17,139	90,000	19%
1998	15,214	80,000	19%
1999	13,367	75,000	18%
2000	7,097	75,000	9%
2001	13,879	85,000	16%
2002	27,824	85,000	33%
2003	35,068	175,000	20%
2004	56,912	170,000	33%
2005	43,302	115,000	38%
2006	58,371	115,000	51%
2007	26,130	115,000	23%
2008	22,517	115,000	20%
2009	23,238	115,000	20%
2010	10,649	115,000	9%
2011	1,463	47,395	3%

Source: Unpublished NMFS Dealer Reports

Table 28 Atlantic Mackerel Landings (%) by Gear

Year	Bottom Otter Trawl	Midwater Trawl	Pair Trawl	Other
1982	71%	0%	1%	28%
1983	34%	0%	16%	51%
1984	44%	0%	14%	37%
1985	56%	0%	9%	34%
1986	87%	0%	0%	13%
1987	85%	0%	0%	15%
1988	91%	0%	0%	9%
1989	93%	0%	0%	7%
1990	90%	0%	0%	10%
1991	94%	3%	1%	2%
1992	96%	0%	0%	4%
1993	81%	10%	0%	9%
1994	94%	0%	0%	6%
1995	94%	1%	0%	6%
1996	85%	8%	0%	7%
1997	90%	4%	0%	6%
1998	83%	4%	9%	3%
1999	93%	1%	0%	6%
2000	81%	13%	0%	6%
2001	5%	92%	0%	3%
2002	15%	44%	39%	1%
2003	15%	50%	34%	1%
2004	13%	41%	36%	10%
2005	13%	20	62%	5%
2006	18%	43%	34%	4%
2007	8%	58%	32%	3%
2008	13%	42%	42%	2%
2009	30%	41	41%	4%
2010	28%	42%	42%	10%
2011	61%	13%	14%	12%

Source: Unpublished NMFS Dealer Reports

3.2.2.3 Northeast Multispecies (Groundfish) Fishery

The overlap between the Northeast multispecies fisheries and the herring fishery is diverse; herring vessel operation overlaps in similar areas and times as multispecies vessel operation. As such, herring vessels encounter and some may land various groundfish species.

With respect to bycatch, haddock in particular are occasionally caught higher in the water column and encountered more frequently by herring vessels than other groundfish species. Framework (46) modified the bycatch regulations for the herring fishery and adjusted the cap on the amount of haddock that could be caught by midwater trawl herring vessels. When the cap is reached, catches of herring from a large part of the GOM and GB areas are limited to 2,000 pounds per trip for all herring vessels.

General Fishery

The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, Atlantic wolffish, and ocean pout) off the New England and Mid-Atlantic coasts. The N FMP has been updated through a series of frameworks and amendments, the most recent being Framework 47 (modified the Ruhle trawl definition and clarifies the regulations for charter/party vessels fishing in groundfish closed areas) and Amendment 17 (defines and facilitates the effective operation of state-operated permit banks by recognizing state-operated permit banks under provisions of the Multispecies FMP). These documents should be referenced for more detailed descriptions of the fishery and the current management measures.

Haddock Stock Status/Landings

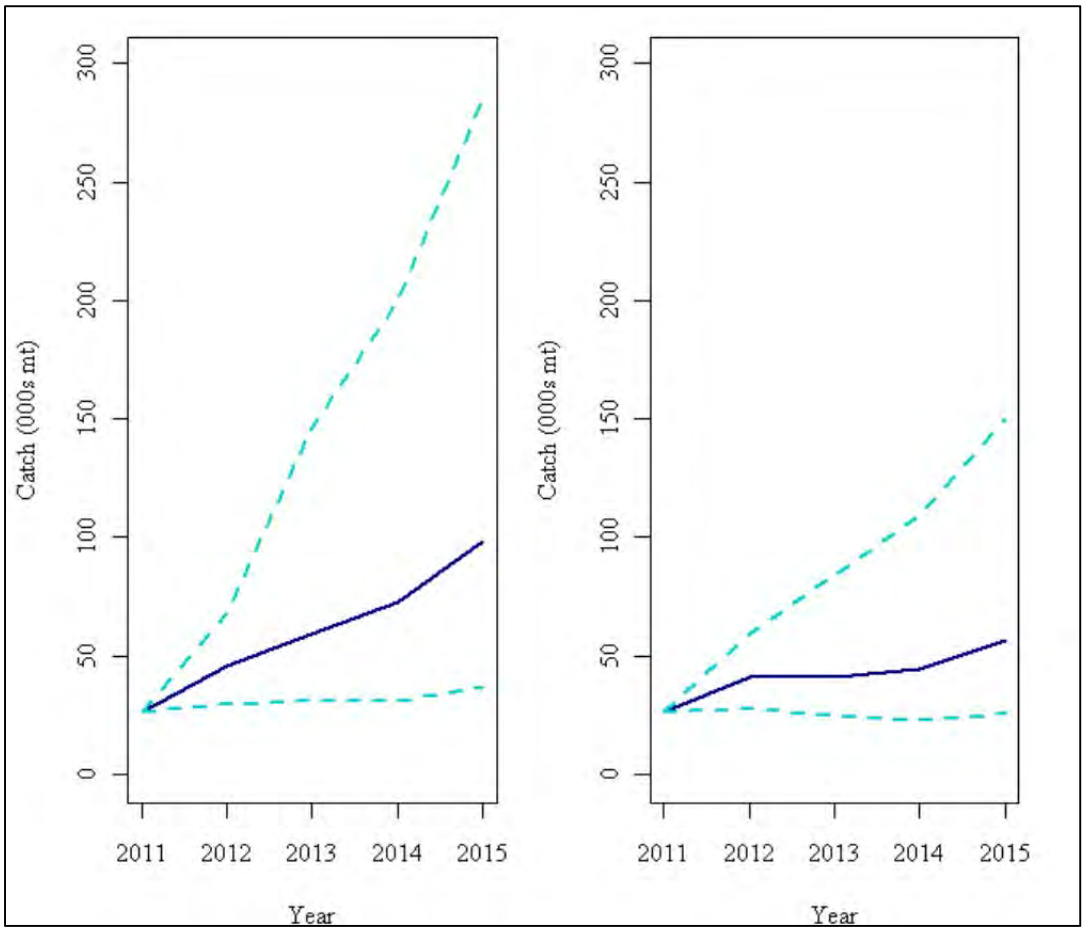
The GOM and GB haddock, *Melanogrammus aeglefinus*, is a commercially-exploited groundfish found in the northwest and northeast Atlantic Ocean. This demersal gadoid species is distributed from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland in the northwest Atlantic, where a total of six distinct haddock stocks have been identified. Two of these haddock stocks are found in U.S. waters associated with Georges Bank and Gulf of Maine.

Median age and size of maturity differ slightly between the GB and GOM haddock stocks. GARM III found that the Gulf of Maine fishery does not target haddock and is directed mostly at flatfish for which the fleet uses large square (6.5 in) mesh gear, which leads to reduced selectivity on haddock. The Gulf of Maine haddock have lower weights at age than the Georges Bank stock and the age at 50 percent maturity was also lower for Gulf of Maine as compared to Georges Bank haddock.

In the most recent groundfish assessment updates (2012), the Georges Bank haddock stock is still considered rebuilt, thus no rebuilding projections were made. However, a projection was made to estimate catch and stock levels from 2011-2015. In this projection, catch in 2011 was assumed to be at the same level as catch in 2010 (25,903 mt), and fishing mortality was assumed to be F_{MSY} in 2012-2015 (F=0.39) seen in Figure 7. Under this mixed harvest scenario, the realized F in 2011 is projected to be 0.20, and catch in years 2012-2015 is projected to increase

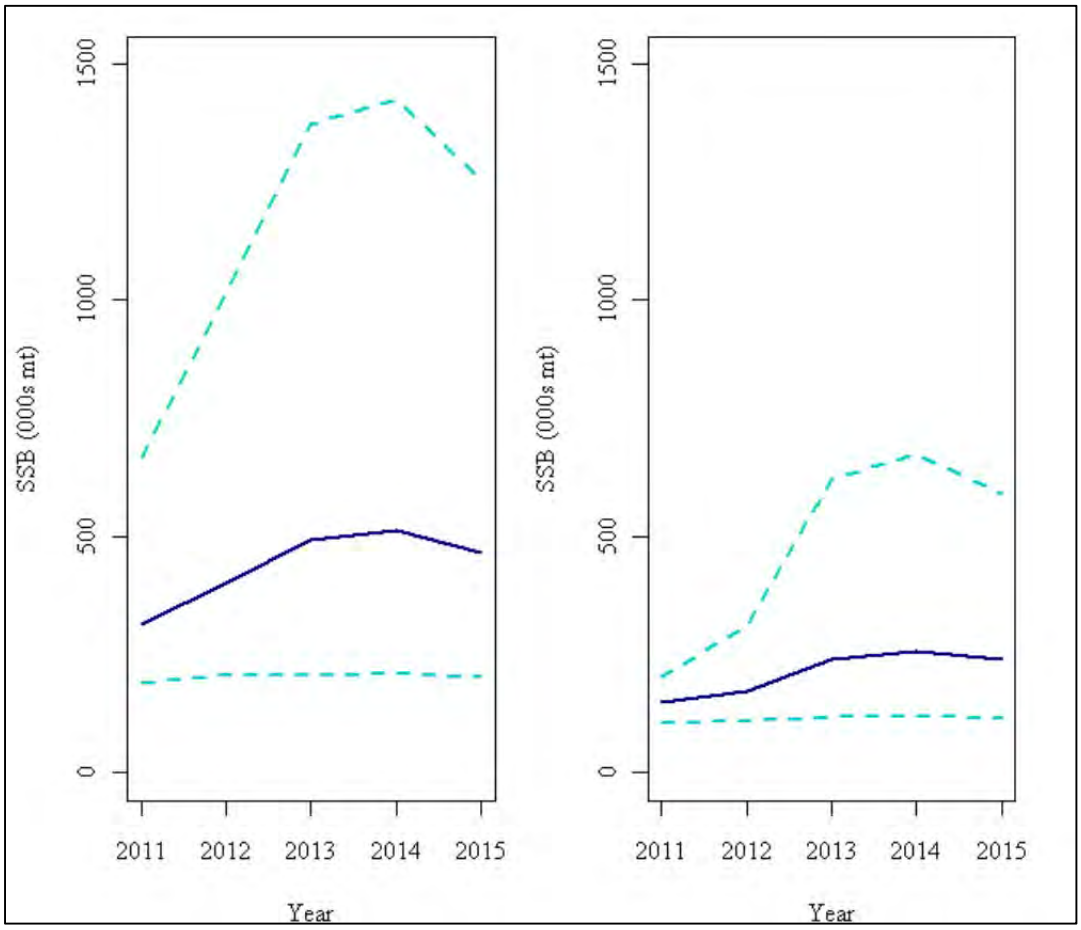
from 45,600 mt to 98,200 mt. SSB from 2011 to 2015 is projected to range from 313,300 mt to 466,300 mt (Figure 8).

Figure 7 Georges Bank Haddock Catch Projections, 2011



Source: NEFSC
Projections assuming a catch in 2011 of 25,903 mt, and fishing at F=0.39 in years 2012-2015. On the left, no adjustment is made to the uncertain 2010 year class. On the right, that year class is decreased by 50% before making the projections.

Figure 8 Georges Bank Haddock SSB Projections, 2011



Source: NEFSC
Projected spawning stock biomass, assuming a catch in 2011 of 25,903 mt, and fishing at F=0.39 in years 2012-2015. On the left, no adjustment is made to the uncertain 2010 year class. On the right, that year class is decreased by 50% before making the projections.

The estimate of haddock SSB for 2010 is 167,278 mt, which is greater than the median estimate of SSB_{MSY} (124,900 mt). Therefore, the Georges Bank haddock stock is not overfished. The estimate of F on fully selected fish in 2010 is 0.24, which is less than the F_{MSY} proxy (0.39), therefore overfishing is not occurring. Applying Mohn's Rho for 7 years did not cause the stocks status to differ from the calculated confidence interval, thus the retrospective pattern was not considered for additional sensitivity configurations (http://nefsc.noaa.gov/publications/crd/crd1206/gbhaddock.pdf).

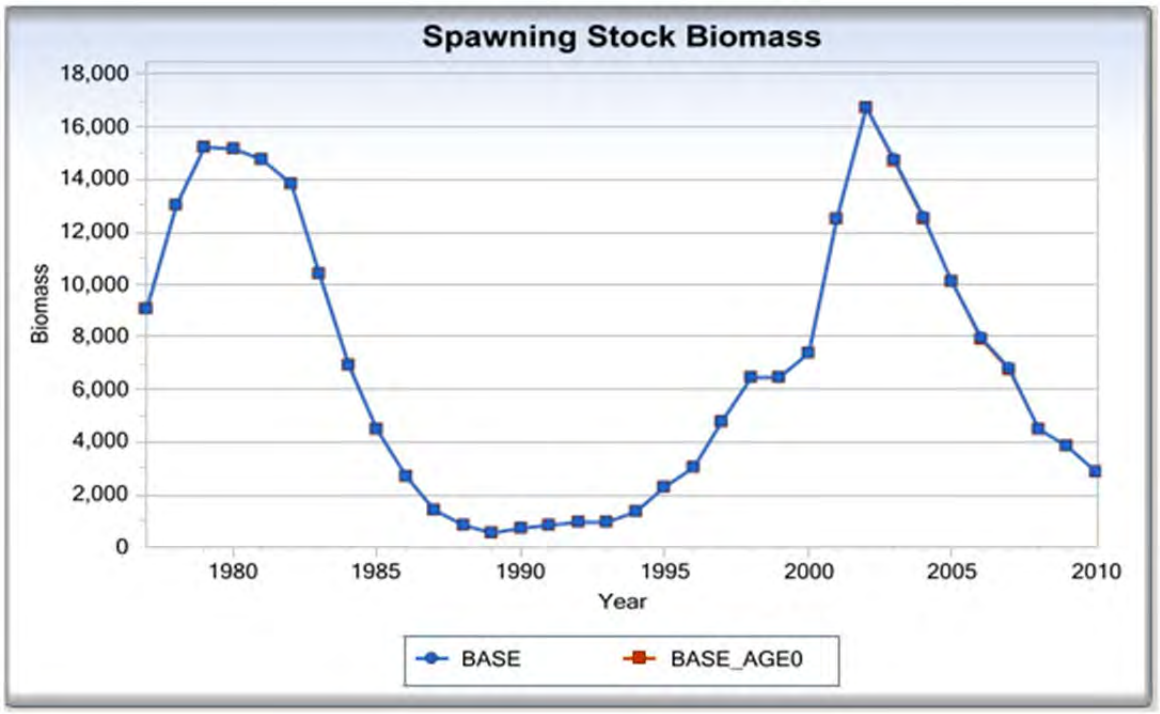
The GB haddock stock is a transboundary resource, which is co-managed with Canada. Substantial declines have recently occurred in the weights at age due to slower than average growth, particularly of the 2003 year-class. This is affecting productivity in the short-term. The growth of subsequent year-classes is returning to the earlier rates. Based on these results, the Georges Bank haddock stock is not overfished and overfishing is not occurring. The stock is above the biomass target.

For the 2012 assessment update of the Gulf of Maine haddock all model configuration details were kept identical to the configuration used in GARM III with the exception of the age 1-9+, due to an inconsistency in the GARM III VPA formulation (ages 0-9+) and biological reference point/projections (ages 1-9+).

Based on the updated 2012 assessment and revised reference points, the stock is not currently overfished, but overfishing is occurring (Figure 9). Accounting for the observed retrospective bias does change stock status with respect to the overfishing definition. However, the revised stock status point does not fall outside the confidence intervals of the un-adjusted point (Figure 9). The GARM III precedence was to not adjust stock status or projection inputs when the F and SSB estimates revised for retrospective bias do not fall outside the confidence intervals of the model.

The current biological reference points seen in Figure 9 are SSB_{MSY} of 4,904 mt, F_{MSY} of 0.46, and MSY of 1,177 mt. Based on these results, the Gulf of Maine haddock stock is not overfished, but overfishing is occurring. The stock is also below the biomass target. This represents a change from GARM III status.

Figure 9 Gulf of Maine Haddock Spawning Stock Biomass, 2012



Source: NEFSC

Framework 46

In September 2011, NMFS implemented Framework 46 to the Multispecies (Groundfish) FMP, which modified the haddock catch cap provisions for the herring fishery, originally adopted in Framework 43. The haddock catch cap provisions apply only to midwater trawl vessels with a herring permit because these vessels catch nearly all of the haddock caught by the herring fishery. Catches of haddock by midwater trawl vessels fishing in Management Areas 1A, 1B, and 3 that are documented by at-sea observers are extrapolated to an estimate of the total catch of haddock. Individual estimates are developed for each haddock stock (GOM and GB haddock). The cap is applied based on the multispecies fishing year (May 1 through April 30). The catch cap is set at one percent of the Acceptable Biological Catch (ABC) of each of the haddock stocks (Gulf of Maine and Georges Bank). If the haddock catch estimate extrapolated from observer reports exceeds a stock-specific cap, midwater trawl vessels will be limited to catching 2,000 pounds of Atlantic herring in a relevant area. If there is an overage of the cap, the cap for the following year will be reduced by the amount of the overage.

In order to monitor the cap, Framework 46 implemented some changes to the reporting requirements for midwater trawl vessels. In addition to the existing requirement to report herring catches by herring management area, midwater trawl vessels fishing in Management Areas 1A, 1B, and 3 are now required to report total kept catch by haddock stock area and gear used. This information is needed to extrapolate observer information to an estimate of total haddock catch.

Other Groundfish Stock Status/Landings

Of the twenty multispecies stocks, seven were reassessed during 2010-2012. These seven stocks, which were peer reviewed in the SAW/SARC process, include pollock in 2010, three stocks of winter flounder in 2011 (SNE/MA, GBK, and GOM), yellowtail flounder (SNE/MA and GB) and Gulf of Maine cod in 2012. This section summarizes the stock status in terms of biomass (B) or spawning stock biomass (SSB) and fishing mortality (F) through 2012 as reported in NEFSC (2012). Projected SSB and F were estimated in 2008 and 2009 for most of the age-based GARM assessments. The Georges Bank yellowtail assessment is updated each year through the TRAC and pollock was assessed in 2010 during SARC 50.

Comparisons between estimated stock sizes for 2007 from GARM III with the revised estimate for 2007 from the current updated results revealed decreases of 46% for Georges Bank cod, 20% for Georges Bank haddock, 57% for Gulf of Maine/Cape Cod yellowtail flounder, and 21% for witch flounder. Revised biomass estimates for GOM haddock, American plaice, and redfish biomasses exceeded those estimated in 2007 at GARM III. The changes in abundance between assessments for the same calendar year estimate are the result of incorporation of more information into the estimate and reduced uncertainty in the stock biomass. Subsequent to GARM III, pollock was assessed in SAW 50 (2010). The stock was determined to be not overfished and not subject to overfishing and remains the most current.

Atlantic wolffish was added to the multispecies groundfish stock complex and was assessed in 2008 in the Data Poor Working Group (DPWG 2008) and updated in 2010. Atlantic wolffish stock is presently overfished with current SSB being at 29% of SSB_{MSY} and overfishing is not occurring (F for fishing year 2010 was only 21% of F_{MSY}). As in the previous assessment a range of knife edge maturity and selectivity assumptions were used to characterize stock status due to a general lack of biological data on this stock.

Measures of stock biomass and fishing mortality were computed for 12 of 13 stocks. A composite snapshot of the overall stock status of these stocks reveals seven stocks that are overfished and of these, four experience overfishing. Of the five stocks that exceed half of the B_{MSY} proxy, one stock (GOM haddock) is experiencing overfishing. There were no changes in overfished status between the current results and GARM III. Of the 12 assessed stocks two (Acadian redfish and SNE/MAB windowpane flounder) have exceeded their B_{MSY} proxy targets and are therefore newly rebuilt since GARM III (Table 29). Model-based estimates were not derived for white hake because the stock is currently scheduled for a benchmark assessment in December 2012. Stock biomasses increased for eight of the 12 stocks between 2007 and 2010. Declines in stock biomass for Georges Bank and Gulf of Maine haddock stocks were expected owing to the reduced influence of the strong 2003 year class to the population. Decreases in biomass for American plaice and ocean pout were 12% and 13% respectively.

All of the fishing mortality reference points are based on F_{MSY} proxy values. Changes in the reference points between GARM III and this update were considered negligible. Determinations of overfishing were consistent between 2008 and 2012 with two exceptions. Overfishing of GOM haddock was not occurring in 2007 (GARM III) but is occurring in 2010. Conversely, overfishing of SNE/MAB windowpane is no longer occurring in 2010. Overfishing was occurring for five of the 12 assessed groundfish stocks in 2010. For most stocks the trend in fishing mortality is downward but GOM haddock constitutes a notable exception. Eight of the 12 stocks demonstrated reduced fishing mortality rates between 2007 and 2010.

Projections of catches for 2012 by stock at various fishing mortality rates (status quo, $F_{rebuild}$, F_{MSY} and 75% of F_{MSY}) were typically lower than the ABCs and ACLs currently specified in Framework 47. The increased biomass of redfish resulted in projected catches higher than ACLs for that stock listed in Framework 47 (NEFMC Groundfish FMP). A similar result occurred for the rebuilt stock of SNE-MAB windowpane flounder. Projected catches of GB cod, GOM haddock, GOM/CC yellowtail flounder, plaice and witch flounder consistent with the current control rule of 75% F_{MSY} were all lower than the Annual Catch limits now set for 2012.

Table 29 and Table 30 summarize 13 groundfish stocks based on GARM III results. Table 29 provides the estimates regarding biomass projections, and Table 30 provides the estimates regarding fishing mortality.

Table 29 Stock Status Summary (Biomass), February, 2012 (13 Groundfish Stocks)

Stock	Biomass (mt or kg/tow if noted)					Status	
	2012 Update			GARM III		Overfished?	
	B_{MSY} Proxy	B2010	B2007	B_{MSY} Proxy	B2007	GARM III	2012 Update
GB Cod	140,424	11,289	9,494	148,084	17,672	YES	YES
GB Haddock	124,900	167,279	252,065	158,873	315,975	NO	NO
GOM Haddock	4,904	2,868	6,796	5,900	5,850	NO	NO
CC GOM YT Flounder	7,080	1,680	824	7,790	1,922	YES	YES
American Plaice	18,398	10,805	12,271	21,940	11,106	NO	NO
Witch Flounder	10,051	4,099	2,710	11,447	3,434	YES	YES
Acadian Redfish	238,000	314,780	241,090	271,000	172,342	NO	NO
White Hake	--	--	--	56,254	19,800	YES	--
GOM GB Windowpane	1.60 kg/tow	0.46 kg/tow	0.242 kg/tow	1.40 kg/tow	0.24 kg/tow	YES	YES
SNE MAB Windowpane	0.24 kg/tow	0.35 kg/tow	0.19 kg/tow	0.34 kg/tow	0.19 kg/tow	NO	NO
Ocean Pout	4.94 kg/tow	0.41 kg/tow	0.47 kg/tow	4.94 kg/tow	0.48 kg/tow	YES	YES
Atlantic Wolffish	1,756	505	490	2184 - 2202	562 - 998	YES	YES
Atlantic Halibut	49,000	1,700	1,320	49,000	1,300	YES	YES

Source: NEFSC

Note the biomass and comparisons between GARM III and groundfish updates, which were provided during peer-review.

Table 30 Stock Status Summary (Fishing Mortality) February, 2012 (13 Groundfish Stocks)

Stock	Fishing mortality (instantaneous rates or 000 mt landings per survey kg/tow)					Status	
	2012 Update			GARM III		Overfishing?	
	F_{MSY} Proxy	F2010	F2007	F_{MSY} Proxy	F2007	GARM III	2012
GB Cod	0.23	0.45	0.88	0.25	0.3	YES	YES
GB Haddock	0.39	0.18	0.19	0.35	0.23	NO	NO
GOM Haddock	0.46	0.82	0.23	0.43	0.35	NO	YES
CC GOM YT Flounder	0.26	0.36	1.02	0.24	0.414	YES	YES
American Plaice	0.18	0.13	0.08	0.19	0.09	NO	NO
Witch Flounder	0.27	0.47	0.52	0.2	0.29	YES	YES
Acadian Redfish	0.04	0.006	0.0049	0.04	0.007	NO	NO
White Hake	--	--	--	0.13	0.15	YES	--
GOM GB Windowpane	0.44	0.51	2.082	0.5	1.96	YES	YES
SNE MAB Windowpane	2.09	1.4	1.82	1.47	1.85	YES	NO
Ocean Pout	0.76	0.31	0.35	0.76	0.38	NO	NO
Atlantic Wolffish	0.33	0.07	0.33	0.13 - 0.32	0.158	UNK	NO
Atlantic Halibut	0.073	0.032	0.062	0.07	0.065	NO	NO

Source: NEFSC

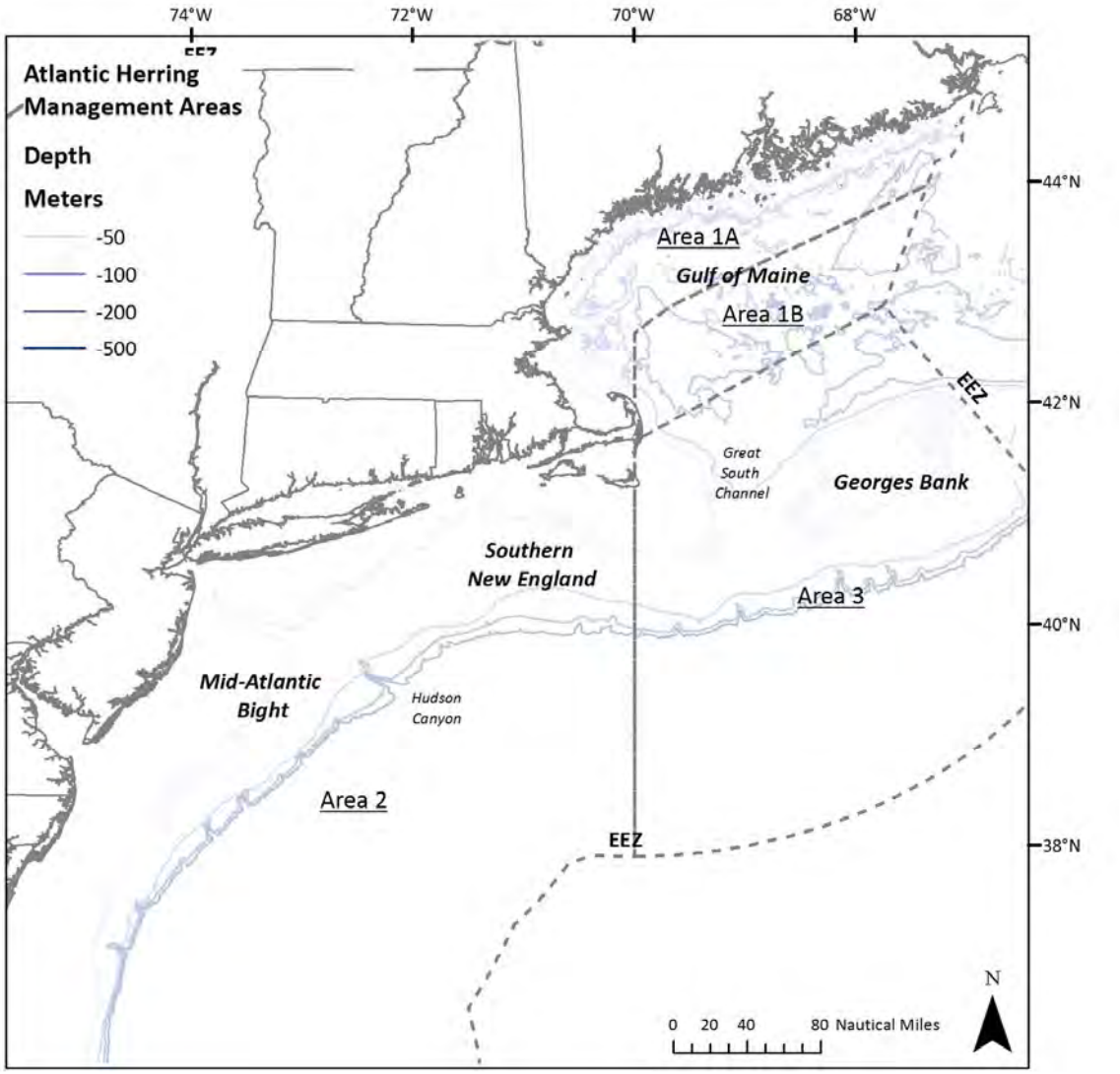
Note the fishing mortality and comparisons between GARM III and groundfish updates, which were provided during peer-review.

3.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

3.3.1 Physical Environment

The Atlantic herring fishery is prosecuted in four areas defined as 1A, 1B, 2, and 3 (Figure 10). These areas collectively cover the entire northeast U.S. shelf ecosystem, which has been defined as the Gulf of Maine south to Cape Hatteras, North Carolina, extending from the coast seaward to the edge of the continental shelf, including offshore to the Gulf Stream (Sherman et al. 1996). Three distinct sub-regions, the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic region, were described in the Affected Environment section of Amendment 5 to the Atlantic Herring FMP, based on a summary compiled for the gear effects technical memo authored by Stevenson et al. (2004). Roughly, Areas 1A and 1B cover the Gulf of Maine, Area 2 covers southern the New England/Mid-Atlantic region, and Area 3 covers Georges Bank.

Figure 10 Atlantic Herring Management Areas and the Northeast U.S. Shelf Ecosystem



3.3.2 Essential Fish Habitat (EFH)

Impacts of the Herring Fishery on EFH

EFH is defined by the Sustainable Fisheries Act of 1996 as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Since 1996, the MSA has included a requirement to evaluate the potential adverse effects of fisheries, including the Atlantic herring fishery, on EFH for the species managed by the FMP (in this case, herring) and on the EFH of other species. The EFH final rule specifies that measures to minimize adverse effects should be enacted when these effects are estimated to be 'more than minimal' and 'not temporary in nature'.

For any fishery, we assume that the magnitude of adverse effects resulting from the fishery's operations is generally related to (1) the location of fishing effort, because habitat vulnerability is spatially heterogeneous, and (2) the amount of fishing effort, specifically the amount of seabed area swept or bottom time. To the extent that adoption of a particular alternative would shift fishing to more vulnerable habitats, and/or increase seabed area swept, adoption would be expected to cause an increase in habitat impacts as compared to no action. If adoption of an alternative is expected to reduce seabed area swept or cause fishing effort to shift away from more vulnerable into less vulnerable habitats, a decrease in habitat impacts would be expected. The magnitude of an increase or decrease in adverse effects relates to the proportion of total fishing effort affected by a particular alternative.

An assessment of the potential adverse effects of the directed Atlantic herring commercial fishery on EFH for Atlantic herring and other federally-managed species in the Northeast region of the U.S. was conducted as part of an EIS that evaluated impacts of the Atlantic herring fishery on EFH (NMFS 2005). This analysis was included in Appendix VI, Volume II of the FSEIS for Amendment 1 to the Atlantic Herring FMP. It found that midwater trawls and purse seines do occasionally contact the seafloor, and particularly in certain areas and at certain times of year when adult herring form pre-spawning aggregations near the bottom, these gears may adversely impact benthic habitats utilized by a number of federally-managed species, including EFH for Atlantic herring eggs. However, after reviewing all the available information, the conclusion was reached that if the quality of EFH is reduced as a result of this contact, the impacts are minimal and/or temporary and, pursuant to MSA, do not need to be minimized, i.e., that there was no need to take specific action at that time to minimize the adverse effects of the herring fishery on benthic EFH. This conclusion also applied to pelagic EFH for Atlantic herring larvae, juveniles, and adults, and to pelagic EFH for any other federally-managed species in the region.

Potential shifts in adverse effects are discussed for each of the alternatives proposed in this action. These assessments are qualitative, as changes in the direction and magnitude of fishing effort in response to management actions can be difficult to predict. The conclusions reached regarding the habitat impacts of individual management measures being considered in this action should be viewed in the context of the overall impacts that the herring fishery has on seabed habitats described above. To reiterate, ***previous analyses have concluded that adverse effect to EFH that result from operation of the herring fishery do not exceed the more than minimal or more than temporary thresholds***.

In summary, it can be concluded that the herring fishery continues to have no more than minimal and temporary adverse effects on EFH. This is based on the previous finding that the fishery, as it existed in 2005, was not having more than a minimal or temporary impact on EFH and that there have not been any significant changes in this fishery since then that have caused this determination to change.

EFH for Atlantic Herring

The EFH designation for Atlantic herring was developed as part of EFH Omnibus Amendment 1 in 1998. EFH Omnibus Amendment 2, which includes updates to the EFH designation for herring, as well as for other NEFMC-managed species, is currently in development. Based on the 1998 designation, which is currently in effect, EFH for Atlantic herring is described in as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated in Figure 11 through Figure 14 and in Table 31 and meet the following conditions:

Eggs: Bottom habitats with a substrate of gravel, sand, cobble and shell fragments, but also on aquatic macrophytes, in the Gulf of Maine and Georges Bank as depicted in Figure 11. Eggs adhere to the bottom, forming extensive egg beds which may be many layers deep. Generally, the following conditions exist where Atlantic herring eggs are found: water temperatures below 15° C, depths from 20 - 80 meters, and a salinity range from 32 - 33‰. Herring eggs are most often found in areas of well-mixed water, with tidal currents between 1.5 and 3.0 knots. Atlantic herring eggs are most often observed during the months from July through November.

Larvae: Pelagic waters in the Gulf of Maine, Georges Bank, and southern New England that comprise 90% of the observed range of Atlantic herring larvae as depicted in Figure 12. Generally, the following conditions exist where Atlantic herring larvae are found: sea surface temperatures below 16° C, water depths from 50 – 90 meters, and salinities around 32‰. Atlantic herring larvae are observed between August and April, with peaks from September through November.

Juveniles: Pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras as depicted in Figure 13. Generally, the following conditions exist where Atlantic herring juveniles are found: water temperatures below 10° C, water depths from 15 – 135 meters, and a salinity range from 26 – 32‰.

Adults: Pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras as depicted in Figure 14. Generally, the following conditions exist where Atlantic herring adults are found: water temperatures below 10° C, water depths from 20 – 130 meters, and salinities above 28‰.

Spawning Adults: Bottom habitats with a substrate of gravel, sand, cobble and shell fragments, but also on aquatic macrophytes, in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Delaware Bay as depicted in Figure 14. Generally, the following conditions exist where spawning Atlantic herring adults are found: water temperatures below 15° C, depths from 20 - 80 meters, and a salinity range from 32 - 33‰. Herring eggs are spawned in areas of well-mixed water, with tidal currents between 1.5 and 3.0 knots. Atlantic herring are most often observed spawning during the months from July through November.

All of the above EFH descriptions include those bays and estuaries listed in Table 31, according to life history stage. The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

Table 31 EFH Designation of Estuaries and Embayments for Atlantic Herring

Estuaries and Embayments	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Passamaquoddy Bay		m,s	m,s	m,s	
Englishman/Machias Bay	s	m,s	m,s	m,s	s
Narraguagus Bay		m,s	m,s	m,s	
Blue Hill Bay		m,s	m,s	m,s	
Penobscot Bay		m,s	m,s	m,s	
Muscongus Bay		m,s	m,s	m,s	
Damariscotta River		m,s	m,s	m,s	
Sheepscot River		m,s	m,s	m,s	
Kennebec / Androscoggin Rivers		m,s	m,s	m,s	
Casco Bay	s	m,s	m,s	s	
Saco Bay		m,s	m,s	s	
Wells Harbor		m,s	m,s	s	
Great Bay		m,s	m,s	s	
Merrimack River		M	m		
Massachusetts Bay		s	s	s	
Boston Harbor		s	m,s	m,s	
Cape Cod Bay	s	s	m,s	m,s	
Waquoit Bay					
Buzzards Bay			m,s	m,s	
Narragansett Bay		s	m,s	m,s	
Long Island Sound			m,s	m,s	
Connecticut River					
Gardiners Bay			s	s	
Great South Bay			s	s	
Hudson River / Raritan Bay		m,s	m,s	m,s	
Barnegat Bay			m,s	m,s	
Delaware Bay			m,s	s	
Chincoteague Bay					
Chesapeake Bay				s	

S ≡ The EFH designation for this species includes the seawater salinity zone of this bay or estuary (salinity > 25.0‰).

M ≡ The EFH designation for this species includes the mixing water / brackish salinity zone of this bay or estuary (0.5 < salinity < 25.0‰).

F ≡ The EFH designation for this species includes the tidal freshwater salinity zone of this bay or estuary (0.0 < salinity < 0.5‰).

These EFH designations of estuaries and embayments are based on the NOAA Estuarine Living Marine Resources (ELMR) program (Jury et al. 1994; Stone et al. 1994).

Figure 11 EFH Designation for Atlantic Herring Eggs

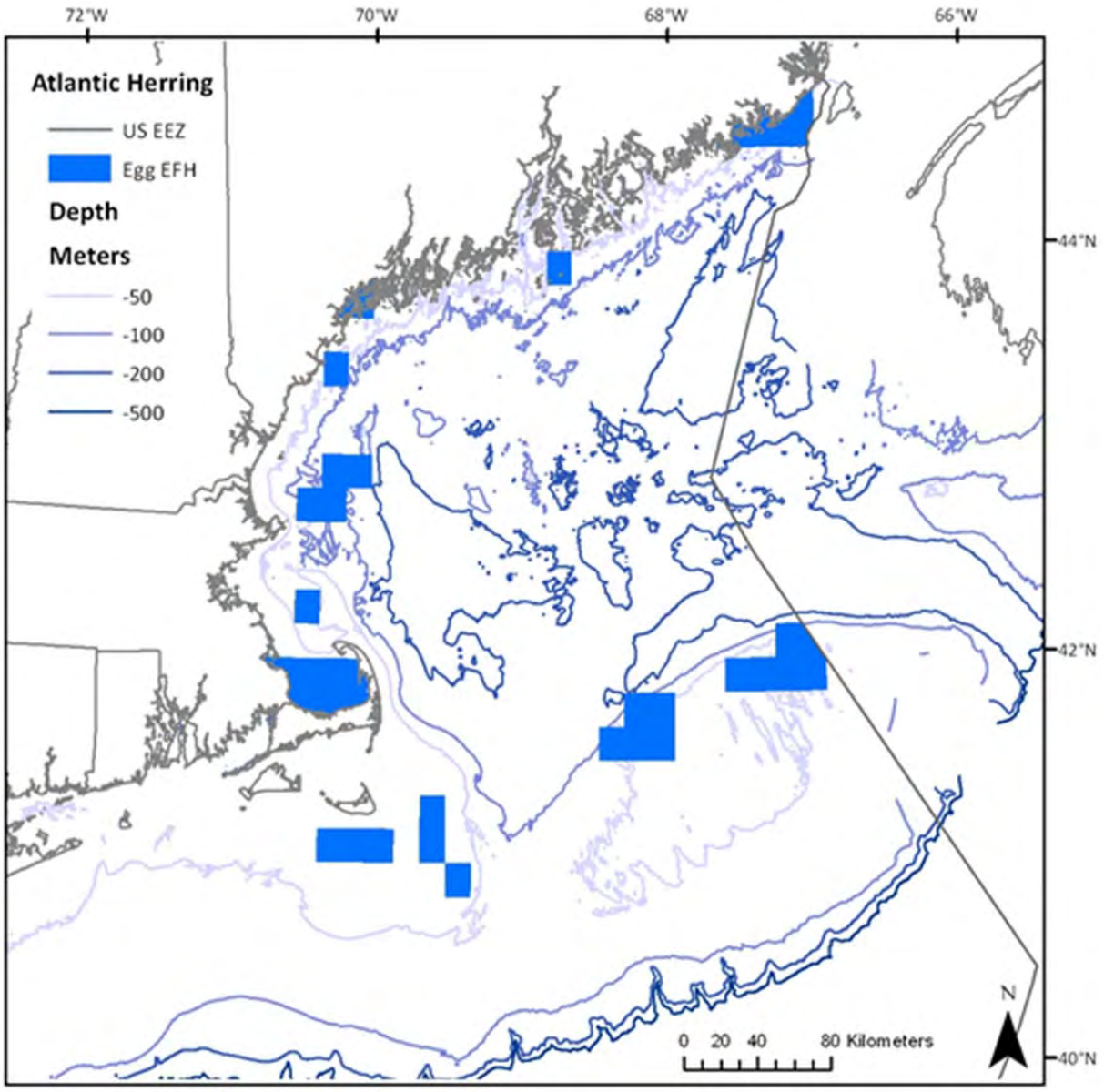


Figure 12 EFH Designation for Atlantic Herring Larvae

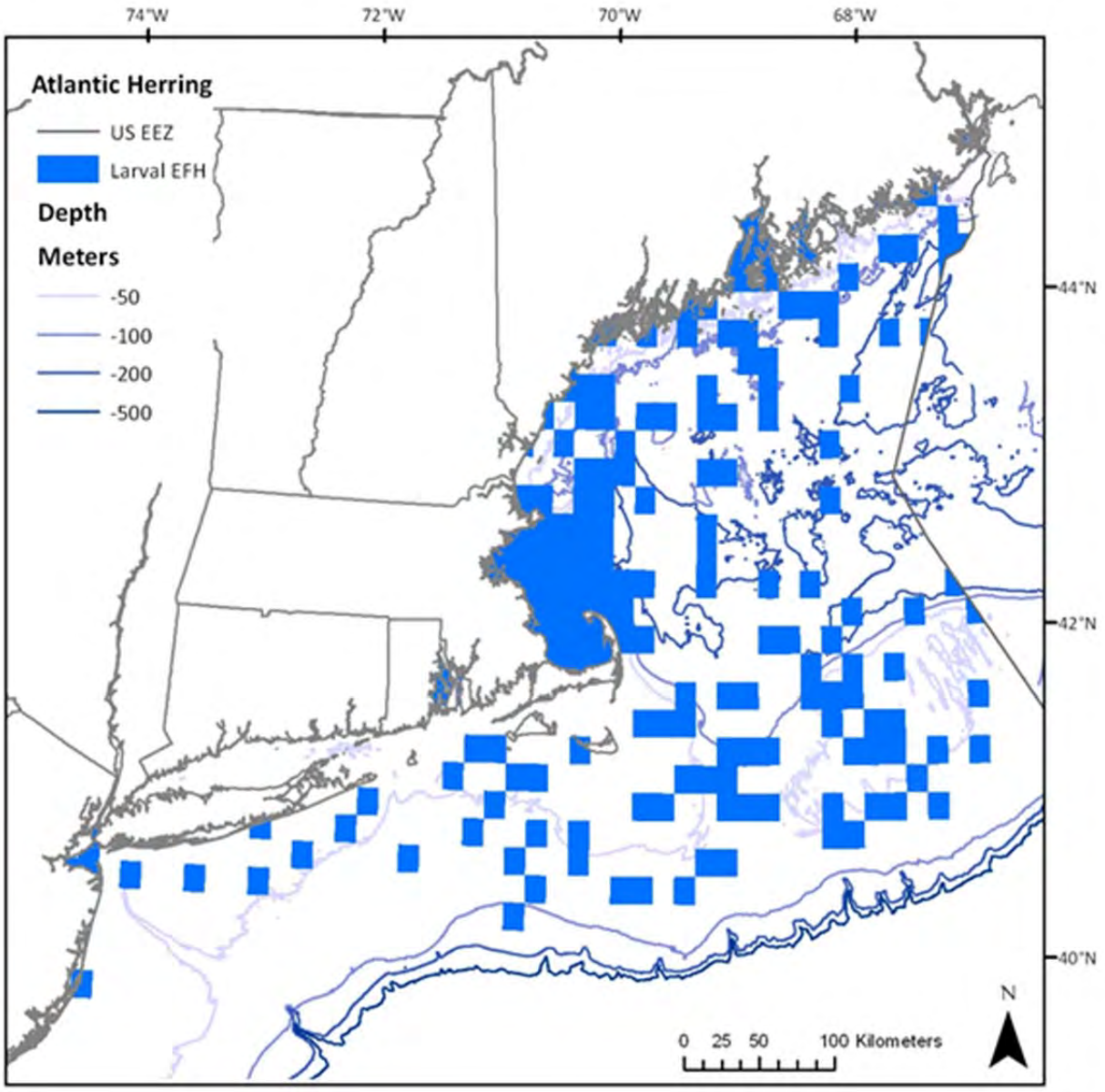


Figure 13 EFH Designation for Atlantic Herring Juveniles

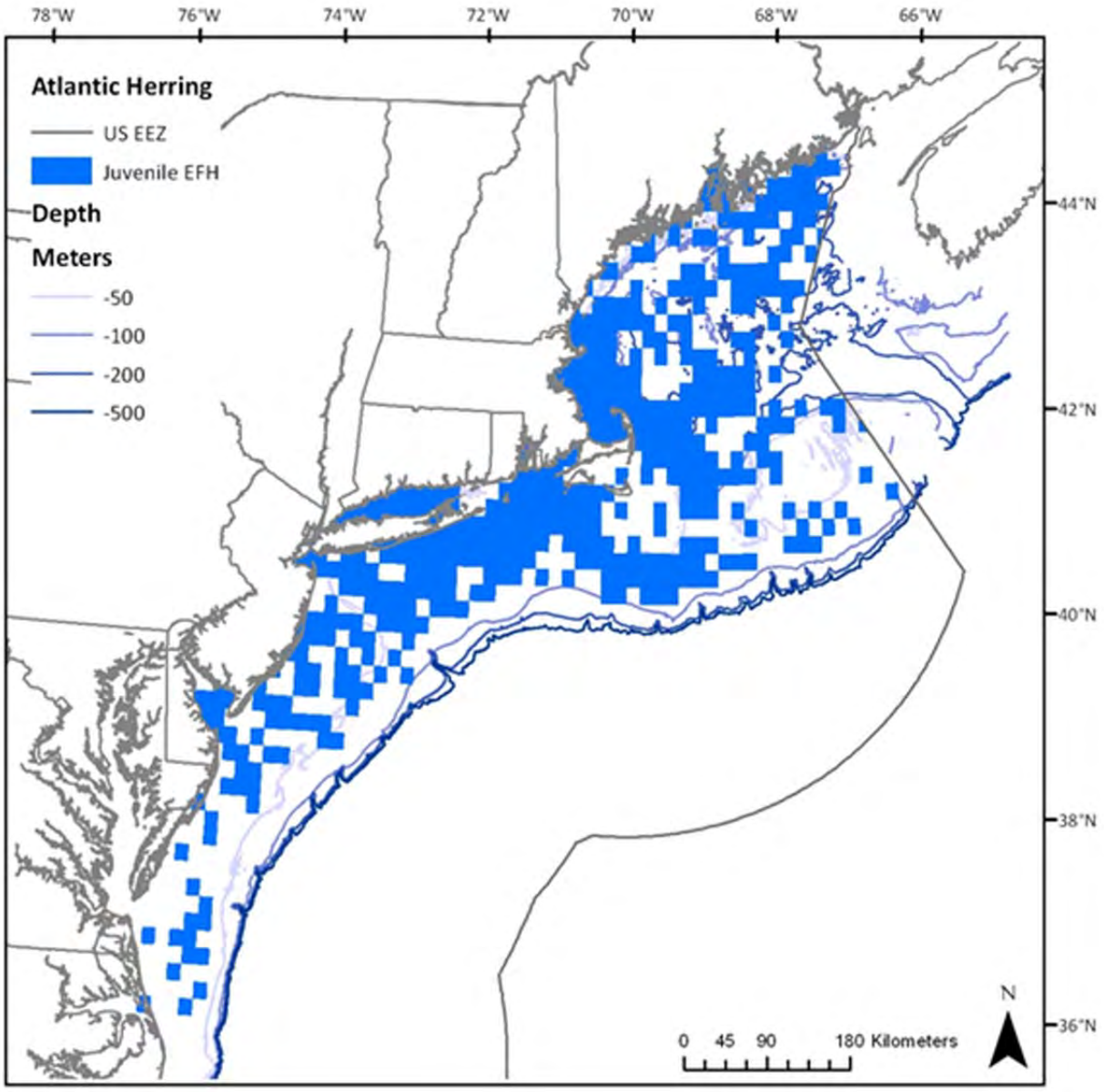
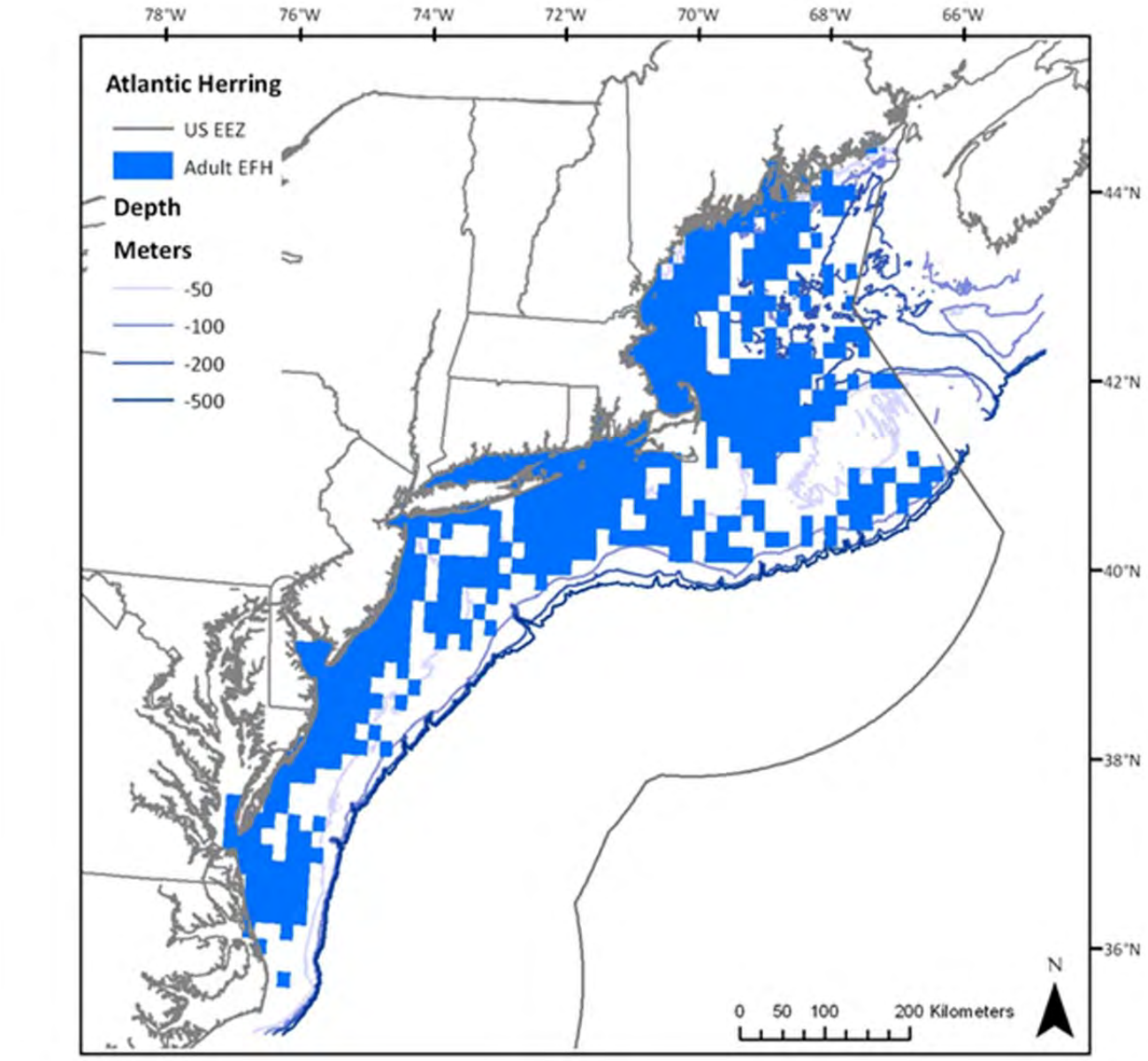


Figure 14 EFH Designation for Atlantic Herring Adults



EFH for Other Species

The environment that could potentially be affected by the Proposed Action has been identified as EFH for the benthic life stages of the species listed in Table 32. Additional information can be found in the FMP document that most recently updated each species' EFH designation (last column in Table 32). NOAA's EFH Mapper is also a good source of information and is a useful way to visualize the designations in a particular location: http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html.

Table 32 Listing of Sources for Current EFH Designation Information

Species	Management Authority	Plan Managed Under	Action where EFH designation was last updated
Monkfish	NEFMC, MAFMC	Monkfish	Amendment 1
Atlantic herring	NEFMC	Atlantic Herring	Original FMP
Atlantic salmon	NEFMC	Atlantic salmon	Original FMP
Atlantic sea scallop	NEFMC	Atlantic Sea Scallop	Amendment 9
American plaice	NEFMC	NE Multispecies	Amendment 11
Atlantic cod	NEFMC	NE Multispecies	Amendment 11
Atlantic halibut	NEFMC	NE Multispecies	Amendment 11
Atlantic wolffish	NEFMC	NE Multispecies	Amendment 16
Haddock	NEFMC	NE Multispecies	Amendment 11
Ocean pout	NEFMC	NE Multispecies	Amendment 11
Offshore hake	NEFMC	NE Multispecies	Amendment 12
Pollock	NEFMC	NE Multispecies	Amendment 11
Red hake	NEFMC	NE Multispecies	Amendment 12
Redfish	NEFMC	NE Multispecies	Amendment 11
Silver hake	NEFMC	NE Multispecies	Amendment 12
White hake	NEFMC	NE Multispecies	Amendment 11
Windowpane flounder	NEFMC	NE Multispecies	Amendment 11
Winter flounder	NEFMC	NE Multispecies	Amendment 11
Witch flounder	NEFMC	NE Multispecies	Amendment 11
Yellowtail flounder	NEFMC	NE Multispecies	Amendment 11
Barndoor skate	NEFMC	NE Skate Complex	Original FMP
Clearnose skate	NEFMC	NE Skate Complex	Original FMP
Little skate	NEFMC	NE Skate Complex	Original FMP
Rosette skate	NEFMC	NE Skate Complex	Original FMP
Smooth skate	NEFMC	NE Skate Complex	Original FMP
Thorny skate	NEFMC	NE Skate Complex	Original FMP
Winter skate	NEFMC	NE Skate Complex	Original FMP
Red crab	NEFMC	Red Crab	Original FMP
Spiny dogfish	MAFMC/NEFMC	Spiny Dogfish	Original FMP
Atlantic surfclam	MAFMC	Atlantic Surfclam Ocean Quahog	Amendment 12
Ocean quahog	MAFMC	Atlantic Surfclam Ocean Quahog	Amendment 12
Bluefish	MAFMC	Bluefish FMP	Amendment 1
Atlantic mackerel	MAFMC	Squid, Mackerel, Butterfish	Amendment 11
Butterfish	MAFMC	Squid, Mackerel, Butterfish	Amendment 11
Longfin squid	MAFMC	Squid, Mackerel, Butterfish	Amendment 11
Shortfin squid	MAFMC	Squid, Mackerel, Butterfish	Amendment 11

Note: Current as of December 2012

Table 32 **continued.**

Black sea bass	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Amendment 12
Scup	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Amendment 12
Summer flounder	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Amendment 12
Tilefish	MAFMC	Tilefish	Amendment 1

Note: Current as of December 2012

3.3.3 General Statement About Impacts on Physical Environment and EFH (Background)

Since 1996, the MSA has included a requirement to evaluate the potential adverse effects of the Atlantic herring fishery on Atlantic herring EFH and on the EFH of other species. The EFH final rule specifies that measures to minimize impacts should be enacted when adverse effects that are 'more than minimal' and 'not temporary in nature' are anticipated.

The magnitude of adverse effects resulting from a fishery's operations is generally related to (1) the location of fishing effort, because habitat vulnerability is spatially heterogeneous, and (2) the amount of fishing effort, specifically the amount of seabed area swept or bottom time. To the extent that adoption of a particular alternative would shift fishing to more vulnerable habitats, and/or increase seabed area swept, adoption would be expected to cause an increase in habitat impacts as compared to no action. If adoption of an alternative is expected to reduce seabed area swept or cause fishing effort to shift away from more vulnerable into less vulnerable habitats, a decrease in habitat impacts would be expected. The magnitude of an increase or decrease in adverse effects relates to the proportion of total fishing effort affected by a particular alternative.

Bearing in mind that both the direction and magnitude of changes are difficult to predict, because changes in fishing behavior in response to management actions can be difficult to predict, potential shifts in adverse effects are discussed for each of the alternatives proposed in this action. However, the conclusions reached regarding the impacts of individual measures on EFH should be viewed in the context of the overall impacts that the herring fishery is estimated to have on seabed habitats. *Specifically, previous analyses have concluded that adverse effect to EFH that result from operation of the herring fishery do not exceed the more than minimal or more than temporary thresholds.*

An assessment of the potential effects of the directed Atlantic herring commercial fishery on EFH for Atlantic herring and other federally-managed species in the Northeast region of the U.S. was conducted as part of an EIS that evaluated impacts of the Atlantic herring fishery on EFH (NMFS 2005). This analysis was included in Appendix VI, Volume II of the FSEIS for Amendment 1 to the Atlantic Herring FMP. It found that midwater trawls and purse seines do occasionally contact the seafloor and may adversely impact benthic habitats utilized by a number of federally-managed species, including EFH for Atlantic herring eggs. However, after reviewing all the available information, the conclusion was reached that if the quality of EFH is reduced as a result of this contact, the impacts are minimal and/or temporary and, pursuant to MSA, do not need to be minimized, i.e., that there was no need to take specific action at that time

to minimize the adverse effects of the herring fishery on benthic EFH (see Table 33). This conclusion also applied to pelagic EFH for Atlantic herring larvae, juveniles, and adults, and to pelagic EFH for any other federally-managed species in the region (see Section 3.3).

Table 33 Summary of EFH Impacts

Measure	Adverse effects
Allow sub-ACL splitting	No change in adverse effects
Allow up to 10% sub-ACL carryover	Option 1 – no change Option 2 – possible small increase in adverse effects Option 3 - possible small increase in adverse effects
OFL/ABC specification	Alternative 2 – small increase in adverse effects Alternative 3 – likely no change
Sub-ACL option	Options 1-6 – small increase in adverse effects; not possible to discriminate between options. No change as a result of seasonal allocations.
Other proposed specification	No change in adverse effects; administrative
Accountability measures	Alternatives 2 and 3 – small decrease in adverse effects Alternative 4 – possibly a small increase in adverse effects

3.4 PROTECTED RESOURCES

There are numerous protected species that inhabit the environment within the Atlantic Herring FMP management unit, and that, therefore, potentially occur in the operations area of the fishery. These species are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. As listed in Table 34, 13 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA; the remaining species in Table 34 are protected by the MMPA and are known to interact with the herring fishery. Non ESA-listed species protected by the MMPA that utilize this environment and have no documented interaction with the herring fishery will not be discussed in this statement.

3.4.1 Species Present in the Area

Table 34 lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the fishery. Table 34 also includes three candidate fish species and one proposed fish species (species being considered for listing as an endangered or threatened species), as identified under the ESA.

Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register. Cusk, alewife, and blueback herring are known to occur within the action area of the herring fishery. Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends considering conservation actions to limit the potential for adverse effects on candidate species.

The Protected Resources Division of the NMFS Northeast Regional Office has initiated review of recent stock assessments, bycatch information, and other information for these candidate species which will be incorporated in the status review reports. Additional information about river herring (alewife and blueback) is provided below.

On August 5, 2011, the National Marine Fisheries Service (NMFS) received a petition from the Natural Resources Defense Council (NRDC), requesting that alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) be listed each as threatened throughout all or a significant portion of their range under the Endangered Species Act (ESA). In the alternative, NRDC requested that NMFS designate distinct population segments of alewife and blueback herring as specified in the petition (Central New England, Long Island Sound, Chesapeake Bay, and Carolina for alewives, and Central New England, Long Island Sound, and Chesapeake Bay for blueback herring). NMFS reviewed the petition and published a positive 90-day finding on November 2, 2011, determining that the information in the petition, coupled with information otherwise available to the agency, indicated that the petitioned action may be warranted. As a result of the positive finding, the agency is required to review the status of the species to determine if listing under the ESA is warranted.

The Atlantic States Marine Fisheries Commission (ASMFC) completed a stock assessment for river herring in May 2012, which they had been conducting since 2008, covering over 50 river specific stocks throughout the species U.S. range. This represented a significant effort on behalf of the ASMFC and the coastal states from Maine to Florida. NMFS recognized this extensive effort to compile the most current information on the status of these stocks throughout their range in the United States and, in order to not duplicate this effort, has been working cooperatively with ASMFC. NMFS will utilize the information from the stock assessment as a critical component in the ESA listing decision for these two species. Due to the nature of the stock assessment, it did not contain all elements necessary for making a listing determination under the ESA; therefore, NMFS identified the additional required elements and held workshops focused on addressing this information. The three workshops organized for this purpose addressed river herring stock structure, extinction risk analysis (ERA), and climate change. Reports from the stock structure and ERA workshop and working group meeting were compiled and are being independently peer reviewed by the Center for Independent Experts, and the report from the climate change workshop has been compiled and is also being reviewed. The peer review reports and additional climate change analysis and extinction risk modeling results will be available in September/October, 2012. NMFS will use these reports and the modeling results along with the ASMFC river herring stock assessment and all other best available information to develop a listing determination which will be published in the *Federal Register* as soon as possible.

Table 34 Species Protected Under the ESA and MMPA That May Occur in the Operations Area for the Atlantic Herring Fishery

Species	Status
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)[b]	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered[c]
Loggerhead sea turtle (*Caretta caretta*)	
NWA DPS	Threatened
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Cusk *(Brosme brosme)*	Candidate
Atlantic sturgeon *(Acipenser oxyrinchus)*	
GOM DPS	Threatened
NYB DPS	Endangered
CB DPS	Endangered
SA DPS	Endangered
CAR DPS	Endangered
Alewife (*Alosa pseudoharengus*)	Candidate
Blueback Herring (*Alosa aestivalis*)	Candidate
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandicus*)	Protected
Hooded seal (*Cystophora cristata*)	Protected

Notes:

[a] MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the Atlantic Herring Fishery, as defined in the 2010 List of Fisheries.

[b] Bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic coastal stock is listed as depleted.

[c] Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

3.4.2 Species Potentially Affected

It is expected that the sea turtle, cetacean, and pinniped species discussed below have the potential to be affected by the operation of the herring fishery. Background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and longline types) can be found in a number of published documents. These include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998, 2000; NMFS and USFWS 2007a, 2007b; Leatherback TEWG 2007), recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005, 2010, and 2011; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 2006; 2007; 2009, 2010), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

Additional ESA background information on the range-wide status of these species and a description of critical habitat can be found in a number of published documents including recent sea turtle (NMFS and USFWS 1995, TEWG 2000, NMFS SEFSC 2001, NMFS and USFWS 2007a), loggerhead recovery team report (NMFS and USFWS 2008), status reviews and stock assessments, Recovery Plans for the humpback whale (NMFS 1991), right whale (NMFS 1991a, NMFS 2005), right whale EIS (August 2007), and the marine mammal stock assessment report (Waring et al. 2010) and other publications (e.g., Perry et al. 1999; Clapham et al. 1999; IWC 2001 a). A recovery plan for fin and sei whales is also available and may be found at the following web site http://www.NOAAFisheries.noaa.gov/prot_res/PR3/recovery.html (NOAA Fisheries unpublished).

3.4.2.1 Sea Turtles

The Northwest Atlantic DPS of loggerhead, leatherback, Kemp's ridley, and green sea turtles occur seasonally in southern New England and Mid-Atlantic continental shelf waters north of Cape Hatteras, North Carolina. In general, turtles move up the coast from southern wintering areas as water temperatures warm in the spring (James et al. 2005a, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). The trend is reversed in the fall as water temperatures cool. By December, turtles have passed Cape Hatteras, returning to more southern waters for the winter (James et al. 2005a, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species are typically observed as far north as Cape Cod whereas the more cold-tolerant leatherbacks are observed in more northern Gulf of Maine waters in the summer and fall (Shoop and Kenney 1992, STSSN database http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp).

On March 16, 2010, the Services announced 12-month findings on petitions to list the North Pacific populations and the Northwest Atlantic populations of the loggerhead sea turtle as DPSs with endangered status and published a proposed rule to designate nine loggerhead DPSs worldwide, seven as endangered (North Pacific Ocean DPS, South Pacific Ocean DPS, Northwest Atlantic Ocean DPS, Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, and Southeast Indo-Pacific Ocean DPS) and two as threatened (Southwest

Indian Ocean DPS and South Atlantic Ocean DPS). On March 22, 2011, the timeline for the final determination was extended for six months until September 16, 2011 (76 FR 15932).

A final listing determination was published on September 22, 2011 (76 FR 58867). Unlike the proposed listing, the final listing designates four DPSs (Northwest Atlantic, South Atlantic, Southeast Indo-Pacific, Southwest Indian) as threatened, and five DPSs (Northeast Atlantic, Mediterranean, North Indian, North Pacific, South Pacific) as endangered.

In general, sea turtles are a long-lived species and reach sexual maturity relatively late (NMFS SEFSC 2001; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Sea turtles are injured and killed by numerous human activities (NRC 1990; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Nest count data are a valuable source of information for each turtle species since the number of nests laid reflects the reproductive output of the nesting group each year. A decline in the annual nest counts has been measured or suggested for four of five western Atlantic loggerhead nesting groups through 2004 (NMFS and USFWS 2007a), however, data collected since 2004 suggests nest counts have stabilized or increased (TEWG 2009). Nest counts for Kemp's ridley sea turtles as well as leatherback and green sea turtles in the Atlantic demonstrate increased nesting by these species (NMFS and USFWS 2007b, 2007c, 2007d).

3.4.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2011) reviewed the current population trend for each of these cetacean species within U.S. EEZ waters, as well as providing information on the estimated annual human-caused mortality and serious injury, and a description of the commercial fisheries that interact with each stock in the U.S. Atlantic. Information from the SAR is summarized below.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf and Maine and Georges Bank, to low latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2011). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002, Patrician et al. 2009). Blue whales are most often sighted on the east coast of Canada, particularly in the Gulf of St. Lawrence, and occurs only infrequently within the U.S. EEZ (Waring et al. 2010).

For North Atlantic right whales, the available information suggests that the population is increasing at a rate of 2.4 percent per year during 1990-2007, and the total number of North Atlantic right whales is estimated to be at least 396 animals in 2007 (Waring et al. 2011). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 2.4 per year during 2005 to 2009 (Waring et al. 2011). Of these, 0.8 per year resulted from fishery interactions.

The North Atlantic population of humpback whales is estimated to be 11,570, although the estimate is considered to be negatively biased (Waring et al. 2011). The best estimate for the Gulf of Maine stock of humpback whales is 847 whales (Waring et al. 2011). The population trend was considered positive for the Gulf of Maine population, but there are insufficient data to estimate the trend for the larger North Atlantic population. Based on data available for selected areas and time periods, the minimum population estimates for other western North Atlantic whale stocks are 3,269 fin whales, 208 sei whales, 440 blue whales, 3,539 sperm whales, and 6,909 minke whales (Waring et al. 2010). Insufficient data exist to determine trends for any other large whale species.

The ALWTRP was revised with publication of a new final rule (72 FR 57104, October 5, 2007) that is intended to continue to address entanglement of large whales (right, humpback, and fin) in commercial fishing gear and to reduce the risk of death and serious injury from entanglements that do occur.

On October 5, 2010, NOAA's Fisheries Service (NMFS) published a notice of a 90-day petition finding and notice of 12-month determination in the Federal Register. NMFS was already conducting an ongoing analysis and evaluation of new information not available at the time of the original 1994 critical habitat designation prior to the receipt of this petition. Three critical habitat areas currently exist, established in 1994, two of which occur in the northeast region: feeding grounds in Cape Cod Bay and the Great South Channel.

3.4.2.3 Small Cetaceans

Numerous small cetacean species (dolphins; pygmy and dwarf sperm whales; pilot and beaked, whales; and the harbor porpoise) occur within [the area from Cape Hatteras through the Gulf of Maine]. Seasonal abundance and distribution of each species in [Mid-Atlantic, Georges Bank, and/or Gulf of Maine] waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso's dolphin, pilot whales), and still others occupy all three habitats (e.g., common dolphin, spotted dolphins, striped dolphins). Information on the western North Atlantic stocks of each species is summarized in Waring et al. (2011).

With respect to harbor porpoise, the most recent Stock Assessment Reports show that the number of harbor porpoise takes (927 animals/year from 2005-2009) exceed this stocks Potential Biological Removal (PBR) level calculated for this species (701 animals) and is therefore a strategic stock. The most recent amendment to the Harbor Porpoise Take Reduction Plan (HPTRP) occurred in 2010. Observer information collected from 1999 through 2007 indicated an increase in porpoise bycatch throughout the geographic area covered by the HPTRP in both New England and Mid-Atlantic waters in commercial sink gillnet gear. The Harbor Porpoise Take Reduction Team developed measures to reduce takes, and NMFS published a proposed rule on July 21, 2009 (74 Federal Register 36058) with five alternatives including no action. The comment period on this rule ended on August 20, 2009 and the final rule was published on February 19, 2010 (75 Federal Register 7383).

The following changes were implemented in the 2010 amendments to the HPTRP:

New England

- Expand the size of the Massachusetts Bay Management Area, as well as pinger use to include November;
- Establish the Stellwagen Bank Management Area and require pingers from November 1 through May 31;
- Establish the Southern New England Management Area where pingers are required from December 1 through May 31; and
- Establish the Cape Cod South Expansion Consequence Closure Area and Coastal Gulf of Maine Consequence Closure Area. These areas would be closed to gillnetting for two to three months if harbor porpoise bycatch levels exceed specific bycatch thresholds.

Mid-Atlantic

- Establish the MudHole South Management Area, with a seasonal closure and gear modifications for large and small mesh gear;
- Modify the northern boundary of the waters off New Jersey Management Area to intersect with the southern shoreline of Long Island, NY at 72° 30' W longitude; and
- Modify tie-down spacing requirement for large mesh gillnets in all Mid-Atlantic management areas (waters off New Jersey, MudHole North and South, and Southern Mid-Atlantic Management Areas).

The Atlantic Trawl Gear Take Reduction Team (ATGTRT) was organized in 2006 to implement a plan to address the incidental mortality and serious injury of long-finned pilot whales, short-finned pilot whales, common dolphins, and Atlantic white-sided dolphins in several trawl gear fisheries. In lieu of a TRP, the ATGTRT agreed to develop an Atlantic Trawl Gear Take Reduction Strategy (ATGTRS). The ATGTRS identifies informational and research tasks as well as education and outreach needs the ATGTRT believes are necessary to provide the basis for achieving the ultimate MMPA goal of achieving ZMRG. The ATGTRS also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. These voluntary measures are as follows:

- Reducing the numbers of turns made by the fishing vessel and tow times while fishing at night; and
- Increasing radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area.

3.4.2.4 Pinnipeds

Of the four species of seals expected to occur in the area, harbor seals have the most extensive distribution with sightings occurring as far south as 30° N (Katona et al. 1993, Waring et al. 2011). Gray seals are the second most common seal species in U.S. EEZ waters, occurring

primarily in New England (Katona et al. 1993; Waring et al. 2011). Pupping for both species occurs in both U.S. and Canadian waters of the western north Atlantic with the majority of harbor seal pupping likely occurring in U.S. waters and the majority of gray seal pupping in Canadian waters, although there are at least three gray seal pupping colonies in U.S. waters as well. Harp and hooded seals are less commonly observed in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late winter/early spring, and then travel to more northern latitudes for molting and summer feeding (Waring et al. 2011). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch (Waring et al. 2011).

3.4.2.5 Atlantic Sturgeon DPSs

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). Available information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT 2007). There are no total population size estimates for any of the five Atlantic sturgeon DPSs at this time. However, there are two estimates of spawning adults per year for two river systems (e.g., 870 spawning adults per year for the Hudson River, and 343 spawning adults per year for the Altamaha River). These estimates represent only a fraction of the total population size as Atlantic sturgeon do not appear to spawn every year and additionally, these estimates do not include sub-adults or early life stages. Detailed life history information may be found in the 2007 Atlantic Sturgeon Status Review, available at: http://sero.nmfs.noaa.gov/pr/esa/Sturgeon/Atl%20Sturgeon/atlanticsturgeon2007.pdf.

There is no documented bycatch of Atlantic sturgeon in midwater trawls and herring purse-seine gear, which makes up the majority of the herring fishing effort. Otter trawl gear is known to capture Atlantic sturgeon and has been known to be used in the herring fishery. However, otter trawl gear make up a very small percentage of the herring fishery effort and it is highly unlikely that this gear would interact with any Atlantic sturgeon.

3.4.2.6 Species Not Likely to be Affected

The Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services on June 19, 2009 (74 FR 29344) included an expanded range for the GOM DPS of Atlantic salmon

Presently, the GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery (GLNFH) and Craig Brook National Fish Hatchery (CBNFH). Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the GOM DPS of Atlantic salmon (74 FR 29300; June 19, 2009). The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine.

The action being considered in the EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Shortnose sturgeon and salmon belonging to the Gulf of Maine DPS of Atlantic salmon occur within the general geographical areas fished by the herring fishery, but they are unlikely to occur in the area where the fishery operates given their numbers and distribution. Therefore, none of these species are likely to be affected by the herring fishery. The following discussion provides the rationale for these determinations. Although there are additional species that may occur in the operations area that are not known to interact with the specific gear types that would be used by the herring fleet, impacts to these species are still considered due to their range and similarity of behaviors to species that have been adversely affected.

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. Shortnose sturgeon can be found in rivers along the western Atlantic coast from St. Johns River, Florida (although the species is possibly extirpated from this system), to the Saint John River in New Brunswick, Canada. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 1998). Since the herring fishery would not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that the fishery would affect shortnose sturgeon.

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S. - Canada border are listed as endangered under the ESA. These populations include those in the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove Brook. Juvenile salmon in New England rivers

typically migrate to sea in May after a 2- to 3-year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn. Results from a 2001 post-smolt trawl survey in Penobscot Bay and the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid- to late May. Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the approval of this EA would affect the Gulf of Maine DPS of Atlantic salmon given that operation of the herring fishery would not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found and herring fishing gear used by the fleet operates in the ocean at or near the bottom rather than near the water surface. Thus, this species is not considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009a). Since operation of the herring fishery would not occur in waters that are typically used by hawksbill sea turtles, it is highly unlikely that its operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2010). In the North Atlantic, blue whales are most frequently sighted in the St. Lawrence from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the mid- and north Atlantic areas of the outer continental shelf (CeTAP 1982). Calving for the species occurs in low latitude waters outside of the area where the herring fishery operates. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. Given that the species is unlikely to occur in areas where the herring fishery operates, and given that the operation of the fishery would not affect the availability of blue whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect blue whales.

Sperm whales occur in waters of the EEZ. However, the distribution of the sperm whales in the EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). In contrast, the herring fishery would operate in continental shelf waters. The average depth of sperm whale sightings observed during the CeTAP surveys was 1792 m (CeTAP 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 1000 m and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). Given that sperm whales are unlikely to occur in areas (based on water depth) where the herring fishery would operate, and given that the operation of the fishery would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect sperm whales.

Although large whales and marine turtles may be potentially affected through interactions with fishing gear, it is likely that the continued authorization of the herring fishery should not have any adverse effects on the availability of prey for these species. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The herring fishery would not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that would pass through herring fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish (e.g., sand lance, herring, mackerel) (Aguilar 2002, Clapham 2002). The TRAC Status Report of 2006 suggests that although predator consumption estimates have increased since the mid-1980s, the productive potential of the herring stock complex has improved in recent years. The proposed management measures may provide a benefit to the protected resources by providing a greater quantity of food available. Moreover, none of the turtle species are known to feed upon herring.

3.4.3 Interactions Between Gear and Protected Resources

Commercial fisheries are categorized by NMFS based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each stock. The system is based on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level (the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population). Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries while Tier 2 considers marine mammal mortality caused by the individual fisheries; Tier 2 classifications are used in this EA to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals. Table 35 identifies the classifications used in the List of Fisheries (LOF) for FY 2012 (76 FR 73912; November 29, 2011), which are broken down into Tier 2 Categories I, II, and III).

Table 35 Descriptions of the Tier 2 Fishery Classification Categories

Category	Category Description
Tier 2, Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's potential biological removal (PBR) level.
Tier 2, Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Tier 2, Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve unintentional interactions with fishing gear. Trophic interactions are more "active" and occur when protected species attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with various types of fishing gear used by herring fishery through the year. Large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer, although they are also relatively abundant during the fall and would have a higher potential for interaction with herring vessels during these seasons. Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents; therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during the winter.

Although interactions between deployed gear and protected species would vary, all the species identified in the following table have the potential to be affected by the operation of the herring fishery. The herring fishery is prosecuted by midwater trawl gear (single), paired midwater trawls, purse seines, stop seines and weirs. A full description of the gear used in the fishery is provided in the Amendment 1 FEIS. Only the first three are considered to be primary gears in the Atlantic herring fishery. Weirs and stop seines are responsible for a only a small fraction of herring landings (see Amendment 1 FEIS), operate exclusively within State waters and are not

regulated by the Federal FMP, and therefore will not be discussed further in this document relative to protected species. It should be noted, however, that both gear types have accounted for interactions with protected species, notably minke whales and harbor porpoise, as well as harbor and gray seals. Animals, particularly pinnipeds, may be released alive.

Table 36 Marine Mammals Impacts Based on Herring Gear (Based on 2012 List of Fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	**Type**		
Tier 2, Category II	Mid-Atlantic mid-water trawl (including pair trawl)	669	Bottlenose dolphin, WNA offshore Common dolphin, WNA Long-finned pilot whale, WNA Risso's dolphin, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
Tier 2, Category II	Northeast mid-water trawl (including pair trawl)	887	Harbor seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
Tier 2 Category II	Gulf of Maine Atlantic herring purse seine	>6	Harbor seal, WNA Gray Seal, WNA
Tier 2, Category III	Gulf of Maine herring and Atlantic mackerel stop seine/weir	Unknown	Gray seal, Northwest North Atlantic Harbor porpoise, GME/BF Harbor seal, WNA Minke whale, Canadian East Coast White-sided dolphin, WNA

Due to the remote likelihood of interactions denoted by the List of Fisheries designations for the purse seine fishery and stop seines and weirs, discussion of these fisheries will only be where necessary. This discussion, as well as that in Amendment 1, will instead focus on the proposed measures and associated midwater trawl activities.

Given the target species of this fishery and because herring is a primary prey species for seals, porpoises and some whales, levels of protected species interactions with the fishery are likely for the midwater and pair trawl. The NOAA Fisheries Northeast Fisheries Science Center incidental take reports are published on the Northeast Fisheries Science Center website - http://www.nefsc.noaa.gov/femad/fishsamp/fsb/. A number of takes have occurred in the past four years by the midwater trawl fishery, as indicated in Table 37.

Table 37 Number of MWT Incidental Takes Recorded by Fisheries Observers

Protected Species Encountered	2011 (To August)	2010	2009	Total
Grey Seal	10	5	1	6
Harbor Seal	3	4	1	5
Common Dolphin		1		1
Dolphin Unk.		1		1
Mammal Unk.		1		1
Seal Unk.	8	1		1

Although the incidents are isolated to observed herring trips, the table indicates that grey seals and harbor seals are the most likely to be taken in the herring fishery. Both gray and harbor seals are distributed inshore during the period of highest activity in the herring fishery, from May through October. Interactions are most likely to occur in Area 1A. Although these species have had documented interactions with the herring purse seine/fixed gear fishery, the animals, if observed, are often released alive.

3.4.4 Actions to Minimize Interactions with Protected Species

To minimize potential impacts to certain cetaceans, herring vessels would be required to adhere to measures in the ALWTRP, although the gear regulated are seldom used in the directed herring fishery. This was developed to reduce the incidental take of large whales, specifically the right, humpback, fin, and minke whales in certain Category I or II commercial fishing efforts that utilize traps/pots and gillnets. The ALWTRP calls for the use of gear markings, area restrictions, and use of weak links, and neutrally buoyant groundline. Fishing vessels would be required to implement the ALWTRP in all areas where gillnets were used. In addition, the HPTRP would be implemented in the Gulf of Maine to reduce interactions between the harbor porpoise and gillnets; the HPTRP implements gear specifications, seasonal area closures, and in some cases, the use of pingers (acoustic devices that emit a loud sound) to deter harbor porpoises and other marine mammals from approaching the nets. Gillnets are not used in the herring fishery, however.

3.5 FISHERY-RELATED BUSINESSES AND COMMUNITIES

3.5.1 Fishery-Related Businesses

3.5.1.1 Background Information

The U.S. Atlantic Herring fishery occurs over the Mid-Atlantic shelf region from Cape Hatteras to Maine, including an active fishery in the inshore Gulf of Maine and seasonally on Georges Bank. The Atlantic herring winter fishery is generally prosecuted south of New England in management Area 2 during the winter (January-April), and oftentimes as part of the directed mackerel fishery. There is significant overlap between the herring and mackerel fisheries in Area 2 and in Area 3 during the winter months, although catches in Area 3 tend to be relatively low. The herring summer fishery (May-August) is generally prosecuted throughout the Gulf of Maine in Areas 1A, 1B and in Area 3 (Georges Bank) as fish are available. Restrictions in Area 1A (including ASMFC days out measures implemented in response to quota reductions) have pushed the fishery in the inshore Gulf of Maine to later months (late summer). Fall fishing (September-December) tends to be more variable and dependent on fish availability; the Area 1A quota is always fully utilized, and the inshore Gulf of Maine fishery usually closes sometime around November. As the 1A and 1B quotas are taken, larger vessels become increasingly dependent on offshore fishing opportunities (Georges Bank, Area 3) when fish may be available.

Businesses related to the Atlantic herring fishery include fishing vessel owners and employees (captains/crew) and herring dealers and processors. Refer to the Amendment 5 FEIS (Section 4.5) for information in addition to that provided in the following subsections.

3.5.1.2 Atlantic Herring Catch

The herring ACL and management area sub-ACLs are tracked/ monitored based on the ***total catch – landings and discards***, which is provided and required by herring permitted vessels through the vessel monitoring system (VMS) catch reports and vessel trip reports (VTRs) as well as through Federal/state dealer data. Herring harvesters are required to report discards in addition to landed catch through these independent methods.

Table 38 summarizes Atlantic herring catch estimates by year and management area from 2003-2012. The following describes how these estimates were determined from 2003 to 2012.

- 2003-2006 catch estimates are provided from quota management implemented through the Atlantic Herring FMP and are based on interactive voice reporting (IVR) data from the call-in system used to monitor TACs. Reported herring discards are included in the totals.
- 2007-2009 catch estimates are based on IVR data supplemented with dealer data. Reported discards are included in the totals.
- 2010-2011 catch estimates are based on a comprehensive methodology developed by NMFS in response to Amendment 4 provisions and the need to better monitor sub-ACLs (see detailed description of NMFS' **"year-end" catch estimation** methods provided in Section 3.5.1.2.1.2). The new year-end methodology for estimating catch is based on landings data obtained from dealer reports (Federal and state) supplemented with VTRs (Federal and State of Maine) with the addition of discard data from extrapolated observer data, which tend to have fewer errors and are more accurate than self-reported discard data.
- 2012 catch estimates (preliminary) are based on NMFS' **"in-season" sub-ACL monitoring** methods (daily VMS catch reports and VTR reports, supplemented with state/federal dealer data, see Section 3.5.1.2.1.1 for more information). Reported herring discards are included in the totals.

Table 38 Atlantic Herring Catch by Year and Management Area, 2003-2012

YEAR	AREA (sub-ACL)	CATCH (MT)	QUOTA (MT)	PERCENT of QUOTA CAUGHT
2003	1A	61,516	60,000	103%
2003	1B	5,271	10,000	53%
2003	2	13,835	50,000	28%
2003	3	20,985	60,000	35%
2004	1A	60,095	60,000	100%
2004	1B	9,044	10,000	90%
2004	2	12,992	50,000	26%
2004	3	11,074	60,000	18%
2005	1A	61,102	60,000	102%
2005	1B	7,873	10,000	79%
2005	2	14,203	30,000	47%
2005	3	12,938	50,000	26%
2006	1A	59,989	60,000	100%
2006	1B	13,010	10,000	130%
2006	2	21,270	30,000	71%
2006	3	4,445	50,000	9%
2007	1A	49,992	50,000	100%
2007	1B	7,323	10,000	73%
2007	2	17,268	30,000	58%
2007	3	11,236	55,000	20%
2008	1A	42,257	43,650	97%
2008	1B	8,671	9,700	89%
2008	2	20,881	30,000	70%
2008	3	11,431	60,000	19%
2009	1A	44,088	43,650	101%
2009	1B	1,799	9,700	19%
2009	2	28,032	30,000	93%
2009	3	30,024	60,000	50%
2010	1A	28,424	26,546	107%
2010	1B	6,001	4,362	138%
2010	2	20,831	22,146	94%
2010	3	17,596	38,146	46%
2011	1A	30,676	29,251	105%
2011	1B	3,530	4,362	81%
2011	2	15,001	22,146	68%
2011	3	37,038	38,146	97%
2012*	1A	24,632	27,668	89%
2012*	1B	3,599	2,723	132%
2012*	2	22,532	22,146	102%
2012*	3	40,851	38,146	107%

Source: NMFS.

Note the shaded rows indicate overages.

**2012 data are preliminary based on NMFS' in-season catch monitoring (Section 3.5.1.2.1.1).*

3.5.1.2.1 Method for Tracking Herring Catch

Changes to methods for monitoring Atlantic herring catch by Federally-permitted vessels (limited access and open access) started during the 2010-2012 specifications cycle due to overages in 2010, which resulted in the need for a more timely catch reporting system to better monitor catch against sub-ACLs. NMFS revised vessels reporting requirements (76 FR 54385) on September 2011; limited access herring vessels are now required to report herring catch daily via vessel monitoring systems (VMS), open access herring vessels are required to report catch weekly via the interactive voice response (IVR) system, and all herring-permitted vessels are required to submit vessel trip reports (VTRs) weekly.

3.5.1.2.1.1 "In-Season" Catch Monitoring – Methodology

Catch in the Atlantic herring fishery is tracked for sub-ACL monitoring using data provided by herring-permitted vessels (VMS catch reports and VTRs) combined with Federal/state dealer data. VMS catch reports are used to verify and determine catch when VTR and/or dealer records are unavailable, but VTR and dealer reports, once received, are used to determine final catch by area. Limited access herring vessels report catch daily via VMS, open access herring vessels report catch weekly via the IVR system, and all herring-permitted vessels submit VTRs weekly. Dealers also submit their reports weekly. The monitoring week extends from Sunday through Saturday. Vessel VTR reports and dealer reports are submitted by midnight on the following Tuesday.

Atlantic herring kept provided on the VMS catch reports are used as an initial place holder and summed by the VTR serial number provided on each VMS catch report. Once VTR and dealer reports are received, summed kept is matched to VMS catch reports using VTR serial number, and the kept from VMS catch reports drops out of the calculation. However, unmatched VMS catch reports are retained and included in the weekly herring report calculation by area.

Herring management area reported on VMS catch reports is assigned to the matched VTR and dealer reports using VTR serial number. If VTR and dealer reports do not match to a VMS catch report, herring management area is determined using the statistical area, latitude, and longitude provided on the VTR reports.

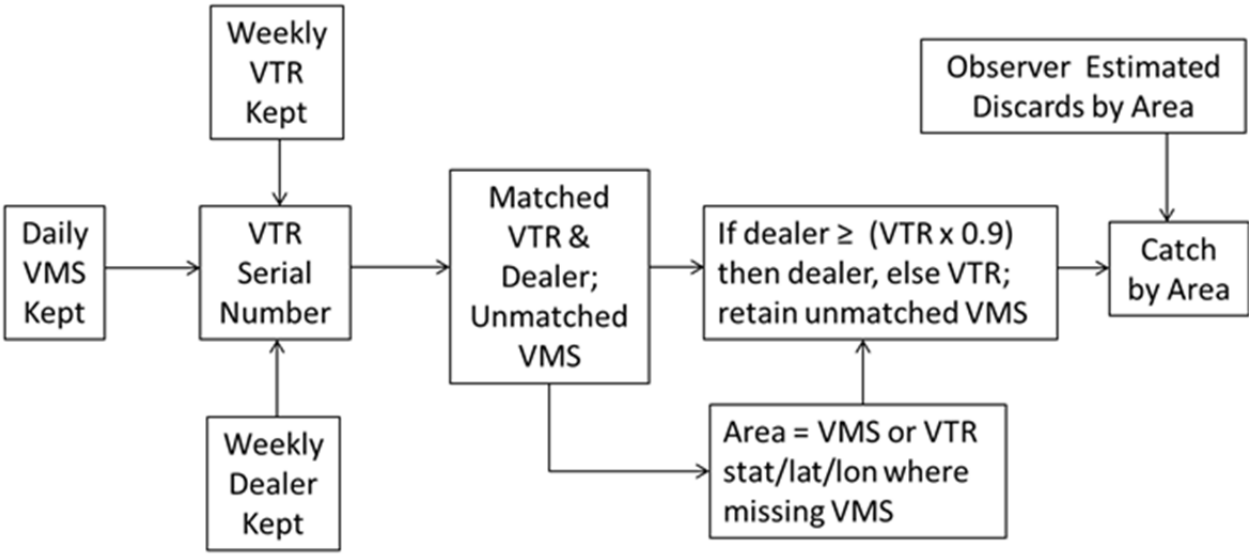
If catch in multiple areas are reported for the same VTR serial number on VMS catch reports, then kept associated with that VTR serial number on the VTR and dealer reports are prorated using area proportions from the VMS catch reports. Once all matching is completed, summed dealer kept by area for a given VTR serial number is used in the weekly herring report unless VTR kept is greater than 90% of dealer kept, in which case VTR kept is used assuming missing dealer reports. As stated above, kept from unmatched VMS reports are also included in the area summation.

Discards of Atlantic herring by area are determined using the following formula, where NK = herring unknown:

$$\frac{Observed\ Atlantic\ Herring\ Discards + Atlantic\ Herring\ NK}{Observed\ Kept\ All\ Species} \times Vessel\ Kept\ All$$

Only discard and kept all data from observed hauls are used in calculating the discard ratio using data from the observer database. Discard ratios are determined for each area and gear type, and then multiplied by vessel kept all by area and gear type. Estimated discards for all gear types are then summed by area, resulting in a fleet-wide estimate of discards for Atlantic herring. Estimated discards by area are then added to the summed herring kept by area from VMS, VTR, and dealer reports as described in the previous section, providing total catch by area. A schematic of data flow is provided in Figure 15.

Figure 15 Atlantic Herring Weekly Reporting Calculation (Catch by Area)



3.5.1.2.1.2 "Year-End" Catch Estimation – Methodology

Year-End Herring Landings

NMFS determined final 2010 and 2011 herring landings based on dealer reports (Federal and state) containing herring purchases, supplemented with VTRs (Federal and State of Maine) containing herring landings. Because VTRs are generally a hail weight or estimate of landings, with an assumed 10% margin of error, dealer reports are assumed to be more accurate source of landings data. However, if the amount of herring reported via VTR exceeded the amount of herring reported by the dealer by 10% or more, it was assumed that the dealer report for that trip was in error. In those instances, the amount of herring reported via VTR was used to determine the amount of herring landed on that trip. Herring landings in the VTR database were checked for accuracy against the scanned image of the paper VTRs submitted by the owner/operator of the vessel. VTR landings were also verified by comparing reported landings to harvesting potential and applicable possession limits for each vessel. As NMFS was reviewing the 2010 and 2011 herring data, and comparing individual VTRs with individual dealer reports, it also resolved data errors resulting from misreporting.

Herring landings reported on VTRs were assigned to herring management areas using latitude and longitude coordinates. VTRs with missing or invalid latitude/longitude coordinates were manually corrected using the statistical area reported on the VTR. If no statistical area was reported on the VTR, then a combination of recent fishing activity and a review of the scanned images of the original VTR were used to assign landings to herring management area. Dealer reports without corresponding VTRs were prorated to herring management area using the proportion of total herring landings stratified by week, gear type, and management area.

Year-End Herring Discards

The method that NMFS used to calculate total herring discards for 2010 and 2011 was determined by extrapolating the amount of observed herring discards (''Atlantic herring'' and ''herring unidentified'') divided by the amount of observed fish landed. This discard ratio was then multiplied by the amount of all fish landed for each trip to calculate total amount of herring discards. This method was reviewed by the Council's Herring Plan Development Team (PDT) in 2011. Based on the Herring PDT's recommendations, NMFS revised its method to include stratification by week, gear type, and area for dealer reports that were prorated to management area in 2011.

The SARC 54 Panel considered herring discards that were incorporated from the VTR data provided to them by NMFS and as a possible source of scientific uncertainty. However, discard estimates have only been available since 1996 and are generally less than 1% of the landings and do not represent a significant source of mortality (see Table 39). Thus, this is not considered problematic for the assessment according to the SARC 54 Panel.

Discard Estimates from NMFS/NERO Year-End Totals for 2010 and 2011

Discards are estimated during the year and based on self-reported VMS reports. Discards of Atlantic herring by area were determined by NMFS using NEFOP observer data and applying the following formula, where NK = herring unknown:

(Observed Atlantic Herring NK/Observed Kept All Species) x (Vessel Kept All Species)

Only discard and kept all data from observed hauls were used in calculating the discard ratio. Discard ratios were determined for each area and gear type, and then multiplied by vessel kept all by area and gear type. Where vessel kept all area and gear type were missing on VTR's, observer ratios were multiplied by the weighted average of the discard ratios for all observed gear types by corresponding area. Estimated discards for all gear types were then summed by area resulting in a fleet-wide estimate of discards for Atlantic herring (provided by NMFS). Table 39 illustrates that "Discards as % of Total Catch" were minimal in 2010 and 2011.

Table 39 Atlantic Herring Discard Estimates 2010 – 2011

Year	Management Area	Total Herring Catch (mt)	Discarded Herring (mt)	Discards as % of Total Catch
2010	1A	28,424	60	0.21
2010	1B	6,001	3	0.05
2010	2	20,831	50	0.24
2010	3	17,596	23	0.13
Total		72,852	136	0.19
2011	1A	30,676	55	0.18
2011	1B	3,530	2	0.06
2011	2	15,001	81	0.54
2011	3	37,038	71	0.19
Total		86,245	209	0.24

Source: NMFS year-end totals. Discards based on NEFOP observer data.

3.5.1.2.1.3 In-Season Versus Year-End Catch Comparison 2010-2011

The AMs under consideration in Section 2.2.7 include alternatives that require direct deductions of a sub-ACL overage in the following fishing year ("in-season" catch estimates) as opposed to the current method of a one year lag or "year-end" catch estimation. To better evaluate the potential impacts of the alternatives under consideration in this document, a comparison of herring catch estimates from in-season monitoring methods versus year-end catch estimation methods for 2010 and 2011 is provided below. "Year-end" totals were acquired from the 2010 and 2011 year-end summary reports, while the "in-season" totals were acquired from the last herring monitoring report posted to the NERO web site each year.

Table 40 provides the "In-Season" and "Year-End Catch" totals for Areas 1A, 1B, 2, and 3 for 2010 and 2011, which are based on a comprehensive methodology. The methodology in which NMFS used in 2012 was "in-season" (see Section 3.5.1.2.1.1). To assess how effective the new 2012 methodology is in comparison to the past, herring catch totals for FY 2012 would need to be provided, however they are currently unavailable. In general, the largest percent of difference from 2010 to 2011 seen in Table 40 is in Area 2 with 12% and 8%, respectively.

Table 41 provides the herring discards by using three methods in 2010 and 2011; VMS, VTR and observer fleet extrapolation. VMS discards were summed together by year and herring management area using the NERO herring VMS catch report database. The VTR discards were summed together by year and area using the NERO VTR databases. Lastly, the observer extrapolated data were acquired from the 2010 and 2011 year-end summary reports. The VMS totals were consistently lower than the VTR and observer extrapolated totals for 2010 and 2011. In 2010 the VTR discard total was 263 mt while the observer extrapolated discard total was 137 mt. In 2011, the VTR discard total 179 mt while the observer extrapolated discard total was 210 mt. This indicates an increase in the observer extrapolation method and a decrease in the VTR method.

Table 40 Atlantic Herring "In-Season" and "Year-End" Catch Estimates by Area for 2010 and 2011

2010 Area Name	In-Season (MT)*	Quota	% of Quota	Year-End (MT)**	% of Quota	Difference	Difference % of Quota
1A	27,741	26,546	105%	28,424	107%	683	2%
1B	6,014	4,362	138%	6,001	138%	-13	0%
2	18,207	22,146	82%	20,831	94%	2,624	12%
3	15,634	38,146	41%	17,596	46%	1,962	5%
2011 Area Name	**In-Season (MT)***	**Quota**	**% of Quota**	**Year-End (MT)****	**% of Quota**	**Difference**	**Difference % of Quota**
1A	29,359	29,251	100%	30,676	105%	1,317	5%
1B	4,172	4,362	96%	3,530	81%	-642	-15%
2	13,320	22,146	60%	15,001	68%	1,681	8%
3	34,452	38,146	90%	37,038	97%	2,586	7%

Source: NOAA/NMFS
**Final weekly monitoring report posted on the NERO website for each fishing year*
***Year-end summary reports for each fishing year*

Table 41 Atlantic Herring Discards by Reporting Method for 2010 and 2011

Year	Area Name	VMS (MT)*	VTR (MT)**	Observer – Fleet Extrapolation (MT)***
2010	1A	0	122	60
2010	1B	0	0	3
2010	2	0	132	50
2010	3	0	9	23
Total		0	263	137
Year	**Area Name**	**VMS (MT)***	**VTR (MT)****	**Observer – Fleet Extrapolation (MT)*****
2011	1A	8	96	55
2011	1B	23	0	2
2011	2	4	70	81
2011	3	9	13	71
Total		179	179	210

Source: NOAA/NMFS
**NERO herring VMS catch report table fso_admin.vms_herring_catch_report_stg*
***NERO VTR databases under the NOAA schema*
****Year-End discard calculation using observer data extrapolated out to the herring fleet*

3.5.1.2.2 Recent ACL/Sub-ACL Overages

Due to the of the high volume and seasonal nature of the fishery and restrictions on fishing times (e.g. days out, spawning restrictions), recent quota overages have tended to occur primarily in the most active areas of the fishery and in years when substantial reductions in quota have been implemented. Since the implementation of herring quota management in 2001, there were no total ACL overages from 2003 to 2011, and sub-ACL quota overages (shaded rows) have been relatively infrequent and minor in scale (see Table 38). In terms of magnitude, the largest overage under quota management occurred in Area 1B during the 2006 fishing year, where 3,000 mt of additional herring were caught (about 6.6 million pounds). Some of this overage may have been attributable to mis-reporting of management area fished and may have been addressed through the area boundary changes implemented in Amendment 1. The following describes Table 42, and provides data on the herring catch and sub-ACL totals for 2011 and 2012 along with the overages that apply to the 2013 sub-ACLs.

To account for the 2010 overages in Areas 1A and 1B, effective February 24, 2012, NMFS reduced the 2012 sub-ACLs in Areas 1A and 1B. Therefore, the sub-ACL for Area 1A is 24,668 mt (reduced from 26,546 mt) and the sub-ACL for Area 1B is 2,723 mt (reduced from 4,362 mt) for the 2012 fishing year (see Table 42). Due to the under harvest of the New Brunswick weir fishery in 2012 an additional 3,000 mt was allocated to Area 1A on November 1, 2012. An additional 295 mt was also allocated to Area 1A on November 1, 2012 due to the under harvest of the fixed gear fisheries west of Cutler, Maine. The total 1A sub-ACL for the 2012 fishing year was therefore 27,668 mt.

On November 13, 2012, NMFS published the Proposed Rule announcing that the 2013 herring specifications will not be in place on January 1, 2013 and that the 2012 herring specifications will remain in place on January 1, 2013 until the 2013-2015 specifications are implemented. The regulations at §648.200 (d) include a provision that allows the previous years' specifications to roll over when the specifications are delayed past the start of fishing year. Therefore, the sub-ACL for Area 1A would be revised from 26,546 mt to 25,121 mt (a reduction of 1,425 mt) to account for the 2011 catch overage (Table 42). When the 2013 specifications are finalized, then the 1,425 mt overage will be deducted from the final 2013 Area 1A sub-ACL.

Additionally, the herring catch seen in the preliminary 2012 totals in Table 42 suggests that there are overages for Areas 1B, 2, and 3. As a result, the indicated sub-ACL overages also indicate there is likely a total ACL overage for the 2012 fishing year, (currently the only year with a total ACL overage). The resulting 2014 sub-ACLs are to be determined.

Table 42 Atlantic Herring Catch – 2011 and 2012 Overages and Resulting 2013 and 2014 Sub-ACLs

YEAR	AREA NAME	CATCH (MT)	SUB-ACL (MT)	% SUB-ACL CAUGHT	2013 SUB-ACL (MT)
2011	1A	30,676	29,251	105%	25,121
2011	1B	3,530	4,362	81%	4,362
2011	2	15,001	22,146	68%	22,146
2011	3	37,038	38,146	97%	38,146
TOTAL		86,245	93,905	92%	89,775
YEAR	**AREA NAME**	**CATCH (MT)**	**QUOTA (MT)**	**% QUOTA CAUGHT**	**2014 Quota (MT)**
2012*	1A	24,632	27,668	89%	TBD
2012*	1B	3,599	2,723	132%	TBD
2012*	2	22,532	22,146	102%	TBD
2012*	3	40,851	38,146	107%	TBD
TOTAL		91,614	90,683	101%	TBD

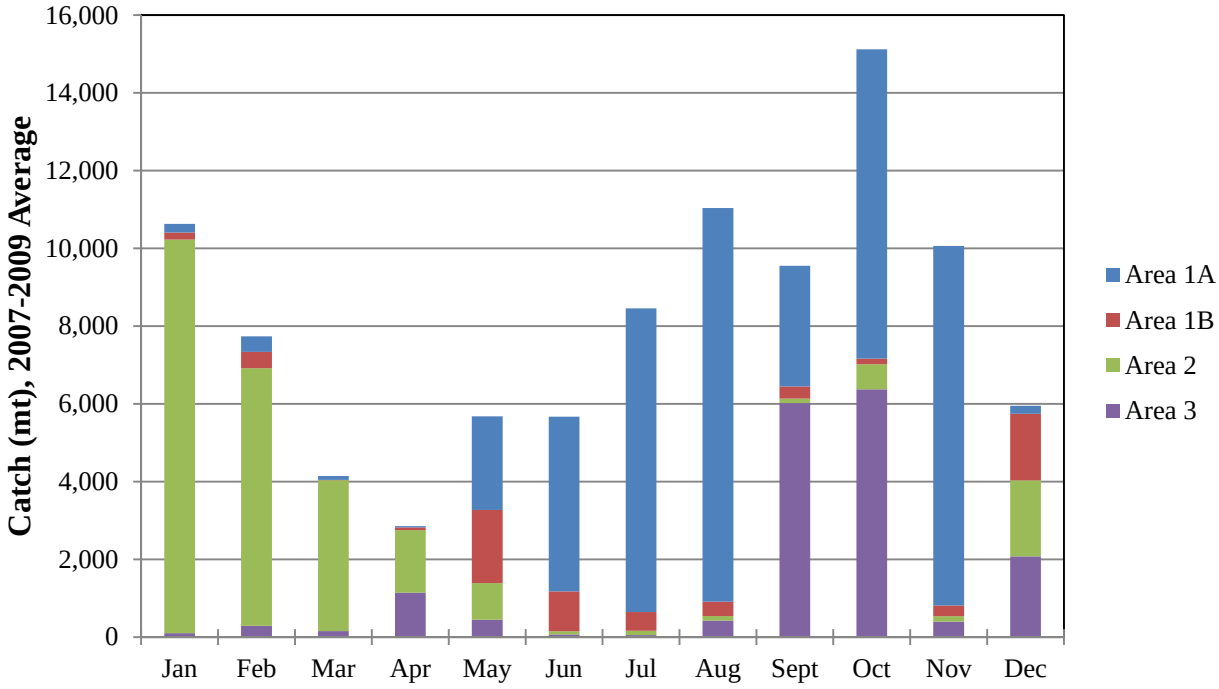
Source: NMFS.
Note the 2013 sub-ACLs are based on rolling over the 2012 Herring specifications per the proposed rule in FRN dated November 13, 2012.
Note the shaded rows indicate overages.
**2012 data is preliminary based on real-time quota monitoring methodology*

3.5.1.2.3 Monthly Quota Utilization

The temporal and spatial variability of the Atlantic herring fishery may be understood by examining the quota utilization in each management area on a monthly basis over the course of the fishing year. In general, the fishery concentrates in Area 2 during the first few months of the year, then effort shifts towards Area 1A through the summer and fall, as well as into Area 3 during the fall and early winter. Area 1B is used throughout the year. These trends are illustrated in Figure 16 and Figure 17, which show average monthly catch by management area during the years 2007-2009 and 2010-2012, respectively. This dichotomy is provided, because the ACL was substantially higher in 2007-2009 than in 2010-2012. Despite this difference, area utilization was roughly similar, though Area 3 became more important in 2010-2012.

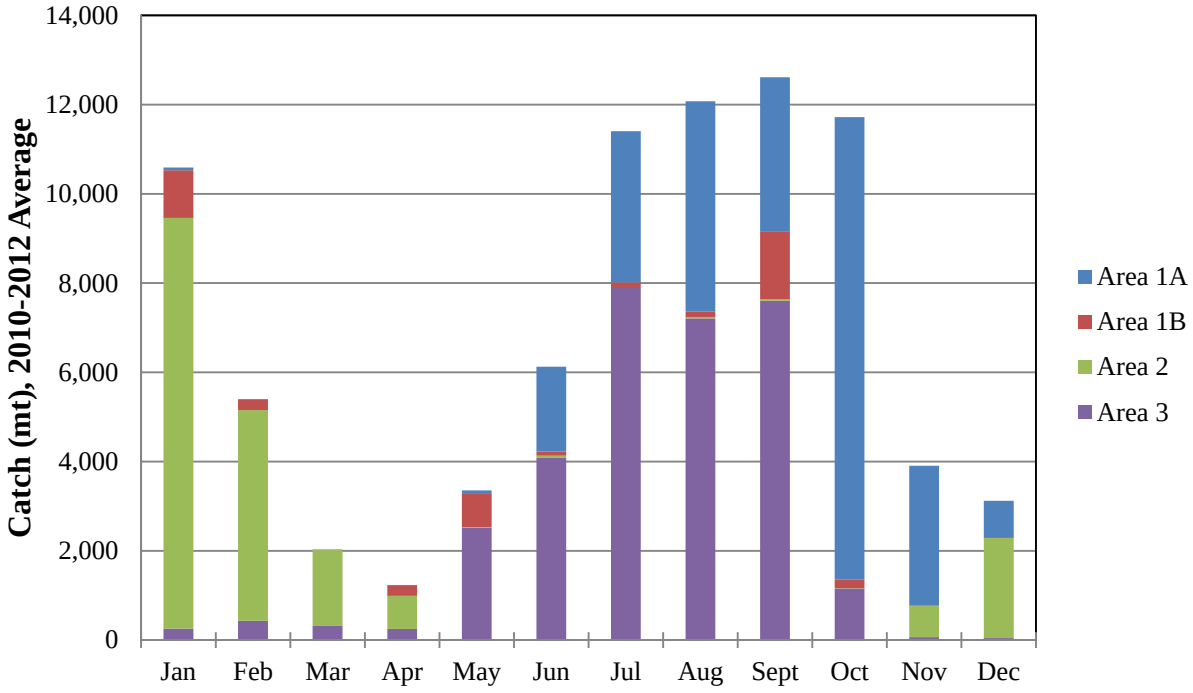
To further illustrate within-season harvests, Figure 18 – Figure 21 provide the sub-ACL utilization of each management area by month over the years 2007-2012. Within Area 1A, the sub-ACL is harvested in a similar temporal pattern, typically between April and October. For Area 1B, the trend is less consistent; the sub-ACL was utilized very early in 2012. It is likely that due to an Area 1B overage in 2010, the industry maximized Area 1B quota in 2012 before an overage deduction would have been implemented. In Area 2, the sub-ACL was fully utilized very early in the year. Increased utilization of Area 3 sub-ACL in recent years is illustrated in Figure 21.

Figure 16 2007-2009 Average Monthly Catch by Management Area



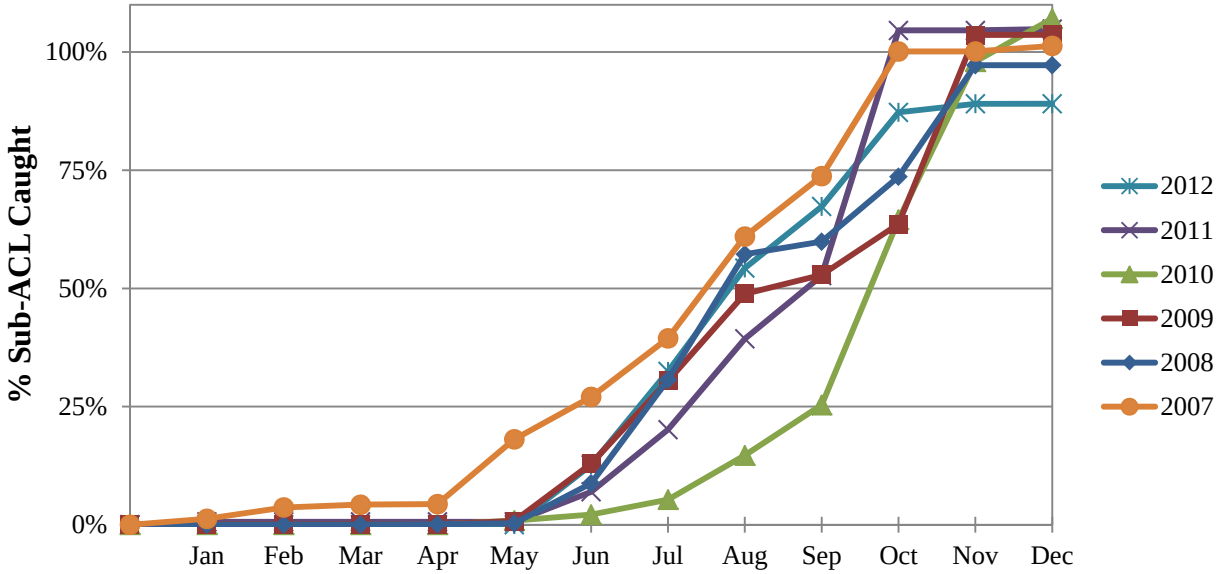
Source: NERO DIMS database, queried 12/7/2012.

Figure 17 2010-2012 Average Monthly Catch by Management Area



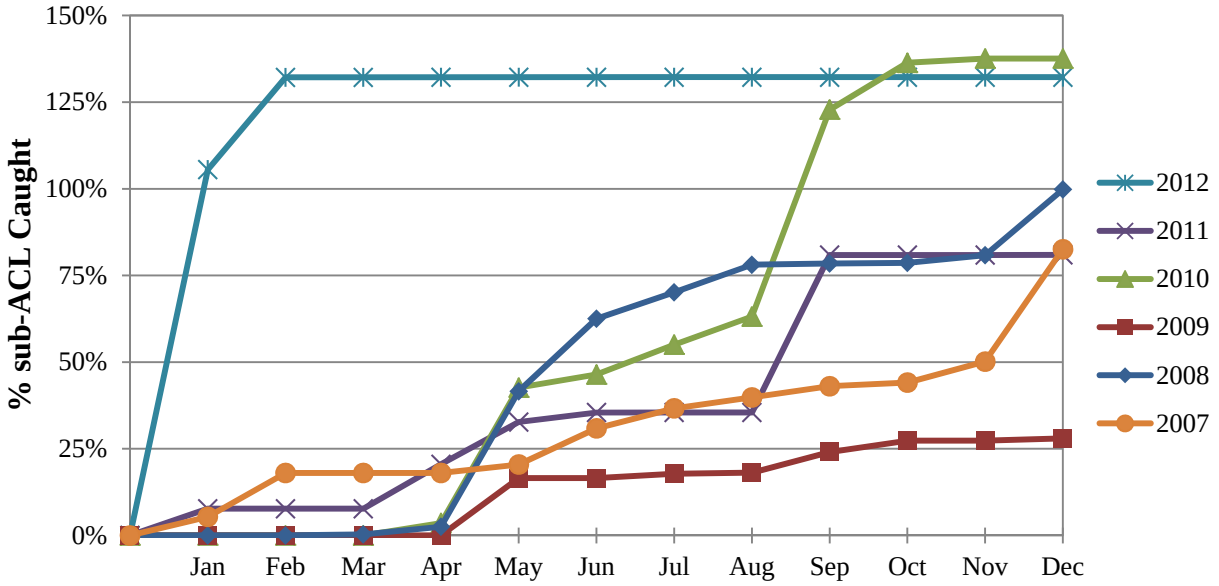
Source: NERO DIMS database, queried 12/7/2012.

Figure 18 Area 1A Sub-ACL Utilization by Month, 2007-2012



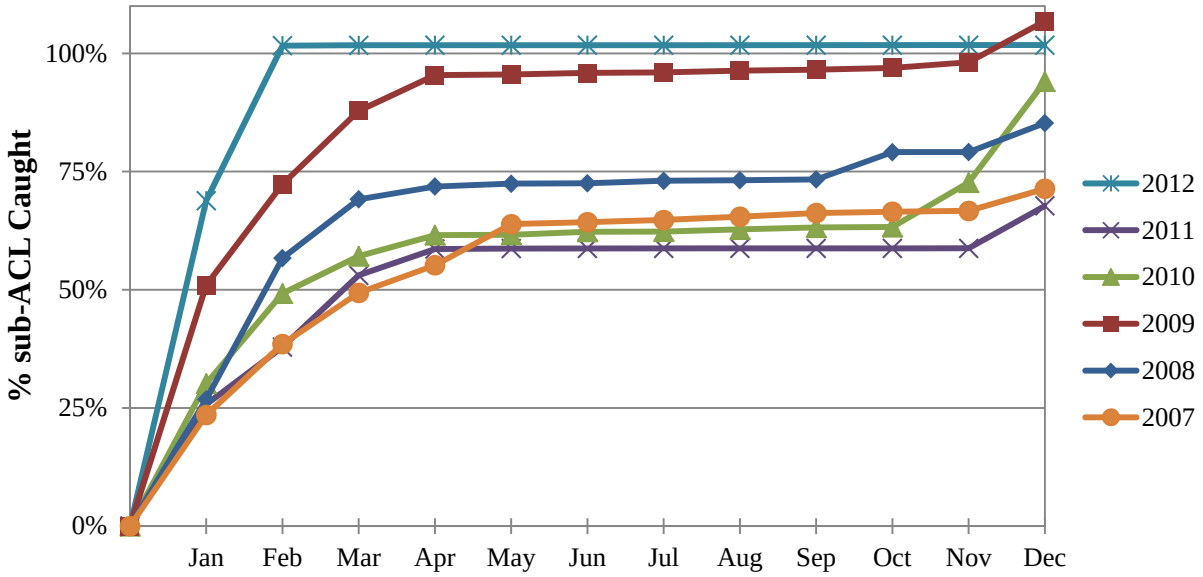
Source: NERO DIMS database, queried 12/7/2012.

Figure 19 Area 1B Sub-ACL Utilization by Month, 2007-2012



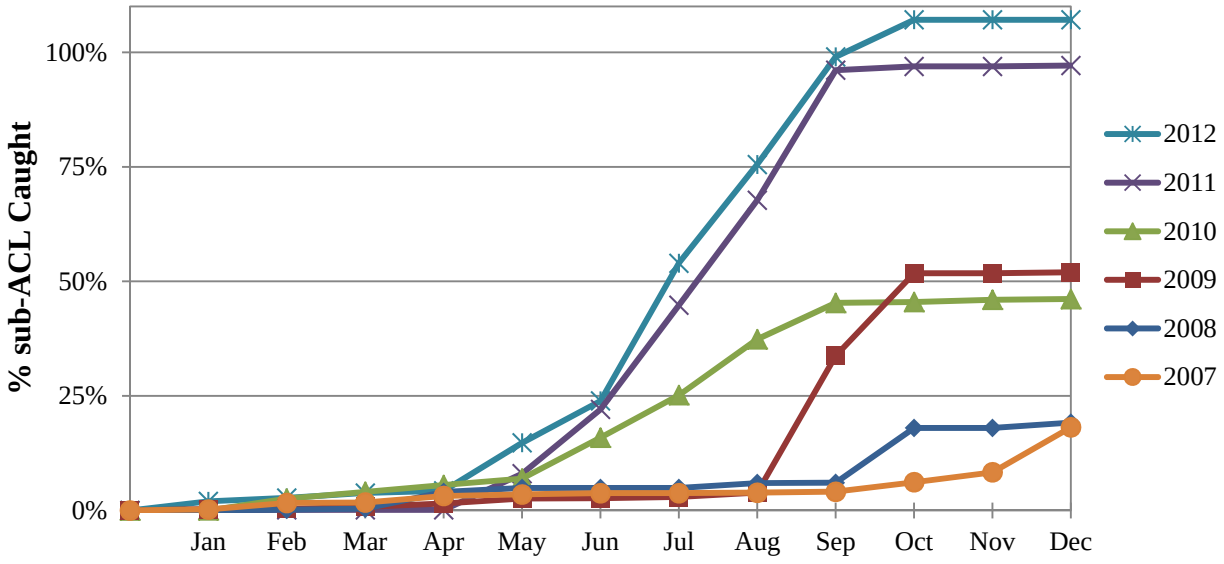
Source: NERO DIMS database, queried 12/7/2012.

Figure 20 Area 2 Sub-ACL Utilization by Month, 2007-2012



Source: NERO DIMS database, queried 12/7/2012.

Figure 21 Area 3 Sub-ACL Utilization by Month, 2007-2012



Source: NERO DIMS database, queried 12/7/2012.

3.5.1.3 Herring Vessels

This section provides information regarding the vessels participating in the herring fishery from 2008-2012. In all of the following tables, nominal revenues for "herring trips" are presented. Here, a herring trip is defined liberally as any trip in which at least one pound of Atlantic herring is retained.

Permits

Atlantic herring vessel permit categories are: Category A limited access all management areas; Category B limited access Areas 2 and 3 only; Category C limited access incidental catch of 25 mt per trip; and Category D open access incidental catch of 3 mt per trip. Category A and B vessels comprise the majority of the directed herring fishery. Many of the Category A, B, and C vessels are also active in the Atlantic mackerel fishery (managed by the MAFMC, see Section 3.2.2.2).

Since 2008, the number of vessels with either a limited access or an open access Atlantic herring permit has decreased annually (Table 43). This includes an annual decrease in limited access directed fishery vessels (Categories A and B), with 42 permitted in 2011. One cause could have been the substantial cuts in herring catch limits in the 2010-2012 specifications from prior levels.

In 2011, 29 of the 42 (69%) Category A and B vessels were active (defined broadly as landing at least one pound of Atlantic herring during the fishing year). For the Category C vessels, 9 of 44 (20%) were active. Just 89 of the 1,991 (4.5%) Category D vessels were active. Although there have been far fewer active limited access versus open access vessels, data presented in the remainder of this section show that the limited access fishery comprises over 99% of the fishery in terms of revenue.

Table 43 Fishing Vessels with Federal Atlantic Herring Permits, 2008-2012

Permit Category	2008	2009	2010	2011	2012*
A	44 (64%)	44 (66%)	42 (64%)	38 (71%)	36 (64%)
B, C	5 (40%)	4 (75%)	4 (75%)	4 (50%)	4 (50%)
C	53 (13%)	51 (25%)	49 (33%)	44 (20%)	41 (22%)
Total Limited Access	**102 (36%)**	**99 (44%)**	**95 (48%)**	**86 (44%)**	**81 (42%)**
D	2,390 (3.3%)	2,373 (3.4%)	2,277 (4.7%)	1,991 (4.5%)	1,869 (3.1%)

*Source: NMFS Permit database (http://www.nero.noaa.gov/permits/permit.html) and VTR database. Note: In parentheses are the percent active vessels, defined as having landed at least one pound of Atlantic herring. This includes all pair trawl vessels, whose partner vessel landed the catch. *Permit data are as of November 2012. Landings data are as of October 2012.*

Fishing Gear

Atlantic herring vessels primarily use purse seines, single midwater trawls or midwater pair trawls for fishing gear, with the midwater pair trawl fleet harvesting the majority of landings from 2008 to 2011 (65%; Table 44). Some herring vessels use multiple gear types during the fishing year. Pair trawl vessels generally fish in all areas (although limited seasonally in Area 1A), while the purse seine fleet fishes exclusively in the inshore Gulf of Maine (Area 1A and, to a lesser extent, Area 1B). The single midwater trawl has been most active in Area 3. Small mesh bottom trawl vessels represented 4% of herring landings over the time series; other gear types (e.g. pots, traps, shrimp trawls, hand lines) comprise less than 1% of the fishery.

Table 44 Fishing Gear Distribution of Herring Landings by Area (2008-2011)

Gear Type	Area 1A (mt)	Area 1B (mt)	Area 2 (mt)	Area 3 (mt)	Total
Bottom Otter Trawl	463 (0.3%)	1 (0%)	14,288 (16%)	117 (0.1%)	**14,869** **(4%)**
Single Midwater Trawl	6,340 (5%)	3,246 (17%)	4,886 (5%)	12,830 (14%)	**27,302** **(8%)**
Midwater Pair Trawl	56,769 (43%)	12,612 (64%)	68,336 (76%)	78,518 (86%)	**216,235** **(65%)**
Purse Seine	69,074 (52%)	3,696 (19%)	2,221 (2%)	0 (0%)	**74,991** **(22%)**
Other	817 (0.6%)	0 (0%)	17 (0%)	1 (0%)	**834** **(0.2%)**
Total	**133,463** **(100%)**	**19,555** **(100%)**	**89,748** **(100%)**	**91,466** **(100%)**	**334,231** **(100%)**

Source: VTR database. September 2012.

Revenues

Table 45 provides a general overview of revenues generated by month and management area for all trips landing herring from 2008-2011 (revenues from all species landed are included in the table). Areas 1A, 1B, and Area 3 generally represent "summer" fisheries, while Area 2 represents a winter fishery that overlaps with the Atlantic mackerel fishery in southern New England and the Mid-Atlantic. Midwater trawl vessels are prohibited from fishing in Area 1A June through September, and ASMFC imposes "days out" restrictions that usually prohibit landing fish from Area 1A January through May. Area 1B and 3 are considered offshore fisheries, primarily pursued using single midwater trawls and pair trawls. Vessels fishing in Area 2 derive a substantial amount of revenues from Atlantic mackerel and other species.

Table 45 Total Revenues by Month and Area (2008-2011) for All Trips Landing Herring

	Area 1A	Area 1B	Area 2	Area 3
January		$91,824	$12,851,152	
February			$9,749,132	$247,319
March			$5,566,787	$326,842
April		$229,495	$2,582,450	$1,125,664
May	$131,552	$2,171,546	$509,784	$1,630,013
June	$2,958,329	$589,678	$664,027	$2,622,790
July	$6,229,295	$321,225	$261,510	$3,663,856
August	$8,095,975	$334,749	$372,640	$4,127,641
September	$3,065,341	$1,335,388	$450,380	$7,556,671
October	$9,213,555	$209,280	$832,894	$4,042,709
November	$7,831,413		$1,253,465	
December	$414,552	$480,466	$3,352,185	$129,495
Grand Total	**$37,956,292**	**$5,821,301**	**$38,446,407**	**$25,757,269**

Table 46 provides more perspective on the revenues in Table 45 by summarizing total revenues by permit category from 2008-2011 and reflecting the percentage of those revenues derived from Atlantic herring. Category A vessels catching Atlantic herring in Areas 1A, 1B, and 3 are catching herring almost exclusively. However, when these vessels catch herring in Area 2, a substantial portion of revenues on these trips (nearly 40%) are attributable to other species. Category C and D vessels derived relatively small amounts of revenue from herring trips from 2008-2011 ($2.96M and $3.6M, respectively). Furthermore, only a small proportion of total revenues for these vessels (Category C and D) are from herring (30% and 11%, respectively). The remainder of the revenues for these vessels are derived from other species (Table 48).

Fishing activity in Area 1B may be of particular interest for the 2013-2015 specifications; Table 47 provides revenue information regarding the midwater trawl and purse seine vessels that caught herring in Area 1B from 2008 through 2011. The data in Table 47 suggest that Area 1B is not heavily relied upon for herring revenues, but is utilized by midwater trawlers (single and paired) most during the months of May and September. ASMFC days out restrictions usually preclude fishing in Area 1A during May, and midwater trawl vessels are prohibited from Area 1A during June-September. Very little purse seine activity occurs in Area 1B.

Table 46 Total Revenues (and Percent of Total) by Permit Category for Trips Landing Herring (2008-2011)

Total Revenues				
	Category A	**Category B/C**	**Category C**	**Category D**
Area 1A	$35,474,735		$1,459,209	$1,022,347
Area 1B	$5,768,737		c	c
Area 2	$33,381,919	$1,178,413	$1,377,175	$2,508,900
Area 3	$25,613,460		c	$56,237
Grand Total	**$100,275,684**	**$1,178,413**	**$2,960,287**	**$3,603,718**
Percentage of Revenues from Herring				
	Category A	**Category B/C**	**Category C**	**Category D**
Area 1A	99.9%		55.1%	32.8%
Area 1B	99.7%			
Area 2	61.6%	94.8%	6.7%	2.5%
Area 3	96.8%			1.2%
Grand Total	**86.4%**	**94.8%**	**30.3%**	**11.2%**

Table 47 Total Revenues by Month and Gear Type (2008-2011) for Herring Vessels Fishing in Area 1B

	Midwater Trawl (Single and Paired)	Purse Seine
January	c	c
February	0	0
March	0	0
April	$229,495	c
May	$2,017,541	$154,005
June	$324,789	$264,889
July	$179,468	$141,757
August	$176,281	$158,468
September	$1,105,545	$202,464
October	c	c
November	c	c
December	$471,513	c
Grand Total	**$4,704,208**	**$1,068,322**

Note: "c" indicates that data cannot be reported due to confidentiality restrictions.

Table 48 summarizes revenues from the top ten species caught by vessels landing herring in Area 2 from 2008 through 2011. The data indicate that herring vessels fishing in Area 2 catch a wider variety of species than those fishing in the Gulf of Maine (Area 1) or on Georges Bank (Area 3), given that 61.6% of the revenue in Area 2 comes from herring versus 99.9% and 96.8% in Areas 1A and 3, respectively (Table 46). Vessels catching herring in Area 2 land other small pelagic species such as mackerel, squid (Loligo), and silver hake (whiting), in addition to herring. Area 2 is the primary area for the Atlantic mackerel fishery, and the data in Table 48 illustrate the overlap between the herring and mackerel fisheries.

Table 48 Revenues from Primary Species Caught by Vessels Landing Herring in Area 2 (2008-2011)

	Grand Total
ATLANTIC HERRING	$21,839,660
ATLANTIC MACKEREL	$11,487,434
LOLIGO SQUID	$1,349,696
SILVER HAKE	$1,088,886
SCUP	$620,362
FLUKE	$545,487
BUTTERFISH	$282,623
ILLEX SQUID	$232,109
RED HAKE	$175,931
BLACK SEA BASS	$150,229

3.5.1.4 Herring Catch by State Waters Vessels

The vast majority of the Atlantic herring resource is harvested in Federal waters. Catch by Federal permit holders that occurs in State waters is reported and counted against the sub-ACLs. Catch by state-only permit holders is monitored by the ASMFC and is not large enough to substantially affect management of the Federal fishery and the ability to remain under the sub-ACLs. The majority of Atlantic herring landings from State waters occurred in the State of Maine. Connecticut (14 mt herring) and Maine are the only two states that reported landings of herring from state waters fisheries during 2006. According to ME DMR, 252 mt of Atlantic herring were landed by weirs and stop seines in Maine during the months of June – September 2007, with the majority of landings occurring during June. An additional 25 mt was landed by other gear types in the state of Maine (gillnets, hooks, pound nets) during 2006.

The Council determined to close the directed herring fishery when 95% of the sub-ACL was harvested (or 92% in areas with a research set-aside), establishing a buffer between OFL and ABC, managing a 500 mt set aside for West of Cutler fixed gear fishermen, and the ASMFC's requirement that fixed gear fishermen must report through IVR (and therefore have catch counted against the sub-ACL) reduced any management uncertainty associated with State waters landings to an insignificant amount.

The non-federally permitted commercial landings in Area 1A are primarily from Maine fixed gear fishermen and a small number of seiners. Amendment 1 sets aside 500 mt of Atlantic Herring until November for fixed gear fishermen West of Cutler. The Commission's Amendment 2 to the Interstate FMP for Atlantic Herring requires fishermen East of Cutler to report *weekly* through the federal IVR system. ME DMR require the ME state commercial fixed gear fishermen to be compliant with the federal IVR weekly reporting requirements and regulations as well as reporting monthly to ME DMR. Non-federally permitted landings in Maine were only 178 mt in 2008.

During 2010 and 2011 (2012 is unavailable) Atlantic herring landings from state waters only occurred in the State of Maine. According to ME DMR, 757 mt of Atlantic herring were landed by weirs and stop seines in Maine during the months of June – July 2010, with the majority of landings occurring during June. An additional 176 mt was landed by other gear types in the state of Maine (gillnets, hooks, pound nets) during 2010. There was 23.67 mt of Atlantic herring that were landed by weirs and stop seines in Maine during the months of June and September 2011, with the majority of landings occurring during June. An additional 8 mt was landed by other gear types in the state of Maine (gillnets, hooks, pound nets) during 2011 (Table 49). Note the substantial decrease in herring landings from 2010 to 2011.

Table 49 2010-2011 Atlantic Herring Landings by Non-Federally-Permitted Vessels

Year	State	Live Pounds	Metric Tons
2010	ME	2,057,901	933.46
2011	ME	70,792	32.11

Source: Provided by ME DMR for non-federally-permitted vessel (mostly purse seine vessels). Maine had the only state landings.

3.5.1.5 Herring Prices, Use as Bait, and Substitute Goods

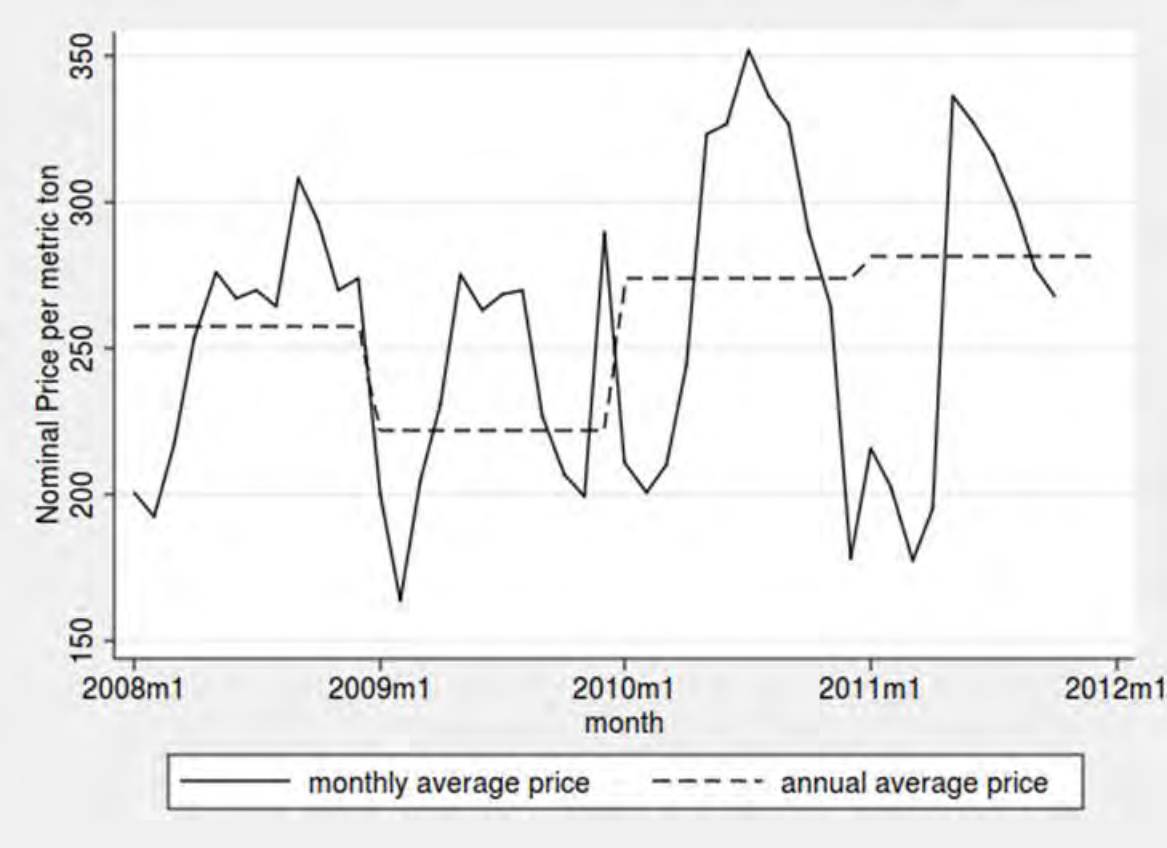
Between 2008-2011, annual landings of herring ranged from 68-103,500 mt (Table 38) while nominal prices ranged from $221-$296 per mt (Figure 22). In general, herring prices have been increasing over time. Atlantic herring which is caught in the Northeast US is eaten by consumers worldwide and utilized as lobster bait. There are likely to be good substitutes for both uses; therefore prices are not likely to be sensitive to quantity changes.

In general, prices will decrease when quantity supplied increase and prices will increase when quantity supplied decreases. The extent to which prices are responsive to changes in quantities (and therefore changes in ACLs and sub-ACLs) depend on the availability of good substitutes. If there good substitutes available, then prices will not be sensitive to changes in quantity supplied. However, if good substitutes are not available, then prices will be quite sensitive to changes in quantity supplied.

Limited amounts of Atlantic herring are consumed as food domestically and Atlantic herring is likely to have one substitute: European herring. US production of Atlantic herring is quite small relative to the worldwide production. In the US, total landings of Atlantic herring have been near 100,000 mt, while total worldwide landings of Atlantic herring are near 2,000,000 mt. Therefore, US producers of herring as human food are likely to be price takers on the world market. This means that moderate changes in the quantity of herring produced for food are unlikely to have an effect on price of herring.

Menhaden is one substitute for herring in the bait market. The majority of menhaden landings are used to produce fish meal and oil. The Atlantic Herring FMP precludes mealing of herring; therefore, herring is not substitutable in the production of these goods. Menhaden landings from 2008-2011 ranged from 610,000-850,000 mt. During this time, *ex-vessel* prices ranged from $139-$169 per mt. This is approximately 33-50% lower than the *ex-vessel* price of herring. If the quantity of herring supplied into the bait market declines dramatically, more menhaden will be used as bait, moderating the increases in herring prices.

Figure 22 Average Nominal Price per Metric Ton of Atlantic Herring, 2008-2012



Atlantic herring is used as bait for many fisheries, such as lobster, tuna, and various recreational fisheries. A more detailed description of the bait sector of the industry is provided in Amendments 1 and 5 to the Herring FMP.

According to NMFS dealer data, 73.8% of the value of herring landed between 2008 and 2011 came from the bait market; the remainder was sold for human consumption (25.8%) and for other purposes (0.4%). Landings of herring used for bait came primarily from ports in Maine (58.2%) and Massachusetts (39.2%).

The lobster industry, particularly in Maine, is dependent on herring as a bait source, though it depends on price and availability. For lobstermen from Maine, New Hampshire and Massachusetts who harvest in Lobster Conservation Management Area A (inshore Gulf of Maine), herring is the predominant bait source (Table 50). A survey of 6,832 lobster license holders in Maine revealed that 58% of respondents answered "very much" to the question "Could the supply or price of herring for bait impact your decisions on how to fish?" (MEDMR, 2008).

Table 50 Bait Usage in the Inshore Gulf of Maine Lobster Fishery

	ME Zone A	ME Zone B	ME Zone C	ME Zone D	ME Zone E	ME Zone F	ME Zone G	NH	MA
Herring	90%	86%	73%	73%	84%	37%	75%	60%	76%
Pogies	3%	2%	0%	15%	14%	39%	11%	4%	13%
Redfish	1%	8%	12%	4%	1%	19%	8%	0%	0%
Racks	1%	2%	1%	2%	0%	1%	1%	26%	6%
Alewives	1%	1%	0%	1%	0%	0%	0%	0%	0%
Other	4%	2%	13%	5%	0%	4%	4%	9%	4%

Source: Maine Lobstermen's Association and Gulf of Maine Research Institute socioeconomic study. Report forthcoming.

Data from New Hampshire port sampling reveals less dependent on herring as a bait source by New Hampshire vessels. Table 51 presents the utilization of herring as bait *along the NH coast* from 2005 to 2011 and is not a representative of the entire herring fishery. It is a representation of a relatively small sample from 23 inshore vessels or Lobster Management Area (LMA) 1 vessels and four dealers. In comparison to other baits used, herring is a small percentage for these vessels, between 1.8% in 2010 and 4.6% in 2005. In terms of herring per trap for Lobster Management Area (LMA) 1, the most used was in 2005 and the least in 2010. This correlates with overall high and low points in the percent of herring bait used. Historically, herring is used for bait by smaller inshore vessels more than larger offshore vessels because it is typically less expensive; in addition, alternative bait options like skates tend to be preferred for longer soaks in offshore waters.

Note that the offshore LMA Area 3 vessels are not included in these data because, at present, there is only one vessel, which tends to utilize redfish and skates as primary bait sources because they do not degrade as rapidly as herring in deeper colder water. Furthermore, the LMA 3 vessel is not included to avoid skewing the data however marginally, due to the diversity in bait types and the sheer volume of bait that is utilized throughout a fishing trip.

Table 51 Herring Utilization for Lobster Bait in New Hampshire

Year	Herring Bait (lbs)	Other Bait (lbs)	Total Bait (lbs)	% Herring of all Bait	# Types of Bait	Herring Per Trap LMA 1* (lbs)
2005	8,200	169,725	177,925	4.6%	11	0.33
2006	9,700	293,125	302,825	3.2%	13	0.20
2007	8,300	226,350	234,650	3.5%	10	0.18
2008	7,658	247,000	254,658	3.0%	12	0.16
2009	8,825	189,690	198,515	4.4%	11	0.25
2010	3,350	181,728	185,078	1.8%	11	0.14
2011	6,100	249,900	256,000	2.4%	9	0.21

Source: NH Fish & Game Department
**LMA Area 3 vessels not included*

3.5.2 Communities

In this document, for the purposes of gaining a better perspective on the nature of the Atlantic herring fishery and the character of the affected human environment, a broader interpretation of fishing community has been applied to include almost all communities with a substantial involvement in or dependence on the Atlantic herring fishery. In terms of National Standard 8 (NS 8), some of the communities identified in this section may not fit the strict interpretation of the criteria for substantial dependence on fishing. The fishing communities that meet the legal definition (as promulgated through NS 8) are likely to be considered a subset of the broader group of communities of interest that are engaged in the herring fishery and identified in this document. A description concerning NS 8 is seen below.

In the 1996 amendments to the M-S Act, Congress added provisions directly related to social and economic factors for consideration by Councils and NMFS. NS 8 of the MSA states that:

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

NS 8 requires the consideration of impacts on fishing communities. Section 316 of MSA defines a fishing community as:

"A community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community."

Because herring is widely used as bait for the lobster fishery, especially in Maine, it is not practical to identify every community with substantial involvement in the lobster fishery (and consequently some level of dependence on the herring fishery) for assessment in this document. Instead, some of the communities of interest were selected, in part, because of their involvement in or dependence on the lobster fishery; assessment of the impacts of the Amendment 1 measures on these communities should provide enough context to understand the potential impacts on any community with substantial involvement in the lobster fishery. Parallels can be drawn between the communities that are identified in this section and other similar communities engaged in the lobster fishery.

NS 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. "Sustained participation" is interpreted as continued access to the fishery within the constraints of the condition of the resource.

Communities of Interest

The following five criteria were used in Amendments 1 and 5 to the Herring FMP to define *Communities of Interest* for the Atlantic herring fishery, which must meet at least one criterion:

1. Atlantic herring landings of at least 10M pounds (4,536 mt) per year from 1997-2008, or anticipated landings above this level based on interviews and documented fishery-related developments.
2. Infrastructure dependent in part or whole on Atlantic herring.
3. Dependence on herring as lobster and/or tuna bait.
4. Geographic isolation in combination with some level of dependence on the Atlantic herring fishery.
5. Utilization of Atlantic herring for value-added production.

Based on the above criteria, there are 11 *Communities of Interest* for the Atlantic herring fishery, identified below and further evaluated in Amendment 5 to the FMP for Atlantic Herring (Section 4.5.3), Also, community profiles of each are available from the NEFSC Social Sciences Branch website(Clay et al. 2007). Since Amendment 1, this list has changed slightly with changes in harvesting and processing sectors.

1. Portland, Maine
2. Rockland, Maine
3. Stonington/Deer Isle, Maine
4. Vinalhaven, Maine
5. Lubec/Eastport, Maine
6. Sebasco Estates, Maine
7. NH Seacoast (Newington, Portsmouth, Hampton/Seabrook)
8. Gloucester, Massachusetts
9. New Bedford, Massachusetts
10. Southern Rhode Island (Point Judith, Newport, North Kingstown)
11. Cape May, New Jersey

Home Ports

Of the Atlantic herring *Communities of Interest*, Gloucester and New Bedford, Southern RI, and Cape May are homeports with largest concentrations of vessels that have Atlantic Herring limited access directed fishery permits, Categories A and B (Table 52). Mid-Coast ME, Portland and Seacoast NH also are home to a few of these permit holders. Beyond the communities of interest, a few Category A and B permit holders have homeports in Bath, Cundys Harbor, Hampden, Owls Head, and West Rockport ME; Boston and Woods Hole MA; and Wanchese NC. For the most part, these vessels use a community of interest as a landing port (NMFS 2012).

Table 52 Distribution of Herring Permit Holders in FY11 which have an Atlantic Herring Community of Interest as a Homeport

Homeport		Permit Category				
		A	B,C	C	D	Total
Maine	Portland	2	0	1	129	**132**
	Rockland	1	0	0	2	**3**
	Stonington/Deer Isle	1	0	0	0	**1**
	Vinalhaven	0	0	0	2	**2**
	Lubec/Eastport	0	0	0	2	**2**
	Sebasco Estates	0	0	0	3	**3**
	Maine, other	5	0	6	196	**207**
New Hampshire	Seacoast	2	0	4	96	**102**
Massachusetts	Gloucester	5	0	2	174	**181**
	New Bedford	7	0	2	201	**210**
	Massachusetts, other	5	1	3	377	**386**
Rhode Island	Southern	4	3	8	117	**132**
New Jersey	Cape May	5	0	7	93	**105**
	New Jersey, other	0	0	0	200	**200**
Other States		1	0	11	494	**506**

Source: NMFS permit databases. http://www.nero.noaa.gov/permits/permit.html. November 2012.

Landing Ports

Atlantic herring harvested from Areas 1A and 1B are landed in fishing communities in Maine, New Hampshire, and Massachusetts, whereas herring from Areas 2 and 3 are landed in a wider range of ports (Table 53). Communities in Rhode Island and New Jersey fish in Area 2 for herring almost exclusively. Portland, Rockland, Gloucester, and New Bedford are ports with the most herring landings in recent years. Within New Jersey, Cape May is the most active landing port.

Table 53 Landing Port Distribution of Herring Landings from Fishing Areas (2008-2011)

Landing Port		Area 1A (mt)	Area 1B (mt)	Area 2 (mt)	Area 3 (mt)
Maine	Portland	23%	22%	1%	23%
	Rockland	26%	15%	1%	10%
	Stonington/Deer Isle	8%	12%	0.5%	0%
	Vinalhaven	2%	5%	0%	2%
	Lubec/Eastport	0%	0%	0%	0%
	Sebasco Estates	0%	0%	0%	0%
	Maine, other	6%	0.3%	0.8%	4%
New Hampshire	Seacoast	3%	0.9%	0.4%	1%
Massachusetts	Gloucester	23%	42%	17%	45%
	New Bedford	8%	2%	45%	16%
	Massachusetts, other	1%	0.1%	4%	0%
Rhode Island	Southern	0%	0%	17%	0.1%
New Jersey	Cape May	0%	0%	13%	0%
	New Jersey, other	0%	0%	0%	0%
Other States		0%	0%	0.1%	0%
Total		**133,463 (100%)**	**19,555 (100%)**	**89,748 (100%)**	**91,466 (100%)**

Source: NMFS VTR database. September 2012.

Community Descriptions

1. Portland, Maine

Portland is the largest city in Maine, with a population of 66,194 (Bureau 2010). Of the civilian employed population 16 years and older, 0.3% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (29.3%) is the largest industry sector (Bureau 2011). Portland's waterfront provides most of the community's fishing industry infrastructure (e.g., Portland Fish Exchange) alongside other industries including recreation, tourism, light industry, transportation, cargo, and marine-related research. Portland's landings come primarily from the large mesh groundfish species and from lobster. Herring brings in about 8.6% of the dollar value of landings in Portland. Portland ranked third in herring landings in the region, taking a six-year (2005-2010) average (13.5K mt) Taking a four-year average (2007-2010), Portland ranked fourth among ports with herring revenue ($3.1M) (Dealer and VTR data).

2. Rockland, Maine

Rockland has a total population of 7,297 (Bureau 2010). Of the civilian employed population 16 years and older, 3.1% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (18.3%) is the largest industry sector (Bureau 2011). Other than fishing and boat building/repair, other stabilizing businesses include furniture and playground equipment manufacturing, biotechnology industries, wholesale distribution, marine-related businesses, seaweed processing, metal fabricating, and food related industries. Rockland's landings come primarily from lobster and herring. Herring brings in about 36% of the dollar value of landings in Rockland. Rockland ranked fourth in herring landings in the region, taking a six-year (2005-2010) average (12.5K mt) Taking a four-year average (2007-2010), Rockland ranked second among ports with herring revenue ($3.4M), though 2009 and 2010 revenues were noticeably lower (Dealer and VTR data).

3. Stonington/Deer Isle, Maine

Stonington and Deer Isle have a total population of 3,018 (Bureau 2010). Of the civilian employed population 16 years and older, 29% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). This is the largest industry sector (Bureau 2011). Deer Isle is home to the Commercial Fisheries News, the widely-read monthly fishing industry newspaper for the Atlantic coast. Stonington is one of the few Maine fishing communities that have secured waterfront access for commercial fishing, because property values have remained stable relative to other coastal cities. Stonington's landings come primarily from lobster. Herring brings in about 0.10% of the dollar value of landings in Stonington and Deer Isle. Stonington and Deer Isle landed 3.9K mt of herring on average over six years (2005-2010). Taking a four-year average (2007-2010), Stonington ranked fifth among ports with herring revenue ($1.0M), though 2009 and 2010 revenues were noticeably lower (Dealer and VTR data). Stonington and Deer Isle are involved in the Atlantic herring fishery primarily through their dependence on herring for lobster bait.

4. Vinalhaven, Maine

The island town of Vinalhaven has a total population of 1,165 (Bureau 2010). Of the civilian employed population 16 years and older, 32.4% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). This is the largest industry sector (Bureau 2011). Vinalhaven is intimately involved with the Atlantic herring fishery because of its dependence on lobster bait. Many of the year-round residents are participants in the lobster fishery. Several lobster bait dealers, including floating stations and a co-op, are located in Vinalhaven. Vinalhaven has several packaging and wholesale companies, including Vinalhaven Lobster Co., Vinalhaven Fishermen's Co-op, Inland Seafood and Alfred Osgood, that ship lobster to Portland and other mainland locations for processing and distribution. Bait dealers on Vinalhaven pay a higher price for bait than dealers on the mainland, as there is limited bait storage capacity on the island and insufficient space on the ferry that transports goods and people from the mainland to make regular bait transshipments during the height of the lobster season. Herring brings in about 2.7% of the dollar value of landings in Vinalhaven. Vinalhaven ranked ninth in herring landings in 2004 (2,674 mt) and tenth cumulatively from 1995-2004 (24,779 mt).

5. Lubec/Eastport, Maine

Lubec and Eastport have a total population of 2,690 (Bureau 2010). Of the civilian employed population 16 years and older, 5.4% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (31%) is the largest industry sector (Bureau 2011). Lubec and Eastport has a diversity of employment, including medical centers, schools, an apparel company, and an Atlantic salmon aquaculture facility. Eastport also has the only Nori seaweed processing plant in the US. Eastport and Lubec are involved in a diversity of fisheries, including lobster, scallops, urchin, clams, and sea cucumbers. No herring landings were reported in Lubec/Eastport in 2004. Lubec and Eastport are representative of geographically isolated small ports that depend on herring for lobster bait.

6. Sebasco Estates, Maine

Sebasco Estates is a small village within the town of Phippsburg, which has a total population of 2,216 (Bureau 2010). Of the civilian employed population of Phippsburg 16 years and older, 5.2% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (22.6%) is the largest industry sector (Bureau 2011). Herring brings in about 0.076% of the dollar value of landings in Sebasco Estates. Several lobster bait dealers, large and small, are located in this area. Sebasco Estates is involved in the Atlantic herring fishery primarily due to its dependence on herring for lobster bait, and is representative of small ports that depend on herring for lobster bait.

7. NH Seacoast – Newington, Portsmouth, Hampton/Seabrook

Newington has a total population of 753 (Bureau 2010). Of the civilian employed population of Newington 16 years and older, 1.0% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (15.8%) is the largest industry sector (Bureau 2011). Major employers in Newington include Fox Run Mall (retail**)** and Neslab (light manufacturing lab equipment). Herring brings in about 4.8% of the dollar value of landings in Newington. Newington ranked fifth in herring landings in 2004 (5,660 mt) and 12th cumulatively from 1995-2004 (16,805 mt), with herring landings increasing in more recent years. Newington is primarily dependent on the herring fishery because of the bait it provides for lobster operations based in Great Bay estuary. Commercial fisheries in the Great Bay estuary include herring, alewives, mummichogs (*Fundulus sp.*) and tomcod, eels, and smelt. Newington has several large and small herring bait dealers, and freezer facilities to store lobster bait. The Little Bay Lobster Company and the Shafmaster Fleet Services both harvest and deliver lobster nationally and internationally. The Newington fishing industry also competes with other water-dependent industries, including tallow, steel scrap and wood chip export industries.

Portsmouth has a total population of 20,779 (Bureau 2010). Of the civilian employed population of Portsmouth 16 years and older, 0.7% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (25.5%) is the largest industry sector (Bureau 2011). Portsmouth is somewhat involved in the herring fishery, primarily through its dependence on herring for lobster and tuna bait. Herring brings in about 1.2% of the dollar value of landings in Portsmouth. The port is centrally-located with good transportation infrastructure and provides other fishing related services. Portsmouth ranked 13th in herring landings in 2004 (800 mt) and 11th cumulatively from 1995-2004 (18,060 mt).

Hampton and Seabrook have a total population of 24,123 (Bureau 2010). Of the civilian employed population 16 years and older, 0.5% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (21.5%) and retail trade (21.8%) are the largest industry sector, in Hampton and Seabrook, respectively (Bureau 2011). Hampton and Seabrook are somewhat involved in the herring fishery through their dependence on herring for lobster and tuna bait. Herring brings in about 0.2% of the dollar value of landings in Hampton and Seabrook. Only 2 mt of herring were reported to have been landed in Hampton in 2004. Seabrook ranked 17th in herring landings in 2004 (96 mt).

8. Gloucester, Massachusetts

Gloucester has a total population of 28,789 (Bureau 2010). Of the civilian employed population of Gloucester 16 years and older, 2.2% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (25.5%) is the largest industry sector (Bureau 2011). Herring brings in about 11% of the dollar value of landings in Gloucester. Gloucester was the top-ranked port for herring landings in 2004 (26,891 mt) and cumulatively from 1995-2004 (227,579 mt). Taking a four-year average (2007-2010), Gloucester ranked first among ports with herring revenue ($6.4M) (Dealer and VTR data). Gloucester lobster fishermen depend on the harvested herring as bait for their traps and tuna fishermen use herring as bait for their lines. Several lobster bait dealers and a pumping station for offloading herring are located in Gloucester. In addition, Cape Seafoods, one of the largest processors of herring for frozen export, is located at the State Pier and owns several dedicated pelagic fishing vessels.

9. New Bedford, Massachusetts

New Bedford has a total population of 95,072 (Bureau 2010). Of the civilian employed population of New Bedford 16 years and older, 1.2% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (26.1%) is the largest industry sector (Bureau 2011). New Bedford contains approximately 44 fish wholesale companies, 75 seafood processors and some 200 shore side industries (Hall-Arber et. al. 2001). Maritime International, which has one of the largest U.S. Department of Agriculture-approved cold treatment centers on the East Coast, is also located in New Bedford. Herring brings in about 0.7% of the dollar value of landings in New Bedford. New Bedford ranked fourth in herring landings in 2004 (7,791 mt) and seventh cumulatively from 1995-2004 (31,089 mt). Taking a four-year average (2007-2010), New Bedford ranked third among ports with herring revenue ($6.4M) (Dealer and VTR data).

10. Southern Rhode Island – Point Judith, Newport, North Kingstown

Census data are not available for Point Judith itself, but are available for the county subdivision "Narragansett Pier CDP" which includes Point Judith. Narragansett Pier CDP has a total population of 3,409 (Bureau 2010). Of the civilian employed population of Narragansett Pier CDP 16 years and older, 0.5% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (27.7%) is the largest industry sector (Bureau 2011). Several lobster bait dealers are located in Point Judith, and some herring is trucked to Maine from Point Judith for processing. Landings of herring in Point Judith were much higher in the early 1990s, possibly due to increased participation in the Atlantic mackerel fishery. Today, herring brings in about 1.2% of the dollar value of landings in Point Judith. Point Judith ranked 10th in herring landings in 2004 (2,129 mt) and fourth cumulatively from 1995-2004 (71,289 mt). Taking a four-year average (2007-2010), Point Judith ranked seventh among ports with herring revenue ($469K) (Dealer and VTR data).

Newport has a total population of 24,672 (Bureau 2010). Of the civilian employed population of Newport 16 years and older, less than 0.01% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (25.1%) is the largest industry sector (Bureau 2011). Herring brings in less than 0.01% of the dollar value of landings in Newport. Newport is marginally involved in the Atlantic herring fishery, and ranked 15th in herring landings in 2004 (313 mt) and 17th cumulatively from 1995-2004 (3,757 mt). Aquidneck Lobster Co., Dry Dock Seafood, International Marine Industries Inc., Long Wharf Seafood, Neptune Trading Group Ltd., Parascandolo and Sons Inc., and Omega Sea are wholesalers and retailers of seafood in Newport.

North Kingstown has a total population of 26,486 (Bureau 2010). Of the civilian employed population of North Kingstown 16 years and older, 1.1% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Educational services and health care and social assistance (25.4%) is the largest industry sector (Bureau 2011). Herring brings in about 6.9% of the dollar value of landings in North Kingstown, which is involved in the herring fishery primarily through its involvement in the bait market. North Kingstown ranked 12th in herring landings in 2004 (1,065 mt) and fifth cumulatively from 1995-2004 (69,094 mt). Several lobster bait dealers and freezer facilities are located in North Kingstown, and some herring is trucked to Maine from North Kingstown for processing. North Kingston's Sea Freeze, Ltd. is the largest producer of sea-frozen fish on the U.S. east coast. It supplies sea-frozen and land-frozen fish to domestic and international markets including bait products to long-line fleets. Sea Freeze owns two freezer trawlers that provide *Illex* and *Loligo* squid, mackerel and herring to the Sea Freeze facilities. Although herring is among the least financially valuable species that Sea Freeze harvests and processes, it is nevertheless important to the business due to its year round availability.

11. Cape May, New Jersey

Cape May has a total population of 3,607 (Bureau 2010). Of the civilian employed population of Cape May 16 years and older, less than 0.01% are employed in the agriculture, forestry, fishing, hunting, or mining sectors (2007-2011 average). Arts, entertainment, recreation, accommodation and food services (19.3%) is the largest industry sector (Bureau 2011). Herring brings in about 0.6% of the dollar value of landings in Cape May. Only 8 mt of herring were reported to have been landed in Cape May in 2004. A pumping station for offloading herring and Lund's Fisheries, a processor of herring and mackerel, are located in Cape May. Lunds' also owns a number of dedicated pelagic fishing vessels, and is a member of the Garden State Seafood Association. There are also two other exporters of seafood in Cape May: the Atlantic Cape Fisheries Inc., which exports marine fish and shellfish, oysters, scallops, clams and squids; and the Axelsson and Johnson Fish Company Inc., which exports shad, marine fish, conch, American lobster, lobster tails, scallops and whole squid.

3.5.3 Canadian Herring Fisheries

The Canadian catch (New Brunswick weir fishery) is quite variable and is the only deduction that the Herring PDT believes is necessary to address management uncertainty at this time. Selection of the buffer to account for uncertainty surrounding the catch in the NB weir fishery is at the discretion of the Council and should be based on recent performance in the fishery and the expected level of effort in the next three years.

Catch of the Gulf of Maine/Georges Bank Atlantic herring stock complex in Canadian waters consists primarily of fish caught in the New Brunswick (NB) weir fishery (the SARC 54 Panel noted that the Atlantic herring stock on the Scotian Shelf region is unknown). Currently, the Herring FMP assumes that 20,000 mt of fish from the inshore component of the Atlantic herring resource will be taken annually in the NB weir fishery for the 2010-2012 specifications. This assumed catch is subtracted from the available yield from the inshore component of the resource before sub-ACLs are determined for management areas in the U.S. EEZ. While the NB weir catch has been quite variable over time, the 20,000 mt assumption has been determined in previous years to be appropriate. The language in Amendment 1 provides flexibility to reconsider this assumption and adjust according to trends in the fishery in future years as part of the fishery specification process.

The Council deducted 14,800 mt from the ABC to account for potential catch of Atlantic herring in the NB weir fishery for the 2010-2012 specifications. NMFS monitored NB weir fishery landings, which are made available by Canada's Department of Fisheries and Oceans (DFO) on a close to real-time basis (within two weeks). If, by considering landings through October 15 of each year, NMFS determines that less than 9,000 mt has been taken in the NB weir fishery, NMFS will allocate an additional 3,000 mt to Area 1A to be made available to the directed herring fishery during November and through the remainder of the fishing year (until it is harvested). This specification provides additional opportunity for fishing in Area 1A if catch in the NB weir fishery is substantially less than the deducted amount (14,800 mt), while still minimizing the likelihood that ABC would be exceeded.

- The NB weir fishery catch is quite variable and dropped to just under 6,500 mt in 2008. The NB weir fishery landings totaled about 30,944 mt in 2007 and 6,448 mt in 2008.
- The most recent five-year average of NB weir landings (2007–2011) is 11,218 mt, and the most recent ten-year average (2002-2011) is 12,358 mt.
- Extremely low landings during the 2008 fishing year decreased these moving averages, especially the ten-year average.
- The 2010 fishing year had NB weir landings of 10,958 mt and decreased in 2011 to 3,711 mt (Table 54).

Table 55 provides the number of active weirs in the fishery and catch per weir from 1978-2011. The data indicate a decreased effort overall, with 2009 and 2011 having only 38 and 37 active weirs respectively, down from a high of 210 weirs in 1979. Although, standardized effort (catch per weir) has been highly variable year to year.

Table 56 provides the monthly weir landings for NB from 1978 to 2010 (2011 data not yet available). These data illustrate that the NB weir fishery is primarily a late summer/fall fishery with very little activity occurring during the winter and later part of the year. There were no weir landings in November and December in 2009, and only 46 mt landed during those months in 2010. Note that the most current monthly weir landings showing reduced catch in Table 56 (2008-2010) also coincide with the reduced level of effort seen in Table 56.

Table 54 Total Atlantic Herring Catch During, 1964 – 2011

YEAR	US Fixed Gear Catch (mt)	Mobile Gear (mt)	New Brunswick Weir (mt)	US Fixed + NB Weir (mt)
1964	31484	142156	29432	60916
1965	36440	58161	31682	68122
1966	23178	162022	35602	58780
1967	17458	258306	29928	47386
1968	24565	421091	32111	56676
1969	9007	362148	25643	34650
1970	4316	302107	15070	19386
1971	5712	327980	12136	17848
1972	22800	225726	31893	54693
1973	7475	247025	19053	26528
1974	7040	203462	19020	26060
1975	11954	190689	30816	42770
1976	35606	79732	29207	64813
1977	26947	56665	19973	46920
1978	20309	52423	38842	59151
1979	47292	33756	37828	85120
1980	42325	57120	13526	55851
1981	58739	26883	19080	77819
1982	15113	29334	25963	41076
1983	3861	29369	11383	15244
1984	471	46189	8698	9169
1985	6036	27316	27864	33900
1986	2120	38100	27885	30005
1987	1986	47971	27320	29306
1988	2598	51019	33421	36019
1989	1761	54082	44112	45873
1990	670	54737	38778	39448
1991	2133	78032	24574	26707
1992	3839	88910	31968	35807
1993	2288	74593	31572	33860
1994	539	63161	22242	22781
1995	6	106179	18248	18254
1996	631	116788	15913	16544
1997	275	123824	20551	20826
1998	4889	103734	20092	24981
1999	653	110200	18644	19298
2000	54	109087	16830	16884
2001	27	120548	20210	20237
2002	46	93176	11874	11920
2003	152	102320	9008	9160
2004	96	94628	20685	20781
2005	68	93670	13055	13123
2006	1007	102994	12863	13870
2007	403	81116	30944	31347
2008	31	84650	6448	6479
2009	98	103458	4031	4129
2010	1263	67191	10958	12221
2011	422	80682	3711	4132

Source: NEFSC (SAW 54 Assessment Report)

Table 55 Number of Active Weirs and the Catch per Weir in the New Brunswick, Canada Fishery from 1978-2011

Year	Number of Active Weirs	Catch per Weir (mt)
1978	208	162
1979	210	155
1980	120	92
1981	147	102
1982	159	140
1983	143	88
1984	116	72
1985	156	171
1986	105	262
1987	123	216
1988	191	200
1989	171	255
1990	154	258
1991	143	166
1992	151	212
1993	145	216
1994	129	160
1995	106	172
1996	101	156
1997	102	200
1998	108	181
1999	100	191
2000	77	213
2001	101	199
2002	83	142
2003	78	115
2004	84	245
2005	76	166
2006	89	131
2007	97	311
2008	76	79
2009	38	95
2010	77	139
2011	37	71

Source: NEFSC (SAW 54 Assessment Report)

Table 56 Monthly Weir Landings (mt) for Weirs Located in New Brunswick, 1978-2010

YEAR	MONTH Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Total
1978	3				512	802	5,499	10,275	10,877	4,972	528	132	33,599
1979	535	96			25	1,120	7,321	9,846	4,939	5,985	2,638	74	32,579
1980					36	119	1,755	5,572	2,352	1,016	216		11,066
1981					70	199	4,431	3,911	2,044	2,435	1,686	192	14,968
1982		17			132	30	2,871	7,311	7,681	3,204	849	87	22,181
1983					65	29	299	2,474	5,382	3,945	375		12,568
1984					6	3	230	2,344	2,581	3,045	145		8,353
1985					22	89	4,217	8,450	6,910	4,814	2,078	138	26,718
1986	43				17		2,480	10,114	5,997	6,233	2,564	67	27,516
1987	39	21	6	12	10	168	2,575	10,893	6,711	5,362	703	122	26,621
1988		12	1	90	657	287	5,993	11,975	8,375	8,457	2,343	43	38,235
1989		24		95	37	385	8,315	15,093	10,156	7,258	2,158		43,520
1990					93	20	4,915	14,664	12,207	7,741	168		39,808
1991					57	180	4,649	10,319	6,392	2,028	93		23,717
1992				15	50	774	5,477	10,989	9,597	4,395	684		31,981
1993					14	168	5,561	14,085	8,614	2,406	470	10	31,328
1994				18		55	4,529	10,592	3,805	1,589	30		20,618
1995					15	244	4,517	8,590	3,956	896	10		18,228
1996					19	676	4,819	7,767	1,917	518	65		15,781
1997				8	153	1,017	6,506	7,396	5,316				20,396
1998					560	713	3,832	8,295	5,604	525			19,529
1999					690	805	5,155	9,895	2,469	48			19,063
2000					10	7	2,104	7,533	4,940	1,713	69		16,376
2001					35	478	3,931	8,627	5,514	1,479			20,064
2002					84	20	1,099	6,446	2,878	1,260	20		11,807
2003					257	250	1,423	3,554	3,166	344	10		9,003
2004					21	336	2,694	8,354	8,298	913	3		20,620
2005						213	802	7,145	3,729	740	11		12,639
2006					8	43	1,112	3,731	3,832	2,328	125	462	11,641
2007	182		20	30	84	633	3,241	11,363	7,637	6,567	314	73	30,145
2008						82	1,502	2,479	1,507	389	49	32	6,041
2009					5	239	699	1,111	1,219	330			3,603
2010				6	64	1,912	2,560	3,903	1,933	247	46		10,671
NB Average Catch (t)	160	34	9	34	127	378	3,549	8,033	5,410	2,912	659	119	20,939
NB Minimum Catch (t)	3	12	1	6	5	3	230	1,111	1,219	48	3	10	3,603
NB Maximum Catch (t)	535	96	20	95	690	1,912	8,315	15,093	12,207	8,457	2,638	462	43,520

Source: NEFSC (SAW 54 Assessment Report)

4.0 ENVIRONMENTAL IMPACTS

The impacts of the management measures proposed by the Council in the 2013-2015 Atlantic Herring Specifications as well as Framework Adjustment 2 to the Herring FMP are assessed and discussed relative to each of the valued ecosystem components (VECs) described in the Affected Environment (see Section 3.0).

Much of the detailed analysis to support the development of the alternatives considered by the Council in the 2013-2015 Atlantic Herring Specifications was provided by the Herring PDT and SSC to form the basis for determining the potential impacts of the measures on each of the VECs. The complete analyses and supporting technical documents are included in the appendices (see XXX) and are summarized below and incorporated by reference where appropriate.

4.1 IMPACTS OF FRAMEWORK 2 ALTERNATIVES

This section addresses the potential impacts of the management alternatives under consideration in Framework 2. Framework 2 includes two provisions, one to allow seasonal splitting of any management area sub-ACL (Area 1A seasonal split was authorized under Framework 1) and one to authorize up to 10% sub-ACL carryover annually under specified conditions. Because Framework 2 only establishes the general policy to allow splits and carryovers to occur in the specifications process, the majority of analyses related to environmental impacts will be provided in the specifications packages if/when splits and carryovers are contemplated in the future.

Overall, because the measures proposed in Framework 2 are administrative in nature (establishing provisions/policy for the specifications process), the direct impacts of the alternatives under consideration on all of the VECs identified in this document are expected to be minor. There may be some differences between the various options under consideration and some long-term/indirect impacts of taking the action proposed in this framework adjustment; these issues are discussed relative to each VEC in the following sub-sections.

4.1.1 Impacts of Framework 2 Alternatives on Atlantic Herring

Sub-ACL Splitting

Alternative 1 (No Action): Under Alternative 1, no measures/provisions to authorize seasonal sub-ACL splitting would be implemented Framework 2. Only the Area 1A sub-ACL could be split January-May/June–December during the specifications process, currently authorized by Framework 1 to the Herring FMP. There are no additional impacts on the herring resource expected from Alternative 1, and the impacts are expected to be *neutral*.

Alternative 2 (Allow Sub-ACL Splitting): Alternative 2 proposes to allow seasonal (by month) splitting of any management area sub-ACL during the herring fishery specifications process. This management action is administrative in nature and is not expected to directly impact the Atlantic herring resource. The herring resource is not overfished, and overfishing is not occurring. However, there may be an indirect benefit if this provision results in a reduction of sub-ACL overages, consequently reducing the possibility of a total ACL overage. The indirect benefits of this alternative on the Atlantic herring resource are difficult to predict, but are generally expected to be *low positive* in comparison to Alternative 1. The more direct impacts of specific sub-ACL splits on the herring resource will be analyzed as part of the specifications process, when the splits are considered.

Carryover Provisions

Alternative 1 (No Action): Under Alternative 1, no measures to authorize un-utilized sub-ACL carryover would be implemented Framework 2. No provisions would be established to allow for the carryover of any un-utilized sub-ACL in any management area in the herring fishery. There are no additional impacts on the herring resource expected from Alternative 1, and the impacts are expected to be *neutral*.

Alternative 2 (Allow Carryover up to 10%): Alternative 2 proposes to establish and allow un-utilized sub-ACL from one fishing year to be carried over to the corresponding sub-ACL for the following fishing year, up to a limit of 10% of the sub-ACL. The herring resource is not overfished, and overfishing is not occurring. For the most part, none of the options under consideration in Framework 2 to allow carryover are expected to have a direct impact on the Atlantic herring resource because they are administrative in nature and simply establish the policy for carryovers to be authorized and evaluated during the specifications process.

However, there may be indirect benefits to the Atlantic herring resource that could result from improvements in the operation of the fishery (increased flexibility) and a consequent reduction in total ACL overages over the long-term. The benefits to the herring resource are difficult to quantify regarding the three options under consideration in Alternative 2 but are expected to be *low positive* in comparison to Alternative 1 (no action).

Options 1, 2, and 3

Options 1, 2, and 3 propose slightly different provisions for authorizing carryover of up to 10% of a sub-ACL (see Section XXX for a complete description of these options). The four provisions below would apply to all three options.

- All AMs would continue to apply to both the sub-ACLs and the stockwide ACL.
- All carryovers would be based on initial sub-ACL allocations for the fishery year.
- Sub-ACL carryovers would only be authorized if the total ACL for the fishing year is not exceeded.
- Provisions for carryovers, including percentages/amounts, can be modified in the future through the herring fishery specifications process (in addition to framework adjustments and amendments).

Option 1: If there is a carryover, the sub-ACL(s) in the corresponding management area(s) would increase for the following fishing year, but the stockwide ACL would remain unchanged. Option 1 would not allow the stockwide ACL to increase even if sub-ACL carryover occurs in one or more management areas, so no additional biological impacts on the stock complex would need to be analyzed during the specifications process. XXX

Option 2: This options would authorize the NMFS Regional Administrator annually determine the amount of carryover for any sub-ACL underages, up to 10% of the sub-ACL for the management area, based on Council recommendations and analyses provided for the upcoming fishing year(s) in the specifications package. Under this option, the biological impacts of any carryovers that would increase the stockwide ACL would be analyzed as part of the specifications package (every three years). In addition, the Council may recommend that a buffer between the stockwide ACL and ABC be maintained even if carryovers are allowed, and the Council may provide recommendations regarding carryovers when sub-ACL overages occur (in other areas) and/or if the stockwide ACL changes substantially. These recommendations can be provided by the Council as part of the specifications process. XXX

Option 3: If there is a carryover, both the sub-ACL(s) in the corresponding management area(s) and the stockwide ACL would increase for the following fishing year, but the stockwide ACL cannot exceed ABC in any fishing year. The specification of management uncertainty would address the potential for sub-ACL carryovers during the upcoming three fishing years, and the biological impacts of any carryovers that would increase the stockwide ACL would be analyzed as part of the specifications package.

Options 2 and 3 are similar and require that any increases in the stockwide ACL resulting from annual carryovers be analyzed in the specifications process (every three years). XXX

Due to recent ACL/sub-ACL overages (2012) as well as the timing of Framework 2 (likely to be implemented for 2014 fishing year), it is improbably that sub-ACL carryovers can be considered in the current specifications package regardless of which option is selected under this alternative if Framework 2.

4.1.2 Impacts of Framework 2 Alternatives on Non-Target Species and Other Fisheries

XXX

4.1.3 Impacts of Framework 2 Alternatives on Physical Environment and EFH

Allow Sub-ACL Splitting

This alternative could lead to catch and effort being more evenly spread out throughout the fishing year, but is not expected to increase the overall amount of fishing activity. Thus, this measure would not have any adverse effects on EFH.

Allow Up to 10% Annual Sub-ACL Carryover

Sub-ACL carryover could lead to slight redistributions in fishing effort if in a subsequent year additional catch is allocated to a particular area but the total ACL remains the same (Option 1), or it could lead to an overall increase in effort if additional catch is carried over in a particular area and the total ACL increases (Option 2). Option 1 would not have any adverse effects on EFH. Any increase in adverse effects to EFH under Option 2 and 3 would be small.

4.1.4 Impacts of Framework 2 Alternatives on Protected Resources

XXX

4.1.5 Impacts of Framework 2 Alternatives on Fishery-Related Businesses and Communities

The analysis of impacts to the "Fishery-Related Businesses and Communities" VEC characterizes the magnitude and extent of the economic and social impacts likely to result from the alternatives considered for the 2012-2013 specifications as compared to the no action alternatives. The current interpretation of National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in forecasting economic and social change relative to fishery management alternatives when communities or other societal groups are constantly evolving in response to numerous external factors, such as market conditions, technology, alternate uses of waterfront, and tourism. Certainly, management regulations influence the direction and magnitude of economic and social change, but attribution is difficult with the tools and data available. While this analysis focuses generally on the economic and social impacts of the proposed fishing regulations, external factors may also influence change, both positive and negative, in the affected communities. In many cases, these factors contribute to a community's vulnerability and ability to adapt to new or different fishing regulations.

When examining potential economic and social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); herring dealers and processors; final users of herring; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short-term negative impact on some communities, this should be weighed against potential long-term benefits to all communities which can be derived from a sustainable herring fishery.

The social impact factors outlined below can be used to describe the Atlantic herring fishery, its sociocultural and community context and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007) and other texts (e.g. Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. While this analysis does not quantify the impacts of the management alternatives relative to the social impact factors, qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts. The factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The effects of the proposed action on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities.
4. The *Non-Economic Social Aspects* of the proposed action; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007).

Seasonal Split of Sub-ACLs

Currently, the Atlantic herring fishery, harvested primarily with trawls and purse seines, is managed using four area-based sub-ACLs. In general, the trawl fishery concentrates in Area 2 during the first few months of the year, targeting both herring and Atlantic mackerel. Trawlers then move into Area 3 during the summer, and may enter Area 1A in autumn. Trawlers may use Area 1B throughout the year. Finally, trawl vessels return to the Area 2 at the end of the calendar year. The purse seine fishery is active during the summer and uses Area 1A almost exclusively (Figure 16 and Figure 17). These usage patterns are driven by a combination of herring availability and fisheries regulations.

In Area 2, herring and Atlantic mackerel are often caught jointly by trawlers at the beginning and ends of the calendar year. Many vessels which are active in the herring fishery are active in the mackerel fishery, and vice versa. In Area 2, the directed catch of herring often approaches the sub-ACL by February or March (Figure 20), which could preclude retention of herring later in the year. The proposal to split the sub-ACLs into seasons was advanced by the industry as a way to ensure that participants in the herring and mackerel fisheries would be able to retain herring at the end of the calendar year. A seasonal sub-ACL is a mechanism by which participants would be required to leave some of the sub-ACL available for the end of the calendar year.

Alternative 1 (No Action)

Under Alternative 1 (No Action), the Area 1A sub-ACL can be split during the specifications process, as authorized by Framework 1 to the Herring FMP, only January-May/June-December. A seasonal sub-ACL split would slow fishing effort by redirecting "early" effort through the year. This would reduce the probability that the entire sub-ACL is caught early in the fishing year and provide benefits for herring consumers who prefer herring caught in Area 1A to be delivered later in the year (e.g. Maine lobster bait).

Potential negative impacts include the possibility that unharvested yield (at the end of the year that could have been caught earlier) could lead to lower employment and a negative impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce. If there is sustainable yield left unharvested as a direct result of the seasonal split, fishermen could hold negative *Attitudes* and *Beliefs* towards management. Finally, it is possible that a seasonal split would produce a "mini-derby" style fishery. This may also lead to an interruption in the supply of fresh herring from management area 1A, potentially raising the cost of herring for the lobster fishery and other users. If an Area 1A split changes *Historical Dependence on and Participation in* the fishery (e.g. prevents industry segments from fishing), perceived inequities could cause resentment or conflict between fishing groups, a negative social impact in the form of changes to *Social Structures and Organizations*.

Alternative 2

Under Alternative 2, seasonal splitting of the sub-ACL would be allowed for all management areas during the specifications process. A seasonal split of the sub-ACLs is a restriction on fishing practices and would not increase harvest of herring relative to the No Action alternative. However, it may produce positive economic impacts for harvesters who catch herring incidentally with mackerel. Mackerel and herring are jointly caught; if the directed herring fishery is closed, then fishing for mackerel is less profitable. An increase in the Area 2 sub-ACL, which is being considered in the 2013-2015 specifications, may allow for sufficient herring to mitigate the mackerel fishery concerns.

A seasonal sub-ACL split would slow fishing effort by spreading effort through the year and reduce the probability that the entire sub-ACL is caught early in the fishing year. Relative to the No Action Alternative, Alternative 2 may provide benefits for user groups who need access to herring in later months of the year, including participants of the winter mackerel fishery. A seasonal split is preferable to having "days out of the fishery" due to the safety concerns of variable or extreme weather conditions in the winter fishery (NEFMC 2012a). This alternative could have a positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest in the mackerel and herring fisheries. It could be perceived as a more equitable distribution of fishing rights.

However, there are also potential negative impacts of a seasonal sub-ACL for the herring industry. A seasonal sub-ACL will restrict the timing of fishing effort, so the industry may become less responsive to market conditions. Relative to the Alternative 1 (No Action), Alternative 2 could reduce fishing profits in the herring fishery. For example, if fishing is "good" during the early season and turns out to be "poor" in the later season, there may be foregone fishing opportunities. Carryover of underage, if allowed, could mitigate this problem. Because the sub-ACLs are allocated to the fleet, a seasonal sub-ACL may also promote a "race to fish" with each sub-season, potentially creating a series of mini-derbies. Finally, because the seasonal splits would be set through the specifications process, it may take 2-3 years to adjust these splits if the movement of herring schools shifts temporally due to environmental change. During this adjustment period, mis-calibrated splits of the sub-ACLs may impose costs on the fishery in terms of foregone revenue. A failure to locate enough fish in other areas could force vessels to temporarily exit the herring fishery should a seasonal sub-ACL be reached early. This alternative could have a negative impact on the overall *Size and Demographic Characteristics* of

the fishery-related workforce, if it reduces the harvest in the herring fishery without an increase in the mackerel fishery. Seasonal splits should not have a significant negative social impact on herring dependent communities, as long as present harvesters are able to continue fishing without significant disruption.

Allowing Sub-ACL carryovers of up to 10%

Currently, there are no provisions to allow the Atlantic herring fishery to carryover unutilized sub-ACL from one year to a subsequent year. Between 2003 and 2012, sub-ACLs have not been fully harvested in 27 out of 40 cases (68%; Table 38). This has been due, at times, to bad weather or unforeseen circumstances near the end of the fishing year, preventing vessels from fishing (industry members, pers. comm. 2012).

Alternative 1

Under Alternative 1 (No Action), the status quo would be maintained. This alternative might have a negative impact on *Non-Economic Social Aspects* of the herring fishery, if the industry is forced to choose between fishing in unsafe conditions at the end of the year or foregoing yield. Lost yield would lead to negative impacts on the *Size and Demographic Characteristics* of the fishery-related workforce (e.g. employment). This alternative could increase uncertainty in business planning, which would have a negative impact on the *Non-Economic Social Aspects* of the fishery.

Alternative 2

Under Alternative 2, unutilized sub-ACL from one fishing year could be carried over to the corresponding sub-ACL for the following fishing year, up to a limit of 10% of the sub-ACL. For example, a hypothetical management area with a sub-ACL of 30,000 mt could have 3,000 mt carried to the following year. At the average nominal price of herring from 2008-2001 ($255/mt), this would translate into about $765,000 in revenue in the following year if the entire sub-ACL is caught.

Relative to Alternative 1 (No Action), sub-ACL carryovers (of up to 10%) would increase operational flexibility for Atlantic herring fishery participants. In the event of bad weather or unforeseen circumstances near the end of the fishing year that prevents the herring fleet from using the entire sub-ACL, a carryover provision would improve safety at sea and allow vessels to fully utilize their allocation in the following year, which would otherwise go unharvested. Thus, this alternative would have a positive impact on *Non-Economic Social Aspects* of the herring fishery (e.g. safety) and the *Size and Demographic Characteristics* of the fishery-related workforce (e.g. employment). On the other hand, allowing sub-ACL carryovers could increase management uncertainty in future fishing years (a carryover is not necessarily determined at the time ACLs are set), increasing the likelihood of a larger buffer and potentially reducing the total quota allocated to fishery in the future. Limiting the carryover to 10% would reduce the risks associated with increased management uncertainty compared to a full carryover option, and falls within the range allowed for other fisheries with carryover provisions (e.g. scallops - Amendment 15 to the Scallop FMP allowed a carryover of 15% of the permit holder's original annual allocation to a subsequent fishing year).

4.2 IMPACTS OF PROPOSED 2013-2015 HERRING FISHERY SPECIFICATIONS

The impacts of the management measures proposed by the Council in the 2013-2015 Atlantic Herring Specifications to the Herring FMP are discussed in the order of OFL/ABC Alternatives, sub-ACL options, and AM Alternatives. The majority of the analysis is provided by the Herring PDT. The analyses and supporting technical documents are included in the appendices (see XXX) and are summarized below.

The analysis of impacts to the "Fishery-Related Businesses and Communities" VEC characterizes the magnitude and extent of the economic and social impacts likely to result from the alternatives considered for the 2012-2013 specifications as compared to the no action alternatives. The current interpretation of National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in forecasting economic and social change relative to fishery management alternatives when communities or other societal groups are constantly evolving in response to numerous external factors, such as market conditions, technology, alternate uses of waterfront, and tourism. Certainly, management regulations influence the direction and magnitude of economic and social change, but attribution is difficult with the tools and data available. While this analysis focuses generally on the economic and social impacts of the proposed fishing regulations, it is recognized that external factors are also influencing change, both positive and negative, in the affected communities. In many cases, these factors contribute to a community's vulnerability and ability to adapt to new or different fishing regulations.

When predicting economic and social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); herring dealers and processors; seafood markets; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. It is important to consider that, while some measures may have a short-term negative impact on some communities, this should be viewed in light of the potential long term benefits to all communities of a sustainable herring fishery.

The social impact factors outlined below can be used to describe the Atlantic herring fishery, its sociocultural and community context and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007) and other texts (e.g. Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. While this analysis does not quantify the impacts of the management alternatives relative to the social impact factors,

qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts. The factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The effects of the proposed action on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities.
4. The *Non-Economic Social Aspects* of the proposed action; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007).

4.2.1 Impacts of OFL/ABC Alternatives

4.2.1.1 Impacts of OFL/ABC Alternatives on Atlantic Herring

The Council considered several alternatives for specifying the OFL/ABC/ABC control rule for Atlantic herring in the 2013-2015 specifications, all of which were reviewed and evaluated by the Herring PDT and SSC. The following discussion addresses the impacts of these alternatives on the Atlantic herring resource.

The following will describe how fishing mortality (F), spawning stock biomass (SSB), and catch are derived. Fishing mortality is derived from the estimate of F_{MSY} (i.e. 0.27) that was derived during the 2012 stock assessment. A simulation of 1,000 projections is then used to capture possible outcomes of SSB and landings for 2013-2015. The values seen in Table 19 are derived from the 2012 fishing mortality deaths, which are based on the 2012 ACL and are specified by the 2012 natural mortality rates equal to the natural mortality rates used in the assessment in 2011. The 2013 fishing mortality deaths are based on the F_{MSY} fishing rate and are specified by the 2013 natural mortality rates equal to the natural mortality rates used in the assessment in 2011. Consequently, the 2012 SSB depends on the 2012 ACL and the 2013 SSB depends on the F_{MSY} fishing rate.

The two key elements used in the projections are abundance (used 2012 projections) and recruitment (used each year for each projection). The numbers-at-age (for 2012) are randomized for each of the 1000 projections by drawing the abundance at age from the probability distributions. Once the numbers at age are projected, then the population of each projection is derived for each year, using the 2012 numbers at age to the fishing mortality rate that was specified. SSB and landings are calculated in the same manner.

Alternative 1 (No Action)

Alternative 1 would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (see Table 2).

This approach is similar to Alternative 2 regarding a constant OFL/ABC throughout the 2013-2015, however the herring resource is not fully utilized by the herring industry in terms of better business planning and more stability in the fishery, which may be possible given the current (rebuilt) status of the stock.

During the development of the 2013-2015 herring fishery specifications Alternative 1 was discussed by the Herring PDT members briefly. Note in Table 57 that the OFL and ABC remain constant from 2013-2015 and the Fishing Mortality (F) increases by 0.04 each year. As the Fishing Mortality (F) increases, the Spawning Stock Biomass (SSB) decreases each year.

Table 57 2013-2015 Fishing Mortality (F) and Biomass (SSB) Projections Under Alternative 1 (No Action)

YEAR	2013	2014	2015
OFL (mt)	127,000	127,000	127,000
ABC (mt)	106,000	106,000	106,000
F	0.16	0.20	0.24
Prob > F_{MSY}	0.03	0.15	0.36
80% CI	0.12 – 0.22	0.14 – 0.29	0.16 – 0.36
SSB (mt)	538,838	422,472	353,218
Prob < $SSB_{MSY}/2$	0	0	0
80% CI	376,273 – 776,755	282,768 – 644,933	226,856 – 536,344

XXX

Alternative 2 (Preferred Alternative)

During the development of the 2013-2015 herring fishery specifications the Herring PDT discussed whether Alternative 2 (constant catch approach) (Table 3) is an option to consider when specifying a level for ABC. Constant catch may allow for better business planning and more stability in the fishery and may be possible given the current (rebuilt) status of the stock. This approach was utilized for setting ABC during the 2010-2012 specifications (average catch 2006-2008).

However, there are tradeoffs to this approach, as catch may be foregone in earlier years to allow for more catch in later years (catch will always be at less than the 50% threshold due to the chance of overfishing as well as a loss of quota in the first two years due to the fact that biomass will still decrease even at a constant catch rate). Table 58 provides the data projecting F at a constant catch for 2013-2015 regarding Atlantic herring. The SSB numbers decrease from 2013-2015 at this projection and the OFL/ABC catch remains at 114,000 mt.

Table 58 2013-2015 Fishing Mortality (F) and Biomass (SSB) Projections Under Alternative 2 (*Preferred Alternative* – Constant Catch)

YEAR	**2013**	**2014**	**2015**
OFL (mt)	169,000	136,000	114,000
ABC (mt)	114,000	114,000	114,000
F	0.17	0.22	0.27
Prob > F_{MSY}	0.05	0.24	0.50
80% CI	0.12 – 0.24	0.15 – 0.32	0.18 – 0.41
SSB (mt)	533,289	411,951	338,957
Prob < $SSB_{MSY}/2$	0	0	0
80% CI	370,787 – 771,161	272,517 – 634,105	212,915 – 521,760

XXX

Alternative 3

This approach has been a default ABC control rule utilized by the SSC in some cases to address uncertainty. The SSC recommended that the Council should consider an Acceptable Biological Catch (ABC) specification that uses the same method for all stocks, similar to guidelines for stocks that have not rebuilt at the end of the required building period:

A. ABC should be determined as the catch associated with 75% of F_{MSY}.

B. If fishing at 75% of F_{MSY} does not achieve the mandated rebuilding requirements for overfished stocks, ABC should be determined as the catch associated with the fishing mortality that meets rebuilding requirements ($F_{rebuild}$).

C. For stocks that cannot rebuild to B_{MSY} in the specified rebuilding period, even with no fishing, the ABC should be based on incidental bycatch, including a reduction in bycatch rate (i.e., the proportion of the stock caught as bycatch).

D. Interim ABCs should be determined for stocks with unknown status according to case-by-case recommendations from the SSC.

The most recent assessment classifies Atlantic sea herring as not overfished with overfishing not occurring. It is not in a rebuilding plan. Following previous SSC guidance, ABC could be set at the projected catch from F= 75% F_{MSY}. Projected catch and SSB at 75% F_{MSY} for 2013-2015 are shown below in Table 59. The SSB and resulting catch decrease from 2013 to 2015 in this projection.

In many cases, 75% of F_{MSY} provides a slightly lower catch than fishing at F_{MSY}, however, many stocks, use $F_{40\%MSY}$ proxies for F_{MSY}. The fundamental idea is that one would take slightly less catch than F_{MSY} with less effort (costs) so that there would be a net gain in value. Ultimately, with respect to groundfish, the Groundfish PDT presented evidence that the 75% F_{MSY} approach did not adequately account for scientific uncertainty in the most recently-updated assessments.

Table 59 provides the data projecting F at a constant 0.2 for 2013-2015 regarding Atlantic herring. The SSB numbers decrease from 2013-2015 at this projection and the OFL/ABC catch remains also decreases from 130,000 mt in 2013 to 88,000 mt in 2015.

Table 59 2013-2015 Fishing Mortality (F) and Biomass (SSB) Projections Under Alternative 3 (Non-Preferred – 75% F_{MSY})

YEAR	2013	2014	2015
OFL (mt)	169,000	127,000	104,000
ABC (mt)	130,000	102,000	88,000
F	0.2	0.2	0.2
Prob > F_{MSY}	0.14	0.15	0.17
80% CI	0.14 – 0.28	0.14 – 0.29	0.14 – 0.30
SSB (mt)	523,243	409,309	354,559
Prob < $SSB_{MSY}/2$	0	0	0
80% CI	382,573 – 723,975	306,011 – 574,128	272,751 – 473,021

XXX

4.2.1.2 Impacts of OFL/ABC Alternatives on Non-Target Species and Other Fisheries

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4.2.1.3 Impacts of OFL/ABC Alternatives on Physical Environment and EFH

Generally, specification of ABC values is an administrative measure that does not affect the magnitude of EFH impacts directly, as the amount and location of fishing depends on the sub-ACL allocations. That being said, the total ABC across all three years under Alternative 2 is greater than the sum of the No Action or Alternative 3 ABCs. Thus, ACLs based on the Alternative 2 ABC values could lead to slight increases in fishing effort and thereby increased seabed contact and adverse effects on EFH. However, any increase in adverse effects to EFH under Alternative 2 would be small. The sum of three years of No Action ABCs and the three years of ABCs under Alternative 3 are very similar, such that across the three years, little to no change in the magnitude of adverse effects would be expected if Alternative 3 is selected in comparison with No Action.

4.2.1.4 Impacts of OFL/ABC Alternatives on Protected Resources

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4.2.1.5 Impacts of OFL/ABC Alternatives on Fishery-Related Businesses and Communities

Over the long-term, harvesting within OFL, ABC, and ACL constraints should provide for a sustainable herring fishery. When considering the importance of fishery resources to fishing communities, National Standard 8 specifies that, "All other things being equal, where two alternatives achieve similar conservation goals, the alternative that provides the greater potential for sustained participation of such [fishing] communities and minimizes the adverse economic impacts on such communities would be the preferred alternative (NMFS 2009)." For the OFL, ABC, and ABC control rule alternatives included in this specifications document (Section 2.2.1), there are trade-offs, but under each alternatives, there is minimal chance that the stock would become overfished. The SSC has determined each alternative to be biologically acceptable (NEFMC 2012b). The potential impacts on fishery-related businesses and communities of each alternative should be considered.

Alternative 1 (No Action)

Under Alternative 1 (No Action), the herring fishery ABC from 2010-2012 would remain constant at 106,000 mt for 2013-2015. The total ACL would remain at 91,200 mt for 2013-2015 as well. With no change in the ABC, there would be a degree of constancy and predictability for fishing industry operations and a steady supply to the market (in addition to the stability provided by a three-year specifications process). Maintaining the status quo ABC would likely result in either neutral or positive social impacts. The *Size and Demographic Characteristics* of the fishery-related workforce would likely be unchanged, as would the *Historical Dependence on and Participation in* the fishery. In light of the SSC determination that the resource can sustain an increase in the ABC, selecting the No Action alternative might cause distrust in management among the industry, leading to a negative impact on the formation of *Attitudes* and *Beliefs*.

Alternative 2 (Preferred Alternative)

Under Alternative 2 (Constant Catch), the herring fishery ABC would increase by 7.5% from the 2010-2012 level, from 106,000 to 114,000 mt for FY2013-2015. Relative to Alternative 1, this provides additional fishing opportunities for participants in the herring fishery in all three years. Because ready substitutes for Atlantic herring exist, prices are not likely to change dramatically when the quantity supplied of herring changes, so an increase in supply is likely to correspond to an increase in revenue (see Section 3.5.1.3). If an increase in quantity supplied is realized, employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. The *Historical Dependence on and Participation in* the fishery would either be sustained or expanded. Like Alternative 1, this alternative maintains a constant ABC over the specifications period, providing consistency for fishing industry operations, stability for the industry and a steady supply to the market (in addition to the stability provided by a three-year specifications process). Relative to Alternative 3, the constant catch approach may allow for better business planning.

Alternative 3 (Non-Preferred)

Under Alternative 3 (75% F_{MSY}), the 2013 herring ABC would increase by 23% from the 2010-2012 level (106,000 to 130,000 mt). Then the ABC would decrease to 102,000 mt in 2014 and 88,000 mt in 2015, to 4% and 17% below the current ABC, respectively. Relative to Alternative 1, Alternative 3 would provide additional fishing opportunity in 2013 and reduced fishing opportunity in 2014 and 2015. Revenues may increase in 2013, but are likely to decrease substantially in 2014 and 2015. Relative to Alternative 2, Alternative 3 would provide for increased fishing opportunities in 2013, decreased fishing opportunities in 2014, and substantially decreased fishing opportunities in 2015. A varying ABC may result in instability within the industry, making business planning and markets less predictable, which may be offset to some degree by the stability provided by knowing the ACLs. Impacts to the *Size and Demographic Characteristics* of the fishery-related workforce are less certain than under scenarios of consistent trend.

4.2.2 Impacts of 2013-2015 Sub-ACL Options

The Council is considering six options, including no action, for specifying sub-ACLs in the four herring management areas for the 2013-2015 fishing years. The following sub-sections address the potential impacts of these options on the five VECs identified in this document.

4.2.2.1 Impacts of 2013-2015 Sub-ACL Options on Atlantic Herring

Sub-ACLs (formerly known as Total Allowable Catches (TACs)) for each of the four herring management areas are categorized as 1A, 1B, 2, and 3 (represented in Figure 1). Set-asides for research and fixed gear fisheries in Area 1A are also specified as necessary. The Council uses the best information available to estimate the proportion of each spawning component of the Atlantic herring stock complex in each area/season and distributes the sub-ACLs such that the risk of overfishing an individual spawning component is minimized to the extent practicable based on the options under consideration.

Comparative Sub-ACL Analysis - Methods

The sub-ACL analysis evaluates the options under consideration by simulating catch/removals from the inshore and offshore stock components across all reasonable mixing rate combinations and generating a relative exploitation rate, which can then be compared to the F_{MSY} exploitation rate for the entire herring stock complex. The ratio of F_{MSY}-based catch (OFL) to January total biomass is used as a basis for comparison to the relative exploitation rates (catch:biomass) generated for the inshore component and offshore component in the simulation model. While there is no separate assessment for the inshore and offshore stock components, and therefore no separate reference points, the F_{MSY} reference point for the stock complex serves as a reasonable basis for comparison. While F_{MSY} may vary to some degree between stock components, the differences are not thought to be extremely significant. The Herring PDT addressed this issue in detail in the 2010-2012 herring specifications.

This simulation methodology is similar to the approach used in previous analyses of herring TACs/sub-ACLs (see 2010-2012 herring specifications). However, several input data have been updated to reflect new information (see discussion below). The updated data, particularly those related to the size/proportion of the individual stock components (inshore/offshore) influence the interpretation of results from this model simulation.

Unlike previous assessments which focused on the inshore stock component as the limiting factor, this assessment evaluates impacts on each stock component equally, consistent with updated information about the population mixing rate (below).

Input Data – Population Mixing Rate

The *population mixing rate* is used in the projections to split the total herring stock biomass into inshore and offshore stock components and to allocate herring catch to the inshore and offshore stock components. This allocation is month and area-specific and based on the best available information about when/where/how the inshore and offshore components of the stock complex are distributed throughout the fishing year.

In the previous analyses (2010-2012 specifications), the population mixing rate was drawn from a triangular distribution based on the best three sources of information about stock component distribution and the proportion of total stock biomass represented by the inshore stock component (0.10 (acoustic survey), 0.13 (morphometric study numbers) and 0.30 (distribution of

survey biomass)). These were values discussed in the 2006 TRAC Assessment (see also Table 62 in 2010-2012 specifications).

The Herring PDT updated the time series of spatial distribution of the NEFSC survey biomass, one of the three sources of information identified above (see Table 60 below). Evaluation of the survey data from 2000-2011 suggests that population/stock component mixing rates may be more variable and that the inshore stock component may represent a larger proportion of the total biomass. The proportion of biomass in NEFSC survey strata sets corresponding to herring management areas is shown in Table 60.

Based on this information, the Herring PDT determined that the population mixing rate would be drawn from a uniform distribution (0.10 – 0.90) in each model simulation. This results in an average proportion for the inshore stock component of 0.5 (50% of total biomass), close to the 2002-2011 observed average (Table 60); it also covers the range of proportions seen in Area 1 (0.18 to 0.86).

Table 60 Proportion of Area Swept NEFSC Survey Biomass by Herring Management Areas 2000-2011

	Proportion of Biomass in NEFSC Survey Strata		
	Area 1	**Area 2**	**Area 3**
2000	0.64	0	0.36
2001	0.29	0	0.71
2002	0.71	0	0.29
2003	0.37	0	0.63
2004	0.18	0.01	0.81
2005	0.53	0	0.47
2006	0.69	0	0.31
2007	0.44	0	0.56
2008	0.40	0	0.6
2009	0.31	0.03	0.66
2010	0.47	0.02	0.51
2011	0.86	0	0.14
Avg. 1963-2011	0.48	0.04	0.48
Avg. 2002-2011	0.49	0.01	0.5
Avg. 2007-2011	0.49	0.01	0.5

Source: NEFSC Autumn Trawl Survey.

Summer Mixing Rate

The *summer mixing rate* is used for allocating catch to inshore and offshore stock components only in Area 1A during the months April-July. Based on the best available information, the summer mixing rate remains a random draw from a uniform distribution over the range 0.2 to 0.8 in this analysis (same as 2010-2012 herring specifications).

The stock mixing percentages applied in the simulation (described above), are shown for the inshore component by month in Table 61.

Table 61 Stock Component Mixing Percentages (Inshore Component as Percent of Total) by Month and Area

Month	Area 1A	Area 1B	Area 2	Area 3
January	100%	Pop mixing	Pop mixing	0%
February	100%	Pop mixing	Pop mixing	0%
March	100%	Pop mixing	Pop mixing	0%
April	Summer mix	Pop mixing	0%	0%
May	Summer mix	Pop mixing	0%	0%
June	Summer mix	Pop mixing	0%	0%
July	Summer mix	Pop mixing	0%	0%
August	100%	Pop mixing	Pop mixing	0%
September	100%	Pop mixing	Pop mixing	0%
October	100%	Pop mixing	Pop mixing	0%
November	100%	Pop mixing	Pop mixing	0%
December	100%	Pop mixing	Pop mixing	0%

**Pop mixing is a random draw from the uniform distribution of 0.1-0.9 and represents the ratio of inshore biomass to total biomass in this table (see previous discussion). The summer mix is a number randomly drawn from a uniform distribution and represents mixing when the components are migrating between areas. Area 3 fish are assumed to be all offshore fish.*

Proportion of Herring Catch by Month/Management Area

The Herring PDT updated the proportion of Atlantic herring catch by month and management area for 2000-2011 based on VTR data (VTR-reported catch). Due to the variability of catch distribution between the years, the simulated proportion of catch by month in this analysis is applied from a random draw during the 2000-2011 period (see Tables 7-9 in the full analysis provided in Appendix XXX). The monthly proportion of catch for all months in the year drawn is applied to all management areas for each simulation.

The 2013-2015 Atlantic herring fishery specifications also consider seasonal splits for some management area sub-ACLs. The splits may alter the monthly distribution of catch by area. A "synthetic proportion" of catch by area and month was constructed to reflect the seasonal sub-ACLs under consideration. For example, January and February were set to contain 50% of Area 2 catch, based on observed proportion of catch in those months compared to total January-February catch in Area 2. Proportions for catch for March-December were constructed by estimating the proportion of catch for each of those months compared to total catch in those months for the same years.

For each of the 1,000 simulations, the mixing rates described above are applied to monthly catch by management area and assigned to either the inshore or offshore stock components. The monthly catch that result from the simulation are then summed to derive an annual total removal for each stock component (inshore/offshore)t. The stock component total removal can be used to generate an annual relative exploitation ratio when it is compared to the projected stock component biomass (catch:biomass ratio).

New Brunswick Weir Catch

All catch of Atlantic herring from the New Brunswick (NB) weir fishery is assumed to come from the inshore component of the Atlantic herring stock complex. The Herring PDT updated NB weir catch and applied a random draw to the 2002-2011 time series (most recent ten years) in the model similar to previous analyses (see 2010-2012 herring specifications). The New Brunswick catch does not exhibit a statistically significant trend during the 2002-2011 period.

OFL Ratio and Relative Exploitation

The catch: biomass ratio for each stock component that is generated by the analysis equates to a relative exploitation rate (a proxy for fishing mortality). For comparative purposes, the catch:biomass ratio for the Atlantic herring stock complex was determined using *OFL: projected January 1 biomass* from the SAW 54 assessment (Table 62). This ratio approximates a proxy exploitation rate associated with fishing at F_{MSY} for the total Atlantic herring stock complex. The ratio of inshore catch to January 1 inshore biomass can be considered as proxy for the exploitation rate because all ages are fully selected by the fishery. This ratio (i.e., relative exploitation rate), however, is largely influenced by selectivity and assumptions about natural mortality. A detailed assessment of the relationship between F_{MSY} and relative exploitation, as well as the differences between January 1 biomass and SSB (end of the year), is provided in the 2010-2012 herring fishery specifications document.

Table 62 OFL, Projected January 1 Herring Stock Biomass, and Ratio of OFL to Biomass (Relative Exploitation)

Year	OFL (mt)	Jan 1 Biomass (mt)	Ratio OFL:Biomass
2013	169,000	1,224,000	0.138
2014	136,000	1,079,000	0.126
2015	114,000	954,377	0.119

For each sub-ACL option that is simulated in this analysis, the catch: biomass ratio is generated for the inshore and offshore stock components and compared to the OFL ratio for the herring stock complex in each year (2013-2015). The proportion of total simulations that result in ratios above the OFL ratio is provided as a basis for comparison between sub-ACL options. Without separate reference points for the individual stock components, the probability of exceeding the F_{MSY} target for the stock complex provides a reasonable proxy for overfishing. ***Note that the probability of exceeding the F_{MSY} target for the total Atlantic herring stock complex is 0.5 in 2015 (see Section XXX).***

Results and Discussion

Summary statistics for the distribution of projected catch: biomass for various sub-ACL options are provided for the inshore and offshore stock components in Table 63 – Table 66. Two particular features are of importance:

1) ***The proportion of simulations with ratios greater than the OFL:B ratio for the total stock complex (P>OFL ratio)***. This is a measure of the probability of exceeding the OFL:B ratio exploitation for the inshore or offshore components in each year. Options that result in a probability higher than 0.5 (50%) are shaded in the summary tables that follow. These values can be compared across sub-ACL options. Note that the probability of exceeding the F_{MSY} target for the total Atlantic herring stock complex is 0.5 in 2015 (see Section XXX).
2) ***The ratio of maximum ratio to OFL:B ratio***. This is a measure of tail length and provides a measure of potential impact of having a rare event. The larger this ratio becomes, the higher the likelihood of having a large impact (even if the event may be rare). These values can be compared across sub-ACL options.

Annual (year-to-year) effects appear to have more influence on the outcome versus the allocation of catch between the four management areas; this holds true when seasonal splits are included in the model as well (see Table 65 and Table 66). This occurs because a buffer exists between the proposed OFL and ABC for 2013 and 2014, but no buffer exists in 2015.

Table 63 Summary Statistics for Simulated Catch of the Inshore Stock Component for Sub-ACL Options (No Seasonal Splits)

	INSHORE CATCH : INSHORE BIOMASS								
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	OFL:B ratio	P> OFL ratio	Max: OFL ratio
option 1, 2013	0.04	0.06	0.08	0.10	0.12	0.49	0.14	0.18	3.5
option 1, 2014	0.05	0.07	0.09	0.11	0.13	0.53	0.13	0.28	4.2
option 1, 2015	0.05	0.08	0.10	0.13	0.15	0.60	0.12	0.38	5.0
option 2, 2013	0.04	0.07	0.09	0.11	0.13	0.51	0.14	0.24	3.7
option 2, 2014	0.05	0.08	0.10	0.13	0.15	0.57	0.13	0.33	4.5
option 2, 2015	0.06	0.09	0.11	0.14	0.17	0.63	0.12	0.36	5.2
option 3, 2013	0.05	0.08	0.10	0.12	0.14	0.50	0.14	0.25	3.6
option 3, 2014	0.06	0.09	0.11	0.14	0.16	0.56	0.13	0.38	4.5
option 3, 2015	0.07	0.10	0.12	0.15	0.18	0.65	0.12	0.52	5.5
option 4, 2013	0.05	0.08	0.09	0.12	0.14	0.53	0.14	0.25	3.8
option 4, 2014	0.06	0.09	0.11	0.14	0.16	0.60	0.13	0.38	4.8
option 4, 2015	0.07	0.10	0.12	0.15	0.18	0.66	0.12	0.52	5.5
option 5, 2013	0.05	0.08	0.10	0.12	0.14	0.51	0.14	0.26	3.7
option 5, 2014	0.06	0.09	0.11	0.13	0.15	0.59	0.13	0.37	4.7
option 5, 2015	0.07	0.10	0.12	0.15	0.18	0.68	0.12	0.52	5.7
option 6, 2013	0.06	0.08	0.11	0.13	0.15	0.56	0.14	0.31	4.1
option 6, 2014	0.06	0.09	0.12	0.15	0.18	0.63	0.13	0.45	5.0
option 6, 2015	0.07	0.11	0.14	0.17	0.20	0.75	0.12	0.63	6.3

P> OFL ratio is the proportion of simulations with a ratio greater than OFL:B ratio for the stock complex.

The max to OFL ratio is a measure of tail length (rare events).

Table 64 Summary Statistics for Simulated Catch of the Offshore Stock Component for Sub-ACL Options (No Seasonal Splits)

	OFFSHORE CATCH : OFFSHORE BIOMASS								
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	OFL:B ratio	P> OFL ratio	Max: OFL ratio
option 1, 2013	0.06	0.07	0.09	0.12	0.14	0.42	0.14	0.27	3.1
option 1, 2014	0.06	0.08	0.11	0.14	0.16	0.47	0.13	0.37	3.7
option 1, 2015	0.07	0.09	0.12	0.15	0.18	0.55	0.12	0.50	4.6
option 2, 2013	0.07	0.08	0.11	0.14	0.17	0.49	0.14	0.34	3.6
option 2, 2014	0.08	0.10	0.13	0.16	0.19	0.57	0.13	0.50	4.5
option 2, 2015	0.09	0.11	0.14	0.18	0.22	0.64	0.12	0.52	5.3
option 3, 2013	0.07	0.08	0.10	0.13	0.15	0.45	0.14	0.30	3.3
option 3, 2014	0.07	0.09	0.12	0.15	0.17	0.52	0.13	0.44	4.1
option 3, 2015	0.08	0.11	0.13	0.17	0.20	0.59	0.12	0.60	4.9
option 4, 2013	0.07	0.08	0.10	0.13	0.15	0.46	0.14	0.31	3.3
option 4, 2014	0.07	0.09	0.12	0.15	0.17	0.51	0.13	0.44	4.1
option 4, 2015	0.09	0.11	0.13	0.17	0.20	0.59	0.12	0.61	4.9
option 5, 2013	0.07	0.08	0.10	0.13	0.15	0.45	0.14	0.30	3.3
option 5, 2014	0.08	0.09	0.12	0.15	0.18	0.51	0.13	0.45	4.0
option 5, 2015	0.08	0.11	0.13	0.17	0.20	0.58	0.12	0.61	4.8
option 6, 2013	0.06	0.08	0.09	0.12	0.14	0.40	0.14	0.25	2.9
option 6, 2014	0.07	0.09	0.11	0.13	0.16	0.47	0.13	0.37	3.7
option 6, 2015	0.08	0.10	0.12	0.15	0.17	0.53	0.12	0.50	4.4

P> OFL ratio is the proportion of simulations with a ratio greater than OFL:B ratio for the stock complex.

The max to OFL ratio is a measure of tail length (rare events).

Table 65 Summary Statistics for Simulated Catch of the Inshore Stock Component for Sub-ACL Options (Includes Seasonal Splits)

	INSHORE CATCH : INSHORE BIOMASS								
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	OFL:B ratio	P> OFL ratio	Max: OFL ratio
option 1, 2013	0.04	0.06	0.08	0.10	0.12	0.48	0.14	0.19	3.4
option 1, 2014	0.04	0.07	0.09	0.12	0.14	0.53	0.13	0.28	4.1
option 1, 2015	0.05	0.08	0.10	0.13	0.15	0.61	0.12	0.38	5.1
option 2, 2013	0.05	0.07	0.09	0.11	0.13	0.51	0.14	0.23	3.7
option 2, 2014	0.05	0.08	0.10	0.13	0.15	0.58	0.13	0.35	4.4
option 2, 2015	0.06	0.09	0.12	0.15	0.17	0.66	0.12	0.47	5.5
option 3, 2013	0.05	0.08	0.10	0.12	0.14	0.53	0.14	0.27	3.8
option 3, 2014	0.06	0.09	0.11	0.14	0.16	0.57	0.13	0.39	4.4
option 3, 2015	0.07	0.10	0.12	0.16	0.18	0.65	0.12	0.53	5.4
option 4, 2013	0.05	0.08	0.10	0.12	0.14	0.52	0.14	0.26	3.7
option 4, 2014	0.06	0.09	0.11	0.14	0.16	0.61	0.13	0.38	4.7
option 4, 2015	0.07	0.10	0.12	0.16	0.18	0.67	0.12	0.53	5.6
option 5, 2013	0.05	0.08	0.10	0.12	0.14	0.53	0.14	0.26	3.9
option 5, 2014	0.06	0.09	0.11	0.14	0.16	0.57	0.13	0.38	4.6
option 5, 2015	0.07	0.10	0.12	0.15	0.18	0.66	0.12	0.52	5.5
option 6, 2013	0.06	0.08	0.11	0.14	0.16	0.58	0.14	0.33	4.2
option 6, 2014	0.06	0.10	0.12	0.15	0.18	0.63	0.13	0.47	5.0
option 6, 2015	0.07	0.11	0.14	0.17	0.20	0.75	0.12	0.63	6.3

P> target are the number of simulations with a ratio greater than OFL:B ratio for the stock complex.
The max to OFL ratio is a measure of tail length (rare events).

Table 66 Summary Statistics for Simulated Catch of the Offshore Stock Component for Sub-ACL Options (Includes Seasonal Splits)

	OFFSHORE CATCH : OFFSHORE BIOMASS								
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	OFL:B ratio	P> OFL ratio	Max: OFL ratio
option 1, 2013	0.06	0.07	0.09	0.12	0.14	0.42	0.14	0.26	3.0
option 1, 2014	0.06	0.08	0.11	0.14	0.16	0.48	0.13	0.37	3.7
option 1, 2015	0.07	0.09	0.12	0.15	0.18	0.53	0.12	0.49	4.4
option 2, 2013	0.07	0.09	0.11	0.14	0.17	0.48	0.14	0.34	3.5
option 2, 2014	0.08	0.10	0.12	0.16	0.19	0.55	0.13	0.49	4.2
option 2, 2015	0.09	0.11	0.14	0.18	0.21	0.63	0.12	0.65	5.2
option 3, 2013	0.07	0.08	0.10	0.13	0.15	0.45	0.14	0.29	3.2
option 3, 2014	0.07	0.09	0.12	0.15	0.17	0.50	0.13	0.44	3.9
option 3, 2015	0.08	0.10	0.13	0.17	0.19	0.56	0.12	0.60	4.7
option 4, 2013	0.07	0.08	0.10	0.13	0.15	0.45	0.14	0.30	3.2
option 4, 2014	0.07	0.09	0.12	0.15	0.17	0.52	0.13	0.45	4.0
option 4, 2015	0.08	0.10	0.13	0.17	0.20	0.60	0.12	0.59	5.0
option 5, 2013	0.07	0.08	0.10	0.13	0.15	0.44	0.14	0.30	3.2
option 5, 2014	0.07	0.09	0.12	0.15	0.17	0.53	0.13	0.43	4.2
option 5, 2015	0.08	0.11	0.13	0.17	0.20	0.58	0.12	0.60	4.9
option 6, 2013	0.06	0.07	0.09	0.12	0.14	0.40	0.14	0.25	2.9
option 6, 2014	0.07	0.08	0.10	0.13	0.15	0.47	0.13	0.35	3.7
option 6, 2015	0.08	0.10	0.12	0.15	0.17	0.50	0.12	0.49	4.2

P> target are the proportion of simulations with a ratio greater than OFL:B ratio for the stock complex.
The max to OFL ratio is a measure of tail length (rare events).

Table 67 summarizes the simulation results for the 2015 fishing year under sub-ACL Options 2-6. The 2015 fishing year is the only year that produces results where the projected catch:biomass ratio from one or both stock components has greater than 50% probability of exceeding the OFL ratio for the total stock complex (shaded cells in the table identify outcomes greater than 0.50). It is important to note that the probability of exceeding the OFL ratio for the total stock complex is 0.50 in 2015 under the ***Preferred Alternative*** for ABC (constant catch approach), so the results are generally consistent with the expectations for the stock complex in 2015.

The results of the simulation and comparison of the sub-ACL options suggest that none of the sub-ACL options under consideration are likely to substantially impacts one stock component more than the other (inshore/offshore). In 2015, most of the options produce a probability of exceeding the stock complex OFL ratio in more than 50% of the simulations for one or both stock components; however, the results summarized in Table 67 are not widely distributed and are generally consistent with the projected outcome for the total stock complex in 2015 (0.50).

Comparatively, there appears to be no difference between Options 3, 4, and 5 in terms of potential impacts on the inshore and offshore stock components. Relative to Options 3-5, Option 2 produces the most favorable result for the inshore stock component in 2015, while Option 6 produces the most favorable result for the offshore stock component in 2015.

Overall, the analyses provided in this document, including biomass and fishing mortality projections under the proposed OFL and ABC specifications (Section 4.2.1.1), as well as this comparative analysis of the sub-ACL options, suggest that management decisions related to specifying the sub-ACLs for the 2013-2015 fishing years should be primarily allocation-based and not driven by concerns about the biological impacts of the sub-ACL allocation on either the herring stock complex or the individual spawning components.

Table 67 Comparison Statistics for Simulated Catch of the Offshore and Inshore Stock Component for Sub-ACL Options (No Seasonal Splits) for year 2015

Sub-ACL Option	2015 Projected Catch:Biomass Ratio (Probabilities)	
	Inshore Component P>OFL Ratio (Max:OFL Ratio in parentheses)	Offshore Component P>OFL Ratio (Max:OFL Ratio in parentheses)
Option 2	0.36 (5.2)	0.52 (5.3)
Option 3	0.52 (5.5)	0.60 (4.9)
Option 4	0.52 (5.5)	0.61 (4.9)
Option 5	0.52 (5.7)	0.61 (4.8)
Option 6	0.63 (6.3)	0.50 (4.4)

Note: The OFL:B ratio for 2015 (0.12) is used as a relative basis for comparison.
P> OFL ratio is the proportion of simulations with a ratio greater than OFL:B ratio for the stock complex.
The Max:OFL ratio is a measure of tail length (rare events).

4.2.2.2 Impacts of 2013-2015 Sub-ACL Options on Non-Target Species and Other Fisheries

XXX

4.2.2.3 Impacts of 2013-2015 Sub-ACL Options on Physical Environment and EFH

The six options summarized below in Table 68 represent alternative allocations of the same total ACL, based on the Alternative 2 ABC specification. Because all six options represent an aggregate increase in allocation and fishing activity and compared to No Action, any of them will lead to a slight increase in adverse effects as compared to No Action. Given the minimal and temporary nature of adverse effects on EFH in the herring fishery, changing the relative allocation of sub-ACLs between areas is not expected to have a measurable influence on the total magnitude of adverse effects in the fishery. Thus, as far as EFH impacts are concerned, there is no real difference between the six ACL allocation options. In addition, any adjustments to the seasonality of the sub-ACL allocations are not expected to have a measurable influence on the total magnitude of adverse effects in the fishery.

Table 68 Summary of Sub-ACL Options

Specification	2010-2012	2013-2015 Options					
		1	2	3	4	5	6
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000					
ABC (mt)	106,000	114,000					
ACL (mt)	91,200	107,800					
Sub-ACL Area 1A	26,546	**26,546**	**31,200**	**32,100**	**32,000**	**32,000**	**40,000**
Sub-ACL Area 1B	4,362	**4,362**	**5,400**	**9,900**	**5,800**	**10,800/ 5,800**	**5,800**
Sub-ACL Area 2	22,146	**22,146**	**25,900**	**27,800**	**32,000**	**27,000/32,000**	**32,000**
Sub-ACL Area 3	38,146	**38,146**	**45,300**	**38,000**	**38,000**	**38,000**	**30,000**
No Research Set-Asides (RSAs) Area 1A Fixed Gear Set-Aside – 295 mt							

4.2.2.4 Impacts of 2013-2015 Sub-ACL Options on Protected Resources

XXX

4.2.2.5 Impacts of 2013-2015 Sub-ACL Options on Fishery-Related Businesses and Communities

Option 1

Under Option 1 (No Action), both the herring fishery ACL from 2010-2012 (91,200 mt) and its distribution among management areas would remain constant for 2013-2015 (Table 6). With no change in the ACL or sub-ACLs, there would be a degree of constancy and predictability for fishing industry operations and a steady supply to the market. Maintaining the status quo would likely result in either neutral or positive social impacts. The *Size and Demographic Characteristics* of the fishery-related workforce would likely be unchanged, as would the *Historical Dependence on and Participation in* the fishery. This option would make more herring available as forage fish in the ecosystem, which would have a positive impact on the fisheries that depend on herring, as well as indirect users (e.g. the whale watch industry).

General Impacts

Options 2-6 for sub-ACL distribution are based on the assumption that the "Constant Catch" approach for OFL and ABC specifications (Alternative 2, Section 2.2.1.2) is selected as the Preferred Alternative. This alternative would provide 16,600 mt of additional yield each year in 2013-2015. Increasing a sub-ACL results in positive economic and social impact, if the increase translates into increased catch. Increases in sub-ACLs which are not likely to be approached will provide minimal, if any, economic or social benefit. The values of sub-ACLs under consideration in all Options are within the range of recent sub-ACLs and catches (Table 38). This suggests that the herring industry could approach full utilization of the sub-ACLs under any of the Options.

A simple ranking of the Options for each of the Areas provides insight into the impacts of each of these options on the users of those areas. Table 69 lists the sub-ACL Options 1-6 according to the numerical value of the sub-ACLs, from highest to lowest. For example, Option 1 provides the lowest amount of fish to each Area and is ranked last. Option 6 provides the highest sub-ACL for Areas 1A and 2, while Options 3 and 2 provide the highest sub-ACL for Areas 1B and 3, respectively.

Table 69 Relative Ranking of the sub-ACLs Available to each Management Area under Options 1-6

	Highest sub-ACL → Lowest sub-ACL					
Area 1A	6	2,3,4,5				1
Area 1B	3	5	2,4,6			1
Area 2	4,6		5	3	2	1
Area 3	2	3,4,5			6	1

Increasing sub-ACLs, under Options 2-6, is likely to have a beneficial effect on and potentially expand the number of communities participating in the herring fishery (Table 52, Section 3.5.2). Based on prior landings, increasing sub-ACLs in Areas 1A, 1B and 3 is likely to increase landings in Maine, New Hampshire and Massachusetts. Because Area 2 is the management area furthest to the southwest (Figure 1), increasing the sub-ACL in Area 2 is likely to result in increased landings in Massachusetts, Rhode Island, and states to the south, though some Maine and New Hampshire landings are from Area 2. Herring which is landed in Maine is more likely to be used as bait in the lobster industry, therefore Options which allocate higher sub-ACLs to Areas 1A, 1B, and 3 are likely to have positive impacts on the lobster industry. This does not imply that herring landed from Area 2 cannot be used as bait, but the costs of doing so may be higher due to higher transportation costs from the landing ports further south to the ports in Maine where herring is used as bait.

Changes in the sub-ACLs in different areas may have different impacts or benefits for the fishermen using different gear to harvest herring (Table 44). Increasing the sub-ACLs in Area 1A would provide benefits to the purse seine vessels, which use Area 1A during the summer. Some benefits may also accrue to the trawl vessels which use Area 1A during the fall. Increasing the sub-ACL in Areas 1B and 3 will provide benefits to the trawl vessels which use these areas during the summer. Increasing the sub-ACL in Area 2 will provide benefits to the trawl vessels which use Area 2 during the winter. These vessels often catch mackerel in addition to herring.

Option 2

Under Option 2, the additional yield would be distributed proportionally to the 2010-2012 sub-ACL specifications (Table 7). Thus, each management area would receive a similar percentage increase (17.0-23.8%). Relative to the No Action alternative, there would be more positive impacts, though the distribution would be similar. Employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. Because each area would receive the same proportionate increase, fishing communities and gear types currently active in the herring fishery would have an equal opportunity to reap the benefits of the additional available yield. Industry-wide, this option may be perceived as the most fair approach to distributing additional yield, relative to Options 3-6. It is likely that ports with *Historical Dependence on and Participation in* the fishery would be equally likely to benefit from this proposed option. A note of caution is that a substantial increase in the Area 3 sub-ACL could increase the harvest of spawning fish, due to the difficult logistics of monitoring the offshore herring fishery. Depleting spawning biomass could result in long-term negative socio-economic impacts.

Option 3

Under Option 3, the additional yield would be divided among Areas 1A, 1B, and 2 (Table 8). These are the areas where sub-ACL overages have occurred most frequently (Table 38). Focusing the additional yield in these areas might make it easier for the industry harvest within the catch limits, particularly in 1B, where the quota has been quite low. Relative to the No Action alternative, there would be more positive impacts. Employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. Since all of the major gear types used in the fishery, and all of the *Communities of Interest* with herring landings, harvest catch from at least one of these management areas (Table 44 and Table 53), Option 3 would distribute benefits to all of the communities and major gear types.

Option 4

Under Option 4, the bulk of the increased yield would be allocated to Area 2, with the remainder divided among Area 1A and 1B (Table 9). This option was developed based on industry concerns that the mackerel fishery operating in herring management Area 2 is constrained by the availability of herring quota. The mackerel industry has indicated that the ~10,000 mt of additional herring sub-ACL for Area 2, proposed in this option, would be sufficient to fully utilize the ACL for mackerel. Relative to the No Action alternative, there would be more positive impacts. This option could increase profits from the joint herring and mackerel fisheries. With increased mackerel and herring harvest, employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. Since virtually all of the *Communities of Interest* with herring landings harvest some of their catch from Area 2 (Table 53), Option 4 would benefit most communities. However, ports in Massachusetts, Rhode Island and New Jersey receive most of the Area 2 landings. Since the trawl fleet harvests 97% of the landings from Area 2, this option would likely benefit this sector of the industry more than others (e.g. purse seine).

Option 5

Under Option 5, the increased yield would be allocated among Areas 1A, 1B, and 2. In 2014, 5,000 mt would be shifted from Area 1B to Area 2, such that in 2014 and 2015, the sub-ACL distributions would be equivalent to the Option 4 scenario (Table 10). The 2013-2015 specifications are expected to be implemented in late summer of 2013. Because the Area 2 fishery is prosecuted primarily between January and May, full utilization of the Area 2 sub-ACL is unlikely in 2013, under Option 4. Thus, Option 5 would allow more opportunity for the fishery-wide ACL to be utilized in 2013. Relative to the No Action alternative, there would be more positive impacts. The social and economic impacts of Option 5 are similar to those of Option 4, except that harvest levels, and thus employment opportunities, would likely be higher under Option 5 than Option 4. There would be more positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce, particularly those industry segments that rely on Area 2.

Option 6

Under Option 6, the yield would increase by ~10,000 mt in Area 2, similar to Option 4. This option was developed based on industry concerns that the mackerel fishery operating in herring management Area 2 is constrained by the availability of herring quota. Participants in the mackerel fishery have indicated that the ~10,000 mt of additional herring sub-ACL for Area 2, proposed in this option, would be sufficient to fully utilize the ACL for mackerel (NEFMC 2012a). Under this option, ~8,000 mt of yield would be removed from Area 3 and shifted to other areas. With the exception of 2011 and 2012, 50% or less of the Area 3 sub-ACL has been caught since 2011. Diverting catch from Area 3 would likely reduce fuel costs for fishing businesses. Option 6 would result in the greatest sub-ACL for Area 1A of all the options. Shifting sub-ACL to Area 1 would benefit the purse seine fishery, in addition to the benefits to the trawl fishery in Area 2 proposed under this option. A 1A sub-ACL of 40,000 mt could put sufficient pressure on the inshore stock component, reducing the long-term socio-economic benefits of the fishery. There would be more positive impacts of Option 6 than the No Action alternative. With increased mackerel and herring harvest, employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. This option is expected to benefit all *Communities of Interest*.

Seasonal Sub-ACL Splits (2014-2015)

If provisions to allow for sub-ACL splitting are adopted in Framework 2 (see Section 2.1.1), then the following splits may apply for 2014 and 2015:

- Area 1A: 0% January-May and 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April and 100% May-December; and
- Area 2: 67% January-February and 33% March-December.

The AMs that apply to the sub-ACLs would also apply to the seasonal sub-ACLs (e.g. apply an overage deduction to each split). Any un-utilized sub-ACL from the first season would be carried over to the second season to allow for the possibility for full utilization during the fishing year. In 2014-2015, this would only be applicable to Area 2 under the splits proposed; however, this may change if the seasonal sub-ACL splits are modified for other areas. Seasonal splits of sub-ACLs was recommended in November 2012 by the Herring Advisory Panel due to concerns for Area 2 and the issues surrounding the mackerel fishery (NEFMC 2012a).

The seasonal split proposed for Area 1A was already authorized by Framework 1, but would be implemented by the 2013-2015 specifications process. In 2007, 18% of the herring sub-ACL was caught by the end of May. Since 2008, less than 1% of the Area 1A herring sub-ACL has been caught by the end of May of each year (Figure 18). Thus, a seasonal split of 0% for January–May and 100% for June-December would have minimal additional economic or social impact for the herring fishery, because there would be little change from how the fishery has used Area 1A for the past five years. For January-May, there would be a zero possession limit, but this would likely result in negligible regulatory discarding, based on past fishing practices.

The seasonal split proposed for Area 1B would delay fishing activity there until May. Between 2007 and 2011, 21% or less of the sub-ACL had been caught by the end of April each year (Figure 19). However, in 2012, the sub-ACL was fully utilized before the end of January. It is likely that due to a 1B overage in 2010, the industry maximized 1B quota in 2012 before an overage deduction would have been implemented. The seasonal split proposed for 1B would change current fishing behaviors more than the proposed split for Area 1A would. Thus, potential social impacts may be greater than for the Area 1A split. Delaying the fishery in 1B until May would allow sufficient time for overage or carryover determinations, so the industry may be better able to harvest within the sub-ACL. A note of caution for the proposed Area 1B split is that it may result in user-group conflicts, particularly between the midwater trawl herring vessels and recreational striped bass anglers, which utilize Area 1B in June. With the exception of 2011 and 2012, Area 1B has been open year-round to the herring fishery (only in 2012 was it closed in June) without significant conflict with the recreational fishery. However, the proposed seasonal split may increase herring vessel activity in Area 1B in June.

The seasonal split proposed for Area 2 would ensure that herring would be available towards the end of the year. This would have positive economic benefits for fishing vessels which are jointly catching herring and mackerel at the end of the calendar year. Once the directed herring fishery closes in Area 2, and the herring possession limit is reduced to 2,000 lbs, many mackerel vessels currently stop fishing to avoid exceeding the herring sub-ACL. Seasonal splits could allow more confidence in harvest planning. Figure 20 illustrates the cumulative catch in Area 2 for 2007-2012. Only twice (2009 and 2012) has more than 67% of the Area 2 sub-ACL been caught by the end of February. For the other years, 57% of the sub-ACL had been caught by the end of February and the sub-ACL was not exceeded by the end of the year. There is typically no fishing in Area 2 between May and October. Then, herring in Area 2 become incidental harvest for the directed mackerel fishery, if the mackerel return to Area 2. The proposed seasonal split would allow the mackerel fishery to proceed in Area 2 within the herring sub-ACL. All vessels with a Category A or B herring permit also hold a mackerel permit, and of the Tier 1 mackerel permit holders, 96% hold a Category A or C permit. Preclusion of individual vessels from Area 2 would be minimal with the seasonal split as proposed. Thus, the proposed split would have minimal negative impact on the directed herring fishery, but have positive impacts for the mackerel fishery. A note of caution is that the industry may become less able to respond to market conditions, and if mackerel do not migrate to Area 2 at the end of the year, then some herring yield may go unharvested. While the Herring AP supports the concept of seasonal splits, there are reservations about proceeding with an Area 2 split at this time (NEFMC, 2013).

4.2.3 Impacts of Other Proposed 2013-2015 Fishery Specifications

XXX

Each of the specifications below are unchanged from 2010-2012, thus relative to the No Action alternative, no new economic or social impacts are expected. The Herring Advisory Panel supports maintaining the status quo for all of these (NEFMC 2012a). Certainty about regulations and the future of the herring fishery is a substantial benefit for business and household planning.

Domestic Annual Harvest

Setting DAH at OY (107,800 mt) would maximize opportunity for the industry. Given that the DAH would increase (from 91,200 mt in 2010-2012), employment opportunities would likely increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. The *Historical Dependence on and Participation in* the fishery would either be sustained or expanded.

Domestic Annual Processing

Since DAP will remain at DAH minus 4,000 mt for border transfer, there will likely be no new socioeconomic impacts relative to the status quo.

Border Transfer

The allowable BT would remain at 4,000 mt. BT actually transferred has generally decreased since 1994, with a peak of 3,690 in 1996. The average BT between 1994 and 2011 has been 971 mt per year, but since 2007, the average has been 200 mt per year (5% of BT). Because allowable BT would be unchanged, there will likely be negligible socioeconomic impacts relative to the status quo.

US At-Sea Processing

Currently, there are no at-sea processing businesses in operation, so there is no need to allocate a portion of the catch in this manner. Relative to the status quo, no socioeconomic impacts are expected from this specification.

4.2.4 Impacts of Alternatives for AMs

4.2.4.1 Impacts of AM Alternatives on Atlantic Herring

XXX

4.2.4.2 Impacts of AM Alternatives on Non-Target Species and Other Fisheries

XXX

4.2.4.3 Impacts of AM Alternatives on Physical Environment and EFH

Alternatives 2 and 3 would likely limit fishing activity slightly and thus would lead to a slight decrease in adverse effects to EFH. Alternative 4 could result in a slight increase in adverse effects to EFH because it would allow the ACL to be exceeded slightly with no future payback penalty. The timing of overage deductions probably has no effect on the magnitude of impacts to EFH (see Table 70).

Table 70 Summary of AM Alternatives on EFH

No Action	Alternative 2	Alternative 3	Alternative 4
In-season management area closure to directed fishing **And** ACL or sub-ACL deductions in future years **And** Haddock catch cap related to haddock sub-ACL allocation	Lower threshold for in-season closures of 92% under some circumstances **Or** Lower threshold of 92% in all circumstances **Or** Reduce threshold based on previous overages	Prohibit possession of herring in an area if the sub-ACL is projected to be reached (optionally, could be applied to stockwide ACL)	Only require payback if sub-ACL is exceeded by 5% or more **And/Or** Deduct overage in the following fishing year rather than in year three (optionally, could be applied to stockwide ACL)

4.2.4.4 Impacts of AM Alternatives on Protected Resources

XXX

4.2.4.5 Impacts of AM Alternatives on Fishery-Related Businesses and Communities

General Impacts

Alternatives 1-4 put the onus on NMFS to develop a more timely process for projecting overages, notifying the industry, and closing the fishery in order to prevent overages from occurring. Through the development of these specifications, the industry has suggested posting catch updates daily once catch begins to approach a sub-ACL. Under each alternative, the efficiency and communication of catch monitoring would likely improve, resulting in a positive impact on the *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities. Without this improvement, there would likely be negative impact on the industry's ability to comply with quota restrictions. In cases where sub-ACL overage deductions are applied, the four management areas could have different closure triggers. This increases management complexity in this fishery.

Alternative 1

If Alternative 1 (No Action) is selected, the current AMs administration would be maintained, resulting in no additional economic or social impacts. The Herring FMP includes an AM for the current haddock catch cap (Section 2.2.7.1). The current AMs also require that the directed herring fishery in a management area close once 95% of the sub-ACL has been reached, with the remaining 5% available for the incidental fishery (2,000 lb trip limit). This helps ensure that long-term sustainable catches are achieved. Closure at 95% of the sub-ACL was chosen because quota-monitoring cannot be perfectly carried out in real time and to allow for unavoidable incidental catch. Additionally, once the final total catch for a fishing year is determined during the subsequent fishing year, any ACL or sub-ACL overage would be deducted from the fishing year that follows after the final catch is tallied. For example, the final total catch in 2012 will be calculated in 2013, and if an overage in 2012 occurred, it would be deducted from the 2014 ACL or sub-ACL. By implementing the corrective reduction in the second year following the overage, fishermen are given time to plan ahead for the needed adjustment. However, waiting a year to implement an AM could be seen as government being slow to act, causing a negative impact on the formation of *Attitudes and Beliefs* about public administration. Any reductions to sub-ACLs resulting from such an overage are likely to be negative over the short-term, but result in long-term benefits by preventing overfishing from occurring.

Alternative 2

If Alternative 2 is selected, provisions for closure of the directed fishery in a management area would be reduced from 95% to 92% of the sub-ACL, and the trigger for closing the directed fishery stock-wide would be reduced from 100% to either 95% or 92%. The additional socioeconomic impact of this trigger would be small relative to the No Action alternative. For example, a hypothetical management area with a sub-ACL of 30,000 mt would close at 27,600 mt (92%) versus 28,500 mt (95%). The 900 mt difference is less than the landings from one trip for most vessels. Reducing the percentage trigger might help the fishery harvest within its limits and not be subject to the negative consequences of overage deductions. This could have a positive impact on the *Attitudes* of the industry if they are able to better comply with regulations and plan for the future.

Applying overage deductions in the year immediately following when an overage occurred could have a positive impact on business planning and predictability relative to the No Action alternative (one-year lag). The option to allow NMFS to prohibit all possession of herring in a management area when 100% of the sub-ACL is projected to be reached, even though the stock-wide ACL is not exceeded, would result in short-term negative impacts to the industry relative to the No Action alternative, since there would be lost yield in the fishery. The possession limit might lead to regulatory discards (e.g. vessels targeting mackerel) in the fishery, which might worsen *Attitudes* and *Beliefs* about management. However, there are long-term socioeconomic benefits to maintaining a sustainable fishery. The Alternative 2 AMs increase constraints on the fishery, likely resulting in short-term negative socioeconomic impacts relative to No Action, but could have long-term benefits from maintaining a sustainable fishery in comparison to taking no action. Moving towards real-time monitoring may incentivize timely catch report submission by the industry.

Alternative 3

If Alternative 3 is selected, provisions for closure of the directed fishery in a management area would be reduced from 95% to 92% of the sub-ACL, but only in when the stock is overfished or overfishing is occurring and the sub-ACL has been exceeded in one of the preceding two years. The additional socioeconomic impact of this trigger would be small relative to the No Action alternative. For example, a hypothetical management area with a sub-ACL of 30,000 mt could close at 27,600 mt (92%) versus 28,500 mt (95%). The 900 mt difference is less than the landings from one trip for most vessels. Currently, the herring resource is not overfished and overfishing is not occurring, and the potential for this status to change over the next three years is low (Section 3.1.2). Therefore, it is unlikely for the scenario outlined in this Alternative to be applicable during 2013-2015. Should the stock status change, then the alternative could apply more constraints to the industry, resulting in negative short-term socioeconomic impacts relative to the No Action alternative. Reducing the percentage trigger might help the fishery harvest within its limits and not be subject to the negative consequences of overage deductions. This could have a positive impact on the *Attitudes* of the industry if they are able to better comply with regulations and plan for the future.

Alternative 3 maintains the one-year lag in implementing overage deductions, so there would be no additional impacts from that feature. This alternative would change the conditions for when overage deductions would apply. When the stock is rebuilt and overfishing is not occurring (the present scenario), a deduction would only occur if the sub-ACL was exceeded by at least 5%, provided that the stockwide ACL is not exceeded. Under stock rebuilding, or if the stockwide ACL is exceeded, then overage deductions would be required. Reductions to sub-ACLs resulting from an overage are likely to be negative over the short-term, but result in long-term benefits by preventing overfishing from occurring in comparison to taking no action. The option to allow NMFS to prohibit all possession of herring in a management area when 100% of the sub-ACL is projected to be reached, even though the stock-wide ACL is not exceeded, would result in short-term negative impacts to the industry relative to the No Action alternative, since there would be lost yield in the fishery. The possession limit might lead to regulatory discards (e.g. vessels targeting mackerel) in the fishery, which might worsen *Attitudes* and *Beliefs* about

management. However, there are long-term socioeconomic benefits to maintaining a sustainable fishery.

In sum, the Alternative 3 AMs increase constraints on the fishery (but less so than Alternative 2), likely resulting in short-term negative socioeconomic impacts relative to No Action, but could result in long-term benefits of maintaining a sustainable fishery in comparison to taking no action.

Alternative 4

If Alternative 4 is selected, the percentage trigger for closing the directed herring fishery in a management area would remain at 95% of the sub-ACL, except when an overage occurs. In that case, the percentage would decrease by the same amount as the overage (a 4% overage would result in a 91% closure). There is an option to apply this AM to the stock-wide ACL. Reducing the percentage trigger might help the fishery harvest within its limits relative to the No Action alternative. Under this alternative, there is greater incentive for the industry to harvest within the sub-ACLs than under Alternatives 2 or 3. This could have a positive impact on the *Attitudes* of the industry if they are able to better comply with regulations and plan for the future.

Alternative 4 maintains the one-year lag in implementing overage deductions, so there would be no additional impacts from that feature. This alternative would change the conditions for when overage deductions would apply. When the stock is rebuilt and overfishing is not occurring (the present scenario), a deduction would only occur if the sub-ACL was exceeded by at least 5%, provided that the stockwide ACL is not exceeded. Under stock rebuilding, or if the stockwide ACL is exceeded, then overage deductions would be required. Reductions to sub-ACLs resulting from an overage are likely to be negative over the short-term, but result in long-term benefits by preventing overfishing from occurring in comparison to taking no action. The option to allow NMFS to prohibit all possession of herring in a management area when 100% of the sub-ACL is projected to be reached, even though the stock-wide ACL is not exceeded, would result in short-term negative impacts to the industry relative to the No Action alternative, since there would be lost yield in the fishery. The possession limit might lead to regulatory discards (e.g. vessels targeting mackerel) in the fishery, which might worsen *Attitudes* and *Beliefs* about management. However, there are long-term socioeconomic benefits to maintaining a sustainable fishery.

In sum, the Alternative 4 AMs increase constraints on the fishery, likely resulting in short-term negative socioeconomic impacts relative to No Action, but could result in long-term benefits of maintaining a sustainable fishery in comparison to taking no action.

4.3 CUMULATIVE EFFECTS ASSESSMENT

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but, rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Framework 46 together with past, present, and reasonably foreseeable future actions that affect the herring environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the MSA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.

The following analysis will identify and characterize the impact on the environment from the proposed 2013-2015 herring specifications when analyzed in the context of other past, present, and reasonably foreseeable future actions. The analysis is generally qualitative in nature because of the limitations of determining effects over the large geographic areas under consideration.

4.3.1 Valued Ecosystem Components (VECs)

Consistent with the guidelines for CEA, cumulative effects can be more easily identified by analyzing the impacts of the Proposed Action on valued ecosystem components (VECs). The affected environment is described in this document based on VECs that were identified for consideration relative to the proposed specifications. The VECs described in this document and considered in this CEA are listed below.

VECs represent the resources, areas, and human communities that may be affected by a Proposed Action or alternatives and by other actions that have occurred or will occur outside the Proposed Action. VECs are generally the "place" where the impacts of management actions are exhibited. An analysis of impacts is performed on each VEC to assess whether the direct/indirect effects of

an alternative adds to or subtracts from the effects that are already affecting the VEC from past, present and future actions outside of the Proposed Action (i.e., cumulative effects).

The Affected Environment is described in this document based on VECs that were identified specifically for 2013-2015 Atlantic herring specifications. The VECs for consideration in the herring specifications include:

1. Atlantic Herring;
2. Non-Target Species and Other Fisheries;
3. Physical Environment and Essential Fish Habitat (EFH);
4. Protected Resources; and
5. Fishery-Related Businesses and Communities.

Changes to the Herring FMP have potential to directly affect the Atlantic herring resource. Similarly, management actions that would alter the distribution and magnitude of fishing effort for herring could directly or indirectly affect non-target species and other fisheries, which, for this specifications, have been identified as groundfish, mackerel, and river herring. The physical environment and EFH VEC focuses on habitat types vulnerable to activities related to directed fishing for herring. The protected resources VEC focuses on those protected species with a history of encounters with the herring fishery. The fishery-related businesses and communities VEC could be affected directly or indirectly through a variety of complex economic and social relationships associated with either the managed species (herring) or any of the other VECs.

The descriptive and analytic components of this document are constructed in a consistent manner. The Affected Environment for herring specifications (Section 3.0 of this document) traces the history of each VEC since the implementation of Amendment 1 to the Herring FMP (in 2006) and consequently addresses the impacts of past actions. The Affected Environment section is designed to enhance the readers' understanding of the historical, current, and near-future conditions (baselines and trends) in order to fully understand the anticipated environmental impacts of the management alternatives and independent measures under consideration in this amendment.

The following assessment will identify and characterize the impact on the VECs by the alternatives proposed in this document when analyzed in the context of other past, present, and reasonably foreseeable future actions. To enhance clarity and maintain consistency, the following terms are used to summarize impacts:

Table 71 Terms Used to Summarize Cumulative Impacts

Impacts Are Known	Impacts Are Uncertain	Impacts Are Unknown
High Negative/Positive	Potentially High Negative/Positive	Unknown
Negative/Positive	Potentially Negative/Positive	
Low Negative/Positive	Potentially Low Negative/Positive	
Neutral	Potentially Neutral	
No Impact		

**In some cases, terms like "more" and "most" are used for the purposes of comparing management alternatives to each other.*

Overall, the temporal scope of past and present actions for Atlantic herring, the physical environment and EFH, protected species, fishery-related businesses and communities, and non-target species is focused principally on actions that have occurred since 1996, when the Magnuson-Stevens Fishery Conservation and Management Act was enacted and implemented new fisheries management and EFH requirements. The temporal scope for marine mammals begins in the mid-1990s, when NMFS was required to generate stock assessments for marine mammals that inhabit waters of the U.S. EEZ that create the baseline against which current stock assessments are evaluated. For turtle species, the temporal scope begins in the 1970s, when populations were noticed to be in decline. The temporal scope for Atlantic herring is focused more on the time since the Council's original Herring FMP was implemented at the beginning of the 2001 fishing year. This FMP serves as the primary management action for the Atlantic herring fishery and has helped to shape the current condition of the resource.

4.3.2 Atlantic Herring Resource

Past and Present Actions:
Reasonably Foreseeable Future Actions:

4.3.3 Non-Target Species and Other Fisheries

Past and Present Actions:
Reasonably Foreseeable Future Actions:

4.3.4 Physical Environment and EFH

Past and Present Actions:
Reasonably Foreseeable Future Actions:

4.3.5 Protected Resources

Past and Present Actions:
Reasonably Foreseeable Future Actions:

4.3.6 Fishery-Related Businesses and Communities

Past and Present Actions:
Reasonably Foreseeable Future Actions:

5.0 RELATIONSHIP TO APPLICABLE LAW

5.1 CONSISTENCY WITH THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (MSFCMA)

XXX

5.2 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

XXX

5.3 MARINE MAMMAL PROTECTION ACT (MMPA)

XXX

5.4 ENDANGERED SPECIES ACT (ESA)

XXX

5.5 PAPERWORK REDUCTION ACT (PRA)

XXX

5.6 INFORMATION QUALITY ACT (IQA)

XXX

5.7 IMPACTS ON FEDERALISM/E.O. 13132

XXX

5.8 ADMINISTRATIVE PROCEDURES ACT (APA)

XXX

5.9 COASTAL ZONE MANAGEMENT ACT (CZMA)

XXX

5.10 REGULATORY FLEXIBILITY ACT (RFA)/E.O. 12866 (REGULATORY PLANNING AND REVIEW)

XXX

5.11 E.O. 13158 (MARINE PROTECTED AREAS)

XXX

5.12 E.O 12898 (ENVIRONMENTAL JUSTICE)

XXX

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7.0 LIST OF PREPARERS AND AGENCIES CONSULTED

This document was prepared by the New England Fishery Management Council and the National Marine Fisheries Service, in consultation with the Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council. Members of the New England Fishery Management Council's Herring Plan Development Team include:

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The following agencies were consulted during the development of the 2013-2015 Atlantic Herring Specifications, either through direct communication/correspondence and/or participation on the Herring Committee or Herring PDT:

- NOAA Fisheries, National Marine Fisheries Service, Northeast Regional Office, Gloucester MA
- Northeast Fisheries Science Center, Woods Hole MA
- Atlantic States Marine Fisheries Commission and Atlantic Herring Section
- Mid-Atlantic Fishery Management Council

New England Fishery Management Council's Preferred Alternatives/Options (January 29, 2013 Council Meeting)

Framework 2 to the Herring FMP

The following subsections describe Council's *Preferred* Alternatives/Options for Framework 2 and the 2013-2015 Atlantic Herring Fishery Specifications. The following alternatives are proposed to allow for seasonal sub-ACL splitting and unutilized sub-ACL carryovers as part of the herring fishery specifications process.

Section 2.1.1 Alternative for Sub-ACL Splitting (*Preferred*)

Alternative 2 – Allow Sub-ACL Splitting in Fishery Specifications

Under this alternative, seasonal (by month) splitting of any management area sub-ACL would be authorized under the Atlantic herring fishery specifications process. The actual splits (amounts or percentages/months) would be analyzed as part of the specifications package.

Section 2.1.2 Alternative for Allowing Carryover of Unutilized Sub-ACL (*Preferred*)

Alternative 2/Option 1 – Allow for Up to 10% Sub-ACL Carryover

This alternative would allow un-utilized sub-ACL in a management area to be carried over from one fishing year to the corresponding sub-ACL for the following fishing year, up to a limit of 10% of the sub-ACL. Sub-ACL underages would be determined based on the same methodology used to determine overages (see XXX).

These four provisions would apply to all three options:

- All AMs would continue to apply to both the sub-ACLs and the stockwide ACL.
- All carryovers would be based on initial sub-ACL allocations for the fishery year.
- Sub-ACL carryovers would only be authorized if the total ACL for the fishing year is not exceeded.
- Provisions for carryovers, including percentages/amounts, can be modified in the future through the herring fishery specifications process (in addition to framework adjustments and amendments).

Option 1: If there is a carryover, the sub-ACL(s) in the corresponding management area(s) would increase for the following fishing year, but the stockwide ACL would remain unchanged.

Framework 2 was approved by the Council at its January 29-31, 2013 meeting for submission to NMFS.

2013-2015 Atlantic Herring Fishery Specifications

The following subsections describe Council's Preferred Alternatives/Options for the 2013-2015 Atlantic Herring Fishery Specifications. The following alternatives proposed are for RSAs, FGSAs, other specifications, AMs, and sub-ACLs.

Section 2.2.1 Specification of OFL/ABC and ABC Control Rule for 2013-2015

Alternative 2 (Constant Catch Approach)

Under the Preferred Alternative, ABC would be specified annually for 2013-2015 as 114,000 mt (the catch that is projected to produce a probability of exceeding F_{MSY} in 2015 that is less than or equal to 50%). OFL would be specified as 169,000 mt in 2013, 136,000 mt in 2014, and 114,000 mt in 2015.

Proposed OFL and ABC Specifications (mt) for 2013-2015

YEAR	2013	2014	2015
OFL (mt)	169,000	136,000	114,000
ABC (mt)	114,000	114,000	114,000

**OFL values are derived from a unique projection that applies F_{MSY} in every year but assumes that catch in prior years is 114,000 mt.*

ABC Control Rule: Under the Preferred Alternative, the ABC Control Rule would specify ABC for three years based on the annual catch that is projected to produce a probability of exceeding F_{MSY} in the third year that is less than or equal to 50%. For 2013-2015, this value is 114,000 mt. The Council may modify this control rule or implement a new control rule at any time through a future management action.

Section 2.2.2 Specification of Management Uncertainty

For the 2013-2015 specifications, the Council is proposing to deduct **6,200 mt** from the ABC to account for management uncertainty due to potential catch of Atlantic herring in the Canadian (New Brunswick (NB)) weir fishery.

Section 2.2.3 Research Set-Asides (RSAs) (*Preferred*)

The Council proposes ***3% RSA*** for all management areas for the 2013-2015 herring specifications.

The Council recommends that a 3% RSA be allocated for 2014-2015 with the highest priority for cooperative research be river herring bycatch avoidance and portside sampling.

Section 2.2.4 Fixed Gear Set-Aside (FGSA) (*Preferred*)

The Council proposes maintaining the current ***295 mt FGSA*** for fixed gear fishermen fishing in Area 1A west of Cutler, Maine.

Section 2.2.5 Options for Sub-ACLs (*Preferred*)

The sub-ACL options under consideration are based on the ***Preferred Alternative*** for specifying OFL/ABC (Alternative 2, see above), with a deduction to account for management uncertainty (described above). The Council recommendation for Atlantic Herring ACL and U.S. OY for 2013-2015 is 107,800 mt.

Proposed Stockwide ACL/OY Specification for 2013-2015

Preferred Alternative	**2013**	**2014**	**2015**
OFL (mt)	169,000	136,000	114,000
ABC (mt)	114,000	114,000	114,000
Management Uncertainty	6,200	6,200	6,200
ACL/OY (mt)	**107,800**	**107,800**	**107,800**

**Based on the Council's Preferred Alternative for OFL/ABC)*

Proposed Sub-ACLs (mt) for 2013-2015 (*Preferred*)

	2010-2012	**2013-2015**
OFL (mt)	145,000/134,000/127,000	169,000/136,000/114,000
ABC (mt)	106,000	114,000
ACL (mt)	91,200	107,800
Sub-ACL Area 1A	26,546 (29%)	**31,200**
Sub-ACL Area 1B	4,362 (5%)	**4,600**
Sub-ACL Area 2	22,146 (24%)	**30,000**
Sub-ACL Area 3	38,146 (42%)	**42,000**
3% Research Set-Asides (RSAs) **Area 1A Fixed Gear Set-Aside – 295 mt**		107,800

**2013-2015 numbers do not reflect overage deductions.*

Sub-ACL Split (*Proposed for 2014 and 2015*)

If provisions to allow for sub-ACL splitting are adopted in Framework 2, then the following seasonal splits apply to this option for 2014 and 2015:

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December

Section 2.2.6 Other Specifications (*Preferred*)

DAH = 107,800
DAP = 103,800
BT = 4,000mt
USAP = 0 mt

2013-2015 Proposed Atlantic Herring Specifications

SPECIFICATION	2013-2015 ALLOCATION (MT)
Overfishing Limit (OFL)	169,000 – 2013 136,000 – 2014 114,000 - 2015
Acceptable Biological Catch (ABC)	114,000
U.S. Optimum Yield (OY)/Annual Catch Limit (ACL)	107,800
Domestic Annual Harvesting (DAH)	107,800
Domestic Annual Processing (DAP)	103,800
U.S. At-Sea Processing (USAP)	N/A
Border Transfer (BT)	4,000
sub-ACL Area 1A	31,200
sub-ACL Area 1B	4,600
sub-ACL 2	30,000
sub-ACL 3	42,000
Research Set-Aside (RSA)	3% of each sub-ACL
Fixed Gear Set-Aside (1A)	295

**Sub-ACL numbers do not include overage deductions, carryovers, or RSA deductions.*

Seasonal Splits for 2014 and 2015 (Pending Framework 2 Approval)

- Area 1A: 0% January-May; 100% June-December (authorized under Framework 1);
- Area 1B: 0% January-April; 100% May-December

Accountability Measures
Section 2.2.7.2 AM Alternative 2/Option A (*Preferred*)

Alternative 2 would continue to rely on herring catch estimation from NMFS' "year-end" catch tallying methods to trigger the AM for overage paybacks Under this alternative, the following accountability measures (AMs) would apply:

1. The trigger for closing the directed herring fishery in a management area would be reduced to **92% of the sub-ACL** (not including RSAs). When 92% of a management area sub-ACL is projected to be reached, the directed herring fishery in that area would close, and all herring permit holders would be limited to 2,000 pounds of herring per trip in that area for the remainder of the fishing year.
    - ***Option A:*** A trigger for closing the directed herring fishery in all management areas would be established at 95% of the stockwide ACL. When 95% of the stockwide ACL for herring is projected to be reached, the directed herring fishery in all management areas would close, and all herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year.

Table 1 AM Alternative 2

AM	Description
Trigger for Directed Fishery Closure	This alternative would adjust the existing AM to require the directed herring fishery in a given management area to close when catch is projected to reach 92% (not including RSAs) of a sub-ACL (versus 95%). The remaining 8% is provided after the closure to account for incidental catch fishing under a 2,000 pound trip limit for all vessels with herring permits.
Overage Payback	Status quo for overage deduction AM ("year-end" methodology).

Framework Adjustment 3 – River Herring Catch Caps

Mr. Grout moved and Mr. Preble seconded:

> **To initiate development of a framework adjustment to establish a river herring catch cap for the herring fishery.**

The motion carried on a show of hands (16/0/1).