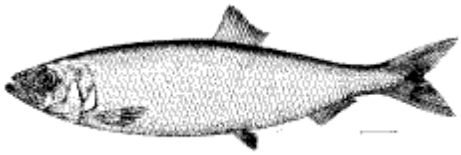
Framework Adjustment 2
to the
Atlantic Herring Fishery Management Plan (FMP)

AND

Proposed 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

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EXECUTIVE SUMMARY

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, including the National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA), and Executive Order 12866.

The actions proposed in this document also link to management objectives associated with minimizing bycatch in the herring fishery, the primary focus of Amendment 5 to the Herring FMP. If Amendment 5 is approved, the most notable changes (anticipated by the 2014 fishing year) would include a comprehensive catch monitoring program for the herring fishery, requirements for 100% observer coverage on Category A and B herring vessels, measures to address river herring bycatch, measures to establish criteria for midwater trawl vessel access to groundfish year-round closed areas. The measures proposed in this Framework 2/specifications document that further support the Amendment 5 objectives include the proposed accountability measures (AMs) for the herring fishery and a 3% research-set aside for the 2013-2015 fishing years, to support cooperative research focused on river herring bycatch avoidance and portside sampling.

Framework 2 parallels the 2013-2015 fishery specifications (separate management action, same document). The ***Preferred Alternative*** 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. Seasonal (monthly) splits of sub-ACLs in Areas 1A and 1B are proposed for the 2014 and 2015 fishing years, and carryover provisions would apply in 2014 and 2015 as well, pending approval of the measures proposed in Framework 2.

The Atlantic Herring FMP mandates that the stockwide Atlantic herring annual catch limit (ACL) be divided into sub-ACLs (formerly TACs) and distributed to four herring management areas on an annual basis through the fishery specifications process (management areas are shown in Figure 1 on p. 2). 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 (inshore/offshore) is minimized to the extent possible.

The Atlantic herring fishery specifications are annual amounts (for the 2013-2015 fishing years, January-December) 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);
- Management Area sub-ACLs;
- Research Set-Asides (RSA); and a
- Fixed Gear Set-Aside (FGSA).

In the 2013-2015 Atlantic herring fishery specifications package, the Council considered alternatives for specifying OFL and ABC, ABC control rules, options for distributing the stockwide herring ACL into four management areas (sub-ACLs), and alternatives for modifying current accountability measures (AMs) in the Atlantic herring fishery. This document also includes the Council's recommendation for management uncertainty for 2013-2015, specifications for domestic annual harvesting (DAH), domestic annual processing (DAP), border transfer (BT), U.S. at-sea processing for the Atlantic herring fishery (USAP), and set-asides for research (RSA) and fixed gear fishing (FGSA) for the 2013-2015 fishing years. The proposed Atlantic herring fishery specifications for the 2013-2015 fishing years are summarized in the table below.

The Council considered a range of deductions for management uncertainty, which are discussed in Section 2.2.3 of this document. The deduction for management uncertainty occurs based on the ***Preferred Alternative*** for ABC, to derive a stockwide ACL, which represents the U.S. Atlantic herring OY for 2013-2015. Specifications for DAH and DAP are derived from formulas that are applied once the stockwide ACL/OY is determined, based on the process outlined in the Herring FMP and the definitions/formulas provided in Section 1.2 of this document (p. 7). Adjustments to the BT and USAP specifications were considered by the Council based on a review of updated information available since the 2010-2012 specifications; the Council determined that no changes to these specifications are necessary at this time, and information to support these specifications is provided in Section 2.2.5 of this document. Options for establishing or modifying RSA and FGSA were considered by the Council as part of the sub-ACL options identified in Section 2.2.3.1 of this document, the Council initially proposed a 0% RSA for each sub-ACL and an option to maintain the current FGSA (no action), although provisions in the FMP allow the Council to specify up to 500 mt for a FGSA. Information specific to the proposed RSA and FGSA is provided in Section 2.2.3.1 and 2.2.3.2 of this document.

The 2010-2012 herring fishery specifications included a provision to allocate an additional 3,000 mt of herring to Area 1A in November and December based on the level of catch in the Canadian New Brunswick (NB) weir fishery. During 2010-2012, the Council deducted 14,800 mt from ABC to account for potential catch of Atlantic herring in the NB weir fishery (i.e., management uncertainty). Note that this provision is not included as part of the specifications for the 2013-2015 fishing years based on the specification of management uncertainty for 2013-2015 (6,200 mt, see Section 2.2.3).

Proposed Atlantic Herring Fishery Specifications for the 2013-2015 Fishing Years (*Preferred Alternatives*)

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 Area 2	30,000
Sub-ACL Area 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
- Area 1B: 0% January-April; 100% May-December

Sub-ACL Carryover Provisions for 2014 and 2015 (Pending Framework 2 Approval)

- 2014: No sub-ACL carryover would be allowed if the stockwide ACL was exceeded in 2012 (2012 year-end catch totals not yet available, but stockwide ACL appears to have been exceeded based on in-season monitoring methods – see Section 3.5.1.2.2)
- 2015: Up to 10% of each 2014 sub-ACL could be carried over to the corresponding management area if the 2014 stockwide ACL is not exceeded; if there is any sub-ACL carryover, the 2015 stockwide ACL would remain the same.

Accountability Measures (AMs)

The 2013-2015 Atlantic herring fishery specifications package includes modifications to the existing accountability measures (AMs) for the Atlantic herring fishery, which will remain effective beyond the 2015 fishing year. The Council considered a range of alternatives to modify existing AMs and is proposing a more conservative suite of AMs to ensure that the herring ACL is not exceeded. The ***Preferred Alternative*** proposes to modify the current AM for closing the directed herring fishery in a management area (sub-ACL) and establish a percentage trigger for closing the directed herring fishery in all management areas (stockwide ACL). This alternative maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions. Under the ***Preferred Alternative***, the following accountability measures 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.

   In addition, a trigger would be established for closing the directed herring fishery in all management areas. The trigger for closing the directed herring fishery in all management areas would be 95% of the stockwide Atlantic herring 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.

2. The AM to require an ACL/sub-ACL overage deduction would continue to be based on year-end catch estimation methods (status quo, one-year lag, see Section 3.5.1.2.1.2 on p. 115 for a description of these methods). The herring fishery can be active during the entire fishing year (January to December), and herring catch data are not finalized until halfway through the following year. Typically, quality control checks on herring catch data are completed in February, observer data are finalized in May, and dealer data are finalized in June. The overage deduction would then be made effective the year following the interim year. These methods would also be utilized to determine underages/carryovers if provisions proposed in Framework 2 are approved (Section 2.1.2).

Preferred Alternative for AMs

AM	Description
Trigger for Directed Fishery Closure	• Adjust the existing AM to require the directed herring fishery in a management area to close when catch is projected to reach **92%** (not including RSAs) of a sub-ACL; the remaining 8% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits. • Establish provisions to close the directed herring fishery in all management areas when catch is projected to reach 95% of the stockwide herring ACL; the remaining 5% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits.
Overage Payback	Status quo

**If provisions to allow carryovers are approved in Framework 2 (Section 2.1.2.2), ACL/sub-ACL overages and underages would be determined, and deductions/carryovers would be applied based on the same methodology ("year-end catch estimation," one year lag, see Section 3.5.1.2.1.2).*

The existing AM associated with the haddock catch cap is described in the no action alternative (AM Alternative 1, Section 2.2.6.1) and will remain effective under the ***Preferred Alternative***. This AM is not addressed in the following discussion. The AMs proposed in this document would continue to apply to the Atlantic herring fishery beyond the 2013-2015 fishing years, until modified by a future Council action (amendment, framework adjustment, or specifications). Impacts of the proposed AMs, therefore, are considered over a longer time frame (not just the 2013-2015 fishing years).

Affected Environment

The descriptive and analytic components of this document are constructed in a consistent manner. During the development of the proposed management action, a series of valued ecosystem components, or VECs were identified. VECs represent the resources, areas, and human communities that may be affected by a proposed management action or alternative(s), and by other actions that have occurred or will occur outside the Proposed Action. VECs are the focus of an EA since they are the "place" where the impacts of management actions are exhibited. The Affected Environment section (Section 3.0, p. 53) is designed to enhance the readers' understanding of the historical, current, and near-future conditions (baselines and trends) relative to each VEC in order to fully understand the anticipated environmental impacts of the management alternatives that were considered in this document. For the purposes of the Atlantic herring management program, the VECs described and considered in the analyses are: Atlantic herring (Section 3.1, p. 53); non-target species and other fisheries (Section 3.2, p. 64); physical environment and essential fish habitat (EFH) (Section 3.3, p. 87); protected resources (Section 3.4, p. 96); and fishery-related businesses and communities (Section 3.5, p. 110).

Impacts of Framework 2 to the Herring FMP

The management measures proposed in Framework 2 are administrative in nature (establishing provisions/policy for the fishery specifications process); the impacts of the ***Preferred Alternatives*** and other alternatives considered in Framework 2 on all of the VECs are expected to be minimal. Impacts of any specifications implemented in the future under the Framework 2 provisions would be analyzed as part of the relevant specifications package. There are some minor differences between the options that the Council considered to establish carryover provisions, and there are expected to be some long-term/indirect positive impacts of taking the action proposed in Framework 2; these impacts are discussed relative to each VEC in the analyses presented in this document (Section 4.1, p. 147).

Impacts of Proposed 2013-2015 Fishery Specifications and AMs

The summary paragraphs below focus on the impacts of the 2013-2015 herring fishery specifications and proposed accountability measures on the VECs identified in this document.

Impacts on the Atlantic Herring Resource: In general, fishing mortality on Atlantic herring is managed through the stockwide ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty), which is divided in to sub-ACLs that are intended to minimize risk to individual stock components while maximizing opportunities for the fishery to achieve OY. Based on the best available scientific information (SAW 54, July 2012), the Atlantic herring resource is not overfished (stock is rebuilt), and overfishing is not occurring.

The Council considered several alternatives for specifying OFL, ABC, and the ABC control rule for Atlantic herring in the 2013-2015 specifications, all of which were reviewed and evaluated by the Herring PDT and Scientific and Statistical Committee (SSC). Alternative 2 is the Council's ***Preferred Alternative*** (Section 2.2.2.2, p. 18). This alternative is based on maintaining a constant catch for all three fishing years (114,000 mt) while accounting for scientific uncertainty. Under this alternative, fishing mortality (F) increases and biomass declines 36% from 2013-2015, but the stock is expected to remain rebuilt (above the biomass target), and fishing mortality is expected to remain below the F_{MSY} target until 2015, when there is a 50% probability that F will equal F_{MSY}. There is a 50% probability of exceeding the F target in 2015 under Alternative 2, but zero probability that the stock would become overfished (below the biomass threshold). While herring biomass is expected to decline if the ABC is fully utilized, the current status of the Atlantic herring resource and the projections suggest that the impacts of for 2013-2015 may be potentially negative but will not affect stock status.

The table below summarizes the results of the projections for the 2015 fishing year under each of the OFL/ABC alternatives and provides a basis for comparing alternatives – by total removals of herring in three years, projected herring SSB in 2015, and the probability of producing a fishing mortality rate above F_{MSY} in 2015. Complete projection results are provided in Section 4.2.1.1 of this document under the discussion of impacts related to each alternative). For comparing alternatives, the outcome at the end of the 2013-2015 specifications cycle can be considered. If no action is selected, removals would be almost identical to those under Alternative 3, but the probability of overfishing in 2015 would be higher. Total removals and the probability of

exceeding F_{MSY} are highest under Alternative 2, but under all alternatives, the stock remains rebuilt with zero chance of falling below the biomass threshold.

Summary Comparison of OFL/ABC Alternatives (2015)

	Alternative 1 (No Action)	Alternative 2	Alternative 3
Total Removals (mt, all years)	**318,000**	**342,000**	**320,000**
2015 SSB (mt)	353,218	338,957	354,559
2015 Prob > F_{MSY}	0.36	0.5	0.17

The impacts of Atlantic herring catch allowed under the proposed 2013-2015 specifications on the Atlantic herring resource are discussed under the impacts of the proposed OFL and ABC specifications, and the ABC control rule for 2013-2015 (see Section 4.2.1.1 of this document). The ***Preferred Alternative*** for specifying ABC for 2013-2015 is expected to have a low negative impact on the herring resource, when compared to the no action alternative (see discussion of impacts in Section 4.2.1.1 of this document). However, because of current stock condition, this alternative is not expected to change or jeopardize herring stock status, which is currently considered to be "rebuilt."

Given the available information/data presented in this document, the Council proposes to deduct 6,200 mt from the ABC and included in the ***Preferred Alternative*** for the Atlantic herring ACL (107,800 mt) to account for management uncertainty associated with the potential catch of Atlantic herring in the NB weir fishery from 2013-2015. However, had the no action alternative for the stockwide ACL been chosen, the level of management uncertainty would also default to the no action level of 14,800 mt, and RSA and FGSA specifications would remain at 2012 levels. During the development of the 2013-2015 herring fishery specifications, the Council considered six options, including a no action option, for specifying sub-ACLs in the four herring management areas for the 2013-2015 fishing years.

Distributing the stockwide herring ACL among the management areas is an allocation-based decision; removals of the stock complex remain controlled by the ABC. The impacts of the sub-ACL options on the Atlantic herring resource are therefore expected to be *neutral*. Additional discussion to support this conclusion is provided in this document. To consider distributive effects and ensure that the allocation of catch to management areas does not disproportionately affect one stock component over another, the Herring PDT provided a comparative sub-ACL analysis. The sub-ACL options distribute the total ACL among the management areas. The sub-ACL analysis compares and evaluates each option under consideration with respect to potential impacts on the individual herring stock components. This analysis is provided in its entirety in Appendix III to this document.

The AMs proposed in this document would continue to apply to the Atlantic herring fishery beyond the 2013-2015 fishing years, until modified by a future Council action (amendment, framework adjustment, or specifications). Impacts of the proposed AMs, therefore, are considered over a longer time frame (not just the 2013-2015 fishing years). Overall, the accountability measures proposed for the Atlantic herring fishery in the 2013-2015 specifications package should have a positive impact on the Atlantic herring resource to the extent that they

prevent the stockwide Atlantic herring ACL and management area sub-ACLs from being exceeded during the fishing year, as well as improve the likelihood that the total ACL (OY) can be caught on a continuing basis while preventing overfishing. The ***Preferred Alternative*** establishes an in-season AM for the stockwide ACL, which previously had not been part of the suite of AMs. This is intended to minimize the risk of exceeding the stockwide ACL, consistent with the requirements of the MSA and NMFS National Standard Guidelines.

Impacts on Non-Target Species and Other Fisheries: It is difficult to predict specific positive or negative impacts to non-target species and other fisheries that may result from the proposed 2013-2015 Atlantic herring fishery specifications. In general, increased catch levels proposed for 2013-2015 in the Atlantic herring fishery may increase interactions with non-target species and other fisheries, but the effects will depend on changes in patterns in the herring fishery (timing/effort) as well as the distribution/abundance of non-target species and other fisheries. Variability associated with these factors prevents specific predictions regarding impacts. River herring and shad are two non-target species of particular concern; impacts on these species will be influenced by changes in fleet behavior and shifts in the distribution/aggregation of stocks/sub-stocks from increased fishing activity, environmental factors, climate change, restoration efforts, or other factors.

Given the magnitude of the proposed increase in herring catch for 2013-2015, any impacts that may be experienced are not likely to change or jeopardize the status of any non-target species. Although herring catch is expected to increase under the ***Preferred Alternative***, catch will remain considerably less than it was under the 2007-2009 herring fishery specifications. Monitoring of all catch the Atlantic herring fishery has improved since 2007-2009 and will continue to improve with the implementation of the Amendment 5, so future interactions with non-target species and other fisheries will be more accurately documented, better managed, and avoided by the industry to the extent practicable. The impacts of the proposed increase in catch under the OFL/ABC ***Preferred Alternative*** are potentially low negative, but are not likely to change or jeopardize the status of any non-target species. The impacts of the sub-ACL options on non-target species are likely to be minor and short-term, resulting from the allocation of an additional 16,600 mt of catch across the fishery. They are not likely to significantly impact/jeopardize the status of any non-target species, or negatively affect other fisheries. Overall, as noted in the analyses presented in this document, the long-term impacts of the Atlantic herring management program on non-target species and other fisheries should be positive, resulting from increased monitoring and improvements in the operation and efficiency of the herring fishery.

The AMs proposed in this document may limit or reduce potential interactions with non-target species and other fisheries by implementing measures to mitigate the Atlantic herring fishery from exceeding sub-ACLs and the stockwide ACL. There is likely a benefit for non-target species with which there may have been additional interactions with the fishery if the AMs had not been in place. In addition, the proposed AMs are not likely to preclude the operation of other fisheries. Overall, the impacts of the AMs on non-target species and other fisheries are expected to be minimal and are not expected to change or jeopardize the status of any non-target species. When compared to the no action alternative, the impacts on non-target species and other fisheries are expected to be potentially low positive.

Impacts on Physical Environment and EFH: The assessment provided in this document concludes that the impacts of the ***Preferred Alternatives*** on the physical environment and essential fish habitat (EFH) will be neutral. 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. This conclusion applies to pelagic EFH for Atlantic herring larvae, juveniles, and adults, and to pelagic EFH for any other federally-managed species in the region. The various species and life stages that might be affected are listed in the Affected Environment section of this document (Section 3.3, Physical Environment and Essential Fish Habitat, p. 87).

Impacts on Protected Resources: It is difficult to predict how the herring fishery will react to the options within the proposed 2013-2015 specifications without a fully developed model and more information, and incorporation of the information seen below is difficult. Predicting the positive or negative impacts to the protected species that may interact with the fishery is therefore also difficult, but several issues are considered qualitatively. The ***Preferred Alternative*** allows for more fishing than the no action alternative and may be slightly more detrimental to the accessibility of forage for some protected species. This is a short-term specification, however, and there is uncertainty surrounding the availability of forage species as prey and whether it is significant enough at this time, making the impact prediction difficult. The potential timing and location of the Atlantic herring fishery is not expected to change significantly under the Proposed Action, but overall catch is expected to increase. Additional fishing effort may increase the risk of encounter with inshore protected species, but increased fishing effort under this alternative is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to jeopardize the status of any protected species. An increase or decrease in the rate of effort in the specific management areas as a result of the sub-ACL distribution is unknown and therefore impacts on specific protected resources are difficult to predict. Overall, relative to the no action alternative, the impacts of the proposed 2013-2015 fishery specifications on protected resources may be potentially low negative.

In general, AMs may limit or reduce potential interactions with protected species by implementing measures to mitigate the herring fishery from exceeding sub-ACLs and the stockwide ACL. There is likely a benefit for protected species with which there may have been interactions with the fishery. Overall, the impacts of AMs on protected resources are expected to be minimal and are not expected to change or jeopardize the status of any protected species. When compared to the no action alternative, the impacts of the ***Preferred Alternative*** for establishing AMs in the herring fishery on protected resources are expected to be potentially low positive.

Impacts 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 in the proposed 2013-2015 herring fishery specifications as compared to the no action alternatives.

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 considered in this specifications document (Section 2.2.2, p. 17), there are trade-offs, but under each alternative, there is no chance that the stock would become overfished. The SSC has determined each alternative to be biologically acceptable (complete SSC Reports are provided in Appendix I and II). The ***Preferred Alternative*** will increase the stock-wide ACL and the sub-ACLs for the 2013-2015 fishing years resulting in a positive impact for fishery and other businesses. The constant catch approach in the ***Preferred Alternative*** provides consistency for fishing industry operations, stability for the industry and a more steady supply to the market (in addition to the stability provided by a three-year specifications process).

Sub-ACLs are proposed to be allocated in a way that maximizes opportunities for the fishery to achieve OY during the 2013-2015 fishing years, while preventing overfishing and achieving other FMP objectives. During the development of the herring fishery specifications, the Council sought input from the fishing industry and the Herring Advisory Panel (AP) regarding how to most effectively allocate the stockwide ACL among the four management areas for 2013-2015. The ***Preferred Alternative*** was developed by members of the Herring AP present at the January 16, 2013 meeting; almost all advisors present at the meeting expressed support for this option, and it was selected by the Council at its January 2013 meeting. The impacts of this alternative on fishery-related businesses and communities is expected to be positive.

The ***Preferred Alternative*** for accountability measures (AMs) would establish a trigger for closing the directed herring fishery (95% of the total herring annual catch limit) and would lower the trigger for closing the fishery in each management area from 95% to 92% of the sub-ACL. This measure may increase operational constraints on the fishery, which may result in short-term negative socioeconomic impacts relative to the no action alternative, but there could be long-term benefits from maintaining a sustainable fishery in comparison to taking no action. This holds true for the range of AM alternatives considered by the Council in this framework adjustment. The impacts of the AM alternatives (including the ***Preferred Alternative***) on fishery-related businesses and communities are expected to be *low positive*. For example, long-term benefits of AMs to the fishery may be realized through increased stability resulting from fewer sub-ACL and/or stockwide ACL overages. Moreover, the alternatives to establish accountability measures (AMs) 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. Moving towards real-time monitoring may incentivize timely catch report submission by the industry. During the development of the 2013-2015 herring fishery specifications, the industry suggested posting catch updates daily once catch begins to approach a sub-ACL, and NMFS expressed interest in considering this further. 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 could be negative impacts on the industry's ability to comply with quota restrictions and consequences from any sub-ACL and ACL overages that could result. These issues are addressed in the discussion of impacts of

the AM alternatives on fishery-related businesses and communities in Section 4.2.4.5 of this document.

RSAs and FGSA

The Council proposes a 3% RSA for all management areas for the 2013-2015 herring specifications as well as a 295 mt FGSA for fixed gear fishermen in the area west of Cutler. The conclusions drawn in this document regarding the potential impacts of the 2013-2015 herring fishery specifications (OFL/ABC, sub-ACLs) are not affected by the proposed fixed gear set-aside because this is a status quo specification (same as 2012), and herring allocated under the FGSA are returned to the Area 1A fishery before the end of the fishing year if not utilized by the fixed gear sector. The conclusions also are not affected by the proposed RSA because fish allocated under the RSA are assumed to be caught during the fishing year and are returned to the fishery if the set-aside is not utilized.

There are long-term benefits to the Atlantic herring resource, participants in the herring fishery, and non-target species and other fisheries from enhancing management through cooperative research. A 3% RSA for the 2013-2015 fishing year encourages the industry to participate in the collection of scientific information and conduct research to reduce interactions with non-target species and other fisheries affected by the herring fishery. The Council has identified river herring bycatch avoidance and portside sampling as top priorities for cooperative research to be funded through any RSA program supported by the 2013-2015 herring fishery specifications. Long-term benefits can be expected from cooperative research programs that address these priorities. Allocating RSA for 2013-2015 under these priorities is consistent with the goals and objectives of the herring management program and the long-term management strategy for bycatch avoidance/minimization provided in Amendment 5.

The following table summarizes the impacts of the management alternative/options that were considered in Framework 2 and the 2013-2015 herring specifications, as well as the ***Preferred Alternative***, on each of the VECs identified in this document and described in the Affected Environment. All comparisons in the summary table are made to the no action alternative/option.

Additional requirements under the MSA, NEPA, and other Federal law are addressed throughout various sections of this document.

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Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications

	Impacts of Framework 2 Alternatives (Section 2.1)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.1.1 Sub-ACL Splitting: Alternative 2 (*Preferred*)– regulatory action to allow sub-ACL splitting	Low Positive FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process. The direct impacts of the splits are analyzed in the herring specifications process.	Negligible FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process.	Negligible FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process.	Positive FW 2 sub-ACL provisions are administrative in nature, but sub-ACL splitting can be beneficial by slowing the pace of the fishery and spreading effort throughout the year.
Section 2.1.2 Carryover Provisions: Alternative 2 (*Preferred*)– allow up to 10% of sub-ACL carryover Option 1 – no stockwide ACL increase Option 2 – RA directive Option 3 – sub-ACL and stockwide ACL increase	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process. The direct impacts of the splits are analyzed in the herring specifications process.	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process.	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process.	Positive FW 2 carryover provisions are administrative in nature, but carryover provisions may increase operational flexibility, enhance safety at sea, and allow fleet to fully utilize OY

Note: All comparisons are made to the no action alternative.

Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications

	Impacts of Proposed 2013-2015 Herring Fishery Specifications (Section 2.2)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.2.1 OFL/ABC Alternatives Alternative 2 (*Preferred*)– constant catch Alternative 3 – 75% F_{MSY}	Potentially Low Negative/Potentially Low Positive SSB is projected to decline, but the stock remains "rebuilt" with zero probability of "overfished." Impacts are compared to the no action alternative, which falls in between the two alternatives in terms of projected SSB and probability of overfishing in 2015.	Potentially Low Negative Overall, increased catch may increase interactions.	Neutral/Potentially Low Negative There would be minimal adverse effects on EFH. The rate of effort in any management area is unknown and the impacts are difficult to predict regarding Protected Resources, but increased catch may increase interactions.	Positive The *Preferred Alternative* establishes a constant ABC over 3 years, providing consistency and stability for the industry. Alternative 3 impacts are expected to be less positive due to a variable ABC.
Section 2.2.3 and 2.2.4 RSAs and FGSA 3% RSA for each management area and 295 mt FGSA	Indirect long-term benefits for the herring resource from enhancing management through cooperative research.	Potential for positive impacts which may come from the cooperative research – river herring bycatch avoidance and portside sampling priorities directly link to Am 5 measures.	Long-term benefits can be expected from cooperative research programs.	Indirect long-term benefits towards the herring resource and participants to enhance management through cooperative research - river herring bycatch avoidance and portside sampling priorities directly link to Am 5 measures.
Section 2.2.5 Sub-ACL Options Six options including no action (2012); *Preferred Alternative* falls within range of Options 2-6	Neutral The *Preferred Alternative* may be more favorable for the inshore component; Option 2 favors the inshore stock component and Option 5 favors the offshore stock component.	Unknown but Potentially Low Negative An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific non-target species are difficult to predict.	Neutral/Potentially Low Negative Neutral EFH Impacts. An increase or decrease in the rate of effort in the specific management areas is difficult to predict; forage for PR may be affected by increases in catch in some areas.	Positive Increasing the sub-ACLs will likely benefit the number of communities participating in the herring fishery.
Section 2.2.6 Other Fishery Specs DAH DAP BT USAP	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.

Note: All comparisons are made to the no action alternative.

Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications

	Impacts of Proposed 2013-2015 Herring Fishery Specifications (Section 2.2)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.2.7 Accountability Measures Alternative 2 (*Preferred*)– reduce sub-ACL trigger to 92%, establish ACL trigger 95%	Positive Most conservative alternative, most positive impacts Intended to minimize risk of exceeding the stockwide ACL and the sub-ACLs and to prevent overfishing, while maximizing opportunities for the fishery to achieve OY.	Potentially Low Positive The *Preferred Alternative* is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded.	Neutral/Potentially Low Positive Neutral EFH impacts. The *Preferred Alternative* is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded.	Low Positive This measure could have a positive impact on business planning and predictability by reducing sub-ACL and ACL overages.
Section 2.2.7 Accountability Measures Alternative 3 – reduce sub-ACL trigger to 92% in some cases, allow to exceed sub-ACL by 5% only if overfishing is not occurring and stock is rebuilt	Unknown/Potentially Positive This alternative is considered the least conservative and does not establish an in-season AM for the stockwide ACL. To the extent that the AMs prevent ACL overages, there are potentially positive impacts.	Potentially Low Positive Considered the least conservative alternative and the most difficult to predict regarding impacts.	Neutral/Potentially Low Positive Remains neutral for EFH but is the least conservative alternative and the most difficult to predict regarding impacts on Protected Resources.	Low Positive This alternative would increase the constraints on the fishery less than Alternative 2; long-term benefits from reducing sub-ACL and ACL overages.
Section 2.2.7 Accountability Measures Alternative 4 – trigger reduced based on overage percentage, allow to exceed sub-ACL by 5% only if overfishing is not occurring and stock is rebuilt	Positive The in-season AM only decreases after an overage; changes to overage deductions are less conservative than status quo; less positive than *Preferred Alternative* but long-term positive impacts from establishing AM for stockwide ACL.	Potentially Low Positive Impacts on non-target species and other fisheries likely be less positive than the *Preferred Alternative*.	Neutral/Potentially Low Positive Neutral EFH Impacts. Impacts on Protected Resources would likely be less positive than the *Preferred Alternative*.	Low Positive Difficult to differentiate impacts between alternative, but long-term benefits from reducing sub-ACL and ACL overages.

Note: All comparisons are made to the no action alternative.

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LIST OF ACRONYMS

ACL	Annual Catch Limit
AM	Accountability Measure
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
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
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

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1.0 INTRODUCTION AND BACKGROUND

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, including 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.

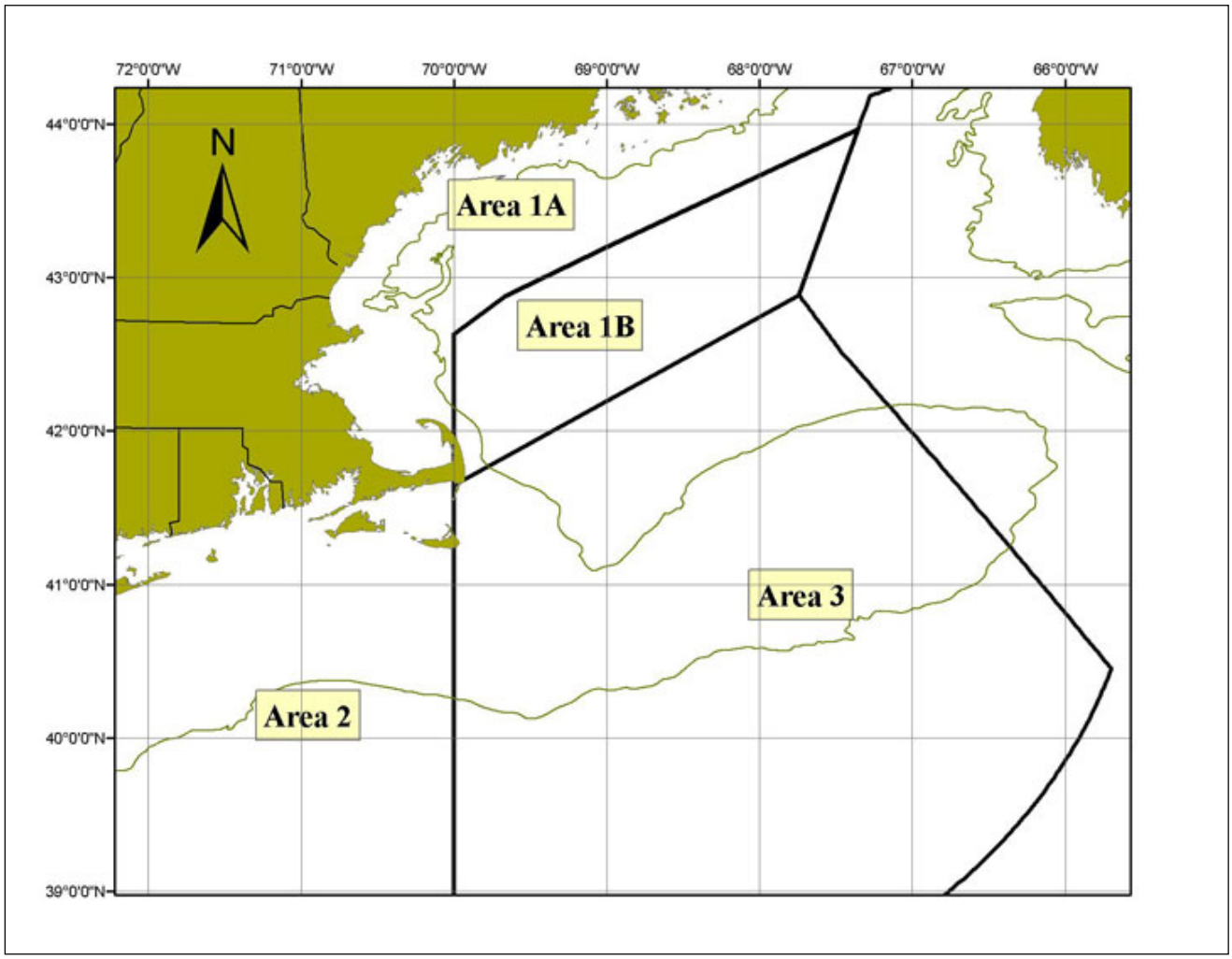
The Atlantic herring fishery specifications are annual amounts (for the 2013-2015 fishing years) including:

- 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).

Seasonal (monthly) splits of sub-ACLs in Areas 1A and 1B are proposed for 2014 and 2015, and carryover provisions would apply in 2014 and 2015 as well, pending approval of Framework 2.

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 established in the Herring FMP and modified in Amendments 1 and 4. 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 Atlantic Herring FMP, which is currently 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 limited access 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 and ensure sustainable long-term management. The measures proposed in Amendment 5 are expected to be implemented by the 2014 fishing year.

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). A letter from NOAA Fisheries Service (NMFS) was provided to the New England Fishery Management Council (NEFMC) on August 31, 2012, describing the legal deficiencies identified by the Court:

1. NMFS did not satisfy its obligation to independently determine whether the NEFMC's designation of "stocks in the fishery" complied with the Magnuson-Stevens Fisheries Conservation and Management Act (MSA);
2. NMFS did not adequately consider whether Amendment 4 complied with National Standard 9's requirement to minimize bycatch to the extent practicable; and
3. NMFS failed to consider the environmental impacts of alternatives to the acceptable biological catch (ABC) control rule and accountability measures (AMs).

The letter from NMFS also described the Court Order. Several elements of the Court Order have already been completed, including the following:

1. NMFS filed a supplemental explanation with the Court on August 31, 2012, setting forth its consideration of whether Amendment 4's definition of the fishery complies with the MSA.
2. NMFS sent a letter to the New England Council on August 31, 2012, "explaining the applicable law and National Standard 1 Guidelines relating to determining the stocks to be included in a fishery" and "recommending that the Council consider, in an amendment to the Atlantic Herring FMP, whether river herring should be designated as a stock in the fishery." The order provides that the Council's consideration be based on, at a minimum, the following:
    A. The 2012 ASMFC river herring stock assessment report and peer review report;
    B. NMFS's 2011 finding that listing river herring as a threatened species under the Endangered Species Act may be warranted;
    C. The 2007 shad stock assessment report and its peer review report;
    D. Alternative Set 9 in the MAFMC's Amendment 14 DEIS (April 2012) to the Mackerel Squid, Butterfish FMP; and
    E. The Court's March 8, 2012, summary judgment opinion.
3. In the same letter to the Council, NMFS recommend that the Council, as part of the 2013-2015 herring specifications, consider a range of alternatives for the ABC control rule and AMs and explain how the measures adopted by the NEFMC as part of Amendment 5 minimize bycatch, to the extent practicable, in the Atlantic herring fishery.
4. NMFS filed a status report with the Court on February 1, 2013, describing its progress on the remedial actions.

These last pieces of the Court Order that need to be filed with the Court by August 2, 2013, include: NMFS's supplemental explanation setting forth its consideration of whether the Atlantic Herring FMP minimizes bycatch to the extent practicable and a final report, describing all remedial actions taken in response to the order and including the completed NEPA analyses for the 2013-2015 herring specifications and Herring Amendment 5.

The Court retains jurisdiction pending full compliance by NMFS with the terms of the Order. If NMFS does not comply with the Court Order, Amendment 4 will be vacated. Consistent with the Court 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 Atlantic herring fishery.

1.1 PURPOSE AND NEED

The Atlantic Herring FMP requires the Council to develop annual specifications for the fishery. Amendment 1 to the Herring FMP (2006) established a process that allows the Council to set multi-year (up to three fishing years) specifications. Amendment 4 to the Herring FMP (2010) modified the specifications process and implemented provisions for annual catch limits (ACLs) and accountability measures (AMs).

The need for this action is to specify the overfishing level (OFL) and allowable biological catch (ABC) for the Atlantic Herring Fishery Management Plan (FMP), and to set specifications for FY 2013-2015 consistent with the best available science and the requirements of the Atlantic Herring FMP, while providing additional flexibility and promoting the full utilization of optimum yield (OY). The requirement to set multi-year specifications is also needed to prevent overfishing and, pursuant to the requirements of the MSA and the Court Order (see Section 1.0), ensure that the herring management program addresses and minimizes bycatch to the extent practicable.

The purpose of this action is to establish provisions for sub-ACL splitting and carryovers, and to implement specifications for the Atlantic herring fishery during the 2013-2015 fishing years. An additional purpose of this action is to consider a range of alternatives for ABC control rules and modifications to the existing suite of accountability measures, consistent with the Court Order, and to modify and create new management measures related to the ACL/AM process for the Atlantic herring fishery. Finally, a corresponding purpose for this action is to adopt measures that would minimize bycatch in the fishery.

The 2013-2015 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

The measures proposed in Framework 2 establish provisions to allow for seasonal (monthly) sub-ACL splitting and carryover of un-utilized sub-ACL (up to 10%) under certain conditions. These provisions are intended to increase flexibility during the specifications process and allow the Council to better allocate yield to achieve the goals and objectives of the Herring FMP identified above.

1.2 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, as modified in Amendment 4, specifies that OY is equal to DAH.

$$\mathbf{OY = DAH}$$

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.

$$\mathbf{DAH = DAP + BT}$$

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 PROPOSED MANAGEMENT ACTION AND OTHER ALTERNATIVES CONSIDERED

This section describes the management action proposed by the Council in Framework 2 to the Atlantic Herring FMP (Section 2.1) as well as the 2013-2015 Atlantic herring fishery specifications (Section 2.2). The Council selected the ***Preferred Alternatives*** for Framework 2 and finalized the 2013-2015 herring fishery specifications at its January 29-31, 2013 meeting in Portsmouth, NH. The Council's rationale for selecting the proposed measures is provided in the following sub-sections as appropriate. Non-preferred alternatives/options are also described in the following sub-sections. All related analyses are provided in Section 4.0 of this document.

2.1 FRAMEWORK ADJUSTMENT 2

The following subsections describe the alternatives considered by the Council in Framework 2 to the Herring FMP (to allow for seasonal sub-ACL splitting and unutilized sub-ACL carryovers as part of the herring fishery specifications process). The Council's ***Preferred Alternatives***, selected at the January 29-2013 meeting, are identified, and rationale is provided where appropriate.

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 (*Preferred Alternative*)

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.

This alternative represents the Council's ***Preferred Alternative***, selected at the January 29-31, 2013 meeting.

Rationale for Preferred Alternative: The Council selected the ***Preferred Alternative***, to allow sub-ACL splitting during the specifications process, to provide more flexibility during the specifications process to allocate the herring ACL among the management areas in the most effective way possible. Allowing sub-ACLs to be split seasonally (by month) may help to reduce derby fishing and distribute the catch throughout the fishing year, allowing for additional fishing opportunities. This measure is policy-based and has no direct impacts. The impacts of any future splits considered by the Council would be analyzed as part of the appropriate 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 (*Preferred Alternative*)

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 a future fishing year, up to a limit of 10% of the sub-ACL. This alternative, combined with Option 1 (described below), represents the Council's ***Preferred Alternative***, selected at the January 29-31, 2013 meeting.

Under this alternative, the following provisions would apply to all three options considered by the Council for allowing sub-ACL carryovers in the Atlantic herring fishery:

- 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 underages would be determined based on the same methodology used to determine sub-ACL overages.
- 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 (Preferred): If there is a carryover, the sub-ACL(s) in the corresponding management area(s) would increase for a future fishing year, but the stockwide ACL would remain unchanged.

At this time, consistent with the current year-end catch estimation methods utilized to determine ACL/sub-ACL overages (see Section 3.5.1.2.1.2), there would be a one-year lag associated with sub-ACL carryovers.

Option 2: This option 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 a future 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.

Rationale for Preferred Alternative (Option 1): The Council chose to establish sub-ACL carryover provisions to increase flexibility and efficiency in the herring fishery without compromising biological objectives of the plan (prevent overfishing). The proposed provisions are consistent with the FMP goals/objectives as well as all MSA requirements and National Standards (see additional discussion in Section 5.1 of this document). The suite of accountability measures established for the Atlantic herring fishery through this action would continue to apply to sub-ACLs and the herring stockwide ACL under any carryover provisions.

The sub-ACL carryover provisions, when combined with the AMs proposed in Section 2.2.6 of this document, are supported by herring industry participants as well as many other stakeholders. During the development of the measures proposed in this document, several stakeholders provided comments suggesting that carryover provisions could help prevent sub-ACL and ACL overages; industry support for the **AM *Preferred Alternative*** (Section 2.2.6) is based, in part, on also implementing provisions to allow carryovers to reduce the potential for available harvest to be under-utilized.

Improving responsiveness to fishery, market, and environmental conditions is consistent with the goals and objectives of the FMP and will ultimately lead to better management of the fishery. Allowing some sub-ACL to be carried over to the next fishing year may reduce derby-style fishing late in the year when weather is less predictable. It also may allow industry participants to capitalize on better market conditions during some times of the year. Limiting the carryover to 10% reduces the risks to the resource as well as any risk associated with increased management uncertainty compared to a full carryover option, and this approach 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). The Council's ***Preferred Alternative*** (Option 1) was selected because it does not allow the total ACL to increase if there is any sub-ACL carryover, so it is the most conservative/precautionary with respect to potential biological risk.

2.2 2013-2015 ATLANTIC HERRING FISHERY SPECIFICATIONS

In the 2013-2015 Atlantic herring fishery specifications package, the Council considered alternatives for specifying OFL and ABC, ABC control rules, options for distributing the stockwide herring ACL into four management areas (sub-ACLs), and alternatives for modifying current accountability measures (AMs) in the Atlantic herring fishery. This document also includes the Council's recommendation for management uncertainty for 2013-2015, specifications for domestic annual harvesting (DAH), domestic annual processing (DAP), border transfer (BT), U.S. at-sea processing for the Atlantic herring fishery (USAP), and set-asides for research (RSA) and fixed gear fishing (FGSA) for the 2013-2015 fishing years. The proposed Atlantic herring fishery specifications for the 2013-2015 fishing years are summarized in Table 2 below; all elements of the 2013-2015 fishery specifications and alternatives/options considered by the Council are described in the following subsections. The Council's ***Preferred Alternatives*** are identified, and rationale for the Council's selection is provided where appropriate.

The Council considered a range of deductions for management uncertainty, which are discussed in Section 2.2.3 of this document. The deduction for management uncertainty occurs based on the ***Preferred Alternative*** for ABC, to derive a stockwide ACL, which represents the U.S. Atlantic herring OY for 2013-2015.

Specifications for DAH and DAP are derived from formulas that are applied once the stockwide ACL/OY is determined, based on the process outlined in the Herring FMP and the definitions/formulas provided in Section 1.2 of this document (p. 7). Adjustments to the BT and USAP specifications were considered by the Council based on a review of updated information available since the 2010-2012 specifications; the Council determined that no changes to these specifications are necessary at this time, and information to support these specifications is provided in Section 2.2.5 of this document.

Options for establishing or modifying RSA and FGSA were considered by the Council as part of the sub-ACL options identified in Section 2.2.3.1 of this document, the Council initially proposed a 0% RSA for each sub-ACL and an option to maintain the current FGSA (no action), although provisions in the FMP allow the Council to specify up to 500 mt for a FGSA.

Information specific to the proposed RSA and FGSA is provided in Section 2.2.3.1 and 2.2.3.2 of this document.

The 2010-2012 herring fishery specifications included a provision to allocate an additional 3,000 mt of herring to Area 1A in November and December based on the level of catch in the Canadian New Brunswick (NB) weir fishery. During 2010-2012, the Council deducted 14,800 mt from ABC to account for potential catch of Atlantic herring in the NB weir fishery (i.e., management uncertainty). Note that this provision is not included as part of the specifications for the 2013-2015 fishing years based on the specification of management uncertainty for 2013-2015 (6,200 mt, see Section 2.2.3).

Table 2 Proposed Atlantic Herring Fishery Specifications for the 2013-2015 Fishing Years (*Preferred Alternatives*)

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 Area 2	30,000
Sub-ACL Area 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
- Area 1B: 0% January-April; 100% May-December

Sub-ACL Carryover Provisions for 2014 and 2015 (Pending Framework 2 Approval)

- 2014: No sub-ACL carryover would be allowed if the stockwide ACL was exceeded in 2012 (2012 year-end catch totals not yet available, but stockwide ACL appears to have been exceeded based on in-season monitoring methods – see Section 3.5.1.2.2)

- 2015: Up to 10% of each 2014 sub-ACL could be carried over to the corresponding management area if the 2014 stockwide ACL is not exceeded; if there is any sub-ACL carryover, the 2015 stockwide ACL would remain the same.

2.2.1 Background – Development of Alternatives

The development of the 2013-2015 Atlantic herring fishery specifications package was a multi-step decision-making process that involved the Council, the Scientific and Statistical Committee (SSC), the Herring Plan Development Team (PDT), Herring Advisory Panel (AP), and Herring Committee. In addition to fishery specifications for the upcoming three fishing years, this package includes consideration of ABC control rules and accountability measures (AMs) for the Atlantic herring fishery, consistent with the Amendment 4 Court Order discussed in Section 1.0 of this document.

Consistent with the provisions in the MSA, the Atlantic Herring FMP states that the control rule for acceptable biological catch (ABC) will be specified and may be modified based on guidance from the SSC during the fishery 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. The vehicle for implementing control rules or modifications will depend on the nature of the action and its potential impacts on the resource and the fishery. The 2013-2015 herring fishery specifications were therefore developed from the SSC recommendations for ABC.

Following the Atlantic herring benchmark stock assessment (SAW 54, July 2012), the SSC considered three alternatives for establishing an ABC control rule and specifying ABC for the 2013-2015 fishing years (September 2012 SSC Report, Appendix I). One control rule applied 75%F_{MSY} in all three projection years, while the other found the constant catch over the three projection years. In this particular situation, these two control rules resulted in a total catch over the three years which is approximately the same (see analyses in Section 4.2.1.1 for more information). The SSC could not find any scientific reason to prefer one of these control rules over the other and considered them to be comparable in terms of risk of overfishing, given the information available. In turn, the SSC recommended that the Council consider either control rule for 2013-2015.

The SSC considered a number of characteristics of the fishery and stock assessment before arriving at this decision regarding the control rule for the 2013-2015 fishing years. All considerations led the SSC to conclude that either control rule can be applied for the next three years with low probability of overfishing or causing the stock to become overfished. While not an explicit term of reference, the SSC did discuss the role of herring in the ecosystem and options for setting ecosystem-based ABCs, as requested by NMFS in the August 31, 2012 correspondence. At that time, the SSC concluded that both control rules for the next three years would result in fishing mortality rates well below the natural mortality rate and a stock size that is well above the standard biomass target, thereby likely meeting ecosystem-based biomass targets for a forage species by default if not by design.

Based on analysis provided by the PDT and recommendations from the SSC, the Council selected the ***Preferred Alternative*** for ABC at its September 2012 meeting (Alternative 2, constant catch, Section 2.2.2.2). However, after further discussion and consideration of the Court Order and NMFS correspondence, the Council requested the SSC to consider two additional alternatives specifically developed based on harvest control strategies for other forage fish. The "Lenfest" and "Pacific" control rules were consequently forwarded to the SSC as additional alternatives for consideration in November 2012 (see description of these alternatives in Section 2.2.7 of this document).

The SSC evaluated these two additional ABC control rule alternatives in November 2012 and considered two different aspects: 1) the short-term catch advice, i.e., the 2013-2015 specifications, and 2) development of long-term control rules to address the issue of whether the increased natural mortality rate in the assessment fully captured all the ecosystem needs (including humans) related to forage species. Regarding the short-term catch advice, the SSC stated that it is difficult to address the Pacific control rule because the specific values of the cutoff, buffer, and fraction have not been specified for Atlantic herring. The SSC noted that the SSB expected in 2015 under either of the previously-reviewed alternatives is well above the targeted 40% unfished amount suggested in the Pacific control rule. Similarly, the ABC alternatives under consideration (75% F_{MSY} and constant catch) are broadly consistent with the biomass aspect of the Lenfest control rule (75% unfished) at currently estimated stock sizes and associated reference points. Thus, the SSC affirmed its original recommendations for specifying ABC for the 2013-2015 fishing years and concluded that these ABC control rules are broadly consistent with the intent of the two new control rules proposed for consideration by the Council.

The SSC noted that more analysis is needed to implement long-term harvest strategies like those suggested by the Lenfest and Pacific control rules and suggested that control rules for forage species should be part of a broader national workshop that involves the community that advises the Council system (see SSC Report in Appendix II). Further discussion by the Council indicated that due to uncertainties associated with adopting either of these approaches in the 2013-2015 herring fishery and the clear need for additional analysis, these alternatives are not likely to meet the purpose and need for this action, set forth in Section 1.1, i.e., to set ABC control rules for the Atlantic herring fishery management plan (FMP), and to set specifications (ACLs) for FY 2013-2015 consistent with the best available science and the requirements of the Herring FMP, while providing additional flexibility and promoting the full utilization of OY from the fishery. For the purposes of this specifications package, therefore, these two alternatives were considered but rejected. Additional evaluation/analysis of these two alternatives is provided in Section 2.2.7.1 of this document (p. 48). Although these alternatives will not be analyzed in this 2013-2015 specifications package (for reasons discussed above and throughout other relevant sections of this document), they may be revisited; both the Herring PDT and the SSC support further consideration of a long-term control rule for herring, perhaps forage-based, through a future action.

Following the full Herring PDT and SSC evaluation, the Council reviewed all information and recommendations, and it affirmed its ***Preferred Alternative*** for the 2013-2015 ABC specification. Once the ABC alternative was selected, the Council considered a range of options for management uncertainty (see Section 2.2.3) to determine the stockwide herring ACL for

2013-2015. The stockwide ACL is equivalent to the U.S. OY for the fishery and forms the basis for other specifications (DAH, DAP, etc.), as outlined in Section 1.2 of this document.

The proposed sub-ACLs and all of the non-preferred sub-ACL options for 2013-2015 were therefore developed based on the ***Preferred Alternative*** for ABC for 2013-2015. Final decisions on all herring fishery specifications for the 2013-2015 fishing years, as well as the accountability measures proposed in this document, were made based on complete analyses and public comment provided at the January 2013 Council meeting.

2.2.2 Alternatives for Specifying 2013-2015 Atlantic Herring OFL, ABC, and ABC Control Rule

The following subsections describe the alternatives considered by the Council for specifying the Atlantic herring overfishing level (OFL) and acceptable biological catch (ABC) for 2013-2015 and for establishing an ABC control rule. The Council's ***Preferred Alternative*** is Alternative 2, which is based on a constant catch approach for the 2013-2015 fishing years. Rationale and technical information supporting the ***Preferred Alternative*** are provided below. Additional analysis of the ABC alternatives can be found in Section 4.2.1 of this document (p. 164), as well as Appendix I and II (SSC Reports).

2.2.2.1 Alternative 1 – No Action

The no action alternative would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (Table 3).

Table 3 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.

2.2.2.2 Alternative 2 – Constant Catch (*Preferred Alternative*)

Alternative 2 is the Council's ***Preferred Alternative*** for specifying OFL and ABC for 2013-2015, selected at the September 2012 Council meeting (Table 4). This alternative 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 and is calculated under this alternative from a projection (based on SAW 54) that applies F_{MSY} in each of the three years but assumes that catch during each year is 114,000 mt, versus the actual catch associated with F_{MSY} in each year (which is applied under Alternative 3).

Table 4 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.

Rationale for Preferred Alternative: Several alternatives for ABC control rules were considered by the Council during the development of the 2013-2015 Atlantic herring fishery specifications. More detailed background discussion regarding the Council's consideration of ABC alternatives is provided in Section 2.2.1 of this document (p. 15).

The ***Preferred Alternative*** for specifying ABC for the herring fishery in 2013-2015 was reviewed/endorsed by the SSC at its September 2012 meeting and further discussed at the November 2012 SSC meeting. Section 2.2.1 of this document provides more detailed discussion of the process by which the ABC alternatives were developed and reviewed. The complete SSC reports can be found in Appendix I and II as well.

At the Council's request, the SSC considered ABC control rules for 2013-2015 that: maintain the 2012 ABC specification (Alternative 1, no action); apply a constant catch approach (Alternative 2, ***Preferred Alternative***); specify ABC based on catch associated with 75% F_{MSY} in all three years (Alternative 3, see below); and specify ABC based on harvest control rules for other forage fish (two additional alternatives). Ultimately, the SSC concluded that more analysis is needed to

develop and implement long-term harvest strategies for Atlantic herring similar to those suggested by the alternatives based on ABC control rules for other forage fish (see Section 2.2.7.1 for more information about these two alternatives). The SSC suggested that control rules for forage species should be part of a broader national workshop that involves the community that advises the Council system (see SSC Report in Appendix II).

Given the current condition of the Atlantic herring stock complex, the two control rules based on constant catch and 75% F_{MSY} (Alternatives 2 and 3) are expected to produce a total catch over the three years which is approximately the same (approximately 320,000 vs. 342,000 mt, see Section 4.2.1.1 of this document for more complete analysis). The SSC noted that there is a higher risk of overfishing in the first year associated with the 75% F_{MSY} control rule and a higher risk of overfishing in the second and third years associated with the constant catch control rule. However, the SSC could not find any scientific reason to prefer one of these control rules over the other and considered them to be comparable in terms of risk of overfishing, given the information available. All considerations led the SSC to conclude that either control rule can be applied for the next three years with low probability of overfishing or causing the stock to become overfished. The SSC recommended that the Council select either of these alternatives to specify ABC for the 2013-2015 fishing years.

The SSC considered a number of characteristics of the herring fishery and stock assessment before arriving at this decision regarding the ABC control rule for the 2013-2015 fishing years. The SSC did discuss the role of herring in the ecosystem and options for setting ecosystem-based ABCs, as requested by NMFS in the August 31, 2012 correspondence. At that time, the SSC concluded that both control rules for the next three years would result in fishing mortality rates well below the natural mortality (M) rate and a stock size that is well above the standard biomass target, thereby likely meeting ecosystem-based biomass targets for a forage species by default if not by design. The SSC also agreed with the Herring PDT conclusion that natural mortality and consumption of herring by predators has been addressed in the SAW 54 benchmark assessment to the extent possible. Addressing M in this manner seems appropriate given herrings role 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 stock assessment more thoroughly than assessments for other species in the Northeast Region.

The Herring PDT, SSC, and Council support the constant catch approach proposed in the ***Preferred Alternative*** for the 2013-2015 fishing years given the current (rebuilt) status of the Atlantic herring resource. Furthermore, the fishing industry generally supports a constant catch approach because it may allow for better business planning and more stability in the fishery during the upcoming years. The SSC and Council note that the constant catch of 114,000 mt for the next three years is not expected to be continued in perpetuity. Rather, alternative control rules will be considered either during the next fishery specifications process or a long-term harvest strategy could be developed through a more comprehensive management action (i.e., FMP amendment). This is discussed in more detail relative to the alternatives based on control rules for forage fish in Section 2.2.7.1 of this document.

This alternative was selected as the ***Preferred Alternative*** because the assessment of impacts on fishery-related businesses and communities (Section 4.2.1.5, p. 174) suggests that there may be more positive impacts on the herring fishery associated with this alternative than Alternative 3 (below). The analysis also indicates that there is no biological need to maintain the status quo and not allow the fishery to expand slightly over the next three years. Since the other alternatives are biologically equivalent (constant catch and 75% F_{MSY}), precluding any economic benefits that may be experienced under the 2013-2015 fishery specifications would not be justified. This alternative provides the greatest socio-economic benefit to the fishery within the biological constraints of the law and is supported more by the industry than Alternative 3.

During the development of the 2013-2015 Atlantic herring fishery specifications, the Council requested the SSC to specifically consider two additional alternatives based on harvest control strategies for other forage fish. The "Lenfest" and "Pacific" control rules were consequently forwarded to the SSC as additional alternatives for consideration in November 2012. The SSC evaluated these two additional ABC control rule alternatives and considered two different aspects: 1) the short-term catch advice, i.e., the 2013-2015 specifications, and 2) development of long-term control rules to address the issue of whether the increased natural mortality rate in the assessment fully captured all the ecosystem needs (including humans) related to forage species (see Section 2.2.1 on p. 15 of this document for additional discussion about the SSC's consideration of ABC alternatives). The SSC considered these alternatives, but recommend that the reference points and projections receive further evaluation prior to implementation as a long-term strategy for managing the Atlantic herring fishery (see SSC Report in Appendix II and Section 2.2.9.1 for additional discussion).

For these reasons, the Council determined that the specifications for 2013-2015 should be based on the constant catch approach for specifying ABC and the ABC control rule; all additional fishery specifications (DAH, DAP, ACL, sub-ACLs, etc.) proposed in this document are based on this ***Preferred Alternative*.** As previously noted, additional details regarding the Council's decision-making process and the development of the specifications are discussed in Section 2.2.1 of this document (p. 15).

2.2.2.3 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 88,000 mt in 2015 (the projected catch associated with fishing at 75% F_{MSY} – see Table 5).

Table 5 Alternative 3 (75% F_{MSY}) – 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, NEFSC 2012).*

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.

Analysis of this alternative and discussion of potential impacts are provided in Section 4.2.1 of this document.

2.2.3 Specification of Atlantic Herring Annual Catch Limit (ACL) for 2013-2015

The provisions in the Atlantic Herring FMP state that management uncertainty should be addressed and deductions should be made from the specified ABC prior to establishing the stockwide ACL (see discussion below as well as formulas presented in Section 1.2 of this document). For 2013-2015, the Council's specification of management uncertainty is therefore deducted from the ABC and included in the ***Preferred Alternative*** for ACL to derive the stockwide herring ACL.

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

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

The management uncertainty associated with state waters catch, herring discards, and Canadian catch is the level of uncertainty around the estimates of these sources of herring mortality.

Given the available information/data presented in this document, the Council proposes to deduct 6,200 mt from the ABC and included in the ***Preferred Alternative*** for the Atlantic herring ACL (107,800 mt) to account for management uncertainty associated with the potential catch of Atlantic herring in the NB weir fishery from 2013-2015. The proposed specification of management uncertainty is consistent with the Herring PDT's recommendations (see additional discussion and the Council's rationale for this recommendation below).

To account for management uncertainty associated with NB weir catch during 2013-2015, the Council considered a range of possible deductions, including:

- The 2010-2012 specification of management uncertainty (no action): 14,800 mt, which represents average 2+ landings from the 1999-2008 NB weir fishery when eliminating the highest and lowest year of the time series;
- A range of 3-year, 5-year, and 10-year average catch totals from the NB weir fishery (Table 6, shaded row represents Council recommendation).

Table 6 Range of Deductions Considered for Management Uncertainty

Option	Deduction (mt, rounded)
2010-2012 specification (no action)	14,800
3-year average NB weir catch (2009-2011)	6,200
5-year average NB weir catch (2007-2011)	11,200
10-year average NB weir catch (2002-2011)	12,400

Source: NEFSC (SAW 54 Assessment Report)

Additional Discussion/Rationale: An additional buffer established between the ABC, and the stockwide ACL is defined as management uncertainty. This is specified by the Council once the ABC is selected. The provisions in the Herring FMP state that management uncertainty should be addressed prior to establishing the stockwide ACL, and deductions should be made from ABC, if necessary, to account for management uncertainty. Once management uncertainty is deducted, the stockwide ACL specification represents the U.S. Optimum Yield (OY).

ABC – Management Uncertainty (determined by Council) = Stockwide ACL = OY

The three sources of management uncertainty considered by the Council (identified above) are discussed individually below; references to additional information in this document are provided as appropriate.

State Waters Catch: Information about recent catch of Atlantic herring in State waters is presented in Section 3.5.1.4 of this document. 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. Only 32 mt of herring was reported to be landed by non-Federally-permitted vessels in 2011. The Herring PDT reviewed state waters catch and agree that no additional deduction for management uncertainty related to state waters catch is necessary at this time, and the Council supports this recommendation.

Herring Discards: Information regarding discards of Atlantic herring by herring vessels is provided in Section 3.5.1.2 of this document. Discard estimates have been available since 1996 and generally represent less than 1% of herring landings. Discards are not considered to represent a significant source of herring mortality and were not factored into the SAW 54 assessment. The Herring PDT agrees that uncertainty related to estimating Atlantic herring discards is not likely to be a significant source of management uncertainty to address for the 2013-2015 fishery specifications, and the Council supports this recommendation. This is because increased observer coverage, combined with improved observer sampling in the Atlantic herring fishery, has improved bycatch accounting and reduced uncertainty associated with estimating herring discards in recent years. In 2010, the Northeast Fisheries Observer Program (NEFOP) revised the training curriculum for observers deployed on herring vessels to focus on effectively sampling in high-volume fisheries. NEFOP also developed a discard log to collect detailed information on discards in the herring fishery, such as why catch was discarded, the estimated amount of discarded catch, and the estimated composition of discarded catch. Moreover, management measures implemented through Amendment 5 will likely improve catch monitoring and the accuracy of herring discard estimates in future years.

Canadian Catch: The management uncertainty specification for 2013-2015 focuses on Canadian catch (New Brunswick (NB) weir fishery) because this catch is quite variable and is the only deduction that the Herring PDT and Council believe is necessary to address management uncertainty for the 2013-2015 fishing years. In September 2012, the Herring PDT noted that 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.

Section 3.5.3 on p. 142 of this document provides detailed information about the NB weir fishery. The NB weir fishery catch is quite variable and dropped to just under 6,500 mt in 2008 after a high of almost 31,000 mt in 2007 (see Table 58 on p. 144). Although variable, landings dropped as low as 3,711 in 2011. Table 59 on p. 145 provides the number of active weirs in the NB weir 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. While there appears to be a substantial amount of variability, there is no reason to expect a significant increase in catch from this fishery over the next three years, especially as effort appears to be decreasing over time. In the discussions that involved setting the stock wide ACL, the Council agreed that maintaining the current (2012) specification of 14,800 mt for management uncertainty associated with NB weir catch does not accurately reflect expected levels of catch from this fishery based on recent performance. In fact, the 2010-2012 specification of management uncertainty is outside of the range of average catch levels for the most recent ten-year time period. However, should the no action alternative for the stockwide ACL be chosen, the level of management uncertainty would also default to the no action level of 14,800 mt.

The Council will reconsider issues related to the specification of management uncertainty based on updated information during the next fishery specifications cycle. NMFS tracks herring catch from the NB weir fishery on a regular basis. Provisions in the Herring FMP allow the Council to revisit this specification during interim years as well, if the need arises.

2.2.3.1 Research Set-Asides (RSAs) for 2013-2015

Provisions in the Atlantic Herring FMP allow the Council to specify research set-asides (RSAs) and Fixed Gear Set-Asides (FGSAs, see Section 2.2.3.2) once the stockwide herring ACL is determined and catch is distributed among the four management areas (sub-ACLs). A range of RSAs for 2013-2015 from 0% (no action – 2010-2012 RSAs) to 3% of each management area sub-ACL was considered by the Council as part of the sub-ACL options presented in Section 2.2.3.1 of this document.

The Council proposes a **3% RSA** for all management areas for the 2013-2015 Atlantic herring fishery specifications. This would apply to the ***Preferred Alternative*** for distributing the stockwide ACL (Section 2.2.3.1, p. 24).

Discussion/Rationale: The RSA provisions were established in Amendment 1 (0-3% for any management area). The Council considered options to specify RSA for 2013-2015 and recommends a 3% set-aside of all management area sub-ACLs to support cooperative research during 2013-2015. Initially, the Council proposed to maintain the current 0% specification for RSAs (no action) for 2013-2015. However, stakeholder input and public comment during the specifications process identified the potential to advance industry-based bycatch avoidance through cooperative research. Correspondence from MA DMF (January 2013) requested consideration of a 3% RSA to potentially fund portside sampling efforts associated with the current SMAST/industry-based river herring bycatch avoidance program, in which portside

sampling plays a critical role in improving bycatch monitoring and avoidance. The Herring Advisory Panel supported a 3% RSA at its January 2013 meeting as well. The Council considered this input and agrees that a RSA for 2013-2015 may be helpful to support cooperative research focused on critical issues identified in Amendment 5 (see below). This action provides a direct link between the 2013-2015 fishery specifications and the management measures anticipated to be implemented through Amendment 5 to the Herring FMP (currently under review). The Council recognizes that because of timing, the RSAs will not be available for the 2013 fishing year.

If the AMs proposed in this specifications package are approved (Section 2.2.6.2, p. 41), the trigger for closing the directed fishery in all management areas would be 92%, after the RSAs are deducted from the 2014 and 2015 sub-ACLs. Consistent with the provisions in the Herring FMP, RSA that is not requested by researchers is re-allocated to the sub-ACL prior to the end of the fishing year from which it was allocated. RSA that is provided to a researcher but is not harvested (ex., bad weather, fish availability) is not re-allocated to the sub-ACL.

When developing its final recommendations for the 2013-2015 herring fishery specifications (January 2013), the Council has identified **river herring bycatch avoidance** and **portside sampling** as top priorities for cooperative research to be funded by herring RSA in 2014 and 2015.

Monitoring – through both at-sea and portside sampling – and avoidance are critical steps to better understand the nature and extent of bycatch in the fishery and work with the industry to minimize it to the extent practicable. The measures to be implemented in Amendment 5 promote cooperation with industry and acknowledge the need to better understand bycatch problems in order to develop effective solutions. Since 2010, midwater trawl vessels bottom trawl vessels targeting herring have participated in four river herring/shad (alosine) bycatch avoidance systems coordinated by SMAST and MA DMF. With enough information and clear, quick communication, areas for vessels to fish that contain adequate amounts of target species but not large amounts of alosines can be identified. This voluntary project, which has been joined by nearly every major participant in the herring and mackerel midwater trawl fleets, provides a mechanism to develop and implement the long-term strategies outlined in Amendment 5. However, current funding for this program will expire in June 2013. Coordinators of this project believe that there may be opportunities for further funding through a RSA program, so the request was made of the Council to consider RSA for 2013-2015.

Establishing a RSA for 2013-2015 with the top priorities identified by the Council is consistent with goals, objectives, and long-term management strategies to be implemented through Amendment 5. Moreover, there are indirect long-term benefits for the fishery and its participants if management is enhanced through improved information and cooperative research. A 3% RSA for the 2013-2015 fishing year encourages the industry to participate in the collection of scientific information and conduct research to reduce interactions with non-target species affected by the herring fishery. Long-term benefits can be expected for fishing-related businesses and communities from cooperative research programs that address these priorities.

2.2.3.2 Fixed Gear Set-Aside (FGSA) for 2013-2015

The Council proposes to maintain the current **295 mt** FGSA for fixed gear fishermen fishing in Area 1A west of Cutler, Maine as part of the specification of the Area 1A sub-ACL for the 2013-2015 fishing years.

Discussion/Rationale: 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. The purpose of the FGSA is to ensure that fixed gear fishermen fishing for herring west of Cutler, ME have access to the fishery if/when the fish move inshore. Depending on timing and fish availability, the sub-ACL in Area 1A may be fully utilized by other sectors of the fishery prior to opportunities for fixed gear fishing west of Cutler. The inability of the fixed gear sector to safely operate in other areas prompted the Council to establish this set-aside (based on historical catch) until November 1 of each fishing year. Unutilized fixed gear 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 Council considered a range of set-asides up to 500 mt for the 2013-2015 FGSA. The FGSA for Area 1A was reduced to 295 mt for the 2010-2012 specifications; rationale for this amount is based on the ACL/sub-ACL reductions that were effective during 2010-2012 (see the 2010-2012 Atlantic herring fishery specifications package). None of this set-aside was utilized during the 2012 fishing year, however, and all 295 mt was returned to the herring fishery on November 1, 2012. Even though herring catch could increase under the 2013-2015 fishery specifications and the proposed sub-ACL for Area 1A is higher than the 2012 sub-ACL, there does not appear to be a need to increase the FGSA above the 2012 level; the Council therefore recommends maintaining the 295 mt FGSA specification for the 2013-2015 fishing years (no action).

2.2.4 Management Area Sub-ACLs for 2013-2015

The Herring FMP requires that the total ACL (OY) be annually distributed as sub-ACLs among the four herring management areas (Figure 1, p. 2). The sub-ACL options considered by the Council for the 2013-2015 fishery specifications are based on the ***Preferred Alternative*** for the stockwide ACL, as described above (Section 2.2.3), which includes a 6,200 mt deduction to account for management uncertainty (6,200 mt, described in Section 2.2.3).

The Council's selected the ***Preferred Alternative*** for allocating sub-ACLs at its January 29-31, 2013 meeting. All options for sub-ACLs were considered based on the ***Preferred Alternatives*** for OFL/ABC, and the stockwide herring ACL, consistent with the provisions in the Herring FMP (see Table 7 below). The ***Preferred Alternative*** for specifying ABC was selected by the Council as the best approach to maximize the ability to achieve OY on a continuing basis, consistent with National Standard 1 (see additional discussion of the Council's rationale in Section 2.2.2.2 of this document).

Table 7 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 2.2.2.2, p. 18)*

The ***Preferred Alternative*** for specifying the 2013-2015 sub-ACLs is presented in Table 8 below. This option was selected by the New England Fishery Management Council at its January 29-31, 2013 meeting and falls within the range of options considered/analyzed in the draft 2013-2015 specifications document provided to the Council for consideration (non-preferred sub-ACL options are described in the following sub-sections). The analysis provided in Section 4.2.1.5 (*Impacts of OFL/ABC alternatives on Fishery-Related Businesses and Communities*) indicated that the impacts of the other alternatives for specifying OFL and ABC may be less positive than the ***Preferred Alternative*** because of the variable (and decreasing) fishing opportunities that may be provided under them. Since the stock is rebuilt and overfishing is not occurring, the Council determined that opportunities should be maximized for the fishery participants, within the constraints of the management program. The constant catch approach favored by the Council may allow for better business planning and more stability in the fishery during the upcoming years. For these reasons, it would not be reasonable for the Council to develop a range of sub-ACL options to consider under the non-preferred OFL/ABC alternatives, as these alternatives have been deemed to be less favorable for the fishery.

Table 8 Proposed Sub-ACLs (mt) for 2013-2015 (*Preferred Alternative*)

	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	**31,200**
Sub-ACL Area 1B	4,362	**4,600**
Sub-ACL Area 2	22,146	**30,000**
Sub-ACL Area 3	38,146	**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, Pending Framework 2 Approval)

If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1.2 of this document), then the following seasonal splits would apply during the 2014 and 2015 fishing years:

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

Sub-ACL Carryover Provisions for 2014 and 2015 (Pending Framework 2 Approval)

- 2014: No sub-ACL carryover would be allowed if the stockwide ACL was exceeded in 2012 (2012 year-end catch totals not yet available, but stockwide ACL appears to have been exceeded based on in-season monitoring methods – see Section 3.5.1.2.2)
- 2015: Up to 10% of each 2014 sub-ACL could be carried over to the corresponding management area if the 2014 stockwide ACL is not exceeded; if there is any sub-ACL carryover, the 2015 stockwide ACL would remain the same.

Discussion/Rationale: Consistent with the goals and objectives of the herring management program, the sub-ACL analysis presented in Section 4.2.2.1 of this document (p. 177) compares and evaluates each option under consideration with respect to potential impacts on the individual herring stock components (inshore/offshore). The results suggest that none of the sub-ACL options considered by the Council, including the ***Preferred Alternative***, are likely to substantially impact one stock component more than the other. Sub-ACLs should therefore be allocated in a way that maximizes opportunities for the fishery to achieve OY during the 2013-2015 fishing years, while preventing overfishing and achieving other FMP objectives.

During the development of the herring fishery specifications, the Council sought input from the fishing industry and the Herring Advisory Panel (AP) regarding how to most effectively allocate the stockwide ACL among the four management areas for 2013-2015. The ***Preferred Alternative*** described above was developed by members of the Herring AP present at the January 16, 2013 meeting; almost all advisors present at the meeting expressed support for this option, and it was selected by the Council as the ***Preferred Alternative*** at its January 2013 meeting. It falls within the range of options that were analyzed in the Draft 2013-2015 Herring specifications document.

This option was selected by the New England Fishery Management Council at its January 29-31, 2013 meeting and falls within the range of options considered/analyzed in the draft 2013-2015 specifications document provided to the Council for consideration (non-preferred sub-ACL options are described in the following sub-sections). The analysis provided in Section 4.2.1.5 (*Impacts of OFL/ABC alternatives on Fishery-Related Businesses and Communities*) indicated that the impacts of the other alternatives for specifying OFL and ABC may be less positive than the ***Preferred Alternative*** because of the variable (and decreasing) fishing opportunities that may be provided under them. Since the stock is rebuilt and overfishing is not occurring, the Council determined that opportunities should be maximized for the fishery participants, within the constraints of the management program. The constant catch approach favored by the Council may allow for better business planning and more stability in the fishery during the upcoming years. For these reasons, it would not be reasonable for the Council to develop a range of sub-ACL options to consider under the non-preferred OFL/ABC alternatives, as these alternatives have been deemed to be less favorable for the fishery.

If provisions for allowing sub-ACL splitting are approved in Framework 2 (Section 2.1.1, p. 10), the 2013-2015 herring specifications would include a seasonal split of the sub-ACLs in Areas 1A and 1B. The proposed sub-ACL splits are intended to 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. This may allow the fishery to maximize opportunities when market conditions may be more favorable. The seasonal split proposed for Area 1A was already authorized by Framework 1 and has been effective for years (through ASMFC days out restrictions) but would be implemented formally in the 2013-2015 specifications. The seasonal split for Area 1B would delay fishing activity in this area until May. The Area 1B sub-ACL is relatively small, and overages have been observed in recent years (see Section 3.5.1.2); the proposed split in Area 1B is intended, in part, to address this problem. Delaying the fishery in 1B until May could allow sufficient time for overage or carryover determinations (if approved in Framework 2), so the

industry may be better able to harvest within the sub-ACL. Additional discussion can be found in Section 4.2.2.5 of this document.

Although not recommended by the Council for 2014 and 2015, an Area 2 split of 67% January-February and 33% March-December was considered by the Council. Seasonal splits of sub-ACLs were initially recommended in November 2012 by the Herring AP and Committee due to concerns about the fishery in Area 2 and the potential for the herring sub-ACL to preclude the Atlantic mackerel fishery (NEFMC 2012a). The seasonal split proposed for Area 2 may have ensured herring availability later in the year. However, after developing the sub-ACL options and discussing this issue further, the industry, through representatives on the Herring AP and at the Council meeting, suggested that increasing the sub-ACL and allowing the fleet to operate in Area 2 based on market conditions and fish availability would be more preferable. Both herring and mackerel availability in this area occur during the winter and can be quite variable, and an early-year split like the one proposed for Area 2 could preclude the fleet from optimizing these fisheries. For these reasons, the Council proposes an 8,000 mt increase in the Area 2 sub-ACL without a seasonal split.

2.2.4.1 Option 1 – No Action (Non-Preferred)

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

Table 9 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.*

2.2.4.2 Option 2 (Non-Preferred)

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 10 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.

2.2.4.3 Option 3 (Non-Preferred)

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 11 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.

2.2.4.4 Option 4 (Non-Preferred)

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 12 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.

2.2.4.5 Option 5 (Non-Preferred)

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 13 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.

2.2.4.6 Option 6 (Non-Preferred)

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 14 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.

2.2.5 Other 2013-2015 Fishery Specifications

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

Specifications for DAH and DAP are derived from formulas that are applied once the stockwide ACL/OY is determined, based on the process outlined in the Herring FMP and the definitions/formulas provided in Section 1.2 of this document (p. 7). Adjustments to the BT and USAP specifications were considered by the Council based on a review of updated information available since the 2010-2012 specifications; the Council determined that no changes to these specifications are necessary at this time.

2.2.5.1 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*** for specifying ABC in Section 2.2.2.2). Domestic annual harvest (DAH) is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year.

OY = DAH

Discussion/Rationale: 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 15). 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 15 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).*

2.2.5.2 Domestic Annual Processing (DAP)

Based on the formulas provided in Section 1.2 of this document, DAP is proposed to be set equal DAH minus 4,000 mt for BT during the 2013-2015 fishing years (**103,800 mt**).

Discussion/Rationale: 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.

2.2.5.3 Border Transfer (BT)

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

Discussion/Rationale: Specification of BT is for Atlantic herring transshipment to Canada to be processed as sardines and has remained at 4,000 mt since the implementation of the Herring FMP. There was no change this specification for the 2010-2012 fishing years, and the Council sees no need to change this for the 2013-2015 fishing years. Table 16 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 16 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*

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

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

Discussion/Rationale: 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.

2.2.6 Alternatives for Accountability Measures

One of the issues recommended by NMFS to be addressed within the 2013-2015 Atlantic herring specifications is reconsideration of existing Atlantic herring AMs (see Section 1.0 for more information about the Amendment 4 Court Order). Consistent with this recommendation, the Council considered a range of alternatives to modify existing accountability measures for the herring fishery as part of the 2013-2015 specifications package. The Council's ***Preferred Alternative*** is described under Alternative 2 below.

Note that the existing AM associated with the haddock catch cap is described in the no action alternative (AM Alternative 1, Section 2.2.6.1) and will remain effective under the ***Preferred Alternative***. This is because the haddock catch cap is a sub-ACL specified by the Multispecies FMP, consistent with provisions in Frameworks 43 and 46. No changes to the provisions associated with the haddock sub-ACL are proposed in this document.

2.2.6.1 AM 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. Under this AM, there is currently no trigger for the stockwide ACL, which would close the directed herring fishery in all management areas.

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.

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.

2.2.6.2 AM Alternative 2 (*Preferred Alternative*)

The ***Preferred Alternative*** proposes to modify the current AM for closing the directed herring fishery in a management area (sub-ACL) and establish a percentage trigger for closing the directed herring fishery in all management areas (stockwide ACL). This alternative maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions. Under the ***Preferred Alternative***, the following accountability measures would apply (described in Table 17):

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.

   In addition, a trigger would be established for closing the directed herring fishery in all management areas. The trigger for closing the directed herring fishery in all management areas would be 95% of the stockwide Atlantic herring 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.

2. The AM to require an ACL/sub-ACL overage deduction would continue to be based on year-end catch estimation methods (status quo, one-year lag, see Section 3.5.1.2.1.2 on p. 115 for a description of these methods). The herring fishery can be active during the entire fishing year (January to December), and herring catch data are not finalized until halfway through the following year. Typically, quality control checks on herring catch data are completed in February, observer data are finalized in May, and dealer data are finalized in June. The overage deduction would then be made effective the year following the interim year. These methods would also be utilized to determine underages/carryovers if provisions proposed in Framework 2 are approved (Section 2.1.2).

The ***Preferred Alternative*** was analyzed as part of AM Alternative 2 (Section 2.2.6.2, p. 41) and falls within the range of alternatives that the Council considered when selecting final measures.

Table 17 Preferred Alternative for AMs

AM	Description
Trigger for Directed Fishery Closure	• Adjust the existing AM to require the directed herring fishery in a management area to close when catch is projected to reach **92%** (not including RSAs) of a sub-ACL; the remaining 8% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits. • Establish provisions to close the directed herring fishery in all management areas when catch is projected to reach 95% of the stockwide herring ACL; the remaining 5% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits.
Overage Payback	Status quo

**If provisions to allow carryovers are approved in Framework 2 (Section 2.1.2.2), ACL/sub-ACL overages and underages would be determined, and deductions/carryovers would be applied based on the same methodology ("year-end catch estimation," one year lag, see Section 3.5.1.2.1.2).*

Rationale for Preferred Alternative: Accountability measures are required under the Magnuson-Stevens Act and are intended to prevent the stockwide Atlantic herring ACL and management area sub-ACLs from being exceeded during the fishing year, as well as improve the likelihood that the total ACL (OY) can be caught on a continuing basis while preventing overfishing. AMs can address management uncertainty, including uncertainty in quantifying catch and monitoring the quota on a real-time basis, as well as the ability of managers to constrain catch in order to avoid ACL overages. The ***Preferred Alternative*** for AMs in the herring fishery is intended, in part, to address management uncertainty, including the ability of managers to constrain catch in order to avoid ACL overages and uncertainty in quantifying catch. In addition to allowing for incidental catch of herring, the stock-wide ACL/sub-ACL buffers associated with the preferred alternative (resulting from using a 92% trigger) would help account for the uncertainty in closure forecasts resulting from variable catch rates and late/missing catch reports.

NMFS' Guidelines state that AMs are management measures implemented for stocks so 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.

NMFS Guidelines also state that if catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness. Catch information presented in Section 3.5.1.2 of this document suggests that the first total herring ACL overage was likely experienced in 2012 (based on preliminary data), though several sub-ACL overages have been observed in prior years (Table 41 and Table 42). The 2013-2015 herring fishery specifications process served as a timely vehicle for reviewing and modifying the current suite of AMs for the fishery, especially in light of upcoming measures to be implemented in the Amendment 5 catch monitoring program. An alternative and more conservative suite of AMs for this fishery may provide greater assurance that catch will remain under the overfishing limit and the acceptable biological catch recommended by the SSC. The Council is therefore proposing modifications to the current AMs and supports the Preferred Alternative because it is the most conservative alternative under consideration and therefore has the greatest likelihood of preventing sub-ACL and ACL overages.

The current AMs for the Atlantic herring fishery (described in Section 2.2.6.1 under the no action alternative) include in-season measures (sub-ACL trigger) designed to prevent the total ACL from being exceeded and year-end measures designed to mitigate sub-ACL and ACL overages as soon as possible (overage paybacks). However, there is no in-season AM in the Herring FMP to minimize the risk of exceeding the stockwide ACL for herring, i.e., no trigger (% of stockwide ACL) for closing all management areas to directed herring fishing. The ***Preferred Alternative*** for AMs establishes this in-season trigger for the stockwide ACL (95%). This AM is intended to minimize the risk of exceeding the stockwide ACL, consistent with the requirements of the MSA and National Standard Guidelines.

Dividing the stockwide Atlantic herring ACL into smaller portions that are attributed to specific management areas (sub-ACLs) further assures that the risk of overfishing is minimized and provides extra precaution because the sub-ACLs are also subject to in-season AMs before the total ACL is fully utilized. In addition to allowing for incidental catch of herring (and therefore minimizing bycatch after the directed fishery closes), the stockwide ACL/sub-ACL buffers are intended to help account for the uncertainty in NMFS' closure forecasts resulting from variable catch rates, late/missing catch reports, and other quota monitoring challenges.

During the development of this management action, the Council considered measures in this alternative that would have modified the AM for overage deductions. The modification (originally considered as part of Alternative 2) would have required a direct deduction of a sub-ACL or ACL overage in the following fishing year (versus the current one-year lag). The process for determining overages (and underages, if carryover provisions are approved in Framework 2) would have been based on "in-season" catch estimation (week ending December 31 of the fishing year, described in Section 3.5.1.2.1.1 on p. 114) and would have applied to both sub-ACLs and the stockwide ACL for herring in the following fishing year (versus the current one-year lag based on "year-end" catch estimation methods).

However, through formal comments to the Council regarding the selection of AMs for the herring fishery, NMFS indicated that the interim year currently included in the overage deduction AM is necessary because the herring fishery can be active during the entire fishing year (January to December), and herring catch data are not finalized until halfway through the interim year. Typically, quality control checks on herring catch data are completed in February, observer data are finalized in May, and dealer data are finalized in June. Depending on when or if possession limits are implemented in the management areas, relying on data as of December 31 may exclude late vessel trip reports or dealer reports (most late reports are submitted within two weeks). If data through mid-January were considered in the final accounting, any overage deductions (and/or carryovers) would not be effective until at least March because of the time needed for proposed and final rulemaking on overage/underage determinations. Implementing deductions in March for management areas that can be intensely fished in January and February, like Area 1B and Area 2, would not be reasonable and could be problematic. For these reasons, the Council recommends that the current process for determining overages should be maintained, especially if provisions to authorize carryovers are approved in Framework 2 (see Section 2.1.2 of this document). It is critical that overage and underage determinations be based on a consistent methodology for estimating total catch and the most complete catch information for the fishing year.

2.2.6.3 AM Alternative 3 (Non-Preferred)

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 18 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).

2.2.6.4 AM Alternative 4 (Non-Preferred)

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 19 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).

2.2.7 Alternatives Considered but Rejected

Consistent with the court order and guidance from NMFS (see Section 1.0 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 January 29-31, 2013 meeting. The alternatives that were eliminated from further consideration were deemed by the Council not to meet the purpose and need for this action. The alternatives considered but rejected 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, fishery specifications package). In some cases, details and preliminary analyses have already been provided, laying the groundwork for reconsideration of these measures in the future.

2.2.7.1 Additional Alternatives for ABC Control Rule

During the development of the 2013-2015 Atlantic herring fishery specifications, the Council requested the SSC to specifically consider two additional alternatives based on harvest control strategies for other forage fish. The "Lenfest" and "Pacific" control rules were consequently forwarded to the SSC as additional alternatives for consideration in November 2012. The SSC evaluated these two additional ABC control rule alternatives and considered two different aspects: 1) the short-term catch advice, i.e., the 2013-2015 specifications, and 2) development of long-term control rules to address the issue of whether the increased natural mortality rate in the assessment fully captured all the ecosystem needs (including humans) related to forage species (see Section 2.2.1 on p. 15 of this document for additional discussion about the SSC's consideration of ABC alternatives).

"Lenfest Control Rule"

This alternative is generally based on the harvest control rule developed by the Lenfest Forage Fish Task Force (addressed in more detail by the SSC, see Appendix I and II). 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 20).

Table 20 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, NEFSC 2012).*

Under this alternative, the ABC Control Rule would specify ABC annually for 2013-2015 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.

"Pacific Control Rule"

This alternative is based on a harvest control rule used by the Pacific Fishery Management Council for forage fish (addressed in detail by the SSC, see Appendix I and II). 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 21).

Table 21 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, NEFSC 2012).*

Under this alternative, the ABC Control Rule would specify ABC annually for 2013-2015 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, 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% $F_{MSY.}$

Discussion

The SSC considered these alternatives, but recommend that the reference points and projections receive further evaluation prior to implementation as a long-term strategy for managing the Atlantic herring fishery (see SSC Report in Appendix II). For this reason, these alternatives cannot be implemented in the 2013-2015 specifications package.

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. The second alternative is based on a harvest control rule used by the Pacific Fishery Management Council for forage fish. This approach is similar to the 75% F_{MSY} approach (Alternative 3, Section 2.2.2.3) in that it suggests 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, would be set more conservative than 75% F_{MSY} based on scientific uncertainty and a "fraction" (additional buffer) to account for forage/ecosystem considerations. The F rate discussed relative to this alternative was 50% $F_{MSY.}$

The Herring PDT noted that the reference points for both harvest control rules considered but rejected are derived based on assessments that utilize a static natural mortality rate (M) and, consequently, are traditional MSY-based reference points. In SAW 54, a time-varying M was utilized in the Atlantic herring assessment, based on an apparent increase in predatory consumption in recent years. This approach yields very different reference points than a constant M approach. The suggested reference points and control rules from the alternatives described above are largely premised on the Pikitch et al. (2012) and Smith et al. (2011) manuscripts. In summary, these manuscripts conclude that, based on ecosystem models, forage species like Atlantic herring should be exploited less than is suggested by conventional single species assessment estimates of F_{MSY}. For example, a suggested fishing mortality reference point to consider is $0.5F_{MSY}$ (50% F_{MSY}). Pikitch et al. (2012) and Smith et al. (2011), however, did not allow for the conventional single species assessments to include time varying natural mortality (M), as with the recent Atlantic herring assessment. Consequently, the conclusions and suggested reference points, such as $0.5F_{MSY}$ may not be applicable to Atlantic herring, particularly given the current status of the stock and the use of time-varying M in the assessment to account for predator removals.

Although the calculations to determine the MSY reference points are similar between an assessment with time-invariant (constant M) and one with time-varying M, the subsequent reference points will differ. For example, F_{MSY} from the base Atlantic herring assessment model was 0.27, but F_{MSY} from a modified base model with constant M was 0.41 (Table 22). The F reference point of $0.5F_{MSY}$ from the constant M assessment run equaled 0.21, which is nearly equal to the F reference point of $0.75F_{MSY}$ from the base assessment model and commonly applied in the northeast (Table 22). Thus, the application of control rules or reference points in the alternatives above *may* not be necessary if assessments include time-varying M because the allowance of time varying M affects the reference points in ways not considered by Pikitch et al. (2012) and Smith et al. (2011). Furthermore, Smith et al. (2011) recommended *not* using their suggested reference points for tactical management decisions.

Table 22 Reference Points at time-varying M and constant M

	BASE	"ConstantM"
Fmsy	0.27	0.41
0.5Fmsy	0.14	**0.21**
0.75Fmsy	**0.20**	0.31
SSBmsy	157357	236428
MSY	52589	121580
SSBo	476445	1080930
Steepness	0.53	0.84

Base = current time-varying M; constant M is based off EarthJustice recommendations.
Source: NEFSC

Although the reference points between the two approaches outlined in the alternatives above are similar, they remain very different control rules, and whether or not the catches at a given level of population abundance are similar will depend on the control rule applied and the specification of other reference points (e.g., CUTOFF in the Pacific Council alternative). Consequently, broader conclusions about the relative performance of reference points and control rules are best made within the context of a simulation or a management strategy evaluation approach. Further exploration is needed to conduct more relevant analyses. The Herring PDT expressed concern about adopting either control rule in the 2013-2015 specifications package, as it represents a significant change in management strategy. Also, it is unclear at this time whether these approaches can be effectively applied to the Atlantic herring fishery without specific consideration of the differing biological, physical, and ecological environments.

The SSC agreed with the Herring PDT and suggested that the Council consider how to manage this resource over the long-term, i.e., as a typical fishery with MSY-based reference points, or at a reduced fishing rate and higher stock size to account for its role in the ecosystem. A control rule which could be set for more than three years would need to consider a wide range of possible stock conditions and have a known objective. The Herring PDT noted that reference points and projections required under a new harvest control strategy should be developed through a scientific assessment and peer-reviewed before adopted for the long-term management of the fishery. The alternatives considered in this document may be re-evaluated by the Council, in the context of the Council's objectives for the management of this resource and the herring fishery. A change in management approach should include evaluation of a full range of alternatives (including reference points) to be adopted in a harvest control rule for the Atlantic herring fishery. A more applicable solution for the long term will require additional analyses for the appropriate multiple reference points and should be evaluated in a full amendment to the Herring FMP.

2.2.7.2 Additional Alternatives for Accountability Measures (AMs)

There were two AM alternatives that the Council considered but rejected during the development of the 2013-2015 specifications package, which are described below.

AM for In-Season Adjustments

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

Similar to a measure considered in Amendment 4, the Council considered an alternative that 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 the Atlantic herring fishery 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 for 2013-2015.

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 23 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 23 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.

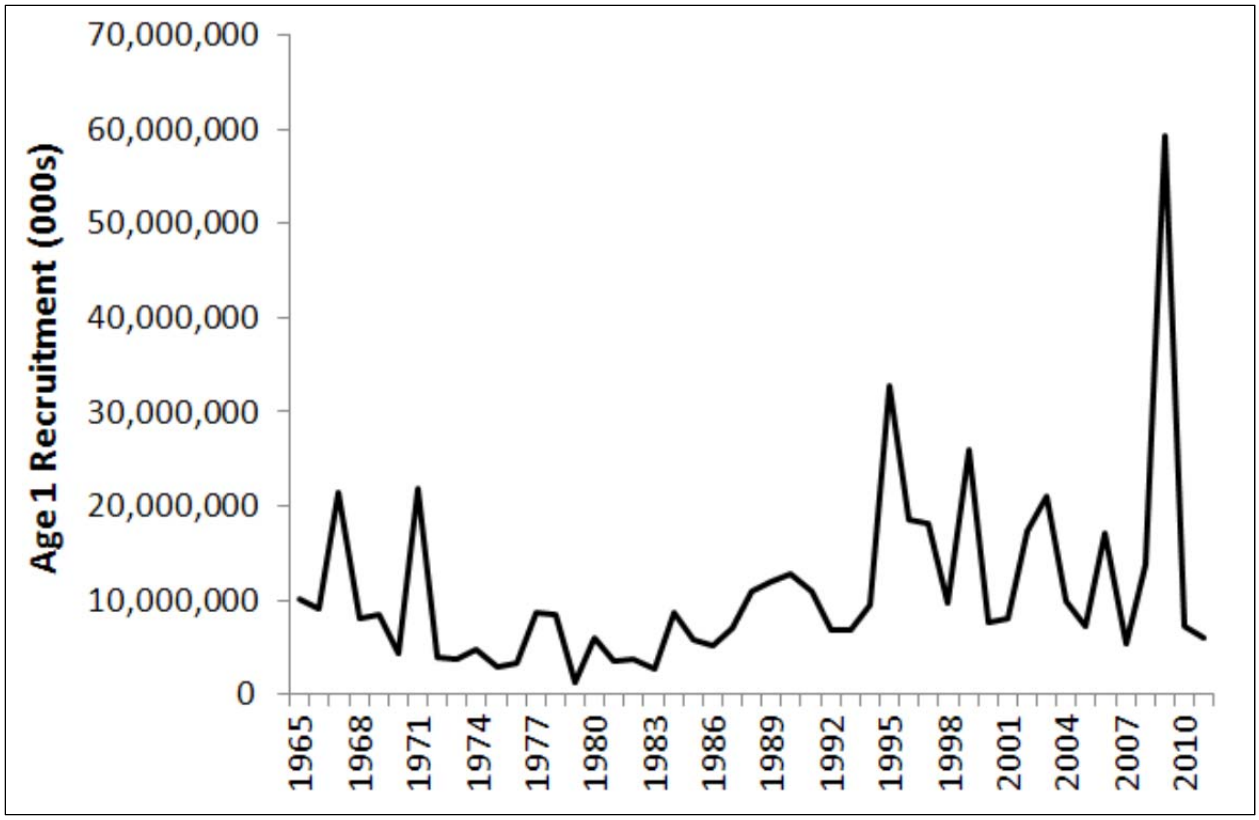
The Herring PDT reviewed the SAW 54 Assessment and discussed assumptions about natural mortality (M) and changes made in the assessment model. The PDT agrees that natural mortality and consumption of herring by predators has been addressed in this assessment to the extent possible. Addressing M in this 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 I 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 2). 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 2 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 24).

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 25), 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 3). 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 24 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 25 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									

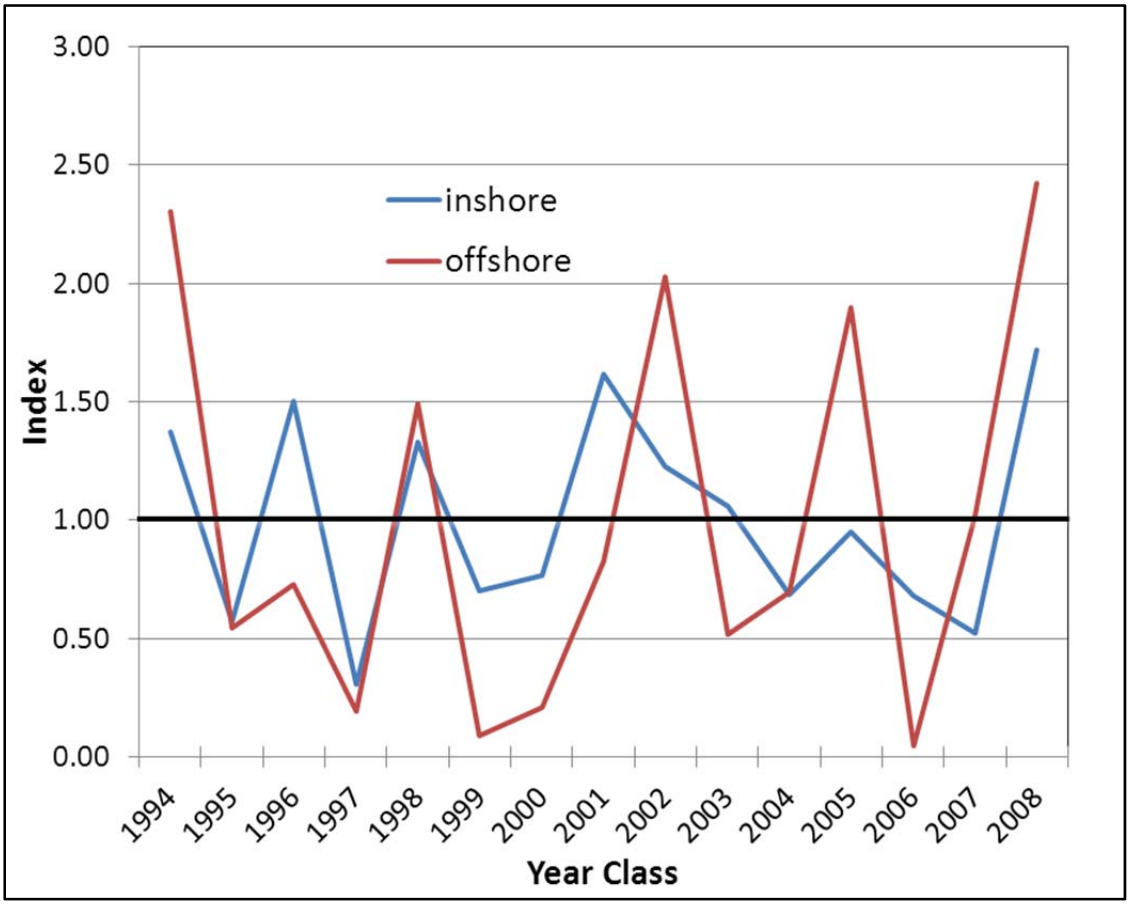
Source: ME DMR

(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 3 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

"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 Atlantic 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.

Non-Target Species: Information from Observer Data

Table 26 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 26 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 data 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

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 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 27). 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 28). 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 27 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 28 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 have been made publicly available by NMFS. 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. No update on the listing determination was available at the time of this writing.

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 29). 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 29 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 30). Most of the Tier 1 mackerel vessels also hold limited access directed herring permits.

Table 30 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

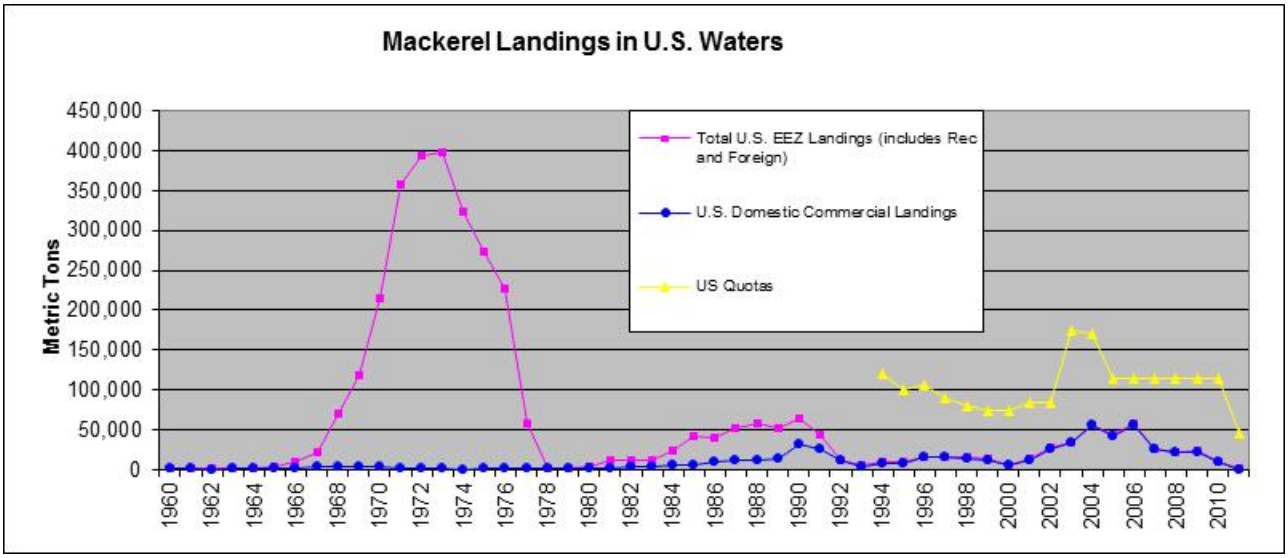
The status of mackerel is currently “unknown” with respect to both fishing mortality rates and stock size. The mackerel stock was last assessed in 2010 (utilizing data through 2008) via a joint U.S. – Canadian Transboundary Resource Assessment Committee (TRAC). The TRAC was unable to resolve uncertainties 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

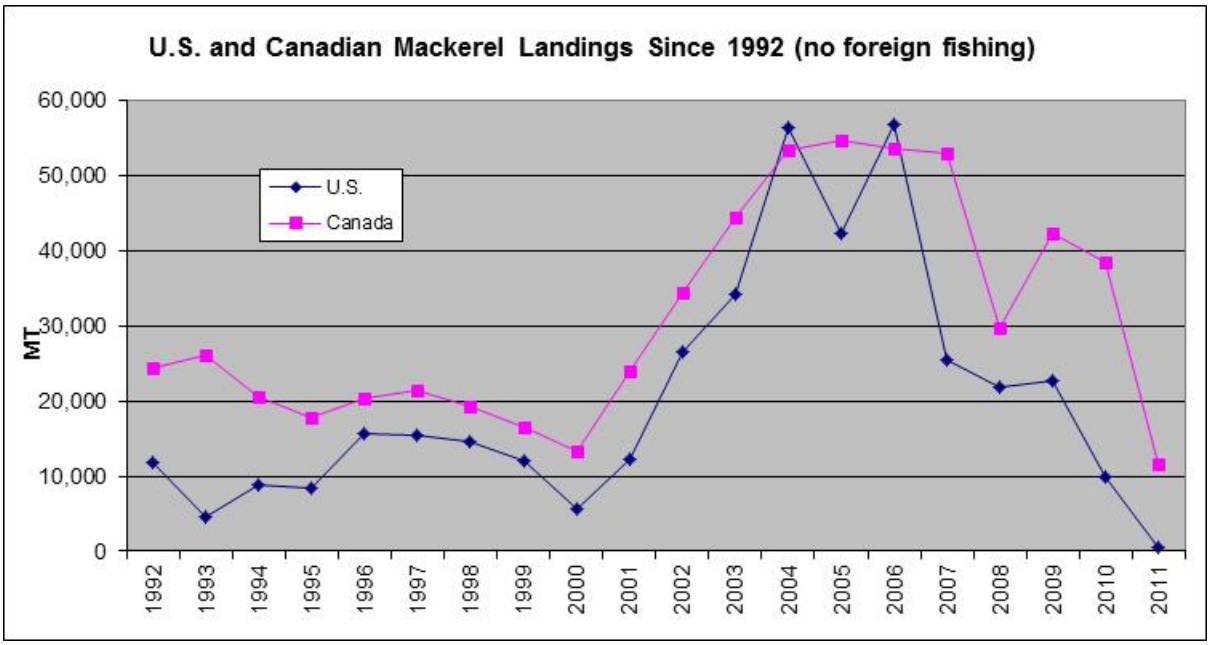
As Figure 4 and Figure 5 illustrate, catch in the fishery has varied substantially in the past 50 years. In the 1970s, foreign vessels came close to landing 400,000 mt of mackerel. In the early 1980s very little mackerel was caught, but by 1990 domestic boats were catching over 25,000 mt. Landings were 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 5.

Figure 4 Atlantic Mackerel Landings Within 200 Miles of the US Coast (2011 Preliminary)



Source: TRAC 2010, unpublished NEFSC dealer reports

Figure 5 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 31 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 32). 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 31 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 32 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.

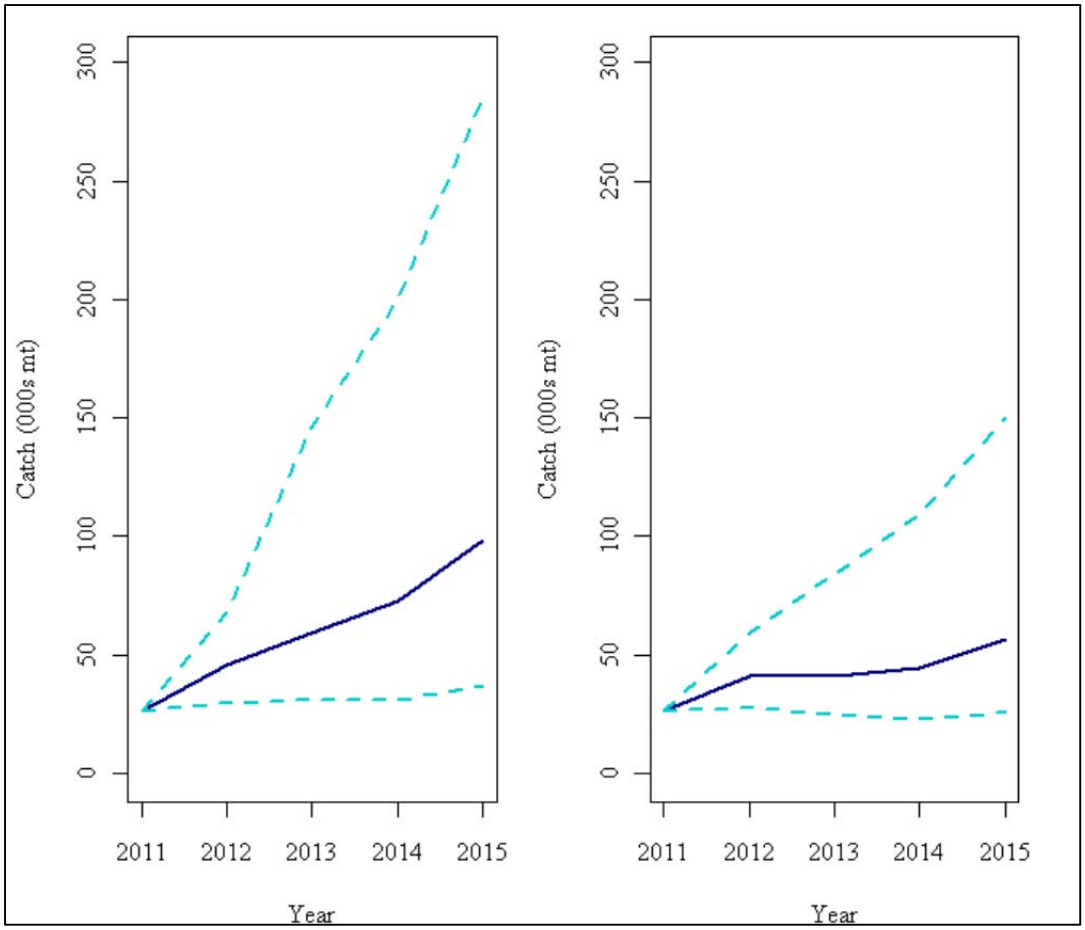
Haddock Stock Status/Landings

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.

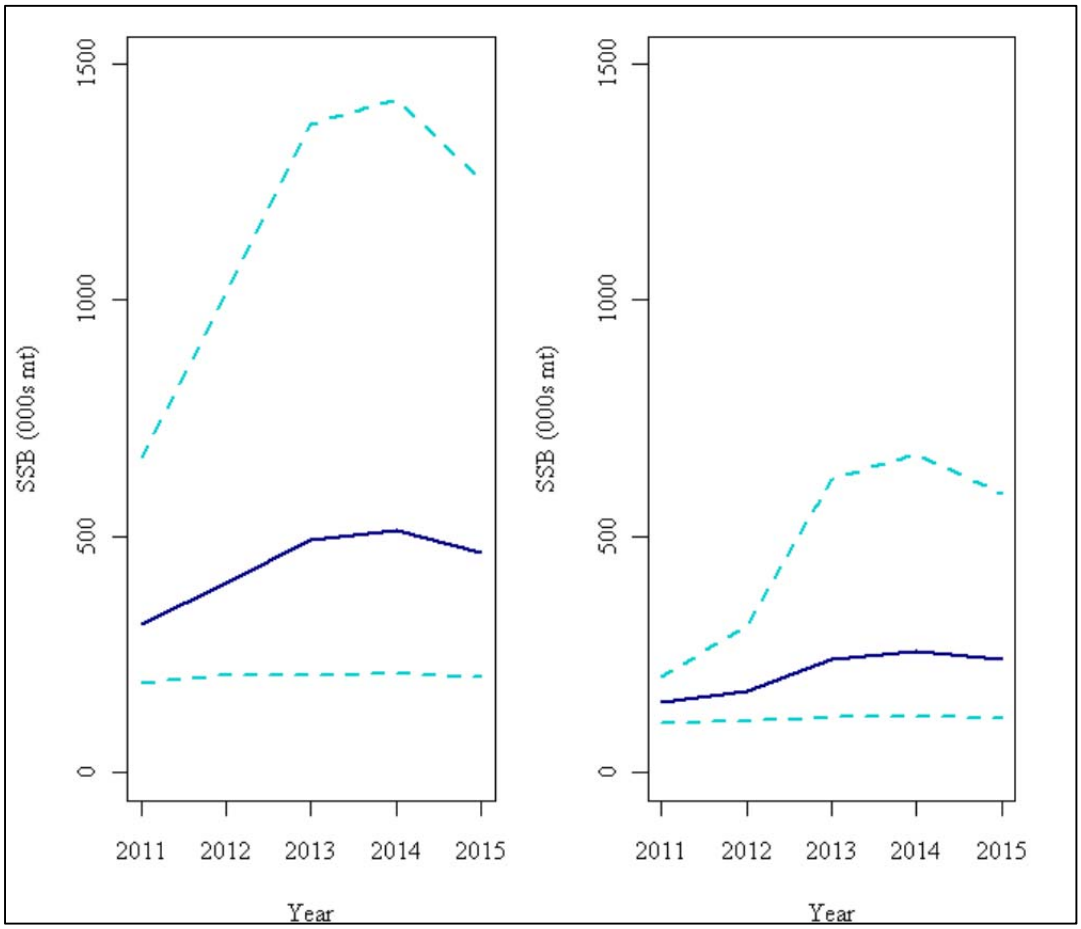
In the most recent groundfish assessment updates (2012), the Georges Bank haddock stock is still considered rebuilt, thus no rebuilding projections were made. However, a projection was made to estimate catch and stock levels from 2011-2015. In this projection, catch in 2011 was assumed to be at the same 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 6. 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 7).

Figure 6 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 7 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).

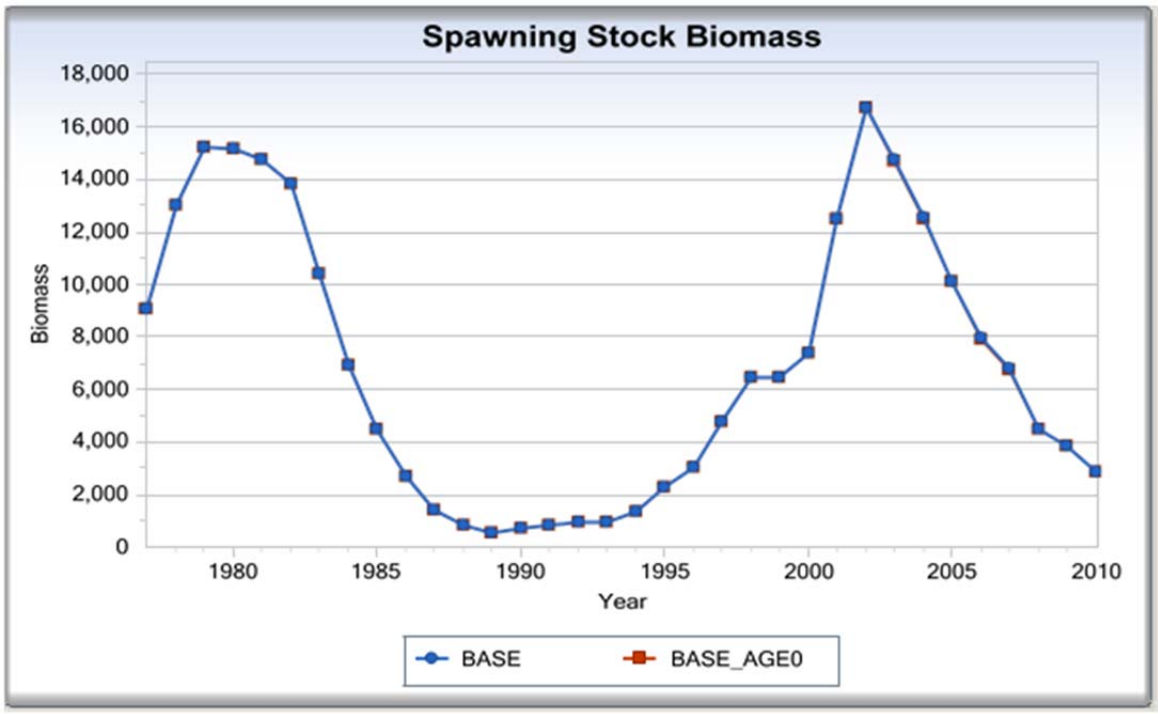
The GB haddock stock is a transboundary resource, which is co-managed with Canada. Substantial declines have recently occurred in the weights at age due to slower than average growth, particularly of the 2003 year-class. This is affecting productivity in the short-term. The growth of subsequent year-classes 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 8). 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 8). 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 8 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 8 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 33). 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 33 and Table 34 summarize 13 groundfish stocks based on GARM III results. Table 33 provides the estimates regarding biomass projections, and Table 34 provides the estimates regarding fishing mortality.

Table 33 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 34 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

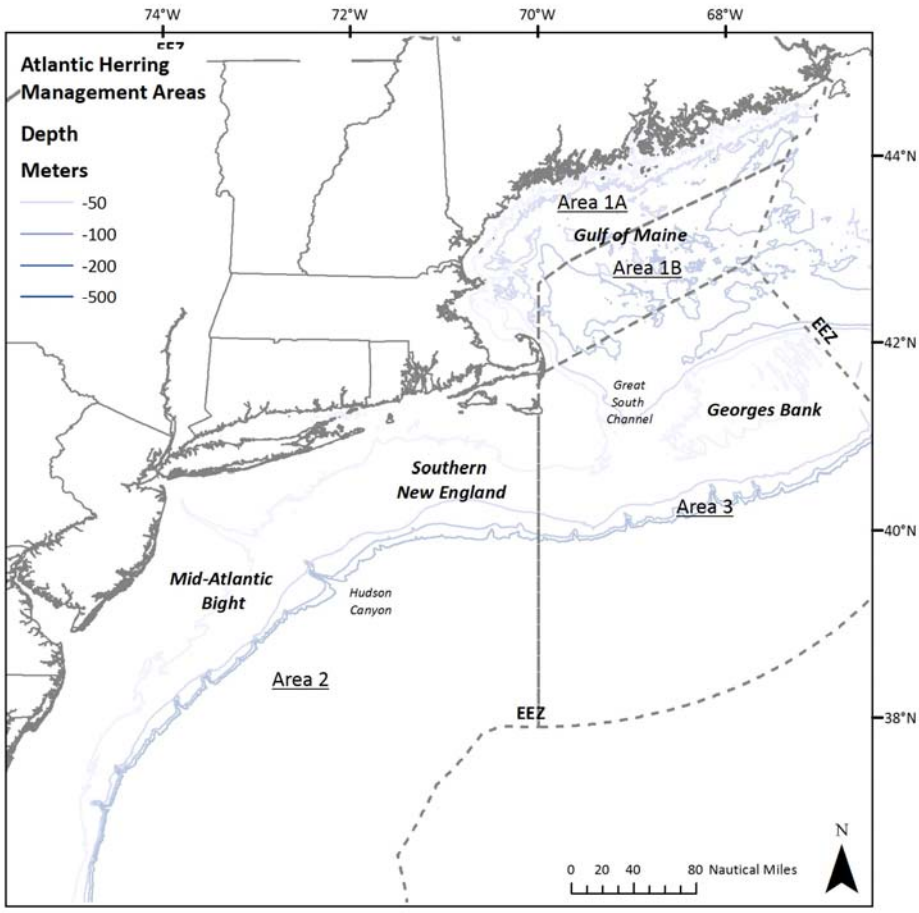
Note the fishing mortality and comparisons between GARM III and groundfish updates, which were provided during peer-review.

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 9). 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 9 Atlantic Herring Management Areas and the Northeast U.S. Shelf Ecosystem



3.3.2 Essential Fish Habitat (EFH)

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 (Sections 4.2.1.3, EFH impacts of Framework 2 alternatives, and 4.2.2.3, EFH impacts of specifications). However, changes in the magnitude of fishing effort as a result of individual measures 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 FEIS 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. 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.

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 10 through Figure 13 and in Table 35 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 10. 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 11. 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 12. 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 13. 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 13. 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 35, according to life history stage. The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

Table 35 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 10 EFH Designation for Atlantic Herring Eggs

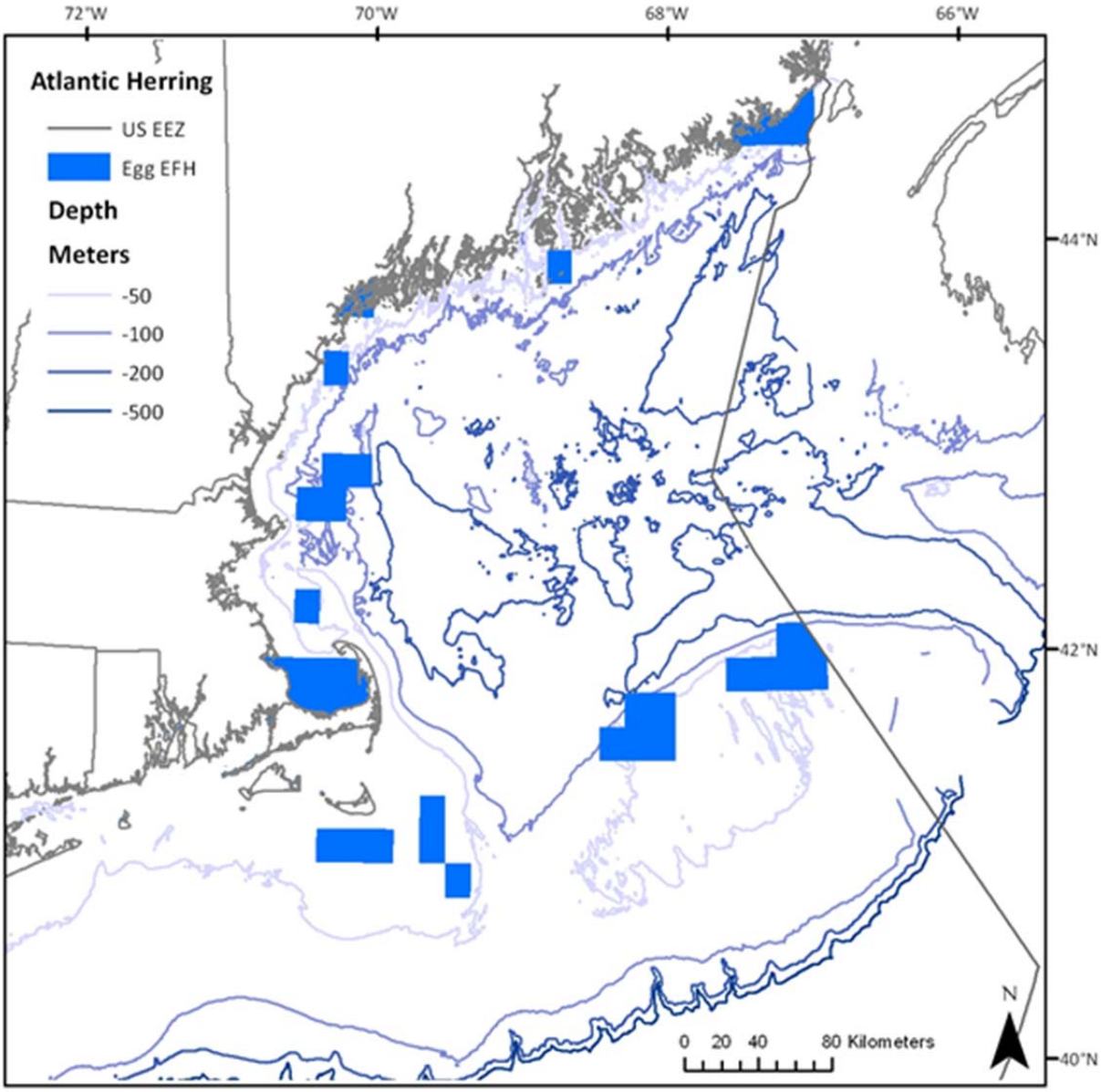


Figure 11 EFH Designation for Atlantic Herring Larvae

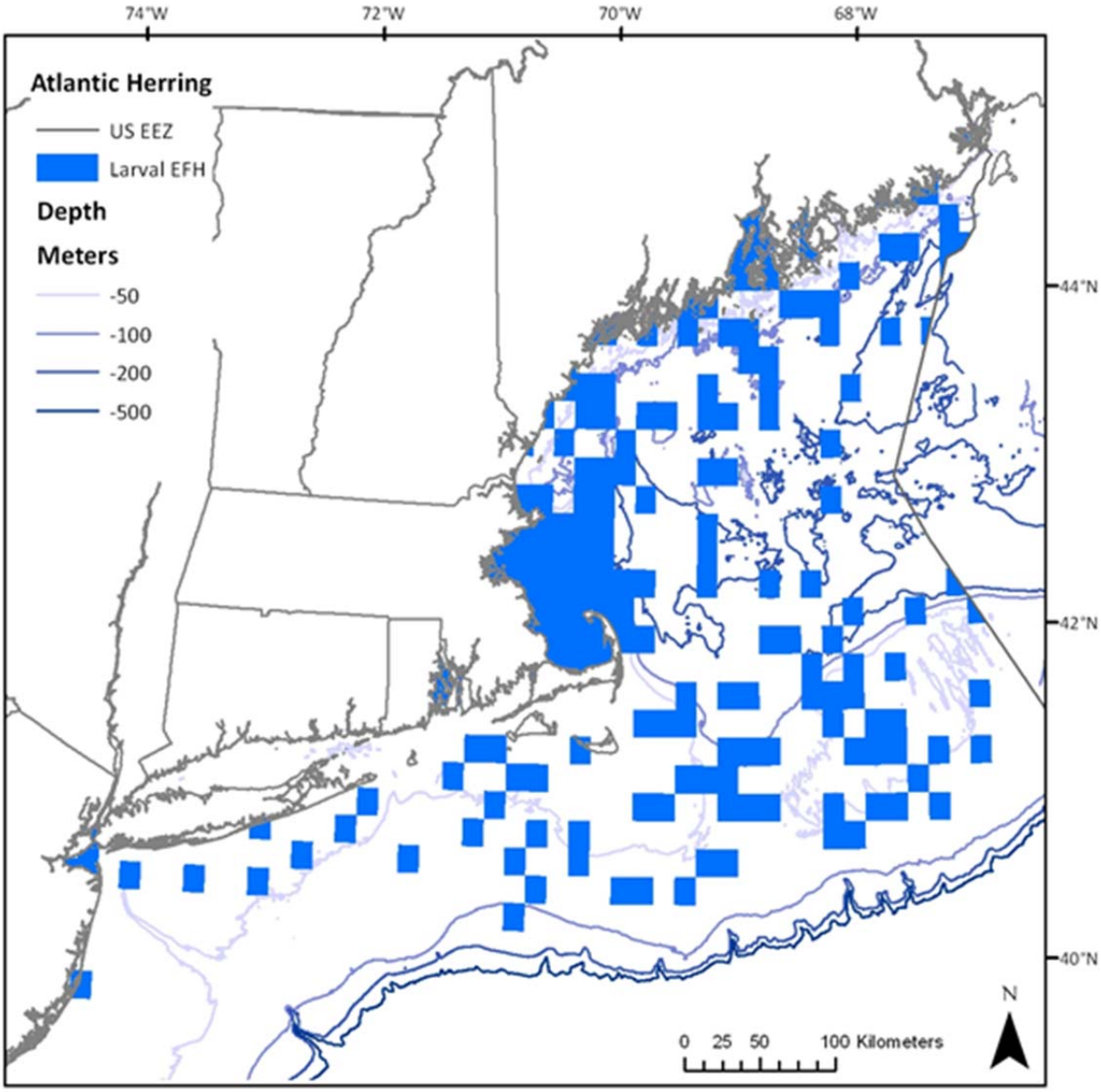


Figure 12 EFH Designation for Atlantic Herring Juveniles

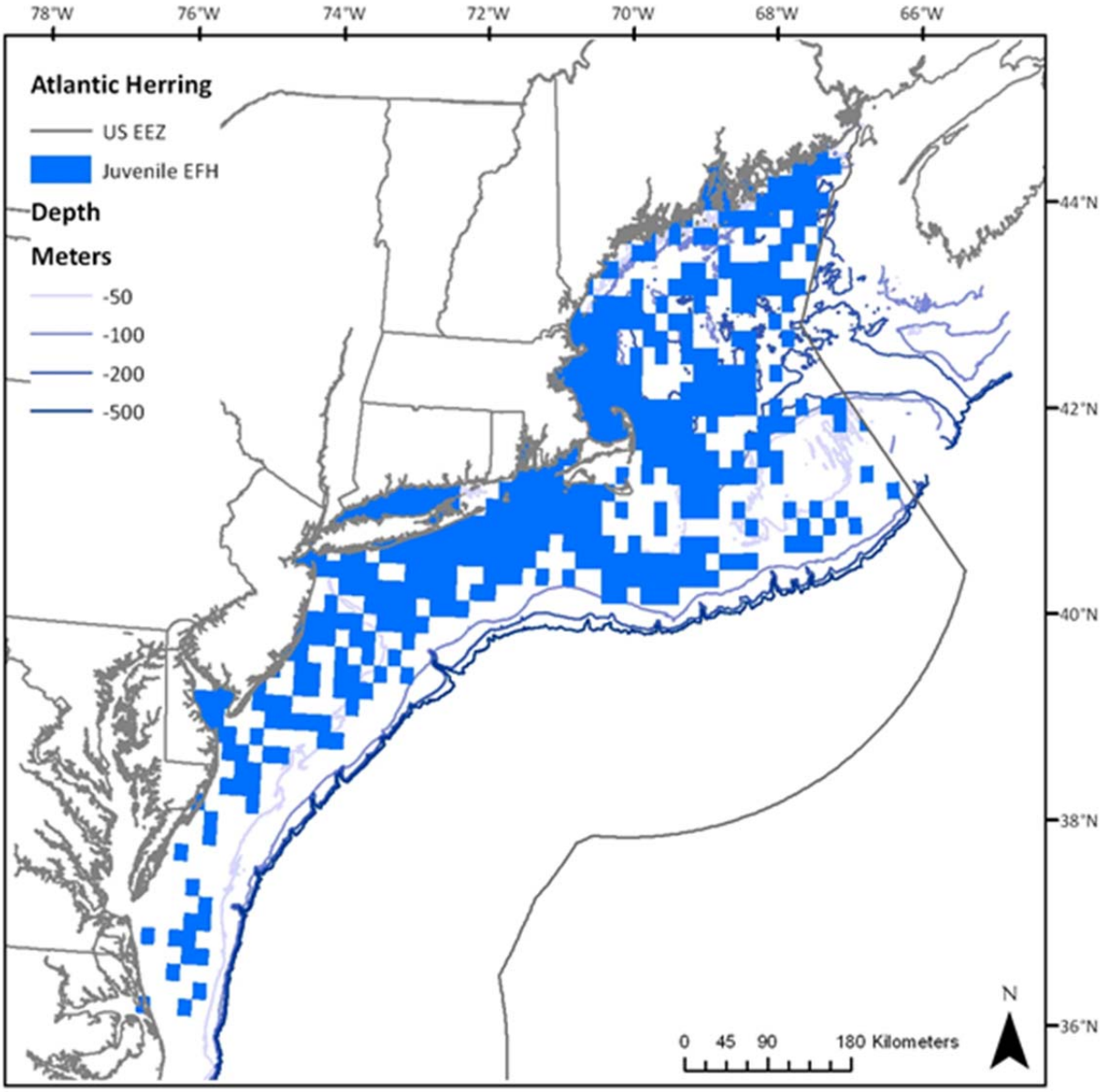
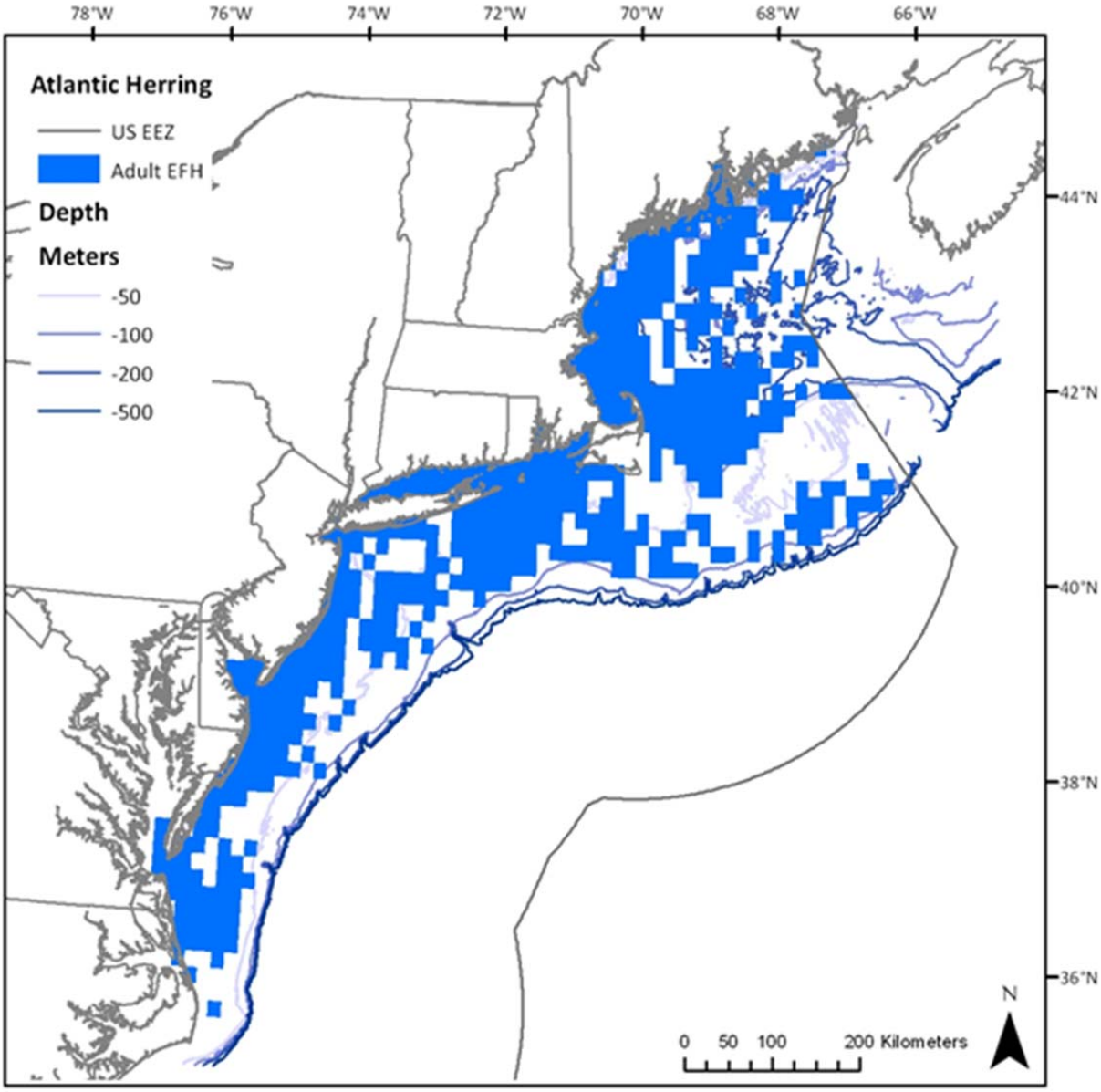


Figure 13 EFH Designation for Atlantic Herring Adults



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 36. Additional information can be found in the FMP document that most recently updated each species' EFH designation (last column in Table 36). 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 36 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 36 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.

3.4 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 37, 13 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA; the remaining species in Table 37 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 37 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 37 also includes three candidate 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 37 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 2011), 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 2007), 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. 2013) 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. 2013) 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. 2013). 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 2.6 percent per year during 1990-2009, and the total number of North Atlantic right whales is estimated to be at least 444 animals in 2009 (Waring et al. 2013). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 3.0 per year during 2006 to 2010 (Waring et al. 2011). Of these, 1.8 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. 2013). The best estimate for the Gulf of Maine stock of humpback whales is 823 whales (Waring et al. 2013). 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). Some additional updated information about small cetaceans can be found at http://www.nmfs.noaa.gov/pr/sars/species.htm.

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). Some additional updated information about pinnipeds can be found at http://www.nmfs.noaa.gov/pr/sars/species.htm.

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 38 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 38 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 39 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 5, 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 40.

Table 40 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 have pushed the fishery in the inshore Gulf of Maine to later months (late summer). The midwater trawl (single and paired) fleet is restricted from fishing in Area 1A in the months of January through September because of the Area 1A split that is currently enforced through ASMFC days-out measures (0% January-May) and the purse seine-fixed gear only area (all of Area 1A) that is effective June-September. 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 41 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 41 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	25,057	27,668	91%
2012*	1B	4,278	2,723	157%
2012*	2	22,949	22,146	104%
2012*	3	40,845	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).*

Table 42 summarizes total Atlantic herring catch as a percentage of the total available catch in each year from 2003-2012. Catch by the U.S. fishery has been somewhat consistent over the time period (and in previous years), averaging about 91,500 mt, with the highest catch of the time series observed in 2009 and lowest in 2008. However, the quota allocated to the fishery (stockwide ACL/OY) has decreased 50% over the ten-year period. The fishery has therefore become more fully utilized in recent years and experienced the first stockwide ACL overage in 2012 (based on preliminary data). Once 2012 data are finalized, the overage deduction will be applied to the stockwide ACL for the 2014 fishing year.

Table 42 Total Annual Atlantic Herring Catch 2003-2012

YEAR	TOTAL HERRING CATCH (MT)	TOTAL QUOTA ALLOCATED (MT)	PERCENT OF TOTAL QUOTA CAUGHT
2003	101,607	180,000	57%
2004	93,205	180,000	52%
2005	96,116	150,000	64%
2006	98,714	150,000	66%
2007	85,819	145,000	59%
2008	83,240	143,350	58%
2009	103,943	143,350	73%
2010	72,852	91,200	80%
2011	86,245	93,905	92%
2012*	93,130	90,683	103%

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.

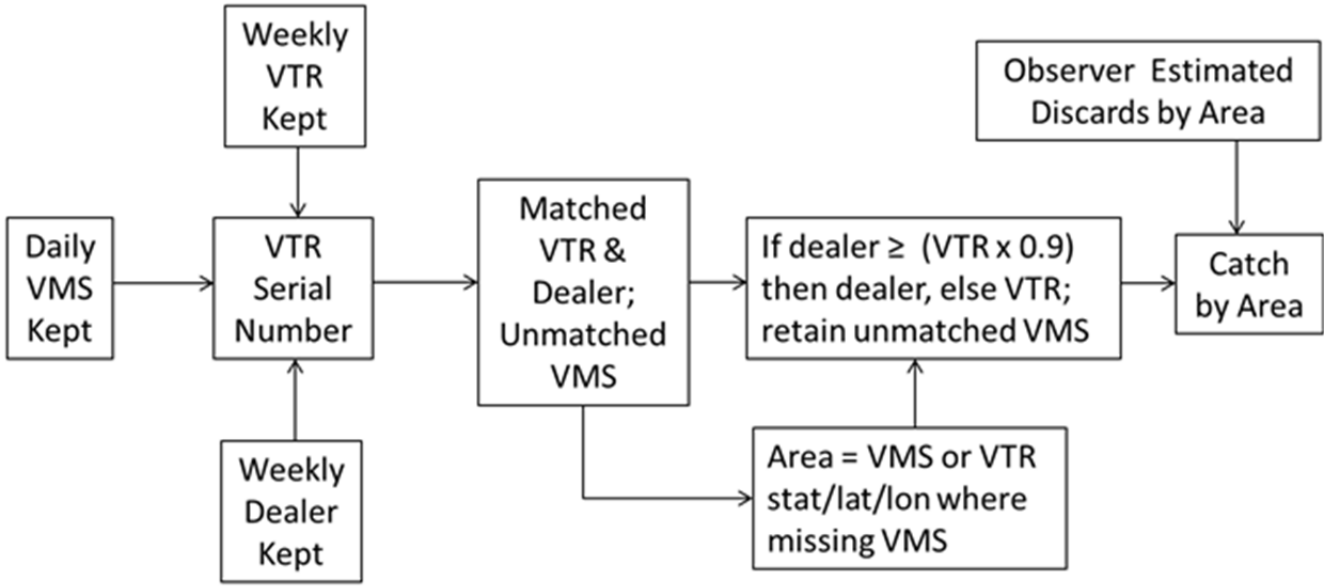
If catch in multiple areas are reported for the same VTR serial number on VMS catch reports, then kept associated with that VTR serial number on the VTR and dealer reports are prorated using area proportions from the VMS catch reports. Once all matching is completed, summed dealer kept by area for a 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 14.

Figure 14 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 43). 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 43 illustrates that “Discards as % of Total Catch” were minimal in 2010 and 2011.

Table 43 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 2.2.6 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 44 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 44 is in Area 2 with 12% and 8%, respectively.

Table 45 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 44 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 45 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 41). 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 46, 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 46). 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 46). The Final Rule for the 2013 adjustments was published on February 25, 2013. When the new 2013 specifications are finalized, then the 1,425 mt overage will be deducted from the final 2013 Area 1A sub-ACL.

As previously noted in this document (Section 3.5.1.2), herring catch seen in the preliminary 2012 totals in Table 46 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 46 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	25,057	27,668	91%	TBD
2012*	1B	4,278	2,723	157%	TBD
2012*	2	22,949	22,146	104%	TBD
2012*	3	40,845	38,146	107%	TBD
TOTAL		93,130	90,683	103%	TBD

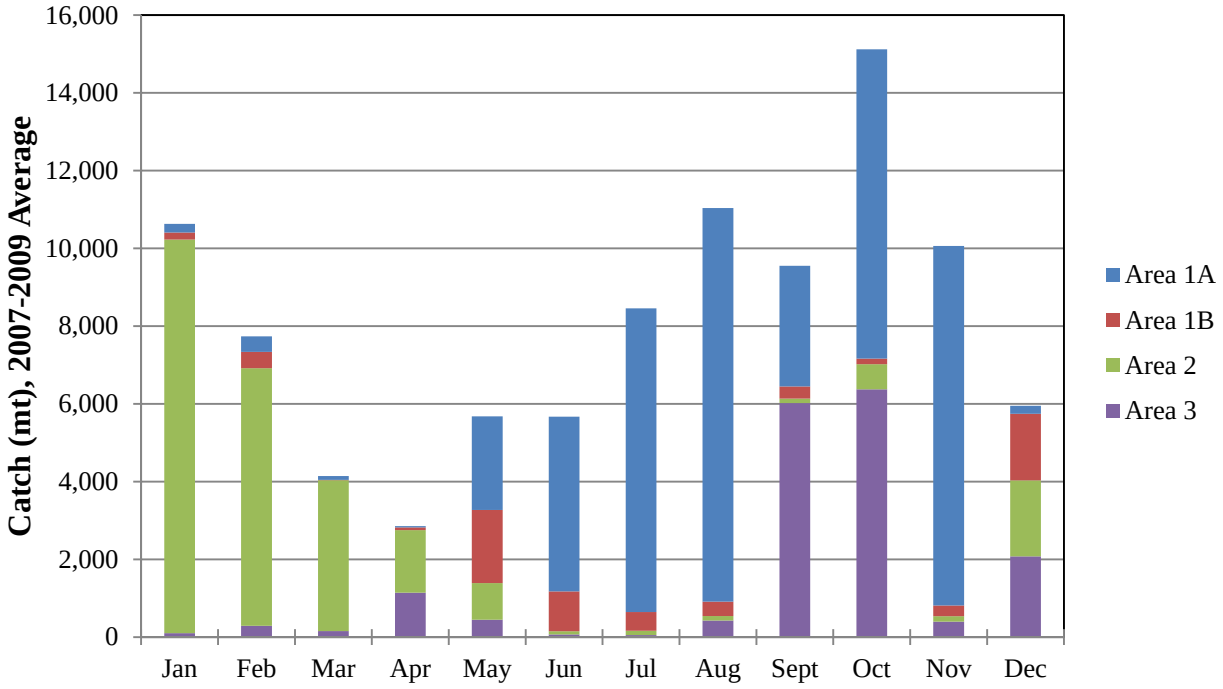
Source: NMFS.
Note the 2013 sub-ACLs are based on rolling over the 2012 Herring specifications per the Proposed Rule in FRN dated November 13, 2012.
Note the shaded rows indicate overages.
**2012 data is preliminary based on real-time quota monitoring methodology.*

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 15 and Figure 16, 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.

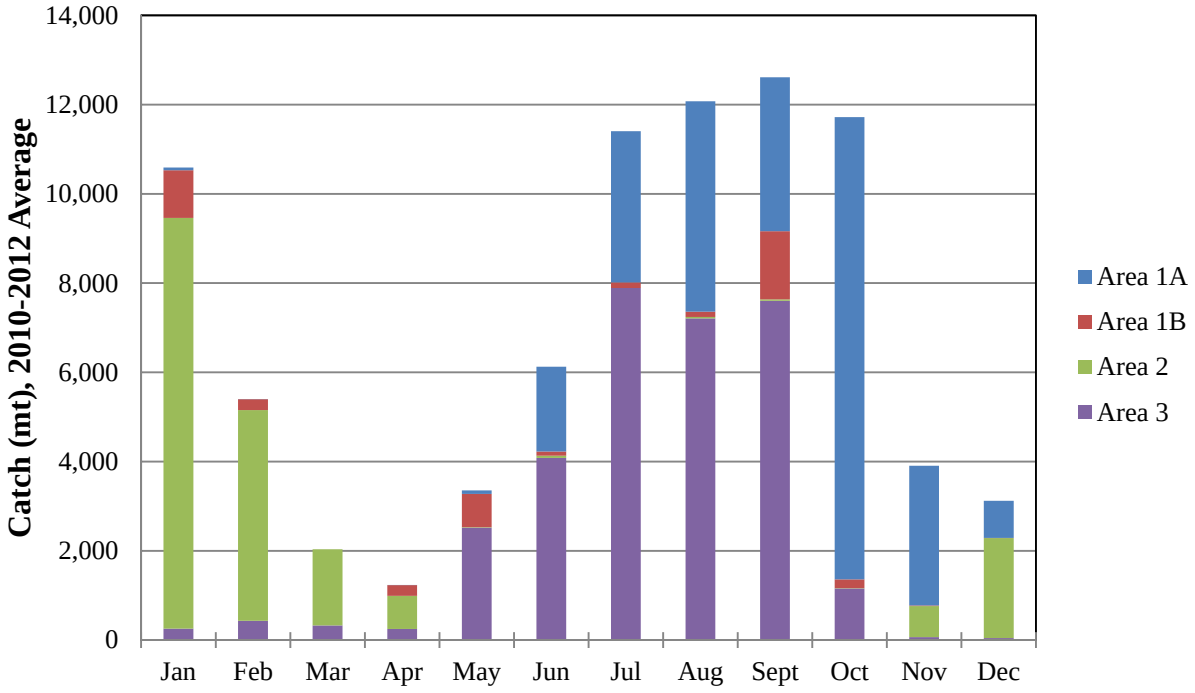
To further illustrate within-season harvests, Figure 17 – Figure 20 provide the sub-ACL utilization of each management area by month over the years 2007-2012. Within Area 1A, the sub-ACL is harvested in a similar temporal pattern, typically between April and October. For Area 1B, the trend is less consistent; 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 20.

Figure 15 2007-2009 Average Monthly Catch by Management Area



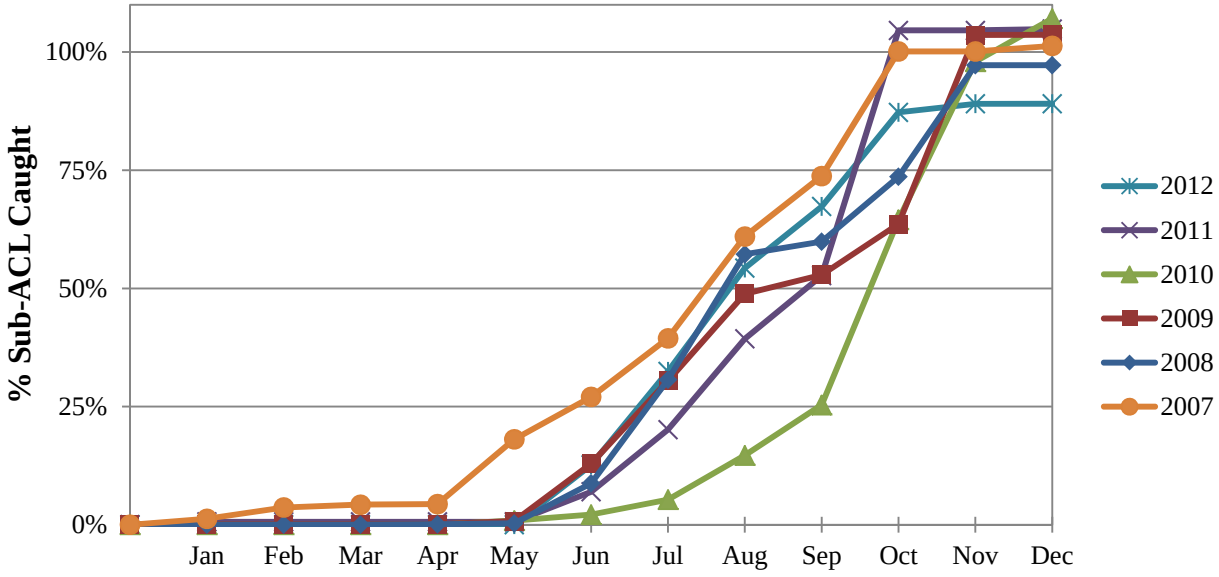
Source: NERO DIMS database, queried 12/7/2012.

Figure 16 2010-2012 Average Monthly Catch by Management Area



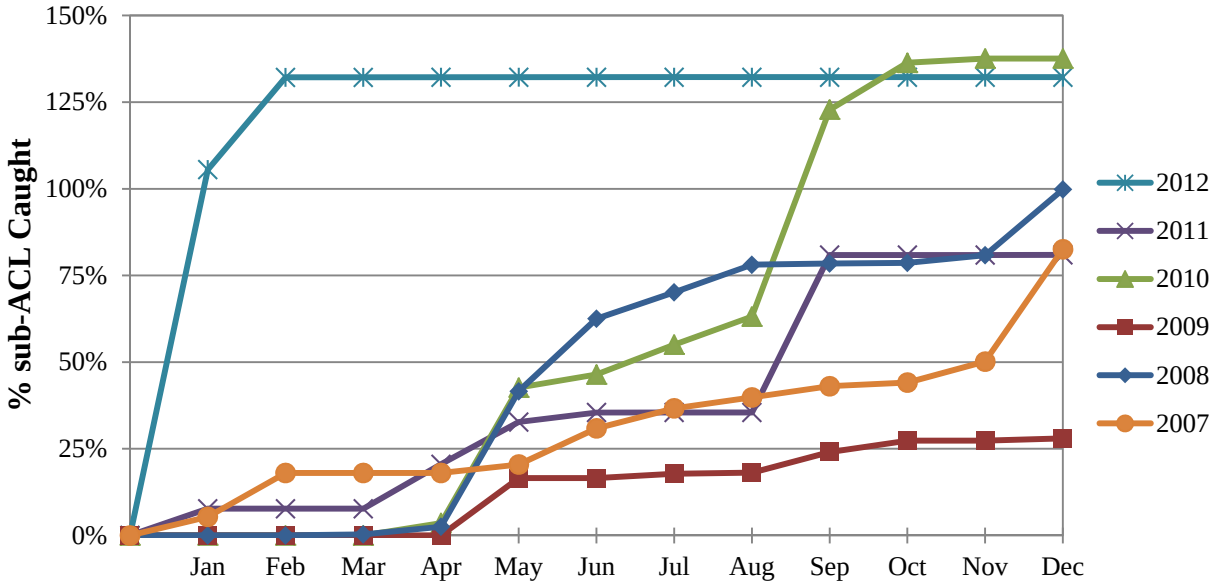
Source: NERO DIMS database, queried 12/7/2012.

Figure 17 Area 1A Sub-ACL Utilization by Month, 2007-2012



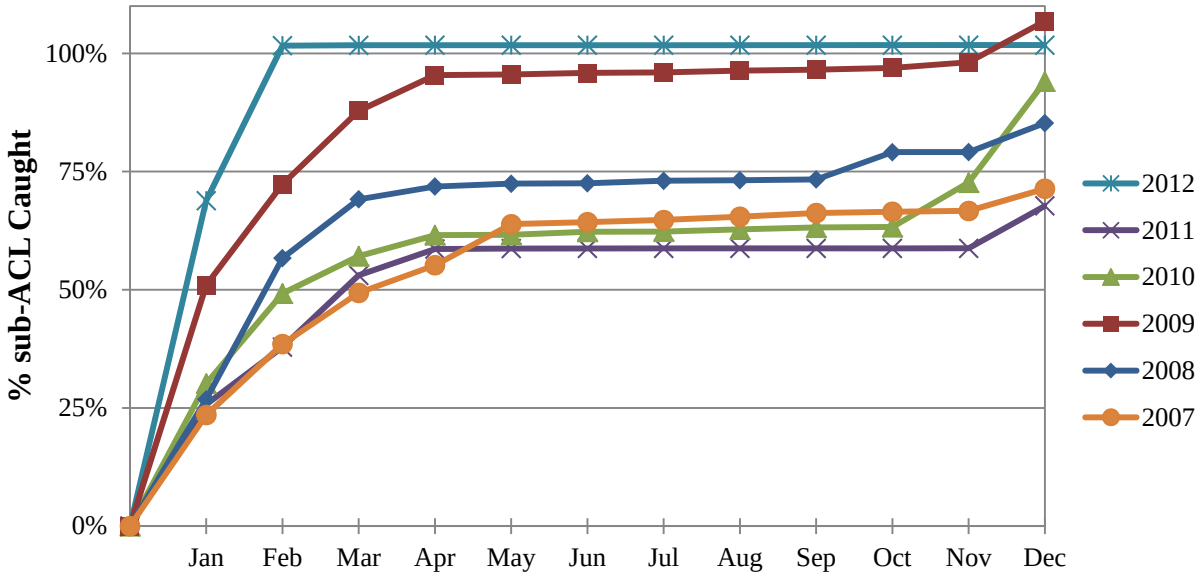
Source: NERO DIMS database, queried 12/7/2012.

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



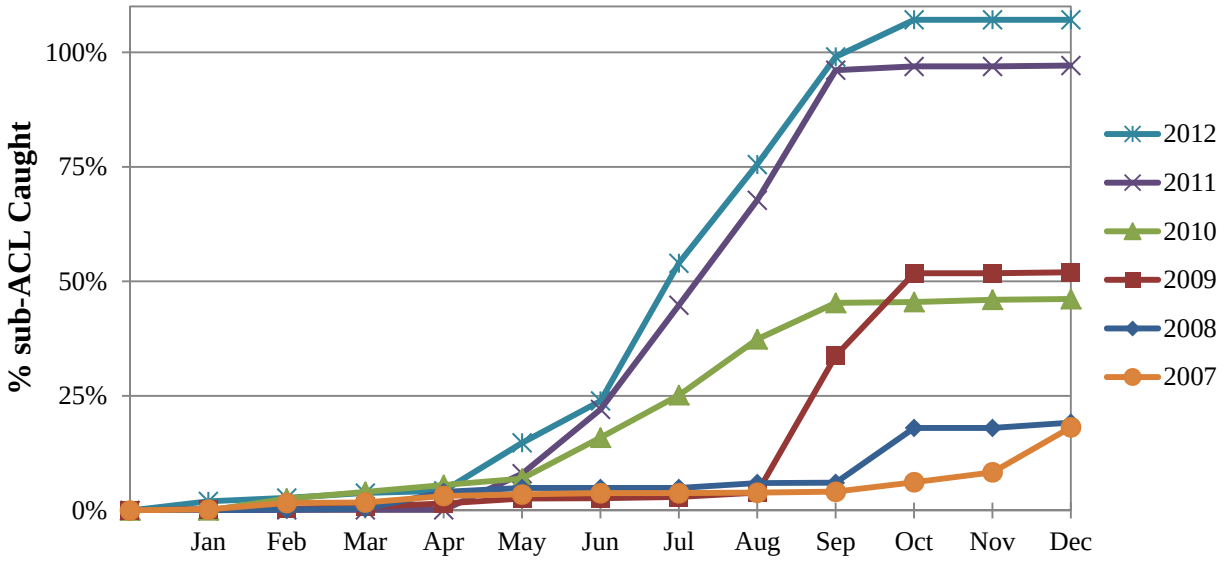
Source: NERO DIMS database, queried 12/7/2012.

Figure 19 Area 2 Sub-ACL Utilization by Month, 2007-2012



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

Figure 20 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 on p. 72).

Since 2008, the number of vessels with either a limited access or an open access Atlantic herring permit has decreased annually (Table 47). 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 47 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 48). Some herring vessels use multiple gear types during the fishing year. Single and pair trawl vessels generally fish in all areas (October-December in Area 1A). The purse seine fleet fishes in the inshore Gulf of Maine (Area 1A and, to a lesser extent, Area 1B) and in Area 2. 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 48 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.
Note: Data include all vessels that landed one pound or more of herring.

Revenues

Table 49 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 49 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 50 provides more perspective on the revenues in Table 49 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 52).

Fishing activity in Area 1B may be of particular interest for the 2013-2015 specifications; Table 51 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 51 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 50 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 51 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 52 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 50). 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 52 illustrate the overlap between the herring and mackerel fisheries.

Table 52 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 53). Note the substantial decrease in herring landings from 2010 to 2011.

Table 53 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

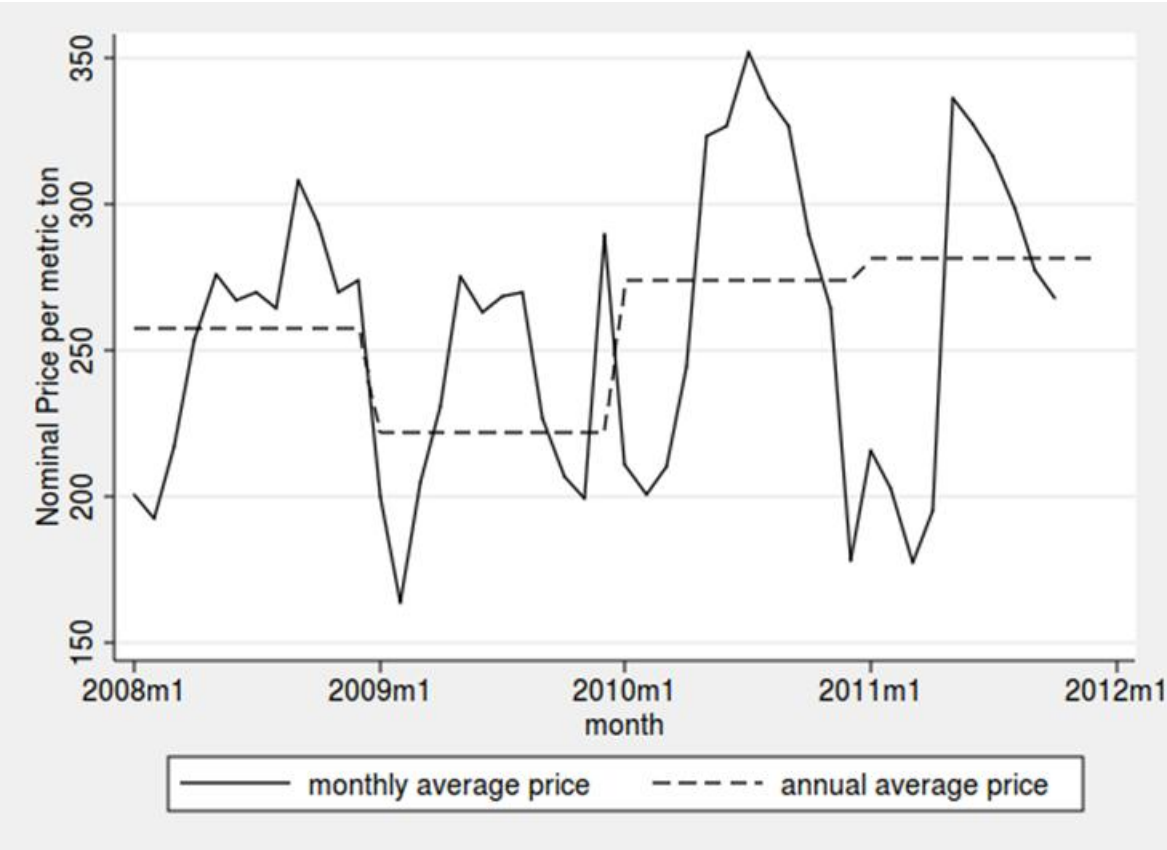
Between 2008-2011, annual landings of herring ranged from 68-103,500 mt (Table 41) while nominal prices ranged from $221-$296 per mt (Figure 21). Overall, herring prices have been increasing over time. Atlantic herring which is caught in the Northeast US is eaten by consumers worldwide and utilized as 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 in the world market, 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 21 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 54). 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 54 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 that New Hampshire vessels are less dependent on herring as a bait source than Maine vessels. Table 55 presents the use of herring as bait along the NH coast from 2005 to 2011. Herring is a small percentage of the bait used by these vessels, ranging between 1.8% in 2010 and 4.6% in 2005. In terms of herring per trap just in 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 the herring per trap calculation because, at present, there is only one vessel in this category, which tends to utilize redfish and skates as primary bait sources. This is because redfish and skates 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 55 Herring Use as 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

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 56). 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 56 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 57). 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 57 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 Council believes is necessary to address management uncertainty at this time (see additional discussion regarding management uncertainty in Section 2.2.3 of this document).

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. Note that the provision to re-allocate 3,000 mt of additional yield does not apply to the 2013-2015 specifications, based on the Council's proposed deduction for management uncertainty (6,200 mt, see Section 2.2.3).

To account for management uncertainty during the 2013-2015 fishing years, the Council considered additional options based on 3-year, 5-year, and 10-year average catch totals from the NB weir fishery (Table 6 on p. 22, shaded row represents Council recommendation).

- 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 58).

Table 59 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 60 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 60 (2008-2010) also coincide with the reduced level of effort seen in Table 60.

Table 58 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 59 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 60 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

In this section, the impacts of the management measures proposed by the Council in Framework 2 to the Atlantic Herring FMP as well as the proposed 2013-2015 Atlantic herring fishery specifications are assessed and discussed relative to each of the valued ecosystem components (VECs) described in the Affected Environment (see Section 3.0). The impacts of the no action alternatives and other alternatives considered by the Council (non-preferred) during the specifications process are also evaluated in this section. Much of the detailed data and analysis to support the development of the alternatives considered by the Council during the 2013-2015 Atlantic herring fishery specifications process were 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 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. This document also includes the proposed Atlantic herring fishery specifications for the 2013-2015 fishing years (Section 2.2). Analysis of the 2013-2015 specifications includes evaluation of specific seasonal splits as well as the potential impacts of sub-ACL carryovers during the 2014 and 2015 fishing years (see discussion throughout Section 4.2 of this document. Future fishery specifications packages will include similar analyses when splits are proposed and carryover may be available.

Overall, because the measures proposed in Framework 2 are administrative in nature (establishing provisions/policy for the specifications process), the impacts of the alternatives in Framework 2 on all of the VECs identified in this document are expected to be minimal. 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

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP, as modified by applicable amendments and framework adjustments. The Herring FMP was developed by the Council and implemented by NMFS in 2000. The fishery specification-setting process is the primary management tool used to administer the herring fishery and was modified in Amendment 1 (from annual to every three years) and Amendment 4 for consistency with the ACL/AM provisions in the reauthorized MSA. The current specifications (75 FR 48874, August 12, 2010) established 2010-2012 herring harvest levels for each of four management areas, and Amendment 4 (76 FR 11373, March 2, 2011) established the trigger for closing the directed fishery in a management area and the provision that any overages would be deducted from future harvest levels (Accountability Measures, AMs).

In general, fishing mortality on Atlantic herring is managed through the overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are intended to minimize risk to individual stock components while maximizing opportunities for the fishery to achieve OY. Based on the best available scientific information (SAW 54, July 2012), the Atlantic herring resource is not overfished (stock is rebuilt), and overfishing is not occurring.

Overall, the measures proposed in Framework 2 are administrative and establish policy/provisions for the specifications process. The measures are not expected to directly impact the Atlantic herring resource; impacts of future fishery specifications implemented in accordance with the provisions in this framework adjustment will be addressed during the specifications process. In addition, due to the continuing management of the Atlantic herring fishery through the FMP and specifications, selection of the no action alternative relative to the proposed measures in Framework 2 would not be expected to affect the status of the herring resource, and the no action alternative is not expected to have an impact on herring. However, as discussed below, some of the long-term benefits from the provisions proposed in Framework 2 may not be realized under the no action alternative.

Alternatives to Allow Sub-ACL Splitting

Alternative 1 (No Action): Under Alternative 1, no measures/provisions to authorize seasonal sub-ACL splitting would be implemented in 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. As discussed above, due to the continuing management of the Atlantic herring fishery through the FMP and fishery specifications, selection of the no action alternative would not be expected to affect the status of the herring resource, and the no action alternative in this case is expected to have a *negligible* impact on the Atlantic herring resource. While there are no impacts on the resource expected from taking no action, some of the indirect benefits that may result from these provisions over the long-term (discussed below) may not be realized.

Alternative 2 (Allow Sub-ACL Splitting, Preferred Alternative): Alternative 2 proposes to allow seasonal (by month) splitting of any management area sub-ACL during the herring fishery specifications process. This measure is administrative in nature and establishes policy/provisions for the specifications process. In other words, the provisions themselves, established in this framework, are not expected to impact the Atlantic herring resource. The impacts of specific sub-ACL splits on the Atlantic herring resource will be analyzed as part of the fishery specifications process, when the splits are considered.

In general, there may be indirect benefits to the herring resource over the long-term if these provision result in a reduction of instances where the herring fishery experiences sub-ACL overages, consequently reducing the possibility of a total ACL overage. This is one of the reasons that the Council has selected this alternative as the ***Preferred Alternative*** (see additional discussion of the Council's rationale in Section 2.1.1.2). The indirect benefits of this alternative on the Atlantic herring resource are long-term and difficult to predict, but are generally expected to be *low positive* in comparison to taking no action (Alternative 1).

Alternatives to Establish Carryover Provisions

Alternative 1 (No Action): Under Alternative 1, no measures to authorize un-utilized sub-ACL carryover would be implemented in 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. As discussed above, due to the continuing management of the Atlantic herring fishery through the FMP and fishery specifications, selection of the no action alternative would not be expected to affect the status of the herring resource, and the no action alternative in this case is expected to have a *negligible* impact on the Atlantic herring resource.

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. At its January 2013 meeting, the Council selected Option 1 as the ***Preferred Alternative*** for allowing carryovers.

Options 1, 2, and 3 propose slightly different provisions for authorizing carryover of up to 10% of a sub-ACL (see Section 2.1.2.2 for a complete description of these options). The following 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).

The above provisions reduce the potential for carryovers to impact the Atlantic herring resource by limiting carryover to instances when the stockwide ACL is not exceeded and ensuring that all AMs continue to apply.

Option 1 (Preferred Alternative): 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. Because Option 1 does now allow the stockwide ACL to increase if carryovers occur, this option is the most conservative/precautionary with respect to impacts on the Atlantic herring resource.

Option 2: This option 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.

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.

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. In other words, the provisions themselves, established in this framework, do not have impacts. Generally, carryovers have the potential to affect the timing and magnitude of sub-ACL harvest in any given fishing year. The impacts of specific carryovers will depend on the stock size, year class strength, and proportion of inshore/offshore stock components and will be evaluated in the specifications packages. These impacts may be positive, negative, or negligible. In terms of the provisions proposed in this framework adjustment, there may be indirect benefits to the Atlantic herring resource that could result from improvements in the operation of the fishery (increased flexibility from allowing carryovers) and a reduction in stockwide ACL overages over the long-term, both of which are reasons that carryover provisions are being established. The benefits to the Atlantic herring resource are long-term and difficult to quantify, however, and because the ***Preferred Alternative*** does not allow for an increase in the stockwide ACL, the impacts on the Atlantic herring resource are generally expected to be *negligible*.

4.1.2 Impacts of Framework 2 Alternatives on Non-Target Species and Other Fisheries

The non-target species and other fisheries considered with respect to this action are described in Section 3.2 of this document (p. 64) and include river herring, mackerel, and multispecies (groundfish) in addition to any other species that may be caught incidentally while directing on Atlantic herring. More comprehensive information about these species/fisheries is available in the Amendment 5 FEIS (under review) as well as their respective FMPs.

In general, interactions between the Atlantic herring fishery and non-target species and other fisheries are managed through provisions required to minimize bycatch/bycatch mortality to the extent practicable (National Standard 9). Available data indicate that the vast majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch. However, because of the high-volume nature of the fishery, it has been important to examine the details of sea sampling protocols and data to better identify species of concern and/or other bycatch issues, to continue to minimize the occurrence of bycatch in the herring fishery. Amendment 5 to the Atlantic Herring FMP recently provided the Council this opportunity, and the measures that are anticipated to be implemented in Amendment 5 in the upcoming year specifically address monitoring, sampling, reporting, minimizing, and avoiding bycatch to the extent practicable. Amendment 5 measures also include criteria for midwater trawl access to groundfish closed areas and a long-term management approach to address/minimize river herring bycatch in the herring fishery. These are the elements of the Atlantic herring management program, if implemented, that will most directly impact non-target species and other fisheries. While the impacts of the measures proposed in this framework adjustment are evaluated independent from the Amendment 5 measures, the benefits of the Amendment 5 provisions on non-target species and other fisheries are acknowledged.

The alternatives/options proposed in Framework 2 are considered to be administrative in nature and are not likely to affect interactions with non-target species and other fisheries. The measures focus on provisions related to specifications for the Atlantic herring fishery and do not address, directly or indirectly, issues related to the catch of non-target species or other fisheries. Sub-ACL splits and carryovers that are implemented through the provisions established in Framework 2 may increase or decrease interactions with non-target species and other fisheries. These impacts will continue to be addressed, as necessary, during the specifications process. Therefore, the impacts of both the proposed provisions for sub-ACL splitting and carryovers on non-target species and other fisheries are considered *negligible*. For each issue addressed in Framework 2 (sub-ACL splitting and carryover provisions), Alternative 1 (discussed below) represents the no action alternative and would maintain status quo. Because the measures proposed in Framework 2 are likely negligible in their impacts, the difference between the no action alternative and the other alternatives presented are expected to be neutral with respect to impacts on non-target species and other fisheries.

Alternatives to Allow Sub-ACL Splitting

Alternative 1 (No Action)

Under Alternative 1, no additional management measures would be implemented in the Atlantic herring fishery specification process to allow seasonal (monthly) sub-ACL splitting. Only the Area 1A sub-ACL could continue to be split January-May/June–December (authorized by Framework 1 to the Herring FMP). There are no additional impacts on non-target species and other fisheries expected from Alternative 1 because it maintains status quo; the impacts are expected to be *negligible.*

*Alternative 2 (**Preferred Alternative**)*

Under the ***Preferred Alternative,*** provisions to allow sub-ACL splitting would be implemented for the Atlantic herring fishery specifications process. If sub-ACLs are split, catch and effort could be spread out more evenly, but the impacts of future splits on non-target species and other fisheries could be either positive, negative, or negligible. The provisions proposed in this alternative are administrative and establish a policy for sub-ACL splits to be implemented during the Atlantic herring fishery specifications process; the impacts of future sub-ACL splits on non-target species and other fisheries will be evaluated in the appropriate specifications package. The impacts of this alternative on non-target species and other fisheries are therefore *negligible*.

Alternatives to Establish Carryover Provisions

Alternative 1 (No Action)

Under Alternative 1, no additional management measures would be implemented in the Atlantic herring fishery specification process to allow for unutilized sub-ACL carryover. There are no additional impacts on non-target species and other fisheries expected from Alternative 1 because it maintains the status quo, and the impacts are expected to be *negligible*.

*Alternative 2 (**Preferred Alternative**)*

This ***Preferred Alternative*** establishes provisions to 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. Generally, the options under consideration in Alternative 2 may have an indirect impact on non-target species and other fisheries due to changes in fishing effort and patterns in the fishery, but it is difficult to predict what the specific impacts may be. The impacts of specific carryovers on non-target species and other fisheries may be positive, negative, or negligible depending on how the carryovers affect fishing effort, as well as biological factors related to non-target species and other fisheries. These impacts will be analyzed, as necessary, in future specifications packages. Alternative 2/Option 1 (***Preferred Alternative***) does not allow for an increase in the total herring ACL, so overall effort in the fishery will not increase; therefore, carryovers that may be enacted under this alternative/option have relatively less potential to impact non-target species and other fisheries. Below is a more detailed discussion of the options considered within this alternative.

- Under ***Option 1 (Preferred)***, 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. Since the total ACL would not increase, this option should not increase management uncertainty. This option could provide greater flexibility to participants in the fishery operating in multiple management areas. Any shifts in fishing effort that may result from carryover provisions enacted under this option are unknown, but they are likely to result in a relatively low impact on non-target species and other fisheries relative to the other options under consideration. This is because the stockwide herring ACL cannot increase under this option. Overall, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on non-target species and other fisheries will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on non-target species and other fisheries.
- Under ***Option 2***, the NMFS Regional Administrator could 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. This option 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. Overall, though, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on non-target species and other fisheries will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on non-target species and other fisheries.
- Under ***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. This option 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. Overall, though, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on non-target species and other fisheries will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on non-target species and other fisheries.

4.1.3 Impacts of Framework 2 Alternatives on Physical Environment and EFH

Alternatives to 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 because catch is managed by the stockwide ACL. More importantly, it has been previously determined that herring midwater trawls and purse seines have minimal adverse effects on EFH (see section 3.3.2). Thus, this measure would not have any adverse effects on EFH as compared to the no action alternative.

Alternatives to Establish Carryover Provisions

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). However, as above, it has been previously determined that herring midwater trawls and purse seines have minimal adverse effects on EFH (see section 3.3.2). Thus, this measure would not have any adverse effects on EFH as compared to the no action alternative.

4.1.4 Impacts of Framework 2 Alternatives on Protected Resources

The protected resources that are considered with respect to this action are identified and described in Section 3.4 of this document. The ESA and MMPA requirements addressed in Section 3.4 further explain the protected species/resources and have been well-documented in the major gear types currently used in the Atlantic herring fishery. Additionally, Table 40 (2009-2011) specifies incidents that are isolated to herring observer trips and indicates that harbor seals and grey seals are the most likely to be taken, which generally occurs in Area 1A. Actions to minimize takes on protected resources specifically certain cetaceans and harbor porpoise are required under ALWTRP and HPTRP measures respectively.

Overall, the action proposed in Framework Adjustment 2 is administrative in nature and is not likely to have any direct impact on protected resources. The provisions are not likely to have any measurable adverse effect and may provide increased benefit to protect and monitor protected resources. While the effects of the provisions themselves are expected to be negligible, it is unknown how specific sub-ACL splits and carryovers may impact the herring fishery in subsequent years and whether these specifications could negatively affect ESA species and protected resources. These impacts may be positive, negative, or negligible and will continue to be analyzed in future specifications packages as specific splits and carryovers are considered by the Council, consistent with provisions implemented through this framework adjustment. For each issue addressed in Framework 2 (sub-ACL splitting and carryover provisions), Alternative 1 (discussed below) represents the no action alternative and would maintain status quo.

Alternatives to Allow Sub-ACL Splitting

Alternative 1 (No Action)

Under Alternative 1, no additional management measures would be implemented in the Atlantic herring fishery specification process to allow seasonal (monthly) sub-ACL splitting. Only the Area 1A sub-ACL could continue to be split January-May/June–December (authorized by Framework 1 to the Herring FMP). There are no additional impacts on protected resources expected from Alternative 1 because it maintains the status quo; the impacts are expected to be *negligible.*

*Alternative 2 (**Preferred Alternative**)*

Under the ***Preferred Alternative,*** provisions to allow sub-ACL splitting would be implemented for the Atlantic herring fishery specifications process. If sub-ACLs are split, catch and effort could be spread out more evenly, but the impacts of future splits on protected resources could be either positive, negative, or negligible. The provisions proposed in this alternative are administrative and establish a policy for sub-ACL splits to be implemented during the Atlantic herring fishery specifications process; the impacts of future sub-ACL splits on protected resources will be evaluated in the appropriate specifications package. The impacts of this alternative on protected resources are therefore *negligible*.

Alternatives to Establish Carryover Provisions

Alternative 1 (No Action)

Under Alternative 1, no additional management measures would be implemented in the Atlantic herring fishery specification process to allow for unutilized sub-ACL carryover. There are no additional impacts on protected resources expected from Alternative 1 because it maintains the status quo, and the impacts are expected to be *negligible*.

*Alternative 2 (**Preferred Alternative**)*

This ***Preferred Alternative*** establishes provisions to 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. Generally, the options under consideration in Alternative 2 may have an indirect impact on protected resources due to changes in fishing effort and patterns in the fishery, but it is difficult to predict what the specific impacts may be. The impacts of specific carryovers on protected resources may be positive, negative, or negligible depending on how the carryovers affect fishing effort, as well as biological factors related to protected resources. These impacts will be analyzed, as necessary, in future specifications packages. Alternative 2/Option 1 (***Preferred Alternative***) does not allow for an increase in the total herring ACL, so overall effort in the fishery will not increase; therefore, carryovers that may be enacted under this alternative/option have relatively less potential to impact protected resources. Below is a more detailed discussion of the options considered within this alternative.

- Under ***Option 1 (Preferred)***, 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. Since the total ACL would not increase, this option should not increase management uncertainty. This option could provide greater flexibility to participants in the fishery operating in multiple management areas. While shifts in effort that may result from carryover provisions enacted under this option are unknown, they are likely to have the least impact on protected resources relative to the other options under consideration. This is because the stockwide ACL cannot increase under this option. Overall, though, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on protected resources will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on protected resources.
- Under ***Option 2***, the NMFS Regional Administrator could 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. This option 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. Overall, though, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on protected resources will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on protected resources.
- Under ***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. This option 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. Overall, though, this measure is an administrative provision that establishes a policy for carryovers to be implemented during the fishery specifications process; the impacts of future carryovers on protected resources will be evaluated in the appropriate specifications package. This option therefore, has a *negligible* impact on protected resources.

4.1.5 Impacts of Framework 2 Alternatives on Fishery-Related Businesses and Communities

Fishery-related businesses and communities are described in Section 3.5 of this document. 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 in Framework 2 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).

Alternatives to Allow Sub-ACL Splitting

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 generally move into Area 3 during the summer, and may enter Area 1A in autumn. The midwater trawl (single and paired) fleet is restricted from fishing in Area 1A in the months of January through September because of the Area 1A split that is currently enforced through ASMFC measures (restrictions on landings January-May) and the purse seine-fixed gear only area (all of Area 1A) that is effective June-September. Trawlers may use Area 1B throughout the year. Trawl vessels return to the Area 2 at the end of the year usually if mackerel are available. The purse seine fishery is active during the summer and uses Area 1A almost exclusively (Figure 15 and Figure 16). These usage patterns are driven by a combination of herring availability and fisheries regulations.

Depending on market/fishery conditions, the Council may want to split the sub-ACL seasonally in certain areas. For example, herring and Atlantic mackerel are often caught jointly by trawlers in Area 2 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 19), which could preclude retention of herring later in the year. A proposal to split the sub-ACLs into seasons was advanced in part, as a way to ensure that participants in the herring and mackerel fisheries could 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), only 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 could slow fishing effort by redirecting "early" effort through the year. This could reduce the probability that the entire sub-ACL is caught early in the fishing year and may provide benefits for herring consumers who prefer herring caught in Area 1A to be delivered later in the year (e.g. Maine lobster bait). In fact, an Area 1A split has been effective for years through ASMFC days-out measures (see Framework 1).

The impacts of the no action alternative on fishery-related businesses and communities are expected to be *neutral*, i.e., the same as the impacts of maintaining the status quo with respect to the current operation of the fishery. However, the benefits of establishing provisions to allow sub-ACL splitting to participants in the fishery, discussed under Alternative 2, may not be realized if the no action alternative is selected.

Alternative 2 (Preferred Alternative)

Under Alternative 2, seasonal splitting of the sub-ACL could be allowed for all management areas during the specifications process. A seasonal split of the sub-ACLs is a restriction on fishing practices and could not increase harvest of herring relative to the no action alternative. A seasonal sub-ACL split could 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. There may be positive and negative impacts of future seasonal splits (discussed below), but overall, a provision to allow splitting during the specifications process is expected to be positive for fishery-related businesses and communities.

Relative to Alternative 1 (no action), Alternative 2 may provide benefits for user groups who need access to herring in certain months of the year. For example, a seasonal split for Area 2 may benefit harvesters who catch herring incidentally with mackerel late in the calendar year. 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. An increase in the Area 2 sub-ACL, which is being considered in the 2013-2015 specifications, may also allow for sufficient herring to mitigate the mackerel fishery concerns. 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.

However, there are also potential negative impacts of a seasonal sub-ACL for the herring industry. A seasonal sub-ACL could restrict the timing of fishing effort, so the industry may become less responsive to market conditions. Relative to 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. 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 fishery-related businesses and herring-dependent communities, as long as present harvesters are able to continue fishing without significant disruption. The impacts of any splits that are considered in the future will be assessed and addressed during the fishery specifications process. The impacts of Alternative 2, in comparison to the no action alternative, are expected to be *positive* for fishery-related businesses and communities, since it would allow seasonal splits to be authorized through the fishery specifications process.

Alternatives to Establish Carryover Provisions

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 41). 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 (No Action)

Under Alternative 1 (no action alternative), the status quo would be maintained. The impacts of the no action alternative on fishery-related businesses and communities are expected to be *neutral*, i.e., the same as the impacts of maintaining the status quo with respect to the current operation of the fishery. However, the benefits of establishing provisions to allow sub-ACL carryovers for participants in the fishery, discussed under Alternative 2, may not be realized if the no action alternative is selected.

Alternative 2 (Preferred Alternative)

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 2008-2011 ($255/mt), this could translate into about $765,000 in additional revenue from that herring management area in the following year if all of the rollover is caught in that year.

Relative to Alternative 1 (no action alternative), sub-ACL carryovers (of up to 10%) could 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 could improve safety at sea and allow vessels to fully utilize their allocation in the following year, which could otherwise go unharvested. Thus, this alternative could 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). Limiting the carryover to 10% could 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).

- Under **Option 1** ***(Preferred)***, 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. Since the total ACL would not increase, this option should not increase management uncertainty. In addition, increases in catch in any herring management area which result from a rollover of the ACL will be balanced against lower catch in the other herring management areas which are necessitated by a fixed ACL. This option could provide greater flexibility and business planning for the industry and responsiveness to fishery and environmental conditions. Harvesting within the stockwide ACL could have long-term benefits for the industry.
- Under **Option 2**, the NMFS Regional Administrator could 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. This option 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. This could have a negative impact on fishing businesses and communities.
- Under **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. This option 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. This could have a negative impact on fishing businesses and communities. However, because the total ACL would increase as a result of carryover, this would provide increased fishing opportunities and provide a positive economic impact for fisheries related business and communities.

The impacts of Alternative 2, Option 1 in comparison to the no action alternative are expected to be *positive* for fishery-related businesses and communities.

4.2 IMPACTS OF PROPOSED 2013-2015 ATLANTIC 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 detailed PDT analyses and supporting technical documents are included in the appendices and are summarized below. The AMs proposed in this document would continue to apply to the Atlantic herring fishery beyond the 2013-2015 fishing years, until modified by a future Council action (amendment, framework adjustment, or specifications). Impacts of the proposed AMs, therefore, are considered over a longer time frame (not just the 2013-2015 fishing years).

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 2013-2015 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 Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP, as modified by applicable amendments and framework adjustments. The Herring FMP was developed by the Council and implemented by NMFS in 2000. The specification-setting process is the primary management tool used to administer the herring fishery and was modified in Amendment 1 (from annual to every three years) Amendment 4 for consistency with the ACL/AM provisions in the reauthorized MSA. The current specifications (75 FR 48874, August 12, 2010) established 2010-2012 herring harvest levels for each of four management areas, and Amendment 4 (76 FR 11373, March 2, 2011) established the trigger for closing the directed fishery in a management area and the provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, fishing mortality on Atlantic herring is managed through the overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are intended to minimize risk to individual stock components while maximizing opportunities for the fishery to achieve OY. Based on the best available scientific information (SAW 54), the Atlantic herring resource is not overfished (stock is rebuilt), and overfishing is not occurring.

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 impacts of the alternatives were evaluated using projections of SSB, fishing mortality, and probability of overfishing/overfished in each year from 2013-2015. In the projections, 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 was then used to capture possible outcomes of SSB and landings for 2013-2015. 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.

Table 61 below summarizes the results of the projections for the 2015 fishing year under each of the OFL/ABC alternatives and provides a basis for comparing alternatives – by total removals of herring in three years, projected herring SSB in 2015, and the probability of producing a fishing mortality rate above F_{MSY} in 2015. Complete projection results are provided below under each alternative. For comparing alternatives, however, the outcome at the end of the 2013-2015 specifications cycle can be considered. If no action is selected, removals would be almost identical to those under Alternative 3, but the probability of overfishing in 2015 would be higher. Total removals and the probability of exceeding F_{MSY} are highest under Alternative 2, but under all alternatives, the stock remains rebuilt with zero chance of falling below the biomass threshold (see additional information below).

Table 61 Summary Comparison of OFL/ABC Alternatives (2015)

	Alternative 1 (No Action)	Alternative 2	Alternative 3
Total Removals (mt, all years)	**318,000**	**342,000**	**320,000**
2015 SSB (mt)	353,218	338,957	354,559
2015 Prob > F_{MSY}	0.36	0.5	0.17

Alternative 1 (No Action)

Alternative 1 would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (see Table 3 on p. 17 of this document).

The biological impacts of Alternative 1 on the Atlantic herring resource are summarized in Table 62 with respect to fishing mortality and biomass projected for 2013-2015. Note in Table 62 that the OFL and ABC remain constant from 2013-2015 (at 2012 levels) and fishing mortality (F) increases slightly by 0.04 each year, as SSB decreases each year.

Table 62 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

Under the no action alternative, F increases and SSB declines from 2013-2015, but the stock is expected to remain rebuilt (above the biomass target), and fishing mortality is expected to remain below the F_{MSY} target. There is a 36% probability of exceeding the F target in 2015 under Alternative 1 and zero probability that the stock would become overfished (below the biomass threshold). While total stock biomass would decline under Alternative 1, the current status of the Atlantic herring resource (rebuilt, no overfishing) suggests that the impacts of this alternative for 2013-2015 would not jeopardize or affect stock status.

Stock biomass is projected to decline under all alternatives (because of stock status). Generally, the outcome of the no action alternative falls in between Alternatives 2 and 3. Total removals expected under Alternative 1 are slightly lower than Alternative 3, with generally equivalent SSB projections and a higher risk of overfishing in 2015(Table 61), while removals and the risk of overfishing in 2015 are higher under Alternative 2 versus Alternative 1. Since none of the alternatives affect stock status, the impacts of Alternative 1 (no action) on the Atlantic herring resource are expected to be *neutral* when compared to the other alternatives.

Alternative 2 (Preferred Alternative)

The Herring PDT and Council developed in Alternative 2 (Table 4, p. 18) for specifying ABC for 2013-2015 in response to suggestions from the industry to consider a constant catch approach. This approach was utilized for setting ABC during the 2010-2012 fishery specifications as well (average catch 2006-2008), based on SSC recommendations. Under Alternative 2, ABC is specified for 2013-2015 as 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. This means that ABC would increase 7.5% from the 2012 level (106,000 mt) for the 2013-2015 fishing years.

When projecting the impacts of the proposed ABC, an increase in catch will result in both a decline in spawning stock biomass and increase in fishing mortality. This could potentially have a negative impact on the resource, depending on stock condition. Table 63 provides the data projecting F and SSB for the Atlantic herring stock complex under a constant catch of 114,000 mt for the 2013-2015 fishing years. Under the ***Preferred Alternative***, F increases and SSB declines 36% from 2013-2015, but the stock is expected to remain rebuilt (above the biomass target), and fishing mortality is expected to remain below the F_{MSY} target until 2015, when there is a 50% probability that F will equal F_{MSY}. There is a 50% probability of exceeding the F target in 2015 under Alternative 2, but zero probability that the stock would become overfished (below the biomass threshold).

Table 63 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

While total stock biomass would decline under the ***Preferred Alternative***, the current condition of the Atlantic herring resource (rebuilt, not overfishing) suggests that the impacts of this alternative for 2013-2015 would not be significant, i.e., the increased catch is not expected to jeopardize Atlantic herring stock status. The increase in catch, however, causes a decline in biomass and may affect the abundance and distribution of herring in certain times and areas. This may change the availability of herring as forage for predator species, but overall, the impact is likely to be minor.

While total stock biomass would decline under this alternative, the current status of the Atlantic herring resource (rebuilt, no overfishing) suggests that the impacts of this alternative for 2013-2015 would not jeopardize or affect stock status. Stock biomass is projected to decline under all alternatives (because of stock status). Because this alternative allows for greater total removals and a higher risk of overfishing in 2015 (Table 61), the impacts of this alternative on the Atlantic herring resource may be *potentially low negative* when compared to the no action alternative.

Alternative 3 (Non-Preferred)

This alternative is based on a 75% F_{MSY} control rule and reduces the annual specification of OFL and ABC in each year during 2013-2015. In 2014 and 2015, the proposed ABC under this alternative is lower than the 2012 ABC. This approach has been a control rule utilized by the SSC in some cases to address scientific 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 rebuilding 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.

When projecting the impacts of the proposed ABC, an increase in catch will result in both a decline in spawning stock biomass and increase in fishing mortality. This could potentially have a negative impact on the resource, depending on stock condition. The most recent stock assessment classifies Atlantic herring as rebuilt with overfishing not occurring (SAW 54, July 2012). Atlantic herring is therefore not in a rebuilding plan. However, to apply the SSC's approach in this alternative, ABC could be set at the projected catch from F= 75% F_{MSY}. Projected catch and SSB at 75% F_{MSY} (F = 0.2) for 2013-2015 are shown below in Table 64.

Table 64 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

Under Alternative 3, F remains constant at 0.2, and SSB declines 32% from 2013-2015, but the stock is expected to remain rebuilt (above the biomass target), and fishing mortality is expected to remain below the F_{MSY} target (F is set at 75% F_{MSY}). There is a 17% probability of exceeding the F target in 2015 under Alternative 3, but zero probability that the stock would become overfished (below the biomass threshold). While total stock biomass would decline under Alternative 3, the current condition of the Atlantic herring resource (rebuilt, not overfishing) suggests that the impacts of this alternative for 2013-2015 would not be significant, i.e., the increased catch is not expected to jeopardize Atlantic herring stock status. The increase in catch, however, causes a decline in biomass and may affect the abundance and distribution of herring in certain times and areas. This may change the availability of herring as forage for predator species, but overall, the impact is likely to be minor.

While total stock biomass would decline under this alternative, the current status of the Atlantic herring resource (rebuilt, no overfishing) suggests that the impacts of this alternative for 2013-2015 would not jeopardize or affect stock status. Stock biomass is projected to decline under all alternatives (because of stock status). Because this alternative is expected to result in a lower probability of overfishing in 2015 (Table 61), the impacts of this alternative on the Atlantic herring resource may be *potentially low positive* when compared to the no action alternative.

4.2.1.2 Impacts of OFL/ABC Alternatives on Non-Target Species and Other Fisheries

The non-target species and other fisheries considered with respect to this action are described in Section 3.2 of this document and include river herring, mackerel, and multispecies (groundfish) in addition to any other species that may be caught incidentally while directing on Atlantic herring. More comprehensive information about these species/fisheries is available in the Amendment 5 FEIS (under review) as well as their respective FMPs. In general, interactions between the Atlantic herring fishery and non-target species and other fisheries are managed through provisions required to minimize bycatch/bycatch mortality to the extent practicable (National Standard 9). Available data indicate that the vast majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch.

However, because of the high-volume nature of the fishery, some non-targeted catch is landed incidentally as well; it has therefore been important to examine the details of reporting by vessels and dealers, in addition to sea sampling protocols, to better identify species of concern and/or other bycatch issues and minimize the occurrence of bycatch in the herring fishery. Monitoring– through both at-sea and portside sampling – and avoidance are critical steps to better understanding the nature and extent of bycatch in the fishery and working with the industry to minimize it to the extent practicable. Amendment 5 to the Atlantic Herring FMP recently provided the Council the opportunity to review and improve catch monitoring in the herring fishery, and the measures that are expected to be implemented in Amendment 5 in the upcoming year specifically address monitoring, sampling, reporting, minimizing, and avoiding bycatch to the extent practicable. Amendment 5 measures also include criteria for midwater trawl access to groundfish closed areas and a long-term management approach to address/minimize river herring bycatch in the herring fishery. These are the elements of the Atlantic herring management program that will most directly impact non-target species and other fisheries in the next few years. The long-term impacts of these management measures on non-target species and other fisheries, if implemented, will be positive. While the impacts of the measures proposed in this framework adjustment are evaluated independent from the Amendment 5 measures, the benefits of the Amendment 5 provisions on non-target species and other fisheries must be acknowledged.

Relative to the 2013-2015 Atlantic herring fishery specifications, it is difficult to predict specific positive or negative impacts to non-target species and other fisheries that may result from the proposed OFL/ABC levels. In general, increased catch levels proposed for 2013-2015 in the Atlantic herring fishery may increase interactions with non-target species and other fisheries, but the effects will depend on changes in patterns in the herring fishery (timing/effort) as well as the distribution/abundance of non-target species and other fisheries. Variability associated with these factors prevents specific predictions regarding impacts. River herring and shad are two non-target species of particular concern; impacts on these species will be influenced by changes in fleet behavior and shifts in the distribution/aggregation of stocks/sub-stocks from increased fishing activity, environmental factors, climate change, restoration efforts, or other factors.

Given the magnitude of the proposed increase in herring catch for 2013-2015, any impacts that may be experienced are not likely to change or jeopardize the status of any non-target species. Monitoring of all catch the Atlantic herring fishery has improved since 2007-2009 and will continue to improve with the implementation of the Amendment 5, so future interactions with non-target species and other fisheries will be more accurately documented, better managed, and avoided by the industry to the extent practicable.

Alternative 1 (No Action)

This alternative would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (Table 3). Because fishing effort and catch would not change, this alternative would have no effects on non-target species and other fisheries, and impacts are expected to be neutral in that this alternative maintains status quo conditions with respect to operation of the fishery and allowable catch. However, relative to the other alternatives considered (discussed below), this alternative is *potentially low positive* for non-target species and other fisheries because it allows for less overall catch (and therefore less fishing effort) than the other alternatives. There may be fewer interactions with non-target species and other fisheries under this alternative than the other alternatives. However, the nature and extent of the interactions are difficult to quantify with respect to impacts on non-target species and other fisheries, as discussed below.

Alternative 2 (Preferred Alternative)

This alternative was developed to maintain a constant catch for all three fishing years while accounting for scientific uncertainty (Table 4). There is an increase in OFL of 42,000 mt from the 2010-2012 herring specifications for the 2013 fishing year, but ABC remains constant in all three years at 114,000 mt. If all of the ABC were to be caught under this alternative, it would represent an increase of 8,000 mt from the 2012 ABC and about a 22,000 mt increase from the 2012 stockwide herring ACL. However, it is not expected that the ABC level will be taken by the fishery in the upcoming years; the specifications include provisions to prevent the entire ABC from being reached or exceeded, including a stockwide herring ACL that accounts for management uncertainty as well as a suite accountability measures for the fishery.

This alternative allows for more fishing than the no action alternative and may be slightly more detrimental to non-target species and other fisheries. The potential timing and location of the Atlantic herring fishery is not expected to change significantly under this alternative, but overall catch is expected to increase. Variability associated with herring and non-target species prevents specific predictions about impacts under this alternative. Because of existing regulations, impacts on multispecies (groundfish) are likely to be minimal. Of greater concern are river herring, shad, and other bycatch species. This is a short-term specification, however, and overall increases in herring catch under this alternative are likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to jeopardize the status of any non-target species. An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific non-target species are difficult to predict. Overall, relative to the no action alternative, the impacts of this alternative on non-target species and other fisheries may be *potentially low negative*.

Alternative 3 (Non-Preferred)

This alternative is based on a 75% F_{MSY} control rule and reduces the annual specification of OFL and ABC in each year during 2013-2015 (Table 5). In 2014 and 2015, the proposed ABC under this alternative is lower than the 2012 ABC. The potential interactions with non-target species and other fisheries would be decreased in 2014 and 2015 in comparison to the no action alternative and the constant catch approach (Alternative 2). ABC is substantially higher in 2013, possibly increasing interactions with non-target species and other fisheries. However, it is not expected that the ABC level will be taken by the fishery in the upcoming years; the specifications include provisions to prevent the entire ABC from being reached or exceeded, including a stockwide herring ACL that accounts for management uncertainty as well as a suite accountability measures for the fishery. Overall, because of the increase in catch allowed during 2013, the impacts of this alternative on non-target species and other fisheries are *potentially low negative* relative to the no action alternative. Because of existing regulations, impacts on multispecies (groundfish) are likely to be minimal. Of greater concern are river herring, shad, and other bycatch species. Increased fishing effort under this alternative is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to jeopardize the status of any non-target species. Because of lower catch levels in 2014 and 2015, the impacts may potentially be less negative than under Alternative 2.

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. 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 total amount of fishing activity comparing this alternative to no action. More important than possible changes in the amount of fishing effort, it has been previously determined that herring midwater trawls and purse seines have minimal adverse effects on EFH (see section 3.3.2). Thus, neither Alternative 2 nor Alternative 3 would have any adverse effects on EFH as compared to the no action alternative.

4.2.1.4 Impacts of OFL/ABC Alternatives on Protected Resources

The protected resources that are considered with respect to this action are identified and described in Section 3.4 of this document. The ESA and MMPA requirements addressed in Section 3.4 further explain the protected species/resources and have been well-documented in the major gear types currently used in the Atlantic herring fishery. Additionally, Table 40 (2009-2011) specifies incidents that are isolated to herring observer trips and indicates that harbor seals and grey seals are the most likely to be taken, which generally occurs in Area 1A. Actions to minimize takes on protected resources specifically certain cetaceans and harbor porpoise are required under ALWTRP and HPTRP measures respectively.

Purse seines operating in the Atlantic herring fishery are known to take several species of seals and harbor porpoise, while midwater trawl gear (including paired midwater trawls) has had documented interactions with pilot whales, white-sided dolphins and seals. Lack of observer coverage hampers quantitative discussions of impacts, but in recent years observer coverage has increased in an effort to minimize interactions with protected species, thus providing better documentation (Table 40). The Atlantic herring fishery operates using midwater trawl and pair midwater trawl gear, purse seines, stop seines and weirs. Currently, there is a NMFS List of Fisheries for 2012 that places the herring purse seines, midwater trawl fishery, including pair trawls, in Category II, denoting a fishery that has been determined to have occasional serious injury and mortality of marine mammals (Table 39). The stop seine and weir fishery is considered to have a remote likelihood of interactions and is listed in Category III. This gear type has the ability to release entrapped animals alive and, as reported in the NMFS sea sampling database, has considerable success with pinnipeds. There has also been an increase in observer coverage (See Section 3.2.1) which may provide more information about the interactions of protected species within the fishery. Additional monitoring and observer coverage is expected during 2013-2015 with the implementation of the catch monitoring measures in Amendment 5. Overall, the impacts of OFL/ABC alternatives on protected resources will likely have very minor effects on protected species that have the potential to interact with the gear types used in the fishery. These effects are not expected to change or jeopardize the status of any protected species.

Some quantitative information does exist for those species potentially affected by the Atlantic herring fishery. For instance, estimates of mortality and Potential Biological Removal (PBR) were provided in the marine mammal stock assessment report (Waring et al. 2011) for white-sided dolphin and pilot whales. Both short-finned and long-finned pilot whales had a PBR of 172 and 93 respectively – while the Atlantic white sided dolphin had a PBR of 190. The total annual estimated average of fishery-related mortality or serious injury to both short-finned and long finned pilot whales combined during 2005-2009 was 162 (CV 0.15). For both species the estimated annual fishery related mortalities in the Northeast Midwater trawl fishery, which included pair trawl, were (CV in parentheses): unknown in 2001-2002, 0 in 2003, 5.6 (CV=0.92) in 2004, 0 in 2005-2007, 16 (CV=0.61) in 2008, and 0 in 2009. The Mid-Atlantic midwater trawl fishery values, which also included the pair trawl, were (CV in parentheses): unknown in 2001-2002, 0 in 2003-2006, 12.1 (CV=0.99) in 2007, 0 in 2008 and 2009. The Atlantic white-sided dolphin had a PBR of 190 and a total annual estimated average fishery-related mortality or serious injury of 245 (CV=0.12) for 2005-2009. For the Northeast midwater trawl fishery, which included pair trawl, the estimated annual fishery related mortalities (CV in parentheses) were: unknown in 2001-2002, 22 (CV=0.97) in 2003, 0 in 2004, 9.4 (CV=1.03) in 2005, 0 in 2006 - 2009. For the Mid-Atlantic midwater trawl fishery, which also included the pair trawl, the values were (CV in parentheses): unknown in 2001-2002, 0 in 2003, 22 (CV=0.99) in 2004, 58 (CV=1.02) in 2005, and 29 (CV=0.74) in 2006. 12 (CV=0.98) in 2007, 15 (CV=0.73) in 2008, and 4 (CV=0.92) in 2009.

It is difficult to predict how the herring fishery will react to the options within the proposed 2013-2015 specifications without a fully developed model and more information, and incorporation of the information seen below is difficult. Predicting the positive or negative impacts to the protected species that may interact with the fishery is therefore also difficult, but several issues are considered qualitatively.

Alternative 1 (No Action)

This alternative would maintain the OFL and ABC specifications from 2012 for the 2013-2015 fishing years (Table 3). Because fishing effort and catch would not change, this alternative would have no effects on protected resources, and impacts are expected to be neutral in that this alternative maintains status quo conditions with respect to operation of the fishery and allowable catch. However, relative to the other alternatives considered (discussed below), this alternative is *potentially low positive* for protected resources because it allows for less overall catch (and therefore less fishing effort) than the other alternatives. There may be fewer interactions with protected resources under this alternative than the other alternatives. However, the nature and extent of the interactions are difficult to quantify with respect to impacts protected resources, as discussed below.

Alternative 2 (Preferred Alternative)

This alternative was developed to maintain a constant catch for all three fishing years while accounting for scientific uncertainty. There is an increase in OFL of 42,000 mt from the 2010-2012 herring specifications in the 2013 fishing year (Table 4), but ABC remains constant in all three years at 114,000 mt. If all of the ABC were to be caught under this alternative, it would represent an increase of 8,000 mt from the 2012 ABC and about a 22,000 mt increase from the 2012 stockwide herring ACL. However, it is not expected that the ABC level will be taken by the fishery in the upcoming years; the specifications include provisions to prevent the entire ABC from being reached or exceeded, including a stockwide herring ACL that accounts for management uncertainty as well as a suite accountability measures for the fishery.

This alternative allows for more fishing than the no action alternative and may be slightly more detrimental to the accessibility of forage amongst some protected species. This is a short-term specification, however, and there is uncertainty surrounding the availability of forage species as prey and whether it is significant enough at this time, making the impact prediction difficult. The potential timing and location of the Atlantic herring fishery is not expected to change significantly under this alternative, but overall catch is expected to increase. Additional fishing effort may increase the risk of encounter with inshore protected species, in particular harbor porpoises, grey seals, and harbor seals which are seasonally abundant in the Gulf of Maine. Increased fishing effort under this alternative is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to jeopardize the status of any protected species. An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific protected resources are difficult to predict. Overall, relative to the no action alternative, the impacts of this alternative on protected resources may be *potentially low negative*.

Alternative 3 (Non-Preferred)

This alternative is based on a 75% F_{MSY} control rule and reduces the annual specification of OFL and ABC in each year during 2013-2015 (Table 5). In 2014 and 2015, the proposed ABC under this alternative is lower than the 2012 ABC. The potential interactions with protected species would be decreased in 2014 and 2015 in comparison to the no action alternative and the constant catch approach (Alternative 2). ABC is substantially higher in 2013, possibly increasing interactions with protected resources. However, it is not expected that the ABC level will be taken by the fishery in the upcoming years; the specifications include provisions to prevent the entire ABC from being reached or exceeded, including a stockwide herring ACL that accounts for management uncertainty as well as a suite accountability measures for the fishery. Overall, because of the increase in catch allowed during 2013, the impacts of this alternative on protected resources are *potentially low negative* relative to the no action alternative. Increased fishing effort under this alternative is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to jeopardize the status of any protected species. Because of lower catch levels in 2014 and 2015, the impacts may potentially be less negative than under Alternative 2.

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 2.2.2), there are trade-offs, but under each alternative, there is no chance that the stock would become overfished. The SSC has determined each alternative to be biologically acceptable (Appendix I and II). The potential impacts of each alternative on fishery-related businesses and communities are considered below.

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). 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*. The industry could not realize the benefits of a rebuilt stock and additional yield that is supported by the best available science.

The impacts of the no action alternative on fishery-related businesses and communities are expected to be *negative*.

Alternative 2 (Preferred Alternative)

Under Alternative 2 (constant catch), the Atlantic 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 could provide 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 revenues. If an increase in quantity supplied is realized, employment opportunities could 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 could be sustained. 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.

The impacts of Alternative 2 in comparison to the no action alternative are expected to be *positive* for fishery-related businesses and communities.

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 could provide additional fishing opportunity in 2013 and reduced fishing opportunity in 2014 and 2015. Revenues may increase in 2013, but could decrease substantially in 2014 and 2015. Relative to Alternative 2, Alternative 3 could 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.

The impacts of Alternative 3 in comparison to the no action alternative are expected to be *positive* for fishery-related businesses and communities. Relative to Alternative 2, the Alternative 3 impacts are expected to be less positive because of the variable (and decreasing) fishing opportunities that may be provided under the proposed ABC.

4.2.2 Impacts of 2013-2015 Sub-ACL Options

Given the available information/data presented in this document, the Council proposes to deduct 6,200 mt from the ABC and included in the ***Preferred Alternative*** for the Atlantic herring ACL (107,800 mt) to account for management uncertainty associated with the potential catch of Atlantic herring in the NB weir fishery from 2013-2015. The proposed specification of management uncertainty is consistent with the Herring PDT's recommendations (see additional discussion and the Council's rationale for this recommendation below). However, had the no action alternative for the stockwide ACL been chosen, the level of management uncertainty would also default to the no action level of 14,800 mt, and RSA and FGSA specifications would remain at 2012 levels.

During the development of the 2013-2015 herring fishery specifications, the Council considered six options, including a no action option, for specifying sub-ACLs in the four herring management areas for the 2013-2015 fishing years.

Preferred Alternative

The ***Preferred Alternative*** for distributing the 2013-2015 sub-ACLs is presented in Table 65 below. This option was developed by members of the Herring Advisory Panel and selected by the New England Fishery Management Council at its January 29-31, 2013 meeting. It falls within the range of options considered/analyzed in the Draft 2013-2015 herring fishery specifications document provided to the Council for consideration.

Table 65 Proposed Sub-ACLs (mt) for 2013-2015 (*Preferred Alternative*)

	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	**31,200**
Sub-ACL Area 1B	4,362	**4,600**
Sub-ACL Area 2	22,146	**30,000**
Sub-ACL Area 3	38,146	**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, Pending Framework 2 Approval)

If provisions to allow for sub-ACL splitting are adopted in Framework 2 (Section 2.1.1.2 of this document), then the following seasonal splits would apply during the 2014 and 2015 fishing years under the ***Preferred Alternative***:

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

Sub-ACL Carryover Provisions for 2014 and 2015 (Pending Framework 2 Approval)

- 2014: No sub-ACL carryover would be allowed if the stockwide ACL was exceeded in 2012 (2012 year-end catch totals not yet available, but stockwide ACL appears to have been exceeded based on in-season monitoring methods – see Section 3.5.1.2.2)
- 2015: Up to 10% of each 2014 sub-ACL could be carried over to the corresponding management area if the 2014 stockwide ACL is not exceeded; if there is any sub-ACL carryover, the 2015 stockwide ACL would remain the same.

The following sub-sections discuss the potential impacts of the sub-ACL options considered by the Council, as well as the ***Preferred Alternative***, 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)) are allocated to each of the four herring management areas 1A, 1B, 2, and 3 (represented in Figure 1 on p. 2) through the specifications process. 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 and other FMP objectives. However, there are no separate stock assessments or biological reference points available for the individual herring stock components (inshore/offshore), and the herring resource continues to be assessed as one stock complex at this time.

The impacts of Atlantic herring catch allowed under the proposed 2013-2015 specifications on the Atlantic herring resource are discussed under the impacts of the proposed OFL and ABC specifications, and the ABC control rule for 2013-2015 (see Section 4.2.1.1 of this document). The ***Preferred Alternative*** for specifying ABC for 2013-2015 is expected to have a low negative impact on the herring resource, when compared to the no action alternative (see discussion of impacts in Section 4.2.1.1 of this document). However, because of current stock condition, this alternative is not expected to change or jeopardize herring stock status, which is currently considered to be “rebuilt.”

Distributing the stockwide herring ACL among the management areas is an allocation-based decision; removals of the stock complex remain controlled by the ABC. The impacts of the sub-ACL options on the Atlantic herring resource are therefore expected to be *neutral*. Additional discussion to support this conclusion is provided below.

To consider distributive effects and ensure that the allocation of catch to management areas does not disproportionately affect one stock component over another, the Herring PDT provided a comparative sub-ACL analysis. The sub-ACL options distribute the total ACL among the management areas. The sub-ACL analysis compares and evaluates each option under consideration with respect to potential impacts on the individual herring stock components.

Herring PDT Sub-ACL Analysis – Methods

Note: The complete sub-ACL analysis developed by the Herring PDT, with all related tables/figures, is provided in Appendix III of this document.

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 Appendix III). 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.

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. 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 Appendix III. 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 (Appendix III); it also covers the range of proportions seen in Area 1 (0.18 to 0.86).

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 Appendix III.

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 with monthly catch proportions in Appendix III of this document). 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 (splits were considered for Areas 1A, 1B, and 2). 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-ACL splits 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. Tables showing the synthetic proportions used to incorporate the proposed sub-ACL splits can be found in the full analysis provided in Appendix III of this document.

For each of the 10,000 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). 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 weir fishery 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 sub-ACL 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 66). 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 66 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 4.2.1.1).

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 the tables in Appendix III of this document. Because the biological impacts of the removals under any of the sub-ACL options are analyzed under the OFL/ABC alternatives (Section 4.2.1.1, p. 164), only summary statistics of the analysis of sub-ACL options are provided below. Appendix III can be referenced for detailed data and the full analysis.

Two particular features are of importance when considering the results of the comparative sub-ACL analysis:

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. 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 4.2.1.1).
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.

Table 67 summarizes the simulation results for the 2015 fishing year under the ***Preferred Alternative*** as well as sub-ACL Options 2-6, including seasonal sub-ACL splits (the Area 2 split was not analyzed as part of the ***Preferred Alternative***). This table was generated from the summary statistics provided in Appendix III. 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). 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 considered by the Council, including the ***Preferred Alternative***, are likely to substantially impact 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).

Table 67 Comparison Statistics for Simulated Catch of the Offshore and Inshore Stock Component for Sub-ACL Options (Including 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	0.47 (5.5)	0.65 (5.2)
Option 3	0.53 (5.4)	0.60 (4.7)
Option 4	0.53 (5.6)	0.59 (5.0)
Option 5	0.52 (5.5)	0.60 (4.9)
Option 6	0.63 (6.3)	0.49 (4.2)
Preferred Alternative	0.49 (5.3)	0.63 (5.0)

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).

The impacts of the total catch (ABC) on the Atlantic herring resource are addressed in Section 4.2.1.1 of this document. Because there are no significant impacts on individual stock components resulting from the allocation of the total ACL among the four management areas, the impacts of all sub-ACL options on the Atlantic herring resource from 2013-2015 are expected to be *neutral*. This is because the sub-ACL analysis produces results for each stock component (inshore/offshore) in 2015 that are generally consistent with the results expected by total removals under the ***Preferred Alternative*** for ABC (0.5 probability of exceeding F_{MSY} in 2015).

Sub-ACL carryovers that may be authorized under Framework 2 are not likely to affect the conclusions regarding the potential impacts of the sub-ACLs. The stockwide ACL was exceed in 2012, so if Framework 2 provisions are approved, no carryovers would be authorized for 2014. Any carryover in 2015 would result from unutilized sub-ACL in 2014 and would only be allowed if the 2013 stockwide ACL is not exceeded. The ***Preferred Alternative*** for authorizing carryovers does not provide for an increase in the stockwide ACL (see Section 2.1.2.2), so total removals would remain the same. While there may be some impacts associated with shifts in effort, these cannot be predicted because stock, fishery, and other environmental conditions will have an influence as well. The impacts on the Atlantic herring resource from 2013-2015, however, are expected to be negligible. In addition, the conclusions regarding the impacts of the sub-ACL options considered in the 2013-2015 specifications are not affected by the proposed fixed gear set-aside (295 mt) because this is a status quo specification, and herring allocated under the FGSA are returned to the Area 1A fishery before the end of the fishing year if not utilized by the fixed gear sector. These conclusions also are not affected by the proposed research set-aside (3% in each management area) because fish allocated under the RSA are assumed to be caught in the simulation model.

4.2.2.2 Impacts of 2013-2015 Sub-ACL Options on Non-Target Species and Other Fisheries

The non-target species and other fisheries considered with respect to this action are described in Section 3.2 of this document and include river herring, mackerel, and multispecies (groundfish) in addition to any other species that may be caught incidentally while targeting Atlantic herring. More comprehensive information about these species/fisheries is available in the Amendment 5 FEIS (under review) as well as their respective FMPs. In general, interactions between the Atlantic herring fishery and non-target species/other fisheries are managed primarily through provisions required to minimize bycatch/bycatch mortality to the extent practicable (National Standard 9). Available data indicate that the majority of catch by herring vessels on directed trips is Atlantic herring, with very low percentages of bycatch. However, because of the high-volume nature of the fishery, some non-targeted catch is landed incidentally as well; it has therefore been important to examine the details of reporting by vessels and dealers, in addition to sea sampling protocols, to better identify species of concern and/or other bycatch issues and minimize the occurrence of bycatch in the herring fishery. Monitoring– through both at-sea and portside sampling – and avoidance are critical steps to better understanding the nature and extent of bycatch in the fishery and working with the industry to minimize it to the extent practicable. Amendment 5 to the Atlantic Herring FMP recently provided the Council the opportunity to review and improve catch monitoring in the herring fishery, and the measures that are expected to be implemented in Amendment 5 in the upcoming year specifically address monitoring, sampling, reporting, minimizing, and avoiding bycatch to the extent practicable. Amendment 5 measures also include criteria for midwater trawl access to groundfish closed areas and a long-term management approach to address/minimize river herring bycatch in the herring fishery. These are the elements of the Atlantic herring management program that will most directly impact non-target species and other fisheries in the next few years. The long-term impacts of these management measures on non-target species and other fisheries, if implemented, will be positive. While the impacts of the measures proposed in this framework adjustment are evaluated independent from the Amendment 5 measures, the benefits of the Amendment 5 provisions on non-target species and other fisheries must be acknowledged.

Regarding the action proposed in this specifications package, increased catch levels in the herring fishery during the 2013-2015 fishing years may increase interactions with non-target species and other fisheries; these impacts are discussed relative to the proposed OFL/ABC levels in Section 4.2.1.2. Under all of the sub-ACL options discussed below (except the no action option), there is expected to be an increase in total Atlantic herring catch of 16,600 mt during the 2013-2015 fishing years (above 2012 levels). This additional catch will be distributed among four management areas (see Figure 1 on p. 2). The total catch that can be expected under the 2013-2015 Atlantic herring fishery specifications is higher than status quo, but considerably less than that authorized under the 2007-2009 specifications. The impacts of the proposed increase in catch under the OFL/ABC ***Preferred Alternative*** are *potentially low negative*, but are not likely to change or jeopardize the status of any non-target species.

It is important to note that any impacts of the sub-ACL options on non-target species are likely to be minor and short-term, resulting from the allocation of an additional 16,600 mt of catch across the fishery. They are not likely to significantly impact/jeopardize the status of any non-target species, or negatively affect other fisheries. Overall, as noted above, the long-term impacts of the Atlantic herring management program on non-target species and other fisheries should be positive, resulting from increased monitoring and improvements in the operation and efficiency of the herring fishery. Catch levels in each of the management areas under the sub-ACL options considered for 2013-2015 will remain similar to or less than the catch allocated to those areas under the 2007-2009 fishery specifications. Monitoring of catch the herring fishery has improved since 2007-2009 and will continue to improve with the implementation of the Amendment 5, so future interactions with non-target species and other fisheries will be more accurately documented, better managed, and avoided by the industry to the extent practicable. The sub-ACL options and the ***Preferred Alternative*** for specifying sub-ACLs are discussed in more detail below.

Option 1 (No Action)

Under the no action option, impacts on non-target species and other fisheries are expected to remain unchanged from the 2012 herring fishery specifications. The sub-ACLs from the 2012 specifications would continue to be used in the four management areas to minimize the risk of overfishing individual stock components. The non-target species interactions would remain at the current levels, with the exception of benefits that may be realized under the Amendment 5 management measures. For this action, however, impacts of Option 1 on non-target species and other fisheries are expected to be *neutral*. The impacts on non-target species and other fisheries resulting from the status quo as well as other options are very similar and negligible, as discussed below.

Preferred Alternative and Other Sub-ACL Options

According to the 2012 SAW/SARC 54 review (see Section 3.1.2), the productive potential of the Atlantic herring stock complex has improved in recent years, although the predator consumption estimates of herring have increased since the mid-1980s. 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 Atlantic herring resource is not overfished and overfishing is not occurring. In fact, the Atlantic herring resource is considered to be completely rebuilt. The best available science justifies the increased catch proposed for the 2013-2015 fishing years.

Allocating an additional 16,600 mt of herring catch to four management areas in each year from 2013-2015 will increase effort above current levels (if the harvest is fully utilized) and may impact some non-target species and other fisheries. While the specific impacts of the sub-ACL options cannot be predicted, they are *unknown but potentially low negative* when compared to the no action option. Observer data and other information about non-target species like river herring, shad, and groundfish suggest that specific impacts on non-target species resulting from increased herring fishing will be temporal (seasonal), spatial (in limited areas), and minor. The extent of these impacts will depend on changes in patterns in the herring fishery (timing/effort) as well as the distribution/abundance of non-target species and other fisheries. 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. The ***Preferred Alternative*** falls within the range of the sub-ACL options that were considered/analyzed.

The seasonal sub-ACL splits proposed for the 2014 and 2015 fishing years could mean intense fishing in Areas 1A and 1B once these areas open due to a reduced time frame for the herring fleet to operate in these areas. The Area 1A split has been effective for many years already, however. Therefore, the impacts are likely to be minor. The distribution of the herring fishery over time and space is an important consideration, but depends on the availability and abundance of fish in these and alternate areas. The information presented in Amendment 5 to the Herring FMP suggests that the inshore portion of Area 1B (around the backside of Cape Cod) is an area of concern regarding river herring bycatch, so sub-ACL options that increase catch in Area 1B may potentially impact river herring more negatively than options that maintain status quo catch in this area.

- Under Option 2, the additional yield would be distributed proportionally to the 2010-2012 sub-ACL specifications (Table 10). Thus, each management area would receive a similar percentage increase (17.0-23.8%). The distribution of impacts on non-target species could be similar to the status quo under this option because it maintains the same proportional distribution of herring catch. This option allows for a slight increase in catch in Area 1B over 2012 levels, an area of concern regarding interactions with river herring. Because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery, the impacts on non-target species and other fisheries are *unknown but potentially low negative* when compared to the no action option.
- Under Option 3, additional yield would be divided among Areas 1A, 1B, and 2 (Table 11). These are the areas where sub-ACL overages have occurred most frequently (Table 41). Focusing the additional yield in these areas might make it easier for the industry harvest within the catch limits, particularly in Area 1B, where the quota has been quite low. Because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery, the impacts on non-target species and other fisheries are *unknown but potentially low negative* when compared to the no action option. This option allows for the largest increase in catch in Area 1B relative to the other options considered for 2013-2015; this is an area of concern regarding interactions with river herring. Because of the increase in Area 1B, the impacts of this option on non-target species and other fisheries may potentially be more negative than other options.
- 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 12 on p. 33). This option was developed based on industry concerns that the mackerel fishery operating in Area 2 is constrained by the availability of herring quota. This option allows for a slight increase in catch in Area 1B, an area of concern regarding interactions with river herring. There is also some concern about river herring bycatch in the inshore portion of Area 2 during some months, but impacts on river herring resulting from this option cannot be accurately predicted. While river herring remains a concern, this option provides benefits to mackerel fishery participants, making the overall impacts on non-target species and other fisheries even more difficult to quantify. From a biological perspective, because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery,

the impacts on non-target species and other fisheries remain *unknown but potentially low negative* when compared to the no action option.

- 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 13 on p. 34). This option allows for increased catch in Area 1B, an area of concern regarding interactions with river herring. The increase is proposed only for the 2013 fishing year, however. Because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery, the impacts on non-target species and other fisheries are *unknown but potentially low negative* when compared to the no action option.
- Under Option 6, the yield would increase by ~10,000 mt in Area 2, similar to Option 4 (Table 14 on p. 35). 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. This option also allows for the greatest increase in catch from Area 1A, the inshore Gulf of Maine. As a result, concerns about impacts on non-target species and other fisheries in the inshore Gulf of Maine are greatest under this option. Because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery, the impacts on non-target species and other fisheries are *unknown but potentially low negative* when compared to the no action option.
- Under the ***Preferred Alternative*** for allocating catch to sub-ACLs, the additional yield would be divided among Areas 1A, 1B, and 2 (Table 11 on p. 32). The impacts of the ***Preferred Alternative*** on non-target species and other fisheries falls within the scope of the impacts of other sub-ACL options discussed above. Because of variability associated with fish distribution and uncertainty about the timing and location of additional effort in the fishery, the impacts on non-target species and other fisheries are *unknown but potentially low negative* when compared to the no action option.

Summary

Impacts of the 2013-2015 sub-ACL options on non-target species and other fisheries result from the distribution of the additional catch and increased fishing effort across the herring management areas. Because of stock/fishery variability and data limitations, it is not possible to predict specific positive or negative impacts to non-target species and other fisheries that may result from the distribution of the stockwide ACL in the herring management areas over the 2013-2015 fishing years. Observer data and other information about non-target species like river herring, shad, and groundfish suggest that specific impacts on non-target species resulting from increased herring fishing will be temporal (seasonal), spatial (in limited areas), and minor. The extent of these impacts will depend on changes in patterns in the herring fishery (timing/effort) as well as the distribution/abundance of non-target species and other fisheries. Variability associated with these factors prevents quantitative assessment of impacts. Relative to the no action option, therefore, the impacts of the sub-ACL options on non-target species and other fisheries are *unknown but potentially low negative*. These impacts are short-term; as discussed above, the long-term impacts of the herring management program on non-target species and other fisheries is expected to be positive.

Sub-ACL carryovers that may be authorized under Framework 2 are not likely to affect the conclusions regarding the potential impacts of the sub-ACLs. The stockwide ACL was exceed in 2012, so if Framework 2 provisions are approved, no carryovers would be authorized for 2014. Any carryover in 2015 would result from unutilized sub-ACL in 2014 and would only be allowed if the 2013 stockwide ACL is not exceeded. The ***Preferred Alternative*** for authorizing carryovers does not provide for an increase in the stockwide ACL (see Section 2.1.2.2), so total removals would remain the same. While there may be some impacts associated with shifts in effort, these cannot be predicted because stock, fishery, and other environmental conditions will have an influence as well.

RSAs and FGSA

The conclusions drawn above regarding the impacts of the sub-ACL options on non-target species and other fisheries are not affected by the proposed fixed gear set-aside (295 mt) because this is a status quo specification, and herring allocated under the FGSA are returned to the Area 1A fishery before the end of the fishing year if not utilized by the fixed gear sector. These conclusions also are not affected by the proposed research set-aside (3% in each management area) because fish allocated under the RSA are assumed to be caught during the fishing year.

There are, of course, long-term benefits to the Atlantic herring resource, participants in the herring fishery, and non-target species and other fisheries from enhancing management through cooperative research. A 3% RSA for the 2013-2015 fishing year encourages the industry to participate in the collection of scientific information and conduct research to reduce interactions with non-target species and other fisheries affected by the herring fishery. The Council has identified **river herring bycatch avoidance** and **portside sampling** as top priorities for cooperative research to be funded through any RSA program supported by the 2013-2015 herring fishery specifications. Long-term benefits to non-target species and other fisheries can be expected from cooperative research programs that address these priorities. Allocating RSA for 2013-2015 under these research priorities is consistent with the goals and objectives of the herring management program and the long-term management strategy for bycatch avoidance/minimization provided in Amendment 5.

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. All six options represent an aggregate increase in allocation and fishing activity and compared to the no action option. The ***Preferred Alternative*** falls within the range of these options.

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. Thus, this measure would not have any adverse effects on EFH as compared to the no action alternative. These conclusions are not affected by the proposed fixed gear set-aside (295 mt) or the proposed research set-aside (3% in each management area).

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 1A	26,546	**26,546**	**31,200**	**32,100**	**32,000**	**32,000**	**40,000**
Sub-ACL 1B	4,362	**4,362**	**5,400**	**9,900**	**5,800**	**10,800/5,800**	**5,800**
Sub-ACL 2	22,146	**22,146**	**25,900**	**27,800**	**32,000**	**27,000/32,000**	**32,000**
Sub-ACL 3	38,146	**38,146**	**45,300**	**38,000**	**38,000**	**38,000**	**30,000**
3% 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

The protected resources that are considered with respect to this action are identified and described in Section 3.4 of this document. The ESA and MMPA requirements addressed in Section 3.4 further explain the protected species/resources and have been well-documented in the major gear types currently used in the Atlantic herring fishery. Additionally, Table 40 (2009-2011) specifies incidents that are isolated to herring observer trips and indicates that harbor seals and grey seals are the most likely to be taken, which generally occurs in Area 1A. Actions to minimize takes on protected resources specifically certain cetaceans and harbor porpoise are required under ALWTRP and HPTRP measures respectively. Additional general discussion about protected resources interactions is provided as part of the discussion of the impacts of the OFL/ABC alternatives in Section 4.2.1.4 of this document.

A summary of the proposed sub-ACLs for the 2013-2015 fishing years can be found in Table 8 (p. 28). Under the ***Preferred Alternative***, as well as any other sub-ACL options (except the no action option), there is expected to be an increase in total Atlantic herring catch of 16,600 mt from 2012 levels. There is also expected to be an increase in observer coverage at-sea in accordance with Amendment 5 catch monitoring measures; therefore, monitoring protected species interactions in the fishery is expected to improve during the 2013-2015 fishing years. Increased fishing effort under the proposed 2013-2015 herring fishery specifications is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to change or jeopardize the status of any protected species. An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific protected resources are difficult to predict.

Option 1 (No Action)

Under the no action option, impacts to protected species are expected to remain unchanged from the 2012 herring specifications. The sub-ACLs from the 2012 specifications would continue to be used in the four management areas to minimize the risk of overfishing individual stock components. The marine mammal/fishery interactions would remain at the current levels, which have decreased in prior years. Impacts on protected resources are therefore expected to be *neutral*.

Preferred Alternative and Other Sub-ACL Options

According to the 2012 SAW/SARC 54 review (see Section 3.1.2), the productive potential of the Atlantic herring stock complex has improved in recent years, although the predator consumption estimates of herring have increased since the mid-1980s. 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 Atlantic herring resource is not overfished and overfishing is not occurring. In fact, the Atlantic herring resource is considered to be completely rebuilt.

The availability of forage for protected species remains of particular importance and one in which natural mortality rates were considered in the stock assessment, specifically from 1996-2011. The natural mortality rates 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 impacts of the Proposed Action on protected species' ability to forage for herring are likely to be slightly more positive under the status quo than under the ***Preferred Alternative*** or other sub-ACL options because of the overall increase in herring catch allowed during 2013-2015. If herring are less available to protected resources than in previous years, then the impact of the fishery may be slightly more detrimental to protected species.

The assumed potential timing and location of the fishery combined with the proposed sub-ACL splitting in Area 1A and Area 1B could subsequently impact protected species in a negative manner. However, under the ***Preferred Alternative***, the timing of the fishery is only expected to have minimal impact from the most recent years, and therefore may not have an effect on protected species. The timing and areas of effort of the fishery may experience a derby like situation in 2014 and 2015, but that will still depend on the availability and abundance of herring in the considered areas (Area 1A and 1B), and are not expected to directly or indirectly impact protected species. An increase or decrease in the rate of effort in these areas is not expected either, and therefore will have minimal effect on protected species in the area.

Table 67 highlights the options which may be more likely to result in higher relative exploitation rates for the inshore and offshore stock components according to the sub-ACL analysis, and includes the ***Preferred Alternative*** and other options considered. The higher the relative exploitation rate with respect to the inshore component, the higher the risk of encounter with inshore protected species, in particular interactions with harbor porpoise, white sided dolphins, pilot whales as well as grey and harbor seals, which are seasonally abundant in the Gulf of Maine. The risk of the ***Preferred Alternative*** is low relative to the other options in the high risk category and therefore the protected species would most likely not be expected to be impacted by the ***Preferred Alternative***.

Availability of Forage

It is difficult to determine the amount of surplus herring biomass that is currently available as forage for predators, but because all options increase in all the management areas except for Area 3 in Options 3-6, so there is a possibility that protected species may be impacted. If herring availability is less than in previous years and catch increases, then the impact of the fishery will be even more detrimental to the accessibility of forage to protected species.

Generally, any shift in available forage should be sufficiently small to not impact the status of the protected species. The effects of fishing would continue to occur, with principal impacts on the species expected to interact with the fishery. Overall, the herring fishery as a whole would not likely jeopardize the continued existence of threatened or endangered species or critical

habitat. The impacts are consistent across the ***Preferred Alternative*** and options 2-6 and thus considered *potentially low negative*.

Area Shifts and Timing

The sub-ACL splits proposed in the 2013-2015 fishery specifications could mean intense fishing in Areas 1A and 1B once these areas open due to a reduced time frame for the herring fleet to operate in these areas. The Area 1A split has been effective for many years already, however. Therefore, the impacts are likely to be minimal. The distribution of the fishing industry over time and space is another important consideration, but depends on the availability and abundance of herring in these and alternate areas. Area 3 could experience an increase in fishing during the warmer months, because Area 2 is primarily a winter fishing ground. Protected species are likely in the area during this time, which may increase the chance of interaction in those offshore areas. Likewise, the availability of herring for forage may be decreased as well, although not enough to change the status of the protected species of consideration. Cost of transportation to those areas and lack of vessel size may provide a hindrance to the shift from the GOM to GB. The cost of steaming to and from the fishing grounds for more scattered fish will increase the cost for the fishery, and may deter inshore fishermen from shifting effort to offshore.

Similarly, the vessels may not be fit for steaming on the open seas. If this does prove to be the case, then the impacts of the actions on protected species would be minimized. Effort in the offshore areas where many migrating species occur would not experience as large of an increase in effort. The offshore areas may not be impacted during the warmer months, where migratory species are likely to be encountered, and would not see an increase in interaction with the fishery. Also, animals such as white-sided dolphin and pilot whales would not be impacted as much. Indirect benefits could come from the enhanced prey species available for protected species. The impacts are consistent across the ***Preferred Alternative*** and options 2-6 and thus considered *potentially low negative*.

Rate of Effort

As described above, implementation of the proposed Area 1A and Area 1B sub-ACL splits could reduce the amount of time the fleet has to fish the area. The Area 1A split has been effective for many years already, however. Therefore, the impacts are likely to be minimal. The reduced amount of time to fish in Area 1A and 1B could create a derby-like situation, in which fishermen compete to get what quota they can in the time allotted, but not likely. This increase in the rate of effort would potentially result in an increase in protected species encounters, particularly for the harbor porpoise, grey seals, and harbor seals which are seasonally abundant in the GOM. It may also reduce the amount of forage available in these areas as the rate of fishing increases. Additionally, more fish would be removed in a smaller amount of time; however the quotas proposed are low enough to limit the potential effects among protected species. The impacts are consistent across the ***Preferred Alternative*** and options 2-6 and thus considered *potentially low negative*.

Monitoring

None of the options under consideration are expected to affect the levels of observer coverage at sea in 2013, but increased monitoring is considered for 2014 and 2015 fishing years. More monitoring for the fishery would prove beneficial to protected species analysis as a more accurate rate of interaction with the fishery could be calculated. Amendment 5 to the Atlantic Herring FMP has included measures that address an implementation of increased monitoring (see the Amendment 5 FEIS, currently under review).

Summary of Impacts on Protected Resources

The Council considered a number of options to specify sub-ACLs in each of the four Atlantic herring management areas. The ***Preferred Alternative*** falls within the range of options initially evaluated by the Council. Table 69 summarizes the potential impacts on protected resources that may result from the proposed action as well as the different options considered by the Council. The **effort** column utilizes the relative magnitude of the difference from the status quo to estimate what may happen to effort in the herring fishery as a result of the different options. The **difference from the status quo** column provides the difference between the 2010-2012 specifications ACL/OY and the 2013-2015 specifications ACL/OY, where the 2010-2012 OY is subtracted from the 2013-2015 OY. The **forage** column indicates what change in the availability of forage may be experienced by protected species as a result of the effort change. The **timing** and **area shift** columns denote where and when the effort may be expected to shift, thereby indicating where and when protected species may be affected. The potential increase or decrease in the rate of fishing by the fleet is indicated by the **rate** column. The six options and no action option can be broken into two groups with approximately equal risk of impacts on protected species, relative to the other groups, which are indicated in the **option comparisons** column as either higher impact or lower impact. The **monitor increase** column indicates if any of the options will increase the amount of observer coverage or other monitoring of the herring fleet, which has the potential to benefit the monitoring of protected species.

Generally, all options show a minor increase in fishing effort and an increase in total ACL of 16,600 mt from the previous 2010-2012 specifications. Consequently, all options show an increase in forage for 2013-2015. The ***Preferred Alternative*** indicates a lower impact in fishing years 2013 and 2014 with 2015 having a higher impact because the OFL equals ABC for that year. As a result, the impacts, when compared to status quo, suggest negligible effects upon protected resources for the 2013-2015 herring specifications.

Sub-ACL carryovers that may be authorized under Framework 2 are not likely to affect the conclusions regarding the potential impacts of the sub-ACLs. The stockwide ACL was exceed in 2012, so if Framework 2 provisions are approved, no carryovers would be authorized for 2014. Any carryover in 2015 would result from unutilized sub-ACL in 2014 and would only be allowed if the 2013 stockwide ACL is not exceeded. The ***Preferred Alternative*** for authorizing carryovers does not provide for an increase in the stockwide ACL (see Section 2.1.2.2), so total removals would remain the same. While there may be some impacts associated with shifts in effort, these cannot be predicted because stock, fishery, and other environmental conditions will have an influence as well.

Table 69 Summary Assessment of Sub-ACL Options Under Consideration in Relation to Protected Species

	Year	Effort	Difference from Status Quo (ACL)	Forage	Timing (Area 1A)	Timing (Area 1B)	Area Shift	Rate	Option Comparisons	Monitor Increase
Proposed Action	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Area 2+3	Increase in all areas	Lower Impact Lower Impact Higher Impact	No Yes Yes
Option 1 (No Action)	2013 2014 2015	No Change	0 0 0	No Change	Jun-Nov	Jan- Dec	No Change	No Change	Lower Impact Lower Impact Lower Impact	No Yes Yes
Option 2	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Area 3	Increase in all areas	Lower Impact Lower Impact Higher Impact	No Yes Yes
Option 3	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Area 1B, 2, 3	Decrease in Area 3	Lower Impact Lower Impact Higher Impact	No Yes Yes
Option 4	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Area 2+3	Decrease in Area 3	Lower Impact Lower Impact Higher Impact	No Yes Yes
Option 5	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Area 1B, 2, 3	Decrease in Area 3	Lower Impact Lower Impact Higher Impact	No Yes Yes
Option 6	2013 2014 2015	Minor Inc Minor Inc Minor Inc	16,600 16,600 16,600	Larger Increase (2013-2015)	Jun- Dec	May -Dec	Unk./ Possibly Areas 1A+2	Decrease in Area 3	Lower Impact Lower Impact Higher Impact	No Yes Yes

**All comparisons have been made relative to the no action/status quo.*

In summary, the impacts of the proposed sub-ACLs on protected resources are expected to be minimal. This includes impacts on the amount of forage available to protected species. The risk of the impacts of the proposed action are low compared to the other alternatives spatially and temporally, and though the rate of fishing is expected to increase, the interactions with the herring fishery may be low, limiting the potential effects to protected species.

In the sub-ACL analysis, the options were divided into two categories – high impact and low impact. Those that have a higher impact listing in Table 67 represent the options which may be more likely to result in higher relative exploitation rates for the inshore and offshore stock components according to the sub-ACL analysis are the options which may result in higher exploitation rates for the inshore stock component, and vice versa. The options which are less likely to have higher exploitation rates for the inshore stock component stand to benefit inshore protected species, in particular harbor porpoises, white-sided dolphins, pilot whales, grey seals, and harbor seals because less fishing may decrease interaction with protected species. The options which are lower risk may also pose a potential benefit to protected species by providing more herring for forage in response to lower fishing rates.

For those options having a higher risk of impact the quotas being proposed are low enough that the effects on protected species may be considered low. There would be a slightly higher risk of interaction with protected species, in particular harbor porpoises, white-sided dolphins, pilot whales, grey and harbor seals, which are seasonally abundant in the GOM - and forage availability may be slightly less. Increased fishing effort under the proposed 2013-2015 herring fishery specifications is likely to result in effort that is less than the 2007-2009 herring fishery specifications and not likely to change or jeopardize the status of any protected species. An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific protected resources are difficult to predict. Overall, the impacts on protected resources are consistent across the ***Preferred Alternative*** and Options 2-6 and considered *potentially low negative* when compared to the no action option. These conclusions are not affected by the proposed fixed gear set-aside (295 mt) or the proposed research set-aside (3% in each management area).

4.2.2.5 Impacts of 2013-2015 Sub-ACL Options on Fishery-Related Businesses and Communities

The ***Preferred Alternative*** for specifying the 2013-2015 sub-ACLs is presented in Table 6. This option was selected by the New England Fishery Management Council at its January 29-31, 2013 meeting and falls within the range of options considered/analyzed in the Draft 2013-2015 Herring Fishery Specifications Document provided to the Council for consideration (non-preferred sub-ACL options are described in the sub-sections that follow).

Table 70 Proposed Sub-ACLs (mt) for 2013-2015 (*Preferred Alternative*)

	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	**31,200**
Sub-ACL Area 1B	4,362	**4,600**
Sub-ACL Area 2	22,146	**30,000**
Sub-ACL Area 3	38,146	**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.*

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 2.2.2.2) is selected as the ***Preferred Alternative***. This alternative would provide 16,600 mt of additional yield each year in 2013-2015 relative to the yield available in 2012. Increasing a sub-ACL results in positive economic and social impacts, 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 benefits. The values of sub-ACLs under consideration in all options are within the range of recent sub-ACLs and catches (Table 41). 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 on the users of those areas. Table 71 lists the sub-ACL Options 1-6 and the ***Preferred Alternative*** (P) according to the numerical value of the sub-ACLs, from highest to lowest. For example, Option 1 provides the lowest amount of fish to Areas 1A, 1B, and 2. 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. The ***Preferred Alternative*** falls within the range of the other options.

Table 71 Relative Ranking of the Sub-ACLs Available to Each Management Area Under Options 1-6

	Highest sub-ACL → Lowest sub-ACL						
Area 1A	6	3	4,5	**P**,2			1
Area 1B	3	5	4,6		2	**P**	1
Area 2	4,5,6			**P**	3	2	1
Area 3	2	**P**	1	3,4,5			6

*Note: **P** represents the Preferred Alternative.*

Increasing sub-ACLs is likely to have a beneficial effect on and potentially expand the number of communities participating in the herring fishery (Table 56, 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 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 48). Increasing the sub-ACLs in Area 1A could 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 could provide benefits to the trawl vessels which use these areas during the summer. Increasing the sub-ACL in Area 2 could provide benefits to the trawl vessels which use Area 2 during the winter. These vessels often catch mackerel in addition to herring.

Option 1 (No Action)

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 9). With no change in the ACL or sub-ACLs, there could be a degree of constancy and predictability for fishing industry operations and a steady supply to the market. Maintaining the status quo could result in negative social impacts. The *Size and Demographic Characteristics* of the fishery-related workforce could be unchanged, as could the *Historical Dependence on and Participation in* the fishery. This option could make more herring available as forage fish in the ecosystem, which could have a positive impact on the fisheries that depend on herring, as well as indirect users (e.g. the whale watch industry). This option could not allow the industry to realize the benefits of a rebuilt stock and additional yield that is supported by the best available science.

The impacts of the no action option on fishery-related businesses and communities are expected to be *negative*.

Preferred Alternative

Under the *Preferred Alternative*, the additional yield would be divided among Areas 1A, 1B, and 2 (Table 11 on p. 32). Relative to the no action alternative, there could be more positive impacts. Employment opportunities could increase, resulting in positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce. It is likely that ports with *Historical Dependence on and Participation in* the fishery could 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, catch of this spawning component could go unobserved.

The impacts of the ***Preferred Alternative*** in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

Option 2

Under Option 2, the additional yield would be distributed proportionally to the 2010-2012 sub-ACL specifications (Table 10 on p. 31). Thus, each management area would receive a similar percentage increase (17.0-23.8%). Relative to the no action alternative, there could be positive impacts, though the distribution of impacts could be similar. Employment opportunities could 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 could 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, catch of this spawning component could go unobserved.

The impacts of Option 2 in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

Option 3

Under Option 3, the additional yield would be divided among Areas 1A, 1B, and 2 (Table 11 on p. 32). These are the areas where sub-ACL overages have occurred most frequently (Table 41). Focusing the additional yield in these areas might make it easier for the industry harvest within the catch limits, particularly in Area 1B, where the quota has been quite low. Relative to the no action alternative, there could be 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 48 and Table 57), Option 3 would distribute benefits to all of the communities and major gear types.

The impacts of Option 3 in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

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 12 on p. 33). 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, could be the minimum required for the industry to satisfy the existing herring market and to fully utilize the ACL for mackerel. Relative to the no action alternative, there could be positive impacts. This option could increase profits from the joint herring and mackerel fisheries. With increased mackerel and herring harvest, employment opportunities could 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 57), Option 4 could 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 could benefit this sector of the industry more than others (e.g. purse seine).

The impacts of Option 4 in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

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 13 on p. 34). 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 could allow more opportunity for the fishery-wide ACL to be utilized in 2013. Relative to the no action alternative, there could be 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 could be more positive impacts to the *Size and Demographic Characteristics* of the fishery-related workforce, particularly those industry segments that rely on Area 2.

The impacts of Option 5 in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

Option 6

Under Option 6, the yield would increase by ~10,000 mt in Area 2, similar to Option 4 (Table 14 on p. 35). 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, could be the minimum required for the industry to satisfy the existing herring market and to fully utilize the ACL for mackerel. 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 could benefit the purse seine fishery, in addition to the benefits to the trawl fishery in Area 2 proposed under this option. An Area 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 could 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*.

The impacts of Option 6 in comparison to the no action option are expected to be *positive* for fishery-related businesses and communities.

RSAs and FGSA

The conclusions drawn above regarding the impacts of the sub-ACL options on fishery-related businesses and communities are not affected by the proposed fixed gear set-aside (295 mt) because this is a status quo specification, and herring allocated under the FGSA are returned to the Area 1A fishery before the end of the fishing year if not utilized by the fixed gear sector. These conclusions also are not affected by the proposed research set-aside (3% in each management area) because fish allocated under the RSA are assumed to be caught during the fishing year.

There are, of course, indirect long-term benefits to both the Atlantic herring resource and participants in the fishery of enhancing management through improved information and cooperative research. A 3% RSA for the 2013-2015 fishing year encourages the industry to participate in the collection of scientific information and conduct research to reduce interactions with non-target species and other fisheries affected by the herring fishery. The Council has identified **river herring bycatch avoidance** and **portside sampling** as top priorities for cooperative research to be funded through any RSA program supported by the 2013-2015 herring fishery specifications. Long-term benefits can be expected for fishing-related businesses and communities from cooperative research programs that address these priorities. Allocating RSA for 2013-2015 under these priorities is consistent with the goals and objectives of the herring management program and the long-term management strategy for bycatch avoidance/minimization provided in Amendment 5.

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 are proposed 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

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).

The seasonal split proposed for Area 1A was already authorized by Framework 1, but would be implemented by the 2013-2015 specifications process. Monthly catch rates, from the VTR data, show that 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 17). 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. There would be little change from how the fishery has used Area 1A for the past five years, due to the ASMFC days out of the fishery. 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 18). 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 could change current fishing behaviors more than the proposed split for Area 1A. Thus, potential social impacts may be greater than for the Area 1A split. Delaying the fishery in 1B until May could 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.

Overall, the impacts of seasonal splits in Areas 1A and 1B in comparison to the no action option are not expected to significantly alter the impacts of the sub-ACL options on fishing-related business as communities.

Although not recommended by the Council for 2014 and 2015, an Area 2 split of 67% January-February and 33% March-December was considered. Seasonal splits of sub-ACLs were recommended in November 2012 by the Herring Advisory Panel due to concerns about Area 2 and the issues surrounding the mackerel fishery (NEFMC 2012a). The seasonal split proposed for Area 2 could ensure herring availability towards the end of the year. This could 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 19 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 could 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 could 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

For the 2013-2015 Atlantic herring fishery specifications, the Council proposes to specify domestic annual harvest (DAH) at 107,800 mt and domestic annual processing (DAP) at 103,800 mt. These specifications are consistent with past approaches for specifying DAH and DAP, as well as the definitions formulas provided in the Herring FMP (see Section 1.2 of this document). Supporting information is provided in Sections 2.2.5.1 and 2.2.5.2, respectively. The Council also proposes to maintain a border transfer (BT) specification of 4,000 mt and U.S. At-Sea Processing (USAP) specification of 0 mt. These specifications represent the status quo for 2013-2015. None of the other proposed fishery specifications affect removals from the fishery, as they are all administrative in nature and represent elements of the proposed stockwide ACL/OY. There are no impacts expected from any of these specifications for the 2013-2015 fishing years.

Impacts of Other Proposed 2013-2015 Fishery Specifications on Atlantic Herring

None of the other fishery specifications affect removals from the fishery, as they are all administrative in nature and represent elements of the proposed stockwide ACL/OY for 2013-2015. Impacts of the other proposed fishery specifications on the Atlantic herring resource with respect to the no action alternative, therefore, are expected to be *neutral*.

Impacts of Other Proposed 2013-2015 Fishery Specifications on Non-Target Species and Other Fisheries

None of the other fishery specifications affect removals from the fishery, as they are all administrative in nature and represent elements of the proposed stockwide ACL/OY for 2013-2015. Impacts of the other proposed fishery specifications on non-target species and other fisheries with respect to the no action alternative, therefore, are expected to be *neutral*.

Impacts of Other Proposed 2013-2015 Fishery Specifications on Physical Environment and EFH

The specifications of DAH, DAP, BT, and USAP remain unchanged as a result of the proposed action. This maintenance of the status quo, combined with a previous determination that herring midwater trawls and purse seines have minimal adverse effects on EFH (see section 3.3.2), means that this measure would not have any adverse effects on EFH as compared to the no action alternative.

Impacts of Other Proposed 2013-2015 Fishery Specifications on Protected Resources

None of the other fishery specifications affect removals from the fishery, as they are all administrative in nature and represent elements of the proposed stockwide ACL/OY for 2013-2015. Impacts of the other proposed fishery specifications on protected resources with respect to the no action alternative, therefore, are expected to be *neutral*.

Impacts of Other Proposed 2013-2015 Fishery Specifications on Fishery-Related Businesses and Communities

Each of the other proposed specifications remain unchanged from 2010-2012, thus relative to the no action alternative, no new economic or social impacts are expected. Overall, the impacts are expected to be *neutral*. 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.

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 could either be sustained or expanded. The positive impacts from increased catch under the proposed 2013-2015 specifications are discussed in Section 4.2.1.5 of this document and do not result directly from the other fishery specifications addressed in this section.

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. The impacts of setting DAP at DAH in comparison to the no action alternative are expected to be *neutral*.

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 not likely be socioeconomic impacts relative to the status quo. The impacts of setting BT at 4,000 mt in comparison to the no action alternative are expected to be *neutral*.

Currently, there are no at-sea processing businesses in operation, so there is no need to allocate a portion of the catch in to U.S. At-Sea Processing. Relative to the status quo, no socioeconomic impacts are expected from this specification. The impacts of this specification in comparison to the no action alternative are expected to be *neutral*.

4.2.4 Impacts of Alternatives for AMs

The ***Preferred Alternative*** proposes to modify the current AM for closing the directed herring fishery in a management area (sub-ACL) and establish a percentage trigger for closing the directed herring fishery in all management areas (stockwide ACL). This alternative maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions. Under the ***Preferred Alternative***, the following accountability measures would apply (described in Table 17):

3. 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.

   In addition, a trigger would be established for closing the directed herring fishery in all management areas. The trigger for closing the directed herring fishery in all management areas would be 95% of the stockwide Atlantic herring 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.

4. The AM to require an ACL/sub-ACL overage deduction would continue to be based on year-end catch estimation methods (status quo, one-year lag, see Section 3.5.1.2.1.2 on p. 115 for a description of these methods). The herring fishery can be active during the entire fishing year (January to December), and herring catch data are not finalized until halfway through the following year. Typically, quality control checks on herring catch data are completed in February, observer data are finalized in May, and dealer data are finalized in June. The overage deduction would then be made effective the year following the interim year. These methods would also be utilized to determine underages/carryovers if provisions proposed in Framework 2 are approved (Section 2.1.2).

The ***Preferred Alternative*** was analyzed as part of AM Alternative 2 (Section 2.2.6.2, p. 41) and falls within the range of alternatives that the Council considered when selecting final measures.

Table 72 Preferred Alternative for AMs

AM	Description
Trigger for Directed Fishery Closure	• Adjust the existing AM to require the directed herring fishery in a management area to close when catch is projected to reach **92%** (not including RSAs) of a sub-ACL; the remaining 8% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits. • Establish provisions to close the directed herring fishery in all management areas when catch is projected to reach 95% of the stockwide herring ACL; the remaining 5% is provided after the closure under a 2,000 pound trip limit for all vessels with herring permits.
Overage Payback	Status quo

**If provisions to allow carryovers are approved in Framework 2 (Section 2.1.2.2), ACL/sub-ACL overages and underages would be determined, and deductions/carryovers would be applied based on the same methodology ("year-end catch estimation," one year lag, see Section 3.5.1.2.1.2).*

The existing AM associated with the haddock catch cap is described in the no action alternative (AM Alternative 1, Section 2.2.6.1) and will remain effective under the ***Preferred Alternative***. This AM is not addressed in the following discussion. The AMs proposed in this document would continue to apply to the Atlantic herring fishery beyond the 2013-2015 fishing years, until modified by a future Council action (amendment, framework adjustment, or specifications). Impacts of the proposed AMs, therefore, are considered over a longer time frame (not just the 2013-2015 fishing years).

The impacts of the AM alternatives on the five VECs identified in this document are discussed in the following subsections.

4.2.4.1 Impacts of AM Alternatives on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP, as modified by applicable amendments and framework adjustments. The Herring FMP was developed by the Council and implemented by NMFS in 2000. The specification-setting process is the primary management tool used to administer the herring fishery and was modified in Amendment 1 (from annual to every three years) Amendment 4 for consistency with the ACL/AM provisions in the reauthorized MSA. The current specifications (75 FR 48874, August 12, 2010) established 2010-2012 herring harvest levels for each of four management areas, and Amendment 4 (76 FR 11373, March 2, 2011) established the trigger for closing the directed fishery in a management area and the provision that any overages would be deducted from future harvest levels (Accountability Measures). The action proposed in this document modifies the suite of accountability measures that apply to the Atlantic herring fishery.

Fishing mortality on Atlantic herring is generally managed through the overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are intended to minimize risk to individual stock components while maximizing opportunities for the fishery to achieve OY. Based on the best available scientific information (SAW 54), the Atlantic herring resource is not overfished (stock is rebuilt), and overfishing is not occurring.

Overall, the accountability measures proposed for the Atlantic herring fishery in the 2013-2015 specifications package should have a *positive* impact on the Atlantic herring resource to the extent that they prevent the stockwide Atlantic herring ACL and management area sub-ACLs from being exceeded during the fishing year, as well as improve the likelihood that the total ACL (OY) can be caught on a continuing basis while preventing overfishing. The ***Preferred Alternative*** establishes an in-season AM for the stockwide ACL, which previously had not been part of the suite of AMs. This is intended to minimize the risk of exceeding the stockwide ACL, consistent with the requirements of the MSA and NMFS National Standard Guidelines. Dividing the stockwide Atlantic herring ACL into smaller portions that are attributed to specific management areas (sub-ACLs) further assures that the risk of overfishing is minimized and provides extra precaution because the sub-ACLs are also subject to in-season AMs before the total ACL is fully utilized. Each alternative considered by the Council is discussed below.

Alternative 1 (No Action): Under the no action alternative, the trigger for closing a management area to directed herring fishing would remain 95% of the sub-ACL, and overage deductions would continue to be based on year-end catch estimation with a one-year lag. The AMs included in the no action alternative include in-season measures (sub-ACL trigger) designed to prevent the total ACL from being exceeded and year-end measures designed to mitigate ACL overages as soon as possible (overage paybacks). There would continue to be no trigger (% of total ACL) for closing all management areas to directed herring fishing.

In general, AMs are intended to foster sustainable management of the fishery. The benefits of AMs on the Atlantic herring resource result from preventing the stockwide Atlantic herring ACL from being exceeded during the fishing year and ensuring, over the long-term, that OY can be caught on a continuing basis while preventing overfishing. The no action alternative provides some assurance that the stockwide ACL for Atlantic herring will not be exceeded by establishing in-season AMs for the sub-ACLs and an overage payback process for both sub-ACLs and the stockwide ACL. The AMs included in the no action alternative were implemented in 2011. Since that time, NMFS has made improvements to in-season sub-ACL/ACL catch monitoring (see Section 3.5.1.2.1 for more information), and the Council approved final measures for Amendment 5 to the Herring FMP, which establishes a comprehensive catch monitoring program for limited access herring vessels. Amendment 5 measures should become effective within the next fishing year.

As a result of the short time frame under the new AMs, enhanced quota monitoring, and further improvements to the catch monitoring program for the herring fishery, it is not possible to predict the impacts of maintaining the no action alternative for AMs on the Atlantic herring resource. During the last two years, however, the stockwide ACL for Atlantic herring was not exceeded in 2011 but appears to have been exceeded in 2012 (based on preliminary data, see Table 41 on p. 112 of this document). NMFS' National Standard Guidelines state that if catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness. An alternative suite of AMs, therefore, may provide greater assurance than the no action alternative that long-term benefits to the Atlantic herring resource can be realized.

With only two years under the existing AMs, it is difficult to determine how effective the current suite of AMs may be in future years, especially with the implementation of the Amendment 5 catch monitoring program (expected in the 2014 fishing year). To the extent that the existing AMs prevent/reduce sub-ACL and ACL overages in the herring fishery, there would potentially be positive impacts on the Atlantic herring resource for the reasons described above. While the impacts of the no action alternative on the Atlantic herring resource are generally *unknown but potentially low positive*, any increased benefit of establishing a more comprehensive and conservative suite of accountability measures for the fishery (such as those under consideration in other alternatives) would not be realized. Without taking action, an in-season AM (to prevent the ACL from being exceeded) would not be implemented, increasing uncertainty about the potential for the existing suite of AMs to provide adequate assurance that overfishing is minimized while considering scientific and management uncertainty. The no action alternative, therefore, is less likely to produce positive impacts on the Atlantic herring resource when compared to the other alternatives under consideration in this document.

Alternative 2 (Preferred Alternative): The Council selected ***Alternative 2, Option A*** as the ***Preferred Alternative***, without the provision to change the timing of accounting for overage deductions (and carryovers, if approved in Framework 2). Under this alternative, the current AM for closing the directed herring fishery in a management area (sub-ACL) would be modified, from 95% to 92% of the sub-ACL. 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 fishing year. This alternative/option also establishes a trigger of 95% of the herring stockwide ACL for closing the directed herring fishery in all areas; when 95% of the stockwide ACL is projected to be reached, the directed herring fishery in all management areas would close and herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year. The ***Preferred Alternative*** maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions.

Relative to the no action alternative and other alternatives considered by the Council, this alternative is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded. It establishes an in-season AM for the stockwide ACL (95% trigger) that does not currently exist within the suite of AMs for the fishery. This is consistent with NMFS NSGs and will minimize the likelihood of ACL overages more than the

no action alternative, and more than other alternatives considered (other alternatives do not establish an in-season trigger for the stockwide ACL).

Reducing the in-season trigger for closing a management area from 95% of a sub-ACL to 92% of a sub-ACL should help minimize sub-ACL overages without significantly preventing the fishery from achieving OY. The fishery impacts associated with this measure are discussed in Section 4.2.4.5 of this document. Dividing the stockwide Atlantic herring ACL into smaller portions that are attributed to specific management areas (sub-ACLs) further assures that the risk of overfishing is minimized and provides extra precaution because the sub-ACLs are also subject to in-season AMs before the total ACL is fully utilized. Information provided in Table 41 suggests that with the exception of Area 1B (very low sub-ACL), sub-ACL overages in other areas would likely have been prevented by a lower trigger for closure of the directed fishery.

Because this alternative establishes an in-season AM for the stockwide ACL, lowers the in-season AM for the sub-ACLs, and maintains provisions for overage deductions (which further ensures accountability), the impacts of this alternative on the Atlantic herring resource are likely to be *positive* when compared to the no action alternative. This alternative also is the most conservative of those considered by the Council for AMs in this document, so this alternative is likely to have the most positive impact relative to other alternatives.

Alternative 3 (Non-Preferred): Alternative 3 proposes that provisions for closure of the directed herring 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. Alternative 3 maintains the one-year lag in implementing overage deductions but 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.

Alternative 3 modifies both existing AMs by establishing criteria to lower the in-season AM (sub-ACLs) and allowing exceptions to the overage deduction AM. It does not establish an in-season AM for the stockwide Atlantic herring ACL. It is unclear how the proposed criteria for lowering the sub-ACL trigger and exceptions for overage deductions would affect the ability of the AMs to prevent overages. The status of the Atlantic herring resource is such that the exemptions proposed in this alternative would currently apply (with the exception of 2012, as the total ACL was exceeded), but it is not possible to predict the impacts associated with these provisions. To the extent that this alternative prevents/reduces sub-ACL and ACL overages in the herring fishery, there would potentially be positive impacts on the Atlantic herring resource. Similar to the no action alternative, therefore, the impacts of this alternative on the Atlantic herring resource are *unknown but potentially positive*. This alternative is less conservative than Alternatives 2 and 4, so the impacts are expected to be less positive than under the other alternatives.

Alternative 4 (Non-Preferred): Under Alternative 4, 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. Alternative 4 maintains the one-year lag in implementing overage deductions but proposes to 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.

Alternative 4 establishes a more conservative in-season AM by modifying the sub-ACL trigger for closing the directed herring fishery in a management area and establishing a similar trigger for the stockwide Atlantic herring ACL. It proposes an exception to the existing AM for overage paybacks, which is less conservative than the status quo. The proposed modifications to the in-season AM are more conservative than the status quo, but they are somewhat reactive in that they lower the trigger for closing the directed fishery after an overage occurs (versus Alternative 2, which lowers the trigger in all cases). However, because this alternative proposes to establish an in-season trigger for the stockwide ACL as well as the sub-ACLs, it is more conservative than the status quo, and the long-term impacts on the Atlantic herring resource are likely to be *positive*, resulting from a greater assurance that the stockwide herring ACL will not be exceeded, reducing the risk of overfishing. The impacts are likely to be less positive than those expected under Alternative 2, however.

Summary

The proposed AMs are intended to better manage the Atlantic herring fishery and prevent overfishing; to the extent that they achieve these goals, consistent with the NMFS National Standard Guidelines, positive impacts on the Atlantic herring resource can be expected. Relative to the no action alternative, AM Alternatives 2 and 4 are expected to have a *positive* impact on the Atlantic herring resource by implementing more precautionary AMs, establishing an AM for the stockwide ACL, and explicitly ensuring greater accountability in the fishery. The impacts of Alternative 3 are unknown, similar to the impacts of the no action alternative. However, the Council selected the alternative that is likely to have the most positive impact on the Atlantic herring resource over the long-term (Alternative 2), relative to taking no action and relative to the other alternatives considered in this document.

4.2.4.2 Impacts of AM Alternatives on Non-Target Species and Other Fisheries

The non-target species and other fisheries considered with respect to this action are described in Section 3.2 of this document and include river herring, mackerel, and multispecies (groundfish) in addition to any other species that may be caught incidentally while directing on Atlantic herring. More comprehensive information about these species/fisheries is available in the Amendment 5 FEIS (under review) as well as their respective FMPs. In general, interactions between the Atlantic herring fishery and non-target species and other fisheries are managed through provisions required to minimize bycatch/bycatch mortality to the extent practicable (National Standard 9).

Available data indicate that the vast majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch. However, because of the high-volume nature of the fishery, it has been important to examine the details of sea sampling protocols and data to better identify species of concern and/or other bycatch issues, to continue to minimize the occurrence of bycatch in the herring fishery. Amendment 5 to the Atlantic Herring FMP recently provided the Council this opportunity, and the measures that are expected to be implemented in Amendment 5 in the upcoming year specifically address monitoring, sampling, reporting, minimizing, and avoiding bycatch to the extent practicable. Amendment 5 measures also include criteria for midwater trawl access to groundfish closed areas and a long-term management approach to address/minimize river herring bycatch in the herring fishery. These are the elements of the Atlantic herring management program that will most directly impact non-target species and other fisheries. The long-term impacts of these management measures on non-target species and other fisheries, if implemented, will be positive. While the impacts of the measures proposed in this framework adjustment are evaluated independent from the Amendment 5 measures, the benefits of the Amendment 5 provisions on non-target species and other fisheries must be acknowledged.

General Impacts: The Council considered four alternatives for establishing a suite of accountability measures (AMs) for the Atlantic herring fishery. The ***Preferred Alternative*** is described in Section 2.2.6 and is a modified version of Alternative 2. In general, AMs may limit or reduce potential interactions with non-target species and other fisheries by implementing measures to mitigate the Atlantic herring fishery from exceeding sub-ACLs and the stockwide ACL. There is likely a benefit for non-target species with which there may have been additional interactions with the fishery if the AMs had not been in place. In addition, the proposed AMs are not likely to preclude the operation of other fisheries. Overall, the impacts of the AMs on non-target species and other fisheries are expected to be minimal and are not expected to change or jeopardize the status of any non-target species. When compared to the no action alternative, the impacts on non-target species and other fisheries are expected to be *potentially low positive*.

Alternative 1 (No Action): If Alternative 1 (no action) is selected, the current AMs administration would be maintained, resulting in no additional impacts on non-target species and other fisheries. The AMs included in the no action alternative include in-season measures (sub-ACL trigger) designed to prevent the total ACL from being exceeded and year-end measures designed to mitigate ACL overages as soon as possible (overage paybacks). There would continue to be no trigger (% of total ACL) for closing all management areas to directed herring fishing. The Herring FMP includes an AM for the current haddock catch cap (described in Section 2.2.6.1). Because fishing effort and catch would not change, this alternative would have no effects on non-target species and other fisheries in the area, and impacts are expected to be *neutral*.

Alternative 2* (*Preferred Alternative*):** The Council selected Alternative 2, Option A as the ***Preferred Alternative, without the provision to change the timing of accounting for overage deductions (and carryovers, if approved in Framework 2). Under this alternative, the current AM for closing the directed herring fishery in a management area (sub-ACL) would be modified, from 95% to 92% of the sub-ACL. 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 fishing year. This alternative/option also establishes a trigger of 95% of the herring stockwide ACL for closing the directed herring fishery in all areas; when 95% of the stockwide ACL is projected to be reached, the directed herring fishery in all management areas would close and herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year. The ***Preferred Alternative*** maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions.

Relative to other alternatives considered in this document, the ***Preferred Alternative*** is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded. It establishes an in-season AM for the stockwide ACL (95% trigger) that does not currently exist within the suite of AMs for the fishery. Under this alternative, it is possible that there would be a lower risk of interaction with non-target species since the directed herring fishery would close at a lower percentage of the sub-ACL, and a trigger would be established for closing the directed herring fishery in all areas. In general, however, AMs are focused on managing catch of the target species in the fishery – Atlantic herring. Impacts on non-target species that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative, the impacts of this alternative on non-target species and other fisheries are *potentially low positive*. This alternative is the most conservative and has the highest likelihood of resulting in positive impacts on non-target species and other fisheries.

Alternative 3 (Non-Preferred): Alternative 3 proposes that provisions for closure of the directed herring 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. Alternative 3 maintains the one-year lag in implementing overage deductions but 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.

Alternative 3 modifies both existing AMs by establishing provisions for exceptions to the AMs. It also does not establish an in-season AM for the stockwide Atlantic herring ACL. This alternative is the least conservative alternative considered by the Council; it may be arguably less conservative than the no action alternative because of the exceptions proposed for the sub-ACL overage deductions. To the extent that this alternative prevents/reduces sub-ACL and ACL overages in the herring fishery, it is possible that there would be a lower risk of interaction with non-target species. Impacts on non-target species and other fisheries that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative, the impacts of this alternative on non-target species and other fisheries are *potentially low positive*. The impacts of this alternative on non-target species and other fisheries are the most difficult to predict; this alternative has the least likelihood of resulting in positive impacts.

Alternative 4 (Non-Preferred): Under Alternative 4, 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. Alternative 4 maintains the one-year lag in implementing overage deductions but proposes to 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.

Alternative 4 establishes a more conservative in-season AM by modifying the sub-ACL trigger for closing the directed herring fishery in a management area and establishing a similar trigger for the stockwide herring ACL. It proposes an exception to the existing AM for overage paybacks, which is less conservative than the status quo. Because this alternative proposes to establish an in-season trigger for the stockwide ACL as well as the sub-ACLs, it is more conservative than the status quo, resulting in a greater assurance that the stockwide herring ACL will not be exceeded, reducing the risk of overfishing. Under this alternative, it is possible that there would be a lower risk of interaction with non-target species. In general, however, AMs are focused on managing catch of the target species in the fishery – Atlantic herring. Impacts on non-target species and other fisheries that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative,

the impacts of this alternative on non-target species and other fisheries are *potentially low positive*. Any impacts would likely be less positive than those under Alternative 2, however.

4.2.4.3 Impacts of AM Alternatives on Physical Environment and EFH

Alternatives 2 and 3 would likely limit fishing activity slightly, while Alternative 4 could result in a slight increase in effort because it would allow a sub-ACL to be exceeded slightly with no future payback penalty. More important than possible changes in the amount of fishing effort, it has been previously determined that herring midwater trawls and purse seines have minimal adverse effects on EFH (see section 3.3.2). Thus, neither Alternative 2 nor Alternative 3 would have any adverse effects on EFH as compared to the no action alternative.

4.2.4.4 Impacts of AM Alternatives on Protected Resources

The protected resources that are considered with respect to this action are identified and described in Section 3.4 of this document. The ESA and MMPA requirements addressed in Section 3.4 further explain the protected species/resources and have been well-documented in the major gear types currently used in the Atlantic herring fishery. Additionally, Table 40 (2009-2011) specifies incidents that are isolated to herring observer trips and indicates that harbor seals and grey seals are the most likely to be taken, which generally occurs in Area 1A. Actions to minimize takes on protected resources specifically certain cetaceans and harbor porpoise are required under ALWTRP and HPTRP measures respectively. Additional general information about protected resources interactions is provided as part of the discussion of the impacts of the OFL/ABC alternatives in Section 4.2.1.4 of this document.

General Impacts: The Council considered four alternatives for establishing a suite of accountability measures (AMs) for the Atlantic herring fishery. The ***Preferred Alternative*** is described in Section 2.2.6 and is a modified version of Alternative 2. In general, AMs may limit or reduce potential interactions with protected species by implementing measures to mitigate the herring fishery from exceeding sub-ACLs and the stockwide ACL. There is likely a benefit for protected species with which there may have been interactions with the fishery. Overall, the impacts of the AMs on protected resources are expected to be minimal and are not expected to change or jeopardize the status of any protected species. When compared to the no action alternative, the impacts on protected resources are expected to be *potentially low positive*.

Alternative 1 (No Action): If Alternative 1 (no action) is selected, the current AMs administration would be maintained, resulting in no additional protected resources impacts. The AMs included in the no action alternative include in-season measures (sub-ACL trigger) designed to prevent the total ACL from being exceeded and year-end measures designed to mitigate ACL overages as soon as possible (overage paybacks). There would continue to be no trigger (% of total ACL) for closing all management areas to directed herring fishing. Because fishing effort and catch would not change, this alternative would have no effects on the protected resources in the area, and impacts are expected to be *neutral*.

Alternative 2* (*Preferred Alternative*):** The Council selected Alternative 2, Option A as the ***Preferred Alternative, without the provision to change the timing of accounting for overage deductions (and carryovers, if approved in Framework 2). Under this alternative, the current AM for closing the directed herring fishery in a management area (sub-ACL) would be modified, from 95% to 92% of the sub-ACL. 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 fishing year. This alternative/option also establishes a trigger of 95% of the herring stockwide ACL for closing the directed herring fishery in all areas; when 95% of the stockwide ACL is projected to be reached, the directed herring fishery in all management areas would close and herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year. The ***Preferred Alternative*** maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions.

Relative to other alternatives considered in this document, the ***Preferred Alternative*** is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded. It establishes an in-season AM for the stockwide ACL (95% trigger) that does not currently exist within the suite of AMs for the fishery. Under this alternative, it is possible that there would be a lower risk of interaction with the protected species since the directed herring fishery would close at a lower percentage of the sub-ACL, and a trigger would be established for closing the directed fishery in all areas. In general, however, AMs are focused on managing catch of the target species in the fishery – Atlantic herring. Impacts on protected resources that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative, the impacts of this alternative on protected resources are *potentially low positive*. This alternative is the most conservative and has the highest likelihood of resulting in positive impacts.

Alternative 3 (Non-Preferred): Alternative 3 proposes that provisions for closure of the directed herring 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. Alternative 3 maintains the one-year lag in implementing overage deductions but 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.

Alternative 3 modifies both existing AMs by establishing provisions for exceptions to the AMs. It also does not establish an in-season AM for the stockwide Atlantic herring ACL. This alternative is the least conservative alternative considered by the Council; it may be arguably less conservative than the no action alternative because of the exceptions proposed for the sub-ACL overage deductions. To the extent that this alternative prevents/reduces sub-ACL and ACL overages in the herring fishery, it is possible that there would be a lower risk of interaction with protected species. Impacts on protected resources that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative, the impacts of this alternative on protected resources are *potentially low positive*. The impacts of this alternative on protected resources are the most difficult to predict; this alternative has the least likelihood of resulting in positive impacts.

Alternative 4 (Non-Preferred): Under Alternative 4, 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. Alternative 4 maintains the one-year lag in implementing overage deductions but proposes to 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.

Alternative 4 establishes a more conservative in-season AM by modifying the sub-ACL trigger for closing the directed herring fishery in a management area and establishing a similar trigger for the stockwide herring ACL. It proposes an exception to the existing AM for overage paybacks, which is less conservative than the status quo. Because this alternative proposes to establish an in-season trigger for the stockwide ACL as well as the sub-ACLs, it is more conservative than the status quo, resulting in a greater assurance that the stockwide herring ACL will not be exceeded, reducing the risk of overfishing. Under this alternative, it is possible that there would be a lower risk of interaction with the protected species. In general, however, AMs are focused on managing catch of the target species in the fishery – Atlantic herring. Impacts on protected resources that result from accountability measures in the herring fishery, while positive, are likely to be indirect and minor. Relative to the no action alternative, the impacts of

this alternative on protected resources are *potentially low positive*. Any impacts would likely be less positive than those under Alternative 2, however.

4.2.4.5 Impacts of AM Alternatives on Fishery-Related Businesses and Communities

The ***Preferred Alternative*** for AMs would establish a trigger for closing the directed herring fishery (95% of the total herring annual catch limit) and would lower the trigger for closing the fishery in each management area from 95% to 92% of the sub-ACL. This measure may increase operational constraints on the fishery, which may result in short-term negative socioeconomic impacts relative to the no action alternative, but there could be long-term benefits from maintaining a sustainable fishery in comparison to taking no action. This holds true for the range of AM alternatives considered by the Council in this framework adjustment, as discussed below.

The impacts of the AM alternatives (including the ***Preferred Alternative***) considered in this action on fishery-related businesses and communities are expected to be *low positive* because they ensure accountability in the fishery and are intended to prevent the negative impacts of quota overages. They may also provide stability to the fishery by ensuring that catch remains at levels set in the specifications. Long-term benefits of AMs to the fishery may be realized through increased stability resulting from fewer sub-ACL and/or stockwide ACL overages.

Moreover, the alternatives to establish accountability measures (AMs) put the onus on NMFS to continue to work with the industry to develop a more timely process for projecting overages, notifying the industry, and closing the fishery in order to prevent overages from occurring. Moving towards real-time monitoring may incentivize timely catch report submission by the industry. During the development of the 2013-2015 herring fishery specifications, the industry suggested posting catch updates daily once catch begins to approach a sub-ACL, and NMFS expressed interest in considering this further. 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 could be negative impacts on the industry's ability to comply with quota restrictions and consequences from any sub-ACL and ACL overages that could result. The impacts are outlined in greater detail below.

Alternative 1 (No Action)

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, which remains unchanged under this and other alternatives considered in this document. The current AMs 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 is intended to ensure that OY is fully used. 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 may have the 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.

The impacts of Alternative 1 on fishery-related businesses and communities are expected to be *neutral* because this represents the status quo with respect to the current operation of the fishery, but the long-term benefits of a comprehensive suite of AMs in the fishery (i.e., minimizing overages) would not be realized.

Alternative 2 (Preferred Alternative)

The Council selected ***Alternative 2, Option A*** as the ***Preferred Alternative***, without the provision to change the timing of accounting for overage deductions (and carryovers, if approved in Framework 2). Under this alternative, the current AM for closing the directed herring fishery in a management area (sub-ACL) would be modified, from 95% to 92% of the sub-ACL. 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. This alternative/option establishes a trigger of 95% of the herring stockwide ACL for closing the directed fishery in all areas; when 95% of the stockwide ACL is projected to be reached, the directed herring fishery in all management areas would close and herring permit holders would be limited to 2,000 pounds of herring per trip for the remainder of the fishing year. The ***Preferred Alternative*** maintains the status quo for the AM that triggers ACL/sub-ACL overage deductions.

The additional socioeconomic impact of the trigger to close the herring fishery in all management areas (95%) could 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 could be reached within a few trips for the directed fishery. Reducing the percentage trigger might help the fishery harvest within its limits and not be subject to the negative consequences of overage deductions (e.g. future catch level uncertainty). 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.

An option to applying overage deductions in the year immediately following when an overage occurred was considered by the Council as part of this alternative, but not selected as part of the final measures based on guidance from NMFS. Elimination of the one-year lag may have improved business planning and predictability over the short-term relative to the no action alternative, but NMFS indicated that availability of final data would preclude the Agency's ability to determine overage deductions prior to the start of the fishing year. Year-end catch tallying includes dealer and VTR data, which are not immediately available (see Section 3.5.1.2 of this document for detailed discussion regarding in-season and year-end catch estimation as well as a comparison of catch estimates). The proposed 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.

The impacts of Alternative 2 (including the ***Preferred Alternative***) on fishery-related businesses and communities are therefore expected to be *low positive*.

Alternative 3 (Non-Preferred)

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 could 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 could be reached within a few trips for the directed fishery. Currently, the herring resource is not overfished and overfishing is not occurring, and it is unlikely that this status to change over the next three years (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 could 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.

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.

The impacts of Alternative 3 on fishery-related businesses and communities are expected to be *low positive*.

Alternative 4 (Non-Preferred)

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 could be 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 could 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 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.

The impacts of Alternative 4 on fishery-related businesses and communities are expected to be *low positive*. With the data available, it is difficult to determine differential impacts between Alternatives 2, 3, and 4 at this time.

Other Options Considered

An 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, was considered but rejected by the Council. This could result in short-term negative impacts to the industry relative to the no action alternative, since there could 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.

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 2 and the 2013-2015 Atlantic herring fishery specifications together with past, present, and reasonably foreseeable future actions that affect the environment related to the Atlantic herring fishery. 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 Framework 2 and 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 (Section 3.0) based on VECs that were identified specifically for actions related to the Atlantic herring fishery, including Framework 2 and the 2013-2015 Atlantic herring specifications. The VECs for consideration in this assessment include:

1. Atlantic Herring (Section 3.1);
2. Non-Target Species and Other Fisheries (Section 3.2);
3. Physical Environment and Essential Fish Habitat (EFH) (Section 3.3);
4. Protected Resources (Section 3.4); and
5. Fishery-Related Businesses and Communities (Section 3.5).

Changes to the Atlantic 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 the 2013-2015 herring 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 Framework 2 and the 2013-2015 herring specifications package traces the history of each VEC since the implementation of Amendment 1 to the Herring FMP (in 2006) through Amendment 5 (currently under review by NMFS) 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 direct/indirect and cumulative impacts of these alternatives and measures are then assessed in Section 4.0 of this document using a similar structure to that found in the Affected Environment. This specifications, there, is intended to follow each VEC through each management alternative.

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 in Table 73 are used to summarize impacts:

Table 73 Terms Used in Tables 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/Negligible		

**In some cases, terms like "more" and "most" are used for the purposes of comparing management alternatives to each other.*

4.3.2 Spatial and Temporal Boundaries

The geographic area that encompasses the physical, biological and human communities impacts to be considered in the cumulative effects analysis are described in detail in Section 3.0 of this document (Affected Environment). The geographic range for impacts to fish species is the range of each fish species in the western Atlantic Ocean. The physical environment, including habitat and EFH, is bounded by the range of the Atlantic herring fishery, from the Gulf of Maine through the mid-Atlantic Bight, and includes adjacent upland areas (from which non-fishing impacts may originate). For protected species, the geographic range is the total range of Atlantic herring. The geographic range for fishery-related businesses and communities is defined in the Affected Environment as well.

Overall, while the effects of the historical herring fishery are important and are considered in the analysis, the temporal scope of past and present actions for Atlantic herring, non-target species and other fisheries, the physical environment and EFH, protected species, fishery-related businesses and communities is focused principally on actions that have occurred since 1996, when the MSA was amended 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. The Atlantic Herring FMP serves as the primary management action for the Atlantic herring fishery and has helped to shape the current condition of the resource.

While the herring fishery specifications are assessed only for the 2013-2015 fishing years, the temporal scope of other management measures proposed in this framework/specifications document generally extends five years into the future for all VECs. This period was chosen because of the dynamic nature of resource management and lack of specific information on projects that may occur in the future, which make it difficult to predict impacts beyond this time frame with any certainty. This is also the rebuilding time frame for the Atlantic herring resource, as defined in the Atlantic Herring FMP, should the resource become overfished and subject to a rebuilding program in the future.

4.3.3 Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; plus (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); plus (3) impacts from the Proposed Action and alternatives.

A description of past, present and reasonably foreseeable future actions is presented in Table 74. The baseline conditions of the resources and human community are subsequently summarized in Section 4.3.5 although it is important to note that beyond the stock managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this specifications is included. The culmination of all these factors is considered when making the cumulative effects assessment.

4.3.4 Past, Present, and Reasonably Foreseeable Future Actions

Table 74 (p. 239) summarizes the combined effects of other past, present and reasonably foreseeable future actions that affect the VECs, i.e., actions other than those alternatives under development in this document.

Note that most of the actions affecting the VECs related to this amendment and considered in Table 74 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management – the reauthorized Magnuson-Stevens Act (MSA). That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the MSA stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about the long-term sustainability of a given resource and as such should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

4.3.4.1 Atlantic Herring Resource

Past and Present Actions: Atlantic herring management measures were implemented in two related, but separate FMPs in 1999 – one by the federal government (NEFMC 1999, amended in 2006) and one by the states (ASMFC 1999, amended in 2006). The status of the Atlantic herring resource is updated in Section 3.1.2 of this document, and the herring fishery is summarized in Section 3.5 of this document. The offshore stock has recovered from its collapse in the early 1970s and, overall, the coastal Atlantic herring resource is not overfished, and overfishing is not occurring. There is more concern for the inshore stock since it receives more fishing pressure, but the most recent benchmark assessment (SAW 54, July 2012) indicates that the herring resource is in a “rebuilt” condition (above the biomass target) and that fishing mortality is well below the overfishing threshold. Additional past and present actions that affect the herring resource are discussed in the other VEC sections. Analyses of the Proposed Action and other alternatives in this document consider impacts on the herring resource as well as the inshore and offshore stock components (Section 4.2.2.1).

The Atlantic States Marine Fisheries Commission manages the Atlantic herring fishery in State waters. The ASMFC adopted Amendment 2 in March of 2006, which revised management area boundaries, biological reference points, the specification process, research set-asides, internal waters processing operations, and measures to address fixed gear fisheries and required fixed gear fishermen to report herring catches through the IVR program. Further discussion can be found in the 2007-2009 Atlantic Herring specifications package.

The ASMFC also adopted an Addendum in 2010 which modified Amendment 1 (Amendment 1) and Amendment 2 (Amendment 2) to the Interstate Fisheries Management Plan for Atlantic Sea Herring by changing the specification setting process and associated definitions. Based on the difficulty of having two sets of acronyms, one for the NEFMC plan and one for the ASMFC plan, for one cooperatively managed species the addendum was developed to establish an identical set of definitions and acronyms as those that the NEFMC is required to use under MSA. The addendum also established a new specification setting process that is more in line with the ASMFC Sea Herring Section's usual process for setting specifications while taking into account the new process that was enacted by the NEFMC. To date, ASMFC management remains generally consistent with Federal management through the Herring FMP.

Amendment 4 to the Atlantic Herring FMP, as enacted by the NEFMC in 2010, primarily responded to the requirements of the MSA and NEPA. The amendment established provisions for ACLs by first defining terms to bring the FMP into compliance with the new requirements of the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing provisions for sub-ACLs, and modifying the specifications process to utilize these elements. Three Accountability Measures (AMs) were also established in Amendment 4: an in-season AM that closes the directed herring fishery in a management area when there is a projection that 95% of the sub-ACL is reached, an AM for overage deductions, which subtracts the amount of an ACL or sub-ACL overage from subsequent ACLs/sub-ACLs, and another AM which established provisions for closing the directed herring fishery if the haddock catch cap (Framework 43 and 46 to the Multispecies FMP, see below) is reached. Currently, Amendment 4 is under court order and pending further action as of August 2012 (see Section 1.0 for more information).

In 2006, Framework 43 to the Northeast Multispecies FMP was enacted, which modified the restrictions for herring vessels so that herring fishing could continue on Georges Bank, but prohibited certain herring vessels from discarding haddock and limited possession of other groundfish to small amounts. It also adopted a cap on the amount of haddock that could be caught by certain herring vessels. In 2011, Framework 46 changed these catch cap provisions so that they would apply only to midwater trawl vessels with a herring permit, because these vessels caught nearly all of the haddock caught by the herring fishery. Catches of haddock by midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 that are documented by at-sea observers are now extrapolated to an estimate of the total catch of haddock. Individual estimates are then developed for each haddock stock (GOM and GB haddock). The cap is then applied based on the multispecies fishing year (May 1 through April 30), and is 1 percent of the Acceptable Biological Catch (ABC) of each stock. If the haddock catch estimate extrapolated from observer reports exceeds a stock-specific cap, midwater trawl vessels are 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 is reduced by the amount of the overage. In order to monitor the cap, midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 are also required to report total kept catch by haddock stock area and gear used.

Presently, the ASMFC has a Draft Addendum IV to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Herring, which proposes to allow small mesh bottom trawl (SMBT) and small purse seine (SPS) vessels an additional landing day or two per week, when landing is restricted through days out measures. In addition to proposing an additional landing day or two for SMBT and SPS vessels, options include a provision that would allow the Section to adjust the extra landing days during a fishing season in response to larger than anticipated SMBT and SPS landings.

The ASMFC is also currently developing Draft Addendum V to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Herring. The Draft Addendum proposes measures to refine and consolidate Atlantic herring spawning regulations, which include: (1) refining sampling protocols; (2) providing flexibility to change spawning boundaries based on Technical Committee input through Section action; and (3) consolidating all spawning regulations into one document. The Draft Addendum responds to observed changes in Atlantic herring spawning behavior (size of spawning fish and extent of spawning area) as well as the need to clarify spawning regulations so that they are interpreted and applied consistently among the implementing states.

Reasonably Foreseeable Future Actions: The final submission for Amendment 5 to the Atlantic Herring FMP was presented to NMFS on Dec 21, 2012 and approved by NEFMC in June 2012 with implementation in 2013/2014. The focus of Amendment 5 is to establish a comprehensive catch monitoring program for the herring fishery, address river herring bycatch, establish criteria for midwater trawl vessel access to groundfish closed areas, and adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA. A foreseeable future action that will likely affect the Atlantic herring resource is the measures surrounding 100% observer coverage for herring fishing vessels A and B, as well as the funding options that pertain to this measure discussed in Amendment 5. An FMAT team has been recently put together by NMFS to discuss funding options surrounding this matter.

An Omnibus EFH Amendment is likely to be implemented in foreseeable future. This amendment could positively affect Atlantic herring via increased protection of benthic habitats used by the species from the adverse effects of various regional fisheries. Further, NMFS is currently in a rule-making process to propose changes to the Harbor Porpoise Take Reduction Plan which are intended to reduce harbor porpoise mortalities (75 FR 7383, February 19, 2010 and 75 FR 12698, March 17, 2010). This action would likely result in vessels facing additional restrictions, possibly resulting in positive impacts to herring and other species taken incidentally.

The sea turtle strategy is a gear-based approach to addressing sea turtle bycatch. NMFS is proposed and made final changes to the regulatory requirements for trawl fisheries to protect sea turtles. As described in the turtle Strategy Final EIS (77 FR 29905 May 21, 2012), NMFS allowed the use of new materials and modified existing approved TED designs to other trawl fisheries and also modified the geographic scope of the TED requirements. This measure is likely to be neutral for the herring resource as it will not affect herring directly.

One of the foreseeable future actions that will likely affect the Atlantic herring resource is Framework Adjustment 3 to the Herring FMP, which is intended to establish river herring catch caps. This is a measure discussed in Amendment 5 and there are concerns regarding the status of the river herring resource. River herring is currently referenced as a "species of concern" by NOAA/NMFS. In Amendment 5, the Council establishes a long-term river herring bycatch avoidance/minimization strategy that relies on industry-based bycatch avoidance presumably combined with a catch cap for river herring. In the amendment, the Council established the provisions to implement the catch caps through a framework adjustment. At its January 2013 meeting, when the Framework 2 measures were selected and the 2013-2015 specifications were finalized, the Council voted to initiate Framework 3 to the Herring FMP. Development of this framework adjustment is expected to begin following the submission of this document.

4.3.4.2 Non-Target Species and Other Fisheries

Past and Present Actions: Updated information about non-target species (bycatch) and other fisheries affected by the herring fishery is provided in Section 3.2 of this document, which discusses river herring, mackerel, and groundfish in detail. Recent years suggest that Atlantic herring, spiny dogfish, Atlantic mackerel, and haddock have represented the majority of observed bycatch by directed herring vessels. Bycatch of haddock in the Atlantic herring fishery was addressed through Framework 43 and Framework 46 to the Northeast Multispecies FMP, as well as the 2010-2012 Atlantic Herring specifications and Amendment 5 to the Atlantic Herring FMP.

The ASMFC 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 and monitoring programs to improve data collection and stock assessment capabilities. Amendment 2 to the ASMFC Interstate Fisheries Management Plan 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 requesting 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. States with approved plans are required to submit annual updates of the achievement and maintenance of sustainability targets. The TC has reviewed proposals from Maine, New Hampshire, North Carolina and South Carolina and the Board approved all plans. The 2012 sustainability plan deadline was implemented in order to allow states with a lengthy legislative process adequate time to develop and implement proposals.

In 2010, the Board approved Amendment 3, which revises 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 reviewed by the TC and approved by the Board. The amendment defines a sustainable fishery as "a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment." Submitted plans must clearly demonstrate that the state's or jurisdiction's American shad fisheries meet this new definition of sustainability through the development of sustainability targets which must be achieved and maintained. The amendment allows any river systems to maintain a catch and release recreational fishery. States and jurisdictions are also required to identify local significant threats to American shad critical habitat and develop a plan for mitigation and restoration.

The MAFMC's Amendment 14 to the Mackerel, Squid, and Butterfish FMP contains Table 53, which provides a summary of all relevant actions to that FMP, starting with the designation of the EEZ. Three original FMPs were implemented between 1978 and 1979, and the plans were merged in 1983. Amendments relevant to the mackerel fishery are currently being considered and are listed under the reasonably foreseeable future actions.

The Northeast Multispecies FMP has a multitude of management measures, a full summary of which has been provided in the most recent Framework to the FMP, Framework 46 (which can be found in Appendix III). Groundfish was considered as its own VEC in that Framework, however groundfish is a portion of the non-target species and other fisheries VEC being considered herein, and as such, the summary of the effects of past, present, and reasonably foreseeable future actions that was used in that Framework will be considered here. In summary, past actions to the regulated groundfish stocks have created mixed effects, as the combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary, but some stocks remain overfished. Present actions created a positive effect, as sustainable stocks were the purpose of the regulations, as was the case for foreseeable future actions as well. Overall, the combined effects had a short-term negative, but long-term positive effect.

In 2006, Framework 43 to the Northeast Multispecies FMP was enacted, which modified the restrictions for herring vessels so that herring fishing could continue on Georges Bank, but prohibited certain herring vessels from discarding haddock and limited possession of other groundfish to small amounts. It also adopted a cap on the amount of haddock that could be caught by certain herring vessels. In 2011, Framework 46 changed these catch cap provisions so that they would apply only to midwater trawl vessels with a herring permit, because these vessels caught nearly all of the haddock caught by the herring fishery. Catches of haddock by midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 that are documented by at-sea observers are now extrapolated to an estimate of the total catch of haddock. Individual estimates are then developed for each haddock stock (GOM and GB haddock). The cap is then applied based on the multispecies fishing year (May 1 through April 30), and is 1 percent of the Acceptable Biological Catch (ABC) of each stock. If the haddock catch estimate extrapolated

from observer reports exceeds a stock-specific cap, midwater trawl vessels are 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 is reduced by the amount of the overage. In order to monitor the cap, midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 are also required to report total kept catch by haddock stock area and gear used.

Amendment 4 to the Atlantic Herring FMP, as enacted by the NEFMC in 2010, primarily responded to the requirements of the MSA and NEPA. The amendment established provisions for ACLs by first defining terms to bring the FMP into compliance with the new requirements of the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing provisions for sub-ACLs, and modifying the specifications process to utilize these elements. Three Accountability Measures (AMs) were also established in Amendment 4: an in-season AM that closes the directed herring fishery in a management area when there is a projection that 95% of the sub-ACL is reached, an AM for overage deductions, which subtracts the amount of an ACL or sub-ACL overage from subsequent ACLs/sub-ACLs, and another AM which established provisions for closing the directed herring fishery if the haddock catch cap (Framework 43 and 46 to the Multispecies FMP, see below) is reached. Currently, Amendment 4 is under court order and pending further action as of August 2012 (see Section 1.0 for more information).

The ASMFC approved Addendum II to the Interstate FMP for Herring in November of 2010, which proposes modifications to Amendment 1 and Amendment 2 that would change the specification setting process and associated definitions. Based on the difficulty of having two sets of acronyms, one for the NEFMC plan and one for the ASMFC plan, for one cooperatively-managed species the addendum was developed to establish an identical set of definitions and acronyms as those that the NEFMC is required to use under MSA. The addendum also proposes to establish a new specification setting process that is more in line with the ASMFC Sea Herring Section's usual process for setting specifications. These changes were made in order to complement the New England Fishery Management Council's Amendment 4 and will not affect the overall management scheme which also establishes quota overage accountability measures that allocates a total quota to Areas 1A, 1B, 2, and 3.

Presently, the ASMFC has a Draft Addendum IV to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Herring, which proposes to allow small mesh bottom trawl (SMBT) and small purse seine (SPS) vessels an additional landing day or two per week, when landing is restricted through days out measures. In addition to proposing an additional landing day or two for SMBT and SPS vessels, options include a provision that would allow the Section to adjust the extra landing days during a fishing season in response to larger than anticipated SMBT and SPS landings.

The ASMFC is also currently developing Draft Addendum V to Amendment 2 to the Interstate Fishery Management Plan for Atlantic Herring. The Draft Addendum proposes measures to refine and consolidate Atlantic herring spawning regulations, which include: (1) refining sampling protocols; (2) providing flexibility to change spawning boundaries based on Technical Committee input through Section action; and (3) consolidating all spawning regulations into one document. The Draft Addendum responds to observed changes in Atlantic herring spawning behavior (size of spawning fish and extent of spawning area) as well as the need to clarify spawning regulations so that they are interpreted and applied consistently among the implementing states.

Reasonably Foreseeable Future Actions: The final submission for Amendment 5 to the Atlantic Herring FMP was presented to NMFS on Dec 21, 2012 and approved by NEFMC in June 2012 with implementation in 2013/2014. The focus of Amendment 5 is to establish a comprehensive catch monitoring program for the herring fishery, address river herring bycatch, establish criteria for midwater trawl vessel access to groundfish closed areas, and adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA. A foreseeable future action that will likely affect non-target species and other fisheries is the measures requiring 100% observer coverage for herring fishing vessels in Categories A and B, as well as the funding options that pertain to this measure discussed in Amendment 5. An FMAT team has been recently put together by NMFS to discuss funding options surrounding this matter. The amendment also establishes a long-term strategy for river herring bycatch avoidance/minimization through industry-based avoidance and, presumably, a catch cap for river herring. Provisions are included in the amendment to allow for the implementation of a river herring catch cap through a framework adjustment to the Herring FMP in the future.

Amendment 11 to the MSB FMP proposes a limited access system consisting of tiered limited access and an open access component. 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: Tier 1 would require at least 400,000 pounds landed in any one year between 1997-2005; Tier 2 would require at least 100,000 pounds landed in any one year 3/1/1994-2005; Tier 3 would require at least 1,000 pounds in any one year 3/1/1994-2005 (would be capped for a maximum catch up to 7% of the commercial quota, set annually during the specifications process (no other allocations)). The open access category would apply to all other vessels. Overall, 47 herring vessels are likely to be assigned to one of the three tiers. A more detailed description of this action and its potential effect on the herring vessels can be found in the Amendment 5 FEIS.

Amendment 14 to the Mackerel Squid Butterfish (MSB) FMP has been developed concurrently to Amendment 5 by the Mid-Atlantic Fishery Management Council. Many of the actions contained with both amendments have been developed to compliment and/or replicate each other so as to avoid conflicting overlaps of restrictions on vessels that participate in both the herring and mackerel fisheries. In some cases, however, the actions contained in both amendments present some conflict with each other. Actions proposed in Amendment 14 include: vessel reporting measures, dealer reporting measures, at-sea observation optimization measures, other sampling and monitoring measures such as port-side monitoring, at-sea observer coverage requirements, mortality caps on river herring, restrictions in areas of high river herring catch,

mesh requirements, and the potential addition of river herring as a stock in the fishery. The ways in which these actions overlap can be seen in Table 196 of the Amendment 5 (FEIS). Similarly, the timelines for Amendment 5 and Amendment 14 were designed to complement each other and allow public comment sessions to occur simultaneously.

The MA Council is selecting RH/S catch caps for the 2014 fishing year during the specifications process, with decisions scheduled for the June 2013 Council meeting. The NE Council is developing river herring catch caps (and the process for setting future caps) for 2014 (partial year) and the 2015 fishing year through Framework Adjustment 3 to the Atlantic Herring FMP. The initial Framework 3 meeting will be the June 2013 Council meeting, and final decisions for Framework 3 are anticipated at the September 2013 Council meeting.

The Mid-Atlantic Council has initiated the development of Amendment 15 to the MSB FMP. This action considers adding river herring and shad as stocks in the MSB FMP. The Council is developing a range of alternatives. NMFS will be providing the MAFMC guidance on how to evaluate whether river herring and shad need additional Federal conservation and management at the June 2013 MAFMC meeting, and development of the amendment will continue during 2013. The timeline for this action is uncertain. The New England Fishery Management Council has also identified this issue as a priority for management action in 2013 and intends to begin the development of this amendment following the completion of Framework 3 to the Herring FMP (river herring/shad catch caps).

NMFS reviewed the petition submitted by NRDC in August 2011 to list river herring as threatened or endangered under the ESA. NMFS published a positive 90-day finding in November 2011; the finding stated 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. ASMFC completed a stock assessment for river herring in May 2012, covering over 50 river specific stocks throughout the species U.S. range. 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 workshops were independently peer reviewed and have been made available by NMFS. 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 (anticipated summer 2013). If listing is determined to be warranted, NMFS will publish a proposed rule and will seek public comment and most likely hold public hearings. During this time, the species would be proposed species and it is possible to prepare a conference opinion under Section 7 of the ESA to determine if federal actions may jeopardize the species.

Implementation of the Omnibus EFH Amendment may also result in additional habitat protections for which there is an indirect positive effect to bycatch/incidental catch species and other fisheries, as they would also receive protection. As with Allocated Target Species, if revisions are made to the Harbor Porpoise Take Reduction Plan, vessels could face additional restrictions, possibly resulting in positive impacts to bycatch through effort reductions.

The sea turtle Strategy is a gear-based approach to addressing sea turtle bycatch. NMFS is currently considering proposing changes to the regulatory requirements for trawl fisheries to protect sea turtles. As described in a NOI to prepare an EIS (74 FR 88 May 8, 2009), NMFS is considering expanding the use of TEDs to other trawl fisheries and modifying the geographic scope of the TED requirements. TED requirements would likely have a positive effect on bycatch and discards as they would likely exclude some of these species from capture in the cod-end.

One of the foreseeable future actions that will likely affect non-target species and other fisheries is Framework Adjustment 3 to the Herring FMP, which is intended to establish river herring catch caps. This is a measure discussed in Amendment 5 and there are concerns regarding the status of the river herring resource. River herring is currently referenced as a "species of concern" by NOAA/NMFS. In Amendment 5, the Council establishes a long-term river herring bycatch avoidance/minimization strategy that relies on industry-based bycatch avoidance presumably combined with a catch cap for river herring. In the amendment, the Council established the provisions to implement the catch caps through a framework adjustment. At its January 2013 meeting, when the Framework 2 measures were selected and the 2013-2015 specifications were finalized, the Council voted to initiate Framework 3 to the Herring FMP. Development of this framework adjustment is expected to begin following the submission of this document.

4.3.4.3 Physical Environment and EFH

Past and Present Actions: The Atlantic herring EFH designation, which was developed as part of an EFH Omnibus Amendment prepared by NEFMC for its entire managed species, is provided in Section 3.3 of this document. The EFH Omnibus Amendment was approved for Atlantic herring by the Secretary of Commerce on October 27, 1999. The final rule implementing the Atlantic Herring FMP to allow for the development of a sustainable Atlantic herring fishery was published on December 11, 2000 (65 FR 77450).

Because the gears used in the Atlantic herring fishery have only occasional bottom contact with the primary substrates used by herring for egg deposition, and because the noises produced by herring fishing operations only temporarily disperse schools of juvenile and adult herring, EFH impacts assessments for the fishery have concluded that it does not have an adverse effect on herring EFH. In addition, these assessments have concluded that the herring fishery does not have an adverse impact on EFH designated for non-herring species.

Various measures have been implemented in the Northeast Region to protect the EFH of NEFMC-managed species. In particular, all bottom-tending mobile gear is prohibited from the level 3 Habitat Closed Areas (HCAs) established in 2004 under Amendment 13 to the Northeast Multispecies FMP and Amendment 10 to the Atlantic Sea Scallop FMP. In large part, these HCAs overlap with areas established in 1994 and 1998 to protect overfished stocks of cod, haddock and other groundfish species. As mobile bottom-tending gear is largely prohibited from the groundfish closures, they have incidental EFH protection benefits. Other measures to protect EFH include spatially-specific roller gear restrictions in the Multispecies and Monkfish fisheries.

Reasonably Foreseeable Future Actions: Reasonably foreseeable future actions that will likely affect habitat include the Omnibus EFH Amendment, currently under development. This action reviews and updates EFH designations, identifies Habitat Areas of Particular Concerns (HAPCs), reviews prey information for all managed species, reviews non-fishery impacts to EFH, and reviews the current science on fishing impacts to habitat. It will also include coordinated and integrated measures intended to minimize the adverse impact of NEFMC-managed fishing on EFH. The net effect of new EFH and HAPC designations and more targeted habitat management measures should be positive for EFH.

The final submission for Amendment 5 to the Atlantic Herring FMP was presented to NMFS on Dec 21, 2012 and approved by NEFMC in June 2012 with implementation in 2013/2014. The focus of Amendment 5 is to establish a comprehensive catch monitoring program for the herring fishery, address river herring bycatch, establish criteria for midwater trawl vessel access to groundfish closed areas, and adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA. A foreseeable future action that will likely affect the Atlantic herring resource is the measures surrounding 100% observer coverage for herring fishing vessels A and B, as well as the funding options that pertain to this measure discussed in Amendment 5. An FMAT team has been recently put together by NMFS to discuss funding options surrounding this matter.

The Strategy for Sea Turtle Conservation and Recovery in Relation to Atlantic Ocean and Gulf of Mexico ("Strategy") is a gear-based approach to addressing sea turtle bycatch. NMFS is currently considering proposing changes to the regulatory requirements for trawl fisheries to protect sea turtles. As described in a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for Sea Turtle Conservation and Recovery in Relation to the Atlantic Ocean and Gulf of Mexico Trawl Fisheries (74 FR 88 May 8, 2009), NMFS is considering expanding the use of TEDs in trawl fisheries and modifying the geographic scope of the TED requirements. Since TED requirements may decrease the catch retention of some target species, vessels may tow longer to offset this loss of catch, likely resulting in negative impacts to habitat and EFH.

4.3.4.4 Protected Resources

Past and Present Actions: A general description of protected species that may be affected by the proposed action is provided in Section 3.4 of this document and in more detail in Amendment 1 and Amendment 5 to the Herring FMP.

Large whales may be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries. Ship strikes and fishing gear entanglement continue to be the most likely sources of human-related injury or mortality for right, humpback, fin and minke whales. Sei, blue and sperm whales are also vulnerable, but fewer ship strikes or entanglements have been recorded. Mobile bottom trawls, as well as midwater trawl gear, appear to be less of a concern for the large whale species. Other marine mammals, however, such as harbor porpoise, dolphins and to a greater degree seals, are vulnerable to entanglement in net gear, including midwater trawl gear and purse seines.

In addition to these actions, NMFS has implemented specific regulatory actions to reduce injuries and mortalities from gear interactions. The ALWTRP, implemented in 1999 with subsequent rule modifications, restrictions, and extensions, includes time and area closures for trap/pot fisheries (e.g., lobster and black sea bass) and gillnet fisheries (e.g., anchored gillnet and shark gillnet fisheries); gear requirements, including a general prohibition on having line floating at the surface in these fisheries; a prohibition on storing inactive gear at sea; and restrictions on setting shark gillnets off the coasts of Georgia and Florida and drift gillnets in the Mid-Atlantic. This plan also contains non-regulatory aspects, including gear research, public outreach, scientific research, a network to inform mariners when right whales are in an area, and increasing efforts to disentangle whales caught in fishing gear. The intent of the ALWTRP is to positively affect large whales by reducing injuries and deaths of large whales (North-Atlantic right, humpback, and fin) in waters off the United States East Coast due to incidental entanglement in fishing gear.

Turtles in general have documented entanglements in shrimp trawls, pound nets, bottom trawls and sink gillnets. Shrimp trawls are required to use turtle excluder devices (TEDs). The diversity of the sea turtle life history also leaves them susceptible to many other human impacts, including impacts on land, in the benthic environment, and in the pelagic environment. Anthropogenic factors that impact the success of nesting and hatching include: beach erosion, beach armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, and an increased presence of native species (e.g., raccoons, armadillos, and opossums) which raid and feed on turtle eggs. Entanglement(s) in debris or ingestion of marine debris are also seen as possible threats.

Reasonably Foreseeable Future Actions: The final submission for Amendment 5 to the Atlantic Herring FMP was presented to NMFS on Dec 21, 2012 and approved by NEFMC in June 2012 with implementation in 2013/2014. The focus of Amendment 5 is to establish a comprehensive catch monitoring program for the limited access herring fishery, address river herring bycatch, establish criteria for midwater trawl vessel access to groundfish closed areas, and adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA. A foreseeable future action that will likely affect protected resources is the measures surrounding 100% observer coverage for herring fishing vessels A and B, as well as the funding options that pertain to this measure discussed in Amendment 5. An FMAT team has been recently put together by NMFS to discuss funding options surrounding this matter.

The likely impacts of the Omnibus EFH Amendment on protected resources cannot be determined at this time. The Harbor Porpoise Take Reduction Plan for the GOM and Mid-Atlantic Coasts was originally implemented in 1998, and NMFS published a proposed rule in July 2009 indicating additional management restrictions for gillnetters. Future measures of this plan may be implemented if take reduction goals are not met, which could further reduce fishing effort and may have a positive effect on the population of this species.

The sea turtle Strategy is a gear-based approach to addressing sea turtle bycatch. Under the Strategy, NMFS has identified trawl gear as a priority for reducing sea turtle bycatch and is considering proposing changes to the TED requirements in the trawl fisheries. TED requirements are designed to have a positive effect on protected resources, specifically turtles by allowing for most turtles caught in trawl nets to escape. NMFS is working to develop and implement bycatch reduction measures in all trawl fisheries in the Atlantic and Gulf of Mexico when and where sea turtle takes have occurred or where gear, time, location, fishing method, and other similarities exist between a particular trawl fishery and sea turtle takes have occurred by trawls (72 FR 7382, February 15, 2007). On February 15, 2007, NMFS issued an advance notice of proposed rulemaking to announce that it is considering amendments to the regulatory requirements for TEDs (72 FR 7382). On May 8, 2009, NMFS issued a NOI to prepare an EIS (74 FR 88 May 8, 2009), and held public scoping meetings throughout the East coast.

4.3.4.5 Fishery-Related Businesses and Communities

Past and Present Actions: A general description of fishery-related businesses and communities that may be affected by the proposed action is provided in Section 3.5 of this document and in more detail in Amendment 5 to the Herring FMP. Past and present actions described in Section 4.3.4.1 affecting the Atlantic herring resource have also affected fishery-related businesses and communities.

In 2010, the ASMFC adopted an Addendum which modified Amendment 1 and Amendment 2 to the Interstate Fisheries Management Plan for Atlantic Sea Herring by changing the specification setting process and associated definitions. Based on the difficulty of having two sets of acronyms, one for the NEFMC plan and one for the ASMFC plan, for one cooperatively managed species the addendum was developed to establish an identical set of definitions and acronyms as those that the NEFMC is required to use under MSA. The addendum also established a new specification setting process that is more in line with the ASMFC Sea Herring Section's usual process for setting specifications while taking into account the new process that was enacted by the NEFMC in Amendment 4 to the Atlantic Herring FMP.

Amendment 4 to the Atlantic Herring FMP, as enacted by the NEFMC in 2010, primarily responded to the requirements of the MSA and NEPA. The amendment established provisions for ACLs by first defining terms to bring the FMP into compliance with the new requirements of the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing provisions for sub-ACLs, and modifying the specifications process to utilize these elements. Three Accountability Measures (AMs) were also established in Amendment 4: an in-season AM that closes the directed herring fishery in a management area when there is a projection that 95% of the sub-ACL is reached, an AM for overage deductions, which subtracts the amount of an ACL or sub-ACL overage from subsequent ACLs/sub-ACLs, and another AM which established provisions for closing the directed herring fishery if the haddock catch cap (Framework 43 and 46 to the Multispecies FMP, see below) is reached. Currently, Amendment 4 is under court order and pending further action as of August 2012 (see Section 1.0 for more information).

In 2006, Framework 43 to the Northeast Multispecies FMP was enacted, which modified the restrictions for herring vessels so that herring fishing could continue on Georges Bank, but prohibited certain herring vessels from discarding haddock and limited possession of other groundfish to small amounts. It also adopted a cap on the amount of haddock that could be caught by certain herring vessels. In 2011, Framework 46 changed these catch cap provisions so that they would apply only to midwater trawl vessels with a herring permit, because these vessels caught nearly all of the haddock caught by the herring fishery. Catches of haddock by midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 that are documented by at-sea observers are now extrapolated to an estimate of the total catch of haddock. Individual estimates are then developed for each haddock stock (GOM and GB haddock). The cap is then applied based on the multispecies fishing year (May 1 through April 30), and is 1 percent of the Acceptable Biological Catch (ABC) of each stock. If the haddock catch estimate extrapolated from observer reports exceeds a stock-specific cap, midwater trawl vessels are 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 is reduced by the amount of the overage. In order to monitor the cap,

midwater trawl vessels fishing in Herring Management Areas 1A, 1B, and 3 are also required to report total kept catch by haddock stock area and gear used.

Reasonably Foreseeable Future Actions: The final submission for Amendment 5 to the Atlantic Herring FMP was presented to NMFS on Dec 21, 2012 and approved by NEFMC in June 2012 with implementation in 2013/2014. The focus of Amendment 5 is to establish a comprehensive catch monitoring program for the herring fishery, address river herring bycatch, establish criteria for midwater trawl vessel access to groundfish closed areas, and adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the MSA. A foreseeable future action that will likely affect fishery-related businesses and communities is the requirement for 100% observer coverage for herring fishing vessels in Categories A and B, as well as the funding options that pertain to this measure discussed in Amendment 5. An FMAT team has been recently put together by NMFS to discuss funding options surrounding this matter. The amendment also establishes a long-term strategy for river herring bycatch avoidance/minimization through industry-based avoidance and, presumably, a catch cap for river herring. Provisions are included in the amendment to allow for the implementation of a river herring catch cap through a framework adjustment to the Herring FMP in the future.

Amendment 14 to the Mackerel Squid Butterfish (MSB) FMP has been developed concurrently to Amendment 5 by the Mid-Atlantic Fishery Management Council. Many of the actions contained with both Amendments have been developed to compliment and/or replicate each other so as to avoid conflicting overlaps of restrictions on vessels that participate in both fisheries. In some cases, however, the actions contained in both Amendments present some conflict with each other. Actions proposed in Amendment 14 include: vessel reporting measures, dealer reporting measures, at-sea observation optimization measures, other sampling and monitoring measures such as port-side monitoring, at-sea observer coverage requirements, mortality caps on river herring, restrictions in areas of high river herring catch, mesh requirements, and the potential addition of river herring as a stock in the fishery. The ways in which these actions overlap can be seen in Table 196 of the Amendment 5 FEIS. Similarly, the timelines for Amendment 5 and Amendment 14 were designed to complement each other and allow public comment sessions to occur simultaneously.

Implementation of the Omnibus EFH Amendment may result in additional habitat protections, which may or may not affect fishery-related businesses and communities depending on what the protection does to vessel effort. Similarly, if revisions are made to the Harbor Porpoise Take Reduction Plan, vessels could face additional restrictions, possibly resulting in positive impacts to bycatch through effort reductions.

NMFS is currently considering proposing changes to the regulatory requirements for trawl fisheries to protect sea turtles. As described in a NOI to prepare an EIS (74 FR 88 May 8, 2009), NMFS is considering expanding the use of TEDs to other trawl fisheries and modifying the geographic scope of the TED requirements. TED requirements may have a negative effect on fishery-related businesses and communities, as they may increase the cost of fishing, however the extent of the measures is unknown at this time.

One of the foreseeable future actions that will likely affect fishery-related businesses and communities is Framework Adjustment 3 to the Herring FMP, which is intended to establish river herring catch caps. This is a measure discussed in Amendment 5 and there are concerns regarding the status of the river herring resource. River herring is currently referenced as a "species of concern" by NOAA/NMFS. In Amendment 5, the Council establishes a long-term river herring bycatch avoidance/minimization strategy that relies on industry-based bycatch avoidance presumably combined with a catch cap for river herring. In the amendment, the Council established the provisions to implement the catch caps through a framework adjustment. At its January 2013 meeting, when the Framework 2 measures were selected and the 2013-2015 specifications were finalized, the Council voted to initiate Framework 3 to the Herring FMP. Development of this framework adjustment is expected to begin following the submission of this document.

Table 74 Summary of Effects of Past, Present, and Reasonably Foreseeable Future Actions on the VECs Identified for Framework 2 and 2013-2015 Herring Specifications

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Atlantic Herring	**Positive** Combined effects of past actions have controlled effort and provided a sustainable fishery with a rebuilt resource	**Positive** Current regulations continue to manage for a sustainable stock	**Positive** Future actions are anticipated to strive to maintain a sustainable stock	**Positive** Stock are being managed for sustainability
Non-Target Species and Other Fisheries	**Mixed** Combined effects of past actions have decreased effort and reduced bycatch; river herring bycatch issues remain a concern	**Mixed** Current regulations continue to decrease effort and reduced bycatch; river herring bycatch remains a concern	**Positive** Future regulations are being developed to improve monitoring and address river herring bycatch issues	**Low Positive** Decreased effort and reduced bycatch continue; river herring bycatch will be addressed
Physical Environment and Essential Fish Habitat (EFH)	**Positive** Combined effects of past actions have decreased effort and improved habitat protection	**Positive** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Positive** Future actions are anticipated to continue rebuilding a healthy environment and increase habitat quality	**Positive** Continued management of Physical environment and EFH for an increased quality of habitat
Protected Resources	**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Positive** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions	**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions
Fishery-Related Businesses and Communities	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce fishing industry and thus businesses	**Mixed** Current regulations continue to manage for a sustainable stock, thus controlling effort on the herring resource provides additional yield for fishery and non-fishery activities	**Mixed** Future regulations will likely control effort and but as stocks improve, effort will likely increase for fishery and non-fishing activities	**Mixed** Continued fisheries management will likely control effort for a sustainable fishery and thus fishery and non-fishery related activities will continue

4.3.5 Baseline Conditions

For the purposes of a cumulative effects assessment, the baseline conditions for resources and human communities are considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. Table 75 summarizes the added effects of the condition of the VECs (i.e., status/trends from Section 3.0) and the sum effect of the past, present and reasonably foreseeable future actions (from Section 4.3.4 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straightforward quantitative metrics of the baseline conditions are only available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECS are complex and varied. As such, the reader should refer to the characterizations provided in Section 3.0 of this document.

Table 75 Cumulative Effects Assessment Baseline Conditions of the VECs

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 74)	Combined CEA Baseline Conditions
Atlantic Herring Resource		Not overfished and overfishing is not occurring.	**Positive -** Stocks are being managed to meet sustainable fishing levels	**Positive -** Stocks are being managed to meet sustainable fishing levels
Non-Target Species and Other Fisheries	**River Herring**	Unknown; ASMFC stock assessment to be completed 2012	**Low Positive** – Decreased effort and reduced bycatch continue; river herring bycatch will be addressed in this Amendment and Amendment 14 to the MSB FMP	**Low Positive** – Effort and bycatch will continue to decrease
	Mackerel	Not overfished and overfishing is not occurring		
	Groundfish (GB and GOM Haddock)	Not overfished and overfishing is not occurring		
Habitat and EFH		Fishing impacts are complex and variable and typically adverse; Non-fishing activities had historically negative but site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities.	**Mixed** - reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as global warming, could increase and have a negative impact.

Table 75 continued. **Cumulative Effects Assessment Baseline Conditions of the VECs**

Protected Resources	**Sea Turtles**	Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened, with a proposed listing.	**Positive** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact	**Positive** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.
	Large Cetaceans	Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MSA and with the exception of minke whales, all are listed as endangered under the ESA.		
	Small Cetaceans	Pilot whales, dolphins and harbor porpoise are all protected under the MSA. The most recent stock assessment for harbor porpoise shows that takes are increasing and nearing PBR.		
	Pinnipeds	Harbor, Grey, Harp and Hooded seals are all protected under the MSA and the MMPA.		
Human Communities		Complex and variable. In general, herring catch for New England states since 1996 has declined, but catch year to year has been variable. Revenues have also generally been variable.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past few years have had negative impacts on communities	**Negative –** short term: lower revenues would continue until stocks are sustainable **Positive** – long term: sustainable resources should support viable communities and economies

4.3.6 Summary of Impacts from FW 2 and Atlantic Herring Specification 2013-2015

Table 76 summarizes the impacts of the management alternative/options that were considered in Framework 2 and the 2013-2015 herring specifications, as well as the ***Preferred Alternatives***, on each of the VECs identified in this document and described in the Affected Environment. All comparisons in the summary table are made to the no action alternative/option.

Table 76 Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications

	Impacts of Framework 2 Alternatives (Section 2.1)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.1.1 Sub-ACL Splitting: Alternative 2 (*Preferred*)– regulatory action to allow sub-ACL splitting	Low Positive FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process. The direct impacts of the splits are analyzed in the herring specifications process.	Negligible FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process.	Negligible FW 2 sub-ACL provisions are administrative in nature and establish policy/provisions for the specifications process.	Positive FW 2 sub-ACL provisions are administrative in nature, but sub-ACL splitting can be beneficial by slowing the pace of the fishery and spreading effort throughout the year.
Section 2.1.2 Carryover Provisions: Alternative 2 (*Preferred*)– allow up to 10% of sub-ACL carryover Option 1 – no stockwide ACL increase Option 2 – RA directive Option 3 – sub-ACL and stockwide ACL increase	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process. The direct impacts of the splits are analyzed in the herring specifications process.	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process.	Negligible FW 2 carryover provisions are administrative in nature and establish policy/provisions for the specifications process.	Positive FW 2 carryover provisions are administrative in nature, but carryover provisions may increase operational flexibility, enhance safety at sea, and allow fleet to fully utilize OY

Note: All comparisons are made to the no action alternative.

Table 76 continued. **Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications**

	Impacts of Proposed 2013-2015 Herring Fishery Specifications (Section 2.2)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.2.1 OFL/ABC Alternatives Alternative 2 (*Preferred*)– constant catch Alternative 3 – 75% F_{MSY}	Potentially Low Negative/Potentially Low Positive SSB is projected to decline, but the stock remains "rebuilt" with zero probability of "overfished." Impacts are compared to the no action alternative, which falls in between the two alternatives in terms of projected SSB and probability of overfishing in 2015.	Potentially Low Negative Overall, increased catch may increase interactions.	Neutral/Potentially Low Negative There would be minimal adverse effects on EFH. The rate of effort in any management area is unknown and the impacts are difficult to predict regarding Protected Resources, but increased catch may increase interactions.	Positive The *Preferred Alternative* establishes a constant ABC over 3 years, providing consistency and stability for the industry. Alternative 3 impacts are expected to be less positive due to a variable ABC.
Section 2.2.3 and 2.2.4 RSAs and FGSA 3% RSA for each management area and 295 mt FGSA	Indirect long-term benefits for the herring resource from enhancing management through cooperative research.	Potential for positive impacts which may come from the cooperative research – river herring bycatch avoidance and portside sampling priorities directly link to Am 5 measures.	Long-term benefits can be expected from cooperative research programs.	Indirect long-term benefits towards the herring resource and participants to enhance management through cooperative research - river herring bycatch avoidance and portside sampling priorities directly link to Am 5 measures.
Section 2.2.5 Sub-ACL Options Six options including no action (2012); *Preferred Alternative* falls within range of Options 2-6	Neutral The *Preferred Alternative* may be more favorable for the inshore component; Option 2 favors the inshore stock component and Option 5 favors the offshore stock component.	Unknown but Potentially Low Negative An increase or decrease in the rate of effort in the specific management areas is unknown and therefore impacts on specific non-target species are difficult to predict.	Neutral/Potentially Low Negative Neutral EFH Impacts. An increase or decrease in the rate of effort in the specific management areas is difficult to predict; forage for PR may be affected by increases in catch in some areas.	Positive Increasing the sub-ACLs will likely benefit the number of communities participating in the herring fishery.
Section 2.2.6 Other Fishery Specs DAH DAP BT USAP	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.	Neutral Administrative in nature and represent elements of the proposed stockwide ACL/OY.

Note: All comparisons are made to the no action alternative.

Table 76 continued. **Summary of Impacts of Alternatives/Options Considered in Framework 2 and the 2013-2015 Herring Fishery Specifications**

	Impacts of Proposed 2013-2015 Herring Fishery Specifications (Section 2.2)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species/Other Fisheries**	**VECs 3 and 4: EFH/ Protected Resources**	**VEC 5: Fishery-Related Businesses and Communities**
Section 2.2.7 Accountability Measures Alternative 2 (*Preferred*)– reduce sub-ACL trigger to 92%, establish ACL trigger 95%	Positive Most conservative alternative, most positive impacts Intended to minimize risk of exceeding the stockwide ACL and the sub-ACLs and to prevent overfishing, while maximizing opportunities for the fishery to achieve OY.	Potentially Low Positive The *Preferred Alternative* is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded.	Neutral/Potentially Low Positive Neutral EFH impacts. The *Preferred Alternative* is the most conservative and provides greater assurance that the stockwide ACL for Atlantic herring will not be exceeded.	Low Positive This measure could have a positive impact on business planning and predictability by reducing sub-ACL and ACL overages.
Section 2.2.7 Accountability Measures Alternative 3 – reduce sub-ACL trigger to 92% in some cases, allow to exceed sub-ACL by 5% only if overfishing is not occurring and stock is rebuilt	Unknown/Potentially Positive This alternative is considered the least conservative and does not establish an in-season AM for the stockwide ACL. To the extent that the AMs prevent ACL overages, there are potentially positive impacts.	Potentially Low Positive Considered the least conservative alternative and the most difficult to predict regarding impacts.	Neutral/Potentially Low Positive Remains neutral for EFH but is the least conservative alternative and the most difficult to predict regarding impacts on Protected Resources.	Low Positive This alternative would increase the constraints on the fishery less than Alternative 2; long-term benefits from reducing sub-ACL and ACL overages.
Section 2.2.7 Accountability Measures Alternative 4 – trigger reduced based on overage percentage, allow to exceed sub-ACL by 5% only if overfishing is not occurring and stock is rebuilt	Positive The in-season AM only decreases after an overage; changes to overage deductions are less conservative than status quo; less positive than *Preferred Alternative* but long-term positive impacts from establishing AM for stockwide ACL.	Potentially Low Positive Impacts on non-target species and other fisheries likely be less positive than the *Preferred Alternative*.	Neutral/Potentially Low Positive Neutral EFH Impacts. Impacts on Protected Resources would likely be less positive than the *Preferred Alternative*.	Low Positive Difficult to differentiate impacts between alternative, but long-term benefits from reducing sub-ACL and ACL overages.

Note: All comparisons are made to the no action alternative.

4.3.7 Cumulative Effects Summary

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 table above provides a summary of likely impacts found in the management alternatives contained in Framework Adjustment 2 and 2013-2015 Atlantic herring fishery specifications. Impacts are listed as no impact/neutral, positive, negative, or unknown. Impacts listed as no impact/neutral include those alternatives that have no impact or have a neutral impact (neither positive nor negative). Impacts listed as mixed contain both positive and negative impacts. The cumulative effect is the sum of: the CEA baseline, as described in Table 75, which represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and present conditions of each VEC, plus the impacts from the Proposed Action, as described in Table 76. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the "other" actions. The resultant positive and negative cumulative effects are described below for each VEC.

Atlantic Herring Resource

Sections 4.1 and 4.2 of this document address the impacts of the measures proposed in Framework 2 and the 2013-2015 Atlantic herring fishery specifications on the Atlantic herring resource. Analysis of the measures proposed in Framework 2 and 2013-2015 specifications has considered the potential impacts of the proposed action and other alternatives on the Atlantic herring resource, in combination with relevant past, present, and reasonably foreseeable future actions as well as applicable non-fishing impacts. The incremental benefits from the proposed action are not likely to result in significant cumulative effects on the Atlantic herring resource. The significance criteria that applies to the herring resource requires the consideration of whether or not the proposed action is reasonably expected to jeopardize the sustainability of any target species (herring) and whether or not the proposed action is expected to result in cumulative adverse impacts with a substantial effect on herring.

The biological analyses provided in this document suggest that the impacts of the proposed action on the Atlantic herring resource will not be significant. While the biomass is projected to decline under the proposed action, the herring resource is not expected to decline substantially or into an overfished condition, and overfishing is not projected to occur. The impacts of the four management areas are evaluated through a sub-ACL analysis; this sub-ACL analysis is considered based on the likelihood of producing an exploitation rate on an individual stock component that may be higher than that associated with the overfishing threshold for the entire stock complex. In sum, past and present impacts, combined with the impacts of the ***Preferred Alternatives*** and future actions on the Atlantic herring resource should yield a positive impact.

Non-Target Species and Other Fisheries

A more thorough discussion of non-target species, including the relationship of herring to other fisheries (mackerel and lobster), is provided in Amendment 1 and Amendment 5 to the Herring FMP. The focus of the cumulative effects analysis for the fishery specifications as they impact non-target species is bycatch in the directed fishery.

Sections 4.1 and 4.2 of this document address the impacts of the measures proposed in Framework 2 and the 2013-2015 Atlantic herring fishery specifications on non-target species and other fisheries. The impacts on the non-target species are likely to be minor. In general, increased catch levels proposed for 2013-2015 in the Atlantic herring fishery may increase interactions with non-target species and other fisheries, but the effects will depend on changes in patterns in the herring fishery (timing/effort) as well as the distribution/abundance of non-target species and other fisheries. Variability associated with these factors prevents specific predictions regarding impacts. However, given the magnitude of the proposed increase for 2013-2015, any impacts that may be experienced are not likely to change or jeopardize the status of any non-target species. Although herring catch is expected to increase under the ***Preferred Alternative***, catch will remain considerably less than it was under the 2007-2009 herring fishery specifications. Monitoring of all catch the Atlantic herring fishery has improved since 2007-2009 and will continue to improve with the implementation of the Amendment 5, so future interactions with non-target species and other fisheries will be more accurately documented, better managed, and avoided by the industry to the extent practicable.

Overall, Table 75 demonstrates that the combined impacts of past Federal fishery management actions have decreased fishing effort and improved habitat protection for non-target species, although some species like river herring continue to remain a concern. Current management measures are expected to continue to control effort, and decrease non-targeted catch and discards. The past and present impacts, combined with the ***Preferred Alternatives*** and future actions, are expected to continue reducing bycatch and striving to maintain sustainable stocks, should yield positive impacts to non-target species and other fisheries.

Physical Environment and EFH

Sections 4.1 and 4.2 of this document address the impacts of the measures proposed in Framework 2 and the 2013-2015 Atlantic herring fishery specifications on habitat and EFH. The proposed action for the 2013-2015 Atlantic herring fishery specifications will likely increase the amount of herring caught and the geographic distribution of fishing activity between management areas. However, because fishing with midwater trawls and purse seines, the gears used in the directed herring fishery, does not impact EFH in a manner that is more than minimal or more than temporary in nature, the impacts to EFH of these alternatives are negligible, regardless of how much fishing takes place in any particular area. It is likely that fishing and non-fishing activities will continue to degrade habitat quality.

While the alternatives proposed in this action may lead to changes in the magnitude or location of effort in the Atlantic herring fishery, 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. Thus, the ***Preferred Alternatives*** would not have any adverse effects on EFH as compared to the no action alternatives. The combination of past, present, and future actions is expected to reduce fishing effort and hence reduce damage to habitat and have a positive impact on habitat and EFH**.**

Protected Resources

Sections 4.1 and 4.2 of this document address the impacts of the measures proposed in Framework 2 and the 2013-2015 Atlantic herring fishery specifications on protected species and supports the conclusion that minimal impacts on protected species are expected from the ***Preferred Alternatives***.

In general, many of the populations of potentially-affected protected species are increasing or stable with notable increases in recent years for some seal populations. However there is concern for the shad/river herring stocks that are considered “species of concern” at present time. Nonetheless, protected species interactions do occur and have been well-documented in the major gear types currently used in the Atlantic herring fishery. Purse seines operating in this fishery are known to take several species of seals and harbor porpoise, while midwater trawl gear and paired midwater trawls have documented interactions with pilot whales, white-sided dolphins, and seals.

Because protected species are vulnerable to the gear types used, and also because herring is a primary prey species for seals, porpoises and some whales, protected species interactions with the herring fishery are likely to continue. Although herring catch is expected to increase under the ***Preferred Alternative***, catch will remain considerably less than it was under the 2007-2009 herring fishery specifications. Monitoring of all catch the Atlantic herring fishery has improved since 2007-2009 and will continue to improve with the implementation of the Amendment 5, so future interactions with protected resources will be more accurately documented, better managed, and avoided by the industry to the extent practicable. Despite ongoing negative effects on protected species from other actions described above, the proposed action will not add or significantly contribute to negative cumulative effects. In summary, the cumulative impacts of the ***Preferred Alternatives*** on protected resources are expected to be minimal.

Fishery-Related Businesses and Communities

Sections 4.1 and 4.2 of this document address the impacts of the measures proposed in Framework 2 and the 2013-2015 Atlantic herring fishery specifications on fishery-related businesses and communities and supports the conclusion that impacts from the ***Preferred Alternatives*** are not expected to be significant. The Atlantic herring resource is not overfished and overfishing is not occurring, thus catch under the 2013-2015 herring fishery specifications is proposed to increase due to actions and regulations that have helped to promote a more sustainable fishery for Atlantic herring. The combination of past, present, and future actions, including the proposed action, is expected to enable a sustainable harvest of herring, and should lead to positive impacts on fishery-related businesses and communities.

5.0 RELATIONSHIP TO APPLICABLE LAW

5.1 CONSISTENCY WITH THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (MSFCMA)

5.1.1 National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery management plans (FMPs) contain conservation and management measures that are consistent with ten National Standards:

In General. – Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the…national standards for fishery conservation and management.

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The primary goal of managing the Atlantic herring fishery is to maintain long-term sustainable catch levels, consistent with the National Standards of the MSA. The first objective of the Herring FMP is to prevent overfishing. The Herring FMP established a fishery specifications process that ensures a consistent review of the herring stock status, fishery performance, and other factors in order to manage by annual catch limits (ACLs) and prevent overfishing. The additional management measures implemented in the herring fishery should further achieve the goals/objectives and reduce the possibility of overfishing the Atlantic herring resource. Optimum yield (OY) for the Atlantic herring fishery is defined in the Herring FMP (as modified by Amendments 1 – 4) and specified annually (in this document for 2013-2015) so that it will not exceed the Allowable Biological Catch (ABC, which accounts for scientific uncertainty), and cannot exceed the overfishing limit (OFL), which is based upon a target fishing mortality rate that is determined as prescribed in the overfishing definition. This ensures that yield from the fishery can be optimized while preventing overfishing on a continuing basis.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the Atlantic herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1, and Amendments 1 and 4. The action proposed in Framework 2 modifies the specifications process by allowing seasonal (monthly) sub-ACL splitting and establishing provisions for sub-ACL carryovers (up to 10%). Opportunities for the fishery to achieve OY through sustainable management will continue to be evaluated during the fishery specifications process, which has been determined to be consistent with MSA and National Standards.

The action proposed for setting ABC in the 2013-2015 herring specifications is ***Alternative 2***, which is a constant catch approach (see Section 2.2.2.2). This approach was developed by the Council to maintain a constant catch for all three years while adequately accounting for scientific uncertainty. After accounting for both scientific and management uncertainty, the specifications proposed in this document for the 2013-2015 fishing years include a U.S. OY of 107,800 mt. The Council's SSC endorsed this approach for the 2013-2015 fishing years, noting that because of stock status, this approach can be applied for the next three years with low probability of overfishing or causing the stock to become overfished (see analysis in Section 4.2.1 as well as Appendix I and II).

(2) Conservation and management measures shall be based upon the best scientific information available.

Biological information from peer-reviewed stock assessments is used to formally evaluate stock condition. In 2012, the 54th stock assessment workshop (SAW 54) completed an Atlantic herring benchmark stock assessment. These formal stock assessments undergo rigorous development and review, and are peer-reviewed through the Stock Assessment Review Committee (SARC) process, which are the only such comprehensive assessments. This assessment therefore represents the best available information regarding the status of the Atlantic herring resource. Conclusions and results were available during the development of the action proposed in this document (Framework 2 and 2013-2015 herring specifications) were evaluated with respect to the management measures considered during the 2013-2015 Atlantic herring specifications process.

The economic analyses provided in this document are based primarily on landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery. Although there are some limitations to the data used in the analysis of impacts of management measures, these data have been thoroughly reviewed and are considered to be the best available. Information about bycatch is based on reports collected by the NEFSC Sea Sampling (Observer) Branch and incorporated into the NOAA Fisheries observer database. The observer data are collected using an approved, scientifically-valid sampling process. Furthermore, the analyses were prepared by and reviewed by the Council's Herring Plan Development Team and complies with the Information Quality Act (IQA, see Section 5.6 for more discussion related to the IQA).

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the Atlantic herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1, and Amendments 1 and 4. These measures are proposed not only to enhance sustainable management but also to provide flexibility for the industry. The provisions proposed in Framework 2 (sub-ACL splitting and carryovers) will be applied during future specifications, and impacts will be evaluated based on the best scientific information available.

The action proposed for the 2013-2015 herring fishery specifications was developed by the Council after Herring PDT and SSC review of the SAW/SARC 54 assessment and related data/analyses. The analyses conducted by the Herring PDT and reviewed by the SSC considered three primary sources of scientific uncertainty: the estimate of the 2008 year class, natural mortality, and the Biological Reference Points (BRPs) resulting from the new stock assessment model. The SSC recommendations for the 2013-2015 herring specifications regarding ABC and the ABC control rule are consistent with requirements of the MSA and based on best available science. The SSC endorsed the Council's ***Preferred Alternative*** for setting ABC for the 2013-2015 fishing years (Appendix I and II), noting that because of herring stock status, this approach can be applied for the next three years with low probability of overfishing or causing the stock to become overfished.

The Atlantic herring stock assessment and related analyses developed for this action acknowledge the importance of Atlantic herring as a forage species in the ecosystem and the impact of predator consumption on natural mortality. The Herring PDT reviewed the SAW 54 Assessment and discussed assumptions about natural mortality (M) and changes made in the assessment model. The Herring 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 role 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 reviewed the Herring PDT advice and addressed this issue in greater detail in November 2012 when it reviewed two additional approaches for setting ABC and an ABC control rule for 2013-2015. The additional control rules were developed based on harvest control strategies adopted for other forage fish, and while not implemented in the 2013-2015 specifications package, they may be further considered by the Council in a future action. In the review, the SSC noted that both control rules would result in fishing mortality rates well below the natural mortality rate and a stock size that is well above the standard biomass target, thereby likely meeting ecosystem-based biomass targets for a forage species by default if not by design, at least for the next three years. The SSC agreed with the Herring PDT that more analysis is needed before long-term control rules can be implemented for this species (see Section 2.2.7.1 as well as Appendix I and II).

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The Atlantic Herring FMP and all related management actions address the long-term management of Atlantic herring throughout the range of the species in U.S. waters, in accordance with the jurisdiction of U.S. law. Most Atlantic herring are caught in the Exclusive Economic Zone (EEZ). While most herring are landed in Maine, Massachusetts, and Rhode Island, Atlantic herring landings have been reported in every state from Maine through Virginia. In order to address that portion of the resource that is caught in State waters, the Herring FMP and related actions, including this framework adjustment and specifications package, were developed in close coordination with the Atlantic States Marine Fisheries Commission.

The coastal stock complex of Atlantic herring includes herring that are caught in the Canadian fixed gear fishery in New Brunswick and in Canadian waters on Georges Bank (Canadian GB catch is minimal and not considered in the specifications). Catch from the NB weir fishery is summarized in Section 3.5.3 of this document(p. 142). While the Herring FMP considers herring catch that may occur in Canadian waters, it does not explicitly regulate those catches because of a lack of U. S. jurisdiction. In general, allowable biological catch (ABC) is estimated for the entire coastal stock complex based on scientific uncertainty, and OY for the U. S. fishery is then determined by accounting for the Canadian catch (NB weir fishery) as part of management uncertainty. For this specifications package, estimates of the Canadian catch that are deducted from the ABC to account for management uncertainty are based on a recent average catches (rounded to the nearest hundredth) from 2008-2011 and are intended to reflect a general expectation of catch from that fishery for 2013-2015 (see Section 2.2.3 for more information about the specification of management uncertainty).

In addition to the overall goal of the management program, the measures proposed in this 2013-2015 herring specifications package are designed to address the following objectives, all of which relate to this National Standard:

- 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.

While the Herring FMP manages the coastal Atlantic herring stock complex as a single unit, it also considers impacts of fishing mortality on individual spawning components. The sub-ACL (formerly TAC) system for the Atlantic herring fishery allocates the stockwide Atlantic herring ACL (OY) among four management areas (see Figure 1 on p. 2). This system is designed to protect the individual spawning components from excessive fishing pressure while allocating catch in a way that maximizes opportunities for participants in the fishery to fully utilize OY.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

Fishery-related businesses and communities that participate in/depend on the Atlantic herring fishery are described in detail in Section 3.5 of this document. The management measures proposed in Framework Adjustment 2 and the 2013-2015 Atlantic herring specifications do not discriminate between residents of different States. This action does not allocate or assign fishing privileges among various fishermen.

The measures proposed in the 2013-2015 herring fishery specifications are intended to be applied equally to herring permit holders of the same category (A/B, C, and/or D), regardless of homeport or location. However, the fact that fish are not distributed evenly, and that individual vessels may target specific stocks at different times of the year, means that distributive impacts cannot be avoided in some cases. While the measures do not discriminate between permit holders from different States, they may result in variable impacts across permit holders/fishery participants. The impacts of the proposed measures on fishing-related businesses and communities are discussed in various sections throughout Section 4.0 of this document; differential impacts are identified and evaluated to the extent possible in the analyses. Overall, the specifications allocate an additional 16,600 mt of yield in each year from 2013-2015, and the impacts of the action proposed in this document are expected to be positive for fishing-related businesses and communities.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The management measures proposed in this document should promote efficiency in the utilization of fishery resources through appropriate measures intended to provide access to the herring fishery for both current and historical participants while minimizing the race to fish in any of the herring management areas. Economic allocation is not the sole purpose of Framework Adjustment 2 or the proposed 2013-2015 Atlantic herring fishery specifications. The ***Preferred Alternatives*** in this document are intended to promote biological stability in the fishery and also provide a benefit to the industry over the long-term. The suite of accountability measures (AMs) proposed in this document are intended to further minimize the risk of overfishing the herring stock complex.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The proposed provisions to allow seasonal splits and sub-ACL carryovers will promote efficiency in the utilization of the herring fishery resources by creating a system that enhances flexibility in the fishery, reduces incentives for derby fishing, and reduces the likelihood of ACL/sub-ACL overages.

The proposed 2013-2015 specifications also allocate the stockwide herring ACL to management areas in a manner that is intended to maximize opportunities for the fishery while minimizing the potential for overfishing. As discussed above (NS 3), one of the objectives of the herring management program is to minimize the risk of overfishing a stock component (inshore/offshore); consequently, economic allocation is not the sole purpose of distributing the catch among management areas. This approach is essential to balance the needs of the fishery, both biologically and economically.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Changes in fisheries occur continuously, both as the result of human activity (for example, new technologies or shifting market demand) and natural variation (for example, oceanographic perturbations). There are a number of factors which could introduce variations into the Atlantic herring fishery. As discussed in the Herring FMP as well as other recent stock assessment documents, there is some uncertainty in the estimate of current stock size. In addition, the structure and status of individual spawning components cannot be determined with precision, resulting in the assessment of a coastal stock complex rather than separate assessments for each individual spawning component. Because of the lack of a permitting and reporting system prior to VTR requirements and implementation of the Herring FMP, there is some uncertainty regarding the total harvest of Atlantic herring and the proportion of herring that is utilized for food/bait, particularly in more historical years. Market fluctuations, environmental factors, and predator-prey interactions constantly introduce additional variations among, and contingencies in, the herring resource, the fishery, and the available catch.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The provisions proposed in Framework 2 (sub-ACL splitting and carryovers) were developed in response to the need to account for variations among the fishery, resource, and catches. Providing a system that can be responsive to market/industry and environmental conditions as part of the specifications process will enhance long-term management of the fishery.

The proposed 2013-2015 herring specifications balance the needs of the fishery and account for the possible variations among the fishery, resource, and catches. For example, many herring fishermen in Area 2 are dependent on the Atlantic mackerel fishery, and oftentimes, herring is caught concurrently when targeting mackerel, especially in the winter months in Area 2. If the sub-ACL is caught early in Area 2 and the directed herring fishery closes, the mackerel fishery may be affected because the incidental catch possession limit of 2,000 lbs herring precludes directed mackerel fishing. For this reason, the Council is proposing to allocate a substantial proportion of additional yield available in 2013-2015 to Area 2 (see Section 2.2.3.1). In addition to this example, provisions that propose splitting the sub-ACL in Area 1A and 1B, along with carryover provisions (if adopted in Framework 2) provide flexibility to allow for variations in the herring fishery.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

As always, the Council considered the costs and benefits associated with the management measures proposed in Framework Adjustment 2 and the 2013-2015 herring specifications when developing the proposed action. Any costs incurred as a result of the measures proposed in this document are considered to be necessary in order to achieve the goals and objectives of the herring management program and are viewed to be outweighed by the benefits of taking the management action. The management measures proposed in this document are not duplicative and were developed in close coordination with NMFS, the Atlantic States Marine Fisheries Commission (ASMFC), and other interested entities and agencies to minimize duplicity.

The measures proposed in Framework Adjustment 2 and the 2013-2015 herring specifications are intended to minimize costs and avoid unnecessary duplication, to the extent possible. NMFS distributed detailed information clarifying reporting requirements and implemented changes to streamline herring catch reporting and enhance catch monitoring through rulemaking in late 2011. The reporting changes address some of the issues identified by the Council in Amendment 5 (currently under review) in a more expeditious manner. These measures, as well as those to be implemented in the near future through Amendment 5, provide a more comprehensive and streamlined system for catch reporting and sub-ACL monitoring, which will apply to the fishery specifications; issues/provisions addressed by NMFS during rulemaking in 2011 were not specifically addressed in this document to avoid duplication.

(8) 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 the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

A complete description of the fishing communities participating in and dependent on the Atlantic herring fishery is provided in Section 3.5.2 of this document. Relative to the no action alternative, the measures proposed in Framework Adjustment 2 and the proposed 2013-2015 herring specifications are expected to have positive impacts on communities engaged in and dependent on the Atlantic herring fishery by managing the herring resource in a precautionary manner to ensure long-term sustainable catch and minimizing the race to fish.

Framework Adjustment 2 is largely administrative in nature. Impacts associated with the fishery specifications themselves on fishing-related businesses and communities will be assessed in each of the future specifications packages. Generally, the flexibility and additional fishing opportunity that the measures proposed in Framework 2 may provide to fishing communities and businesses should result in a positive impact. Allowing sub-ACL splitting is intended to provide flexibility and extend the fishing seasons; the proposed carryover provisions will likely increase flexibility, reduce negative impacts of overages, and may provide added safety benefits to the industry (see Section 4.1.5). These measures not only allow for the sustained participation of the herring communities, but also help to minimize adverse economic impacts on the communities.

The proposed 2013-2015 herring specifications allocates an additional yield of 16,600 mt to the fishery, which produces a positive impact on fishery-related businesses and communities (Section 4.2.2.5). The proposed action may allow for better business planning, which also promotes more flexibility and sustainability within the fishery communities by also increasing revenues.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The MSA defines bycatch as fish that are harvested in a fishery, but which are not sold or kept for personal use. This includes economic discards and regulatory discards. The fish that are being targeted may be bycatch if they are not retained. Comprehensive information related to bycatch in the Atlantic herring fishery is provided in Section 3.2 of this document (Non-Target Species and Other Fisheries). In this document, "non-target species" refers to species other than herring which are caught 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) and the regulations allow for the sale of the species (incidental catch). Available data indicate that the vast majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch (discards).

However, because of the high-volume nature of the fishery, some unwanted catch is landed incidentally as well; it has therefore been important to examine the details of reporting by vessels and dealers, in addition to sea sampling protocols, to better identify species of concern and/or other bycatch issues and minimize the occurrence of bycatch in the herring fishery. Monitoring– through both at-sea and portside sampling – and avoidance are critical steps to better understanding the nature and extent of bycatch in the fishery and working with the industry to minimize it to the extent practicable. Towards this end, the Council recognizes the importance of portside sampling for this fishery and is proposing a 3% research set-aside for 2013-2015. The Council has identified river herring bycatch avoidance and portside sampling as the top priorities for cooperative research (see Section 2.2.3.1 for more information about the proposed RSA). Establishing a RSA for 2013-2015 with the top priorities identified by the Council is consistent with goals, objectives, and long-term management strategies to be implemented through Amendment 5. The measures to be implemented in Amendment 5 promote cooperation with the industry and acknowledge the need to better understand bycatch problems in order to develop effective solutions. A 3% RSA for the 2013-2015 fishing year encourages the industry to participate in the collection of scientific information and conduct research to reduce interactions with non-target species affected by the herring fishery.

The action proposed in Framework 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The impacts of specifications themselves on non-target species and other fisheries will continue to be assessed in future specifications packages.

The proposed 2013-2015 herring specifications allocates an additional yield of 16,600 mt to the fishery, however, the Council intends to minimize bycatch to the extent practicable while allowing yield from the fishery to increase during 2013-2015 by applying management measures in Amendment 5 to address catch monitoring. Amendment 5 is expected to be implemented by the 2014 fishing year. Increased herring catch expected under the 2013-2015 fishery specifications will remain considerably less than under the 2007-2009 specifications, and observer coverage is much higher now than it was in 2007-2009, so monitoring and documenting bycatch has improved.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Fishing is a dangerous occupation; participants must constantly balance the risks imposed by weather against the economic benefits. A management plan should be designed so that it does not encourage dangerous behavior by the participants. According to the National Standard guidelines, the safety of the fishing vessel and the protection from injury of persons aboard the vessel are considered the same as "safety of human life at sea. The safety of a vessel and the people aboard is ultimately the responsibility of the master of that vessel. Each master makes many decisions about vessel maintenance and loading and about the capabilities of the vessel and crew to operate safely in a variety of weather and sea conditions. This national standard does not replace the judgment or relieve the responsibility of the vessel master related to vessel safety. The Councils, the USCG, and NMFS, through the consultation process of paragraph (d) of this section, will review all FMPs, amendments, and regulations during their development to ensure they recognize any impact on the safety of human life at sea and minimize or mitigate that impact where practicable."

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. Generally, the seasonal splits of sub-ACLs may be one way to promote safety by minimizing derby fishing and spreading the fishery out through the fishing year, especially over winter months and allowing the industry more flexibility to fish in more fair sea conditions. The carryover provision promotes a similar flexibility and allows industry to catch an under-harvest of herring in the following fishing year versus fully utilizing the catch at the end of the fishing year, when weather may be more variable.

The Council has the utmost concern regarding safety, and understands how important safety is when considering allocations for the stockwide ACL to the individual management areas. The proposed 2013-2015 herring specification process ensures that access to the fishery is provided for vessels of all sizes and gear types, which is one reason for distributing the catch in both inshore and offshore areas (example of safety concerns include – concern of vessel maintenance, duration at sea). The action proposed in this document, to the extent practicable, promotes human life at sea while allowing the industry to benefit from increased yield and revenues due to a healthy Atlantic herring resource.

5.1.2 Other Required Provisions of MSFCMA

Section 303 of the Magnuson-Stevens Fishery Conservation and Management Act contains 14 additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall:

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

Framework 2 is administrative in nature and does not address conservation and management measures applicable to foreign fishing. Foreign fishing for the Atlantic herring resource is considered during the fishery specifications process when OY is determined and the management area sub-ACLs are established for a fishing year.

The original Herring FMP provided MSA requirement to consider TALFF when domestic fishing capacity is not adequate. Generally, foreign fishing for the Atlantic herring resource is considered during the fishery specifications process when optimal yield (OY) is determined and the management area sub-ACLs are established for a fishing year. During the proposed 2013-2015 herring specifications the Council set OY for Atlantic herring, which the Council could then set a domestic annual harvest (DAH) yield. If, at any point in this process DAH is not adequate to utilize OY then TALFF is added to the herring management uncertainty specifications. During recent fishing years DAH has shown to be adequate amongst the herring fishery/industry. As a result, the Council eliminated the need to annually consider TALFF in Amendment 4. However, eliminating the need to specify TALFF annually does not eliminate the legal requirement under the MSA to provide TALFF if DAH is not adequate.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

Much of the information required by this provision can be found in this document as well as in the Amendment 5 FEIS document. This document updates herring stock and fishery information through the 2012 fishing year when available. A thorough description on the Atlantic herring analysis regarding the catch information methods, fishing gear used, species of fish involved and their location, costs incurred in management, and actual and potential revenues from the fishery can be found in Section 3.5 of this document, which supplements and updates the information provided in the Amendment 5 FEIS. 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 with over hundred million dollars in revenue from 2008-2011.

The measures proposed in this document are found to be consistent with the goals, objectives, and provisions of the Atlantic Herring FMP and its related amendments and adjustments. A detailed description of the herring fishery is included in the Affected Environment section of this document (Section 3.0). Aside from the importance of herring as a forage species in the Northeast Region and the use of herring as bait, both of which are addressed in this and other related documents, there is no specific recreational interest in the fishery. Currently, there is neither foreign fishing for herring in the EEZ, nor are there any Indian treaty rights related to the Atlantic herring fishery.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. Thus, the provisions related to MSY and OY are evaluated in the appropriate specifications packages.

The present and probable future condition of the resource and estimates of MSY were updated through the most recent Atlantic herring benchmark stock assessment in June 2012 (SAW/SARC 54). Information related to SAW 54 and the updated Atlantic herring biological reference points are summarized in Section 3.1.2 of this document. Unique to this latest stock assessment, MSY changed due primarily to the new assumptions about natural mortality. The updated stock information in Section 3.1.2 acknowledges differences in natural mortality assumptions between assessments attributable to the 50% increase in natural mortality during 1996-2011. Consequently, the 50% increase in natural mortality during 1996-2011 implies a decrease in sustainable yield (178,000 mt in 2009 to 53,000 mt in 2012).

For the 2013-2015 herring specifications the optimal yield (OY) should be less than or equal to acceptable biological catch (ABC) minus the expected Canadian catch (C) from the stock complex, which accounts for management uncertainty. The domestic annual harvest (DAH) proposed is set equal to OY for the U.S. Atlantic herring fishery (107,800 mt, based on the Council's ***Preferred Alternative***). DAH is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year. See Section 2.2.5 of this document for a more detailed description of these specifications, including supporting information.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Amendment 1. Thus, the provisions regarding OY, DAP, and DAH are evaluated in the appropriate specifications packages.

This required provision relates directly to the fishery specification process and is addressed when the Council develops the specifications for the fishery, including OY, Domestic Annual Processing (DAP), and Domestic Annual Harvesting (DAH).

- DAH proposed during this specifications process was set equal to OY of 107,800 mt. This is set below ABC as part of the M-S Act and is discussed above (see Section 2.2.5.1).
- TALFF (proposed to be set at 0 mt) is considered when domestic fishing capacity is not adequate and foreign fishing for the Atlantic herring resource is considered during the fishery specifications process when optimum yield (OY) is determined. However, as previously noted, there is no opportunity for TALFF in 2013-2015 because OY is set equal to DAH (and DAH has been adequate for several fishing years).
- Domestic annual processing (DAP) is considered 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. DAP is proposed to be set equal DAH minus 4,000 mt for BT during the 2013-2015 fishing years (103,800 mt, see Section 2.2.5.2). 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.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

Regulations implemented through the Atlantic Herring FMP apply to all federally-permitted herring vessels and dealers. Reporting requirements for the Atlantic herring fishery are addressed in the Atlantic Herring FMP and its related amendments and framework adjustment, Frameworks 43 and 46 to the Northeast Multispecies FMP (haddock catch cap for the herring fishery), and the 2011 herring rulemaking action taken by NMFS to clarify reporting and implement VMS reporting for limited access herring vessels. All limited access herring vessels are required to utilize a VMS for reporting and enforcement purposes. In addition, ASMFC Amendment 2 to the Interstate FMP for herring implemented an IVR reporting requirement for fixed gear state waters fishermen during the 2006 fishing year; this ensured that the fixed gear measures in the Herring FMP can be adequately monitored and enforced. There is no direct recreational component to the fishery, however it is recognized that herring is an important resource as bait throughout the businesses and communities. Data regarding the type and quantity of fishing gear used, catch by species, areas fished, season, sea sampling hauls, and domestic harvesting/processing capacity are updated to the extent possible from the Amendment 5 FEIS and provided in the Affected Environment (description of Fishery-Related Businesses, Section 3.5) of this document.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The proposed 2013-2015 herring specifications addresses the commercial fishery for Atlantic herring and will be implemented in State waters through continued coordination with the ASMFC. The information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors is provided in the Affected Environment (Section 3.0). It is recognized that 65% of Atlantic herring vessel operators primarily use purse seines, single midwater trawls or midwater pair trawls for fishing gear. The midwater pair trawl fleet harvested the majority of landings from 2008 to 2011 (216,235 mt); the total revenue of herring was over one hundred million dollars (total revenues are highest in Area 1A and Area 2) from 2008-2011. Domestic processing capacity is specified for 2013-2015 as 103,800 mt (see DAP specification, Section 2.2.5.2).

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

The action proposed in Framework Adjustment 2 and the 2013-2015 herring fishery specifications does not alter any adjustments made in the Herring FMP that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fisheries. No consultation with the Coast Guard is required relative to this issue. The safety of fishing vessels and life at-sea is a high priority issue for the Council and was considered throughout the development of the management measures proposed in this document (for more information, see discussion of National Standard 9 in previous section). The Amendment 5 FEIS (currently under review) also includes more detailed discussion regarding this issue.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Essential fish habitat was identified for Atlantic herring in the Atlantic Herring FMP and has been addressed through all subsequent related management actions in a manner that is consistent with the MSA. This document provides a description of the physical environment and EFH in Section 3.3 and evaluates the impacts of the proposed management action and other alternatives considered on EFH throughout Section 4.0. Overall, there are no additional impacts to the physical environment or EFH expected from the action proposed in Framework 2 and the 2013-2015 Atlantic herring specifications.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

The Amendment 5 FEIS (under review) provides an updated list of data and research needs with respect to the Atlantic herring fishery and its management program. Included are general research needs as well as those specific to cooperative research and improving information about the importance of herring as a forage species in the Northeast Region ecosystem.

Biological information from stock assessments is used to evaluate stock condition. In 2012, the 54th stock assessment workshop (SAW 54) completed an Atlantic herring benchmark stock assessment (see Section 3.1.2). These formal stock assessments undergo rigorous development and review, are peer-reviewed through the Stock Assessment Review Committee (SARC) process, and are the only such comprehensive assessments. This assessment therefore represents the best available information regarding the status of the Atlantic herring resource. Conclusions and results were available during the development of the action proposed in this document (Framework 2 and 2013-2015 herring specifications) were evaluated with respect to the proposed management measures during the 2013-2015 Atlantic herring specifications process. Included in the assessment report are data and research needs and related technical recommendations.

Consistent with this requirement, the Council is proposing a 3% research set-aside for the 2013-2015 fishing years. The Council has identified river herring bycatch avoidance and portside sampling as the primary research priorities for RSA allocations during the 2014 and 2015 fishing years (see Section 2.2.3.1 and previous discussion regarding National Standard 9).

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants; and (C) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery;

The Council developed the measures proposed in the 2013-2015 herring specifications in consultation with the ASMFC and Mid-Atlantic Fishery Management Council as well, through the participation of its members on the Herring PDT, Advisory Panel, and Committee, in addition to attendance at Council meetings. This action does not represent an FMP or an amendment, but this document does include analyses and discussion of the impacts of the proposed management measures and other alternatives considered on the affected human environment, including herring fishery participants and communities. The fishery impact statement for this document is contained in Section 4.0 (various sections addressing the potential impacts of the proposed action on fishery-related businesses and communities). The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Amendment 1. Impacts of the 2013-2015 herring specifications and future specifications on participants in the fishery and fisheries in adjacent areas will continue to be evaluated through the specifications process.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

The status determination criteria for Atlantic herring were established in the Atlantic Herring FMP and are further addressed in Amendment 4. Objective and measurable criteria for determining when the fishery is overfished, including an analysis of how the criteria were determined, can be found in the Herring FMP (NEFMC 1999), based on a report from the Council's Overfishing Definition Review Panel (1998). Included in the status determination criteria (overfishing definition) is a rebuilding program (control rule) if the stock ever becomes overfished.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The proposed provisions to allow sub-ACL splits and carryovers should promote sustainable management, prevent overfishing, and increase opportunities for the fishery to achieve OY on a continuing basis.

For the proposed 2013-2015 herring specifications, the best available science was used to determine the status of the Atlantic herring stock complex. Recent stock assessments have evaluated status determination criteria and updated biological reference points for the Atlantic herring stock complex. The 2012 SAW 54 benchmark assessment results estimated that Atlantic herring spawning stock biomass (SSB) in 2011 was 517,930 mt, which is well above the new B_{MSY} reference point (157,000 mt). Estimated fishing mortality in 2011 was 0.14, which is below F_{MSY} (0.27). Currently, the herring fishery is not overfished and overfishing is not occurring; it is currently considered to be rebuilt. More information can be found in Section 3.1.2 of this document (p. 54).

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;

The Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment to the fishery management plans of the Northeast region was implemented in February 2008 to address the requirements of the Magnuson-Stevens Fishery Conservation and Management Act to include standardized bycatch reporting methodology in all FMPs of the New England Fishery Management Council and Mid-Atlantic Fishery Management Council. The SBRM can be viewed as the combination of sampling design, data collection procedures and analyses used to estimate bycatch and allocate observer coverage across multiple fisheries.

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.

This document updates information about and considers impacts of the proposed action on non-target species (species other than herring which are caught 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) and the regulations allow for the sale of the species. Overall, catch levels for the 2013-2015 fishing years are expected to be less than those under the 2007-2009 fishery specifications, and catch monitoring has vastly improved since then. With the implementation of enhanced reporting requirements through NMFS rulemaking and Amendment 5, increased observer coverage, and fishery-wide efforts to minimize bycatch, the collection of bycatch information under the Framework 2 measures and 2013-2015 herring fishery specifications should be improved, and bycatch should continue to be minimized to the extent practicable. Additional discussion about this issue is provided above (National Standard 9, Section 5.1.1).

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

There is no direct recreational component to the fishery, however it is recognized that herring is an important resource as bait throughout the businesses and communities. The action proposed in this document does not address recreational fishing regulations.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Amendment 1. The impacts of specifications implemented under the sub-ACL split and carryover provisions that may be established in Framework 2 would be evaluated as appropriate as part of each future herring specifications document.

A detailed and updated description of all participants in the Atlantic herring fishery is included in the Affected Environment (Fishery-Related Businesses and Communities, Section 3.5) and updates information provided in the FEIS for Amendment 5 to the Herring FMP. This section includes data for herring vessels, processors, dealers, communities, and information about industries and other sectors that are dependent on Atlantic herring (lobster, tuna, ecotourism, recreational, other). It updates all available information about the fishery and characterizes trends through the 2011 and 2012 fishing years wherever possible. Aside from the importance of herring as a forage species in the Northeast Region and the use of herring as bait, both of which were considered during the development of measures proposed in this document, there is no specific recreational interest in the fishery.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery;

Recent stock assessments have evaluated status determination criteria and updated biological reference points for the Atlantic herring stock complex. The 2012 SAW 54 benchmark assessment results estimated that Atlantic herring spawning stock biomass (SSB) in 2011 was 517,930 mt, which is well above the new B_{MSY} reference point (157,000 mt). Estimated fishing mortality in 2011 was 0.14, which is below F_{MSY} (0.27). The stock is not in an overfished condition and overfishing is not occurring –the Atlantic herring resource is considered to be rebuilt at this time. A rebuilding plan and/or other conservation and management measures to reduce the overall harvest in the fishery are not necessary at this time.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The provisions to allow sub-ACL split and carryovers should promote long-term sustainable management. The overall harvest from the Atlantic herring fishery, including ABC, OY, DAH, DAP, ACLs, will continue to be reviewed, established, and analyzed through the Atlantic herring fishery specifications process, which includes buffers/reductions from an overfishing limit and acceptable biological catch to account for scientific and management uncertainty. Actions related to the specification process will continue to consider fairness and equity as it relates to a reduction in the overall harvest of Atlantic herring, should such a reduction occur in the future.

(15) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

Amendment 1 to the Herring FMP implemented a multi-year specifications process for the herring fishery (completed every three years). Amendment 4 to the Herring FMP implemented changes to the herring fishery specifications process to comply with the new ACL/AM provisions adopted in the MSA. Future Council actions will continue to address the mechanism for specifying ACLs and the need to ensure accountability in the fishery.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. Future sub-ACL splits and carryovers that are applied under the Framework 2 provisions will be evaluated and implemented as appropriate within each herring specifications package.

The proposed Atlantic herring fishery specifications for the 2013-2015 fishing years considered a range of alternatives for ABC control rules and adjustments to the current accountability measures (AMs) for the Atlantic herring fishery. The specifications implement multi-year ACLs and sub-ACLs at a level such that overfishing should not occur in the fishery. Unique to this specifications package are adjustments to current AMs for the herring fishery. The ***Preferred Alternative*** changes the threshold for closing the directed herring fishery in each management area 95% of the sub-ACL to 92% and establishes a threshold for closing the directed herring fishery in all management areas at 95% of the total ACL. During the development of the action proposed in this document, the Council reviewed sub-ACL monitoring methods in detail, which are summarized in Section 3.5.1.2.1 (p. 113). The Council is proposing adjustments to the current AMs to match catch monitoring needs in the fishery and better ensure long-term sustainability. The Council will continue to work with NMFS to ensure adequate monitoring and accountability in the fishery so that overfishing does not occur and the fishery can continue to achieve OY on a continuing basis.

5.2 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the MSA and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508). All of those requirements are addressed in this document, as referenced below. This integrated document also contains the elements required under NEPA for both Framework Adjustment 2 to the Herring FMP and the 2013-2015 herring specifications.

To prepare the Draft Framework Adjustment 2 and 2013-2015 herring fishery specifications, the Council held meetings of its Herring Plan Development Team, Herring Oversight Committee, and Herring Advisory Panel, in addition to Council meetings. All of these meetings were open to the public. Final selection of management alternatives for inclusion in this document occurred at the January 2013 New England Fishery Management Council meeting.

5.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document, in addition to other relevant sections, as follows:

- An Executive Summary (beginning of the document);
- A Table of Contents (beginning of the document);
- The need for this action is described in Section 1.1;
- The alternatives that were considered are described in Section 2.0;
- A description of the Affected environment is found in Section 3.0;
- The environmental impacts of the Proposed Action are described in Section 4.0;
- Cumulative impacts of the Proposed Action are discussed in Section 4.3;
- A finding of no significant impact is provided in Section 5.2.2 (below);
- The list of preparers and agencies consulted on this action is provided in Section 7.0.

5.2.2 Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides sixteen criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below:

1. Can the Proposed Action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

Response: The proposed action is not expected to jeopardize the sustainability of the target species affected by this action – Atlantic herring. Relative to the no action alternative, the proposed action is less conservative; however the intention is to minimize the risk of overfishing discrete spawning components, and is consistent with the best available scientific information (SAW/SARC 54). Overall, based on the updated stock assessment and related recommendations provided by the Herring PDT and the SSC, the Council has concluded the Atlantic herring resource is healthy at this time (rebuilt), and the proposed action is therefore biologically sound. The acceptable biological catch level for 2013-2015 has been endorsed by the Council's SSC.

The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. These measures proposed are not expected to jeopardize the sustainability of the target species affected by this action and are intended to provide better sustainability and flexibility.

Generally, the proposed 2013-2015 herring specifications proposed action continues to be at reduced harvest levels in the Atlantic herring fishery from levels observed historically and in recent years. ABC is proposed to increase from 106,000 mt to 114,000 mt, and total allowable yield (OY) is proposed to decrease by 61,200 mt from 169,000 mt to 107,800 mt, and there is an increase of 16,600 mt from the 2010-2012 herring specifications to the 2013-2015 herring specifications. The changes are being proposed to account for scientific and management uncertainty and ensure that fishing mortality remains below threshold levels despite any uncertainty related to stock status. Projections provided in Section 4.2.1.1 of this document (p. 164) indicate that the stock complex should remain in a "rebuilt" condition under the catch levels implemented through the 2013-2015 specifications.

2. Can the Proposed Action reasonably be expected to jeopardize the sustainability of any non-target species?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative and the measures proposed are not expected to jeopardize the sustainability of any non- target species affected by this action. The Framework 2 provisions ultimately may decrease interactions with non-target species if sub-ACL splits and carryovers are utilized to reduce derbies in the fishery, depending on how fishing effort is distributed.

The action proposed in the 2013-2015 herring fishery specifications cannot reasonably be expected to jeopardize the sustainability of any non-target species that may be affected. The proposed measures will likely increase fishing effort slightly and may therefore increase interactions between herring fishing vessels and non-target species, but these interactions are not expected to be significant. Non-Target species are generally described in Section 3.2.1 of this document, and impacts are discussed throughout Section 4.0.

3. Can the Proposed Action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The measures proposed are not expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs.

The proposed 2013-2015 herring specifications cannot be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identifies in the FMP. EFH and habitat are generally described in Section 3.3 of this document, and impacts are discussed throughout Section 4.0. In general, EFH that occurs in areas where the fishery occurs is designated as the bottom habitats consisting of varying substrates (depending upon species) within the Gulf of Maine, Georges Bank, and the continental shelf off southern New England and the Mid-Atlantic south to Cape Hatteras. The primary gears utilized to harvest Atlantic herring are purse seines and midwater trawls which typically do not impact bottom habitats. An evaluation of the impacts to EFH in the proposed 2013-2015 specifications package stated that changes in the amount of herring caught and the distribution of the catch by area would have little to no impact on EFH because the fishery as a whole has minimal and temporary impacts on EFH (the conclusion from the most recent EIS). Though the sub-ACLs specified in this action have increased compared to the previous specifications, the proposed action will not result in adverse impacts to EFH in comparison with the no action alternative.

4. Can the Proposed Action be reasonably expected to have a substantial adverse impact on public health or safety?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The measures proposed are not expected to cause substantial adverse impact on public health or safety and may provide benefit to the current safety standards in the fishery.

Nothing in the proposed 2013-2015 herring specifications can reasonably be expected to have a substantial adverse impact on public health or safety. When developing management measures, the Council usually receives extensive comments from affected members of the public regarding the safety implications of measures under consideration. No such impacts were expected from specifications for previous years, and the Council has received no comments from affected members of the public suggesting that such impacts could be expected from the specifications that are proposed for the 2013-2015 fishing years or the accountability measures that are included in the specifications package. The safety of human life at sea is discussed further in Section 5.1.1 of this document (National Standard 10).

5. Can the Proposed Action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The measures proposed are not expected to cause substantial adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species.

Protected resources that may be affected by the proposed action are generally described in Section 3.4 of this document, and impacts are discussed throughout Section 4.0. The proposed action is not reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat for these species. The activities to be conducted under the proposed action are within the scope of the FMP and do not change the basis for the determinations made in previous consultations. Though the proposed action may increase interactions with protected species as compared to the status quo, there is likely to be continued minimal interaction.

6. Can the Proposed Action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The measures proposed are not expected to cause substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.).

The proposed 2013-2015 Atlantic herring fishery specifications are not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. While Atlantic herring is recognized as one of many important forage fish for marine mammals, other fish, and birds throughout the region, the resource appears to be large enough at this time to accommodate all predators including Atlantic bluefish, Atlantic striped bass, and several other pelagic species such as shark and tuna. The Atlantic herring itself is not known to prey on other species of fish but prefers chaetognaths and euphausiids. Consumption of Atlantic herring by predator species was factored into the most recent benchmark stock assessment (SAW 54, July 2012) and affects current biological reference points including MSY, as well as yield that may be available to the fishery (see Section 3.1.2 for more information). The proposed 2013-2015 fishery specifications account for these important issues.

The proposed action is intended to continue to ensure biodiversity and ecosystem stability over the 2013-2015 fishing years, and the proposed AMs are expected to have long-term positive impacts. Though the Council is proposing to increase OY from the 2012 levels, the proposed specifications account for scientific and management uncertainty and have been endorsed by the Council's SSC. In addition to accounting for predation through the stock assessment, the proposed buffer between the F_{MSY}-based catch level (OFL) and the U.S. OY (ACL) should ensure that an adequate forage base continues to be available for important fish, marine mammal, and bird species in the Gulf of Maine region during the upcoming years.

7. Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. There are no significant social or economic impacts interrelated with natural or physical environmental effects expected from Framework 2.

A complete discussion of the potential impacts of the proposed 2013-2015 Atlantic herring fishery specifications is provided in Section 4.2 of this document. The environmental assessment concludes that no significant natural or physical effects will result from the implementation of the 2013-2015 herring specifications. The proposed action is designed to implement specifications to continue to harvest the Atlantic herring resource consistent with the definition of overfishing contained in the Atlantic Herring FMP and prevent overfishing. As

described in Section 4.2.1, the action is expected to maintain this trajectory. The action cannot be reasonably expected to have a substantial impact on habitat or protected species, as the impacts are expected to fall within the range of those resulting from previous actions addressing the management of this fishery.

NMFS has determined that despite the potential socio-economic impacts resulting from this action, there is no need to prepare an EIS. The purpose of NEPA is to protect the environment by requiring Federal agencies to consider the impacts of their Proposed Actions on the human environment, defined as "the natural and physical environment and the relationship of the people with that environment." The EA for Framework Adjustment 2 and the Atlantic Herring Specifications for the 2013-2015 fishing year describes and analyzes the proposed measures and alternatives and concludes there will be no significant impacts to the natural and physical environment. While some fishermen, shore-side businesses and others may experience impacts to their livelihood, these impacts in and of themselves do not require the preparation of an EIS, as supported by NEPA's implementing regulations at 40 C.F.R. 1508.14. Most of the impacts are expected to be positive, and they are not anticipated to be significant. Consequently, because the EA demonstrates that the action's potential natural and physical impacts are not significant, the execution of a FONSI remains appropriate under criteria 7.

8. Are the effects on the quality of the human environment likely to be highly controversial?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. There are no significant effects on the quality of the human environment likely to be highly controversial. Benefits from future sub-ACL splits and the carryover provisions will likely support the human environment and support the fishery throughout the year.

The effects of the proposed 2013-2015 herring specifications on the quality of human environment are not expected to be highly controversial. The need to maintain a sustainable herring resource is grounded in Federal fisheries law and forms the basis of the goals and objectives of the herring management program, as described in the Herring FMP. While there remains some differing perspectives regarding the allocation of additional yield to the fishery, the Council developed the proposed 2013-2015 herring fishery specifications while considering the needs of herring fishery participants, other fishery-related interests, and the long-term health of the Atlantic herring resource.

9. Can the Proposed Action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action is not expected to have substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas.

The proposed 2013-2015 herring specifications are not expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. The proposed action affects fishing for herring in the U.S. Exclusive Economic Zone and is not expected to have any impacts on shoreside historical and/or cultural resources. In addition, the proposed action is not expected to substantially affect fishing and other vessel operations around the unique historical and cultural resources encompassed by the Stellwagen Bank National Marine Sanctuary.

10. Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action is not expected to have substantial impacts on the human environment that are highly uncertain or involve unique or unknown risks. This action was proposed to aid in a reduction of human risks, known and unknown.

The proposed 2013-2015 herring specifications are not expected to result in highly uncertain effects on the human environment or involve unique or unknown risks. The specifications proposed in this document are generally consistent with those adopted in past years and are based on the provisions for the specifications process outlined in the Herring FMP. Scientific uncertainty related to the herring stock assessment is addressed through the reduction in the F_{MSY}-based catch level to the proposed ABC level, as recommended by the Council's SSC. Management uncertainty is addressed through the reduction in the ABC to the total U.S. OY (stockwide herring ACL). The proposed specifications account for uncertainty such that the risk of overfishing the Atlantic herring resource has been minimized to the extent practicable.

While there is uncertainty related to the biomass of the inshore stock component and the inshore/offshore mixing rates, the analytic tools used to evaluate the proposed action and other alternatives account for this by evaluating the proposed measures across a range of mixing ratios. The analytic methodology was applied in previous actions (2005/2006, 2007-2009, 2010-2012 specifications), and related uncertainties have been further addressed in this assessment by refining and improving the sub-ACL analysis model (see Section 4.2.2.1 and Appendix III for more information). In addition, while there may be some degree of uncertainty related to how fishery participants may respond to the proposed specifications, potential impacts, adaptations, and responses have been considered to the extent possible in this analysis.

11. Is the Proposed Action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action is not related to other actions with individually insignificant, but cumulatively significant impacts.

The proposed 2013-2015 herring specifications are not related to other actions with individually insignificant, but cumulatively significant impacts. The cumulative effects analysis presented in Section 4.3 of this document considers the impacts of the proposed action in combination with relevant past, present, and reasonably foreseeable future actions and concludes that no additional significant cumulative impacts are expected from the 2013-2015 herring specifications.

12. Is the Proposed Action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action will not likely adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources.

The proposed 2013-2015 herring specifications are not likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor is the proposed action expected to cause loss or destruction to significant scientific, cultural, or historical resources. The proposed action is specific only to the specifications and sub-ACLs for the Atlantic herring fishery, which occurs primarily in the EEZ.

13. Can the Proposed Action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action will not likely be expected to result in the introduction or spread of a non-indigenous species because it is a resource that is removed and likely utilized as bait thus limiting the spread of possible non-indigenous species.

The proposed 2013-2015 herring specifications proposed action is not expected to result in the introduction or spread of a non-indigenous species. The proposed action relates specifically to removals of Atlantic herring in the Northeast Region using traditional fishing practices. Vessels affected by the proposed action are those currently engaged in the Atlantic herring fishery. The fishing-related activity of these vessels is anticipated to occur solely within the Northeast Region and should not result in the introduction or spread of a non-indigenous species.

14. Is the Proposed Action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action will not likely establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration. The provisions for sub-ACL splits and carryover(s) will be determined by Council during each specifications process, based on the needs of the fishery and the resource. Analyses of the potential impacts of these provisions will be analyzed in the appropriate specifications package.

The proposed 2013-2015 herring specifications are not likely to establish a precedent for future actions with significant effects and does not represent a decision in principle about a future consideration. The proposed action adopts specifications for the 2013-2015 fishing years only, with flexibility for the Council to adjust the specifications during the interim years if the need arises or if new information becomes available. This action is consistent with specifications adopted in past years and is based on the provisions for the specifications process outlined in the Atlantic Herring FMP. The intent of the process is to establish specifications and other sub-ACLs for a short time frame (in this case, three years) so that new stock and fishery information can be reviewed and considered prior to making decisions about specifications in future years. The measures are designed to specifically address current stock and fishery conditions and are not intended to represent a decision about future management actions that may include other measures.

15. Can the Proposed Action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action will not be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The proposed 2013-2015 herring specifications are intended to establish fishery specifications and sub-ACLs that will offer further protection to marine resources, particularly Atlantic herring, and would not threaten a violation of Federal, State, or Local law or other requirements to protect the environment. NMFS will determine whether this action is consistent with the Coastal Zone Management Act (CZMA) requirements of the affected States.

16. Can the Proposed Action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: The action proposed in Framework Adjustment 2 to the Herring FMP is largely administrative in nature and addresses the herring fishery specifications process, which was established in the Herring FMP and modified in Framework 1 and Amendments 1 and 4. The Proposed Action will not be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species. The proposed provisions are intended to benefit target species and non-target species in sustainable manner with as minimal an impact as possible.

As specified in the responses to the first two criteria of this section, the proposed 2013-2015 herring specifications are not expected to result in cumulative adverse effects that would have a substantial effect on target or non-target species. As described in the sub-sections contained in Section 4.0 of this document, impacts on resources encompassing herring and other stocks are expected to be minimal.

In view of the analysis presented in this document, the establishment of the measures proposed in Framework Adjustment 2 and the 2013-2015 fishing years to the Atlantic Herring FMP will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not required.

_____ _____

Assistant Administrator for Fisheries, NOAA *Date*

5.3 MARINE MAMMAL PROTECTION ACT (MMPA)

The New England Fishery Management Council has reviewed the impacts of the measures proposed in Framework 2 and the proposed 2013-2015 Atlantic herring fishery specifications on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP.

5.4 ENDANGERED SPECIES ACT (ESA)

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. A description of the protected resources potentially affected by the action proposed in the herring specifications is provided in Section 3.4 of this document. For further information on the potential impacts of the fishery as well as the ***Preferred Alternative*** and other alternatives considered by the Council on listed species, see Section 4.0 of this document.

5.5 PAPERWORK REDUCTION ACT (PRA)

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

The measures proposed in Framework Adjustment 2 to the Herring FMP, as well as the proposed Atlantic herring fishery specifications for the proposed 2013-2015 fishing years, contain no new or additional collection-of-information requirements.

5.6 INFORMATION QUALITY ACT (IQA)

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to address these requirements.

Utility of Information Product

Framework Adjustment 2 and the proposed 2013-2015 Atlantic herring specifications include: a description of the management issues to be addressed, statement of goals and objectives, a description of the proposed action and other alternatives considered, analyses of the impacts of the proposed measures and other alternatives on the affected environment, and the reasons for selecting the preferred management measures. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act as well as all other existing applicable laws.

Utility means that disseminated information is useful to its intended users. "Useful" means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document are participants in the Atlantic herring fishery and other interested parties and members of the general public. The information contained in this document may be useful to owners of vessels holding an Atlantic herring permit as well as Atlantic herring dealers and processors since it serves to notify these individuals of any potential changes to management measures for the fishery. This information will enable these individuals to adjust their fishing practices and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in the Framework Adjustment 2 and the 2013-2015 herring specifications package concerning the status of the Atlantic herring fishery is updated based on landings and effort information through the 2011 fishing year, and 2012 if possible. Information presented in this document is intended to support the proposed specifications for the 2013-2015 fishing years, which have been developed through a multi-stage process involving all interested

members of the public. Consequently, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

The media being used in the dissemination of the information contained in this document will be contained in a *Federal Register* notice announcing the Proposed and Final Rules for this action. This information will be made available through printed publication and on the Internet website for the Northeast Regional Office (NERO) of NOAA Fisheries. In addition, the final Framework Adjustment 2 and 2013-2015 Atlantic Herring Specifications document will be available on the Council's website (www.nefmc.org) in standard PDF format. Copies will be available for anyone in the public on CD ROM and paper from the Council's office.

Integrity of Information Product

Integrity refers to security – the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, NOAA information, independent of the intended mechanism for distribution, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA adheres to the standards set out in Appendix III, "Security of Automated Information Resources," OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act. If information is confidential, it is safeguarded pursuant to the Privacy Act and Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business and financial information).

Objectivity of Information Product

Objective information is presented in an accurate, clear, complete, and unbiased manner, and in proper context. The substance of the information is accurate, reliable, and unbiased; in the scientific, financial, or statistical context, original and supporting data are generated and the analytical results are developed using sound, commonly-accepted scientific and research methods. "Accurate" means that information is within an acceptable degree of imprecision or error appropriate to the particular kind of information at issue and otherwise meets commonly accepted scientific, financial, and statistical standards.

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act. Several sources of data were used in the development of this document, including the analysis of potential impacts. These data sources include, but are not limited to: landings data from vessel trip reports, landings data from individual voice reports, information from resource trawl surveys, data from the dealer weighout purchase reports, descriptive information provided (on a voluntary basis) by processors and dealers of Atlantic herring, and ex-vessel price information. Although there are some limitations to the data used in the analysis of impacts of

management measures and in the description of the affected environment, these data are considered to be the best available.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this document are based on either assessments subject to peer-review through the Stock Assessment Review Committee (SARC) or on updates of those assessments. Landings and revenue information is based on information collected daily VMS catch reports and VTR reports, and supplemented with state/federal dealer data. Information on catch composition and bycatch is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Herring Plan Development Team.

The policy choices (i.e., management measures) proposed in this Framework Adjustment 2 and the 2013-2015 herring specifications package are supported by the best available scientific information. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section 3.0 and Section 4.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. Qualitative discussion is provided in cases where quantitative information was unavailable, utilizing appropriate references as necessary.

The review process for any action under an FMP involves the Northeast Regional Office (NERO) of NOAA Fisheries, the Northeast Fisheries Science Center (Center), and NOAA Fisheries Headquarters (Headquarters). The Council review process involves public meetings at which affected stakeholders have the opportunity to provide comments on the proposed changes to the FMP. Reviews by staff at NERO are conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. The Center's technical review is conducted by senior-level scientists with specialties in population dynamics, stock assessment methodology, fishery resources, population biology, and the social sciences.

Final approval of this Framework Adjustment 2 and the 2013-2015 herring specifications package and clearance of the Proposed and Final Rules is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. This review process is standard for any action under an FMP, and provides input from individuals having various expertise who may not have been directly involved in the development of the proposed actions. Thus, the review process for any FMP modification, including Framework 2 and the herring specifications for the 2013-2015 fishing years, is performed by technically-qualified individuals to ensure the action is valid, complete, unbiased, objective, and relevant.

5.7 IMPACTS ON FEDERALISM/E.O. 13132

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected States have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council) and coordination with the Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council.

5.8 ADMINISTRATIVE PROCEDURES ACT (APA)

This action was developed in compliance with the requirements of the Administrative Procedures Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

5.9 COASTAL ZONE MANAGEMENT ACT (CZMA)

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to the CZMA regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in § 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity. The Council has determined that this action is consistent with the coastal zone management plan and policies of the coastal states in this region. NMFS will formally request consistency reviews by CZM state agencies following Council submission of Framework 2 and the 2013-2015 Atlantic herring fishery specifications.

5.10 REGULATORY FLEXIBILITY ACT (RFA)/E.O. 12866 (REGULATORY PLANNING AND REVIEW)

5.10.1 Regulatory Flexibility Act (RFA) – Initial Regulatory Flexibility Analysis

The purpose of the RFA is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the RFA requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains an Initial Regulatory Flexibility Analysis (IRFA), found below, which includes an assessment of the effects that the Proposed Action and other alternatives are expected to have on small entities.

Under section 603(b) of the RFA, an IRFA must describe the impact of the proposed rule on small entities and contain the following information:

1. A description of the reasons why the action by the agency is being considered.
2. A succinct statement of the objectives of, and legal basis for, the proposed rule.
3. A description—and, where feasible, an estimate of the number—of small entities to which the proposed rule will apply.
4. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the types of professional skills necessary for preparation of the report or record.
5. An identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule.

5.10.1.1 Reasons for Considering the Action

The statement of the problem(s) that this document addresses can be found in the Purpose and Need for Action section (Section 1.1, p. 5) and should be referenced for additional information. The goals and objectives of Framework 2 and the proposed 2013-2015 Atlantic herring fishery specifications are discussed in Section 1.1 as well.

5.10.1.2 Objectives and Legal Basis for the Action

The objective of the Proposed Action is to implement Framework Adjustment 2 and the 2013-2015 Atlantic herring fishery specifications, as required under the regulations implementing the Atlantic Herring FMP, which are provided in 50 CFR 648.

5.10.1.3 Description and Number of Small Entities to Which the Rule Applies

The RFA recognizes three kinds of small entities: small businesses, small organizations, and small governmental jurisdictions. The small business criteria in the finfish fishing industry (NAICS 114111) is a firm that is independently owned and operated and not dominant in its field of operation, with gross annual receipts $4 million or less. Small organizations and small governmental jurisdictions are not directly regulated by this action. For the following shaded text – see "Note" on page 289. A final rule effective July 22, 2013, included revised SBA small business size standards for several industries in (78 FR 37398, June 20, 2013). The rule increased

the size standard for Finfish Fishing from $4.0 to $19.0 million, Shellfish Fishing from $4.0 to $5.0 million, and Other Marine Fishing from $4.0 to $7.0 million

Regulated Commercial Harvesting Entities

One of the major features of Amendment 1 was the establishment of a limited access program in the federal Atlantic herring fishery. There are four permit categories: 1) limited access permit for all management areas (Category A); 2) limited access permit for access to Areas 2 and 3 only (Category B); 3) limited access incidental catch permit for 25 mt per trip (Category C); and 4) an open access incidental catch permit for 3 mt per trip (Category D).

Table 77 categorizes the number of large and small vessel permit holders in the herring fishery over the 2010-2012 time period. Note that open-access (Category D) permit holders, while quite numerous, are subject to fairly low possession limits for herring, are responsible for very small levels of landings, and derive relatively little revenue from this fishery. ~~In 2012, there were 3 large entities and 86 small entities which had limited access permits. Another 1,984 small vessels held open access permits.~~

Table 77 Small and Large Vessel in Categories A/B/C/D, 2010-2012 Fishing Years

Vessel Categories	2010		2011		2012	
	Large	Small	Large	Small	Large	Small
A	0	43	3	39	3	37
B	0	4	0	4	0	4
C	0	49	0	47	0	45
D	0	2276	0	2124	0	1984

Source: NOAA 2012

Table 78 summarizes numbers of vessels, mean gross revenues, and mean gross revenues of herring associated with potentially impacted limited-access (Categories A, B, or C) permits in 2012.

Table 78 Gross Herring Sales by Permit for 2012 Fishing Year (Categories A/B/C)

Gross Sales Category	Number of Permits	Mean Gross Sales	Mean Sales of Herring
0	15	$0	$0
<$50K	4	$22,567	$0
$50-100K	6	$73,943	$990
$100-500K	15	$261,931	$83,350
$500K-1M	15	$764,142	$185,495
$1-4M	39	$1,726,859	$416,479
$4+M	3	$5,263,488	$1,905,180

Source: NOAA 2012

Ownership Entities in Regulated Commercial Harvesting Businesses

Individually-permitted vessels may hold permits for several fisheries, harvesting species of fish that are regulated by several different fishery management plans, even beyond those impacted by the proposed action. Furthermore, multiple permitted vessels and/or permits may be owned by entities affiliated by stock ownership, common management, identity of interest, contractual relationships, or economic dependency. For the purposes of this analysis, ownership entities are defined by those entities with common ownership personnel as listed on permit application documentation. Only permits with identical ownership personnel are categorized as an ownership entity. For example, if five permits have the same seven personnel listed as co-owners on their application paperwork, those seven personnel form one ownership entity, covering those five permits. If one or several of the seven owners also own additional vessels, with sub-sets of the original seven personnel or with new co-owners, those ownership arrangements are deemed to be separate ownership entities for the purpose of this analysis.

Summary of Regulated Ownership Entities within Potentially Impacted Fisheries

For the following stricken text – See "Note" on page 289. ~~Ownership data are available for 2010 onward. Data for 2010-2012 are presented, although data for the calendar year 2012 are preliminary. Table 79 describes gross sales by ownership group (large and small entities) for 2010-2012. While there are entities that hold limited-access herring permits (Category A/B/C) with gross receipts greater than $4M, none of these entities reported any herring revenues during 2010-2012.~~

The following table is stricken and replaced with Table 79 on page 287.

~~Table 79 Gross Sales by Ownership for 2010-2012 Fishing Years (Categories A/B/C)~~

		~~2010~~		~~2011~~		~~2012~~	
~~Entities Category~~	~~Revenue group~~	~~Some Herring Landings~~	~~No herring Landings~~	~~Some Herring Landings~~	~~No herring Landings~~	~~Some Herring Landings~~	~~No herring Landings~~
~~Small~~	~~<$4M~~	~~28~~	~~42~~	~~23~~	~~41~~	~~21~~	~~40~~
~~Large~~	~~>=$4M~~	~~0~~	~~1~~	~~0~~	~~4~~	~~0~~	~~3~~

~~*Source: NOAA 2012*~~

~~Finally, there are some ownership groups which are composed solely of Category D permits. Though quite numerous, this group is subject to fairly small herring landings as seen in Table 80, especially among the large entities (only one in 2011).~~

The following table is stricken and replaced with table 80 on page 288.

~~Table 80 Gross Sales by Ownership for 2010-2012 Fishing Years (Category D Only)~~

		~~2010~~		~~2011~~		~~2012~~	
~~Entities Category~~	~~Revenue group~~	~~Some Herring Landings~~	~~No herring Landings~~	~~Some Herring Landings~~	~~No herring Landings~~	~~Some Herring Landings~~	~~No herring Landings~~
~~Small~~	~~<$4M~~	~~45~~	~~1641~~	~~39~~	~~1500~~	~~35~~	~~1412~~
~~Large~~	~~>=$4M~~	~~0~~	~~20~~	~~1~~	~~20~~	~~0~~	~~18~~

~~*Source: NOAA 2012*~~

For the following shaded text – see "Note" on page 289. NMFS has identified 70 entities that held at least one limited access herring permit in 2012 (category A, B, or C). Many of these entities are active in both finfish fishing and shellfish fishing industries. In order to classify entities as small or large, fishing entities are first classified as participants in either the Finfish Fishing or Shellfish Fishing industry. If a firm derives more than 50 percent of its gross revenues from shellfish fishing, the $5.0 million standard for total revenues is applied. If a firm derives more than 50 percent of its gross revenues from finfish fishing, the $19.0 million standard for total revenues is applied. Based on the revised criteria, there are 7 large fishing entities to which the proposed rule will apply. All of the large entities qualify under the Shellfish size standard. There are 63 small entities to which the proposed rule will apply. Forty-two are small finfish entities (50 percent or more revenues from finfish, and total revenues under $19.0 million) and 21 are small shellfish entities (less than 50 percent of revenues from shellfish, and total revenues under $5.0 million).

Of the sixty-three small entities, 39 reported no revenue from herring during 2012. For the 24 small entities that were active in the herring fishery, median gross revenues were approximately $872,000 and median revenues from the herring fishery were approximately $219,000. There is large variation in the importance of herring fishing for these small entities. Eight of these twenty-four active small entities derive less than 5 percent of their total fishing revenue from herring. Seven of these twenty-four active small entities derive more than 95 percent of their total fishing revenue from herring. Table 79 summarizes the number of small and large entities that would be affected based on gross revenues in 2010-2012.

Table 79 Counts of Small and Large Entities Holding at Least 1 Limited Access Herring Permit in 2010-2012

	2010		2011		2012	
Entities Category	**Some Herring Landings**	**No herring Landings**	**Some Herring Landings**	**No herring Landings**	**Some Herring Landings**	**No herring Landings**
Small	31	39	25	42	24	39
Large	4	2	5	2	5	2

There are some ownership groups which are composed solely of Category D permits. While quite numerous and directly regulated, this group participates minimally in the herring fishery (Table 80).

Table 80 Counts of Small and Large Entities Holding Only Category D (Open-access) Herring Permits in 2010-2012

	2010		2011		2012	
Entities Category	**Some Herring Landings**	**No herring Landings**	**Some Herring Landings**	**No herring Landings**	**Some Herring Landings**	**No herring Landings**
Small	45	1,054	39	957	35	925
Large	0	15	1	17	0	18

5.10.1.4 Record Keeping and Reporting Requirements

The proposed action does not introduce any new reporting, recordkeeping, or other compliance requirements.

5.10.1.5 Duplication, Overlap, or Conflict with Other Federal Rules

The proposed action does not duplicate, overlap or conflict with any other Federal rules.

For the following stricken section – see "Note" on page 289.

~~5.10.1.6 Determination of Significance~~

~~***Substantial Number Criterion***~~

~~Given that the majority of entities in this industry, both at the permit and ownership entity level, earn less than $4 million annually, all of the proposed alternatives will have impacts on a substantial number of small entities.~~

~~***Significant Economic Impacts***~~

~~The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability. *Disproportionality* refers to whether or not the regulations place small entities at a significant competitive disadvantage to large entities. *Profitability* refers to whether or not the regulations significantly reduce profits for a substantial number of small entities.~~

~~The proposed action does not place small entities at a significant competitive disadvantage relative to large entities. The proposed action will affect all entities, large and small, in a similar manner.~~

~~Impacts on profits from the proposed action are likely to be small, and will not significantly reduce profits for a substantial number of small entities. Under the ***Preferred Alternatives*** in Framework Adjustment 2, sub-ACL carryover would be allowed, improving profitability. Sub-~~

~~ACL splits were advocated for by the industry; based on this, it is reasonable to believe that these regulations would also increase profitability if they are implemented in the future.~~

~~Under the ***Preferred Alternatives*** in the proposed 2013-2015 herring specifications, ABC and the corresponding sub-ACLs would increase for the upcoming three fishing years. Management uncertainty, RSA, DAH, DAP, BT, JVP, and FGSA are expected to have minimal, if any, impacts on profitability. Sub-ACL splits were advocated for by the industry; based on this, it is reasonable to believe that these regulations would also increase profitability. The proposed AMs are expected to act as an incentive to avoid exceeding the ACL and are also expected to have minimal impacts on profitability.~~

Note: NMFS has added the shaded text and tables within Section 5.10.1, and stricken the previously included text, including Section 5.10.1.6 in its entirety. NMFS has made this revision based on the new standards for identifying small businesses established by the SBA and as a result of an error discovered while considering the new size standards in preparation for publishing the proposed rule. While reviewing the permit, ownership, and landings data to classify and describe the small entities affected by FW2, NMFS discovered an error in summarizing revenues for fishing entities. This error affected only Table 79 (the stricken version contained entities that held exactly 1 limited access permit, instead of entities that held a least 1 limited access permit). Tables 77 and 78 are unaffected by this error. Previously, NMFS erroneously identified 61 small entities that held at least 1 limited access (A, B, BC, or C) herring permit in 2012. Of those 61, only 21 had revenues from herring fishing. NMFS had identified 3 large entities that held at least 1 limited access herring permit. None of these derived any revenues from herring fishing. In addition, NMFS strikes the text in Section 5.10.1.6, that included conclusions relative to the RFA. This was not appropriate for inclusion in an initial regulatory flexibility analysis. Highlights and stricken text are left in place to clearly identify the change in the document following Council submission.

5.10.2 E.O. 12866 (Regulatory Planning and Review)

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant action is any regulatory action that may:

- Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, of the principles set forth in the Executive Order.

In deciding how whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, include the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider.

5.10.2.1 Statement of the Problem/Goals and Objectives

The statement of the problem(s) that this document addresses can be found in the Purpose and Need for Action section (Section 1.1, p. 5) and should be referenced for additional information. The goals and objectives of Framework 2 and the proposed 2013-2015 Atlantic herring fishery specifications are discussed in Section 1.1 as well.

5.10.2.2 Management Alternatives and Rationale

The proposed management action is identified as the Council's ***Preferred Alternative*** throughout Section 2.0 of this document (Proposed Management Action and Other Alternatives Considered, p. 10). The Council's rationale for selecting the ***Preferred Alternative*** is provided in Section 2.0 as well. Management measures that the Council considered but rejected during the development of the herring specifications are discussed in Section 2.2.7.

5.10.2.3 Description of the Fishery

Information about fishery-related businesses and communities potentially affected by the measures proposed in Framework Adjustment 2 and the proposed 2013-2015 herring specifications is presented in detail in Section 3.5 of this document (p. 110).

5.10.2.4 Summary of Impacts

The expected effects of each alternative relative to the status quo for the fishery-related businesses and communities are discussed throughout Section 4.0 of this document. Executive Order 12866 requires consideration of all costs and benefits. These include costs which are not imposed on fishery-related businesses and communities. These also include benefits which do not accrue to fishery- related businesses and communities. The costs and benefits of most of the alternatives considered as part of these actions will be confined to the fishery-related businesses and communities. However, certain measures may have effects which spill into other fisheries or onto the federal government. These effects are described below.

5.10.2.4.1 Framework 2

Seasonal Splits of Sub-ACLs

Relative to the status quo, the ***Preferred Alternative,*** which allows for seasonal splits, may have costs to the herring industry. A seasonal split would delay harvest of herring and potentially reallocate herring effort from earlier in the season to later in the season. However, Framework Adjustment 2 was proposed by and supported by the herring industry. The purpose of this

measure is to ensure that the herring sub-ACLs are not met or exceeded early in the fishing year. This is desirable in many cases; for example, because herring and mackerel are jointly caught at the end of the fishing year in Area 2, there may be benefits to delaying some effort until later during the year. Therefore, there may be benefits to fishing businesses which participate in both the herring and mackerel fishery.

Additional costs include increased quota-monitoring and notification costs. Because the Northeast Regional Office is currently using real-time quota monitoring in this fishery, these increased costs are expected to be minimal.

Carryover Provisions

Relative to the status quo, the ***Preferred Alternative***, Alternative 2, allows for carryover of up to 10% of sub-ACL has benefits for the herring industry which are described in Section 4.1.5 of this document. For all options, there are slightly higher regulatory and monitoring costs for NMFS. Under the Preferred Option (Option 1), there will be no corresponding increase in the total stockwide ACL. Under Option 2, an increase in the total stockwide ACL is possible and the determination is authorized by NMFS Regional Administrator. Under Option 3, the total stockwide ACL can increase but cannot exceed ABC in any fishing year. All options provide benefits to the herring industry in terms of increased operational flexibility, higher levels of catch in subsequent years, or both. There may be moderate increases in monitoring and reporting costs which would accrue to fishery managers (NMFS) associated with these options.

5.10.2.4.2 Herring Specifications 2013-2015

Impacts of OFL/ABC Alternatives

Relative to the status quo, the ***Preferred Alternative*** (Alternative 2, Section 2.2.2.2) for setting the herring ABC and OFL for 2013-2015 will result in an increase. This will provide net benefits to the herring industry in the short and long term relative to the status quo. Moderately higher amounts of catch may result in slightly lower bait costs in the lobster industry.

Alternative 3 for setting ABC for 2013-2015 (Section 2.2.2.3) would also increase net benefits to the herring industry in the short and long term relative to the status quo. However, Alternative 3 would provide lower net benefits than Alternative 2. No additional costs or benefits are expected to accrue to the nation under either Alternative 2 or 3 relative to the status quo.

Sub-ACL Options

The ***Preferred Alternative*** for specifying the 2013-2015 sub-ACLs is presented in Table 8 on p. 28 of this document. Relative to the status quo, all alternatives would increase net benefits to the nation by increasing the total ACL available for harvest by the herring fishery. The economic costs and benefits of the alternatives, relative to the status quo, are discussed in Section 4.2.2.5. Relative to the status quo, Alternatives 2-6 are expected to provide similar benefits to the nation. These alternatives for sub-ACLs are primarily distributive in nature.

Seasonal Split Options for 2013-2015

The status quo for seasonal splits includes a seasonal split for Area 1A (0% for January–May and 100% for June-December), and no seasonal splits for the other areas. The ***Preferred Alternative*** adds a seasonal split for Area 1B (0% January-April and 100% May-December). This is a way to delay fishing in Area 1B, to allow for sufficient time for overage or carryover determinations, so the industry may be better able to harvest within the sub-ACL. The proposed Area 1B split may increase user-group conflicts, particularly between the midwater trawl herring vessels and recreational striped bass anglers, who 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.

An Area 2 split of 67% January-February and 33% March-December was considered, but not selected. 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 2 could ensure herring availability towards the end of the year. This could have positive economic benefits for fishing vessels which are jointly catching herring and mackerel at the end of the calendar year.

In general, a seasonal split can be viewed as a constraint on the fishing practices or firms. This will reduce profits in the herring fishery and can be viewed as a negative cost financially. However, because herring are often caught jointly with mackerel, a regulation which constrains fishing practices may allow for higher profits when both herring and mackerel are taken into account.

Impacts of Other Proposed 2013-2015 Fishery Specifications

No costs or benefits are expected for the specifications of management uncertainty, Research Set-Asides (RSAs), Fixed Gear Set-Aside (FGSA), DAH, JVP, BT, or USAP relative to the status quo.

Accountability Measures

The ***Preferred Alternative***, a modified version of Alternative 2 (described in Section 2.2.6), would close the directed fishery at 92% of the sub-ACL. Relative to the status quo of 95% of the sub-ACL, this alternative may limit fishing opportunities and be a cost to the industry. However, Alternative 2 may also ensure that sub-ACLs are not exceeded. The Preferred Option – Option A – would close the entire fishery at 95% of the total stockwide ACL; this differs from the status quo because there is currently no trigger to close the directed fishery in all areas based on a percentage of the total ACL. This may impose a small short-term cost on the herring industry relative to the status quo, but there are expected to be long-term benefits from reducing ACL overages. Moreover, the 92% trigger for the sub-ACLs in the management areas should minimize impacts associated with closures, especially when combined with carryover provisions that are proposed in Framework 2. Option B would close the entire fishery at 92% of the total stockwide ACL; this would also impose a small cost on the herring industry relative to the status quo, but presumably less than Option A (***Preferred Alternative***).

Alternative 3 would have lower cost to the herring industry but may be less effective at achieving the conservation objectives of the Herring FMP. Under Alternative 4, the closure trigger would be a function of any previous overages. This would increase the management complexity for regulators and the industry because there could be different triggers for each management area.

5.10.2.5 Determination of Significance

Based on the analyses provided in this document, Framework Adjustment 2 and the proposed 2013-2015 herring specifications are not expected to constitute "significant regulatory actions." These actions are not expected to have an impact of $100M or more on the economy, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities. They are not expected to raise novel legal and policy issues. The proposed action also does not interfere with an action taken or planned by another agency. It does not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients.

5.11 E.O. 13158 (MARINE PROTECTED AREAS)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the extent practicable, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. defines a Marine Protected Area as "any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. The Tilefish Gear Restricted Areas in Oceanographer, Lydonia, Veatch, and Norfolk canyons are included in the National System of Marine Protected Areas (MPAs). This action under the Herring FMP is not expected to occur within any of these MPAs. No further guidance related to this Executive Order is available at this time.

5.12 E.O 12898 (ENVIRONMENTAL JUSTICE)

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898 1994). These individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin. Although the impacts of the Atlantic herring specifications may affect communities with environmental justice concerns, the actions in this document should not have disproportionately high effects on low income or minority populations. The proposed measures would apply to all participants in the affected area, regardless of minority status or income level.

The existing demographic data on participants in the Atlantic herring fishery (i.e. vessel owners, crew, dealers, processors, employees of supporting industries) do not allow identification of those who live below the poverty level or are racial or ethnic minorities. Thus, it is not possible to fully determine how the actions within this specification document may impact these population segments. The public comment processes is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to the 2013-2015 Atlantic herring specifications. The public has never requested translations of documents pertinent to the herring fishery.

For the Atlantic herring *Communities of Interest* (Section 3.5.2), poverty and minority rate data at the state and county levels are provided in Table 81. In terms of poverty, Washington County is the only county that is more than 1% higher than its state average (Maine). Washington and Cumberland Counties are the only counties with a minority rate more than 1% higher than their state average (Maine). Minority populations in Southern New England have historically participated in the fishing industry. For the Atlantic herring fishery, evidence suggests that minority participation is focused within the processing sector. For a New Bedford-based herring processor, 90-95% of its employees are of Central American decent (Section 4.5.1.5.4, Amendment 5 DEIS). For a New Jersey-based processor, its minority employees are Hispanic and the rate is close to the county rate (Lund's, personal communication, 2012).

With respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. NERO tracks these issues, but there are no federally recognized tribal agreements for subsistence fishing in New England federal waters.

Table 81 Demographic Data for Atlantic Herring Fishing Communities of Interest

State/County	Minority Ratea	Poverty Rateb
Maine	**5.7%**	**12.6%**
Cumberland	8.3%	10.5%
Knox	3.7%	12.5%
Hancock	4.0%	11.5%
Washington	9.0%	19.8%
Sagadahoc	4.6%	8.8%
New Hampshire	**7.8%**	**7.8%**
Rockingham	6.0%	4.7%
Massachusetts	**23.6%**	**10.5%**
Essex	24.3%	10.1%
Bristol	13.5%	11.3%
Rhode Island	**23.5%**	**12.2%**
Newport	12.2%	7.3%
Washington	7.9%	7.4%
New Jersey	**41.1%**	**9.1%**
Cape May	13.4%	9.2%

Source: U.S. Census Bureau, 2010, http://quickfacts.census.gov/qfd/states.html
[a] *Persons other than those who report as White persons not Hispanic.*
[b] *Persons below poverty level, 2006-2010.*

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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:

- Lori Steele, NEFMC Staff, Herring PDT Chair
- Rachel Feeney and Rachel Neild, NEFMC Staff
- Michelle Bachman, NEFMC Staff
- Matt Cieri, ME DMR Biologist, ASMFC Herring TC Chair
- Amy van Atten, Sara Weeks, NEFOP
- Jon Deroba, NEFSC Population Dynamics
- Min Yang Lee, NEFSC Social Sciences
- Steve Correia, MA DMF Biologist
- Micah Dean, MA DMF Biologist
- Madeleine Hall-Arber, MIT Sea Grant
- Jamie Cournane, UNH
- Carrie Nordeen, NMFS NERO
- Lindsey Feldman, NMFS NERO
- Tim Cardiasmenos, NMFS NERO
- Daniel Marrone, NMFS NERO
- Robert Vincent, NMFS NERO
- Jason Didden, MAFMC Staff
- Renee Zobel, NH Fish and Game Marine Biologist

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
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- Mid-Atlantic Fishery Management Council